



# Water and Wastewater Rate Study

## Township of Cavan Monaghan

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Watson & Associates Economists Ltd.  
905-272-3600  
[info@watsonecon.ca](mailto:info@watsonecon.ca)

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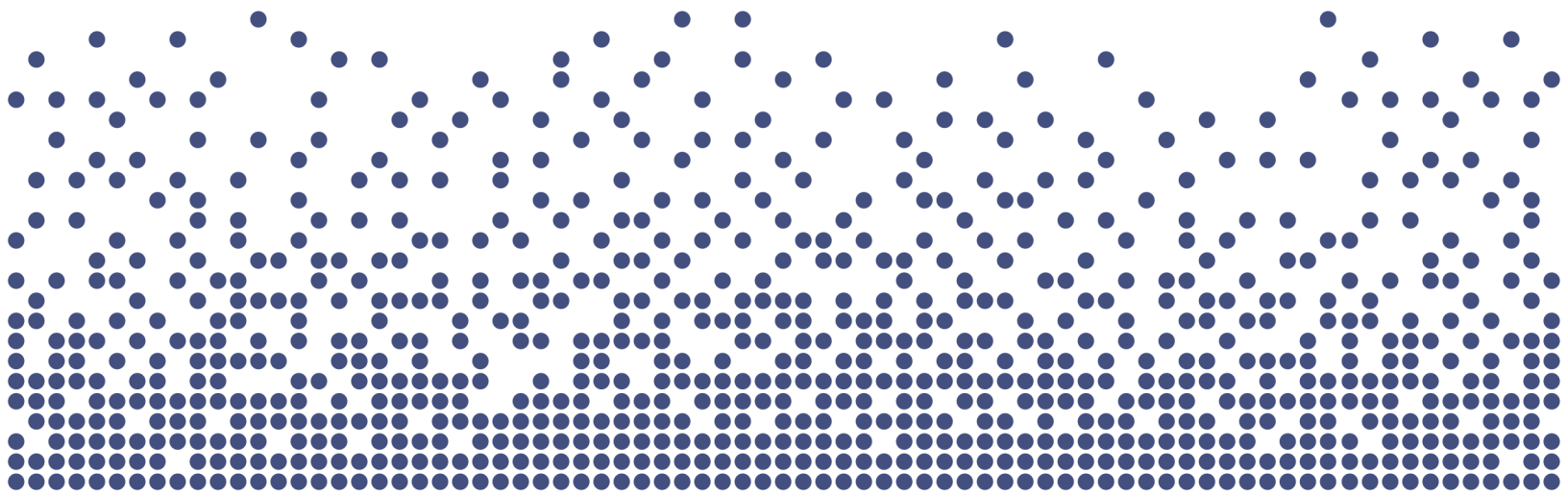
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## List of Acronyms and Abbreviations

Acronym	Full Description of Acronym
A.M.O.	Association of Municipalities of Ontario
C.W.W.F.	Clean Water and Wastewater Fund
D.C.A.	Development Charges Act, 1997
F.I.R.	Financial Information Return
I.J.P.A.	Infrastructure for Jobs and Prosperity Act, 2015
I.O.	Infrastructure Ontario
LPAT	Local Planning Appeal Tribunal
M.O.E.	Ministry of Environment
O.C.I.F.	Ontario Community Infrastructure Fund
O.M.B.	Ontario Municipal Board
O.Reg.	Ontario Regulation
O.S.I.F.A.	Ontario Strategic Infrastructure Financing Authority
P.S.A.B.	Public Sector Accounting Board
P.T.I.F.	Public Transit Infrastructure Fund
S.W.S.S.A.	Sustainable Water and Sewage Systems Act, 2002



# Executive Summary



## Executive Summary

The Township of Cavan Monaghan retained Watson & Associates Economists Ltd. (Watson) to undertake a water and wastewater rate study. This study aims to update the analysis for current capital and operating forecasts, costing for lifecycle expenditure requirements, current volumes, and customer profiles. The results of this analysis provide updated water and wastewater base charges and volume rates for customers within the serviced area of Township of Cavan Monaghan. The rate analysis contained herein continues to provide fiscally responsible practices that are in line with current provincial legislation at a level of rate increases that are reasonable.

The analysis presented herein provides the following:

- The 2021 to 2029 capital spending program for water and wastewater is \$4.14 million and \$3.11 million (uninflated), respectively;
- Annual operating expenditures are assumed to increase by 2% per annum for most expenditures; expenditures related to utilities, fuels, chemicals and other materials have been increased at 5% per annum;
- The present rate structure (base monthly charge and a constant volume rate) is continued for both water and wastewater;
- Existing water customers total 826; new customers will range from between 20 and 60 customers annually over the next 10-year period;
- Existing wastewater customers total 814; the same level of increase as water is assumed over the period;
- The Development Charge (D.C.) reserve funds are in deficit positions throughout the forecast period; and
- The combined balance of all reserves and reserve funds remains positive for all years except 2023.

Based on the above information, rate increases have been provided in two scenarios:

1. 2% increases annually for water and wastewater; and
2. 0% increase for 2021, then 2.25% annual increases thereafter.



Tables ES-1 and ES-2 summarize the recommended water and wastewater annual bills for each respective scenario (assuming an annual volume of 140 m<sup>3</sup>) based on the analysis provided herein over the forecast period.



Table ES-1  
Scenario 1  
2% Annual Increases

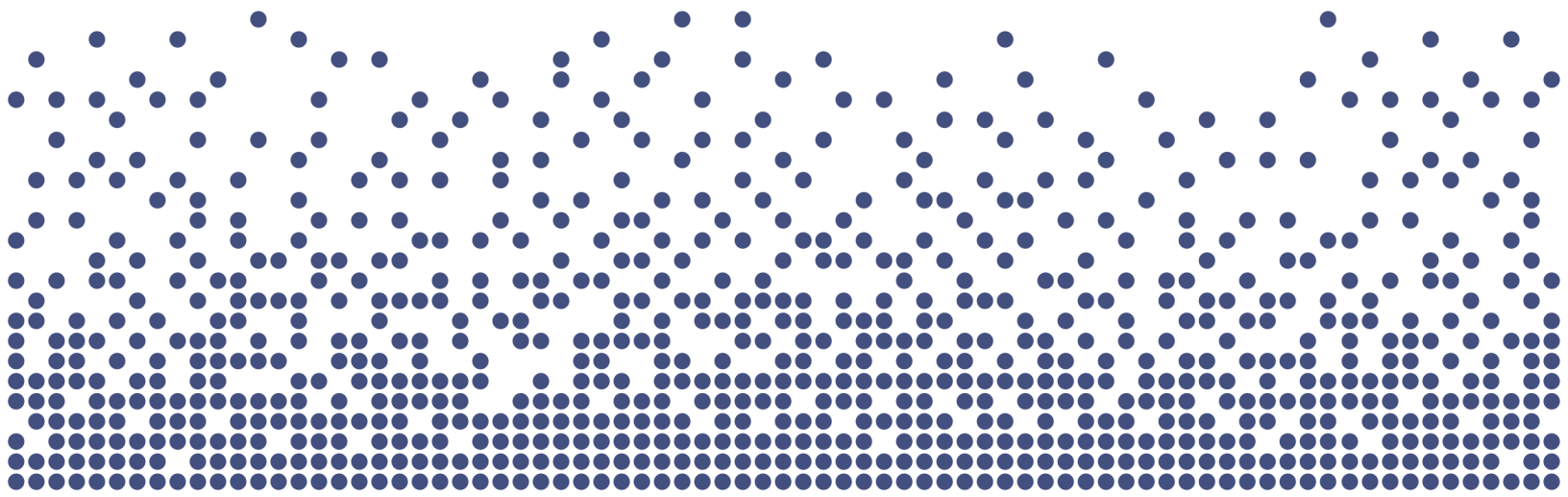
Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$33.33	\$34.00	\$34.67	\$35.37	\$36.08	\$36.80	\$37.53	\$38.28	\$39.05
Volume Rate	\$1.82	\$1.86	\$1.89	\$1.93	\$1.97	\$2.01	\$2.05	\$2.09	\$2.13	\$2.17
Annual Base Charge	\$392.10	\$399.94	\$407.94	\$416.10	\$424.42	\$432.91	\$441.57	\$450.40	\$459.41	\$468.60
Annual Volume Charge	\$254.80	\$259.90	\$264.60	\$270.20	\$275.80	\$281.40	\$287.00	\$292.60	\$298.20	\$303.80
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$659.84</b>	<b>\$672.54</b>	<b>\$686.30</b>	<b>\$700.22</b>	<b>\$714.31</b>	<b>\$728.57</b>	<b>\$743.00</b>	<b>\$757.61</b>	<b>\$772.40</b>
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$61.68	\$62.91	\$64.17	\$65.45	\$66.76	\$68.10	\$69.46	\$70.85	\$72.27
Volume Rate	\$2.49	\$2.54	\$2.59	\$2.64	\$2.69	\$2.74	\$2.79	\$2.85	\$2.91	\$2.97
Annual Base Charge	\$725.64	\$740.15	\$754.96	\$770.05	\$785.46	\$801.17	\$817.19	\$833.53	\$850.20	\$867.21
Annual Volume Charge	\$348.60	\$355.57	\$362.60	\$369.60	\$376.60	\$383.60	\$390.60	\$399.00	\$407.40	\$415.80
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,095.72</b>	<b>\$1,117.56</b>	<b>\$1,139.65</b>	<b>\$1,162.06</b>	<b>\$1,184.77</b>	<b>\$1,207.79</b>	<b>\$1,232.53</b>	<b>\$1,257.60</b>	<b>\$1,283.01</b>
<b>Total Water and Wastewater Bill</b>	<b>\$1,721.14</b>	<b>\$1,755.56</b>	<b>\$1,790.10</b>	<b>\$1,825.95</b>	<b>\$1,862.28</b>	<b>\$1,899.08</b>	<b>\$1,936.36</b>	<b>\$1,975.53</b>	<b>\$2,015.21</b>	<b>\$2,055.40</b>
Annual % Increase		2%	2%	2%	2%	2%	2%	2%	2%	2%





Table ES-2  
Scenario 2  
0% Annual Increase for 2021 then 2.25% Annual Increases

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$32.68	\$33.41	\$34.16	\$34.93	\$35.72	\$36.52	\$37.34	\$38.18	\$39.04
Volume Rate	\$1.82	\$1.82	\$1.86	\$1.90	\$1.95	\$1.99	\$2.04	\$2.08	\$2.13	\$2.18
Annual Base Charge	\$392.10	\$392.10	\$400.92	\$409.94	\$419.17	\$428.60	\$438.24	\$448.10	\$458.18	\$468.49
Annual Volume Charge	\$254.80	\$254.80	\$260.54	\$266.42	\$272.44	\$278.60	\$284.90	\$291.34	\$297.92	\$304.64
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$646.90</b>	<b>\$661.46</b>	<b>\$676.36</b>	<b>\$691.61</b>	<b>\$707.20</b>	<b>\$723.14</b>	<b>\$739.44</b>	<b>\$756.10</b>	<b>\$773.13</b>
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$60.47	\$61.83	\$63.22	\$64.64	\$66.10	\$67.59	\$69.11	\$70.66	\$72.25
Volume Rate	\$2.49	\$2.49	\$2.55	\$2.60	\$2.66	\$2.72	\$2.78	\$2.85	\$2.91	\$2.98
Annual Base Charge	\$725.64	\$725.64	\$741.97	\$758.66	\$775.73	\$793.18	\$811.03	\$829.28	\$847.94	\$867.02
Annual Volume Charge	\$348.60	\$348.60	\$356.44	\$364.42	\$372.68	\$381.08	\$389.62	\$398.44	\$407.40	\$416.50
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,074.24</b>	<b>\$1,098.41</b>	<b>\$1,123.08</b>	<b>\$1,148.41</b>	<b>\$1,174.26</b>	<b>\$1,200.65</b>	<b>\$1,227.72</b>	<b>\$1,255.34</b>	<b>\$1,283.52</b>
<b>Total Water and Wastewater Bill</b>	<b>\$1,721.14</b>	<b>\$1,721.14</b>	<b>\$1,759.87</b>	<b>\$1,799.44</b>	<b>\$1,840.02</b>	<b>\$1,881.46</b>	<b>\$1,923.79</b>	<b>\$1,967.16</b>	<b>\$2,011.44</b>	<b>\$2,056.65</b>



# Report



# Chapter 1

## Introduction



# 1. Introduction

## 1.1 Background

The Township of Cavan Monaghan currently services 826 metered water customers and 814 wastewater customers. The Township's water and wastewater system operates from the Millbrook Water Treatment facility and the Millbrook Wastewater Treatment facility and currently consists of approximately 12.43 kilometers of water mains, 12.44 kilometers of sanitary pipes, 132 sanitary manholes, and 120 hydrants.

The water and wastewater systems are metered and utilize rate structures with a monthly base charge as well as a volume charge on a per cubic metre basis. Table 1-1 provides the existing rates currently in effect.

Table 1-1  
Township of Cavan Monaghan  
Water and Wastewater Rates – 2020

Township of Cavan Monaghan		Township of Cavan Monaghan	
2020 - Water Billing Rates		2020 - Wastewater Billing Rates	
Millbrook Monthly Base Charge		Millbrook Monthly Base Charge	
15mm/18mm	32.68	15mm/18mm	60.47
25mm	59.67	25mm	112.33
40mm	135.74	40mm	279.32
50mm	316.23	50mm	662.34
75mm	653.02	75mm	1,373.75
100mm	1,158.07	100mm	2,441.25
Volume Charge		Volume Charge	
\$	1.820 per m <sup>3</sup>	\$	2.490 per m <sup>3</sup>
Bulk Water Rate			
\$	4.260 per m <sup>3</sup>		

With the legislative changes being made across Ontario as a result of the Walkerton crisis, municipalities will be required to conform to new statutes governing the management of water and wastewater systems. Watson & Associates Economists Ltd. (Watson) was retained by the Township of Cavan Monaghan to assist in addressing these changes in a proactive manner as they relate to the water and wastewater systems. The assessment provided herein addresses changes recommended to the



water and wastewater rates based on the most current information and forecasts the implications over the next ten-year period.

## 1.2 Study Process

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The objectives of the study and the steps involved in carrying out this assignment are summarized below:

- Identify all current and future water and wastewater system capital needs to assess the immediate and longer-term implications;
- Identify potential methods of cost recovery from the capital needs listing. These recovery methods may include other statutory authorities (e.g. *Development Charges Act, 1997* (D.C.A.), *Municipal Act*, etc.) as an offset to recovery through the water and wastewater rates;
- Identify existing operating costs by component and estimate future operating costs over the next ten years. This assessment identifies fixed and variable costs in order to project those costs sensitive to changes to the existing infrastructure inventory, as well as costs which may increase commensurate with growth; and
- Provide staff and Committee/Council the findings to assist in gaining approval of the rates for 2021 and future years.

## 1.3 Regulatory Changes in Ontario

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Resulting from the water crisis in Walkerton, significant regulatory changes have been made in Ontario. These changes arise as a result of the Walkerton Commission and the 93 recommendations made by the Walkerton Inquiry Part II report. Areas of recommendation include:

- watershed management and source protection;
- quality management;
- preventative maintenance;
- research and development;
- new performance standards;
- sustainable asset management; and
- lifecycle costing.



The legislation which would have most impacted municipal water and wastewater rates was the *Sustainable Water and Sewage Systems Act* (S.W.S.S.A.) which would have required municipalities to implement full cost pricing. The legislation was enacted in 2002, however, it had not been implemented pending the approval of its regulations. The Act was repealed as of January 1, 2013. It is expected that the provisions of the *Water Opportunities Act* will implement the fundamental requirements of S.W.S.S.A. Furthermore, on December 27, 2017, O.Reg. 588/17 was released under the *Infrastructure for Jobs and Prosperity Act, 2015* (I.J.P.A.), which outlines the requirements for asset management for municipalities. The results of the asset management review under this Act will need to be considered in light of the recent investments undertaken by the Township and the capital spending plan provided herein. The following sections describe these various resulting changes.

## 1.4 Sustainable Water and Sewage Systems Act

---

As noted earlier, the S.W.S.S.A. was passed on December 13, 2002. The intent of the Act was to introduce the requirement for municipalities to undertake an assessment of the “full cost” of providing their water and wastewater services. It is noted, however, that this Act has been repealed. To provide broader context and understanding to other legislation discussed herein, a description of the Act is provided below.

Full costs for water service was defined in subsection 3(7) of the Act and included “...source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs associated with extracting, treating or distributing water to the public and such other costs which may be specified by regulation.” Similar provisions were made for wastewater services in subsection 4(7) with respect to “...collecting, treating or discharging waste water.”

The Act would have required the preparation of two reports for submission to the Ministry of the Environment (or such other member of the Executive Council as may be assigned the administration of this Act under the *Executive Council Act*). The first report was on the “full cost of services” and the second was the “cost recovery plan.” Once these reports were reviewed and approved by the Ministry, the municipality would have been required to implement the plans within a specified time period.

In regard to the **full cost of services** report, the municipality (deemed a regulated entity under the Act) would prepare and approve a report concerning the provision of water



and sewage services. This report was to include an inventory of the infrastructure, a management plan providing for the long-term integrity of the systems, and would address the full cost of providing the services (other matters may be specified by the regulations) along with the revenue obtained to provide them. A professional engineer would certify the inventory and management plan portion of the report. The municipality's auditor would be required to provide a written opinion on the report. The report was to be approved by the municipality and then be forwarded to the Ministry along with the engineer's certification and the auditor's opinion. The regulations would stipulate the timing for this report.

The second report was referred to as a **cost recovery plan** and would address how the municipality intended to pay for the full costs of providing the service. The regulations were to specify limitations on what sources of revenue the municipality may use. The regulations may have also provided limits as to the level of increases any customer or class of customer may experience over any period of time. Provision was made for the municipality to implement increases above these limits; however, ministerial approval would be required first. Similar to the first report, the municipal auditor would provide a written opinion on the report prior to Council's adoption, and this opinion must accompany the report when submitted to the Province.

The Act provided the Minister the power to approve or not approve the plans. If the Minister was not satisfied with the report or if a municipality did not submit a plan, the Minister may have a plan prepared. The cost to the Crown for preparing the plan would be recovered from the municipality. As well, the Minister may direct two or more regulated municipalities to prepare a joint plan. This joint plan may be directed at the onset or be directed by the Minister after receiving the individual plans from the municipalities.

The Minister also had the power to order a municipality to generate revenue from a specific revenue source or in a specified manner. The Minister may have also ordered a regulated entity to do or refrain from doing such things as the Minister considered advisable to ensure that the entity pays the full cost of providing the services to the public.

Once the plans were approved and in place, the municipality would be required to submit progress reports. The timing of these reports and the information to be contained therein would be established by the regulations. A municipal auditor's



opinion must be provided with the progress report. Municipalities would also revise the plans if they deem the estimate does not reflect the full cost of providing the services, as a result of a change in circumstances, regulatory or other changes that affect their plan, etc. The municipality would then revise its prior plan, provide an auditor's opinion, and submit the plan to the Minister.

## 1.5 Financial Plans Regulation

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On August 16, 2007, the M.O.E. passed O.Reg 453/07 which requires the preparation of financial plans for water (and wastewater) systems. The M.O.E. has also provided a Financial Plan Guidance Document to assist in preparing the plans. A brief summary of the key elements of the regulation is provided below:

- The financial plan will represent one of the key elements for the municipality to obtain its Drinking Water Licence;
- The financial plans shall be for a period of at least six years, but longer planning horizons are encouraged;
- As the regulation is under the *Safe Drinking Water Act, 2002*, the preparation of the plan is mandatory for water and encouraged for wastewater;
- The plan is considered a living document (i.e. will be updated as annual budgets are prepared) but will need to be undertaken, at a minimum, every five years;
- The plans generally require the forecasting of capital, operating and reserve fund positions, providing detailed inventories, forecasting future users and volume usage and corresponding calculation of rates. In addition, P.S.A.B. information on the system must be provided for each year of the forecast (i.e. total non-financial assets, tangible capital asset acquisitions, tangible capital asset construction, betterments, write-downs, disposals, total liabilities and net debt);
- The financial plans must be made available to the public (at no charge) upon request and be available on the municipality's website. The availability of this information must also be advertised; and
- The financial plans are to be approved by Resolution of the Council or governing body indicating that the drinking water system is financially viable.

In general, the financial principles of the draft regulations follow the intent of S.W.S.S.A. to move municipalities towards financial sustainability. Many of the prescriptive





requirements, however, have been removed (e.g. preparation of two separate documents for provincial approval, auditor opinions, engineer certifications, etc.).

A Guideline (“Towards Financially Sustainable Drinking Shores – Water and Wastewater Systems”) had been developed to assist municipalities in understanding the Province’s direction and provided a detailed discussion on possible approaches to sustainability. The Province’s Principles of Financially Sustainable Water and Wastewater Services are provided below:

Principle #1: Ongoing public engagement and transparency can build support for, and confidence in, financial plans and the system(s) to which they relate.

Principle #2: An integrated approach to planning among water, wastewater, and stormwater systems is desirable given the inherent relationship among these services.

Principle #3: Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services.

Principle #4: Lifecycle planning with mid-course corrections is preferable to planning over the short term, or not planning at all.

Principle #5: An asset management plan is a key input to the development of a financial plan.

Principle #6: A sustainable level of revenue allows for reliable service that meets or exceeds environmental protection standards, while providing sufficient resources for future rehabilitation and replacement needs.

Principle #7: Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received.

Principle #8: Financial plans are “living” documents that require continuous improvement. Comparing the accuracy of financial projections with actual results can lead to improved planning in the future.



Principle #9: Financial plans benefit from the close collaboration of various groups, including engineers, accountants, auditors, utility staff, and municipal Council.

## 1.6 Water Opportunities Act, 2010

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As noted earlier, since the passage of the *Safe Drinking Water Act, 2002*, continuing changes and refinements to the legislation have been introduced. Some of these Bills have found their way into law, while others have not been approved. Bill 72, the *Water Opportunities Act, 2010*, was introduced into legislation on May 18, 2010 and received Royal Assent on November 29, 2010.

The Act provides for the following elements:

- The fostering of innovative water, wastewater and stormwater technologies, services and practices in the private and public sectors;
- Preparation of water conservation plans to achieve water conservation targets established by the regulations; and
- Preparation of sustainability plans for municipal water services, municipal wastewater services and municipal stormwater services.

With regard to the sustainability plans:

- The Act extends from the water financial plans and requires a more detailed review of the water financial plan and requires a full plan for wastewater and stormwater services; and
- Regulations will provide performance targets for each service – these targets may vary based on the jurisdiction of the regulated entity or the class of entity.

The financial plan shall include:

- An asset management plan for the physical infrastructure;
- A financial plan;
- For water, a water conservation plan;
- An assessment of risks that may interfere with the future delivery of the municipal service, including, if required by the regulations, the risks posed by climate change and a plan to deal with those risks; and



- Strategies for maintaining and improving the municipal service, including strategies to ensure the municipal service can satisfy future demand, consider technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources, and increase co-operation with other municipal service providers.

Performance indicators will be established by service, with the following considerations:

- May relate to the financing, operation or maintenance of a municipal service or to any other matter in respect of what information may be required to be included in a plan;
- May be different for different municipal service providers or for municipal services in different areas of the Province.

Regulations will prescribe:

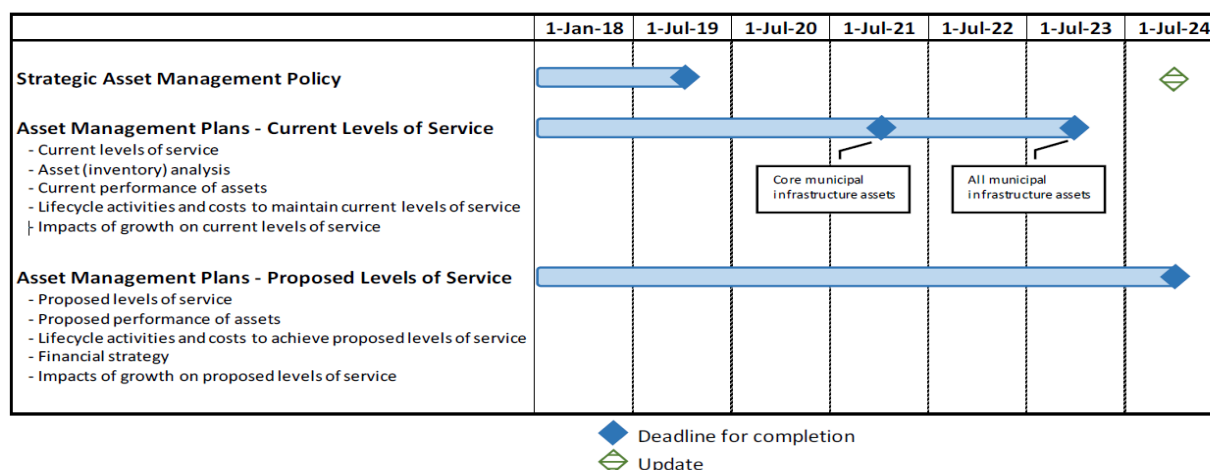
- Timing;
- Contents of the plans;
- Which identified portions of the plan will require certification;
- Public consultation process; and
- Limitations, updates, refinements, etc.

As noted earlier, it is expected that this Act will implement the principles of the S.W.S.S.A. once all regulations are put in place. The Township has also retained Watson to undertake the Water Financial Plan which is provided under separate cover.

## **1.7 Infrastructure for Jobs and Prosperity Act, 2015 (I.J.P.A.)**

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On June 4, 2015, the Province of Ontario passed the I.J.P.A. which, over time, will require municipalities to undertake and implement asset management plans for all infrastructure they own. On December 27, 2017, the Province released Ontario Regulation 588/17 under the I.J.P.A. which has three phases that municipalities must meet:



Every municipality in Ontario will have to prepare a strategic asset management policy by July 1, 2019. Municipalities will be required to review their strategic asset management policies at least every five years and make updates as necessary. The subsequent phases are as follows:

- Phase 1 – Asset Management Plan (by July 1, 2021):
  - For core assets, municipalities must have the following:
    - Inventory of assets;
    - Current levels of service measured by standard metrics; and
    - Costs to maintain levels of service.
- Phase 2 – Asset Management Plan (by July 1, 2023):
  - Same steps as Phase 1 but for all assets.
- Phase 3 – Asset Management Plan (by July 1, 2024):
  - Builds on Phase 1 and 2 by adding:
    - Proposed levels of service; and
    - Lifecycle management and financial strategy.

In relation to water and wastewater (which is considered a core asset), municipalities will need to have an asset management plan that addresses the related infrastructure by July 1, 2021 (Phase 1). O.Reg. 588/17 specifies that the municipality's asset management plan must include the following for each asset category:

- The current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at



most the two calendar years prior to the year in which all information required under this section is included in the asset management plan;

- The current performance of each asset category, including:
  - a summary of the assets in the category;
  - the replacement cost of the assets in the category;
  - the average age of the assets in the category, determined by assessing the average age of the components of the assets;
  - the information available on the condition of the assets in the category;
  - a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate; and
- The lifecycle activities that would need to be undertaken to maintain the current levels of service.

Upon completion of the asset management plan for water and wastewater services, the Township will need to consider the impacts on the capital plan provided herein.

## **1.8 Forecast Growth and Servicing Requirements**

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As mentioned in Section 1.1, the Township of Cavan Monaghan services 826 metered water customers and 814 wastewater customers. Information on the existing number of customers and existing billable volumes was obtained from the Township staff.

For future water and wastewater customers to be added to the systems, consideration has been given to development potential within the serviced areas of the Township over the forecast period 2020 to 2029.

The forecast assumes the addition of 450 water and wastewater customers over the forecast period, an average of 45 new customers per year. For operating revenue purposes, it would be undesirable to forecast too high as it could produce a potential operating deficit should the growth not materialize. Forecasting higher amounts for development charge purposes, however, ensures that capital infrastructure is in place so as not to inhibit development.

Table 1-2 provides for the forecast of water users and volumes for Cavan Monaghan, while Table 1-3 provides the forecast of wastewater users and volumes.



