Water, Wastewater, and Stormwater Rate Study

Municipality of North Middlesex

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Table of Contents

Page

Executive Summary ..... **i**

1. Introduction **1-1**
- 1.1 Background 1-1
- 1.2 Current Issues to Be Addressed 1-3
- 1.3 Study Process 1-4
- 1.4 Regulatory Changes in Ontario 1-4
- 1.5 Sustainable Water and Sewage Systems Act 1-5
- 1.6 Financial Plans Regulation 1-7
- 1.7 Water Opportunities Act, 2010 1-9
- 1.8 Infrastructure for Jobs and Prosperity Act, 2015 (I.J.P.A.) 1-10
- 1.9 Forecast Growth and Servicing Requirements 1-12

2. Capital Infrastructure Needs **2-1**
- 2.1 Capital Forecast 2-1

3. Lifecycle Costing **3-1**
- 3.1 Overview of Lifecycle Costing 3-1
  - 3.1.1 Definition 3-1
  - 3.1.2 Financing Costs 3-1
  - 3.1.3 Costing Methods 3-4
- 3.2 Impact on Budgets 3-6

4. Capital Cost Financing Options **4-1**
- 4.1 Summary of Capital Cost Financing Alternatives 4-1
- 4.2 Development Charges Act, 1997 4-2
- 4.3 Municipal Act 4-3
- 4.4 Grant Funding Availability 4-5
- 4.5 Existing Reserves/Reserve Funds 4-6
- 4.6 Debenture Financing 4-7
- 4.7 Infrastructure Ontario 4-8

Table of Contents (Cont'd)

Page

4.8 Recommended Capital Financing Approach 4-9

5. Overview of Expenditures and Revenues 5-1
5.1 Water Operating Expenditures 5-1
5.2 Water Operating Revenues 5-1
5.3 Wastewater Operating Expenditures 5-4
5.4 Wastewater Operating Revenues 5-4
5.5 Stormwater Operating Expenditures and Revenues 5-7

6. Pricing Structures 6-1
6.1 Introduction 6-1
6.2 Alternative Pricing Structures 6-2
6.3 Assessment of Alternative Pricing Structures 6-4
6.4 Rate Structures in Ontario 6-9
6.5 Recommended Rate Structures 6-10

7. Analysis of Water, Wastewater, and Stormwater Rates and Policy Matters 7-1
7.1 Introduction 7-1
7.2 Water Rates 7-1
7.3 Wastewater Rates 7-3
7.4 Stormwater Rates 7-5
7.5 Forecast of Combined Water, Wastewater, and Stormwater Impact for the Average Residential Customer 7-5

8. Recommendations 8-1

Appendix A Water System Inventory Data A-1

Appendix B Wastewater System Inventory Data B-1

Appendix C Stormwater System Inventory Data C-1

Appendix D Detailed Water Rate Calculations D-1

Appendix E Detailed Wastewater Rate Calculations E-1

Appendix F Detailed Stormwater Rate Calculations F-1

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.C.P.	Ministry of Environment, Conservation and Parks
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 Municipality of North Middlesex retained Watson & Associates Economists Ltd. (Watson) to undertake a water, wastewater, and stormwater rate study. This study aims to update the analysis for current capital and operating forecasts, costing for lifecycle cost requirements, current volumes, and customer profiles. The results of this analysis provides the Municipality with two options for water and wastewater rates; the first option is a base charge and volume rate where 90% of the revenues required are collected through the base charges. The second option is a flat rate charge where all revenues are recovered through a flat rate. In both options, the base charges and flat rates vary based on 2018 metered water volume categories. This allows for the impacts of any increases to be shared amongst all users equally. In addition, an analysis was undertaken to implement a rate structure for stormwater management (capital costs only) to provide for efficient stormwater infrastructure planning and maintenance. 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 required for the capital program, operations, and lifecycle replacement of the system.

Section 1.2 of this report lays out some main issues for consideration when reviewing the rates proposed in this study. The Municipality is facing large expenditures due to required capital works in the next few years, significant lifecycle replacement costs for the number of customers, and a high rate of water loss. All of these factors have been incorporated into the rate increased proposed in this study.

The analysis presented herein provides the following:

- The 2020 to 2029 capital spending program for water, wastewater, and stormwater is $14.07 million, $22.83 million, and $301,000 (uninflated), respectively;
- Internal loans to water and wastewater reserves from tax-supported reserves are addressed and paid back over a period of five years for water and 25 years for wastewater;
- Establishment of lifecycle reserve funds to begin to save for replacement of infrastructure;
- Annual operating expenditures are assumed to increase by 2 to 5% per annum based on the expenditure;

- The present rate structure for water (base monthly charge and a constant volume rate) was reviewed and two new rate structure options are proposed;
- The present rate structure for wastewater (flat rate for residential and small commercial and a base monthly charge and a constant volume rate for all other users) was reviewed and two new rate structure options are proposed;
- A stormwater rate is proposed to recover capital costs related to the system;
- Existing water customers total 2,350; new customers will range from between 17 and 18 customers annually over the next 10-year period;
- Existing wastewater customers total 1,201; the same level of increase in customers as water is assumed over the period; and
- Current customers that are attributed stormwater services total 1,220; the same level of increase in customers as water and wastewater is assumed over the period.

As a result of large anticipated capital expenditures, the needs for both water and wastewater are significant for the first half of the forecast period. Additionally, the Municipality has a large linear water system, which requires extensive lifecycle replacement needs. Hence, the required rate increases are substantial for 2020 and require increases thorughout the forecast period. This is achieved by providing the following changes to water and wastewater:

- For both water and wastewater two options have been proposed:
  - base charge and volume rate whereby the base charge revenue recovers 90% of required revenues and the volume rate is only imposed on annual usage above 250 cu.m per customer. This provides stable revenue generation required due to the significant expenditures identified.
  - Flat rate whereby 100% of the required revenues are recovered on a fixed basis and a nominal rate of $1 per cu.m is imposed on usage that exceeds each customers average usage over the previous three years.
  - In both options, the base charge and flat rate are tiered based on a range of volumes (using 2018 volumes) as follows:

Billing Group Category		
Annual Volume Ranges		Name
-	250	0 to 250
250	300	250 to 300
300	400	300 to 400
400	500	400 to 500
500	600	500 to 600
600	800	600 to 800
800	1,000	800 to 1000
1,000	1,500	1000 to 1500
1,500	2,000	1500 to 2000
2,000	3,000	2000 to 3000
3,000	4,000	3000 to 4000
4,000	5,000	4000 to 5000
5,000	7,500	5000 to 7500
7,500	10,000	7500 to 10000
10,000	12,000	10000 to 12000
12,000	14,161	12000 to 14161

- To meet the needs of the water forecast:
  - For Option 1, an initial 47% increase in the annual bill is required and the annual bill would increase 6% annually thereafter. Volume rates would decrease initially, then increase at 6% annually.
  - For Option 2, an initial 52% increase in the annual bill is required and the annual bill would increase 6% annually thereafter.
- Similar to water, the wastewater needs arise near the beginning of the forecast period and therefore, it is recommended that the following is required:
  - For Option 1, an initial increase in the annual bill of 60% is required (for residential users). Subsequently the annual base charge would increase by 30% in 2021, 20% in 2022, then 10% annually for the remainder of the forecast. Volume rates would increase by 2% annually.
  - For Option 2, an initial increase in the annual bill of 60% is required (for all users). Subsequently the annual flat rate would increase at 30% in 2021, 25% in 2022, 12% in 2023, 2024, and 2025, then 10% annually thereafter.
- To meet the needs of the stormwater forecast, a flat rate of $68.29 per year would be imposed in 2020. Subsequently, the rates would increase at 10% per year until 2029 ($161.03 per year).

Table ES-1 and Table ES-2 summarize the recommended water, wastewater, and stormwater rates and average annual bills (assuming an annual volume of 180 m^3) for each option based on the analysis provided herein over the forecast period.

Table ES-1
Municipality of North Middlesex
Option 1 – Base Charge and Volume Bill (for volume usage above 250 cu.m annually)

Annual Bill for Residential User with 180 cu.m Volume	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water											
Base Charge	248	854	905	959	1,017	1,078	1,143	1,211	1,284	1,361	1,442
Volume	333	-	-	-	-	-	-	-	-	-	-
Total Water Bill	**581**	**854**	**905**	**959**	**1,017**	**1,078**	**1,143**	**1,211**	**1,284**	**1,361**	**1,442**
Wastewater											
Base Charge	518	829	1,078	1,294	1,423	1,565	1,722	1,894	2,083	2,292	2,521
Volume	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Bill	**518**	**829**	**1,078**	**1,294**	**1,423**	**1,565**	**1,722**	**1,894**	**2,083**	**2,292**	**2,521**
Stormwater - Flat Rate		**68**	**75**	**83**	**91**	**100**	**110**	**121**	**133**	**146**	**161**
Total Combined Bill	**1,099**	**1,751**	**2,058**	**2,336**	**2,531**	**2,743**	**2,974**	**3,226**	**3,500**	**3,799**	**4,124**
Annual Percentage Change		**59%**	**18%**	**13%**	**8%**	**8%**	**8%**	**8%**	**8%**	**9%**	**9%**

Table ES-2
Municipality of North Middlesex
Option 2 – Flat Rate and Volume Rate (for volume usage that exceeds average three year usage)

Annual Bill for Residential User with 180 cu.m Volume	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water											
Base Charge	248	883	936	992	1,051	1,115	1,181	1,252	1,327	1,407	1,491
Volume	333	-	-	-	-	-	-	-	-	-	-
Total Water Bill	**581**	**883**	**936**	**992**	**1,051**	**1,115**	**1,181**	**1,252**	**1,327**	**1,407**	**1,491**
Wastewater											
Base Charge	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
Volume	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Bill	**518**	**829**	**1,078**	**1,348**	**1,509**	**1,690**	**1,893**	**2,082**	**2,291**	**2,520**	**2,772**
Stormwater - Flat Rate	**-**	**68**	**75**	**83**	**91**	**100**	**110**	**121**	**133**	**146**	**161**
Total Combined Bill	**1,099**	**1,780**	**2,089**	**2,422**	**2,652**	**2,905**	**3,185**	**3,456**	**3,751**	**4,073**	**4,424**
Annual Percentage Change		**62%**	**17%**	**16%**	**9%**	**10%**	**10%**	**9%**	**9%**	**9%**	**9%**

Report

Chapter 1
Introduction

1. Introduction

1.1 Background

The Municipality of North Middlesex currently services 2,350 metered water customers and 1,201 wastewater customers. Stormwater services are provided to 1,220 properties. The Municipality purchases water from the Lake Huron Primary Water Supply System which enters the North Middlesex Distribution System from five points. The distribution system is comprised of two water reservoirs, two booster pump stations and multiple water mains totalling almost 475km. The wastewater system is served by a lagoon facility in Parkhill, a wastewater treatment plant in Ailsa Craig, and a number of pumping stations, forcemains, and sanitary mains throughout the Municipality.

The water system is metered and utilizes a rate structure with a monthly base charge as well as a volume charge on a per cubic metre basis. For wastewater, single family residential users and small commercial users are charged a monthly flat rate, whereas all other metered users pay a base charge and volume rate similar to water. Table 1-1 provides the existing rates currently in effect.

Table 1-1
Municipality of North Middlesex
Water and Wastewater Rates – 2019

2019 - Water Billing Rates	
Base Charge - Monthly	
All Areas	$20.65
Volume Charge	
	per 1,000 gallons
$ 1.850	per m^3

Note: Customers with a quarterly consumption in excess of 2,000 m3 receive a discount equal to the annual consumption rate increase on any consumption over 2,000 m3 per quarter. Rebate to be credited on the last billing of the year and will be reviewed by council annually.

2019 - Wastewater Billing Rates	
Flat/Base Charge - Monthly	
Single Family Residential and Small Commercial Flat Charge	
Ward 1 - Parkhill	$40.00
Ward 2 - Ailsa Craig	$50.00
Ward 3 - McGillivray	$0.00
Ward 4 - Nairn/East Williams	$50.00
Ward 5 - West Williams	$0.00
Multi-residential, Institutional, and Large Commercial Base Charge	
Ward 1 - Parkhill	$10.00
Ward 2 - Ailsa Craig	$10.00
Volume Charge	
	per 1,000 gallons
$ 1.900	per m^3

Note: Volume charge applies only to metered Multi-res, Institutional, and Large Commercial users

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) and Dillon Consulting Limited (Dillon) were retained by the Municipality of North Middlesex to assist in addressing these changes in a proactive manner as they relate to the water, wastewater, and stormwater systems. In order to address the need to provide for the long-term protection and enhancement of stormwater resources in the Municipality, an analysis of rate structures for stormwater rates has also been undertaken. The assessment provided herein addresses recommendations for the water, wastewater, and stormwater rates based on the most current information and forecasts the implications over the next ten-year period.