Table 1-2  
2020 to 2029 Water System Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020	50	25	50	50	50	50	50	50	50	50	50
2021	60		30	60	60	60	60	60	60	60	60
2022	20			10	20	20	20	20	20	20	20
2023	40				20	40	40	40	40	40	40
2024	40					20	40	40	40	40	40
2025	45						23	45	45	45	45
2026	40							20	40	40	40
2027	55								28	55	55
2028	55									28	55
2029	45										23
<b>Total</b>	<b>450</b>	<b>25</b>	<b>80</b>	<b>120</b>	<b>150</b>	<b>190</b>	<b>233</b>	<b>275</b>	<b>323</b>	<b>378</b>	<b>428</b>
m <sup>3</sup> /user	140	140	140	140	140	140	140	140	140	140	140
<b>Annual Flow</b>		<b>3,500</b>	<b>11,200</b>	<b>16,800</b>	<b>21,000</b>	<b>26,600</b>	<b>32,620</b>	<b>38,500</b>	<b>45,220</b>	<b>52,920</b>	<b>59,920</b>

Water Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	826	826	826	826	826	826	826	826	826	826
New - Growth	25	80	120	150	190	233	275	323	378	428
<b>Total</b>	<b>851</b>	<b>906</b>	<b>946</b>	<b>976</b>	<b>1,016</b>	<b>1,059</b>	<b>1,101</b>	<b>1,149</b>	<b>1,204</b>	<b>1,254</b>

Water Volume Forecast (m <sup>3</sup> )	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Millbrook</b>										
Existing	110,620	110,620	110,620	110,620	110,620	110,620	110,620	110,620	110,620	110,620
Bulk Water	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
New - CMCC	2,438	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250
New - Growth	3,500	11,200	16,800	21,000	26,600	32,620	38,500	45,220	52,920	59,920
<b>Total</b>	<b>127,058</b>	<b>135,570</b>	<b>141,170</b>	<b>145,370</b>	<b>150,970</b>	<b>156,990</b>	<b>162,870</b>	<b>169,590</b>	<b>177,290</b>	<b>184,290</b>



Table 1-3  
2020 to 2029 Wastewater System Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020	50	25	50	50	50	50	50	50	50	50	50
2021	60		30	60	60	60	60	60	60	60	60
2022	20			10	20	20	20	20	20	20	20
2023	40				20	40	40	40	40	40	40
2024	40					20	40	40	40	40	40
2025	45						23	45	45	45	45
2026	40							20	40	40	40
2027	55								28	55	55
2028	55									28	55
2029	45										23
<b>Total</b>	<b>450</b>	<b>25</b>	<b>80</b>	<b>120</b>	<b>150</b>	<b>190</b>	<b>233</b>	<b>275</b>	<b>323</b>	<b>378</b>	<b>428</b>
m <sup>3</sup> /user	140	140	140	140	140	140	140	140	140	140	140
<b>Annual Flow</b>		<b>3,500</b>	<b>11,200</b>	<b>16,800</b>	<b>21,000</b>	<b>26,600</b>	<b>32,620</b>	<b>38,500</b>	<b>45,220</b>	<b>52,920</b>	<b>59,920</b>

Wastewater Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	814	814	814	814	814	814	814	814	814	814
New - Growth	25	80	120	150	190	233	275	323	378	428
<b>Total</b>	<b>839</b>	<b>894</b>	<b>934</b>	<b>964</b>	<b>1,004</b>	<b>1,047</b>	<b>1,089</b>	<b>1,137</b>	<b>1,192</b>	<b>1,242</b>

Wastewater Flows Forecast (m <sup>3</sup> )	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Millbrook</b>										
Existing	108,940	108,940	108,940	108,940	108,940	108,940	108,940	108,940	108,940	108,940
New - CMCC	2,438	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250
New - Growth	3,500	11,200	16,800	21,000	26,600	32,620	38,500	45,220	52,920	59,920
<b>Total</b>	<b>114,878</b>	<b>123,390</b>	<b>128,990</b>	<b>133,190</b>	<b>138,790</b>	<b>144,810</b>	<b>150,690</b>	<b>157,410</b>	<b>165,110</b>	<b>172,110</b>

Note: Above flows are water flows on which the wastewater billing will be calculated



# Chapter 2

## Capital Infrastructure Needs





## 2. Capital Infrastructure Needs

### 2.1 Capital Forecast

Capital forecasts have been provided for the water and wastewater systems and are presented on Tables 2-1 and 2-2 (note: the costs are provided in uninflated dollars based on 2020 values). The bases for these forecasts are the Township's Capital Budgets and works identified by staff as replacement needs.

A summary of the capital works related to the water and wastewater services is provided on the following tables.

Table 2-1  
2021 to 2029 Water Capital Forecast Summary (Uninflated \$)

Description	Total 2021 to 2029	Years Undertaken
<b>Water Distribution System (4830)</b>	-	
Watermain Replacement (various locations)	3,000,000	2021 to 2029
Replacement of Well and Pump	150,000	2022
<b>Growth Related:</b>		
Water Master Servicing Study	20,000	2021
Duke Street from King Street Southwards	153,000	2022
King Street from Queen Street to IO Property	51,000	2025
Water Servicing Studies - Future Development	102,000	2029
Future Watermain Booster Pumping Station	663,000	2023
<b>Total</b>	<b>4,139,000</b>	



Table 2-2  
2021 to 2029 Wastewater Capital Forecast Summary (Uninflated \$)

Description	Total 2021 to 2029	Years Undertaken
<b>Capital Expenditures</b>		
<b>Wastewater Collection System(4811)</b>		
Sewer Relining	250,000	2021
Various Wastewater Facility Upgrades	300,000	2022, 2024, & 2026
<b>Growth Related:</b>		
Wastewater Master Servicing Study	274,000	2021
Cambium Studies	80,000	2021, 2022
Infiltration Solutions	100,000	2021, 2022
Pump Station and Forcemain between property	500,000	2023
Duke Street from King Street Southwards	255,000	2022
King Street from Queen Street to IO Property	102,000	2025
Future Sanitary Pumping Station - Sewage	1,122,000	2023
Future Trunk Sanitary Sewer (oversizing)	122,400	2021
<b>Total</b>	<b>3,105,400</b>	



# Chapter 3

## Lifecycle Costing



## 3. Lifecycle Costing

### 3.1 Overview of Lifecycle Costing

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#### 3.1.1 Definition

For many years, lifecycle costing has been used in the field of maintenance engineering and to evaluate the advantages of using alternative materials in construction or production design. The method has gained wider acceptance and use in the areas of industrial decision-making and the management of physical assets.

By definition, lifecycle costs are all the costs which are incurred during the lifecycle of a physical asset, from the time its acquisition is first considered to the time it is taken out of service for disposal or redeployment. The stages which the asset goes through in its lifecycle are specification, design, manufacture (or build), install, commission, operate, maintain and disposal. Figure 3-1 depicts these stages in a schematic form.

#### 3.1.2 Financing Costs

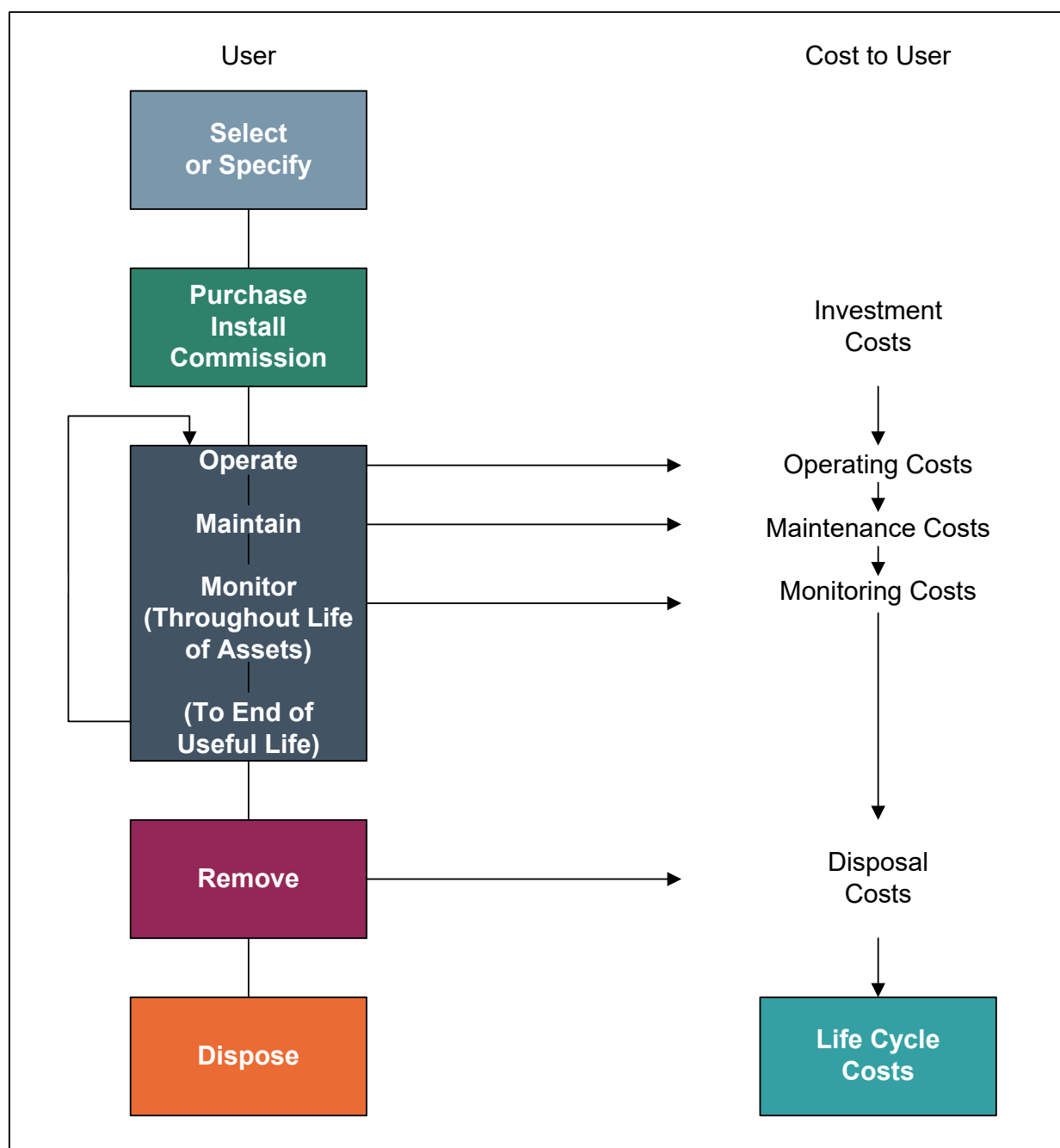
This section will focus on financing mechanisms in place to fund the costs incurred throughout the asset's life.

In a municipal context, services are provided to benefit tax/rate payers. Acquisition of assets is normally timed in relation to direct needs within the community. At times, economies of scale or technical efficiencies will lead to oversizing an asset to accommodate future growth within the Township. Over the past few decades, new financing techniques such as development charges have been employed based on the underlying principle of having tax/rate payers who benefit directly from the service paying for that service. Operating costs which reflect the cost of the service for that year are charged directly to all existing tax/rate payers who have received the benefit. Operating costs are normally charged through the tax base or user rates.

Capital expenditures are recouped through several methods, with operating budget contributions, development charges, reserves, developer contributions and debentures, being the most common.



Figure 3-1  
Lifecycle Costing



New construction related to growth could produce development charges and developer contributions (e.g. works internal to a subdivision which are the responsibility of the developer to construct) to fund a significant portion of projects, where new assets are being acquired to allow growth within the Township to continue. As well, debentures



could be used to fund such works, with the debt charge carrying costs recouped from taxpayers in the future.

Capital construction to replace existing infrastructure, however, is largely not growth-related and will therefore not yield development charges or developer contributions to assist in financing these works. Hence, a municipality will be dependent upon debentures, reserves and contributions from the operating budget to fund these works.

Figure 3-2 depicts the costs of an asset from its initial conception through to replacement and then continues to follow the associated costs through to the next replacement.

As referred to earlier, growth-related financing methods such as development charges and developer contributions could be utilized to finance the growth-related component of the new asset. These revenues are collected (indirectly) from the new homeowner who benefits directly from the installation of this asset. Other financing methods may be used as well to finance the non-growth-related component of this project, such as reserves which have been collected from past tax/rate payers, operating budget contributions which are collected from existing tax/rate payers and debenturing which will be carried by future tax/rate payers. Ongoing costs for monitoring, operating and maintaining the asset will be charged annually to the existing tax/rate payer.

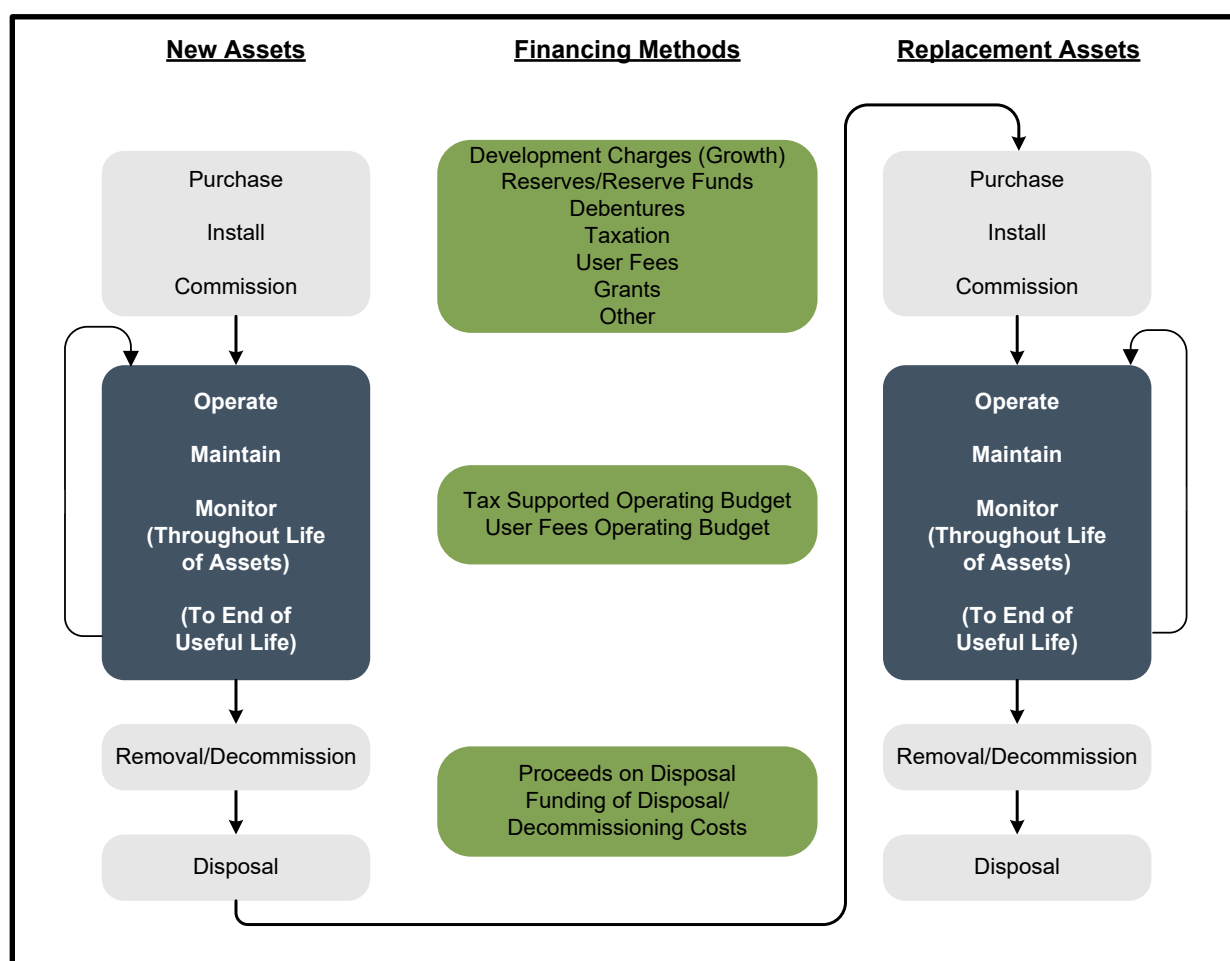
When the asset requires replacement, the sources of financing will be limited to reserves, debentures and contributions from the operating budget. At this point, the question is raised: "If the cost of replacement is to be assessed against the tax/rate payer who benefits from the replacement of the asset, should the past tax/rate payer pay for this cost or should future rate payers assume this cost?" If the position is taken that the past user has used up the asset, hence he should pay for the cost of replacement, then a charge should be assessed annually through the life of the asset, to have funds available to replace it when the time comes. If the position is taken that the future tax/rate payer should assume this cost, then debenturing and, possibly, a contribution from the operating budget should be used to fund this work.

Charging for the cost of using up an asset is the fundamental concept behind depreciation methods utilized by the private sector. This concept allows for expending the asset as it is used up in the production process. The tracking of these costs forms part of the product's selling price and, hence, end-users are charged for the asset's



depreciation. The same concept can be applied in a municipal setting to charge existing users for the asset's use and set those funds aside in a reserve to finance the cost of replacing the asset in the future.

Figure 3-2  
Financing Lifecycle Costs



### 3.1.3 Costing Methods

There are two fundamental methods of calculating the cost of the usage of an asset and for the provision of the revenue required when the time comes to retire and replace it. The first method is the Depreciation Method. This method recognizes the reduction in the value of the asset through wear and tear and aging. There are two commonly used forms of depreciation: the straight-line method and the reducing balance method (shown graphically in Figure 3-3).



The straight-line method is calculated by taking the original cost of the asset, subtracting its estimated salvage value (estimated value of the asset at the time it is disposed of) and dividing this by the estimated number of years of useful life. The reducing balance method is calculated by utilizing a fixed percentage rate and this rate is applied annually to the undepreciated balance of the asset value.

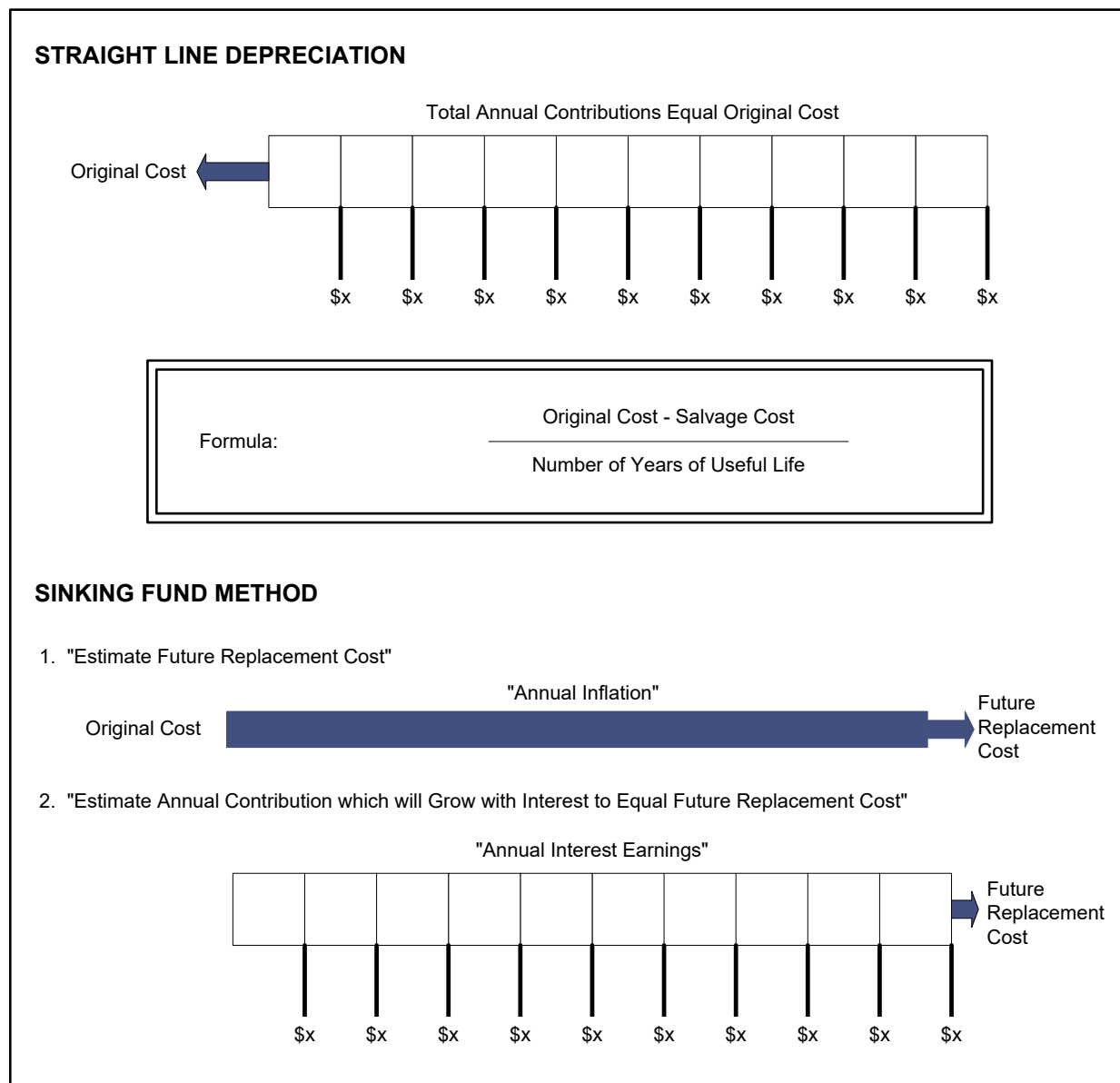
The second method of lifecycle costing is the sinking fund method. This method first estimates the future value of the asset at the time of replacement. This is done by inflating the original cost of the asset at an assumed annual inflation rate. A calculation is then performed to determine annual contributions (equal or otherwise) which, when invested, will grow with interest to equal the future replacement cost.

The preferred method used herein for forecasting purposes is the sinking fund method of lifecycle costing.





Figure 3-3



## 3.2 Impact on Budgets

Detailed water and wastewater systems inventory information was obtained from the Township. The age of the water and wastewater systems dates back to the mid 1970s. Both systems have been expanded throughout the years. The total value of existing water infrastructure is \$15.53 million, and the value of existing wastewater infrastructure is \$35.73 million.



The detailed water and wastewater inventories are provided in Appendices A and B, respectively. As well, the lifecycle “sinking fund” contribution amounts for each piece of infrastructure have also been included. These calculations determine the level of investment the Township may wish to consider as part of its budgeting practices. This information is summarized in Figure 3-4.

Figure 3-4  
Township of Cavan Monaghan  
Summary of Water and Wastewater Infrastructure

Area	Total Replacement Value	Suggested amount to be included in 10-year forecast based on estimated life	Amount included in 10-year forecast	Net Replacement for Future Lifecycle	Annual Lifecycle Replacement
<b>Water</b>					
Water Facilities	2,455,170	26,586	3,350,000	12,177,357	156,654
Watermains	10,012,414	-			284,723
Hydrants	315,562	242,981			5,755
Water Meters	185,653	179,067			485
Other Inventory	2,558,558	2,705			92,735
<b>Total Water</b>	<b>15,527,357</b>	<b>451,339</b>	<b>3,350,000</b>	<b>12,177,357</b>	<b>540,353</b>
<b>Wastewater</b>					
Wastewater Facilities	20,984,735	-	899,000	34,832,447	559,747
Sewage Pumping Stations	629,943	459,886			7,842
Sewer Mains	13,059,725	-			437,321
Sewer Other	1,057,044	9,130			38,509
<b>Total Wastewater</b>	<b>35,731,447</b>	<b>469,016</b>	<b>899,000</b>	<b>34,832,447</b>	<b>1,043,418</b>
<b>Total Water &amp; Wastewater</b>	<b>51,258,804</b>	<b>920,355</b>	<b>4,249,000</b>	<b>47,009,804</b>	<b>1,583,771</b>

Investment per customer is \$18,798 for water and \$43,896 for wastewater

The total value of the water and wastewater systems equate to an average investment per customer of \$18,798 and \$43,896 respectively.

With respect to lifecycle costing contained in the Appendices, the following information was taken into consideration:

- approximate age;
- estimated useful life; and
- estimated replacement costs.

Summaries of both water and wastewater assets and their expected replacement dates, based on estimate useful lives, are shown on Figures 3-5 and 3-6. These figures show when the assets are coming due and the cost of replacement in 2020 dollars.



Figure 3-5  
Township of Cavan Monaghan  
Summary of Water Infrastructure Replacement Years (2020 \$)

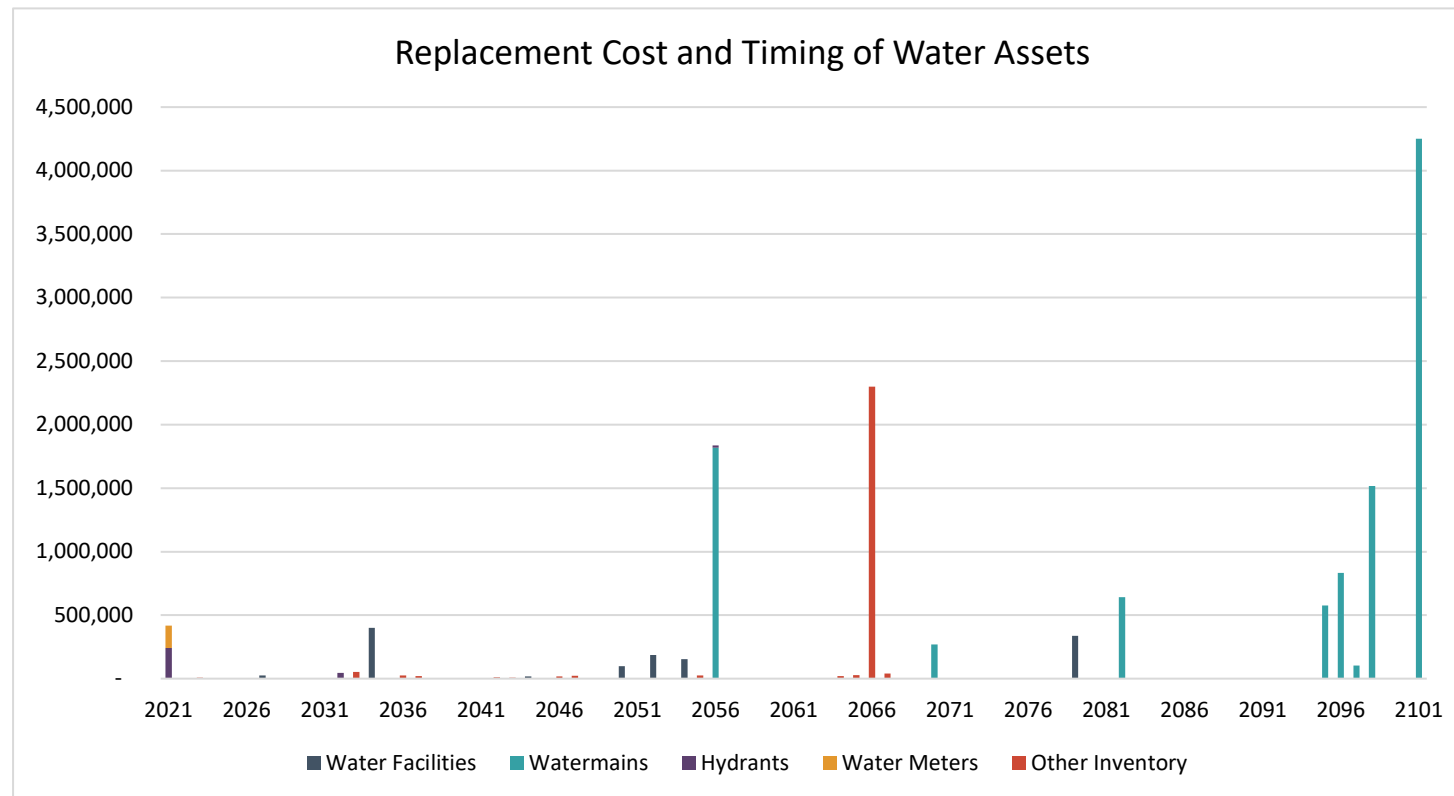
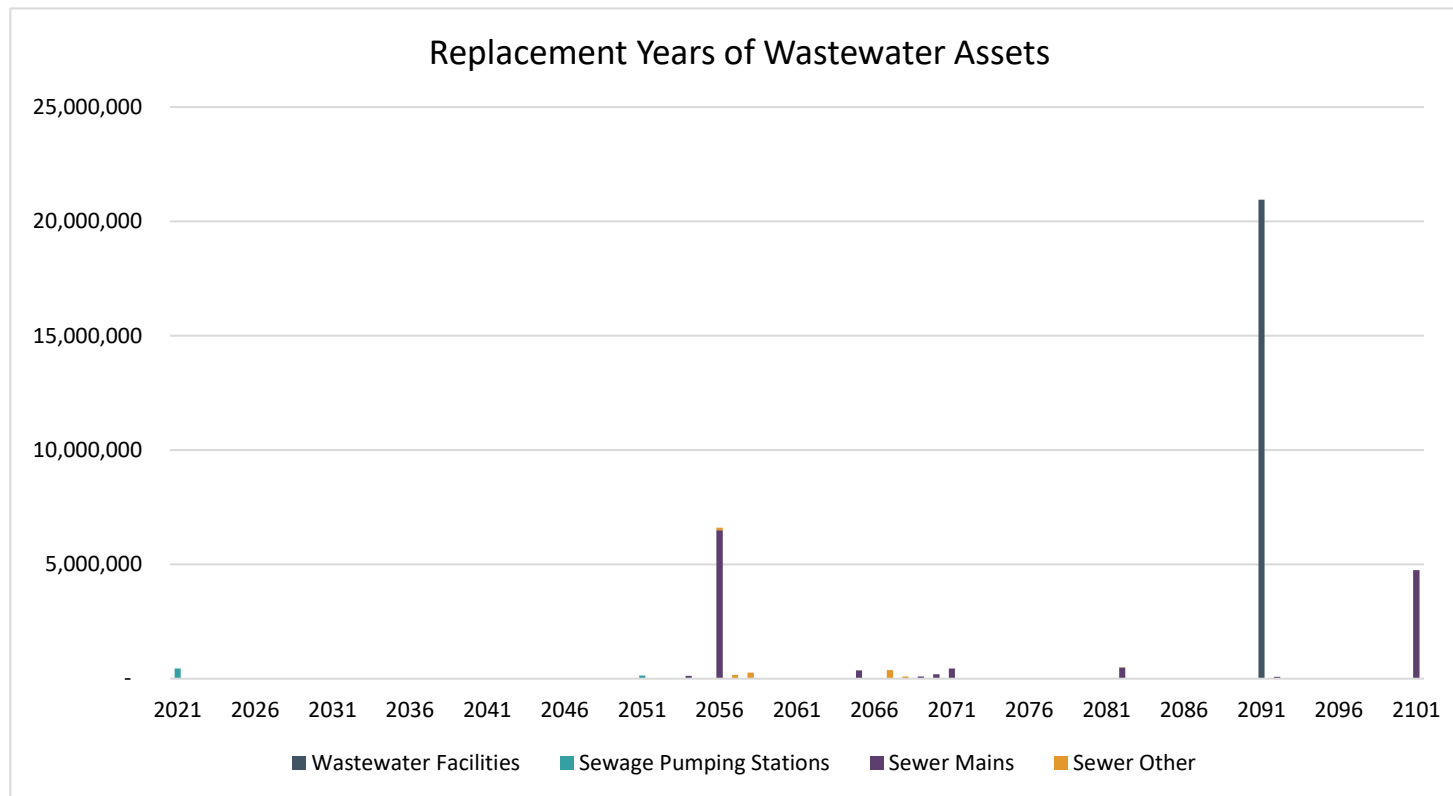




Figure 3-6  
Township of Cavan Monaghan  
Summary of Wastewater Infrastructure Replacement Years (2020 \$)





# Chapter 4

## Capital Cost Financing Options



## 4. Capital Cost Financing Options

### 4.1 Summary of Capital Cost Financing Alternatives

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Historically, the powers that municipalities had to raise alternative revenues to taxation to fund capital services have been restrictive. Over the past decade, legislative reforms have been introduced. Some of these have expanded municipal powers (e.g. Bill 26 introduced in 1996 to provide for expanded powers for imposing fees and charges), while others appear to restrict them (Bill 98 in 1997 providing amendments to the D.C.A.).

The Province passed a new *Municipal Act* which came into force on January 1, 2003. Part XII of the Act and O.Reg. 584/06 govern a municipality's ability to impose fees and charges. In contrast to the previous *Municipal Act*, this Act provides municipalities with broadly defined powers and does not differentiate between fees for operating and capital purposes. It is anticipated that the powers to recover capital costs under the previous *Municipal Act* will continue within the new Statutes and Regulations, as indicated by s.9(2) and s.452 of the new *Municipal Act*.

Under s.484 of *Municipal Act, 2001*, the *Local Improvement Act* was repealed with the in-force date of the *Municipal Act* (January 1, 2003). The municipal powers granted under the *Local Improvement Act* now fall under the jurisdiction of the *Municipal Act*. To this end, on December 20, 2002, O.Reg. 390/02 was filed, which allowed for the *Local Improvement Act* to be deemed to remain in force until April 1, 2003. O.Reg. 119/03 was enacted on April 19, 2003, which restored many of the previous *Local Improvement Act* provisions; however, the authority is now provided under the *Municipal Act*.

The methods of capital cost recovery available to municipalities are provided as follows:

Recovery Methods	Section Reference
• <i>Development Charges Act, 1997</i>	4.2
• <i>Municipal Act</i>	4.3
○ Fees and Charges	
○ Sewer and Water Area Charges	
○ Connection Fees	
○ Local Improvements	



Recovery Methods	Section Reference
• <i>Historical Grant Funding Availability</i>	4.4
• <i>Existing Reserves/ Reserve Funds</i>	4.5
• <i>Debenture Financing</i>	4.6
• <i>Infrastructure Ontario</i>	4.7

## 4.2 Development Charges Act, 1997, as amended

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In November 1996, the Ontario Government introduced Bill 98, a new *Development Charges Act*. The Province's stated intentions were to "create new construction jobs and make home ownership more affordable" by reducing the charges and to "make municipal Council decisions more accountable and more cost effective." The basis for this Act is to allow municipalities to recover the growth-related capital cost of infrastructure necessary to accommodate new growth within the municipality. Generally, the Act provided the following changes to the former Act:

- Replace those sections of the 1989 Act that govern municipal development charges;
- Limit services which can be financed from development charges, specifically excluding parkland acquisition, administration buildings, and cultural, entertainment, tourism, solid waste management and hospital facilities;
- Ensure that the level of service used in the calculation of capital costs will not exceed the average level of service over the previous decade. Level of service is to be measured from both a quality and quantity perspective;
- Provide that uncommitted excess capacity available in existing municipal facilities and benefits to existing residents are removed from the calculation of the charge;
- Ensure that the development charge revenues collected by municipalities are spent only on those capital costs identified in the calculation of the development charge;
- Require municipalities to contribute funds (e.g. taxes, user charges or other non-development charge revenues) to the financing of certain projects primarily funded from development charges. The municipal contribution is 10 percent for services such as recreation, parkland development, libraries, etc.;
- Permit (but apparently not require) municipalities to grant developers credits for the direct provision of services identified in the development charge calculation and, when credits are granted, require the municipality to reimburse the



developer for the costs the municipality would have incurred if the project had been financed from the development charge reserve fund;

- Set out provisions for front-end financing capital projects (limited to essential services) required to service new development; and
- Set out provisions for appeals and complaints.

In late 2015, the Province approved further amendments to the D.C.A. With respect to water and wastewater, the only changes are for the municipality to provide an asset management calculation for the growth-related works and for the Council to consider (but not necessarily approve) area-specific rates. The D.C.A. was further amended with the *More Homes, More Choice Act, 2019* and the *COVID-19 Economic Recovery Act, 2020*. However, these amendments may not have significant impacts on D.C. revenue collection for water and wastewater in the Township. Further analysis may be provided upon update of the Township's D.C. study.

## 4.3 Municipal Act

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Part XII of the *Municipal Act* provides municipalities with broad powers to impose fees and charges via passage of a by-law. These powers, as presented in s.391(1), include imposing fees or charges:

- “for services or activities provided or done by or on behalf of it;
- for costs payable by it for services or activities provided or done by or on behalf of any other municipality or local board; and
- for the use of its property including property under its control.”

Restrictions are provided to ensure that the form of the charge is not akin to a poll tax. Any charges not paid under this authority may be added to the tax roll and collected in a like manner. The fees and charges imposed under this part are not appealable to the Local Planning Appeal Tribunal (LPAT, formerly known as the O.M.B.).

Section 221 of the previous *Municipal Act* permitted municipalities to impose charges, by by-law, on owners or occupants of land who would or might derive benefit from the construction of sewage (storm and sanitary) or water works being authorized (in a specific benefit area). For a by-law imposed under this section of the previous Act:





- A variety of different means could be used to establish the rate and recovery of the costs and could be imposed by a number of methods at the discretion of Council (i.e. lot size, frontage, number of benefiting properties, etc.);
- Rates could be imposed with respect to costs of major capital works, even though an immediate benefit was not enjoyed;
- Non-abutting owners could be charged;
- Recovery was authorized against existing works, where a new water or sewer main was added to such works, "notwithstanding that the capital costs of existing works has in whole or in part been paid;"
- Charges on individual parcels could be deferred;
- Exemptions could be established;
- Repayment was secured; and
- LPAT approval was not required.

While under the new *Municipal Act* no provisions are provided specific to the previous s.221, the intent to allow capital cost recovery through fees and charges is embraced within s.391. The new *Municipal Act* also maintains the ability of municipalities to impose capital charges for water and sewer services on landowners not receiving an immediate benefit from the works. Under s.391(2) of the Act, "a fee or charge imposed under subsection (1) for capital costs related to sewage or water services or activities may be imposed on persons not receiving an immediate benefit from the services or activities but who will receive a benefit at some later point in time." Also, capital charges imposed under s.391 are not appealable to the LPAT on the grounds that the charges are "unfair or unjust."

Section 222 of the previous *Municipal Act* permitted municipalities to pass a by-law requiring buildings to connect to the municipality's sewer and water systems, charging the owner for the cost of constructing services from the mains to the property line. Under the new *Municipal Act*, this power still exists under Part II, General Municipal Powers (s.9 (3) b of the *Municipal Act*). Enforcement and penalties for this use of power are contained in s.427 (1) of the *Municipal Act*.

Under the previous *Local Improvement Act*:

- A variety of different types of works could be undertaken, such as watermain, storm and sanitary sewer projects, supply of electrical light or power, bridge construction, sidewalks, road widening and paving;



- Council could pass a by-law for undertaking such work on petition of a majority of benefiting taxpayers, on a 2/3 vote of Council and on sanitary grounds, based on the recommendation of the Minister of Health. The by-law was required to go to the LPAT, which might hold hearings and alter the by-law, particularly if there were objections;
- The entire cost of a work was assessed only upon the lots abutting directly on the work, according to the extent of their respective frontages, using an equal special rate per metre of frontage; and
- As noted, this Act was repealed as of April 1, 2003; however, O.Reg. 119/03 was enacted on April 19, 2003 which restores many of the previous *Local Improvement Act* provisions; however, the authority is now provided under the *Municipal Act*.

## 4.4 Historical Grant Funding Availability

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### Federal Infrastructure Funding

#### Phase 1 (April 1, 2016 to March 31, 2018)

Funding was provided by the Government of Canada to expressly help municipalities with repair and rehabilitation projects. Funding was mainly provided through the Clean Water and Wastewater Fund (C.W.W.F.) and Public Transit Infrastructure Fund (P.T.I.F.) in Federal Phase 1 projects. The C.W.W.F. was announced in Ontario on September 15, 2016. The Fund is \$1.1 billion for water, wastewater, and storm water systems in Ontario. The federal government provided \$569 million and Ontario and municipal governments provided \$275 million each.

Over 1,300 water, wastewater, and storm water projects have been approved in Ontario through the C.W.W.F. In Ontario, P.T.I.F. accounted for nearly \$1.5 billion of the national total of \$3.4 billion. The program was allocated by ridership numbers from the Canadian Urban Transit Association. The Association of Municipalities of Ontario (A.M.O.) understands that \$1 billion of Ontario's share has been approved.

#### Phase 2: Next Steps

The federal government announced Phase 2 of its infrastructure funding plan with a total of \$180 billion spent over 11 years. In addition to the balance of funding for



previous green, social, and public transit infrastructure funds (\$20 billion each, including Phase 1), the government has added \$10.1 billion for trade and transportation infrastructure and \$2 billion for rural and northern communities. This funding must be implemented by agreements with each Province and Territory.

In Phase 2, Ontario will be eligible for \$11.8 billion including \$8.3 billion for transit, \$2.8 billion for green infrastructure, \$407 million for community, culture and recreation and \$250 million for rural and northern communities.

### Federal Gas Tax

The federal Gas Tax is a permanent source of funding provided up front, twice-a-year, to Provinces and Territories, who in turn flow this funding to their municipalities to support local infrastructure priorities. Municipalities can pool, bank and borrow against this funding, providing significant financial flexibility. Every year, the federal Gas Tax provides over \$2 billion and supports approximately 2,500 projects in communities across Canada. Each municipality selects how best to direct the funds with the flexibility provided to make strategic investments across 18 different project categories, which include other water and wastewater servicing.

### Ontario Government

The Province has taken steps to increase municipal infrastructure funding. The Ontario Community Infrastructure Fund (O.C.I.F.) was increased in 2016 with formula-based support growing to \$200 million, and application funding growing to \$100 million annually by 2018/2019. As well, \$15 million annually will go to the new Connecting Links program to help pay for the construction and repair costs of municipal roads that connect communities to provincial highways. This is on top of the Building Ontario Up investment of \$130 billion in public infrastructure over 10 years starting in 2015.

## **4.5 Existing Reserves/Reserve Funds**

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The Township has established reserves and reserve funds for water and wastewater costs. The following table summarizes the water and wastewater reserves utilized in this analysis and their respective estimated balances at December 31, 2020:



Reserve / Reserve Fund	Dec. 31 2020
<b>Water</b>	
Capital Reserve	1,391,060
Development Charges Reserve Fund	(358,817)
<b>Wastewater</b>	
Capital Reserve	906,024
Development Charges Reserve Fund	475,372

## 4.6 Debenture Financing

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Although it is not a direct method of minimizing the overall cost to the ratepayer, debentures are used by municipalities to assist in cash flowing large capital expenditures.

The Ministry of Municipal Affairs regulates the level of debt incurred by Ontario municipalities, through its powers established under the *Municipal Act*. Ontario Regulation 403/02 provides the current rules respecting municipal debt and financial obligations. Through the rules established under these regulations, a municipality's debt capacity is capped at a level where no more than 25% of the municipality's own purpose revenue may be allotted for servicing the debt (i.e. debt charges). The Township of Cavan Monaghan's calculation on Debt Capacity is shown on Schedule 81 of the Township's most recent Financial Information Return (2018 F.I.R.). This calculates to the Township's estimated annual repayment limit of approximately \$2.9 million. Based upon 10-year financing at an assumed rate of 3%, the available debt for the Township is approximately \$24.72 million.

## 4.7 Infrastructure Ontario

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Infrastructure Ontario (I.O.) is an arms-length crown corporation, which has been set up as a tool to offer low-cost and longer-term financing to assist municipalities in renewing their infrastructure (this corporation has merged the former O.S.I.F.A. into its operations). I.O. combines the infrastructure renewal needs of municipalities into an infrastructure investment "pool." I.O. will raise investment capital to finance loans to the public sector by selling a new investment product called Infrastructure Renewal Bonds to individual and institutional investors.

I.O. provides access to infrastructure capital that would not otherwise be available to smaller borrowers. Larger borrowers receive a longer term on their loans than they



could obtain in the financial markets, and can also benefit from significant savings on transaction costs such as legal costs and underwriting commissions. Under the I.O. approach, all borrowers receive the same low interest rate. I.O. will enter into a financial agreement with each municipality subject to technical and credit reviews, for a loan up to the maximum amount of the loan request.

The first round of the former O.S.I.F.A.'s 2004/2005 infrastructure renewal program was focused on municipal priorities of clean water infrastructure, sewage treatment facilities, municipal roads and bridges, public transit and waste management infrastructure. The focus of the program was expanded in 2005/2006 somewhat to include:

- clean water infrastructure;
- sewage infrastructure;
- waste management infrastructure;
- municipal roads and bridges;
- public transit;
- municipal long-term care homes;
- renewal of municipal social housing and culture; and
- tourism and recreation infrastructure.

With the merging of O.S.I.F.A. and I.O., the program was broadened in late 2006 to also include municipal administrative buildings, local police and fire stations, emergency vehicles and equipment, ferries, docks and municipal airports.

To be eligible to receive these loans, municipalities must submit a formal application along with pertinent financial information. Allotments are prioritized and distributed based upon the Province's assessment of need.

The analysis provided herein assumes that the Township will not require debt financing for the capital projects identified.

## **4.8 Recommended Capital Financing Approach**

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Of the various funding alternatives provided in this section, the following are recommended for further consideration by the Township of Cavan Monaghan for the capital expenditures (inflated) provided in Chapter 2:

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Description	Water 2021 to 2029	Wastewater 2021 to 2029
<b>Capital Financing</b>		
Provincial/Federal Grants	-	-
Development Charges Reserve Fund	1,061,000	2,726,000
Non-Growth Related Debenture Requirements	-	-
Growth Related Debenture Requirements	-	-
Operating Contributions	-	-
Lifecycle Reserve Fund	-	-
Water Reserve	3,491,000	580,000
<b>Total Capital Financing</b>	<b>4,552,000</b>	<b>3,306,000</b>

Tables 4-1 and 4-2 provide for the full capital expenditure and funding program by year for water and wastewater, respectively.

Note that the development charge funding amounts provided above represent the required amounts needed to finance the growth-related projects. As shown in the forecasted D.C. reserve fund tables (Appendix C, Table C.1-6 for water and Appendix D, Table D.1-6 for wastewater), both the water and wastewater reserve funds are forecasted to be in deficit positions over the 10-year period (2029 ending deficit balances of -\$1.4 million for water and -\$3.5 million for wastewater). This funding shortfall would therefore require the Township to collect their D.C. funds earlier than at building permit, which is the current practice. It is therefore recommended that the Township require collection of D.C.s at subdivision signing or alternatively, have the landowners construct the services and receive credits back for their developments.



Table 4-1  
Capital Budget Forecast – Water (inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Water Distribution System (4830)</b>											
Water Main Replacement Main Street	200,000	-	-	-	-	-	-	-	-	-	-
Watermain Replacement (various locations)	-	3,335,000	306,000	312,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
Replacement of Well and Pump	-	156,000	-	156,000	-	-	-	-	-	-	-
<b>Studies:</b>											
Water Rate Study & Financial Plan	30,000	-	-	-	-	-	-	-	-	-	-
<b>Growth Related:</b>											
Water Master Servicing Study	50,000	20,000	20,000	-	-	-	-	-	-	-	-
Duke Street from King Street Southwards	-	159,000	-	159,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	56,000	-	-	-	-	56,000	-	-	-	-
Water Servicing Studies - Future Development Areas	-	122,000	-	-	-	-	-	-	-	-	122,000
Future Watermain Booster Pumping Station	-	704,000	-	-	704,000	-	-	-	-	-	-
Future Trunk Watermain Costs (Oversizing)	76,500	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>
<b>Capital Financing</b>											
Provincial/Federal Grants		-									
Development Charges Reserve Fund	126,500	1,061,000	20,000	159,000	704,000	-	56,000	-	-	-	122,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	230,000	3,491,000	306,000	468,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
<b>Total Capital Financing</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>



Table 4-2  
Capital Budget Forecast – Wastewater (inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Wastewater Collection System(4811)</b>	-	-	-	-	-	-	-	-	-	-	-
Sewer Relining	349,000	255,000	255,000	-	-	-	-	-	-	-	-
Various Wastewater Facility Upgrades	-	325,000	-	104,000	-	108,000	-	113,000	-	-	-
<b>Growth Related:</b>		-	-	-	-	-	-	-	-	-	-
Wastewater Master Servicing Study	90,000	315,000	71,000	-	-	-	-	-	-	-	244,000
Cambium Studies	-	83,000	41,000	42,000	-	-	-	-	-	-	-
Infiltration Solutions	-	103,000	51,000	52,000	-	-	-	-	-	-	-
Pump Station and Forcemain between property north of Municipal Office and Larmer Line	-	531,000	-	-	531,000	-	-	-	-	-	-
Duke Street from King Street Southwards	-	265,000	-	265,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	113,000	-	-	-	-	113,000	-	-	-	-
Nina Court Extension Sanitary Sewer Oversizing	112,200	-	-	-	-	-	-	-	-	-	-
Wastewater Servicing Studies - Future Development Areas	75,000	-	-	-	-	-	-	-	-	-	-
Future Sanitary Pumping Station - Sewage	-	1,191,000	-	-	1,191,000	-	-	-	-	-	-
Future Trunk Sanitary Sewer (oversizing)	-	125,000	125,000	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>626,200</b>	<b>3,306,000</b>	<b>543,000</b>	<b>463,000</b>	<b>1,722,000</b>	<b>108,000</b>	<b>113,000</b>	<b>113,000</b>	<b>-</b>	<b>-</b>	<b>244,000</b>
<b>Capital Financing</b>											
Provincial/Federal Grants	117,424	-									
Development Charges Reserve Fund	277,200	2,726,000	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	231,576	580,000	255,000	104,000	-	108,000	-	113,000	-	-	-
<b>Total Capital Financing</b>	<b>626,200</b>	<b>3,306,000</b>	<b>543,000</b>	<b>463,000</b>	<b>1,722,000</b>	<b>108,000</b>	<b>113,000</b>	<b>113,000</b>	<b>-</b>	<b>-</b>	<b>244,000</b>





# Chapter 5

## Overview of Expenditures and Revenues



## 5. Overview of Expenditures and Revenues

### 5.1 Water Operating Expenditures

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In this report, the forecast water budget figures (2021 to 2029) are based on the Township's 2020 operating budget. The costs for each component of the operating budget have been reviewed with staff to establish forecast adjustments, including inflationary adjustments. Most of the expenditures have been assumed to increase at a rate of 2.0% annually. Operating expenditures that involve utilities, fuels, chemicals and hydro have been inflated by 5.0% annually. Note that annual contributions have been provided to the capital reserve in order to minimize the need for additional debt to finance the capital program. Also included are any contributions to reserve funds and existing and future debenture payments.

### 5.2 Water Operating Revenues

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The Township has base charges and miscellaneous revenue sources to help contribute towards operating expenditures. These miscellaneous revenues, including meter installation charges, rents, other charges, and fees have been assumed to increase at 2% each year over the forecast period. Table 5-1 provides for the operating budget for the water system based on 2% annual increases and Table 5-2 provides for the operating budget based on 0% increases for 2021 then 2% annual increases thereafter.



**Table 5-1**  
**Operating Budget Forecast – Water (inflated \$)**  
**Scenario 1 - 2% Annual Increases**

Description	Budget	Forecast								
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Trave	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
Toilet Rebate Program	5,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
<b><u>Millbrook Water Distribution System</u></b>										
Hydrant Maintenance	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
Materials and Supplies	1,000	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Locates	500	500	500	500	500	500	500	500	500	500
Contracted Services	50,000	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500
<b><u>Millbrook Water Treatment &amp; Supply</u></b>										
Audit Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operator Contract	123,335	125,000	127,500	130,100	132,700	135,400	138,100	140,900	143,700	146,600
Phone	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Managed Router & VDSL Servi	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Hydro	13,000	15,000	15,800	16,600	17,400	18,300	19,200	20,200	21,200	22,300
Contracted Services	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Millbrook Water - Standpipe Tower</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	5,200	9,000	9,500	10,000	10,500	11,000	11,600	12,200	12,800	13,400
Contracted Services	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
<b><u>Water Capacity Monitoring</u></b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b><u>Bulk Water Sale</u></b>										
Material and Supplies	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Hydro	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Contracted Services	500	500	510	520	530	541	552	563	574	585
Interdepartmental Charge - Wat	23,000	23,000	23,500	24,000	24,500	25,000	25,500	26,000	26,500	27,000
<b>Sub Total Operating</b>	<b>354,928</b>	<b>369,778</b>	<b>378,210</b>	<b>386,526</b>	<b>394,846</b>	<b>403,573</b>	<b>412,406</b>	<b>421,445</b>	<b>430,490</b>	<b>439,841</b>



Table 5-1 (continued)  
Operating Budget Forecast – Water (inflated \$)  
Scenario 1 - 2% Annual Increases

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	41,809	43,146	44,526	45,950	47,420	48,936	50,501	52,117	53,784	55,504
Existing Debt (Interest) - Growth Related	42,092	43,391	44,731	46,114	47,541	49,014	50,534	52,102	53,721	55,391
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	9,560	9,883	10,217	10,563	10,920	11,289	11,671	12,065	12,473	12,895
Existing Debt (Interest) - Non-Growth Related	14,328	14,005	13,671	13,326	12,968	12,599	12,217	11,823	11,415	10,993
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,925	373,866	399,210	432,061	468,852	509,785	549,252	598,861	652,089	700,677
<b>Sub Total Capital Related</b>	<b>451,714</b>	<b>484,291</b>	<b>512,355</b>	<b>548,013</b>	<b>587,702</b>	<b>631,624</b>	<b>674,176</b>	<b>726,968</b>	<b>783,481</b>	<b>835,460</b>
<b>Total Expenditures</b>	<b>806,642</b>	<b>854,069</b>	<b>890,565</b>	<b>934,539</b>	<b>982,548</b>	<b>1,035,197</b>	<b>1,086,582</b>	<b>1,148,413</b>	<b>1,213,971</b>	<b>1,275,301</b>
<b>Revenues</b>										
Base Charge	359,598	388,787	412,880	433,621	459,270	487,071	515,358	547,284	583,497	618,597
Misc. Base Charge from New Development	17,448	11,998	4,079	8,322	8,488	9,740	8,831	12,386	12,634	10,543
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Water Connection /Other Chrg	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Bulk Water Sale	45,000	45,625	46,537	47,468	48,417	49,386	50,373	51,381	52,408	53,456
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>575,397</b>	<b>602,397</b>	<b>623,754</b>	<b>653,975</b>	<b>685,137</b>	<b>719,647</b>	<b>752,698</b>	<b>793,970</b>	<b>836,344</b>	<b>875,392</b>
<b>Water Billing Recovery - Total</b>	<b>231,245</b>	<b>251,672</b>	<b>266,811</b>	<b>280,564</b>	<b>297,411</b>	<b>315,550</b>	<b>333,884</b>	<b>354,443</b>	<b>377,628</b>	<b>399,909</b>



**Table 5-2**  
**Operating Budget Forecast – Water (inflated \$)**  
**Scenario 2 – 0% Increase in 2021 then 2% Annual Increases**

Description	Budget	Forecast								
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Trave	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
Toilet Rebate Program	5,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
<b><u>Millbrook Water Distribution System</u></b>										
Hydrant Maintenance	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
Materials and Supplies	1,000	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Locates	500	500	500	500	500	500	500	500	500	500
Contracted Services	50,000	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500
<b><u>Millbrook Water Treatment &amp; Supply</u></b>										
Audit Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operator Contract	123,335	125,000	127,500	130,100	132,700	135,400	138,100	140,900	143,700	146,600
Phone	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Managed Router & VDSL Servi	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Hydro	13,000	15,000	15,800	16,600	17,400	18,300	19,200	20,200	21,200	22,300
Contracted Services	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Millbrook Water - Standpipe Tower</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	5,200	9,000	9,500	10,000	10,500	11,000	11,600	12,200	12,800	13,400
Contracted Services	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
<b><u>Water Capacity Monitoring</u></b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b><u>Bulk Water Sale</u></b>										
Material and Supplies	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Hydro	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Contracted Services	500	500	510	520	530	541	552	563	574	585
Interdepartmental Charge - Wat	23,000	23,000	23,500	24,000	24,500	25,000	25,500	26,000	26,500	27,000
<b>Sub Total Operating</b>	<b>354,928</b>	<b>369,778</b>	<b>378,210</b>	<b>386,526</b>	<b>394,846</b>	<b>403,573</b>	<b>412,406</b>	<b>421,445</b>	<b>430,490</b>	<b>439,841</b>



Table 5-2 (continued)  
Operating Budget Forecast – Water (inflated \$)  
Scenario 2 – 0% Increase in 2021 then 2% Annual Increases

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	41,809	43,146	44,526	45,950	47,420	48,936	50,501	52,117	53,784	55,504
Existing Debt (Interest) - Growth Related	42,092	43,391	44,731	46,114	47,541	49,014	50,534	52,102	53,721	55,391
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	9,560	9,883	10,217	10,563	10,920	11,289	11,671	12,065	12,473	12,895
Existing Debt (Interest) - Non-Growth Related	14,328	14,005	13,671	13,326	12,968	12,599	12,217	11,823	11,415	10,993
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,925	360,178	387,142	420,894	458,838	501,205	542,480	594,217	650,007	701,634
<b>Sub Total Capital Related</b>	<b>451,714</b>	<b>470,603</b>	<b>500,287</b>	<b>536,847</b>	<b>577,687</b>	<b>623,044</b>	<b>667,404</b>	<b>722,324</b>	<b>781,400</b>	<b>836,416</b>
<b>Total Expenditures</b>	<b>806,642</b>	<b>840,381</b>	<b>878,497</b>	<b>923,373</b>	<b>972,533</b>	<b>1,026,617</b>	<b>1,079,810</b>	<b>1,143,769</b>	<b>1,211,890</b>	<b>1,276,257</b>
<b>Revenues</b>										
Base Charge	359,598	381,164	405,777	427,205	453,584	482,219	511,475	544,492	581,944	618,462
Misc. Base Charge from New Development	17,448	11,763	4,009	8,199	8,383	9,643	8,765	12,323	12,600	10,541
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Water Connection /Other Chrg	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Bulk Water Sale	45,000	44,730	45,736	46,765	47,818	48,894	49,994	51,119	52,269	53,445
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>575,397</b>	<b>593,643</b>	<b>615,779</b>	<b>646,733</b>	<b>678,746</b>	<b>714,207</b>	<b>748,369</b>	<b>790,853</b>	<b>834,617</b>	<b>875,242</b>
<b>Water Billing Recovery - Total</b>	<b>231,245</b>	<b>246,737</b>	<b>262,717</b>	<b>276,639</b>	<b>293,788</b>	<b>312,410</b>	<b>331,440</b>	<b>352,917</b>	<b>377,273</b>	<b>401,015</b>



## **5.3 Wastewater Operating Expenditures**

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The wastewater operating expenditures have been adjusted over the forecast period by an annual inflationary factor of 2.0%. Operating expenditures that involve utilities, fuels, chemicals and hydro have been inflated by 5.0% annually. Also included are contributions to the capital reserve.

## **5.4 Wastewater Operating Revenues**

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The operating revenue for the wastewater program comes mainly from base charges along with volumetric revenue from customers. A small amount of revenue is also generated from sewer service charges and a pollution plant charge. Table 5-3 provides for the operating budget for the wastewater system based on 2% annual increases and Table 5-4 provides for the operating budget based on 0% increases for 2021 then 2% annual increases thereafter.