1.2 Current Issues to Be Addressed

There are a number of issues with the water and wastewater systems in the Municipality that need to be addressed as soon as possible. These issues include a high rate of water loss, large lifecycle costs, and large capital costs. The recommended rates provided in this report seek to address these issues to the extent possible. The following provides a list of the significant issues:

- High rate of water loss – The Municipality is facing a high rate of water loss (approximately 50%) which effectively doubles the annual cost to purchase water from the Lake Huron Primary Water Supply System (i.e. approximately $300,000 annually due to water loss). On average throughout Ontario, it is common for a municipality to incur annual water loss in the range of 10% to 15%. Staff are seeking to address this issue through the inclusion of meter pit installations which have been included in the capital forecast.
- Lifecycle Costs for Water – The Municipality has an extensive amount of linear water infrastructure. The length of watermains in the Municipality totals 473.76km which provides for a total lifecycle replacement cost of approximately $257.42 million with a customer count of 2,350. To compare, the City of Sarnia has a total watermain replacement cost of approximately $243.76 million with a customer count of 25,940. With the release of the Infrastructure for Jobs and Prosperity Act, the Municipality will have to complete an asset management plan that provides for their plan to fund and replace all infrastructure.
- Large Capital Costs – It has been identified that the Municipality requires installation of a water tower as well as the construction of a wastewater treatment plant to replace the existing lagoon system in Parkhill. These capital costs are anticipated to occur in the next few years as they are required to allow for future development. In total, these two projects cost $23 million which puts a large burden on the rates.

To address the above items, it is recommended that the Municipality consider any and all sources of funding to ease the anticipated rate increases. First, it is recommended that the Municipality consider updating their Development Charge Background Study and to consider imposing 100% of the calculated rate, at least for water and wastewater. Additionally, the Municipality may want to consider

discussions/presentations to senior levels of government to acquire existing grant funding or potential assistance. These recommendations may help to ease the increase in the rates presented in this report.

1.3 Study Process

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

- Identify all current and future water, wastewater, and stormwater system capital needs to assess the immediate and longer-term implications;
- Identify the significant lifecycle replacement costs required for the water system;
- 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, wastewater, and stormwater 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;
- Provide staff and Council the findings to assist in gaining approval of the rates for 2020 and future years; and
- Assist in addressing the existing issues faced by the Municipality, as described in the previous section.

1.4 Regulatory Changes in Ontario

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 Municipality and the capital spending plan provided herein. The following sections describe these various resulting changes.

1.5 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 wastewater."

The Act would have required the preparation of two reports for submission to the Ministry of the Environment, Conservation and Parks (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.

1.6 Financial Plans Regulation

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.

1.7 Water Opportunities Act, 2010

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:

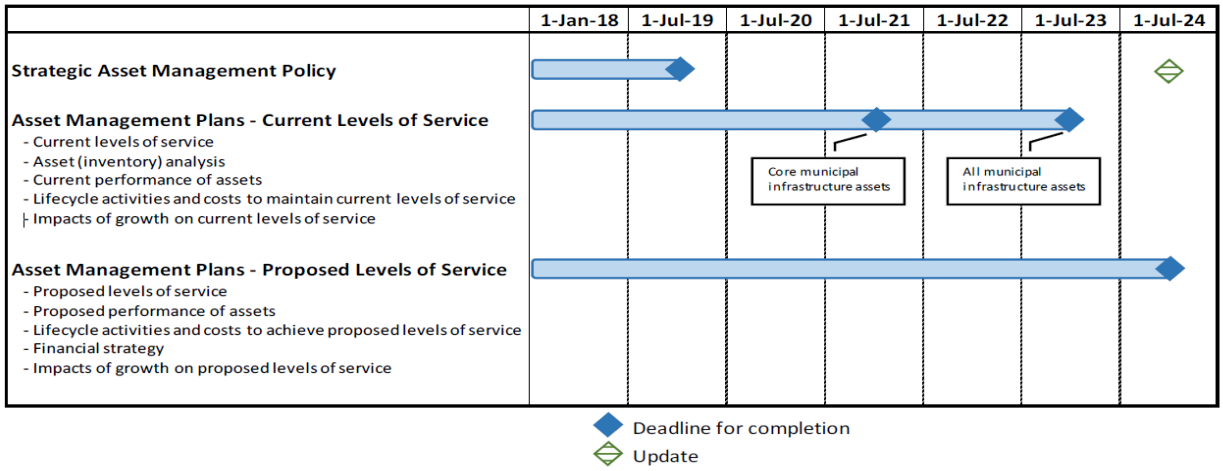
- Timing;
- Contents of the plans;
- Which identified portions of the plan will require certification;
- Public consultation process; and
- Limitations, updates, refinements, etc.

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.

1.8 Infrastructure for Jobs and Prosperity Act, 2015 (I.J.P.A.)

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, wastewater, and stormwater (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, wastewater, and stormwater services, the Municipality will need to consider the impacts on the capital plan provided herein.

1.9 Forecast Growth and Servicing Requirements

The Municipality of North Middlesex services 2,350 metered water customers, 1,201 wastewater customers, and 1,220 stormwater customers. Information on the existing number of customers and existing billable volumes was obtained from the Municipality.

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

The Municipality also purchases water from the Lake Huron Primary Water Supply System. Based on a review of the billable water volumes relative to the purchased water volumes over the past three years, it was determined that on average, the unaccounted-for water was 46%. As a result, the anticipated purchased water volumes are estimated to be 54% greater than the anticipated billable volumes.

Table 1-2 provides for the forecast of water users and volumes for North Middlesex, while Tables 1-3 and 1-4 provide the forecast of wastewater and stormwater users and volumes, respectively.

Table 1-2
Municipality of North Middlesex
2020 to 2029 Water System Forecast

Water Users Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020	19	10	19	19	19	19	19	19	19	19	19
2021	19		10	19	19	19	19	19	19	19	19
2022	19			10	19	19	19	19	19	19	19
2023	19				10	19	19	19	19	19	19
2024	17					9	17	17	17	17	17
2025	17						9	17	17	17	17
2026	17							9	17	17	17
2027	17								9	17	17
2028	18									9	18
2029	18										9
Total	**180**	**10**	**29**	**48**	**67**	**85**	**102**	**119**	**136**	**153**	**171**
m^3/user	180	180	180	180	180	180	180	180	180	180	180
Annual Flow		**1,800**	**5,220**	**8,640**	**12,060**	**15,300**	**18,360**	**21,420**	**24,480**	**27,540**	**30,780**

Water Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350
New - Growth	10	29	48	67	85	102	119	136	153	171
Total	**2,360**	**2,379**	**2,398**	**2,417**	**2,435**	**2,452**	**2,469**	**2,486**	**2,503**	**2,521**

Water Volume Forecast (m^3)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141
New - Growth	1,800	5,220	8,640	12,060	15,300	18,360	21,420	24,480	27,540	30,780
Total	**730,941**	**734,361**	**737,781**	**741,201**	**744,441**	**747,501**	**750,561**	**753,621**	**756,681**	**759,921**

Water Purchases	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Billable Volumes	730,941	734,361	737,781	741,201	744,441	747,501	750,561	753,621	756,681	759,921
Consumed Water as a % of Purchased Water	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Total Purchased Water	1,362,206	1,368,580	1,374,954	1,381,327	1,387,365	1,393,068	1,398,771	1,404,474	1,410,176	1,416,214
Purchased Water Rates	0.5141	0.5295	0.5454	0.5618	0.5787	0.5961	0.6140	0.6324	0.6450	0.6579
Total	**700,310**	**724,663**	**749,900**	**776,030**	**802,868**	**830,408**	**858,845**	**888,189**	**909,564**	**931,728**

Table 1-3
Municipality of North Middlesex
2020 to 2029 Wastewater System Forecast

Wastewater Users Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020	19	10	19	19	19	19	19	19	19	19	19
2021	19		10	19	19	19	19	19	19	19	19
2022	19			10	19	19	19	19	19	19	19
2023	19				10	19	19	19	19	19	19
2024	17					9	17	17	17	17	17
2025	17						9	17	17	17	17
2026	17							9	17	17	17
2027	17								9	17	17
2028	18									9	18
2029	18										9
Total	**180**	**10**	**29**	**48**	**67**	**85**	**102**	**119**	**136**	**153**	**171**
m^3/user	180	180	180	180	180	180	180	180	180	180	180
Annual Flow		**1,800**	**5,220**	**8,640**	**12,060**	**15,300**	**18,360**	**21,420**	**24,480**	**27,540**	**30,780**

Wastewater Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201
New - Growth	10	29	48	67	85	102	119	136	153	171
Total	**1,211**	**1,230**	**1,249**	**1,268**	**1,286**	**1,303**	**1,320**	**1,337**	**1,354**	**1,372**

Wastewater Flows Forecast (m^3)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363
New	1,800	5,220	8,640	12,060	15,300	18,360	21,420	24,480	27,540	30,780
Total	**277,163**	**280,583**	**284,003**	**287,423**	**290,663**	**293,723**	**296,783**	**299,843**	**302,903**	**306,143**

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

Table 1-4
Municipality of North Middlesex
2020 to 2029 Stormwater System Forecast

Stormwater Users Forecast

Year	Total Users	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020	19	10	19	19	19	19	19	19	19	19	19
2021	19		10	19	19	19	19	19	19	19	19
2022	19			10	19	19	19	19	19	19	19
2023	19				10	19	19	19	19	19	19
2024	17					9	17	17	17	17	17
2025	17						9	17	17	17	17
2026	17							9	17	17	17
2027	17								9	17	17
2028	18									9	18
2029	18										9
Total	**180**	**10**	**29**	**48**	**67**	**85**	**102**	**119**	**136**	**153**	**171**

Stormwater Customer Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220
New - Growth	10	29	48	67	85	102	119	136	153	171
Total	**1,230**	**1,249**	**1,268**	**1,287**	**1,305**	**1,322**	**1,339**	**1,356**	**1,373**	**1,391**

Chapter 2
Capital Infrastructure Needs

2. Capital Infrastructure Needs

2.1 Capital Forecast

Capital forecasts have been provided for the water, wastewater, and stormwater systems and are presented on Tables 2-1, 2-2 and 2-3 (note: the costs are provided in uninflated dollars). The basis for these forecasts is the Municipality's Capital Forecasts, works identified by Dillon, and works identified as asset replacement needs based on the inventory data provided for the water, wastewater, and stormwater systems.

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

Table 2-1
Municipality of North Middlesex
2020 to 2029 Water Capital Forecast Summary (Uninflated $)

Description	Total 2020 to 2029	Years Undertaken
Capital Expenditures		
SCADA IMPLEMNTATION West Williams Booster station	150,000	2020
SCADA, Electrical, Process Overhaul Parkhill Resevoir	425,000	2021 to 2022
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	350,000	2022 to 2023
METER PIT INSTALLTIONS	1,760,000	2020 to 2029
WATER DISTRIBUTION MASTER PLAN	50,000	2020
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	300,000	2020
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	134,900	2021
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	121,600	2022
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	2,113,200	2023
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	237,500	2024
WATER TOWER INSTALLATION	5,000,000	2020 to 2022
MCGILIVARAY BOOSTER STATION	25,000	2027
MT.CARMEL RESEVOIR	160,500	2021 to 2025
PARKHILL RESEVOIR	484,001	2020 to 2025 & 2027
Waterline Takeoffs	1,500,000	2020 to 2029
Lifecycle:		
Water Facilities	724,000	2020, 2022, 2024, 2025
Hydrants	532,000	2020, 2022, 2024, 2025, 2026, 2028
Total Capital Needs	**14,067,701**	

Table 2-2
Municipality of North Middlesex
2020 to 2029 Wastewater Capital Forecast Summary (Uninflated $)

Description	Total 2020 to 2029	Years Undertaken
Capital Expenditures		
WASTEWATER COLLECTION MASTER PLAN	35,000	2020
WASTEWATER COLLECTION WORKS	280,000	2020 to 2029
PARKHILL WWTP	18,000,000	2020 to 2022
BEAR CREEK PUMPING STATION	168,500	2020 to 2024 & 2026
NEW ONTARIO PUMPING STATION	193,500	2020 to 2024 & 2027
WILLIAM ST PUMPING STATION	308,500	2020 to 2025 & 2028
VICTORIA ST PUMPING STATION	522,500	2020 to 2025 & 2029
STATION ST PUMPING STATION	241,500	2024 to 2028
AC WWTP	3,083,500	2020 to 2029
Total Capital Needs	**22,833,000**	

Table 2-3
Municipality of North Middlesex
2020 to 2029 Stormwater Capital Forecast Summary (Uninflated $)

Description	Total 2020 to 2029	Years Undertaken
Capital Expenditures		
STORMWATER COLLECTION MASTER PLAN	270,900	2020 to 2024
WESTWOOD ESTATES STORM POND	30,000	2028 to 2029
Total Capital Needs	**300,900**	

Chapter 3
Lifecycle Costing

3. Lifecycle Costing

3.1 Overview of Lifecycle Costing

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.