**Table 5-3**  
**Operating Budget Forecast – Wastewater (inflated \$)**  
**Scenario 1 - 2% Annual Increases**

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b>Operating Costs</b>										
<b>Wastewater Administration</b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Travel	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
<b>Pumping Station Expenses</b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Hydro	4,700	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Contracted Services	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
<b>Millbrook Wastewater Plant</b>										
Biosolid management	20,000	24,000	24,500	25,000	25,500	26,000	26,500	27,000	27,500	28,100
Operator Contract	287,782	290,000	295,800	301,700	307,700	313,900	320,200	326,600	333,100	339,800
Phone	6,500	6,500	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300
Managed Router & VDSL Servi	2,800	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
Hydro	114,000	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
Gas - Heating	13,905	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400
Contracted Services	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
<b>Wastewater Collection System</b>										
Locates	500	500	510	520	530	541	552	563	574	585
Contracted Services	2,000	10,000	10,200	10,404	10,612	10,824	11,040	11,261	11,486	11,716
<b>Sysco Oper. Wastewater Agreement</b>										
Contracted Services	40,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	7,000	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100
<b>Sysco Oper. Wastewater Agreement Booster Pumping Station</b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	7,200	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b>Kawartha Downs Wastewater Agreement</b>										
Contracted Services	46,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b>Wastewater Capacity Monitoring</b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Sub Total Operating</b>	<b>687,180</b>	<b>705,878</b>	<b>719,910</b>	<b>733,924</b>	<b>748,042</b>	<b>762,665</b>	<b>777,592</b>	<b>792,824</b>	<b>808,160</b>	<b>824,001</b>





Figure 5-3 (continued)  
Operating Budget Forecast – Wastewater (inflated \$)  
Scenario 1 - 2% Annual Increases

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	154,911	159,876	165,000	170,289	175,747	181,381	187,195	193,195	199,387	205,779
Existing Debt (Interest) - Growth Related	158,821	163,256	167,833	172,555	177,427	182,455	187,643	192,996	198,519	204,219
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	46,920	48,507	50,147	51,843	53,595	55,408	57,281	59,218	61,220	63,290
Existing Debt (Interest) - Non-Growth Related	70,325	68,739	67,099	65,403	63,650	61,838	59,964	58,028	56,025	53,955
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,480	397,803	437,800	491,105	550,032	616,154	679,183	761,449	849,282	929,067
<b>Sub Total Capital Related</b>	<b>774,457</b>	<b>838,181</b>	<b>887,879</b>	<b>951,195</b>	<b>1,020,452</b>	<b>1,097,235</b>	<b>1,171,266</b>	<b>1,264,886</b>	<b>1,364,435</b>	<b>1,456,310</b>
<b>Total Expenditures</b>	<b>1,461,637</b>	<b>1,544,059</b>	<b>1,607,789</b>	<b>1,685,119</b>	<b>1,768,494</b>	<b>1,859,900</b>	<b>1,948,858</b>	<b>2,057,710</b>	<b>2,172,595</b>	<b>2,280,311</b>
<b>Revenues</b>										
Base Charge	662,919	716,886	761,422	799,752	847,165	898,559	950,852	1,009,878	1,076,837	1,141,734
Misc. Base Charge from New Development	32,291	22,205	7,550	15,401	15,709	18,026	16,344	22,922	23,381	19,512
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Local Improvements - Water/Se	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Miscellaneous Revenue - Sysco Oper. Wastewater Agreement	47,000	47,000	47,900	48,900	49,900	50,900	51,900	52,900	54,000	55,100
Miscellaneous Revenue - Kawartha Downs Wastewater Agreement Revenue	50,200	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,175,592</b>	<b>1,230,673</b>	<b>1,273,705</b>	<b>1,333,497</b>	<b>1,395,149</b>	<b>1,463,121</b>	<b>1,528,433</b>	<b>1,609,091</b>	<b>1,692,125</b>	<b>1,769,144</b>
<b>Wastewater Billing Recovery - Total</b>	<b>286,045</b>	<b>313,386</b>	<b>334,084</b>	<b>351,622</b>	<b>373,345</b>	<b>396,779</b>	<b>420,425</b>	<b>448,619</b>	<b>480,470</b>	<b>511,167</b>



**Table 5-4**  
**Operating Budget Forecast – Wastewater (inflated \$)**  
**Scenario 2 – 0% Increase in 2021 then 2% Annual Increases**

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
<b><u>Wastewater Administration</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits - Other	-	-	-	-	-	-	-	-	-	-
Meal Allowance	-	-	-	-	-	-	-	-	-	-
Mileage Reimbursement / Travel	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Software Licensing & Support	-	-	-	-	-	-	-	-	-	-
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Land Telephone	-	-	-	-	-	-	-	-	-	-
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Postage/Courier	-	-	-	-	-	-	-	-	-	-
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
<b><u>Pumping Station Expenses</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Hydro	4,700	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Contracted Services	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
<b><u>Millbrook Wastewater Plant</u></b>										
Biosolid management	20,000	24,000	24,500	25,000	25,500	26,000	26,500	27,000	27,500	28,100
Operator Contract	287,782	290,000	295,800	301,700	307,700	313,900	320,200	326,600	333,100	339,800
Phone	6,500	6,500	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300
Managed Router & VDSL Servi	2,800	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
Hydro	114,000	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
Gas - Heating	13,905	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400
Contracted Services	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
<b><u>Wastewater Collection System</u></b>										
Locates	500	500	510	520	530	541	552	563	574	585
Contracted Services	2,000	10,000	10,200	10,404	10,612	10,824	11,040	11,261	11,486	11,716
<b><u>Sysco Oper. Wastewater Agreement</u></b>										
Contracted Services	40,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	7,000	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100
<b><u>Sysco Oper. Wastewater Agreement Booster Pumping Station</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	7,200	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b><u>Kawartha Downs Wastewater Agreement</u></b>										
Contracted Services	46,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Wastewater Capacity Monitoring</u></b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Sub Total Operating</b>	<b>687,180</b>	<b>705,878</b>	<b>719,910</b>	<b>733,924</b>	<b>748,042</b>	<b>762,665</b>	<b>777,592</b>	<b>792,824</b>	<b>808,160</b>	<b>824,001</b>



Figure 5-4 (continued)  
Operating Budget Forecast – Wastewater (inflated \$)  
Scenario 2 – 0% Increase in 2021 then 2% Annual Increases

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	154,911	159,876	165,000	170,289	175,747	181,381	187,195	193,195	199,387	205,779
Existing Debt (Interest) - Growth Related	158,821	163,256	167,833	172,555	177,427	182,455	187,643	192,996	198,519	204,219
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	46,920	48,507	50,147	51,843	53,595	55,408	57,281	59,218	61,220	63,290
Existing Debt (Interest) - Non-Growth Related	70,325	68,739	67,099	65,403	63,650	61,838	59,964	58,028	56,025	53,955
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,480	377,166	418,894	474,116	535,462	604,417	670,841	755,551	846,352	929,673
<b>Sub Total Capital Related</b>	<b>774,457</b>	<b>817,544</b>	<b>868,973</b>	<b>934,206</b>	<b>1,005,883</b>	<b>1,085,499</b>	<b>1,162,924</b>	<b>1,258,987</b>	<b>1,361,505</b>	<b>1,456,916</b>
<b>Total Expenditures</b>	<b>1,461,637</b>	<b>1,523,422</b>	<b>1,588,883</b>	<b>1,668,130</b>	<b>1,753,925</b>	<b>1,848,164</b>	<b>1,940,516</b>	<b>2,051,811</b>	<b>2,169,665</b>	<b>2,280,917</b>
<b>Revenues</b>										
Base Charge	662,919	702,829	748,322	787,919	836,676	889,608	943,688	1,004,726	1,073,969	1,141,485
Misc. Base Charge from New Development	32,291	21,769	7,420	15,173	15,515	17,847	16,221	22,805	23,318	19,508
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Local Improvements - Water/Se	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Miscellaneous Revenue - Sysco Oper. Wastewater Agreement	47,000	47,000	47,900	48,900	49,900	50,900	51,900	52,900	54,000	55,100
Miscellaneous Revenue - Kawartha Downs Wastewater Agreement Revenue	50,200	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,175,592</b>	<b>1,216,181</b>	<b>1,260,475</b>	<b>1,321,436</b>	<b>1,384,466</b>	<b>1,453,991</b>	<b>1,521,146</b>	<b>1,603,822</b>	<b>1,689,195</b>	<b>1,768,890</b>
<b>Wastewater Billing Recovery - Total</b>	<b>286,045</b>	<b>307,241</b>	<b>328,409</b>	<b>346,694</b>	<b>369,459</b>	<b>394,173</b>	<b>419,370</b>	<b>447,989</b>	<b>480,470</b>	<b>512,027</b>



# Chapter 6

## Pricing Structures

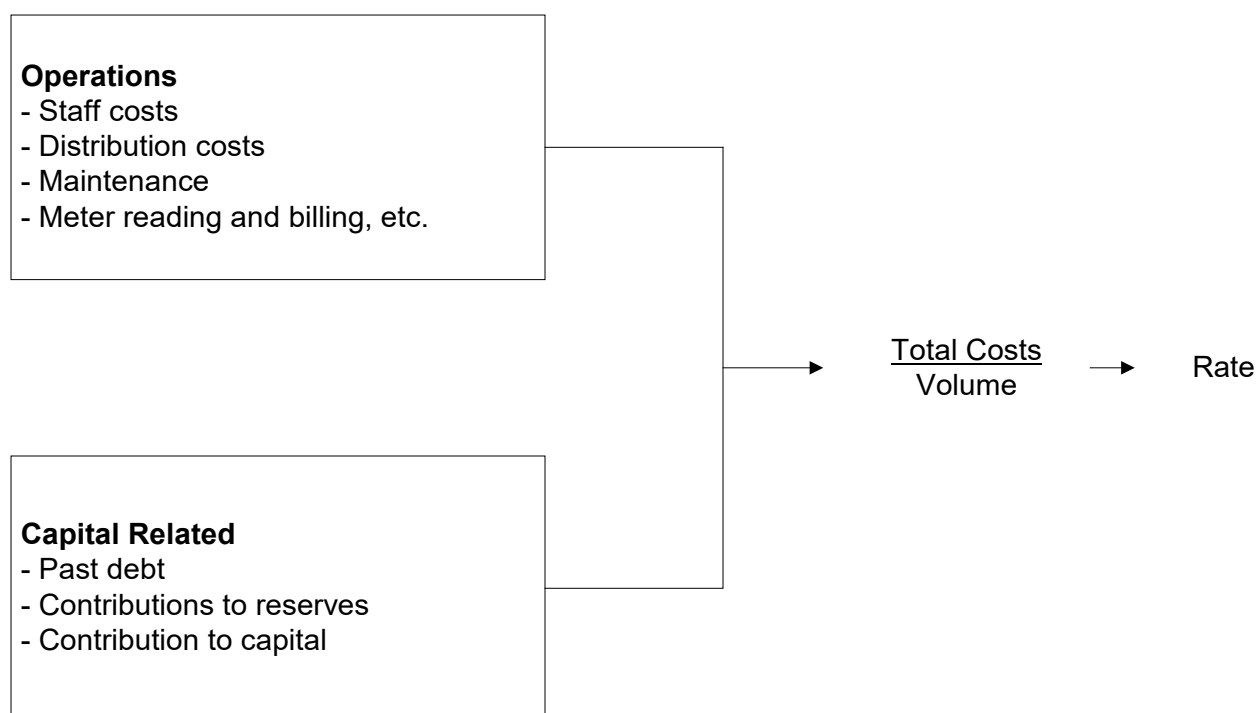


## 6. Pricing Structures

### 6.1 Introduction

Rates, in their simplest form, can be defined as total costs to maintain the utility function divided by the total expected volume to be generated for the period. Total costs are usually a combination of operating costs (e.g. staff costs, distribution costs, maintenance, administration, etc.) and capital-related costs (e.g. past debt to finance capital projects, transfers to reserves to finance future expenditures, etc.). The schematic below provides a simplified illustration of the rate calculation for water.

#### “Annual Costs”



These operating and capital expenditures will vary over time. Examples of factors that will affect the expenditures over time are provided below.

#### Operations

- Inflation;



- Increased maintenance as system ages; and
- Changes to provincial legislation.

### Capital Related

- New capital will be built as areas expand;
- Replacement capital needed as system ages; and
- Financing of capital costs are a function of policy regarding reserves and direct financing from rates (pay as you go), debt and user pay methods (development charges, *Municipal Act*).

## 6.2 Alternative Pricing Structures

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Throughout Ontario, and as well, Canada, the use of pricing mechanisms varies between municipalities. The use of a particular form of pricing depends upon numerous factors, including Council preference, administrative structure, surplus/deficit system capacities, economic/demographic conditions, to name a few.

Municipalities within Ontario have two basic forms of collecting revenues for water purposes, those being through incorporation of the costs within the tax rate charged on property assessment and/or through the establishment of a specific water rate billed to the customer. Within the rate methods, there are five basic rate structures employed along with other variations:

- Flat Rate (non-metered customers);
- Constant Rate;
- Declining Block Rate;
- Increasing (or Inverted) Block Rate;
- Hump Back Block Rate; and
- Base Charges.

The definitions and general application of the various methods are as follows:

**Property Assessment:** This method incorporates the total costs of providing water into the general requisition or the assessment base of the municipality. This form of collection is a "wealth tax," as payment increases directly with the value of property owned and bears no necessary relationship to actual consumption. This form is easy to



administer as the costs to be recovered are incorporated in the calculation for all general services, normally collected through property taxes.

**Flat Rate:** This rate is a constant charge applicable to all customers served. The charge is calculated by dividing the total number of user households and other entities (e.g. businesses) into the costs to be recovered. This method does not recognize differences in actual consumption but provides for a uniform spreading of costs across all users. Some municipalities define users into different classes of similar consumption patterns, that is, a commercial user, residential user and industrial user, and charge a flat rate by class. Each user is then billed on a periodic basis. No meters are required to facilitate this method, but an accurate estimate of the number of users is required. This method ensures set revenue for the collection period but is not sensitive to consumption, hence may cause a shortfall or surplus of revenues collected.

**Constant Rate:** This rate is a volume-based rate, in which the consumer pays the same price per unit consumed, regardless of the volume. The price per unit is calculated by dividing the total cost of the service by the total volume used by total consumers. The bill to the consumer climbs uniformly as the consumption increases. This form of rate requires the use of meters to record the volume consumed by each user. This method closely aligns the revenue recovery with consumption. Revenue collected varies directly with the consumption volume.

**Declining Block Rates:** This rate structure charges a successively lower price for set volumes, as consumption increases through a series of "blocks." That is to say that within set volume ranges, or blocks, the charge per unit is set at one rate. Within the next volume range, the charge per unit decreases to a lower rate, and so on. Typically, the first, or first and second blocks cover residential and light commercial uses. Subsequent blocks normally are used for heavier commercial and industrial uses. This rate structure requires the use of meters to record the volume consumed by each type of user. This method requires the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect revenue from rate payers.

**Increasing or Inverted Block Rates:** The increasing block rate works essentially the same way as the declining block rate, except that the price of water in successive blocks increases rather than declines. Under this method the consumer's bill rises faster with higher volumes used. This rate structure also requires the use of meters to



record the volume consumed by each user. This method requires, as with the declining block structure, the collection and analysis of consumption patterns by user classification to establish rates at a level which does not over or under collect from rate payers.

**The Hump Back Rate:** The hump back rate is a combination of an increasing block rate and the declining block rate. Under this method the consumer's bill rises with higher volumes used up to a certain level and then begins to fall for volumes in excess of levels set for the increasing block rate.

## 6.3 Assessment of Alternative Pricing Structures

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The adoption by a municipality or utility of any one particular pricing structure is normally a function of a variety of administrative, social, demographic and financial factors. The number of factors, and the weighting each particular factor receives, can vary between municipalities. The following is a review of some of the more prevalent factors.

### Cost Recovery

Cost recovery is a prime factor in establishing a particular pricing structure. Costs can be loosely defined into different categories: operations, maintenance, capital, financing and administration. These costs often vary between municipalities and even within a municipality, based on consumption patterns, infrastructure age, economic growth, etc.

The pricing alternatives defined earlier can all achieve the cost recovery goal, but some do so more precisely than others. Fixed pricing structures, such as Property Assessment and Flat Rate, are established on the value of property or on the number of units present in the municipality, but do not adjust in accordance with consumption. Thus, if actual consumption for the year is greater than projected, the municipality incurs a higher cost of production, but the revenue base remains static (since it was determined at the beginning of the year), thus potentially providing a funding shortfall. Conversely, if the consumption level declines below projections, fixed pricing structures will produce more revenue than actual costs incurred.





The other pricing methods (declining block, constant rate, increasing block) are consumption-based and generally will generate revenues in proportion to actual consumption.

### Administration

Administration is defined herein as the staffing, equipment and supplies required to support the undertaking of a particular pricing strategy. This factor not only addresses the physical tangible requirements to support the collection of the revenues, but also the intangible requirements, such as policy development.

The easiest pricing structure to support is the Property Assessment structure. As municipalities undertake the process of calculating property tax bills and the collection process for their general services, the incorporation of the water costs into this calculation would have virtually no impact on the administrative process and structure.

The Flat Rate pricing structure is relatively easy to administer as well. It is normally calculated to collect a set amount, either on a monthly, quarterly, semi-annual or annual basis, and is billed directly to the customer. The impact on administration centres mostly on the accounts receivable or billing area of the municipality, but normally requires minor additional staff or operating costs to undertake.

The three remaining methods, those being Increasing Block Rate, Constant Rate and Declining Block Rate, have a more dramatic effect on administration. These methods are dependent upon actual consumption and hence involve a major structure in place to administer. First, meters must be installed in all existing units in the municipality, and units to be subsequently built must be required to include these meters. Second, meter readings must be undertaken periodically. Hence staff must be available for this purpose or a service contract must be negotiated. Third, the billings process must be expanded to accommodate this process. Billing must be done per a defined period, requiring staff to produce the bills. Lastly, either through increased staffing or by service contract, an annual maintenance program must be set up to ensure meters are working effectively in recording consumed volumes.

The benefit derived from the installation of meters is that information on consumption patterns becomes available. This information provides benefit to administration in calculating rates which will ensure revenue recovery. Additionally, when planning what services are to be constructed in future years, the municipality or utility has documented



consumption patterns distinctive to its own situation, which can be used to project sizing of growth-related works.

### Equity

Equity is always a consideration in the establishment of pricing structures but its definition can vary depending on a municipality's circumstances and based on the subjective interpretation of those involved. For example: is the price charged to a particular class of rate payer consistent with those of a similar class in surrounding municipalities; through the pricing structure does one class of rate payer pay more than another class; should one pay based on ability to pay, or on the basis that a unit of water costs the same to supply no matter who consumes it; etc.? There are many interpretations. Equity therefore must be viewed broadly in light of many factors as part of achieving what is best for the municipality as a whole.

### Conservation

In today's society, conservation of natural resources is increasingly being more highly valued. Controversy continuously focuses on the preservation of non-renewable resources and on the proper management of renewable resources. Conservation is also a concept which applies to a municipality facing physical limitations in the amount of water which can be supplied to an area. As well, financial constraints can encourage conservation in a municipality where the cost of providing each additional unit is increasing.

Pricing structures such as property assessment and flat rate do not, in themselves, encourage conservation. In fact, depending on the price which is charged, they may even encourage resource "squandering," either because consumers, without the price discipline, consume water at will, or the customer wants to get his money's worth and hence adopts more liberal consumption patterns. The fundamental reason for this is that the price paid for the service bears no direct relationship to the volume consumed and hence is viewed as a "tax," instead of being viewed as the price of a purchased commodity.

The Declining Block Rate provides a decreasing incentive towards conservation. By creating awareness of volumes consumed, the consumer can reduce his total costs by restricting consumption; however, the incentive lessens as more water is consumed, because the marginal cost per unit declines as the consumer enters the next block



pricing range. Similarly, those whose consumption level is at the top end of a block have less incentive to reduce consumption.

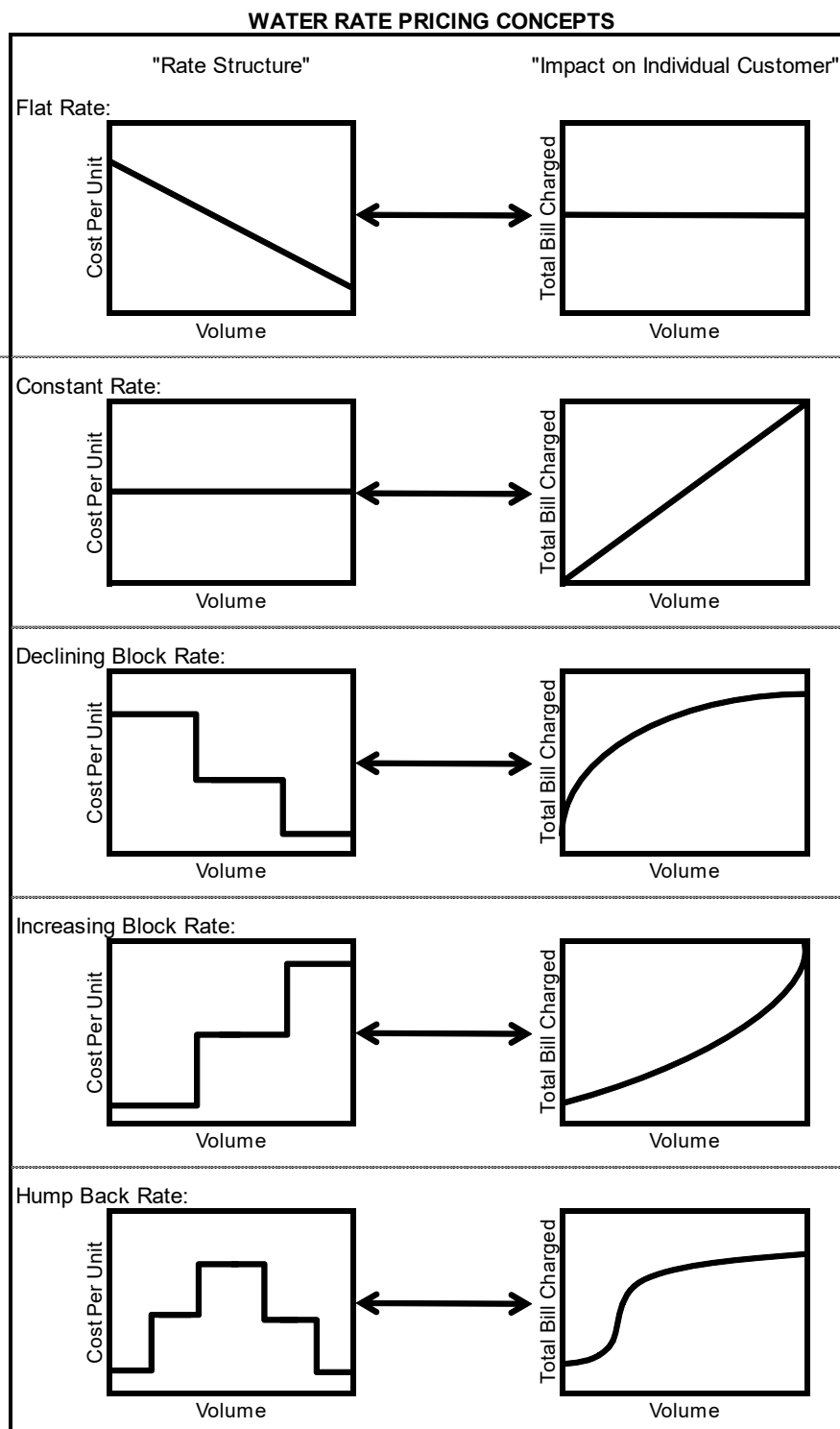
The Constant Rate structure presents the customer with a linear relationship between consumption and the cost thereof. As the consumer pays a fixed cost per unit, his bill will vary directly with the amount consumed. This method presents tangible incentive for consumers to conserve water. As metering provides direct feedback as to usage patterns and the consumer has direct control over the total amount paid for the commodity, the consumer is encouraged to use only those volumes that are reasonably required.

The Inverted Block method presents the most effective pricing method for encouraging conservation. Through this method, the price per unit consumed increases as total volumes consumed grow. The consumer becomes aware of consumption through metering with the charges increasing dramatically with usage. Hence, there normally is awareness that exercising control over usage can produce significant savings. This method not only encourages conservation methods, but may also penalize legitimate high-volume users if not properly structured.

Figure 6-1 provides a schematic representation of the various rate structures (note property tax as a basis for revenue recovery has not been presented for comparison, as the proportion of taxes paid varies in direct proportion to the market value of the property). The graphs on the left-hand side of the figure present the cost per unit for each additional amount of water consumed. The right-hand side of the figure presents the impact on the customer's bill as the volume of water increases. Following the schematic is a table summarizing each rate structure.



Figure 6-1





<b>RATE STRUCTURE</b>	<b>COST PER UNIT AS VOLUME INCREASES</b>	<b>IMPACT ON CUSTOMER BILL AS VOLUME INCREASES</b>
Flat Rate	Cost per unit decreases as more volume consumed	Bill remains the same no matter how much volume is consumed
Constant Rate	Cost per unit remains the same	Bill increases in direct proportion to consumption
Declining Block	Cost per unit decreases as threshold targets are achieved	Bill increases at a slower rate as volumes increase
Increasing Block	Cost per unit increases as threshold targets are achieved	Bill increases at a faster rate as volumes increase
Hump Back Rate	Combination of an increasing block at the lower consumption volumes and then converts to a declining block for the high consumption	Bill increases at a faster rate at the lower consumption amounts and then slows as volumes increase

## 6.4 Rate Structures in Ontario

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In a past survey of over 170 municipalities (approximately half of the municipalities who provide water and/or sewer), all forms of rate structures are in use by Ontario municipalities. The most common rate structure is the constant rate (for metered municipalities). Most municipalities (approximately 92%) who have volume rate structures also impose a base monthly charge.

Historically, the development of a base charge often reflected either the recovery of meter reading/billing/collection costs, plus administration or those costs plus certain fixed costs (such as capital contributions or reserve contributions). More recently, many municipalities have started to establish base charges based on ensuring a secure portion of the revenue stream which does not vary with volume consumption. Selection of the quantum of the base charge is a matter of policy selected by individual municipalities.



## 6.5 Recommended Rate Structures

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Based on the foregoing, it is recommended that the same rate structures be continued in the future.

The non-growth-related capital program for water is allocated throughout the forecast period evenly whereas a substantial amount of the growth-related works are required by 2023. For wastewater, the non-growth-related capital needs represent only 17.5% of the capital needs over the forecast period, with a substantial amount of the growth-related works required by 2023.

In order to meet the needs identified, transfers to the water and wastewater capital reserves are required to balance the deficits in the D.C. reserve funds throughout the forecast period. As a result, rate increases have been provided at 2% annually over the forecast period for both the base charge and volume rate (Scenario 1). Note that with these rate increases, the overall combined balance in the reserves and reserve funds remains in a deficit position in 2023.

Given the significant economic impacts of COVID-19 on the community, a second scenario is provided whereby the rates for 2021 will not increase, however, annual increases thereafter are provided at 2.25% annually (for both the base charge and volume rate).

The above increases are recommended to ensure that the Township can fund the capital and operating costs while minimizing the need for debentures. The balances in the D.C. reserve funds remain in deficit positions for the forecast period to ensure the growth-related costs do not impact the rates of existing users. Further recommendations with respect to D.C.s are provided in subsequent sections.

The forecast base charges and anticipated revenues for water are presented in Table 6-1 for Scenario 1 and Table 6-2 for Scenario 2. The forecast base charges and revenues for wastewater are presented in Table 6-3 for Scenario 1 and Table 6-4 for Scenario 2.



**Table 6-1**  
**Base Charge Forecast – Water**  
**Scenario 1 – 2% Annual Increases**

Water	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	826	826	826	826	826	826	826	826	826	826
New	25	80	120	150	190	233	275	323	378	428
<b>Total Customers</b>	<b>851</b>	<b>906</b>	<b>946</b>	<b>976</b>	<b>1,016</b>	<b>1,059</b>	<b>1,101</b>	<b>1,149</b>	<b>1,204</b>	<b>1,254</b>
<b>Total Annual Revenue</b>	<b>\$359,598</b>	<b>\$388,787</b>	<b>\$412,880</b>	<b>\$433,621</b>	<b>\$459,270</b>	<b>\$487,071</b>	<b>\$515,358</b>	<b>\$547,284</b>	<b>\$583,497</b>	<b>\$618,597</b>

15mm/18mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	818	818	818	818	818	818	818	818	818	818
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>843</b>	<b>898</b>	<b>938</b>	<b>968</b>	<b>1,008</b>	<b>1,051</b>	<b>1,093</b>	<b>1,141</b>	<b>1,196</b>	<b>1,246</b>
Monthly Base Charge	\$32.68	\$33.33	\$34.00	\$34.67	\$35.37	\$36.08	\$36.80	\$37.53	\$38.28	\$39.05
Annual Base Charge	\$392.10	\$399.94	\$407.94	\$416.10	\$424.42	\$432.91	\$441.57	\$450.40	\$459.41	\$468.60
<b>Total Annual Revenue</b>	<b>\$330,540</b>	<b>\$359,148</b>	<b>\$382,649</b>	<b>\$402,784</b>	<b>\$427,817</b>	<b>\$454,988</b>	<b>\$482,634</b>	<b>\$513,906</b>	<b>\$549,452</b>	<b>\$583,870</b>

25mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$59.67	\$60.86	\$62.08	\$63.32	\$64.59	\$65.88	\$67.20	\$68.54	\$69.91	\$71.31
Annual Base Charge	\$716.04	\$730.36	\$744.97	\$759.87	\$775.06	\$790.57	\$806.38	\$822.50	\$838.95	\$855.73
<b>Total Annual Revenue</b>	<b>\$2,148</b>	<b>\$2,191</b>	<b>\$2,235</b>	<b>\$2,280</b>	<b>\$2,325</b>	<b>\$2,372</b>	<b>\$2,419</b>	<b>\$2,468</b>	<b>\$2,517</b>	<b>\$2,567</b>

40mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$135.74	\$138.45	\$141.22	\$144.05	\$146.93	\$149.87	\$152.87	\$155.92	\$159.04	\$162.22
Annual Base Charge	\$1,628.88	\$1,661.46	\$1,694.69	\$1,728.58	\$1,763.15	\$1,798.42	\$1,834.38	\$1,871.07	\$1,908.49	\$1,946.66
<b>Total Annual Revenue</b>	<b>\$1,629</b>	<b>\$1,661</b>	<b>\$1,695</b>	<b>\$1,729</b>	<b>\$1,763</b>	<b>\$1,798</b>	<b>\$1,834</b>	<b>\$1,871</b>	<b>\$1,908</b>	<b>\$1,947</b>

50mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$316.23	\$322.55	\$329.00	\$335.58	\$342.29	\$349.14	\$356.12	\$363.24	\$370.51	\$377.92
Annual Base Charge	\$3,794.70	\$3,870.59	\$3,948.01	\$4,026.97	\$4,107.51	\$4,189.66	\$4,273.45	\$4,358.92	\$4,446.10	\$4,535.02
<b>Total Annual Revenue</b>	<b>\$11,384</b>	<b>\$11,612</b>	<b>\$11,844</b>	<b>\$12,081</b>	<b>\$12,323</b>	<b>\$12,569</b>	<b>\$12,820</b>	<b>\$13,077</b>	<b>\$13,338</b>	<b>\$13,605</b>

75mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	0	0	0	0	0	0	0	0	0	0
New										
<b>Subtotal Customers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Monthly Base Charge	\$653.02	\$666.08	\$679.40	\$692.99	\$706.85	\$720.99	\$735.41	\$750.11	\$765.12	\$780.42
Annual Base Charge	\$7,836.24	\$7,992.96	\$8,152.82	\$8,315.88	\$8,482.20	\$8,651.84	\$8,824.88	\$9,001.38	\$9,181.40	\$9,365.03
<b>Total Annual Revenue</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

100mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$1,158.07	\$1,181.23	\$1,204.85	\$1,228.95	\$1,253.53	\$1,278.60	\$1,304.17	\$1,330.25	\$1,356.86	\$1,383.99
Annual Base Charge	\$13,896.78	\$14,174.72	\$14,458.21	\$14,747.37	\$15,042.32	\$15,343.17	\$15,650.03	\$15,963.03	\$16,282.29	\$16,607.94
<b>Total Annual Revenue</b>	<b>\$13,897</b>	<b>\$14,175</b>	<b>\$14,458</b>	<b>\$14,747</b>	<b>\$15,042</b>	<b>\$15,343</b>	<b>\$15,650</b>	<b>\$15,963</b>	<b>\$16,282</b>	<b>\$16,608</b>



Table 6-2  
Base Charge Forecast – Water  
Scenario 2 – 0% Increase for 2021, then 2.25% Increases Annually

Water	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	826	826	826	826	826	826	826	826	826	826
New	25	80	120	150	190	233	275	323	378	428
<b>Total Customers</b>	<b>851</b>	<b>906</b>	<b>946</b>	<b>976</b>	<b>1,016</b>	<b>1,059</b>	<b>1,101</b>	<b>1,149</b>	<b>1,204</b>	<b>1,254</b>
<b>Total Annual Revenue</b>	<b>\$359,598</b>	<b>\$381,164</b>	<b>\$405,777</b>	<b>\$427,205</b>	<b>\$453,584</b>	<b>\$482,219</b>	<b>\$511,475</b>	<b>\$544,492</b>	<b>\$581,944</b>	<b>\$618,462</b>

15mm/18mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	818	818	818	818	818	818	818	818	818	818
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>843</b>	<b>898</b>	<b>938</b>	<b>968</b>	<b>1,008</b>	<b>1,051</b>	<b>1,093</b>	<b>1,141</b>	<b>1,196</b>	<b>1,246</b>
Monthly Base Charge	\$32.68	\$32.68	\$33.41	\$34.16	\$34.93	\$35.72	\$36.52	\$37.34	\$38.18	\$39.04
Annual Base Charge	\$392.10	\$392.10	\$400.92	\$409.94	\$419.17	\$428.60	\$438.24	\$448.10	\$458.18	\$468.49
<b>Total Annual Revenue</b>	<b>\$330,540</b>	<b>\$352,106</b>	<b>\$376,065</b>	<b>\$396,825</b>	<b>\$422,520</b>	<b>\$450,456</b>	<b>\$478,998</b>	<b>\$511,284</b>	<b>\$547,988</b>	<b>\$583,743</b>

25mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$59.67	\$59.67	\$61.01	\$62.39	\$63.79	\$65.22	\$66.69	\$68.19	\$69.73	\$71.30
Annual Base Charge	\$716.04	\$716.04	\$732.15	\$748.62	\$765.47	\$782.69	\$800.30	\$818.31	\$836.72	\$855.55
<b>Total Annual Revenue</b>	<b>\$2,148</b>	<b>\$2,148</b>	<b>\$2,196</b>	<b>\$2,246</b>	<b>\$2,296</b>	<b>\$2,348</b>	<b>\$2,401</b>	<b>\$2,455</b>	<b>\$2,510</b>	<b>\$2,567</b>

40mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$135.74	\$135.74	\$138.79	\$141.92	\$145.11	\$148.38	\$151.71	\$155.13	\$158.62	\$162.19
Annual Base Charge	\$1,628.88	\$1,628.88	\$1,665.53	\$1,703.00	\$1,741.32	\$1,780.50	\$1,820.56	\$1,861.53	\$1,903.41	\$1,946.24
<b>Total Annual Revenue</b>	<b>\$1,629</b>	<b>\$1,629</b>	<b>\$1,666</b>	<b>\$1,703</b>	<b>\$1,741</b>	<b>\$1,781</b>	<b>\$1,821</b>	<b>\$1,862</b>	<b>\$1,903</b>	<b>\$1,946</b>

50mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$316.23	\$316.23	\$323.34	\$330.62	\$338.05	\$345.66	\$353.44	\$361.39	\$369.52	\$377.84
Annual Base Charge	\$3,794.70	\$3,794.70	\$3,880.08	\$3,967.38	\$4,056.65	\$4,147.92	\$4,241.25	\$4,336.68	\$4,434.25	\$4,534.03
<b>Total Annual Revenue</b>	<b>\$11,384</b>	<b>\$11,384</b>	<b>\$11,640</b>	<b>\$11,902</b>	<b>\$12,170</b>	<b>\$12,444</b>	<b>\$12,724</b>	<b>\$13,010</b>	<b>\$13,303</b>	<b>\$13,602</b>

75mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	0	0	0	0	0	0	0	0	0	0
New										
<b>Subtotal Customers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Monthly Base Charge	\$653.02	\$653.02	\$667.71	\$682.74	\$698.10	\$713.81	\$729.87	\$746.29	\$763.08	\$780.25
Annual Base Charge	\$7,836.24	\$7,836.24	\$8,012.56	\$8,192.84	\$8,377.18	\$8,565.66	\$8,758.39	\$8,955.45	\$9,156.95	\$9,362.98
<b>Total Annual Revenue</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

100mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$1,158.07	\$1,158.07	\$1,184.12	\$1,210.76	\$1,238.01	\$1,265.86	\$1,294.34	\$1,323.47	\$1,353.24	\$1,383.69
Annual Base Charge	\$13,896.78	\$13,896.78	\$14,209.46	\$14,529.17	\$14,856.08	\$15,190.34	\$15,532.12	\$15,881.59	\$16,238.93	\$16,604.31
<b>Total Annual Revenue</b>	<b>\$13,897</b>	<b>\$13,897</b>	<b>\$14,209</b>	<b>\$14,529</b>	<b>\$14,856</b>	<b>\$15,190</b>	<b>\$15,532</b>	<b>\$15,882</b>	<b>\$16,239</b>	<b>\$16,604</b>





**Table 6-3**  
**Base Charge Forecast – Wastewater**  
**Scenario 1 – 2% Annual Increases**

Wastewater	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	814	814	814	814	814	814	814	814	814	814
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>839</b>	<b>894</b>	<b>934</b>	<b>964</b>	<b>1,004</b>	<b>1,047</b>	<b>1,089</b>	<b>1,137</b>	<b>1,192</b>	<b>1,242</b>
<b>Total Annual Revenue</b>	<b>\$662,919</b>	<b>\$716,886</b>	<b>\$761,422</b>	<b>\$799,752</b>	<b>\$847,165</b>	<b>\$898,559</b>	<b>\$950,852</b>	<b>\$1,009,878</b>	<b>\$1,076,837</b>	<b>\$1,141,734</b>

15mm/18mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	807	807	807	807	807	807	807	807	807	807
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>832</b>	<b>887</b>	<b>927</b>	<b>957</b>	<b>997</b>	<b>1,040</b>	<b>1,082</b>	<b>1,130</b>	<b>1,185</b>	<b>1,235</b>
Monthly Base Charge	\$60.47	\$61.68	\$62.91	\$64.17	\$65.45	\$66.76	\$68.10	\$69.46	\$70.85	\$72.27
Annual Base Charge	\$725.64	\$740.15	\$754.96	\$770.05	\$785.46	\$801.17	\$817.19	\$833.53	\$850.20	\$867.21
<b>Total Annual Revenue</b>	<b>\$603,732</b>	<b>\$656,516</b>	<b>\$699,844</b>	<b>\$736,943</b>	<b>\$783,100</b>	<b>\$833,212</b>	<b>\$884,198</b>	<b>\$941,891</b>	<b>\$1,007,490</b>	<b>\$1,071,001</b>

25mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2	2	2	2	2	2	2	2	2	2
New										
<b>Subtotal Customers</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
Monthly Base Charge	\$112.33	\$114.58	\$116.87	\$119.21	\$121.59	\$124.02	\$126.50	\$129.03	\$131.61	\$134.24
Annual Base Charge	\$1,347.96	\$1,374.92	\$1,402.42	\$1,430.47	\$1,459.08	\$1,488.26	\$1,518.02	\$1,548.38	\$1,579.35	\$1,610.94
<b>Total Annual Revenue</b>	<b>\$2,696</b>	<b>\$2,750</b>	<b>\$2,805</b>	<b>\$2,861</b>	<b>\$2,918</b>	<b>\$2,977</b>	<b>\$3,036</b>	<b>\$3,097</b>	<b>\$3,159</b>	<b>\$3,222</b>

40mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$279.32	\$284.90	\$290.60	\$296.41	\$302.34	\$308.39	\$314.55	\$320.85	\$327.26	\$333.81
Annual Base Charge	\$3,351.78	\$3,418.82	\$3,487.19	\$3,556.94	\$3,628.07	\$3,700.64	\$3,774.65	\$3,850.14	\$3,927.14	\$4,005.69
<b>Total Annual Revenue</b>	<b>\$3,352</b>	<b>\$3,419</b>	<b>\$3,487</b>	<b>\$3,557</b>	<b>\$3,628</b>	<b>\$3,701</b>	<b>\$3,775</b>	<b>\$3,850</b>	<b>\$3,927</b>	<b>\$4,006</b>

50mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$662.34	\$675.58	\$689.09	\$702.88	\$716.93	\$731.27	\$745.90	\$760.81	\$776.03	\$791.55
Annual Base Charge	\$7,948.02	\$8,106.98	\$8,269.12	\$8,434.50	\$8,603.19	\$8,775.26	\$8,950.76	\$9,129.78	\$9,312.37	\$9,498.62
<b>Total Annual Revenue</b>	<b>\$23,844</b>	<b>\$24,321</b>	<b>\$24,807</b>	<b>\$25,304</b>	<b>\$25,810</b>	<b>\$26,326</b>	<b>\$26,852</b>	<b>\$27,389</b>	<b>\$27,937</b>	<b>\$28,496</b>

75mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	0	0	0	0	0	0	0	0	0	0
New										
<b>Subtotal Customers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Monthly Base Charge	\$1,373.75	\$1,401.22	\$1,429.24	\$1,457.83	\$1,486.99	\$1,516.73	\$1,547.06	\$1,578.00	\$1,609.56	\$1,641.75
Annual Base Charge	\$16,484.94	\$16,814.64	\$17,150.93	\$17,493.95	\$17,843.83	\$18,200.71	\$18,564.72	\$18,936.01	\$19,314.73	\$19,701.03
<b>Total Annual Revenue</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

100mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$2,441.25	\$2,490.08	\$2,539.88	\$2,590.67	\$2,642.49	\$2,695.34	\$2,749.24	\$2,804.23	\$2,860.31	\$2,917.52
Annual Base Charge	\$29,295.00	\$29,880.90	\$30,478.52	\$31,088.09	\$31,709.85	\$32,344.05	\$32,990.93	\$33,650.75	\$34,323.76	\$35,010.24
<b>Total Annual Revenue</b>	<b>\$29,295</b>	<b>\$29,881</b>	<b>\$30,479</b>	<b>\$31,088</b>	<b>\$31,710</b>	<b>\$32,344</b>	<b>\$32,991</b>	<b>\$33,651</b>	<b>\$34,324</b>	<b>\$35,010</b>



Table 6-4  
Base Charge Forecast – Wastewater  
Scenario 2 – 0% Increase for 2021, then 2.25% Increases Annually

Wastewater	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	814	814	814	814	814	814	814	814	814	814
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>839</b>	<b>894</b>	<b>934</b>	<b>964</b>	<b>1,004</b>	<b>1,047</b>	<b>1,089</b>	<b>1,137</b>	<b>1,192</b>	<b>1,242</b>
<b>Total Annual Revenue</b>	<b>\$662,919</b>	<b>\$702,829</b>	<b>\$748,322</b>	<b>\$787,919</b>	<b>\$836,676</b>	<b>\$889,608</b>	<b>\$943,688</b>	<b>\$1,004,726</b>	<b>\$1,073,969</b>	<b>\$1,141,485</b>

15mm/18mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	807	807	807	807	807	807	807	807	807	807
New	25	80	120	150	190	233	275	323	378	428
<b>Subtotal Customers</b>	<b>832</b>	<b>887</b>	<b>927</b>	<b>957</b>	<b>997</b>	<b>1,040</b>	<b>1,082</b>	<b>1,130</b>	<b>1,185</b>	<b>1,235</b>
Monthly Base Charge	\$60.47	\$60.47	\$61.83	\$63.22	\$64.64	\$66.10	\$67.59	\$69.11	\$70.66	\$72.25
Annual Base Charge	\$725.64	\$725.64	\$741.97	\$758.66	\$775.73	\$793.18	\$811.03	\$829.28	\$847.94	\$867.02
<b>Total Annual Revenue</b>	<b>\$603,732</b>	<b>\$643,643</b>	<b>\$687,803</b>	<b>\$726,039</b>	<b>\$773,404</b>	<b>\$824,912</b>	<b>\$877,536</b>	<b>\$937,086</b>	<b>\$1,004,807</b>	<b>\$1,070,766</b>

25mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2	2	2	2	2	2	2	2	2	2
New										
<b>Subtotal Customers</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
Monthly Base Charge	\$112.33	\$112.33	\$114.86	\$117.44	\$120.08	\$122.79	\$125.55	\$128.37	\$131.26	\$134.22
Annual Base Charge	\$1,347.96	\$1,347.96	\$1,378.29	\$1,409.30	\$1,441.01	\$1,473.43	\$1,506.58	\$1,540.48	\$1,575.14	\$1,610.58
<b>Total Annual Revenue</b>	<b>\$2,696</b>	<b>\$2,696</b>	<b>\$2,757</b>	<b>\$2,819</b>	<b>\$2,882</b>	<b>\$2,947</b>	<b>\$3,013</b>	<b>\$3,081</b>	<b>\$3,150</b>	<b>\$3,221</b>

40mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$279.32	\$279.32	\$285.60	\$292.03	\$298.60	\$305.31	\$312.18	\$319.21	\$326.39	\$333.73
Annual Base Charge	\$3,351.78	\$3,351.78	\$3,427.20	\$3,504.31	\$3,583.15	\$3,663.77	\$3,746.21	\$3,830.50	\$3,916.69	\$4,004.81
<b>Total Annual Revenue</b>	<b>\$3,352</b>	<b>\$3,352</b>	<b>\$3,427</b>	<b>\$3,504</b>	<b>\$3,583</b>	<b>\$3,664</b>	<b>\$3,746</b>	<b>\$3,830</b>	<b>\$3,917</b>	<b>\$4,005</b>

50mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3
New										
<b>Subtotal Customers</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
Monthly Base Charge	\$662.34	\$662.34	\$677.24	\$692.48	\$708.06	\$723.99	\$740.28	\$756.93	\$773.96	\$791.38
Annual Base Charge	\$7,948.02	\$7,948.02	\$8,126.85	\$8,309.70	\$8,496.67	\$8,687.85	\$8,883.32	\$9,083.20	\$9,287.57	\$9,496.54
<b>Total Annual Revenue</b>	<b>\$23,844</b>	<b>\$23,844</b>	<b>\$24,381</b>	<b>\$24,929</b>	<b>\$25,490</b>	<b>\$26,064</b>	<b>\$26,650</b>	<b>\$27,250</b>	<b>\$27,863</b>	<b>\$28,490</b>

75mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	0	0	0	0	0	0	0	0	0	0
New										
<b>Subtotal Customers</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Monthly Base Charge	\$1,373.75	\$1,373.75	\$1,404.65	\$1,436.26	\$1,468.57	\$1,501.62	\$1,535.40	\$1,569.95	\$1,605.27	\$1,641.39
Annual Base Charge	\$16,484.94	\$16,484.94	\$16,855.85	\$17,235.11	\$17,622.90	\$18,019.41	\$18,424.85	\$18,839.41	\$19,263.30	\$19,696.72
<b>Total Annual Revenue</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

100mm Meter Size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1
New										
<b>Subtotal Customers</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
Monthly Base Charge	\$2,441.25	\$2,441.25	\$2,496.18	\$2,552.34	\$2,609.77	\$2,668.49	\$2,728.53	\$2,789.92	\$2,852.70	\$2,916.88
Annual Base Charge	\$29,295.00	\$29,295.00	\$29,954.14	\$30,628.11	\$31,317.24	\$32,021.88	\$32,742.37	\$33,479.07	\$34,232.35	\$35,002.58
<b>Total Annual Revenue</b>	<b>\$29,295</b>	<b>\$29,295</b>	<b>\$29,954</b>	<b>\$30,628</b>	<b>\$31,317</b>	<b>\$32,022</b>	<b>\$32,742</b>	<b>\$33,479</b>	<b>\$34,232</b>	<b>\$35,003</b>



# Chapter 7

## Analysis of Water and Wastewater Rates and Policy Matters



## 7. Analysis of Water and Wastewater Rates and Policy Matters

### 7.1 Introduction

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To summarize the analysis undertaken thus far, Chapter 2 reviewed capital-related issues and responds to the provincial directives to maintain and upgrade infrastructure to required levels. Chapter 4 provided a review of capital financing options to which water and wastewater reserve contributions will be the predominant basis for financing future capital replacement. Chapter 5 established the 10-year operating forecast of expenditures including an annual capital reserve contribution. The base charge revenues are to ensure that fixed costs are recovered regardless of the amount of volume used by customers. This chapter will provide for the calculation of the volume rates over the forecast period. These calculations will be based on the net operating expenditures (the variable costs) provided in Chapter 5, divided by the water volume forecast and wastewater volumes provided in section 1.8.

### 7.2 Water Rates

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Based on the discussion of rate structures provided in section 6.5 and the recommendation to continue with the present structures, the rates are calculated by taking the net recoverable amounts from Table 5-1 (the product of total expenditures less non-rate revenues and deduct the base charge amounts provided in section 6.5) and completes the calculation by dividing them by the volumes resulting in the forecasted rates. As stated earlier, to address the capital needs and maintain an overall positive balance in the water reserves and reserve funds, the volume rates are anticipated to increase at 2% per year over the forecast period (Scenario 1). These volume rates are presented in Table 7-1. A second scenario is provided whereby the rates for 2021 do not increase, however, increase 2.25% annually thereafter. This second scenario is provided for Council's consideration due to the economic impacts of COVID-19 on the community. These volume rates are presented in Table 7-. Detailed calculations of the volume rates are provided in Appendix C. Note, bulk water rates for both scenarios are included in the calculations and rates are forecasted based on the rate increases for each respective scenario. Summaries of the recommended base



charges and volume rates along with the total annual bill for an average residential user who consumes 140 cu.m per year are as follows:

Table 7-1  
Average Annual Water Bill Based on 140 cu.m and Bulk Water Rates  
Scenario 1 – 2% Annual Increases

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$33.33	\$34.00	\$34.67	\$35.37	\$36.08	\$36.80	\$37.53	\$38.28	\$39.05
Volume Rate	\$1.82	\$1.86	\$1.89	\$1.93	\$1.97	\$2.01	\$2.05	\$2.09	\$2.13	\$2.17
Annual Base Charge	\$392.10	\$399.94	\$407.94	\$416.10	\$424.42	\$432.91	\$441.57	\$450.40	\$459.41	\$468.60
Annual Volume Charge	\$254.80	\$259.90	\$264.60	\$270.20	\$275.80	\$281.40	\$287.00	\$292.60	\$298.20	\$303.80
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$659.84</b>	<b>\$672.54</b>	<b>\$686.30</b>	<b>\$700.22</b>	<b>\$714.31</b>	<b>\$728.57</b>	<b>\$743.00</b>	<b>\$757.61</b>	<b>\$772.40</b>
<b>Bulk Water Rates (per cu.m)</b>	<b>\$4.26</b>	<b>\$4.35</b>	<b>\$4.43</b>	<b>\$4.52</b>	<b>\$4.61</b>	<b>\$4.70</b>	<b>\$4.80</b>	<b>\$4.89</b>	<b>\$4.99</b>	<b>\$5.09</b>
Annual % Increase		2%	2%	2%	2%	2%	2%	2%	2%	2%

Table 7-2  
Average Annual Water Bill Based on 140 cu.m and Bulk Water Rates  
Scenario 2 – 0% Increase for 2021, then 2.25% Increases Annually

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$32.68	\$33.41	\$34.16	\$34.93	\$35.72	\$36.52	\$37.34	\$38.18	\$39.04
Volume Rate	\$1.82	\$1.82	\$1.86	\$1.90	\$1.95	\$1.99	\$2.04	\$2.08	\$2.13	\$2.18
Annual Base Charge	\$392.10	\$392.10	\$400.92	\$409.94	\$419.17	\$428.60	\$438.24	\$448.10	\$458.18	\$468.49
Annual Volume Charge	\$254.80	\$254.80	\$260.54	\$266.42	\$272.44	\$278.60	\$284.90	\$291.34	\$297.92	\$304.64
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$646.90</b>	<b>\$661.46</b>	<b>\$676.36</b>	<b>\$691.61</b>	<b>\$707.20</b>	<b>\$723.14</b>	<b>\$739.44</b>	<b>\$756.10</b>	<b>\$773.13</b>
<b>Bulk Water Rates</b>	<b>\$4.26</b>	<b>\$4.26</b>	<b>\$4.36</b>	<b>\$4.45</b>	<b>\$4.55</b>	<b>\$4.66</b>	<b>\$4.76</b>	<b>\$4.87</b>	<b>\$4.98</b>	<b>\$5.09</b>
Annual % Increase		0%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%

## 7.3 Wastewater Rates

Similar to water, the calculation of the wastewater rates takes the net recoverable amounts from Table 5-2 and completes the calculation by dividing them by the volumes, resulting in the forecast rates. Detailed calculations are provided in Appendix D. As mentioned in Chapter 6, to address the capital needs and to try to maintain an overall positive balance in the wastewater reserves and reserve funds, the volume rates are anticipated to increase at 2% per year over the forecast period (Scenario 1). Note, the increases still result in a negative overall wastewater deficit in 2023 and 2024. When combined with water, there is a deficit only in 2023. Recommendations to address this deficit are provided in Chapter 8.

As with water, given the economic impacts of COVID-19 on the community, a second scenario is provided whereby the rates do not increase for 2021, then increase at 2.25% annually thereafter.



The following summarizes the recommended rates for wastewater and provides the average annual bill for a residential customer who uses 140 cu.m per year:

Table 7-3  
Average Annual Wastewater Bill Based on 140 cu.m  
Scenario 1 – 2% Annual Increases

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$61.68	\$62.91	\$64.17	\$65.45	\$66.76	\$68.10	\$69.46	\$70.85	\$72.27
Volume Rate	\$2.49	\$2.54	\$2.59	\$2.64	\$2.69	\$2.74	\$2.79	\$2.85	\$2.91	\$2.97
Annual Base Charge	\$725.64	\$740.15	\$754.96	\$770.05	\$785.46	\$801.17	\$817.19	\$833.53	\$850.20	\$867.21
Annual Volume Charge	\$348.60	\$355.57	\$362.60	\$369.60	\$376.60	\$383.60	\$390.60	\$399.00	\$407.40	\$415.80
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,095.72</b>	<b>\$1,117.56</b>	<b>\$1,139.65</b>	<b>\$1,162.06</b>	<b>\$1,184.77</b>	<b>\$1,207.79</b>	<b>\$1,232.53</b>	<b>\$1,257.60</b>	<b>\$1,283.01</b>
Annual % Increase		2%	2%	2%	2%	2%	2%	2%	2%	2%

Table 7-4  
Average Annual Wastewater Bill Based on 140 cu.m  
Scenario 2 – 0% Increase for 2021, then 2.25% Increases Annually

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$60.47	\$61.83	\$63.22	\$64.64	\$66.10	\$67.59	\$69.11	\$70.66	\$72.25
Volume Rate	\$2.49	\$2.49	\$2.55	\$2.60	\$2.66	\$2.72	\$2.78	\$2.85	\$2.91	\$2.98
Annual Base Charge	\$725.64	\$725.64	\$741.97	\$758.66	\$775.73	\$793.18	\$811.03	\$829.28	\$847.94	\$867.02
Annual Volume Charge	\$348.60	\$348.60	\$356.44	\$364.42	\$372.68	\$381.08	\$389.62	\$398.44	\$407.40	\$416.50
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,074.24</b>	<b>\$1,098.41</b>	<b>\$1,123.08</b>	<b>\$1,148.41</b>	<b>\$1,174.26</b>	<b>\$1,200.65</b>	<b>\$1,227.72</b>	<b>\$1,255.34</b>	<b>\$1,283.52</b>
Annual % Increase		0%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%

## 7.4 Forecast of Combined Water and Wastewater Impact for the Average Residential Customer

Based on the foregoing information, the combined impact of the water and wastewater base charge and volume rates equal an increase of 2% annually for scenario 1 and 0% in 2021 with 2.25% annual increases thereafter for scenario 2. Tables 7-3 and 7-4 present the forecast combined annual bill for customers with a 5/8" meter based on 140 cu.m of volume.



Table 7-5  
Average Annual Water and Wastewater Bill Based on 140 cu.m and Bulk Water Rates  
Scenario 1 – 2% Annual Increases

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$33.33	\$34.00	\$34.67	\$35.37	\$36.08	\$36.80	\$37.53	\$38.28	\$39.05
Volume Rate	\$1.82	\$1.86	\$1.89	\$1.93	\$1.97	\$2.01	\$2.05	\$2.09	\$2.13	\$2.17
Annual Base Charge	\$392.10	\$399.94	\$407.94	\$416.10	\$424.42	\$432.91	\$441.57	\$450.40	\$459.41	\$468.60
Annual Volume Charge	\$254.80	\$259.90	\$264.60	\$270.20	\$275.80	\$281.40	\$287.00	\$292.60	\$298.20	\$303.80
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$659.84</b>	<b>\$672.54</b>	<b>\$686.30</b>	<b>\$700.22</b>	<b>\$714.31</b>	<b>\$728.57</b>	<b>\$743.00</b>	<b>\$757.61</b>	<b>\$772.40</b>
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$61.68	\$62.91	\$64.17	\$65.45	\$66.76	\$68.10	\$69.46	\$70.85	\$72.27
Volume Rate	\$2.49	\$2.54	\$2.59	\$2.64	\$2.69	\$2.74	\$2.79	\$2.85	\$2.91	\$2.97
Annual Base Charge	\$725.64	\$740.15	\$754.96	\$770.05	\$785.46	\$801.17	\$817.19	\$833.53	\$850.20	\$867.21
Annual Volume Charge	\$348.60	\$355.57	\$362.60	\$369.60	\$376.60	\$383.60	\$390.60	\$399.00	\$407.40	\$415.80
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,095.72</b>	<b>\$1,117.56</b>	<b>\$1,139.65</b>	<b>\$1,162.06</b>	<b>\$1,184.77</b>	<b>\$1,207.79</b>	<b>\$1,232.53</b>	<b>\$1,257.60</b>	<b>\$1,283.01</b>
<b>Total Water and Wastewater Bill</b>	<b>\$1,721.14</b>	<b>\$1,755.56</b>	<b>\$1,790.10</b>	<b>\$1,825.95</b>	<b>\$1,862.28</b>	<b>\$1,899.08</b>	<b>\$1,936.36</b>	<b>\$1,975.53</b>	<b>\$2,015.21</b>	<b>\$2,055.40</b>
Annual % Increase		2%	2%	2%	2%	2%	2%	2%	2%	2%
<b>Bulk Water Rates (per cu.m)</b>	<b>\$4.26</b>	<b>\$4.35</b>	<b>\$4.43</b>	<b>\$4.52</b>	<b>\$4.61</b>	<b>\$4.70</b>	<b>\$4.80</b>	<b>\$4.89</b>	<b>\$4.99</b>	<b>\$5.09</b>



Table 7-6  
Average Annual Water and Wastewater Bill Based on 140 cu.m  
Scenario 2 – 0% Increase for 2021, then 2.25% Increases Annually

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water</b>										
Base Monthly Charge	\$32.68	\$32.68	\$33.41	\$34.16	\$34.93	\$35.72	\$36.52	\$37.34	\$38.18	\$39.04
Volume Rate	\$1.82	\$1.82	\$1.86	\$1.90	\$1.95	\$1.99	\$2.04	\$2.08	\$2.13	\$2.18
Annual Base Charge	\$392.10	\$392.10	\$400.92	\$409.94	\$419.17	\$428.60	\$438.24	\$448.10	\$458.18	\$468.49
Annual Volume Charge	\$254.80	\$254.80	\$260.54	\$266.42	\$272.44	\$278.60	\$284.90	\$291.34	\$297.92	\$304.64
<b>Total Water Bill</b>	<b>\$646.90</b>	<b>\$646.90</b>	<b>\$661.46</b>	<b>\$676.36</b>	<b>\$691.61</b>	<b>\$707.20</b>	<b>\$723.14</b>	<b>\$739.44</b>	<b>\$756.10</b>	<b>\$773.13</b>
<b>Wastewater</b>										
Base Monthly Charge	\$60.47	\$60.47	\$61.83	\$63.22	\$64.64	\$66.10	\$67.59	\$69.11	\$70.66	\$72.25
Volume Rate	\$2.49	\$2.49	\$2.55	\$2.60	\$2.66	\$2.72	\$2.78	\$2.85	\$2.91	\$2.98
Annual Base Charge	\$725.64	\$725.64	\$741.97	\$758.66	\$775.73	\$793.18	\$811.03	\$829.28	\$847.94	\$867.02
Annual Volume Charge	\$348.60	\$348.60	\$356.44	\$364.42	\$372.68	\$381.08	\$389.62	\$398.44	\$407.40	\$416.50
<b>Total Wastewater Bill</b>	<b>\$1,074.24</b>	<b>\$1,074.24</b>	<b>\$1,098.41</b>	<b>\$1,123.08</b>	<b>\$1,148.41</b>	<b>\$1,174.26</b>	<b>\$1,200.65</b>	<b>\$1,227.72</b>	<b>\$1,255.34</b>	<b>\$1,283.52</b>
<b>Total Water and Wastewater Bill</b>	<b>\$1,721.14</b>	<b>\$1,721.14</b>	<b>\$1,759.87</b>	<b>\$1,799.44</b>	<b>\$1,840.02</b>	<b>\$1,881.46</b>	<b>\$1,923.79</b>	<b>\$1,967.16</b>	<b>\$2,011.44</b>	<b>\$2,056.65</b>
Annual % Increase		0%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%
<b>Bulk Water Rates (per cu.m)</b>	<b>\$4.26</b>	<b>\$4.26</b>	<b>\$4.36</b>	<b>\$4.45</b>	<b>\$4.55</b>	<b>\$4.66</b>	<b>\$4.76</b>	<b>\$4.87</b>	<b>\$4.98</b>	<b>\$5.09</b>





## 7.5 Development Charges Reserve Funds

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As noted above, the growth-related capital needs are significant in the first few years of the forecast period. There is an estimated \$887,000 in growth-related capital works identified for water by 2023 and \$2.45 million identified for wastewater by 2023. These works are all 100% growth-related, therefore completely funded through D.C.s. The current balances in the D.C. reserve funds along with the anticipated D.C. revenues over the next few years will not be sufficient to fund the growth-related works. As a result, the Township has a few options:

1. Borrow from the water and wastewater capital reserve;
2. Issue growth-related debt;
3. Borrow from tax-supported reserves; and
4. Developer funds growth-related capital by constructing works or accelerating payment timing.