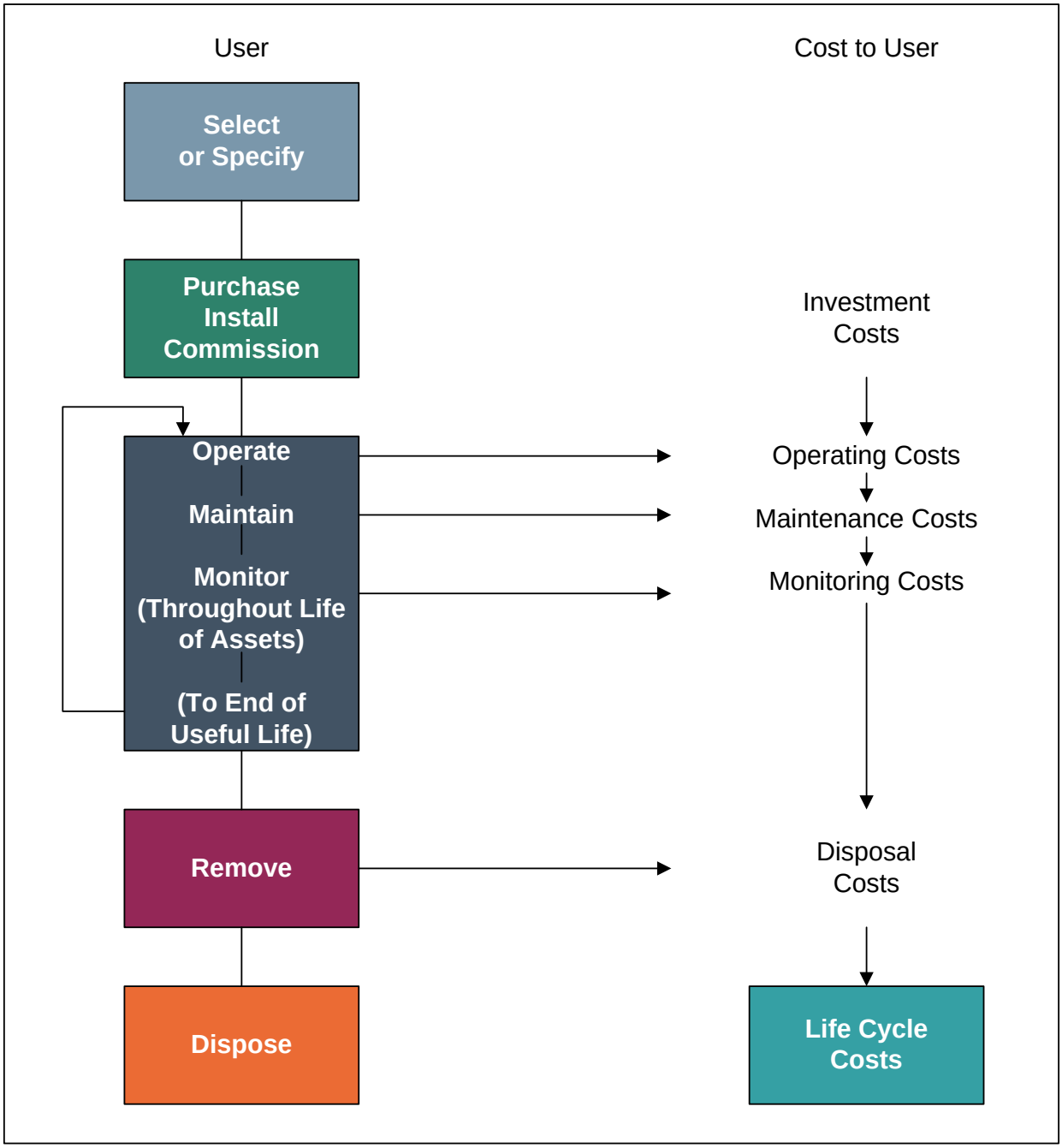
3.1.2 Financing Costs

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 Municipality. 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 Municipality 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.

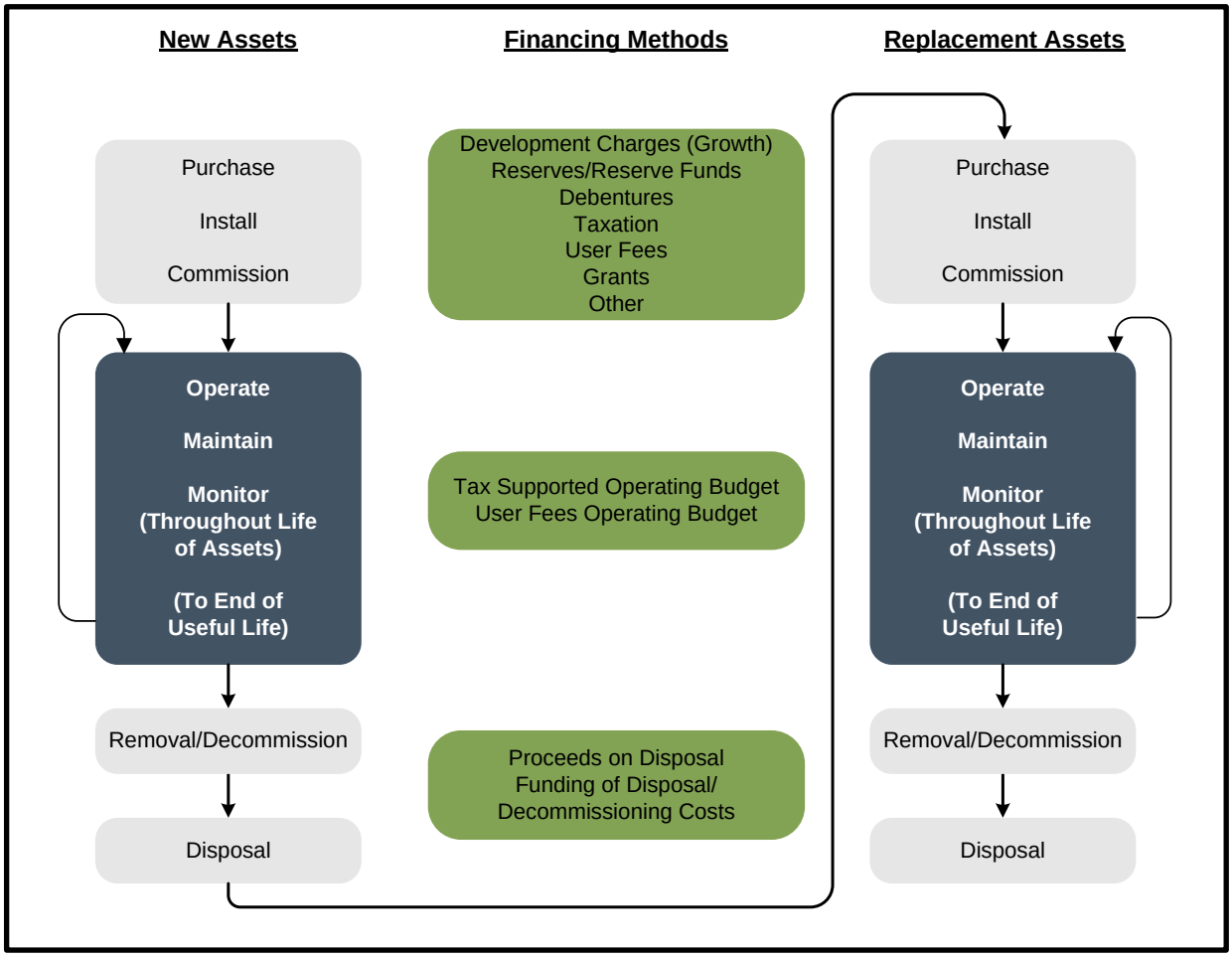
As referred to earlier, growth-related financing methods such as development charges and developer contributions could be utilized to finance the growth-related component of the new asset. These revenues are collected (indirectly) from the new homeowner who benefits directly from the installation of 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

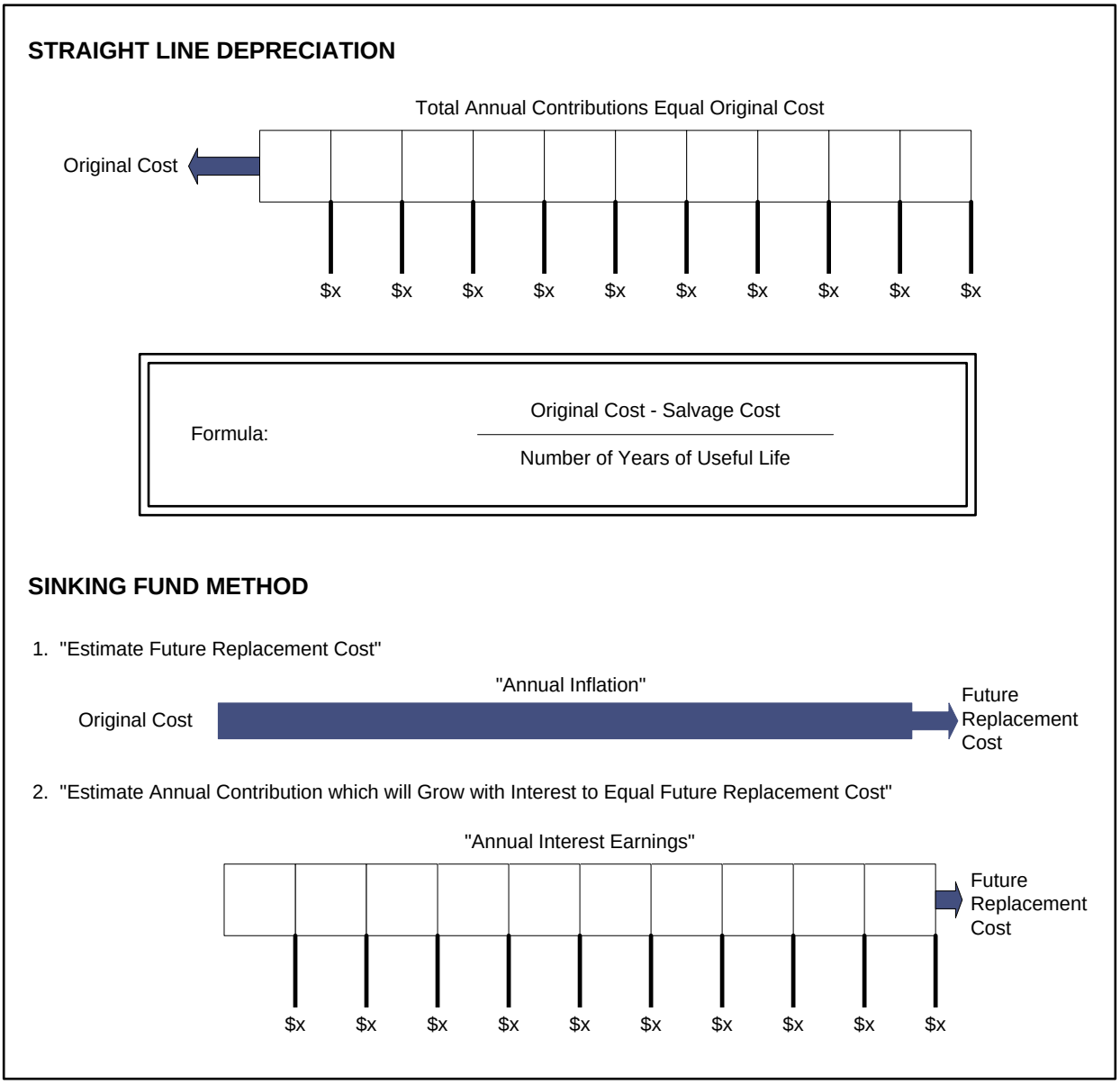
There are two fundamental methods of calculating the cost of the usage of an asset and for the provision of the revenue required when the time comes to retire and replace it. The first method is the Depreciation Method. This method recognizes the reduction in the value of the asset through wear and tear 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, wastewater, and stormwater systems inventory information was obtained from the Municipality. The age of the water system dates back to the mid 1950s. The water system has been expanded throughout the years. The wastewater system dates back to the early 1980s. The total value of existing water infrastructure is

$264.11 million, the value of existing wastewater infrastructure is $53.16 million, and the value of existing stormwater infrastructure is $35.00 million.

The detailed water, wastewater, and stormwater inventories are provided in Appendices A, B, and C, 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 Municipality may wish to consider as part of its budgeting practices. This information is summarized in Figure 3-4.

Figure 3-4
Municipality of North Middlesex
Summary of Water, Wastewater, and Stormwater 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
Water					
Water Facilities	4,379,500	724,000			201,048
Watermains	257,421,400	494,000	3,908,000	260,200,140	9,967,418
Hydrants	1,099,000	532,000			29,938
Meters	1,208,240	-			65,910
Total Water	**264,108,140**	**1,750,000**	**3,908,000**	**260,200,140**	**10,264,314**
Wastewater					
Wastewater Facilities	17,269,000	703,932	13,169,568	39,987,176	680,920
Sanitary Sewers	35,887,745	-			1,362,191
Total Wastewater	**53,156,745**	**703,932**	**13,169,568**	**39,987,176**	**2,043,111**
Stormwater					
Stormwater Linear	34,998,000	-	-	34,998,000	1,363,151
Total Stormwater	**34,998,000**	**-**	**-**	**34,998,000**	**1,363,151**
Total	**352,262,884**	**2,453,932**	**17,077,568**	**335,185,316**	**13,670,575**

Investment per customer is $112,386 for water and $44,260 for wastewater and $28,687 for stormwater

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

- approximate age;
- material type;
- main lengths;
- diameter of the mains;
- estimated useful life; and
- estimated replacement costs.

Summaries of water, wastewater, and stormwater asset replacement are shown on Figures 3-5, 3-6, and 3-7. These figures show when the assets are due to be replaced based on an average useful life and the cost of replacement in 2019 dollars.

As noted earlier, the Municipality will be undertaking a detailed asset management plan for water and wastewater services. The results of this evaluation may vary from the results provided herein. At that time, the results of the plans can be considered in light of the capital plan provided herein.

Figure 3-5
Municipality of North Middlesex
Summary of Water Infrastructure Replacement (2019 $)

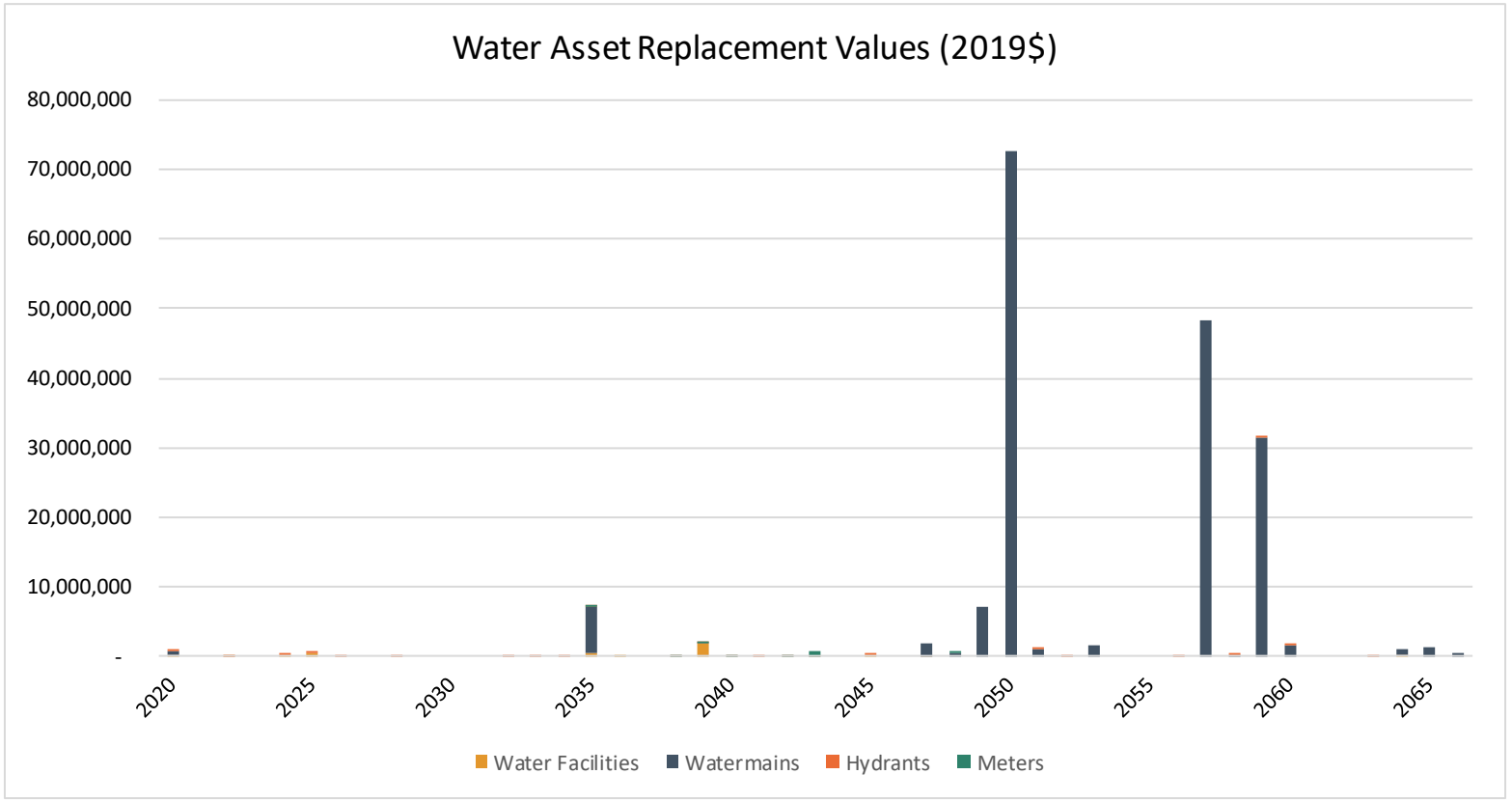


Figure 3-6
Municipality of North Middlesex
Summary of Wastewater Infrastructure Replacement (2019 $)

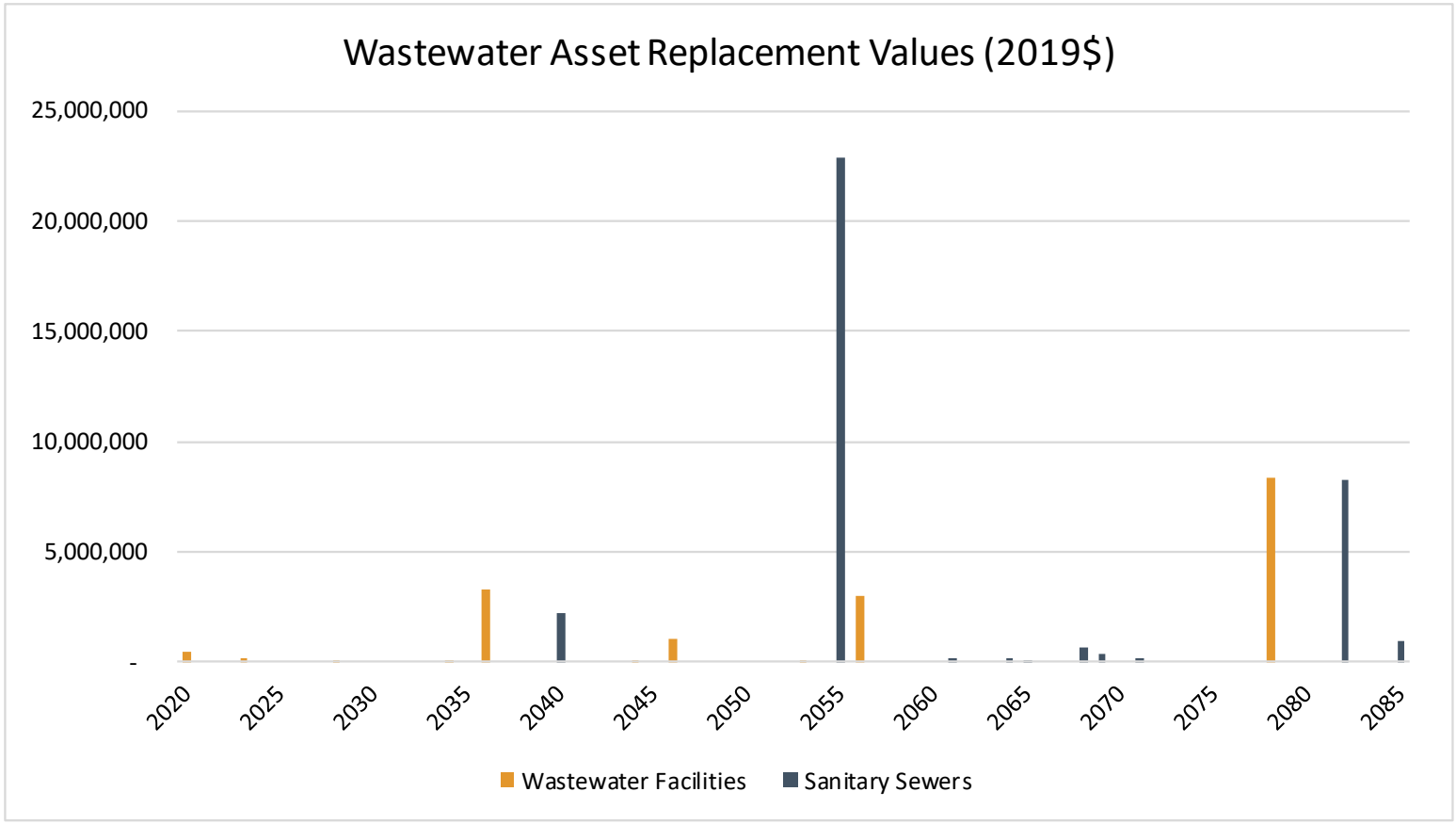
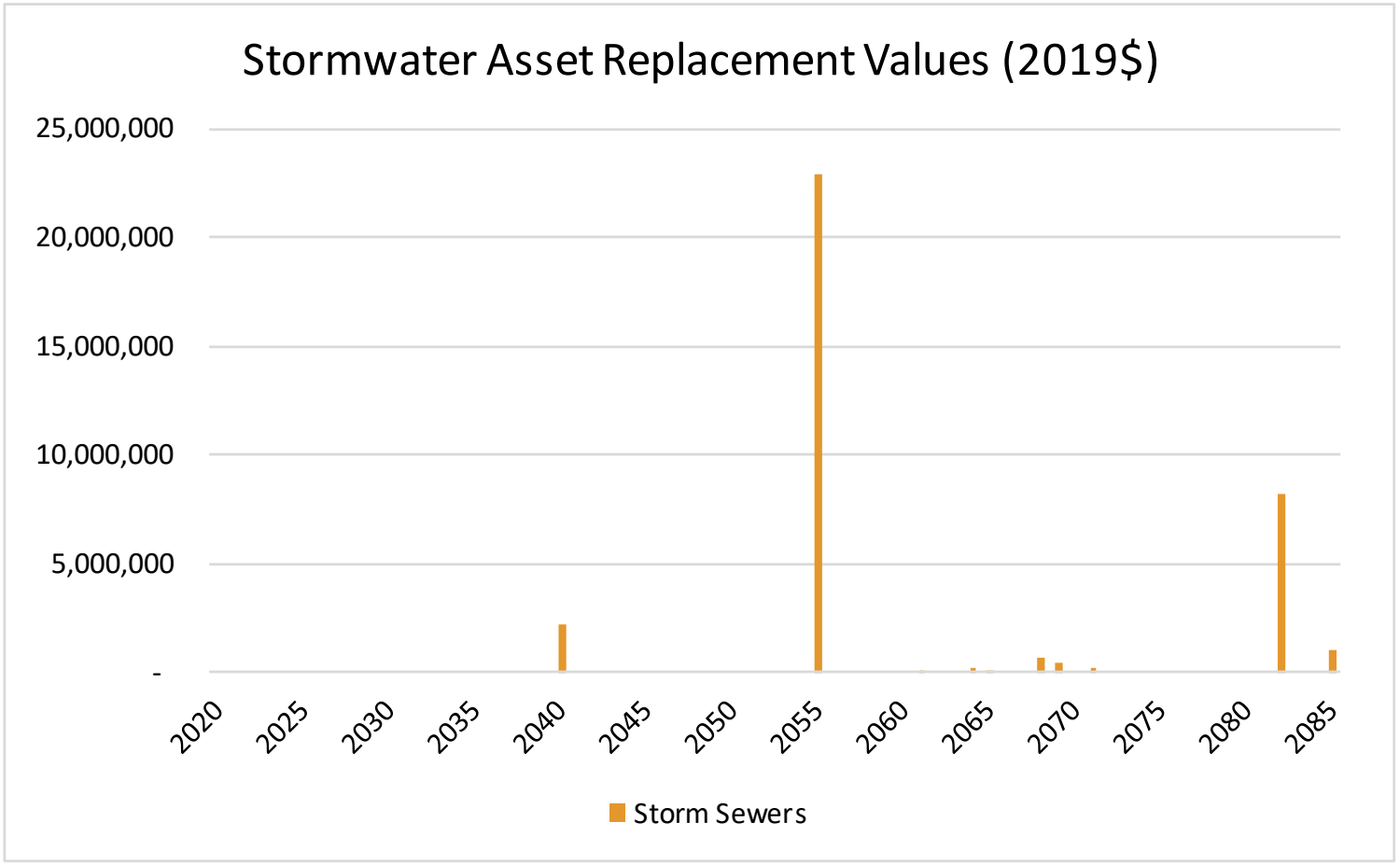


Figure 3-7
Municipality of North Middlesex
Summary of Stormwater Infrastructure Replacement (2019 $)



Chapter 4
Capital Cost Financing Options

4. Capital Cost Financing Options

4.1 Summary of Capital Cost Financing Alternatives

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
• *Development Charges Act, 1997*	4.2
• *Municipal Act*	4.3
○ Fees and Charges	
○ Sewer and Water Area Charges	
○ Connection Fees	
○ Local Improvements	

Recovery Methods	Section Reference
• *Grant Funding*	4.4
• *Existing Reserves/Reserve Funds*	4.5
• *Debenture Financing*	4.6
• *Infrastructure Ontario*	4.7

4.2 Development Charges Act, 1997

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.

4.3 Municipal Act

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 Grant Funding Availability

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

The Municipality has established reserves and reserve funds for water, wastewater, and stormwater costs. The following table summarizes the water, wastewater, and stormwater reserves utilized in this analysis and their respective balances at December 31, 2019 (estimated):

Reserve	Estimated Dec. 31, 2019
Water	
Capital Reserve	1,503,638
Development Charges Reserve Fund	23,540
Lifecycle Reserve Fund	-
Wastewater	
Capital Reserve	535,036
Development Charges Reserve Fund	466,661
Lifecycle Reserve Fund	-
Stormwater	
Capital Reserve	-
Development Charges Reserve Fund	20,220
Lifecycle Reserve Fund	-

Note: The water reserves owe $448,957 to tax-supported reserves and the wastewater reserves owe $3,131,682 to tax-supported reserves. The rate forecast for water and wastewater provide for payback of these balances over a 5-year period.