With respect to option 1, the calculations identified above provide sufficient reserves to loan to the D.C. reserve funds to pay for the required expenditures, however, a combined deficit position is anticipated in 2023. This limits the funds available to the Township should an immediate need occur (i.e. major capital replacement not anticipated).

With respect to option 2, the Township currently pays approximately \$84,000 annually in growth-related debt payments for water and pays approximately \$314,000 annually for wastewater. The current growth-related debt payments are close to the anticipated D.C. revenues for water and higher than the anticipated D.C. revenues for wastewater. As a result, further issuance of growth-related debt will further increase the negative balances. In addition, the Township's debt capacity allows for further debt of approximately \$25 million. Given other Township priorities and potential debt issuances for other Township services, this approach is not recommended.

For option 3, borrowing from tax-supported reserves is allowable, however, would mean that the existing residents and non-water/wastewater properties would assist in funding growth-related costs.



Option 4 provides for the developing landowner to either construct the works and receive a credit at the time of taking out their building permits or alternatively, accelerate the timing of payment. Accelerated payments may be achieved by:

1. Amending the payment timing within the D.C. by-law to receive the water and wastewater D.C.s at the time of subdivision approval;
2. Entering into an accelerated payment agreement (Section 27 of the D.C.A.) for payments to be made earlier than subdivision agreement (credit given for these payments); or
3. Front-ending agreements where the developing landowner pays for the works and funds are flowed back as other developments pay D.C.s.

Option 4 is recommended. Alternative funding arrangements can be discussed with the various landowners.



# Chapter 8

## Recommendations

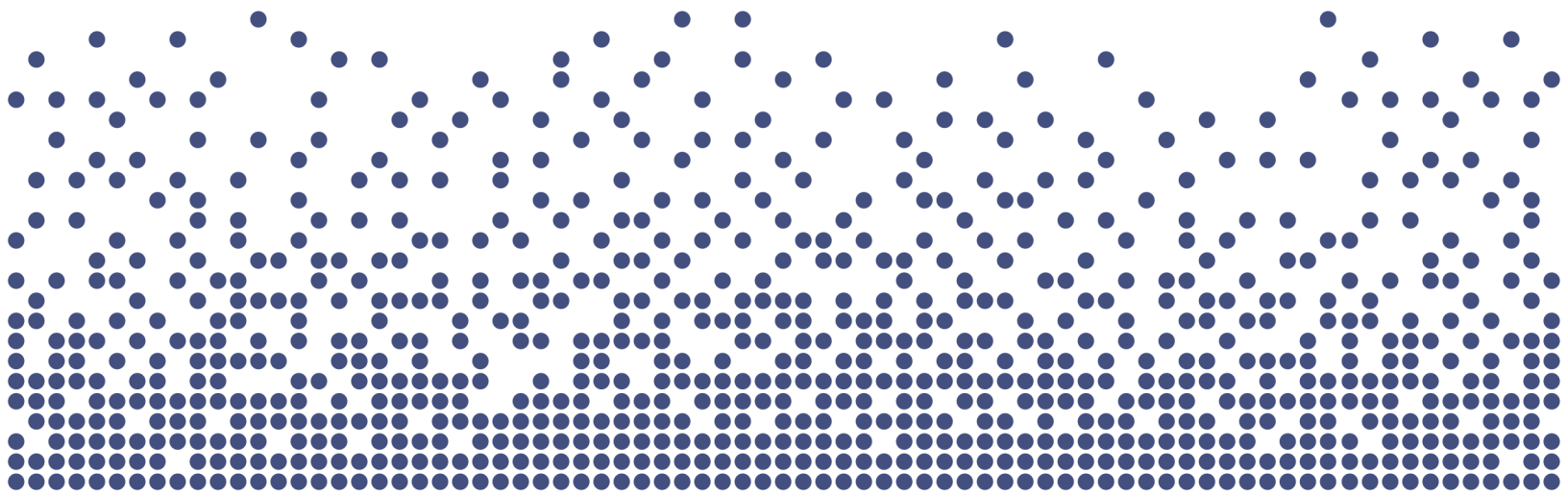


## 8. Recommendations

As presented within this report, capital and operating expenditures have been identified and forecast to 2029 for water and wastewater services.

Based upon the information provided in Chapters 1 to 7, the following recommendations are identified for consideration by Township Council:

1. That Council provide for the recovery of all water and wastewater costs through full cost recovery rates.
2. That Council consider the Capital Plan for water and wastewater as provided in Tables 2-1 and 2-2 and the associated Capital Financing Plan as set out in Tables 4-1 and 4-2.
3. That Council consider the base charges provided in Tables 6-1 and 6-2 for water and Tables 6-3 and 6-4 for wastewater.
4. That Council consider the volume rates for water and wastewater as provided in Tables 7-1 through 7-4 respectively.
5. That Council consider the bulk water rate as provided in Tables 7-1 and 7-2.
6. That Council consider updating the D.C. By-law and negotiate accelerated payment timing agreements to fund growth-related capital works as provided in Section 7.5 of this report.



# Appendices



# Appendix A

## Water System Inventory Data



Table A-1  
Township of Cavan Monaghan  
Water Facilities

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
	<b><u>Water Treatment Plants</u></b>								
	<b><u>Yard Piping</u></b>								
719	250 mm Watermain	Yard Piping	2004	50	2054	12,431	33	518	-
720	900 mm Watermain	Yard Piping	2004	50	2054	93,696	33	3,906	-
	<b><u>Site Works</u></b>								-
721	Site Works	Site Works	2004	75	2079	209,768	58	6,143	-
722	Driveway	Site Works	2004	75	2079	3,885	58	114	-
	<b><u>Process Equipment</u></b>								-
723	Process Piping & Valves	Process Equipment	2004	30	2034	349,613	13	30,807	-
724	Chemical Feed System	Process Equipment	2004	30	2034	46,615	13	4,108	-
725	Flow Control Valve	Process Equipment	1977	45	2022	2,099	1	suggested for 10 year capital forecast	2,099
726	Flow Meter	Process Equipment	1977	50	2027	24,487	6	suggested for 10 year capital forecast	24,487
727	Air Release Valve	Process Equipment	2004	30	2034	4,662	13	411	-
728	Drilled Wells	Process Equipment	1977	75	2052	186,565	31	8,134	-
729	Drilled Wells	Process Equipment	2004	75	2079	124,307	58	3,641	-
730	Chart Recorder	Process Equipment	2004	40	2044	3,885	23	212	-
731	Submersible Well Pump Rated at 25 l/s @64m TDH	Process Equipment	2000	50	2050	98,805	29	4,523	-
732	Submersible Well Pump Rated at 25 l/s @64m TDH	Process Equipment	2004	50	2054	46,615	33	1,943	-
2577	RECONDITIONED FLOW MET	0	2019	25	2044	14,409	23	788	-



Table A-1  
Township of Cavan Monaghan  
Water Facilities (Cont.)

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
	<b>Other</b>								-
2357	Booster Pumping Station	Zone 2 Feed	2016	20	2036	1,101,506	15	85,725	-
2358	Bulk Water Station	Bulk Fill Station for Trucks	2016	20	2036	42,758	15	3,328	-
2452	Bulk Water Station	Bulk Water Station	2015	20	2035	28,498	14	2,354	-
543	Bulk Water Fill Station	0	2006	25	2031	60,566	10	suggested for 10 year capital forecast	-
<b>Total</b>						<b>2,455,170</b>		<b>156,654</b>	<b>26,586</b>





Table A-2  
Township of Cavan Monaghan  
Hydrants

Asset ID	Name	Year Installed	Estimated Life	Replacement Year	Total Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
536	Hydrants ISW769005	1976	30	2021	242,981	0	suggested for 10 year capital forecast	242,981
537	Hydrants ISW029006	2002	30	2032	45,859	11	4,686	-
1743	Hydrants - Various Locations	2015	40	2055	5,753	34	235	-
2455	Hydrant On Frederick Street	2017	40	2057	5,247	36	206	-
2457	Hydrant - Wing Street	2016	40	2056	12,205	35	488	-
2458	Hydrants - Various Locations	2016	40	2056	3,517	35	141	-
<b>Total</b>					<b>315,562</b>		<b>5,755</b>	<b>242,981</b>



Table A-3  
Township of Cavan Monaghan  
Water Meters

Asset ID	Name	Year Installed	Estimated Life	Replacement Year	Total Water Meter Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
538	Water Meters (1st install)	2001	15	2021	67,586	0	suggested for 10 year capital forecast	67,586
539	Water Meters (2nd install)	2002	15	2021	88,770	0	suggested for 10 year capital forecast	88,770
540	Water Meters (2004) Estimated	2004	15	2021	6,200	0	suggested for 10 year capital forecast	6,200
541	Water Meters (2005) Estimated	2005	15	2021	5,936	0	suggested for 10 year capital forecast	5,936
542	Water Meters (2006) Estimated	2006	15	2021	5,340	0	suggested for 10 year capital forecast	5,340
544	Water Meters	2008	15	2023	1,713	2	suggested for 10 year capital forecast	1,713
546	Water Meters	2008	15	2023	3,522	2	suggested for 10 year capital forecast	3,522
2465	Water Meters - 5/8x3/4 Iperl M3 4w-6w-8w 1534 6WHL	2017	20	2037	6,586	16	485	-
<b>Total</b>					<b>185,653</b>		<b>485</b>	<b>179,067</b>



**Table A-4**  
**Township of Cavan Monaghan**  
**Watermains**

Asset ID	Street	Location	Length (m)	Year Installed	Estimated Life	Replacement Year	Replace-ment Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
479	ANNE ST.	CAVAN ST. to STATION 10+00	127	1976	80	2056	213	27,052	35	1,082	-
480	ANNE ST.	FREDERICK ST. to CAVAN ST.	177	1976	80	2056	213	37,717	35	1,509	-
481	ANNE ST.	STATION 10+00 to END OF ANNE ST.	266	1976	80	2056	213	56,835	35	2,274	-
482	BANK ST. NORTH	TUPPER ST. to END OF BANK ST. NORTH	256	1976	80	2056	213	54,559	35	2,182	-
483	BANK ST. SOUTH	KING ST. to END OF BANK ST. SOUTH	192	1976	80	2056	213	40,903	35	1,636	-
484	CAVAN ST.	ANNE ST. to STATION 2+47	74	1976	80	2056	213	15,867	35	635	-
485	CAVAN ST.	STATION 8+00 to KING ST.	130	1976	80	2056	213	27,629	35	1,105	-
486	CAVAN ST.	STATION 2+47 to STATION 8+00	164	1976	80	2056	213	34,986	35	1,400	-
487	CENTENNIAL LANE	East of TUPPER ST. to WPCP	354	1990	80	2070	305	107,741	49	3,470	-
488	CENTENNIAL LANE	TUPPER ST. to 21 m E of TUPPER ST	21	2002	80	2082	300	6,303	61	180	-
489	CENTRE ST.	STATION 12+00 to TUPPER ST.	178	1976	80	2056	213	37,912	35	1,517	-
490	CENTRE ST.	START OF CENTRE STREET to STATION 12+00	357	1976	80	2056	213	76,084	35	3,044	-
491	CENTRE ST.	CENTER ST. to TUPPER ST.	16	2002	80	2082	300	4,653	61	133	-
492	CENTURY BLVD	CENTENNIAL LANE to NINA COURT	158	1990	80	2070	305	48,142	49	1,550	-
493	CENTURY BLVD	CENTENNIAL LANE to 17 m N OF Centennial Lane	17	2002	80	2082	334	5,670	61	162	-
494	CHARLES ST.	MAIN ST to END OF CHARLES ST.	79	1976	80	2056	213	16,842	35	674	-
495	DISTILLERY ST.	START OF DISTILLERY ST. to KING ST.	202	1976	80	2056	213	43,179	35	1,727	-
496	DUFFERIN ST.	DISTILLERY ST. to MATCH LINE 3+00	93	1976	80	2056	213	19,834	35	793	-
497	DUFFERIN ST.	MATCH LINE 3+00 to GRAVEL RD.	165	1976	80	2056	213	35,181	35	1,407	-
498	DEYELL ST.	START OF DEYELL ST. to MILL ST.	99	1976	80	2056	213	21,015	35	841	-
499	EASEMENT	TUPPER ST. to NINA COURT	104	2002	80	2082	300	31,217	61	890	-
500	FREERICK ST.	STATION 10+00 to ANNE ST.	240	1976	80	2056	213	51,113	35	2,045	-
501	FREERICK ST.	START OF FREDERICK ST. to STATION 10+00	303	1976	80	2056	213	64,704	35	2,588	-



**Table A-4**  
**Township of Cavan Monaghan**  
**Watermains (Cont.)**

Asset ID	Street	Location	Length (m)	Year Installed	Estimated Life	Replacement Year	Replace-ment Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
502	GEORGE ST.	START OF GEORGE ST. to KING ST.	219	1976	80	2056	213	46,626	35	1,865	-
503	GRAVEL RD.	START OF GRAVEL RD. to KING ST.	245	1976	80	2056	213	52,348	35	2,094	-
504	HUNTER ST.	QUEEN ST. to TURNER ST.	165	1976	80	2056	213	35,246	35	1,410	-
505	HUSTON ST.	START OF HUSTON ST. to KING ST.	278	1976	80	2056	213	59,306	35	2,372	-
506	KING ST.	LISA COURT to UNION ST.	849	1976	80	2056	296	251,545	35	10,062	-
507	KING ST.	QUEEN ST. to STATION 3+00	88	1976	80	2056	213	18,860	35	754	-
508	KING ST.	STATION 3+00 to STATION 7+15	126	1976	80	2056	237	29,869	35	1,195	-
509	KING ST.	STATION 42+62 to STATION 42+78	5	1976	80	2056	295	1,535	35	61	-
510	KING ST.	STATION 42+78 to STATION 42+93	6	1976	80	2056	296	1,716	35	69	-
511	KING ST.	STATION 42+93 to STATION 43+40	14	1976	80	2056	297	4,245	35	170	-
512	KING ST.	DISTILLERY ST. to STATION 42+62	62	1976	80	2056	296	18,335	35	733	-
513	KING ST.	STATION 43+40 to STATION 47+00	106	1976	80	2056	296	31,431	35	1,257	-
514	KING ST.	UNION ST. to DISTILLERY ST.	170	1976	80	2056	296	50,488	35	2,020	-
515	KING ST.	STATION 59+00 to END OF KING ST.	206	1976	80	2056	296	60,965	35	2,439	-
516	KING ST.	STATION 47+00 to STATION 59+00	366	1976	80	2056	296	108,381	35	4,335	-
517	LISA COURT	KING ST. to END OF LISA COURT	209	1976	80	2056	213	44,590	35	1,784	-
518	MAIN ST.	START OF MAIN ST. to END OF MAIN ST.	177	1976	80	2056	213	37,782	35	1,511	-
519	MAIN ST.	START OF MAIN ST. to KING ST.	330	1976	80	2056	213	70,296	35	2,812	-
520	MARSHALL ST.	START OF MARSHALL ST. to END OF MARSHALL ST.	178	1976	80	2056	213	38,042	35	1,522	-
521	MILL ST.	DEYELL ST. to END OF MILL ST.	102	1976	80	2056	213	21,719	35	869	-
522	NINA COURT	0	225	1990	80	2070	305	68,557	49	2,208	-
523	PRINCE ST.	START OF PRINCE ST. to ANNE ST.	125	1976	80	2056	213	26,571	35	1,063	-
524	PRINCESS ST.	START OF PRINCESS ST. to ANNE ST.	140	1976	80	2056	213	29,848	35	1,194	-



**Table A-4  
Township of Cavan Monaghan  
Watermains (Cont.)**

Asset ID	Street	Location	Length (m)	Year Installed	Estimated Life	Replacement Year	Replace-ment Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
525	SOWDEN LANE	LISA COURT to END OF SNOWDEN LANE	150	1990	80	2070	305	45,705	49	1,472	-
526	TUPPER ST.	KING ST. to END OF TUPPER ST.	762	2002	80	2082	417	317,676	61	9,061	-
527	TURNER ST.	KING ST. to END OF TURNER ST.	169	1976	80	2056	213	35,961	35	1,439	-
528	UNION ST.	KING ST. to END OF UNION ST.	215	1976	80	2056	213	45,845	35	1,834	-
529	WING ST.	BANK ST. SOUTH to END OF WING ST.	99	1976	80	2056	213	21,069	35	843	-
530	BAXTER CREEK CRT.	BROOKSIDE ST. to END OF BAXTER CREEK CRT.	91	2002	80	2082	350	31,818	61	908	-
531	BROOKSIDE ST.	TUPPER ST. to TUPPER ST.	843	2002	80	2082	35	29,643	61	846	-
532	BUCKLAND DR.	TUPPER ST. to	106	2002	80	2082	464	49,222	61	1,404	-
533	BURNHAM CRT.	MCGUIRE DR. to END OF BURNHAM ST.	59	2002	80	2082	1,301	76,761	61	2,189	-
534	MCGUIRE DR.	UNION ST. to END OF MCGUIRE DR.	501	2002	80	2082	129	64,501	61	1,840	-
535	NEEDLER'S LANE	DISTILLERY ST. to HAY ST.	200	1976	80	2056	79	15,867	35	635	-
2352	TUPPER ST.	Brookside St. to Municipal Office	880	2015	80	2095	225	198,154	74	5,153	-
2353	BAXTER CREEK CRT. EASEM	BURNHAM CRT. To: BAXTER CREEK CRT.	33	2002	80	2082	350	11,538	61	329	-
2354	BURNHAM CRT. Easement	MCGUIRE DR. TO BURNHAM CRT.	34	2002	80	2082	350	11,888	61	339	-
2355	QUEEN STREET	KING ST. WEST to HUNTER ST	112	2018	80	2098	324	36,325	77	929	-
2439	Queen Street Watermain (105m)		1	2018	80	2098	65,521	65,521	77	1,675	-
2453	Centennial Watermain Replace		1	2015	80	2095	259,856	259,856	74	6,758	-
2454	Engineering - Centennial Lane		1	2015	80	2095	12,689	12,689	74	330	-
2459	King Street Water Main Replace		1	2015	80	2095	105,870	105,870	74	2,753	-
2461	Buckland Drive Watermain		1	2016	80	2096	89,099	89,099	75	2,304	-
2462	King Street Watermain		1	2016	80	2096	689,841	689,841	75	17,836	-
2463	King Street Watermain Engine		1	2016	80	2096	54,730	54,730	75	1,415	-
2466	Frederick Street Watermain 120		1	2017	80	2097	103,419	103,419	76	2,659	-
2471	King Street Watermain Union T		1	2018	80	2098	509,961	509,961	77	13,037	-
2472	King Street Watermain Cavan		1	2018	80	2098	773,506	773,506	77	19,774	-
2473	George Street Watermain (283)		1	2018	80	2098	132,110	132,110	77	3,377	-



Table A-4  
Township of Cavan Monaghan  
Watermains (Cont.)

Asset ID	Street	Location	Length (m)	Year Installed	Estimated Life	Replacement Year	Replace-ment Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
<b>Estimated New Watermains Not Yet Assumed</b>											
	Towerhill Phase 1		3,500	2021	80	2101	420	1,470,000	80	36,986	-
	Towerhill Phase 2		4,840	2021	80	2101	420	2,032,800	80	51,147	-
	Nina Court		170	2021	80	2101	420	71,400	80	1,796	-
	Centre Street		240	2021	80	2101	420	100,800	80	2,536	-
	Turner Street		770	2021	80	2101	420	323,400	80	8,137	-
	Fallis Line		600	2021	80	2101	420	252,000	80	6,340	-
	<b>Total</b>		<b>22,545</b>					<b>10,012,414</b>		<b>284,723</b>	<b>0</b>



Table A-5  
Township of Cavan Monaghan  
Other Water Inventory

Asset ID	Name	Material	Year Installed	Estimated Life	Replacement Year	Total Other Inventory Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
1535	Water Main Valves		2014	50	2064	11,779	43	411	-
2450	Main Valves 04-4830-4100		2015	50	2065	27,164	44	934	-
545	Touch Gun (Finance)		2008	15	2023	2,705	2	suggested for 10 year capital forecast	2,705
547	Generator & Pad		2008	25	2033	52,315	12	4,947	-
550	Dual Pump Hypo Feed Systems		2006	40	2046	17,219	25	882	-
551	Chlorine Analyzer		2007	35	2042	5,088	21	299	-
552	Replacement of Pumps in Well #2 & #3		2007	40	2047	22,142	26	1,100	-
553	UV Sensor Probe		2007	35	2042	4,194	21	247	-
554	Chlorine Analyzer		2008	35	2043	4,149	22	235	-
555	Hauser Pressure Transmitter		2008	35	2043	4,161	22	236	-
2356	Water Storage Tank		2016	50	2066	2,298,626	45	77,946	-
2451	VFD Pump		2015	40	2055	20,817	34	850	-
2464	Pressure Pump For Bulk Water Station		2016	20	2036	24,955	15	1,942	-
2468	Well Pump 1		2017	50	2067	16,370	46	548	-
2469	Well Pump 2		2017	50	2067	24,035	46	804	-
2470	SPD-KPSI Level Transducer		2017	20	2037	14,410	16	1,061	-
1536	Water - Curbstops		2014	50	2064	8,429	43	294	-
<b>Total</b>						<b>2,558,558</b>		<b>92,735</b>	<b>2,705</b>



# Appendix B

## Wastewater System Inventory Data





Table B-1  
Township of Cavan Monaghan  
Wastewater Inventory

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
	<b><u>Water Pollution Control Plants</u></b>								
	<b><u>Yard Piping</u></b>								
1749	Yard Piping WWTP	Yard Piping	2016	75	2091	595,153	70	15,871	-
	<b><u>Site Works</u></b>								
1748	Site Works WWTP	Site Works	2016	75	2091	2,274,759	70	60,662	-
	<b><u>Other Equipment</u></b>								
1750	Building Structure WWTP	Building Structure	2016	75	2091	10,088,178	70	269,028	-
1751	Process Piping & Valves	Process Equipment	2016	75	2091	3,932,676	70	104,875	-
1752	Mechanical Systems	Process Equipment	2016	75	2091	3,137,740	70	83,676	-
1753	Electrical Systems	Process Equipment	2016	75	2091	927,703	70	24,740	-
2433	Permanent Sludgeline At WWTP With Heat Tracing	Sludgeline At Wastewater Treat	2017	40	2057	11,057	36	434	-
2449	Water Treatment Plant Drain Pipe (35m) 100mm	Water Treatment Plant Drainag	2018	75	2093	17,469	72	460	-
	<b>Total</b>					<b>20,984,735</b>		<b>559,747</b>	<b>0</b>



Table B-2  
Township of Cavan Monaghan  
Sewage Pumping Stations

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Total Pumping Station Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
741	Sewers	Yard Piping	1976	50	2026	11,853	5	suggested for 10 year capital forecast	11,853
742	Watermains	Yard Piping	1976	50	2026	2,371	5	suggested for 10 year capital forecast	2,371
743	Site Works	Site Works	1976	75	2051	142,233	30	6,351	-
744	Driveway	Site Works	1976	75	2051	2,963	30	132	-
745	Process Piping & Valves	Process Equipment	1976	40	2021	426,698	0	suggested for 10 year capital forecast	426,698
746	Raw Sewage Pump	Process Equipment	2004	40	2044	24,861	23	1,359	-
747	Raw Sewage Pump	Process Equipment	1976	40	2021	18,964	0	suggested for 10 year capital forecast	18,964
<b>Total</b>						<b>629,943</b>		<b>7,842</b>	<b>459,886</b>



**Table B-3**  
**Township of Cavan Monaghan**  
**Sewer Mains**

Asset ID	Name	Description	Length (m)	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Sewer Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
558	ANNE ST.	From MH: 64 To MH: 65	60	1976	80	2056	772	46,642	35	1,866	-
559	ANNE ST.	From MH: 61 To MH: 63	71	1976	80	2056	762	54,276	35	2,171	-
560	ANNE ST.	From MH: 60 To MH: 61	99	1976	80	2056	766	76,115	35	3,045	-
561	ANNE ST.	From MH: 68 To MH: 70	108	1976	80	2056	764	82,086	35	3,284	-
562	ANNE ST.	From MH: 70 To MH: 71	111	1976	80	2056	759	84,554	35	3,382	-
563	ANNE ST.	From MH: 65 To MH: 68	114	1976	80	2056	757	86,104	35	3,444	-
564	BANK ST. NORTH	From MH: 25 To MH: 24	49	1976	80	2056	249	12,139	35	486	-
565	BANK ST. NORTH	From MH: 26 To MH: 25	105	1976	80	2056	249	26,174	35	1,047	-
566	BANK ST. NORTH	From MH: 19 To MH: 26	113	1976	80	2056	249	28,071	35	1,123	-
567	BANK ST. SOUTH	From MH: 80 To MH: 79	85	1976	80	2056	249	21,243	35	850	-
568	BANK ST. SOUTH	From MH: 91 To MH: 80	99	1976	80	2056	249	24,558	35	982	-
569	BROWNE ST.	From MH: 36 To MH: 35	28	1976	80	2056	771	21,354	35	854	-
570	BROWNE ST.	From MH: 35 To MH: 34	52	1976	80	2056	771	39,919	35	1,597	-
571	BROWNE ST.	From MH: 4 To MH: 36	93	1976	80	2056	770	71,653	35	2,866	-
572	CAVAN ST.	From MH: 64 To MH: 63	12	1976	80	2056	248	2,906	35	116	-
573	CAVAN ST.	From MH: 63 To MH: 62	65	1976	80	2056	249	16,258	35	650	-
574	CENTENNIAL LANE	0	355	1976	80	2056	4,522	1,605,222	35	64,212	-
575	CENTRE ST.	From MH: 47 To MH: 48	74	1976	80	2056	770	57,090	35	2,284	-
576	CENTRE ST.	From MH: 44 To MH: 45	74	1976	80	2056	768	57,166	35	2,287	-
577	CENTRE ST.	From MH: 45 To MH: 46	83	1976	80	2056	771	63,649	35	2,546	-
578	CENTRE ST.	From MH: 48 To MH: 17	101	1976	80	2056	249	25,112	35	1,005	-
579	CENTRE ST.	From MH: 46 To MH: 47	107	1976	80	2056	771	82,214	35	3,289	-
580	CENTRE ST.	From MH: 43 To MH: 44	107	1976	80	2056	771	82,536	35	3,302	-
581	CHARLES ST.	From MH: 41 To MH: 42	88	1976	80	2056	771	68,116	35	2,725	-
582	DEYELL ST.	From MH: 71 To MH: 72	97	1976	80	2056	249	24,202	35	968	-
583	DISTILLERY	From MH: 76 To MH: 73	43	1976	80	2056	249	10,568	35	423	-
584	DISTILLERY	From MH: 73 To MH: 74	22	1976	80	2056	319	7,121	35	285	-
585	DISTILLERY	From MH: 74 To MH: 84	47	1976	80	2056	320	15,119	35	605	-
586	DISTILLERY	From MH: 75 To MH: 76	75	1976	80	2056	249	18,618	35	745	-
587	DUFFERIN ST.	From MH: 76 To MH: 77	64	1976	80	2056	249	15,841	35	634	-
588	DUFFERIN ST.	From MH: 77 To MH: 78	77	1976	80	2056	249	19,096	35	764	-
589	DUFFERIN ST.	From MH: 78 To MH: 78A	91	1976	80	2056	249	22,760	35	910	-
590	FREDERICK ST.	From MH: 51 To MH: 52	14	1976	80	2056	1,555	21,770	35	871	-
591	FREDERICK ST.	From MH: 59 To MH: 60	90	1976	80	2056	745	67,131	35	2,685	-



Table B-3  
Township of Cavan Monaghan  
Sewer Mains (Cont.)

Asset ID	Name	Description	Length (m)	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Sewer Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
592	FREDERICK ST.	From MH: 52 To MH: 54	94	1976	80	2056	758	71,344	35	2,854	-
593	FREDERICK ST.	From MH: 54 To MH: 57	107	1976	80	2056	758	80,900	35	3,236	-
594	FREDERICK ST.	From MH: 57 To MH: 58	107	1976	80	2056	758	80,900	35	3,236	-
595	FREDERICK ST.	From MH: 58 To MH: 59	107	1976	80	2056	758	80,900	35	3,236	-
596	GEORGE ST.	From MH: 30 To MH: 31	106	1976	80	2056	771	81,607	35	3,264	-
597	GEORGE ST.	From MH: 31 To MH: 3	107	1976	80	2056	771	82,761	35	3,311	-
598	GRAVEL RD.	From MH: 83 To MH: 90	109	1976	80	2056	249	27,085	35	1,083	-
599	GRAVEL RD.	From MH: 82 To MH: 83	122	1976	80	2056	249	30,347	35	1,214	-
600	HUNTER ST.	From MH: 33 To MH: 35	74	1976	80	2056	770	57,090	35	2,284	-
601	HUNTER ST.	From MH: 32 To MH: 33	86	1976	80	2056	771	65,972	35	2,639	-
602	HUSTON ST.	From MH: 28 To MH: 29	76	1976	80	2056	771	58,717	35	2,349	-
603	HUSTON ST.	From MH: 27 To MH: 28	91	1976	80	2056	771	69,975	35	2,799	-
604	HUSTON ST.	From MH: 29 To MH: 1	113	1976	80	2056	770	86,681	35	3,467	-
605	KING ST.	From MH: 87 To MH: 88	5	1976	80	2056	248	1,214	35	49	-
606	KING ST.	From MH: 1 To MH: 2	39	1976	80	2056	771	30,052	35	1,202	-
607	KING ST.	From MH: 88 To MH: 89	44	1976	80	2056	249	11,046	35	442	-
608	KING ST.	From MH: 4 To MH: 4A	46	1976	80	2056	771	35,215	35	1,409	-
609	KING ST.	From MH: 3 To MH: 4	49	1976	80	2056	771	37,758	35	1,510	-
610	KING ST.	From MH: 4A To MH: 5	67	1976	80	2056	771	51,242	35	2,050	-
611	KING ST.	From MH: 2 To MH: 3	81	1976	80	2056	771	62,416	35	2,497	-
612	KING ST.	From MH: 92 To MH: 93	92	1976	80	2056	249	22,798	35	912	-
613	KING ST.	From MH: 5 To MH: 6	108	1976	80	2056	850	91,740	35	3,670	-
614	KING ST.	From MH: 6 To MH: 7	91	1976	80	2056	842	76,929	35	3,077	-
615	KING ST.	From MH: 7 To MH: 8	76	1976	80	2056	842	64,136	35	2,566	-
616	KING ST.	From MH: 8 To MH: 9	76	1976	80	2056	842	64,136	35	2,566	-
617	KING ST.	From MH: 9 To MH: 10	91	1976	80	2056	842	76,929	35	3,077	-
618	KING ST.	From MH: 10 To MH: 10A	81	1976	80	2056	842	68,510	35	2,741	-
619	KING ST.	From MH: 10A To MH: 11	71	1976	80	2056	842	59,759	35	2,390	-
620	KING ST.	From MH: 11 To MH: 12	75	1976	80	2056	842	62,873	35	2,515	-
621	KING ST.	From MH: 12 To MH: 13	78	1976	80	2056	842	65,398	35	2,616	-
622	KING ST.	From MH: 13 To MH: 14	41	1976	80	2056	842	34,341	35	1,374	-
623	KING ST.	From MH: 14 To MH: 15	75	1976	80	2056	1,115	83,989	35	3,360	-



Table B-3  
Township of Cavan Monaghan  
Sewer Mains (Cont.)