4.6 Debenture Financing

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 Municipality of North Middlesex's 2018 calculation on Debt Capacity is shown on Schedule 81 of the Municipality's most recent Financial Information Return (F.I.R.). This calculates to the Municipality's estimated annual repayment limit of approximately $2.59 million. Based upon 20-year financing at an assumed rate of 3.25%, the available debt for the Municipality is approximately $37.60 million.

4.7 Infrastructure Ontario

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 Municipality will require debt financing for the capital projects identified.

4.8 Recommended Capital Financing Approach

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

Description	Option 1 - 90% Base Charge, 10% Volume		Option 2 - Flat Rate		Stormwater
	Water 2020 to 2029	Wastewater 2020 to 2029	Water 2020 to 2029	Wastewater 2020 to 2029	Stormwater 2020 to 2029
Capital Financing					
Provincial/Federal Grants	-	1,100,000	-	1,100,000	-
Development Charges Reserve Fund	-	-	-	-	-
Non-Growth Related Debenture Requirements	7,646,000	10,831,439	6,161,500	12,170,540	-
Growth Related Debenture Requirements	-	7,918,260	-	7,918,260	-
Operating Contributions	-	-	-	-	-
Lifecycle Reserve Fund	998,000	-	998,000	-	-
Capital Reserve	6,482,000	4,417,301	7,966,500	3,078,200	320,000
Total Capital Financing	**15,126,000**	**24,267,000**	**15,126,000**	**24,267,000**	**320,000**

Tables 4-1 to 4-5 provide for the full capital expenditure and funding program by year for water, wastewater, and stormwater.

Table 4-1
Municipality of North Middlesex
Capital Budget Forecast – Water (inflated $)
Option 1 – 90% Base Charge, 10% Volume (in excess of 250 cu.m)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
SCADA IMPLEMNTATION West Williams Booster station	153,000	153,000	-	-	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Parkhill Resevoir	449,000	-	78,000	371,000	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	378,000	-	-	80,000	298,000	-	-	-	-	-	-
METER PIT INSTALLTIONS	1,966,000	180,000	183,000	187,000	191,000	194,000	198,000	202,000	206,000	210,000	215,000
WATER DISTRIBUTION MASTER PLAN	51,000	51,000	-	-	-	-	-	-	-	-	-
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	306,000	306,000	-	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	140,000	-	140,000	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	129,000	-	-	129,000	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive	2,287,000	-	-	-	2,287,000	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	262,000	-	-	-	-	262,000	-	-	-	-	-
WATER TOWER INSTALLATION	5,229,000	357,000	3,121,000	1,751,000	-	-	-	-	-	-	-
MCGILIVARAY BOOSTER STATION	29,000	-	-	-	-	-	-	-	29,000	-	-
MT.CARMEL RESEVOIR	176,000	-	13,000	27,000	22,000	31,000	83,000	-	-	-	-
PARKHILL RESEVOIR	529,000	128,000	27,000	34,000	58,000	63,000	78,000	-	141,000	-	-
Waterline Takeoffs	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Lifecycle:	-	-	-	-	-	-	-	-	-	-	-
Water Facilities	798,000	112,000	-	32,000	-	153,000	501,000	-	-	-	-
Hydrants	569,000	257,000	-	7,000	-	185,000	79,000	16,000	-	25,000	-
Total Capital Expenditures	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**
Capital Financing											
Provincial/Federal Grants	-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	7,646,000	281,000	1,549,500	1,885,500	2,502,000	359,000	330,000	172,000	205,000	179,000	183,000
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	998,000	-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Water Capital Reserve	6,482,000	1,416,000	2,168,500	852,500	516,000	357,000	198,000	202,000	347,000	210,000	215,000
Total Capital Financing	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**

Table 4-2
Municipality of North Middlesex
Capital Budget Forecast – Wastewater (inflated $)
Option 1 – 90% Base Charge, 10% Volume (in excess of 250 cu.m)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
WASTEWATER COLLECTION MASTER PLAN	36,000	36,000	-	-	-	-	-	-	-	-	-
WASTEWATER COLLECTION WORKS	311,000	42,000	28,000	28,000	29,000	29,000	30,000	30,000	31,000	32,000	32,000
PARKHILL WWTP	18,853,000	2,040,000	8,323,000	8,490,000	-	-	-	-	-	-	-
BEAR CREEK PUMPING STATION	189,000	4,000	7,000	27,000	26,000	10,000	-	115,000	-	-	-
NEW ONTARIO PUMPING STATION	216,000	29,000	7,000	27,000	26,000	10,000	-	-	117,000	-	-
WILLIAM ST PUMPING STATION	340,000	56,000	59,000	64,000	11,000	11,000	19,000	-	-	120,000	-
VICTORIA ST PUMPING STATION	580,000	4,000	4,000	4,000	438,000	4,000	4,000	-	-	-	122,000
STATION ST PUMPING STATION	270,000	-	-	-	-	138,000	113,000	6,000	6,000	7,000	-
AC WWTP	3,472,000	99,000	561,000	45,000	101,000	725,000	373,000	380,000	388,000	396,000	404,000
Total Capital Expenditures	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**
Capital Financing											
Provincial/Federal Gas Tax	1,100,000	1,100,000									
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	10,831,439	-	5,151,077	5,101,362	579,000	-	-	-	-	-	-
Growth Related Debenture Requirements	7,918,260	856,800	3,495,660	3,565,800	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Wastewater Capital Reserve	4,417,301	353,200	342,263	17,838	52,000	927,000	539,000	531,000	542,000	555,000	558,000
Total Capital Financing	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**

Table 4-3
Municipality of North Middlesex
Capital Budget Forecast – Water (inflated $)
Option 2 – Flat Rate (Volume Rate in excess of 250 cu.m)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
SCADA IMPLEMNTATION West Williams Booster station	153,000	153,000	-	-	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Parkhill Resevoir	449,000	-	78,000	371,000	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	378,000	-	-	80,000	298,000	-	-	-	-	-	-
METER PIT INSTALLTIONS	1,966,000	180,000	183,000	187,000	191,000	194,000	198,000	202,000	206,000	210,000	215,000
WATER DISTRIBUTION MASTER PLAN	51,000	51,000	-	-	-	-	-	-	-	-	-
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	306,000	306,000	-	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	140,000	-	140,000	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	129,000	-	-	129,000	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	2,287,000	-	-	-	2,287,000	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	262,000	-	-	-	-	262,000	-	-	-	-	-
WATER TOWER INSTALLATION	5,229,000	357,000	3,121,000	1,751,000	-	-	-	-	-	-	-
MCGILIVARAY BOOSTER STATION	29,000	-	-	-	-	-	-	-	29,000	-	-
MT.CARMEL RESEVOIR	176,000	-	13,000	27,000	22,000	31,000	83,000	-	-	-	-
PARKHILL RESEVOIR	529,000	128,000	27,000	34,000	58,000	63,000	78,000	-	141,000	-	-
Waterline Takeoffs	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Lifecycle:	-	-	-	-	-	-	-	-	-	-	-
Water Facilities	798,000	112,000	-	32,000	-	153,000	501,000	-	-	-	-
Hydrants	569,000	257,000	-	7,000	-	185,000	79,000	16,000	-	25,000	-
Total Capital Expenditures	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**
Capital Financing											
Provincial/Federal Grants	-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	6,161,500	-	1,621,500	1,770,000	2,375,500	219,000	175,500	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	998,000	-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Water Capital Reserve	7,966,500	1,697,000	2,096,500	968,000	642,500	497,000	352,500	374,000	552,000	389,000	398,000
Total Capital Financing	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**

Table 4-4
Municipality of North Middlesex
Capital Budget Forecast – Wastewater (inflated $)
Option 2 – Flat Rate (Volume Rate in excess of 250 cu.m)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
WASTEWATER COLLECTION MASTER PLAN	36,000	36,000	-	-	-	-	-	-	-	-	-
WASTEWATER COLLECTION WORKS	311,000	42,000	28,000	28,000	29,000	29,000	30,000	30,000	31,000	32,000	32,000
PARKHILL WWTP	18,853,000	2,040,000	8,323,000	8,490,000	-	-	-	-	-	-	-
BEAR CREEK PUMPING STATION	189,000	4,000	7,000	27,000	26,000	10,000	-	115,000	-	-	-
NEW ONTARIO PUMPING STATION	216,000	29,000	7,000	27,000	26,000	10,000	-	-	117,000	-	-
WILLIAM ST PUMPING STATION	340,000	56,000	59,000	64,000	11,000	11,000	19,000	-	-	120,000	-
VICTORIA ST PUMPING STATION	580,000	4,000	4,000	4,000	438,000	4,000	4,000	-	-	-	122,000
STATION ST PUMPING STATION	270,000	-	-	-	-	138,000	113,000	6,000	6,000	7,000	-
AC WWTP	3,472,000	99,000	561,000	45,000	101,000	725,000	373,000	380,000	388,000	396,000	404,000
Total Capital Expenditures	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**
Capital Financing											
Provincial/Federal Gas Tax	1,100,000	1,100,000									
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	12,170,540	-	5,493,340	5,119,200	631,000	927,000	-	-	-	-	-
Growth Related Debenture Requirements	7,918,260	856,800	3,495,660	3,565,800	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Wastewater Capital Reserve	3,078,200	353,200	-	-	-	-	539,000	531,000	542,000	555,000	558,000
Total Capital Financing	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**

Table 4-5
Municipality of North Middlesex
Capital Budget Forecast – Stormwater (inflated $)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
STORMWATER COLLECTION MASTER PLAN	284,000	84,000	40,000	95,000	43,000	22,000	-	-	-	-	-
WESTWOOD ESTATES STORM POND	36,000	-	-	-	-	-	-	-	-	18,000	18,000
Total Capital Expenditures	**320,000**	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Capital Financing											
Provincial/Federal Grants	-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Stormwater Reserve	320,000	84,000	40,000	95,000	43,000	22,000	-	-	-	18,000	18,000
Total Capital Financing	**320,000**	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**

Chapter 5
Overview of Expenditures and Revenues

5. Overview of Expenditures and Revenues

5.1 Water Operating Expenditures

In this report, the forecast water budget figures (2020 to 2029) are based on the 2019 operating budgets. The costs for each component of the operating budget have been provided by staff which establishes forecast inflationary adjustments. Most of the expenditures have been assumed to increase from 3% to 5% annually. Note that annual contributions have been provided to the capital reserves in order to balance rate increases with the need for additional debt to finance the capital program. Also included are any debenture expenditures and contributions to reserve funds.

5.2 Water Operating Revenues

The Municipality has miscellaneous revenue sources to help contribute towards operating expenditures. These miscellaneous revenues, including water/sewer final reads, returned cheque charges, utility penalty charges, and other revenues have been assumed to increase 2% per year over the forecast period. Base charges for the Municipality are discussed further in Chapter 6. Tables 5-1 and 5-2 provide for the operating budget for the water system.

Table 5-1
Municipality of North Middlesex
Operating Budget Forecast – Water (inflated $)
Option 1 – 90% Base Charge, 10% Volume (in excess of 250 cu.m)

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Operating Costs										
Salaries & Wages	118,174	121,129	124,157	127,261	130,442	133,703	137,046	140,472	143,984	147,584
Mileage	400	408	416	424	433	442	450	459	469	478
Meal Expenses - all	250	255	260	265	271	276	282	287	293	299
Confrence & Conventions	900	918	936	955	974	994	1,014	1,034	1,054	1,076
Office Supplies - office/shop	250	255	260	265	271	276	282	287	293	299
Computer Supplies	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	250	258	265	273	281	290	299	307	317	326
County IT Proportional Share	500	515	530	546	563	580	597	615	633	652
Education & Training - all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier - ALL	150	153	156	159	162	166	169	172	176	179
Memberships - ALL	1,000	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195
Advertising	250	255	260	265	271	276	282	287	293	299
Telephone - office/shop	125	130	135	141	146	152	158	164	171	178
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Materials Purchased misc shop supplies	500	515	530	546	563	580	597	615	633	652
Meter Pits	79,250	81,628	84,076	86,599	89,197	91,872	94,629	97,468	100,392	103,403
Vehicle Maintenance	1,750	1,803	1,857	1,912	1,970	2,029	2,090	2,152	2,217	2,283
Vehicle Fuel	4,900	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871
Vehicle Replacement	12,000	12,480	12,979	13,498	14,038	14,600	15,184	15,791	16,423	17,080
Equip Repairs/Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Small Tools	1,000	1,300	1,690	2,197	2,856	3,713	4,827	6,275	8,157	10,604
Service/Curb Stop Repairs	41,795	43,258	44,772	46,339	47,961	49,639	51,377	53,175	55,036	56,962
Backflow Program	20,475	21,192	21,933	22,701	23,496	24,318	25,169	26,050	26,962	27,905
Road Repair & Restoration	27,500	28,463	29,459	30,490	31,557	32,661	33,805	34,988	36,212	37,480
Meter Reading/Billing	14,520	14,702	14,888	15,078	15,272	15,470	15,673	15,880	16,091	16,307
Water Meter Miantenance	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Valve Maintenance	62,390	64,574	66,834	69,173	71,594	74,100	76,693	79,378	82,156	85,031
Final Reads	5,550	-	-	-	-	-	-	-	-	-
Watermain Breaks	56,000	57,960	59,989	62,088	64,261	66,510	68,838	71,248	73,741	76,322
Water Line Maintenance	41,750	43,211	44,724	46,289	47,909	49,586	51,321	53,118	54,977	56,901
Generator Maintenance & Inspection	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Hydrant Maintenance	25,000	25,875	26,781	27,718	28,688	29,692	30,731	31,807	32,920	34,072
Program Support Costs	1,500	1,553	1,607	1,663	1,721	1,782	1,844	1,908	1,975	2,044
SCADA Support/Maintenance	11,590	11,996	12,415	12,850	13,300	13,765	14,247	14,746	15,262	15,796
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
Water Loss Identification	49,920	51,667	53,476	55,347	57,284	59,289	61,364	63,512	65,735	68,036
Photocopier	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance (Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Hydro	59,648	61,736	63,897	66,133	68,448	70,844	73,323	75,889	78,546	81,295
Insurance Premiums	15,940	16,497	17,075	17,672	18,291	18,931	19,594	20,280	20,989	21,724
Building Repairs & Maintenance	9,000	9,315	9,641	9,978	10,328	10,689	11,063	11,451	11,851	12,266
Telephone	6,240	6,365	6,492	6,622	6,754	6,889	7,027	7,168	7,311	7,457
Water Purchased	700,310	724,663	749,900	776,030	802,868	830,408	858,845	888,189	909,564	931,728
Equipment Repairs & Maintenance	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Contracted Services	575,171	593,236	611,935	631,287	651,318	672,049	693,505	715,713	738,698	762,487
Disruptions	60,000	62,100	64,274	66,523	68,851	71,261	73,755	76,337	79,009	81,774
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Contracted Services-Equip. Exp.	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Customer Acct Write Offs	200	200	200	200	200	200	200	200	200	200
Property Taxes	1,172	2,461	2,584	2,714	2,849	2,992	3,141	3,298	3,463	3,636
Sub Total Operating	**2,060,134**	**2,123,395**	**2,193,885**	**2,266,915**	**2,342,388**	**2,420,395**	**2,501,249**	**2,585,095**	**2,663,217**	**2,744,566**
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related										
Existing Debt (Interest) - Non-Growth Related										
New Non-Growth Related Debt (Principal)	-	5,671	37,127	76,386	129,363	140,813	152,049	160,462	169,814	178,946
New Non-Growth Related Debt (Interest)	-	9,133	59,307	119,379	198,212	205,675	211,823	212,472	213,919	214,218
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	1,288,187	1,149,154	1,047,789	714,709	559,110	403,946	517,920	690,171	545,214	535,242
Sub Total Capital Related	**1,288,187**	**1,163,957**	**1,144,223**	**910,474**	**886,685**	**750,434**	**881,793**	**1,063,105**	**928,948**	**928,405**
Total Expenditures	**3,348,321**	**3,287,352**	**3,338,108**	**3,177,389**	**3,229,073**	**3,170,828**	**3,383,042**	**3,648,200**	**3,592,164**	**3,672,971**
Revenues										
Base Charge	2,824,264	3,001,865	3,181,977	3,372,895	3,575,269	3,789,785	4,017,172	4,258,203	4,513,695	4,784,517
Other Revenue		-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF formula	149,000	152,000	155,000	158,100	161,300	164,500	167,800	171,200	174,600	178,100
Water/Sewer Final Reads	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
Returned Cheque Charges	200	200	200	200	200	200	200	200	200	200
Utility Penalty Charges	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300
Sale of Waterline Parts and Meters	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Misc. Utility Revenue	200	200	200	200	200	200	200	200	200	200
Water Connection & Insp. Fees	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
Reconnection Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Water Capital Reserve	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**3,057,364**	**3,239,665**	**3,424,477**	**3,620,295**	**3,827,669**	**4,047,185**	**4,279,672**	**4,526,003**	**4,786,895**	**5,063,217**
Water Billing Recovery - Operating	**290,957**	**47,687**	**(86,369)**	**(442,906)**	**(598,596)**	**(876,357)**	**(896,631)**	**(877,803)**	**(1,194,730)**	**(1,390,245)**
Lifecycle Reserve Contribution ($)	1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Water Billing Recovery - Total	**292,220**	**310,033**	**327,649**	**348,787**	**369,926**	**391,065**	**415,726**	**440,388**	**468,573**	**496,758**

Table 5-2
Municipality of North Middlesex
Operating Budget Forecast – Water (inflated $)
Option 2 – Flat Rate (Volume Rate in excess of 250 cu.m)

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Operating Costs										
Salaries & Wages	118,174	121,129	124,157	127,261	130,442	133,703	137,046	140,472	143,984	147,584
Mileage	400	408	416	424	433	442	450	459	469	478
Meal Expenses - all	250	255	260	265	271	276	282	287	293	299
Confrence & Conventions	900	918	936	955	974	994	1,014	1,034	1,054	1,076
Office Supplies - office/shop	250	255	260	265	271	276	282	287	293	299
Computer Supplies	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	250	258	265	273	281	290	299	307	317	326
County IT Proportional Share	500	515	530	546	563	580	597	615	633	652
Education & Training - all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier - ALL	150	153	156	159	162	166	169	172	176	179
Memberships - ALL	1,000	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195
Advertising	250	255	260	265	271	276	282	287	293	299
Telephone - office/shop	125	130	135	141	146	152	158	164	171	178
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Materials Purchased misc shop supplies	500	515	530	546	563	580	597	615	633	652
Meter Pits	79,250	81,628	84,076	86,599	89,197	91,872	94,629	97,468	100,392	103,403
Vehicle Maintenance	1,750	1,803	1,857	1,912	1,970	2,029	2,090	2,152	2,217	2,283
Vehicle Fuel	4,900	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871
Vehicle Replacement	12,000	12,480	12,979	13,498	14,038	14,600	15,184	15,791	16,423	17,080
Equip Repairs/Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Small Tools	1,000	1,300	1,690	2,197	2,856	3,713	4,827	6,275	8,157	10,604
Service/Curb Stop Repairs	41,795	43,258	44,772	46,339	47,961	49,639	51,377	53,175	55,036	56,962
Backflow Program	20,475	21,192	21,933	22,701	23,496	24,318	25,169	26,050	26,962	27,905
Road Repair & Restoration	27,500	28,463	29,459	30,490	31,557	32,661	33,805	34,988	36,212	37,480
Meter Reading/Billing	14,520	14,702	14,888	15,078	15,272	15,470	15,673	15,880	16,091	16,307
Water Meter Miantenance	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Valve Maintenance	62,390	64,574	66,834	69,173	71,594	74,100	76,693	79,378	82,156	85,031
Final Reads	5,550	-	-	-	-	-	-	-	-	-
Watermain Breaks	56,000	57,960	59,989	62,088	64,261	66,510	68,838	71,248	73,741	76,322
Water Line Maintenance	41,750	43,211	44,724	46,289	47,909	49,586	51,321	53,118	54,977	56,901
Generator Maintenance & Inspection	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Hydrant Maintenance	25,000	25,875	26,781	27,718	28,688	29,692	30,731	31,807	32,920	34,072
Program Support Costs	1,500	1,553	1,607	1,663	1,721	1,782	1,844	1,908	1,975	2,044
SCADA Support/Maintenance	11,590	11,996	12,415	12,850	13,300	13,765	14,247	14,746	15,262	15,796
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
Water Loss Identification	49,920	51,667	53,476	55,347	57,284	59,289	61,364	63,512	65,735	68,036
Photocopier	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance (Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Hydro	59,648	61,736	63,897	66,133	68,448	70,844	73,323	75,889	78,546	81,295
Insurance Premiums	15,940	16,497	17,075	17,672	18,291	18,931	19,594	20,280	20,989	21,724
Building Repairs & Maintenance	9,000	9,315	9,641	9,978	10,328	10,689	11,063	11,451	11,851	12,266
Telephone	6,240	6,365	6,492	6,622	6,754	6,889	7,027	7,168	7,311	7,457
Water Purchased	700,310	724,663	749,900	776,030	802,868	830,408	858,845	888,189	909,564	931,728
Equipment Repairs & Maintenance	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Contracted Services	575,171	593,236	611,935	631,287	651,318	672,049	693,505	715,713	738,698	762,487
Disruptions	60,000	62,100	64,274	66,523	68,851	71,261	73,755	76,337	79,009	81,774
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Contracted Services-Equip. Exp.	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Customer Acct Write Offs	200	200	200	200	200	200	200	200	200	200
Property Taxes	1,172	2,461	2,584	2,714	2,849	2,992	3,141	3,298	3,463	3,636
Sub Total Operating	**2,060,134**	**2,123,395**	**2,193,885**	**2,266,915**	**2,342,388**	**2,420,395**	**2,501,249**	**2,585,095**	**2,663,217**	**2,744,566**
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)	-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related										
Existing Debt (Interest) - Non-Growth Related										
New Non-Growth Related Debt (Principal)	-	-	32,725	69,510	119,711	128,021	135,724	140,135	144,689	149,391
New Non-Growth Related Debt (Interest)	-	-	52,699	109,160	184,105	187,332	188,875	184,464	179,909	175,207
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	1,388,404	1,261,763	1,163,460	841,265	698,687	558,904	687,249	876,646	749,016	757,083
Sub Total Capital Related	**1,388,404**	**1,261,763**	**1,248,883**	**1,019,935**	**1,002,502**	**874,256**	**1,011,847**	**1,201,244**	**1,073,614**	**1,081,681**
Total Expenditures	**3,448,538**	**3,385,158**	**3,442,769**	**3,286,850**	**3,344,890**	**3,294,651**	**3,513,096**	**3,786,339**	**3,736,831**	**3,826,247**
Revenues										
Base Charge										
Other Revenue		-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF formula	149,000	152,000	155,000	158,100	161,300	164,500	167,800	171,200	174,600	178,100
Water/Sewer Final Reads	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
Returned Cheque Charges	200	200	200	200	200	200	200	200	200	200
Utility Penalty Charges	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300
Sale of Waterline Parts and Meters	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Misc. Utility Revenue	200	200	200	200	200	200	200	200	200	200
Water Connection & Insp. Fees	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
Reconnection Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Water Capital Reserve	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**233,100**	**237,800**	**242,500**	**247,400**	**252,400**	**257,400**	**262,500**	**267,800**	**273,200**	**278,700**
Water Billing Recovery - Operating	**3,215,438**	**3,147,358**	**3,200,269**	**3,039,450**	**3,092,490**	**3,037,251**	**3,250,596**	**3,518,539**	**3,463,631**	**3,547,547**
Lifecycle Reserve Contribution ($)	1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Water Billing Recovery - Total	**3,216,702**	**3,409,704**	**3,614,286**	**3,831,143**	**4,061,012**	**4,304,673**	**4,562,953**	**4,836,730**	**5,126,934**	**5,434,550**

5.3 Wastewater Operating Expenditures

In this report, the forecast wastewater budget figures (2020 to 2029) are based on the 2019 operating budgets. The costs for each component of the operating budget have been provided by staff which establishes forecast inflationary adjustments. Most of the expenditures have been assumed to increase from 3% to 5% annually. Note that annual contributions have been provided to the capital reserves in order to balance rate increases with the need for additional debt to finance the capital program. Also included are any debenture expenditures and contributions to reserve funds.

5.4 Wastewater Operating Revenues

The Municipality has miscellaneous revenue sources to help contribute towards operating expenditures. These miscellaneous revenues, including utility penalty charges, OCIF grants, connection permits, and debt paid by ratepayers have been assumed to increase 2% per year over the forecast period. Base charges for the Municipality are discussed further in Chapter 6. Tables 5-3 and 5-4 provide for the operating budget for the water system.