Asset ID	Name	Description	Length (m)	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Sewer Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
624	KING ST.	From MH: 15 To MH: 84	85	1976	80	2056	1,116	95,172	35	3,807	-
625	KING ST.	From MH: 84 To MH: 85	47	1976	80	2056	320	14,875	35	595	-
626	KING ST.	From MH: 85 To MH: 86	6	1976	80	2056	319	1,756	35	70	-
627	KING ST.	From MH: 86 To MH: 87	27	1976	80	2056	320	8,691	35	348	-
628	KING ST.	From MH: 93 To MH: 94	105	1976	80	2056	249	26,136	35	1,045	-
629	KING ST.	From MH: 89 To MH: 90	107	1976	80	2056	249	26,584	35	1,063	-
630	KING ST.	From MH: 91 To MH: 92	108	1976	80	2056	249	26,773	35	1,071	-
631	KING ST.	From MH: 90 To MH: 91	121	1976	80	2056	249	30,028	35	1,201	-
632	LISA COURT	From MH: 4A To MH: 95	38	1976	80	2056	770	29,500	35	1,180	-
633	LISA COURT	From MH: 95 To MH: 96	75	1976	80	2056	770	57,787	35	2,312	-
634	LISA COURT	From MH: 96 To MH: 97	75	1976	80	2056	771	57,792	35	2,312	-
635	MAIN ST.	From MH: 37 To MH: 38	39	1976	80	2056	771	30,288	35	1,212	-
636	MAIN ST.	From MH: 56 To MH: 55	58	1976	80	2056	249	14,412	35	577	-
637	MAIN ST.	From MH: 54 To MH: 53	91	1976	80	2056	757	69,202	35	2,768	-
638	MAIN ST.	From MH: 41 To MH: 5	109	1976	80	2056	771	83,608	35	3,345	-
639	MAIN ST.	From MH: 55 To MH: 54	111	1976	80	2056	763	84,357	35	3,374	-
640	MAIN ST.	From MH: 38 To MH: 41	115	1976	80	2056	771	88,308	35	3,533	-
641	MARSHALL ST.	From MH: 38 To MH: 40	90	1976	80	2056	771	69,278	35	2,771	-
642	MARSHALL ST.	From MH: 39 To MH: 38	96	1976	80	2056	771	73,745	35	2,950	-
643	MILL ST.	From MH: 72 To MH: 73	101	1976	80	2056	249	25,036	35	1,001	-
644	PRINCE ST.	From MH: 69 To MH: 68	122	1976	80	2056	249	30,423	35	1,217	-
645	PRINCESS ST.	From MH: 67 To MH: 66	51	1976	80	2056	249	12,594	35	504	-
646	PRINCESS ST.	From MH: 66 To MH: 65	84	1976	80	2056	249	20,863	35	835	-
647	TUPPER ST.	From MH: SPS To MH: Centennial Lane	271	1976	80	2056	320	86,726	35	3,469	-
648	TUPPER ST.	From MH: 19 To MH: 20	82	1976	80	2056	249	20,311	35	812	-
649	TUPPER ST.	From MH: 20 To MH: 21	82	1976	80	2056	249	20,311	35	812	-
650	TUPPER ST.	From MH: 21 To MH: 22	106	1976	80	2056	249	26,285	35	1,051	-
651	TUPPER ST.	From MH: 22 To MH: 23	107	1976	80	2056	249	26,553	35	1,062	-
652	TUPPER ST.	From MH: 16 To MH: 17	62	1976	80	2056	1,234	77,003	35	3,080	-
653	TUPPER ST.	From MH: 17 To MH: 17A	88	1976	80	2056	1,234	109,087	35	4,364	-
654	TUPPER ST.	From MH: 18 To MH: 19	106	1976	80	2056	320	33,795	35	1,352	-



**Table B-3  
Township of Cavan Monaghan  
Sewer Mains (Cont.)**

Asset ID	Name	Description	Length (m)	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Sewer Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
655	TUPPER ST.	From MH: 84 To MH: 16	49	1976	80	2056	1,114	55,046	35	2,202	-
656	TUPPER ST.	From MH: 17A To MH: 18	29	1976	80	2056	1,234	35,786	35	1,432	-
657	UNION ST.	From MH: 50 To MH: 48	52	1976	80	2056	771	39,687	35	1,588	-
658	UNION ST.	From MH: 14 To MH: 50	72	1976	80	2056	771	55,412	35	2,217	-
659	UNION ST.	From MH: 48 To MH: 49	99	1976	80	2056	770	76,353	35	3,054	-
660	WING ST.	From MH: 80 To MH: 81	104	1976	80	2056	249	25,901	35	1,036	-
661	CENTURY BLVD	From MH: To MH:	175	1990	80	2070	355	62,209	49	2,003	-
662	NINA COURT	From MH: To MH:	225	1990	80	2070	355	79,983	49	2,576	-
663	SOWDEN LANE	From MH: To MH:	150	1990	80	2070	355	53,322	49	1,717	-
664	BAXTERCREECK CT.	From MH: 13A To MH: 4A	92	2002	67	2069	350	32,323	48	1,054	-
665	BAXTERCREECK CT.	From MH: 14A To MH: 13A	90	2002	80	2082	350	31,517	61	899	-
666	BROOKSIDE ST.	From MH: 10A To MH: 9A	80	2002	80	2082	350	27,998	61	799	-
667	BROOKSIDE ST.	From MH: 11A To MH: 10A	70	2002	80	2082	350	24,619	61	702	-
668	BROOKSIDE ST.	From MH: 12A To MH: 11A	95	2002	80	2082	350	33,408	61	953	-
669	BROOKSIDE ST.	From MH: 1A To MH: 7A	79	2002	80	2082	350	27,665	61	789	-
670	BROOKSIDE ST.	From MH: 2A To MH: 1A	65	2002	80	2082	350	22,850	61	652	-
671	BROOKSIDE ST.	From MH: 3A To MH: 2A	63	2002	80	2082	350	22,132	61	631	-
672	BROOKSIDE ST.	From MH: 4A To MH: 3A	63	2002	80	2082	350	22,185	61	633	-
673	BROOKSIDE ST.	From MH: 5A To MH: 4A	53	2002	80	2082	350	18,490	61	527	-
674	BROOKSIDE ST.	From MH: 7A To MH: 6A	20	2002	80	2082	349	6,986	61	199	-
675	BROOKSIDE ST.	From MH: 9A To MH: 8A	17	2002	80	2082	349	5,971	61	170	-
676	BROOKSIDE ST.	From MH: 8A To MH: 7A	79	2002	80	2082	350	27,665	61	789	-
677	BROOKSIDE ST.	From MH: 6A To MH: 5A	51	2002	80	2082	350	17,930	61	511	-
678	BURNHAM CT.	From MH: 17A To MH: 16A	76	2002	80	2082	350	26,534	61	757	-
679	CENTENNIAL LANE	From MH: To MH:	141	2002	80	2082	221	31,135	61	888	-
680	MCGUIRE DR.	From MH: 15A To MH: 14A	31	2002	80	2082	350	10,803	61	308	-
681	MCGUIRE DR.	From MH: 17A To MH: 15A	74	2002	80	2082	350	26,002	61	742	-
682	MCGUIRE DR.	From MH: 18A To MH: 17A	68	2002	80	2082	350	23,813	61	679	-
683	MCGUIRE DR.	From MH: 19A To MH: 18A	22	2002	80	2082	350	7,704	61	220	-
684	MCGUIRE DR.	From MH: 21A To MH: 20A	17	2002	80	2082	350	5,953	61	170	-
685	MCGUIRE DR.	From MH: 22A To MH: 21A	30	2002	80	2082	350	10,506	61	300	-
686	MCGUIRE DR.	From MH: 23A To MH: 22A	46	2002	80	2082	350	16,109	61	459	-
687	MCGUIRE DR.	From MH: 20A To MH: 19A	79	2002	80	2082	350	27,665	61	789	-



Table B-3  
Township of Cavan Monaghan  
Sewer Mains (Cont.)

Asset ID	Name	Description	Length (m)	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Sewer Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
688	MCGUIRE DR.	From MH: 24A To MH: 23A	32	2002	80	2082	350	11,206	61	320	-
1529	George Street	Sewer Relining	100	2014	40	2054	186	18,565	33	774	-
1530	King Street East	Sewer Relining	171	2014	40	2054	230	39,321	33	1,639	-
1531	Sewer Relining	Relining of Concrete Sewer Lines	240	2014	40	2054	270	64,802	33	2,701	-
1744	CENTRE ST.	From MH: 166 to MH:43	163	1991	80	2071	685	111,688	50	3,554	-
1745	CENTRE ST.	from MH: 167 to MH: 168	164	1991	80	2071	685	112,373	50	3,576	-
1746	CENTRE ST.	From MH: 168 to MH: 169	165	1991	80	2071	685	113,058	50	3,598	-
1747	CENTRE ST.	From MH: 169 to MH: 17	166	1991	80	2071	685	113,743	50	3,620	-
2419	New Sewer On Centennial Lane	Centennial Lane Sewer (350m)	1	2015	50	2065	344,840	344,840	44	11,858	-
2420	Engineering - New Sewer On Centennial Lane	Centennial Lane Sewer (350m)	1	2015	50	2065	25,433	25,433	44	875	-
2436	Municipal Office Sewer Connection 8	Municipal Office Sewer (85m)	1	2017	75	2092	80,807	80,807	71	2,141	-
2437	Municipal Office Sewer Connection 8	Municipal Office Sewer (85m)	1	2017	75	2092	1,584	1,584	71	42	-
2578	ANNE ST.	0	90	2019	50	2069	116	10,399	48	339	-
2579	ANNE ST.	0	140	2019	50	2069	116	16,177	48	527	-
2580	ANNE ST.	0	127	2019	50	2069	116	14,674	48	478	-
2581	ANNE ST.	0	101	2019	50	2069	116	11,670	48	380	-
2582	ANNE ST.	0	103	2019	50	2069	116	11,901	48	388	-
<b>Estimated New Watermains Not Yet Assumed</b>											
	Towerhill Phase 1		3,500	2021	80	2101	470	1,645,000	80	41,389	-
	Towerhill Phase 2		4,840	2021	80	2101	470	2,274,800	80	57,236	-
	Nina Court		170	2021	80	2101	470	79,900	80	2,010	-
	Centre Street		240	2021	80	2101	470	112,800	80	2,838	-
	Turner Street		770	2021	80	2101	470	361,900	80	9,106	-
	Fallis Line		600	2021	80	2101	470	282,000	80	7,095	-
	<b>Total</b>		<b>22,561</b>					<b>13,059,725</b>		<b>437,321</b>	<b>0</b>



Table B-4  
Township of Cavan Monaghan  
Other Sewer Inventory

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Total Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
2430	Sanitary Manholes (3) Frederick Street	Sanitary Manoles On Frederick Street (3) Main West Limit	2017	40	2057	36,197	36	1,420	-
2440	9 Manholes On King Street	Manholes	2018	50	2068	6,069	47	200	-
548	New Meter Base (WW Plant)	0	2008	15	2023	3,678	2	suggested for 10 year capital forecast	3,678
549	Transfer Switch	0	2008	15	2023	5,452	2	suggested for 10 year capital forecast	5,452
556	Ultrasonic Controllers	0	2007	35	2042	7,668	21	451	-
2434	HexaCover Floating Cover	Tankage Covers	2018	25	2043	10,465	22	593	-
2435	HexaCover Floating Cover System	Tankage Covers	2017	25	2042	7,003	21	412	-
2421	Sewer Relining - Huston Street (280m)	Sewer Relining - Huston Street (280m)	2016	40	2056	52,950	35	2,118	-
2422	Sewer Relining - King Street West (285m)	Sewer Relining - King Street West (285m)	2016	40	2056	54,227	35	2,169	-
2426	George Street Sewer Relining 108.4m	Sewer Relining - George Street (108.4m)	2017	40	2057	16,796	36	659	-
2427	George Street Sewer Relining 108.4m	Sewer Relining - George Street (108.4m)	2017	40	2057	11	36	0	-
2428	Centre Street Sewer Relining 452.9m	Sewer Relining - Centre Street (452.9m)	2017	40	2057	66,279	36	2,600	-
2429	Union Street Sewer Relining 228.2m	Sewer Relining - Union Street (228.2m)	2017	40	2057	37,908	36	1,487	-
2441	Sewer Relining - Turner Street	Sewer Relining - Turner Street (175m) 200mm	2018	40	2058	22,552	37	868	-
2442	Sewer Relining Hunter Street	Sewer Relining - Hunter Street (165m) 200mm	2018	40	2058	21,263	37	819	-





Table B-4  
Township of Cavan Monaghan  
Other Sewer Inventory (Cont.)

Asset ID	Name	Description	Year Installed	Estimated Life	Replacement Year	Total Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
2430	Sanitary Manholes (3) Frederick Street	Sanitary Manholes On Frederick Street (3) Main West Limit	2017	40	2057	36,197	36	1,420	-
2440	9 Manholes On King Street	Manholes	2018	50	2068	6,069	47	200	-
2443	Sewer Relining Lisa Court	Sewer Relining - Lisa Court (200m) 200mm	2018	40	2058	25,774	37	992	-
2444	Sewer Relining Main Street	Sewer Relining - Main Street (275m) 200mm	2018	40	2058	35,439	37	1,365	-
2445	Sewer Relining King Street	Sewer Relining - King Street (849m) 250mm	2018	40	2058	110,348	37	4,249	-
2446	Sewer Relining Centre Street	Sewer Relining - Centre Street (165m) 200mm	2018	40	2058	21,263	37	819	-
2447	Sewer Relining Sowden Lane	Sewer Relining - Sowden Lane (75m) 200mm	2018	40	2058	9,665	37	372	-
2448	Sewer Relining Charles Street	Sewer Relining - Charles Street (175m) 200mm	2018	40	2058	22,554	37	868	-
1725	CENTENNIAL LANE	Unassumed Portion (2009)	2012	70	2082	18,242	61	520	-
2423	Storm Sewer On Main Street	Storm Sewer Main Street	2017	50	2067	222,351	46	7,438	-
2424	Storm Sewer On Main Street	Storm Sewer Main Street	2017	50	2067	674	46	23	-
2431	Storm Sewer Frederick Street	Frederick Street Storm Sewer	2017	50	2067	155,129	46	5,190	-
2438	Storm Sewer George Street	Storm Sewer George Street	2018	50	2068	87,087	47	2,875	-
	<b>Total</b>					<b>1,057,044</b>		<b>38,509</b>	<b>9,130</b>



# Appendix C

## Detailed Water Rate Calculations



## C.1 – Scenario 1 – Rate Increase of 2%

Table C-1.1  
Township of Cavan Monaghan  
Capital Budget Forecast (Uninflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Water Distribution System (4830)</b>		-									
Water Main Replacement Main Street	200,000	-									
Watermain Replacement (various locations)		3,000,000	300,000	300,000	300,000	300,000	300,000	350,000	350,000	400,000	400,000
Replacement of Well and Pump		150,000		150,000							
<b>Studies:</b>		-									
Water Rate Study & Financial Plan	30,000	-									
<b>Growth Related:</b>		-									
Water Master Servicing Study	50,000	20,000	20,000								
Duke Street from King Street Southwards		153,000		153,000							
King Street from Queen Street to IO Property		51,000					51,000				
Water Servicing Studies - Future Development Areas		102,000									102,000
Future Watermain Booster Pumping Station		663,000			663,000						
Future Trunk Watermain Costs (Oversizing)	76,500	-									
<b>Total Capital Expenditures</b>	<b>356,500</b>	<b>4,139,000</b>	<b>320,000</b>	<b>603,000</b>	<b>963,000</b>	<b>300,000</b>	<b>351,000</b>	<b>350,000</b>	<b>350,000</b>	<b>400,000</b>	<b>502,000</b>



Table C-1.2  
Township of Cavan Monaghan  
Capital Budget Forecast (Inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Water Distribution System (4830)</b>											
Water Main Replacement Main Street	200,000	-	-	-	-	-	-	-	-	-	-
Watermain Replacement (various locations)	-	3,335,000	306,000	312,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
Replacement of Well and Pump	-	156,000	-	156,000	-	-	-	-	-	-	-
<b>Studies:</b>											
Water Rate Study & Financial Plan	30,000	-	-	-	-	-	-	-	-	-	-
<b>Growth Related:</b>											
Water Master Servicing Study	50,000	20,000	20,000	-	-	-	-	-	-	-	-
Duke Street from King Street Southwards	-	159,000	-	159,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	56,000	-	-	-	-	56,000	-	-	-	-
Water Servicing Studies - Future Development Areas	-	122,000	-	-	-	-	-	-	-	-	122,000
Future Watermain Booster Pumping Station	-	704,000	-	-	704,000	-	-	-	-	-	-
Future Trunk Watermain Costs (Oversizing)	76,500	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>
<b>Capital Financing</b>											
Provincial/Federal Grants		-									
Development Charges Reserve Fund	126,500	1,061,000	20,000	159,000	704,000	-	56,000	-	-	-	122,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	230,000	3,491,000	306,000	468,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
<b>Total Capital Financing</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>



Table C-1.3  
Township of Cavan Monaghan  
Schedule of Non-Growth-Related Debenture Repayments

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
Total Annual Debt Charges			-	-	-	-	-	-	-	-	-

Table C-1.4  
Township of Cavan Monaghan  
Schedule of Growth-Related Debenture Repayments

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
Total Annual Debt Charges			-	-	-	-	-	-	-	-	-



Table C-1.5  
Township of Cavan Monaghan  
Water Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	1,244,267	1,391,060	1,494,232	1,459,937	1,612,089	1,798,435	2,025,069	2,233,085	2,488,750	2,736,498
Transfer from Operating	343,925	373,866	399,210	432,061	468,852	509,785	549,252	598,861	652,089	700,677
Transfer to Capital	230,000	306,000	468,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
<b>Closing Balance</b>	<b>1,358,192</b>	<b>1,458,926</b>	<b>1,425,442</b>	<b>1,573,998</b>	<b>1,755,941</b>	<b>1,977,220</b>	<b>2,180,321</b>	<b>2,429,946</b>	<b>2,671,839</b>	<b>2,959,175</b>
Interest	32,868	35,306	34,496	38,091	42,494	47,849	52,764	58,805	64,659	71,612

Table C-1.6  
Township of Cavan Monaghan  
Development Charges Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	(307,403)	(358,817)	(401,252)	(588,349)	(1,291,887)	(1,299,715)	(1,357,365)	(1,368,145)	(1,349,631)	(1,326,644)
Development Charge Proceeds	167,466	73,583	75,061	123,051	117,843	128,372	122,583	154,622	161,838	138,918
Transfer to Capital	126,500	20,000	159,000	704,000	-	56,000	-	-	-	122,000
Transfer to Operating	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
<b>Closing Balance</b>	<b>(350,339)</b>	<b>(391,771)</b>	<b>(574,447)</b>	<b>(1,261,362)</b>	<b>(1,269,005)</b>	<b>(1,325,293)</b>	<b>(1,335,818)</b>	<b>(1,317,742)</b>	<b>(1,295,297)</b>	<b>(1,420,621)</b>
Interest	(8,478)	(9,481)	(13,902)	(30,525)	(30,710)	(32,072)	(32,327)	(31,889)	(31,346)	(34,379)
Required from Development Charges	126,500	20,000	159,000	704,000	-	56,000	-	-	-	122,000



Table C-1.7  
Township of Cavan Monaghan  
Operating Budget Forecast  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Travel	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
Toilet Rebate Program	5,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
<b><u>Millbrook Water Distribution System</u></b>										
Hydrant Maintenance	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
Materials and Supplies	1,000	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Locates	500	500	500	500	500	500	500	500	500	500
Contracted Services	50,000	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500
<b><u>Millbrook Water Treatment &amp; Supply</u></b>										
Audit Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operator Contract	123,335	125,000	127,500	130,100	132,700	135,400	138,100	140,900	143,700	146,600
Phone	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Managed Router & VDSL Servi	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Hydro	13,000	15,000	15,800	16,600	17,400	18,300	19,200	20,200	21,200	22,300
Contracted Services	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Millbrook Water - Standpipe Tower</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	5,200	9,000	9,500	10,000	10,500	11,000	11,600	12,200	12,800	13,400
Contracted Services	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800



Table C-1.7  
Township of Cavan Monaghan  
Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water Capacity Monitoring</b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Bulk Water Sale</b>										
Material and Supplies	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Hydro	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Contracted Services	500	500	510	520	530	541	552	563	574	585
Interdepartmental Charge - Wat	23,000	23,000	23,500	24,000	24,500	25,000	25,500	26,000	26,500	27,000
<b>Sub Total Operating</b>	<b>354,928</b>	<b>369,778</b>	<b>378,210</b>	<b>386,526</b>	<b>394,846</b>	<b>403,573</b>	<b>412,406</b>	<b>421,445</b>	<b>430,490</b>	<b>439,841</b>
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	41,809	43,146	44,526	45,950	47,420	48,936	50,501	52,117	53,784	55,504
Existing Debt (Interest) - Growth Related	42,092	43,391	44,731	46,114	47,541	49,014	50,534	52,102	53,721	55,391
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	9,560	9,883	10,217	10,563	10,920	11,289	11,671	12,065	12,473	12,895
Existing Debt (Interest) - Non-Growth Related	14,328	14,005	13,671	13,326	12,968	12,599	12,217	11,823	11,415	10,993
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,925	373,866	399,210	432,061	468,852	509,785	549,252	598,861	652,089	700,677
<b>Sub Total Capital Related</b>	<b>451,714</b>	<b>484,291</b>	<b>512,355</b>	<b>548,013</b>	<b>587,702</b>	<b>631,624</b>	<b>674,176</b>	<b>726,968</b>	<b>783,481</b>	<b>835,460</b>
<b>Total Expenditures</b>	<b>806,642</b>	<b>854,069</b>	<b>890,565</b>	<b>934,539</b>	<b>982,548</b>	<b>1,035,197</b>	<b>1,086,582</b>	<b>1,148,413</b>	<b>1,213,971</b>	<b>1,275,301</b>





Table C-1.7  
Township of Cavan Monaghan  
Operating Budget Forecast (Cont.)  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Revenues</b>										
Base Charge	359,598	388,787	412,880	433,621	459,270	487,071	515,358	547,284	583,497	618,597
Misc. Base Charge from New Development	17,448	11,998	4,079	8,322	8,488	9,740	8,831	12,386	12,634	10,543
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Water Connection /Other Charg	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Bulk Water Sale	45,000	45,625	46,537	47,468	48,417	49,386	50,373	51,381	52,408	53,456
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>575,397</b>	<b>602,397</b>	<b>623,754</b>	<b>653,975</b>	<b>685,137</b>	<b>719,647</b>	<b>752,698</b>	<b>793,970</b>	<b>836,344</b>	<b>875,392</b>
<b>Water Billing Recovery - Total</b>	<b>231,245</b>	<b>251,672</b>	<b>266,811</b>	<b>280,564</b>	<b>297,411</b>	<b>315,550</b>	<b>333,884</b>	<b>354,443</b>	<b>377,628</b>	<b>399,909</b>



Table C-1.8  
Township of Cavan Monaghan  
Water Rate Forecast  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Water Billing Recovery	231,245	251,672	266,811	280,564	297,411	315,550	333,884	354,443	377,628	399,909
Total Metered Volume (m <sup>3</sup> )	127,058	135,570	141,170	145,370	150,970	156,990	162,870	169,590	177,290	184,290
<b>Constant Rate</b>	<b>1.82</b>	<b>1.86</b>	<b>1.89</b>	<b>1.93</b>	<b>1.97</b>	<b>2.01</b>	<b>2.05</b>	<b>2.09</b>	<b>2.13</b>	<b>2.17</b>
<b>Bulk Water Rate</b>	<b>4.26</b>	<b>4.35</b>	<b>4.43</b>	<b>4.52</b>	<b>4.61</b>	<b>4.70</b>	<b>4.80</b>	<b>4.89</b>	<b>4.99</b>	<b>5.09</b>
<b>Annual Percentage Change</b>		<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>	<b>2%</b>



## C.2 – Scenario 2 – Rate Increase Between 0% and 2.25%

Table C-2.1  
Township of Cavan Monaghan  
Capital Budget Forecast (Uninflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Water Distribution System (4830)</b>		-									
Water Main Replacement Main Street	200,000	-									
Watermain Replacement (various locations)		3,000,000	300,000	300,000	300,000	300,000	300,000	350,000	350,000	400,000	400,000
Replacement of Well and Pump		150,000		150,000							
<b>Studies:</b>		-									
Water Rate Study & Financial Plan	30,000	-									
<b>Growth Related:</b>		-									
Water Master Servicing Study	50,000	20,000	20,000								
Duke Street from King Street Southwards		153,000		153,000							
King Street from Queen Street to IO Property		51,000					51,000				
Water Servicing Studies - Future Development Areas		102,000									102,000
Future Watermain Booster Pumping Station		663,000			663,000						
Future Trunk Watermain Costs (Oversizing)	76,500	-									
<b>Total Capital Expenditures</b>	<b>356,500</b>	<b>4,139,000</b>	<b>320,000</b>	<b>603,000</b>	<b>963,000</b>	<b>300,000</b>	<b>351,000</b>	<b>350,000</b>	<b>350,000</b>	<b>400,000</b>	<b>502,000</b>



Table C-2.2  
Township of Cavan Monaghan  
Capital Budget Forecast (Inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Water Distribution System (4830)</b>											
Water Main Replacement Main Street	200,000	-	-	-	-	-	-	-	-	-	-
Watermain Replacement (various locations)	-	3,335,000	306,000	312,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
Replacement of Well and Pump	-	156,000	-	156,000	-	-	-	-	-	-	-
<b>Studies:</b>											
Water Rate Study & Financial Plan	30,000	-	-	-	-	-	-	-	-	-	-
<b>Growth Related:</b>											
Water Master Servicing Study	50,000	20,000	20,000	-	-	-	-	-	-	-	-
Duke Street from King Street Southwards	-	159,000	-	159,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	56,000	-	-	-	-	56,000	-	-	-	-
Water Servicing Studies - Future Development Areas	-	122,000	-	-	-	-	-	-	-	-	122,000
Future Watermain Booster Pumping Station	-	704,000	-	-	704,000	-	-	-	-	-	-
Future Trunk Watermain Costs (Oversizing)	76,500	-	-	-	-	-	-	-	-	-	-
<b>Total Capital Expenditures</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>
<b>Capital Financing</b>											
Provincial/Federal Grants		-									
Development Charges Reserve Fund	126,500	1,061,000	20,000	159,000	704,000	-	56,000	-	-	-	122,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Water Reserve	230,000	3,491,000	306,000	468,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
<b>Total Capital Financing</b>	<b>356,500</b>	<b>4,552,000</b>	<b>326,000</b>	<b>627,000</b>	<b>1,022,000</b>	<b>325,000</b>	<b>387,000</b>	<b>394,000</b>	<b>402,000</b>	<b>469,000</b>	<b>600,000</b>



Table C-2.3  
Township of Cavan Monaghan  
Schedule of Non-Growth-Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
Total Annual Debt Charges			-	-	-	-	-	-	-	-	-

Table C-2.4  
Township of Cavan Monaghan  
Schedule of Growth-Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
Total Annual Debt Charges			-	-	-	-	-	-	-	-	-



Table C-2.5  
Township of Cavan Monaghan  
Water Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	1,244,267	1,391,060	1,480,213	1,433,218	1,573,287	1,748,437	1,965,074	2,164,702	2,413,956	2,657,762
Transfer from Operating	343,925	360,178	387,142	420,894	458,838	501,205	542,480	594,217	650,007	701,634
Transfer to Capital	230,000	306,000	468,000	318,000	325,000	331,000	394,000	402,000	469,000	478,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
<b>Closing Balance</b>	<b>1,358,192</b>	<b>1,445,238</b>	<b>1,399,354</b>	<b>1,536,113</b>	<b>1,707,125</b>	<b>1,918,642</b>	<b>2,113,554</b>	<b>2,356,919</b>	<b>2,594,963</b>	<b>2,881,395</b>
Interest	32,868	34,975	33,864	37,174	41,312	46,431	51,148	57,037	62,798	69,730

Table C-2.6  
Township of Cavan Monaghan  
Development Charges Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	(307,403)	(358,817)	(401,252)	(588,349)	(1,291,887)	(1,299,715)	(1,357,365)	(1,368,145)	(1,349,631)	(1,326,644)
Development Charge Proceeds	167,466	73,583	75,061	123,051	117,843	128,372	122,583	154,622	161,838	138,918
Transfer to Capital	126,500	20,000	159,000	704,000	-	56,000	-	-	-	122,000
Transfer to Operating	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
<b>Closing Balance</b>	<b>(350,339)</b>	<b>(391,771)</b>	<b>(574,447)</b>	<b>(1,261,362)</b>	<b>(1,269,005)</b>	<b>(1,325,293)</b>	<b>(1,335,818)</b>	<b>(1,317,742)</b>	<b>(1,295,297)</b>	<b>(1,420,621)</b>
Interest	(8,478)	(9,481)	(13,902)	(30,525)	(30,710)	(32,072)	(32,327)	(31,889)	(31,346)	(34,379)
Required from Development Charges	126,500	20,000	159,000	704,000	-	56,000	-	-	-	122,000



Table C-2.7  
Township of Cavan Monaghan  
Operating Budget Forecast  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Travel	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
Toilet Rebate Program	5,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
<b><u>Millbrook Water Distribution System</u></b>										
Hydrant Maintenance	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800
Materials and Supplies	1,000	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800
Locates	500	500	500	500	500	500	500	500	500	500
Contracted Services	50,000	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500
<b><u>Millbrook Water Treatment &amp; Supply</u></b>										
Audit Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operator Contract	123,335	125,000	127,500	130,100	132,700	135,400	138,100	140,900	143,700	146,600
Phone	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Managed Router & VDSL Servi	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Hydro	13,000	15,000	15,800	16,600	17,400	18,300	19,200	20,200	21,200	22,300
Contracted Services	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Millbrook Water - Standpipe Tower</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	5,200	9,000	9,500	10,000	10,500	11,000	11,600	12,200	12,800	13,400
Contracted Services	4,000	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800



Table C-2.7  
Township of Cavan Monaghan  
Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Water Capacity Monitoring</b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Bulk Water Sale</b>										
Material and Supplies	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Hydro	1,000	1,000	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478
Contracted Services	500	500	510	520	530	541	552	563	574	585
Interdepartmental Charge - Wat	23,000	23,000	23,500	24,000	24,500	25,000	25,500	26,000	26,500	27,000
<b>Sub Total Operating</b>	<b>354,928</b>	<b>369,778</b>	<b>378,210</b>	<b>386,526</b>	<b>394,846</b>	<b>403,573</b>	<b>412,406</b>	<b>421,445</b>	<b>430,490</b>	<b>439,841</b>
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	41,809	43,146	44,526	45,950	47,420	48,936	50,501	52,117	53,784	55,504
Existing Debt (Interest) - Growth Related	42,092	43,391	44,731	46,114	47,541	49,014	50,534	52,102	53,721	55,391
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	9,560	9,883	10,217	10,563	10,920	11,289	11,671	12,065	12,473	12,895
Existing Debt (Interest) - Non-Growth Related	14,328	14,005	13,671	13,326	12,968	12,599	12,217	11,823	11,415	10,993
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,925	360,178	387,142	420,894	458,838	501,205	542,480	594,217	650,007	701,634
<b>Sub Total Capital Related</b>	<b>451,714</b>	<b>470,603</b>	<b>500,287</b>	<b>536,847</b>	<b>577,687</b>	<b>623,044</b>	<b>667,404</b>	<b>722,324</b>	<b>781,400</b>	<b>836,416</b>
<b>Total Expenditures</b>	<b>806,642</b>	<b>840,381</b>	<b>878,497</b>	<b>923,373</b>	<b>972,533</b>	<b>1,026,617</b>	<b>1,079,810</b>	<b>1,143,769</b>	<b>1,211,890</b>	<b>1,276,257</b>





Table C-2.7  
Township of Cavan Monaghan  
Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Revenues</b>										
Base Charge	359,598	381,164	405,777	427,205	453,584	482,219	511,475	544,492	581,944	618,462
Misc. Base Charge from New Development	17,448	11,763	4,009	8,199	8,383	9,643	8,765	12,323	12,600	10,541
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Water Connection /Other Chrg	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Bulk Water Sale	45,000	44,730	45,736	46,765	47,818	48,894	49,994	51,119	52,269	53,445
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	83,901	86,537	89,257	92,064	94,961	97,950	101,035	104,219	107,504	110,895
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>575,397</b>	<b>593,643</b>	<b>615,779</b>	<b>646,733</b>	<b>678,746</b>	<b>714,207</b>	<b>748,369</b>	<b>790,853</b>	<b>834,617</b>	<b>875,242</b>
<b>Water Billing Recovery - Total</b>	<b>231,245</b>	<b>246,737</b>	<b>262,717</b>	<b>276,639</b>	<b>293,788</b>	<b>312,410</b>	<b>331,440</b>	<b>352,917</b>	<b>377,273</b>	<b>401,015</b>



Table C-2.8  
Township of Cavan Monaghan  
Water Rate Forecast  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Water Billing Recovery	231,245	246,737	262,717	276,639	293,788	312,410	331,440	352,917	377,273	401,015
Total Metered Volume (m <sup>3</sup> )	127,058	135,570	141,170	145,370	150,970	156,990	162,870	169,590	177,290	184,290
Constant Rate	1.82	1.820	1.861	1.903	1.946	1.990	2.035	2.081	2.128	2.176
Bulk Water Rate	4.26	4.260	4.356	4.454	4.554	4.657	4.761	4.868	4.978	5.090
Annual Percentage Change		0%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%



# Appendix D

## Detailed Wastewater Rate Calculations



## Appendix D: Detailed Wastewater Rate Calculations

### D.1 – Scenario 1 – Rate Increase of 2%



Table D-1.1  
Township of Cavan Monaghan  
Wastewater Capital Budget Forecast (Uninflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Wastewater Collection System(4811)</b>		-									
Sewer Relining	349,000	250,000	250,000	-	-	-	-	-	-	-	-
Various Wastewater Facility Upgrades		300,000		100,000	-	100,000	-	100,000	-	-	-
		-									
<b>Growth Related:</b>		-									
Wastewater Master Servicing Study	90,000	274,000	70,000								204,000
Cambium Studies		80,000	40,000	40,000							
Infiltration Solutions		100,000	50,000	50,000							
Pump Station and Forcemain between property north of Municipal Office and Larmer Line		500,000			500,000						
Duke Street from King Street Southwards		255,000		255,000							
King Street from Queen Street to IO Property		102,000					102,000				
Nina Court Extension Sanitary Sewer Oversizing	112,200	-									
Wastewater Servicing Studies - Future Development Areas	75,000	-									
Future Sanitary Pumping Station - Sewage		1,122,000			1,122,000						
Future Trunk Sanitary Sewer (oversizing)		122,400	122,400								
	-	-									
	-	-									
<b>Total Capital Expenditures</b>	<b>626,200</b>	<b>3,105,400</b>	<b>532,400</b>	<b>445,000</b>	<b>1,622,000</b>	<b>100,000</b>	<b>102,000</b>	<b>100,000</b>	<b>-</b>	<b>-</b>	<b>204,000</b>



Table D-1.2  
Township of Cavan Monaghan  
Wastewater Capital Budget Forecast (Inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
Wastewater Collection System(4811)	-	-	-	-	-	-	-	-	-	-	-
Sewer Relining	349,000	255,000	255,000	-	-	-	-	-	-	-	-
Various Wastewater Facility Upgrades	-	325,000	-	104,000	-	108,000	-	113,000	-	-	-
Growth Related:		-	-	-	-	-	-	-	-	-	-
Wastewater Master Servicing Study	90,000	315,000	71,000	-	-	-	-	-	-	-	244,000
Cambium Studies	-	83,000	41,000	42,000	-	-	-	-	-	-	-
Infiltration Solutions	-	103,000	51,000	52,000	-	-	-	-	-	-	-
Pump Station and Forcemain between property north of Municipal Office and Larmer Line	-	531,000	-	-	531,000	-	-	-	-	-	-
Duke Street from King Street Southwards	-	265,000	-	265,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	113,000	-	-	-	-	113,000	-	-	-	-
Nina Court Extension Sanitary Sewer Oversizing	112,200	-	-	-	-	-	-	-	-	-	-
Wastewater Servicing Studies - Future Development Areas	75,000	-	-	-	-	-	-	-	-	-	-
Future Sanitary Pumping Station - Sewage	-	1,191,000	-	-	1,191,000	-	-	-	-	-	-
Future Trunk Sanitary Sewer (oversizing)	-	125,000	125,000	-	-	-	-	-	-	-	-
Total Capital Expenditures	626,200	3,306,000	543,000	463,000	1,722,000	108,000	113,000	113,000	-	-	244,000
Capital Financing											
Provincial/Federal Grants	117,424	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	277,200	2,726,000	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund		-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	231,576	580,000	255,000	104,000	-	108,000	-	113,000	-	-	-
Total Capital Financing	626,200	3,306,000	543,000	463,000	1,722,000	108,000	113,000	113,000	-	-	244,000



Table D-1.3  
Township of Cavan Monaghan  
Wastewater Schedule of Non-Growth Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-

Table D-1.4  
Township of Cavan Monaghan  
Wastewater Schedule of Growth-Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-



Table D-1.5  
Township of Cavan Monaghan  
Wastewater Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	772,712	906,024	1,074,208	1,442,082	1,979,970	2,480,615	3,171,710	3,828,351	4,700,873	5,684,469
Transfer from Operating	343,480	397,803	437,800	491,105	550,032	616,154	679,183	761,449	849,282	929,067
Transfer to Capital	231,576	255,000	104,000	-	108,000	-	113,000	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
<b>Closing Balance</b>	<b>884,616</b>	<b>1,048,827</b>	<b>1,408,008</b>	<b>1,933,187</b>	<b>2,422,002</b>	<b>3,096,769</b>	<b>3,737,894</b>	<b>4,589,800</b>	<b>5,550,156</b>	<b>6,613,536</b>
Interest	21,408	25,382	34,074	46,783	58,612	74,942	90,457	111,073	134,314	160,048

Table D-1.6  
Township of Cavan Monaghan  
Wastewater Development Charges Reserve Fund Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	678,642	475,372	19,503	(526,886)	(2,377,399)	(2,532,495)	(2,792,934)	(2,969,585)	(3,085,176)	(3,198,586)
Development Charge Proceeds	376,430	154,802	157,893	270,505	257,917	282,389	268,352	343,497	360,074	305,653
Transfer to Capital	277,200	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000
Transfer to Operating	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
<b>Closing Balance</b>	<b>464,140</b>	<b>19,042</b>	<b>(514,437)</b>	<b>(2,321,225)</b>	<b>(2,472,657)</b>	<b>(2,726,942)</b>	<b>(2,899,419)</b>	<b>(3,012,279)</b>	<b>(3,123,009)</b>	<b>(3,546,931)</b>
Interest	11,232	461	(12,449)	(56,174)	(59,838)	(65,992)	(70,166)	(72,897)	(75,577)	(85,836)
Required from Development Charges	277,200	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000





Table D-1.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
<b><u>Wastewater Administration</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Mileage Reimbursement / Trave	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
<b><u>Pumping Station Expenses</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Hydro	4,700	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Contracted Services	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
<b><u>Millbrook Wastewater Plant</u></b>										
Biosolid management	20,000	24,000	24,500	25,000	25,500	26,000	26,500	27,000	27,500	28,100
Operator Contract	287,782	290,000	295,800	301,700	307,700	313,900	320,200	326,600	333,100	339,800
Phone	6,500	6,500	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300
Managed Router & VDSL Servi	2,800	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
Hydro	114,000	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
Gas - Heating	13,905	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400
Contracted Services	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600



Table D-1.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b><u>Wastewater Collection System</u></b>										
Locates	500	500	510	520	530	541	552	563	574	585
Contracted Services	2,000	10,000	10,200	10,404	10,612	10,824	11,040	11,261	11,486	11,716
<b><u>Sysco Oper. Wastewater Agreement</u></b>										
Contracted Services	40,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	7,000	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100
<b><u>Sysco Oper. Wastewater Agreement Booster Pumping Station</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	7,200	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b><u>Kawartha Downs Wastewater Agreement</u></b>										
Contracted Services	46,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Wastewater Capacity Monitoring</u></b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Sub Total Operating</b>	<b>687,180</b>	<b>705,878</b>	<b>719,910</b>	<b>733,924</b>	<b>748,042</b>	<b>762,665</b>	<b>777,592</b>	<b>792,824</b>	<b>808,160</b>	<b>824,001</b>
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	154,911	159,876	165,000	170,289	175,747	181,381	187,195	193,195	199,387	205,779
Existing Debt (Interest) - Growth Related	158,821	163,256	167,833	172,555	177,427	182,455	187,643	192,996	198,519	204,219
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	46,920	48,507	50,147	51,843	53,595	55,408	57,281	59,218	61,220	63,290
Existing Debt (Interest) - Non-Growth Related	70,325	68,739	67,099	65,403	63,650	61,838	59,964	58,028	56,025	53,955
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,480	397,803	437,800	491,105	550,032	616,154	679,183	761,449	849,282	929,067
<b>Sub Total Capital Related</b>	<b>774,457</b>	<b>838,181</b>	<b>887,879</b>	<b>951,195</b>	<b>1,020,452</b>	<b>1,097,235</b>	<b>1,171,266</b>	<b>1,264,886</b>	<b>1,364,435</b>	<b>1,456,310</b>
<b>Total Expenditures</b>	<b>1,461,637</b>	<b>1,544,059</b>	<b>1,607,789</b>	<b>1,685,119</b>	<b>1,768,494</b>	<b>1,859,900</b>	<b>1,948,858</b>	<b>2,057,710</b>	<b>2,172,595</b>	<b>2,280,311</b>



Table D-1.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Revenues</b>										
Base Charge	662,919	716,886	761,422	799,752	847,165	898,559	950,852	1,009,878	1,076,837	1,141,734
Misc. Base Charge from New Development	32,291	22,205	7,550	15,401	15,709	18,026	16,344	22,922	23,381	19,512
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Local Improvements - Water/Se	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Miscellaneous Revenue - Sysco Oper. Wastewater Agreement	47,000	47,000	47,900	48,900	49,900	50,900	51,900	52,900	54,000	55,100
Miscellaneous Revenue - Kawartha Downs Wastewater Agreement Revenue	50,200	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,175,592</b>	<b>1,230,673</b>	<b>1,273,705</b>	<b>1,333,497</b>	<b>1,395,149</b>	<b>1,463,121</b>	<b>1,528,433</b>	<b>1,609,091</b>	<b>1,692,125</b>	<b>1,769,144</b>
<b>Wastewater Billing Recovery - Total</b>	<b>286,045</b>	<b>313,386</b>	<b>334,084</b>	<b>351,622</b>	<b>373,345</b>	<b>396,779</b>	<b>420,425</b>	<b>448,619</b>	<b>480,470</b>	<b>511,167</b>



Table D-1.8  
Township of Cavan Monaghan  
Wastewater Rate Forecast  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Wastewater Billing Recovery	286,045	313,386	334,084	351,622	373,345	396,779	420,425	448,619	480,470	511,167
Total Volume (m <sup>3</sup> )	114,878	123,390	128,990	133,190	138,790	144,810	150,690	157,410	165,110	172,110
Constant Rate	2.49	2.54	2.59	2.64	2.69	2.74	2.79	2.85	2.91	2.97
Annual Percentage Change		2%	2%	2%	2%	2%	2%	2%	2%	2%



## Appendix D: Detailed Wastewater Rate Calculations

### D.2 – Scenario 2 – Rate Increase Between 0% - 2.25%



Table D-2.1  
Township of Cavan Monaghan  
Wastewater Capital Budget Forecast (Uninflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Capital Expenditures</b>											
<b>Wastewater Collection System(4811)</b>		-									
Sewer Relining	349,000	250,000	250,000	-	-	-	-	-	-	-	-
Various Wastewater Facility Upgrades		300,000		100,000	-	100,000	-	100,000	-	-	-
		-									
<b>Growth Related:</b>		-									
Wastewater Master Servicing Study	90,000	274,000	70,000								204,000
Cambium Studies		80,000	40,000	40,000							
Infiltration Solutions		100,000	50,000	50,000							
Pump Station and Forcemain between property north of Municipal Office and Larmer Line		500,000			500,000						
Duke Street from King Street Southwards		255,000		255,000							
King Street from Queen Street to IO Property		102,000					102,000				
Nina Court Extension Sanitary Sewer Oversizing	112,200	-									
Wastewater Servicing Studies - Future Development Areas	75,000	-									
Future Sanitary Pumping Station - Sewage		1,122,000			1,122,000						
Future Trunk Sanitary Sewer (oversizing)		122,400	122,400								
	-	-									
	-	-									
<b>Total Capital Expenditures</b>	<b>626,200</b>	<b>3,105,400</b>	<b>532,400</b>	<b>445,000</b>	<b>1,622,000</b>	<b>100,000</b>	<b>102,000</b>	<b>100,000</b>	<b>-</b>	<b>-</b>	<b>204,000</b>



Table D-2.2  
Township of Cavan Monaghan  
Wastewater Capital Budget Forecast (Inflated \$)

Description	Budget 2020	Total	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
Wastewater Collection System(4811)	-	-	-	-	-	-	-	-	-	-	-
Sewer Relining	349,000	255,000	255,000	-	-	-	-	-	-	-	-
Various Wastewater Facility Upgrades	-	325,000	-	104,000	-	108,000	-	113,000	-	-	-
Growth Related:		-	-	-	-	-	-	-	-	-	-
Wastewater Master Servicing Study	90,000	315,000	71,000	-	-	-	-	-	-	-	244,000
Cambium Studies	-	83,000	41,000	42,000	-	-	-	-	-	-	-
Infiltration Solutions	-	103,000	51,000	52,000	-	-	-	-	-	-	-
Pump Station and Forcemain between property north of Municipal Office and Larmer Line	-	531,000	-	-	531,000	-	-	-	-	-	-
Duke Street from King Street Southwards	-	265,000	-	265,000	-	-	-	-	-	-	-
King Street from Queen Street to IO Property	-	113,000	-	-	-	-	113,000	-	-	-	-
Nina Court Extension Sanitary Sewer Oversizing	112,200	-	-	-	-	-	-	-	-	-	-
Wastewater Servicing Studies - Future Development Areas	75,000	-	-	-	-	-	-	-	-	-	-
Future Sanitary Pumping Station - Sewage	-	1,191,000	-	-	1,191,000	-	-	-	-	-	-
Future Trunk Sanitary Sewer (oversizing)	-	125,000	125,000	-	-	-	-	-	-	-	-
Total Capital Expenditures	626,200	3,306,000	543,000	463,000	1,722,000	108,000	113,000	113,000	-	-	244,000
Capital Financing											
Provincial/Federal Grants	117,424	-	-	-	-	-	-	-	-	-	-
Development Charges Reserve Fund	277,200	2,726,000	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Wastewater Reserve	231,576	580,000	255,000	104,000	-	108,000	-	113,000	-	-	-
Total Capital Financing	626,200	3,306,000	543,000	463,000	1,722,000	108,000	113,000	113,000	-	-	244,000



Table D-2.3  
Township of Cavan Monaghan  
Wastewater Schedule of Non-Growth Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-

Table D-2.4  
Township of Cavan Monaghan  
Wastewater Schedule of Growth Related Debenture Repayments  
Inflated \$

Debenture Year	2020	Principal (Inflated)	Forecast								
			2021	2022	2023	2024	2025	2026	2027	2028	2029
2021		-		-	-	-	-	-	-	-	-
2022		-			-	-	-	-	-	-	-
2023		-				-	-	-	-	-	-
2024		-					-	-	-	-	-
2025		-						-	-	-	-
2026		-							-	-	-
2027		-								-	-
2028		-									-
2029		-									
2030		-									
<b>Total Annual Debt Charges</b>	-	-	-	-	-	-	-	-	-	-	-





Table D-2.5  
Township of Cavan Monaghan  
Wastewater Reserve Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	772,712	906,024	1,053,072	1,401,071	1,920,567	2,404,851	3,082,093	3,728,021	4,592,074	5,570,036
Transfer from Operating	343,480	377,166	418,894	474,116	535,462	604,417	670,841	755,551	846,352	929,673
Transfer to Capital	231,576	255,000	104,000	-	108,000	-	113,000	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
<b>Closing Balance</b>	<b>884,616</b>	<b>1,028,190</b>	<b>1,367,966</b>	<b>1,875,187</b>	<b>2,348,029</b>	<b>3,009,269</b>	<b>3,639,934</b>	<b>4,483,572</b>	<b>5,438,426</b>	<b>6,499,709</b>
Interest	21,408	24,882	33,105	45,380	56,822	72,824	88,086	108,502	131,610	157,293

Table D-2.6  
Township of Cavan Monaghan  
Wastewater Development Charges Reserve Fund Continuity  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	678,642	475,372	19,503	(526,886)	(2,377,399)	(2,532,495)	(2,792,934)	(2,969,585)	(3,085,176)	(3,198,586)
Development Charge Proceeds	376,430	154,802	157,893	270,505	257,917	282,389	268,352	343,497	360,074	305,653
Transfer to Capital	277,200	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000
Transfer to Operating	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
<b>Closing Balance</b>	<b>464,140</b>	<b>19,042</b>	<b>(514,437)</b>	<b>(2,321,225)</b>	<b>(2,472,657)</b>	<b>(2,726,942)</b>	<b>(2,899,419)</b>	<b>(3,012,279)</b>	<b>(3,123,009)</b>	<b>(3,546,931)</b>
Interest	11,232	461	(12,449)	(56,174)	(59,838)	(65,992)	(70,166)	(72,897)	(75,577)	(85,836)
Required from Development Charges	277,200	288,000	359,000	1,722,000	-	113,000	-	-	-	244,000



Table D-2.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Expenditures</b>										
<b><u>Operating Costs</u></b>										
<b><u>Wastewater Administration</u></b>										
Gross Wages - Full Time	32,600	45,000	45,900	46,800	47,700	48,700	49,700	50,700	51,700	52,700
Benefits – OMERS	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits – EI Reduced Premium	425	425	400	400	400	400	400	400	400	400
Benefits – CPP	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Benefits – EHT	650	650	700	700	700	700	700	700	700	700
Benefits – WSIB	1,125	1,125	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Manulife Group Benefits	2,600	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300	3,400
Benefits - Other	-	-	-	-	-	-	-	-	-	-
Meal Allowance	-	-	-	-	-	-	-	-	-	-
Mileage Reimbursement / Travel	100	100	100	100	100	100	100	100	100	100
Staff Training & Development	750	750	800	800	800	800	800	800	800	800
Uniforms / Clothing	100	100	100	100	100	100	100	100	100	100
Legal Expense	750	750	800	800	800	800	800	800	800	800
Corporate Insurance	10,578	10,578	10,800	11,000	11,200	11,400	11,600	11,800	12,000	12,200
Software Licensing & Support	-	-	-	-	-	-	-	-	-	-
Water Meters	10,000	5,000	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800
Radio Licenses	500	500	500	500	500	500	500	500	500	500
Office Supplies	750	800	800	800	800	800	800	800	800	800
Allocated Land Telephone	-	-	-	-	-	-	-	-	-	-
Allocated Phone Service	310	300	300	300	300	300	300	300	300	300
Advertising	50	50	100	100	100	100	100	100	100	100
Postage/Courier	-	-	-	-	-	-	-	-	-	-
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Allocated Vehicle Costs	1,305	1,250	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Property taxes	22,800	22,800	23,300	23,800	24,300	24,800	25,300	25,800	26,300	26,800
<b><u>Pumping Station Expenses</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Hydro	4,700	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Contracted Services	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
<b><u>Millbrook Wastewater Plant</u></b>										
Biosolid management	20,000	24,000	24,500	25,000	25,500	26,000	26,500	27,000	27,500	28,100
Operator Contract	287,782	290,000	295,800	301,700	307,700	313,900	320,200	326,600	333,100	339,800
Phone	6,500	6,500	6,600	6,700	6,800	6,900	7,000	7,100	7,200	7,300
Managed Router & VDSL Servi	2,800	2,800	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600
Hydro	114,000	116,000	118,300	120,700	123,100	125,600	128,100	130,700	133,300	136,000
Gas - Heating	13,905	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400
Contracted Services	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600



Table D-2.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b><u>Wastewater Collection System</u></b>										
Locates	500	500	510	520	530	541	552	563	574	585
Contracted Services	2,000	10,000	10,200	10,404	10,612	10,824	11,040	11,261	11,486	11,716
<b><u>Sysco Oper. Wastewater Agreement</u></b>										
Contracted Services	40,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	7,000	7,000	7,100	7,200	7,300	7,400	7,500	7,700	7,900	8,100
<b><u>Sysco Oper. Wastewater Agreement Booster Pumping Station</u></b>										
Phone	800	800	800	800	800	800	800	800	800	800
Managed Router & VDSL Servi	800	800	800	800	800	800	800	800	800	800
Hydro	7,200	7,200	7,300	7,400	7,500	7,700	7,900	8,100	8,300	8,500
Contracted Services	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
<b><u>Kawartha Downs Wastewater Agreement</u></b>										
Contracted Services	46,000	40,000	40,800	41,600	42,400	43,200	44,100	45,000	45,900	46,800
Sewer Operator Service Charge	6,000	6,000	6,100	6,200	6,300	6,400	6,500	6,600	6,700	6,800
<b><u>Wastewater Capacity Monitoring</u></b>										
Contracted Services	20,000	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300
<b>Sub Total Operating</b>	<b>687,180</b>	<b>705,878</b>	<b>719,910</b>	<b>733,924</b>	<b>748,042</b>	<b>762,665</b>	<b>777,592</b>	<b>792,824</b>	<b>808,160</b>	<b>824,001</b>
<b>Capital-Related</b>										
Existing Debt (Principal) - Growth Related	154,911	159,876	165,000	170,289	175,747	181,381	187,195	193,195	199,387	205,779
Existing Debt (Interest) - Growth Related	158,821	163,256	167,833	172,555	177,427	182,455	187,643	192,996	198,519	204,219
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related	46,920	48,507	50,147	51,843	53,595	55,408	57,281	59,218	61,220	63,290
Existing Debt (Interest) - Non-Growth Related	70,325	68,739	67,099	65,403	63,650	61,838	59,964	58,028	56,025	53,955
New Non-Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Non-Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	343,480	377,166	418,894	474,116	535,462	604,417	670,841	755,551	846,352	929,673
<b>Sub Total Capital Related</b>	<b>774,457</b>	<b>817,544</b>	<b>868,973</b>	<b>934,206</b>	<b>1,005,883</b>	<b>1,085,499</b>	<b>1,162,924</b>	<b>1,258,987</b>	<b>1,361,505</b>	<b>1,456,916</b>
<b>Total Expenditures</b>	<b>1,461,637</b>	<b>1,523,422</b>	<b>1,588,883</b>	<b>1,668,130</b>	<b>1,753,925</b>	<b>1,848,164</b>	<b>1,940,516</b>	<b>2,051,811</b>	<b>2,169,665</b>	<b>2,280,917</b>



Table D-2.7  
Township of Cavan Monaghan  
Wastewater Operating Budget Forecast (Cont.)  
Inflated \$

Description	Budget 2020	Forecast								
		2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Revenues</b>										
Base Charge	662,919	702,829	748,322	787,919	836,676	889,608	943,688	1,004,726	1,073,969	1,141,485
Misc. Base Charge from New Development	32,291	21,769	7,420	15,173	15,515	17,847	16,221	22,805	23,318	19,508
Public Utility Grant Program (M	18,700	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	21,900
Miscellaneous Revenue - Sysco	2,500	2,500	2,600	2,700	2,800	2,900	3,000	3,100	3,200	3,300
Rent Revenue	4,600	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400
Meter Installation Revenue	10,000	10,000	10,200	10,400	10,600	10,800	11,000	11,200	11,400	11,600
User Fees and Service Charge	8,400	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Local Improvements - Water/Se	-	-	-	-	-	-	-	-	-	-
Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	-
Water & Sewer Account Set Up	11,750	11,750	12,000	12,200	12,400	12,600	12,900	13,200	13,500	13,800
Locates & User Fees	-	-	-	-	-	-	-	-	-	-
Write off - Contra Revenue Acc	500	500	500	500	500	500	500	500	500	500
Penalty and Interest Income -	13,000	13,000	13,300	13,600	13,900	14,200	14,500	14,800	15,100	15,400
Miscellaneous Revenue - Sysco Oper. Wastewater Agreement	47,000	47,000	47,900	48,900	49,900	50,900	51,900	52,900	54,000	55,100
Miscellaneous Revenue - Kawartha Downs Wastewater Agreement Revenue	50,200	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
<b>Other Revenue</b>										
Contributions from Development Charges Reserve Fund	313,732	323,132	332,833	342,844	353,175	363,836	374,837	386,191	397,907	409,997
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
<b>Total Operating Revenue</b>	<b>1,175,592</b>	<b>1,216,181</b>	<b>1,260,475</b>	<b>1,321,436</b>	<b>1,384,466</b>	<b>1,453,991</b>	<b>1,521,146</b>	<b>1,603,822</b>	<b>1,689,195</b>	<b>1,768,890</b>
<b>Wastewater Billing Recovery - Total</b>	<b>286,045</b>	<b>307,241</b>	<b>328,409</b>	<b>346,694</b>	<b>369,459</b>	<b>394,173</b>	<b>419,370</b>	<b>447,989</b>	<b>480,470</b>	<b>512,027</b>



Table D-2.8  
Township of Cavan Monaghan  
Wastewater Rate Forecast  
Inflated \$

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Wastewater Billing Recovery	286,045	307,241	328,409	346,694	369,459	394,173	419,370	447,989	480,470	512,027
Total Volume (m <sup>3</sup> )	114,878	123,390	128,990	133,190	138,790	144,810	150,690	157,410	165,110	172,110
<b>Constant Rate</b>	<b>2.49</b>	<b>2.490</b>	<b>2.546</b>	<b>2.603</b>	<b>2.662</b>	<b>2.722</b>	<b>2.783</b>	<b>2.846</b>	<b>2.910</b>	<b>2.975</b>
<b>Annual Percentage Change</b>		<b>0%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>	<b>2.25%</b>