Table 5-3
Municipality of North Middlesex
Operating Budget Forecast – Wastewater (inflated $)
Option 1 – 90% Base Charge, 10% Volume (in excess of 250 cu.m)

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Operating Costs										
Ward 1										
Salaries & Wages	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Mileage	400	412	424	437	450	464	478	492	507	522
Meal Expenses- ALL	250	258	265	273	281	290	299	307	317	326
Confrence & Conventions	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Office Supplies-office/shop	250	258	265	273	281	290	299	307	317	326
Computer Supplies	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	250	258	265	273	281	290	299	307	317	326
Couty IT Proportional Share	500	515	530	546	563	580	597	615	633	652
Education & Training-all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	150	153	156	159	162	166	169	172	176	179
Memberships-ALL	1,000	1,027	1,055	1,083	1,113	1,143	1,175	1,207	1,240	1,274
Advertising/Communications	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Materials Purchased Misc Shop supplies	500	515	530	546	563	580	597	615	633	652
Photocopier	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance(Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Vehicle Fuel	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Hydro	9,261	9,693	10,146	10,653	241,186	253,245	265,907	279,202	293,163	307,821
Insurance Premiums	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Materials Purchased	500	518	536	554	574	594	615	636	658	681
Equipment Rental	500	518	536	554	574	594	615	636	658	681
Small Tools	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Sanitary Locates	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs	740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Generator Maintenance & Inspection	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Lagoon Chemical Discharge	60,000	68,775	72,214	-	-	-	-	-	-	-
Equip Repairs /Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Repairs & Maintenance (System)	23,000	23,805	24,638	25,501	26,393	27,317	28,273	29,262	30,287	31,347
Sewage Pump/Life Repairs & Maintenance	24,000	24,840	25,709	26,609	27,541	28,504	29,502	30,535	31,603	32,710
Contracted Services	64,505	36,231	37,499	207,003	207,003	207,003	207,003	207,003	207,003	207,003
Contracted Services-Equip. Exp.	66,000	68,310	70,701	73,175	75,737	78,387	81,131	83,970	86,909	89,951
Property Tax	9,283	9,515	9,774	10,041	10,315	10,596	10,886	11,183	11,489	11,804
Ward 2										
Salaries & Wages	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Confrence & Conventions	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Meal Expenses- ALL	250	258	265	273	281	290	299	307	317	326
Office Supplies-office/shop	250	258	265	273	281	290	299	307	317	326
Education & Training-all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	150	153	156	159	162	166	169	172	176	179
Advertising/Communications	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Photocopier	200	207	214	222	230	238	246	254	263	273
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Prog Maint & Enhance(Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Fuel	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Equipment Rental	500	518	536	554	574	594	615	636	658	681
Small Tools	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	7,871	8,146	8,432	8,727	9,032	9,348	9,675	10,014	10,365	10,727
Sanitary Locates	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs	740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	15,371	15,909	16,466	17,042	17,639	18,256	18,895	19,556	20,241	20,949
Sewer Debenture Debt - Interest	37,700	-	-	-	-	-	-	-	-	-
Hydro	228,643	239,659	251,226	263,371	276,123	289,513	303,572	318,335	333,835	350,110
Insurance Premiums	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Equip Repairs /Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Generator Maintenance & Inspection	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Equipment-Servicing & Inspection	15,750	16,301	16,872	17,462	18,073	18,706	19,361	20,038	20,740	21,466
Sewage Pump/Life Repairs & Maintenance	14,500	15,008	15,533	16,076	16,639	17,221	17,824	18,448	19,094	19,762
Contracted Services	236,703	214,455	221,961	229,730	237,770	246,092	254,706	263,620	272,847	282,397
Contracted Services-Equip. Exp.	8,500	8,798	9,105	9,424	9,754	10,095	10,449	10,814	11,193	11,585
Property Taxes	7,261	7,442	7,628	7,819	8,015	8,215	8,420	8,631	8,847	9,068
Sub Total Operating	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	17,292	88,402	163,239	168,544	174,022	179,678	185,517	191,547	197,772
New Growth Related Debt (Interest)	-	27,846	140,893	253,908	248,603	243,125	237,470	231,630	225,601	219,376
Existing Debt (Principal) - Non-Growth Related										
Existing Debt (Interest) - Non-Growth Related										
New Non-Growth Related Debt (Principal)	-	-	103,958	210,290	228,810	236,246	243,924	251,852	260,037	268,488
New Non-Growth Related Debt (Interest)	-	-	167,410	329,826	341,809	334,372	326,694	318,767	310,582	302,130
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	419,031	676,020	473,712	560,107	359,855	536,891	498,319	594,546	772,027	870,358
Sub Total Capital Related	**419,031**	**721,158**	**974,375**	**1,517,371**	**1,347,621**	**1,524,658**	**1,486,085**	**1,582,312**	**1,759,794**	**1,858,124**
Total Expenditures	**1,609,182**	**1,861,885**	**2,158,565**	**2,839,158**	**2,941,295**	**3,173,364**	**3,192,114**	**3,348,049**	**3,587,730**	**3,750,858**
Revenues										
Flat Rate User Charges	1,122,191	1,479,330	1,799,775	2,006,790	2,235,644	2,488,479	2,769,525	3,081,895	3,429,044	3,817,325
Ward 1										
Provincial Grants - OCIF Formula	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #1 Utility Penalty	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500
Debt Paid by Ratepayers	37,700									
Ward 2 & 4	-	-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF Formula	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #2 Utility Penalty	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500
Contributions from Development Charges Reserve	-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Contributions from Capital Reserve	-	-	-	-	-	-	-	-	-	-
Contributions from Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**1,313,391**	**1,680,968**	**2,188,570**	**2,586,637**	**2,818,691**	**3,074,727**	**3,358,973**	**3,674,743**	**4,025,292**	**4,416,973**
Wastewater Billing Recovery - Operating	**295,791**	**180,917**	**(30,005)**	**252,520**	**122,604**	**98,638**	**(166,859)**	**(326,694)**	**(437,562)**	**(666,115)**
Lifecycle Reserve Contribution ($)	100,000	224,240	442,209	166,729	303,692	334,704	607,247	777,651	899,089	1,138,211
Wastewater Billing Recovery - Total	**395,791**	**405,157**	**412,203**	**419,249**	**426,296**	**433,342**	**440,388**	**450,957**	**461,527**	**472,096**

Table 5-4
Municipality of North Middlesex
Operating Budget Forecast – Wastewater (inflated $)
Option 2 – Flat Rate (Volume Rate in excess of 250 cu.m)

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Operating Costs										
Ward 1										
Salaries & Wages	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Mileage	400	412	424	437	450	464	478	492	507	522
Meal Expenses- ALL	250	258	265	273	281	290	299	307	317	326
Confrence & Conventions	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Office Supplies-office/shop	250	258	265	273	281	290	299	307	317	326
Computer Supplies	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	250	258	265	273	281	290	299	307	317	326
Couty IT Proportional Share	500	515	530	546	563	580	597	615	633	652
Education & Training-all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	150	153	156	159	162	166	169	172	176	179
Memberships-ALL	1,000	1,027	1,055	1,083	1,113	1,143	1,175	1,207	1,240	1,274
Advertising/Communications	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Materials Purchased Misc Shop supplies	500	515	530	546	563	580	597	615	633	652
Photocopier	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance(Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Vehicle Fuel	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Hydro	9,261	9,693	10,146	10,653	241,186	253,245	265,907	279,202	293,163	307,821
Insurance Premiums	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Materials Purchased	500	518	536	554	574	594	615	636	658	681
Equipment Rental	500	518	536	554	574	594	615	636	658	681
Small Tools	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Sanitary Locates	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs	740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Generator Maintenance & Inspection	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Lagoon Chemical Discharge	60,000	68,775	72,214	-	-	-	-	-	-	-
Equip Repairs /Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Repairs & Maintenance (System)	23,000	23,805	24,638	25,501	26,393	27,317	28,273	29,262	30,287	31,347
Sewage Pump/Life Repairs & Maintenance	24,000	24,840	25,709	26,609	27,541	28,504	29,502	30,535	31,603	32,710
Contracted Services	64,505	36,231	37,499	207,003	207,003	207,003	207,003	207,003	207,003	207,003
Contracted Services-Equip. Exp.	66,000	68,310	70,701	73,175	75,737	78,387	81,131	83,970	86,909	89,951
Property Tax	9,283	9,515	9,774	10,041	10,315	10,596	10,886	11,183	11,489	11,804
Ward 2										
Salaries & Wages	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Confrence & Conventions	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Meal Expenses- ALL	250	258	265	273	281	290	299	307	317	326
Office Supplies-office/shop	250	258	265	273	281	290	299	307	317	326
Education & Training-all	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	150	153	156	159	162	166	169	172	176	179
Advertising/Communications	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Photocopier	200	207	214	222	230	238	246	254	263	273
Clothing Allowances & Safetywear	300	312	324	337	351	365	380	395	411	427
Prog Maint & Enhance(Keystone)	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Fuel	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Equipment Rental	500	518	536	554	574	594	615	636	658	681
Small Tools	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	7,871	8,146	8,432	8,727	9,032	9,348	9,675	10,014	10,365	10,727
Sanitary Locates	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs	740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	15,371	15,909	16,466	17,042	17,639	18,256	18,895	19,556	20,241	20,949
Sewer Debenture Debt - Interest	37,700	-	-	-	-	-	-	-	-	-
Hydro	228,643	239,659	251,226	263,371	276,123	289,513	303,572	318,335	333,835	350,110
Insurance Premiums	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Telephone-office/shop	63	65	68	70	73	76	79	82	86	89
Equip Repairs /Maintenance-shop	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Generator Maintenance & Inspection	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Equipment-Servicing & Inspection	15,750	16,301	16,872	17,462	18,073	18,706	19,361	20,038	20,740	21,466
Sewage Pump/Life Repairs & Maintenance	14,500	15,008	15,533	16,076	16,639	17,221	17,824	18,448	19,094	19,762
Contracted Services	236,703	214,455	221,961	229,730	237,770	246,092	254,706	263,620	272,847	282,397
Contracted Services-Equip. Exp.	8,500	8,798	9,105	9,424	9,754	10,095	10,449	10,814	11,193	11,585
Property Taxes	7,261	7,442	7,628	7,819	8,015	8,215	8,420	8,631	8,847	9,068
Sub Total Operating	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**
Capital-Related										
Existing Debt (Principal) - Growth Related										
Existing Debt (Interest) - Growth Related										
New Growth Related Debt (Principal)	-	17,292	88,402	163,239	168,544	174,022	179,678	185,517	191,547	197,772
New Growth Related Debt (Interest)	-	27,846	140,893	253,908	248,603	243,125	237,470	231,630	225,601	219,376
Existing Debt (Principal) - Non-Growth Related										
Existing Debt (Interest) - Non-Growth Related										
New Non-Growth Related Debt (Principal)	-	-	110,865	217,782	237,595	264,025	272,606	281,466	290,613	300,058
New Non-Growth Related Debt (Interest)	-	-	178,534	341,304	354,734	377,140	368,559	359,699	350,552	341,107
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	150,846	416,281	274,629	389,301	222,341	396,374	359,787	446,946	611,961	691,231
Sub Total Capital Related	**150,846**	**461,418**	**793,323**	**1,365,535**	**1,231,817**	**1,454,687**	**1,418,099**	**1,505,258**	**1,670,274**	**1,749,543**
Total Expenditures	**1,340,997**	**1,602,146**	**1,977,513**	**2,687,321**	**2,825,491**	**3,103,394**	**3,124,127**	**3,270,995**	**3,498,210**	**3,642,277**
Revenues										
Flat Rate User Charges										
Ward 1										
Provincial Grants - OCIF Formula	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #1 Utility Penalty	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500
Debt Paid by Ratepayers	37,700									
Ward 2 & 4	-	-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF Formula	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #2 Utility Penalty	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500
Contributions from Development Charges Reserve Fund	-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Contributions from Capital Reserve	-	-	-	-	-	-	-	-	-	-
Contributions from Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**191,200**	**201,638**	**388,795**	**579,848**	**583,048**	**586,248**	**589,448**	**592,848**	**596,248**	**599,648**
Wastewater Billing Recovery - Operating	**1,149,797**	**1,400,508**	**1,588,718**	**2,107,474**	**2,242,443**	**2,517,146**	**2,534,680**	**2,678,148**	**2,901,962**	**3,042,629**
Lifecycle Reserve Contribution ($)	100,000	224,227	442,202	167,156	305,142	336,150	603,945	774,340	895,775	1,134,881
Wastewater Billing Recovery - Total	**1,249,797**	**1,624,736**	**2,030,920**	**2,274,630**	**2,547,586**	**2,853,296**	**3,138,625**	**3,452,488**	**3,797,737**	**4,177,510**

5.5 Stormwater Operating Expenditures and Revenues

Currently, the stormwater charge is seeking to recover costs for capital costs only. The Municipality plans to prepare a stormwater master plan study in the near future which will provide a detailed breakdown of capital and operating costs. These costs may be included in a future update of the rate study, pending presentations to Council and the public. Revenue received from stormwater rates are transferred to the capital reserve to fund the capital projects. Additionally, annual amounts are transferred to the lifecycle reserve for ultimate replacement of existing assets.

Table 5-5
Municipality of North Middlesex
Operating Budget Forecast – Stormwater (inflated $)

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Capital-Related										
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	84,000	40,000	95,000	43,000	22,000				18,000	18,000
Transfer to Rate Stabilization Reserve	-	-	-	-	-	-	-	-	-	-
Sub Total Capital Related	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Total Expenditures	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Revenues										
Other Revenue		-	-	-	-	-	-	-	-	-
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Contributions from Rate Stabilization Reserve	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Stormwater Billing Recovery - Operating	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Lifecycle Reserve Contribution ($)	-	53,825	9,775	73,975	108,474	145,394	161,992	180,456	182,993	205,993
Stormwater Billing Recovery - Total	**84,000**	**93,825**	**104,775**	**116,975**	**130,474**	**145,394**	**161,992**	**180,456**	**200,993**	**223,993**

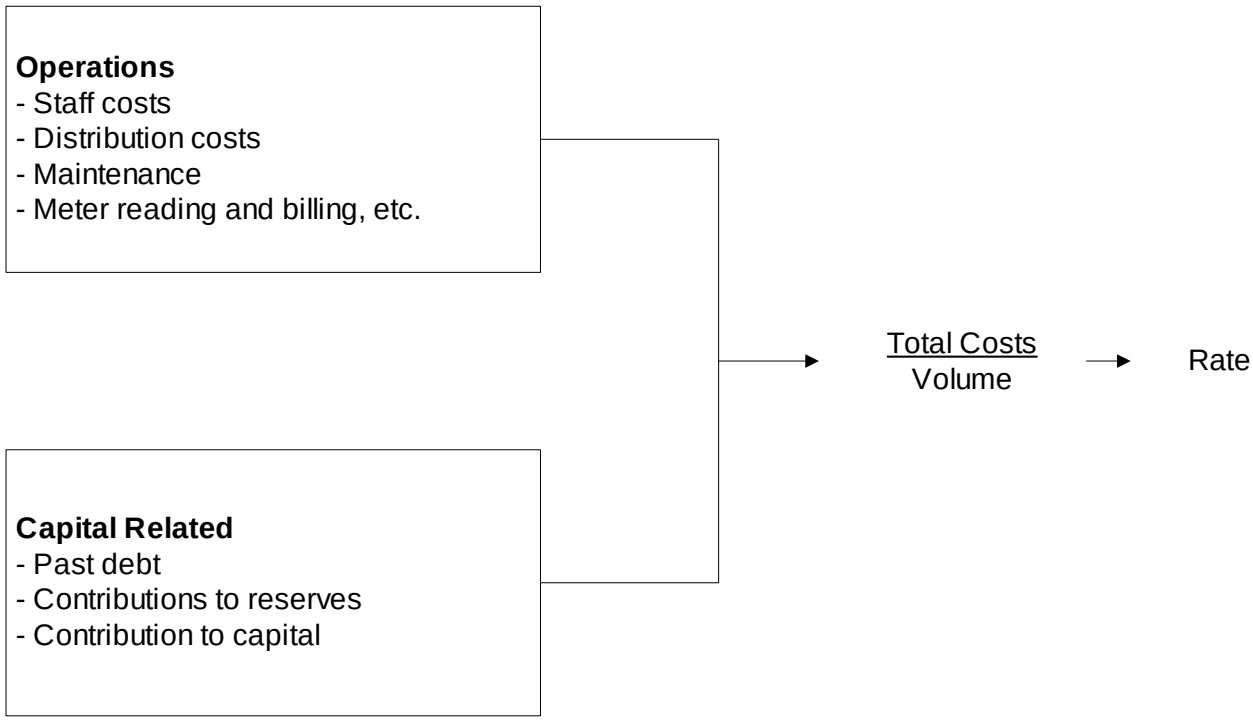
Chapter 6
Pricing Structures

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

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

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

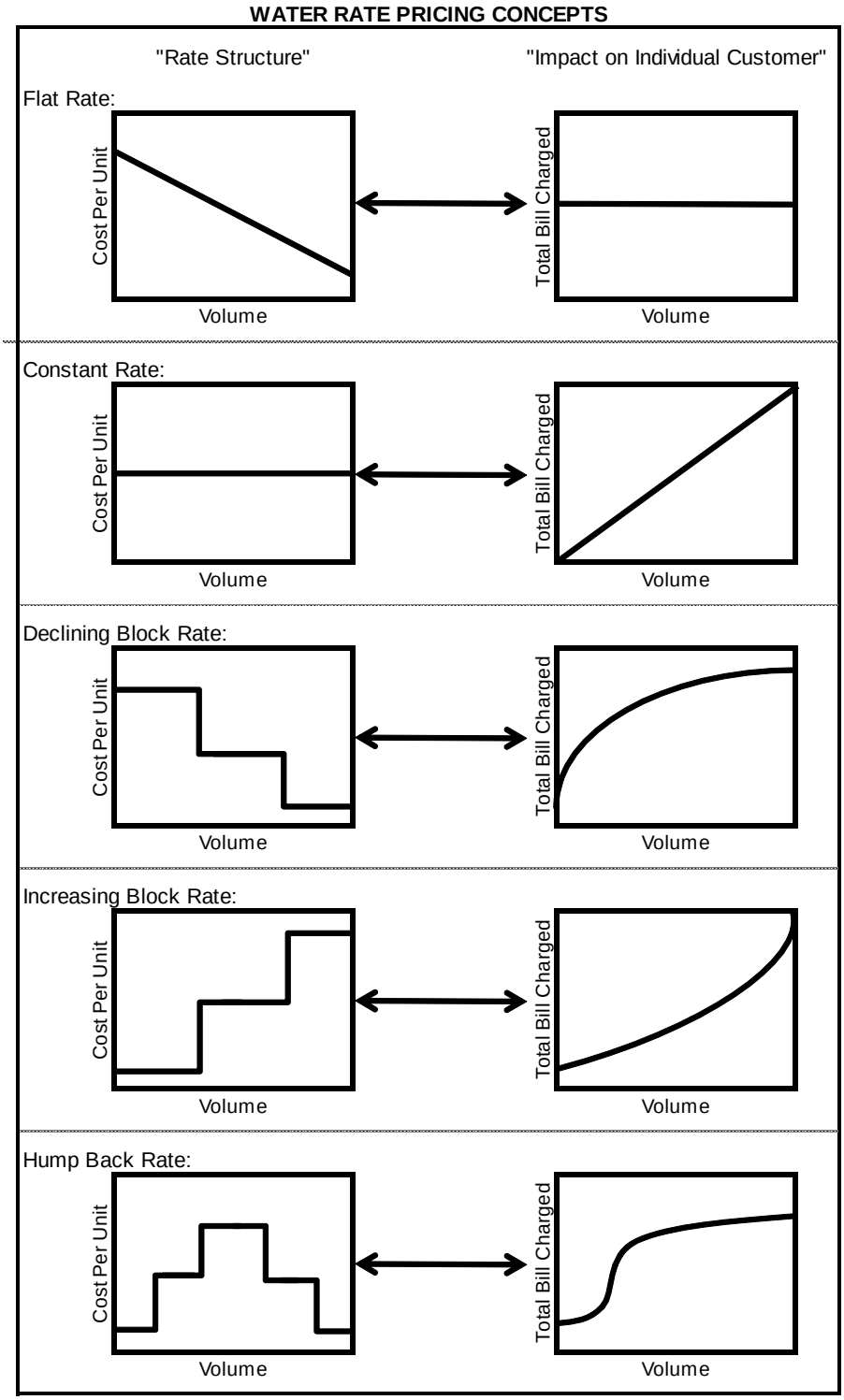
pricing range. Similarly, those whose consumption level is at the top end of a block have less incentive to reduce consumption.

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


WATER RATE PRICING CONCEPTS
"Rate Structure"
"Impact on Individual Customer"
Flat Rate:
Cost Per Unit
Volume
Total Bill Charged
Volume
Constant Rate:
Cost Per Unit
Volume
Total Bill Charged
Volume
Declining Block Rate:
Cost Per Unit
Volume
Total Bill Charged
Volume
Increasing Block Rate:
Cost Per Unit
Volume
Total Bill Charged
Volume
Hump Back Rate:
Cost Per Unit
Volume
Total Bill Charged
Volume

RATE STRUCTURE	COST PER UNIT AS VOLUME CONSUMPTION INCREASES	IMPACT ON CUSTOMER BILL AS VOLUME CONSUMPTION INCREASES
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 increases
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	Bill increases at a faster rate at the lower consumption amounts and then slows as volumes increase

6.4 Rate Structures in Ontario

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

Based on the foregoing, it is recommended that the rate structures be implemented as follows:

- Water and wastewater – two options have been provided:
  - Option 1 – Base charge and volume rate, whereby the base charge recovers 90% of the required revenue and the volume rate applies to usage above 250 cu.m per year; and
  - Option 2 – Flat rate with nominal volume rate, whereby the flat rate recovers 100% of the required revenue and the volume charge is imposed on volumes that exceed the average of the previous three years.
  - For both options, the base charges and flat rate are tiered based on anticipated 2018 annual volumes.
- Stormwater – flat rate per property.

As noted earlier, the needs for water are significant for the first half of the forecast period. In addition, the Municipality has an extensive amount of linear infrastructure for their number of customers. As a result, the lifecycle replacement costs are high. Hence rate increases are recommended to be substantial in the first year (anticipated increase in annual bill of 47% for Option 1, and 52% for Option 2).

The needs for wastewater are also large at the beginning of the forecast period. This is mainly related to the construction of a wastewater treatment plant in Parkhill to replace the existing lagoon system as well as to payback an internal loan from a tax-supported reserve. As a result, the recommended increases in the annual bill for wastewater in 2020 is 60% for both options.

In general, changes to a rate structure may provide a larger burden to one category of users over another. However, the base charges and flat rate provided in both options (for water and wastewater) are adjusted based on 2018 metered volume categories to ensure that the percentage impact on all bills is approximately the same. This structure provides an equitable distribution of the impacts as well as ensures security of revenue for the Municipality. For water in Option 1, the base charge is anticipated to recover approximately 90% of the required revenue in each year. For wastewater in Option 1, the base charge is anticipated to recover 74% in 2020 and increase to approximately 90% by 2029.

The stormwater rate has been introduced as a flat rate per property. The rates proposed are set to recover only capital costs related to stormwater. As noted above, the Municipality is planning on preparing a stormwater master plan in the near future which will provide total operating and capital costs applicable to stormwater services. The stormwater rate is proposed to be $68.29 annually in 2020 and increase at 10% per year to $161.03 annually in 2029.

For water in Option 1, the volume rates (as calculated in Chapter 7 and applicable to 250 cu.m per year and over) are anticipated to decrease by 55% in 2020 to $0.83 per cu.m. To meet the needs identified, annual increases of 6% are recommended which would provide for a rate of $1.41 per cu.m by 2029. For water in Option 2, as the flat rate provides for 100% of required revenues, a nominal $1.00 per cu.m is recommended for metered volumes in excess of the average volumes metered for the previous three years.

For wastewater in Option 1, the volume rates (as calculated in Chapter 7 and applicable to 250 cu.m per year and over) are anticipated to decrease by 41% to $1.12 per cu.m. To meet the needs identified for wastewater over the forecast period, 2% annual increases are recommended. For Option 2, similar to water, a nominal $1.00 per cu.m. is recommended for metered volumes in excess of the average volumes metered for the previous three years.

The forecast base charges for water (Option 1) are presented in Table 6-1 and the forecast base charges for wastewater (Option 1) are presented in Table 6-2.

Table 6-1
Municipality of North Middlesex
Base Charge Forecast – Water

Water	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350
New	-	10	19	19	19	19	19	19	19	19	19
Total Customers	**2,350**	**2,360**	**2,369**	**2,369**	**2,369**	**2,369**	**2,369**	**2,369**	**2,369**	**2,369**	**2,369**
Total Annual Revenue	**$1,915,460**	**$2,824,264**	**$3,001,865**	**$3,181,977**	**$3,372,895**	**$3,575,269**	**$3,789,785**	**$4,017,172**	**$4,258,203**	**$4,513,695**	**$4,784,517**

0 to 250	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,756	1,756
New	0	10	19	19	19	19	19	19	19	19	19
Subtotal Customers	**1,756**	**1,766**	**1,775**	**1,775**	**1,775**	**1,775**	**1,775**	**1,775**	**1,775**	**1,775**	**1,775**
Monthly Base Charge	$48.40	$71.15	$75.42	$79.94	$84.74	$89.82	$95.21	$100.92	$106.98	$113.40	$120.20
Annual Base Charge	$580.80	$853.78	$905.00	$959.30	$1,016.86	$1,077.87	$1,142.54	$1,211.10	$1,283.76	$1,360.79	$1,442.44
Total Annual Revenue	**$1,019,885**	**$1,507,769**	**$1,606,380**	**$1,702,762**	**$1,804,928**	**$1,913,224**	**$2,028,017**	**$2,149,698**	**$2,278,680**	**$2,415,401**	**$2,560,325**

250 to 300	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	137	137	137	137	137	137	137	137	137	137	137
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**137**	**137**	**137**	**137**	**137**	**137**	**137**	**137**	**137**	**137**	**137**
Monthly Base Charge	$61.90	$90.99	$96.45	$102.24	$108.37	$114.87	$121.77	$129.07	$136.82	$145.03	$153.73
Annual Base Charge	$742.78	$1,091.89	$1,157.40	$1,226.85	$1,300.46	$1,378.48	$1,461.19	$1,548.86	$1,641.80	$1,740.30	$1,844.72
Total Annual Revenue	**$101,761**	**$149,589**	**$158,564**	**$168,078**	**$178,162**	**$188,852**	**$200,183**	**$212,194**	**$224,926**	**$238,422**	**$252,727**

300 to 400	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	216	216	216	216	216	216	216	216	216	216	216
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**216**	**216**	**216**	**216**	**216**	**216**	**216**	**216**	**216**	**216**	**216**
Monthly Base Charge	$70.02	$102.93	$109.10	$115.65	$122.59	$129.94	$137.74	$146.00	$154.76	$164.05	$173.89
Annual Base Charge	$840.22	$1,235.13	$1,309.24	$1,387.79	$1,471.06	$1,559.32	$1,652.88	$1,752.05	$1,857.18	$1,968.61	$2,086.72
Total Annual Revenue	**$181,488**	**$266,788**	**$282,795**	**$299,763**	**$317,748**	**$336,813**	**$357,022**	**$378,443**	**$401,150**	**$425,219**	**$450,732**

400 to 500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	54	54	54	54	54	54	54	54	54	54	54
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**
Monthly Base Charge	$80.85	$118.84	$125.97	$133.53	$141.54	$150.04	$159.04	$168.58	$178.70	$189.42	$200.78
Annual Base Charge	$970.15	$1,426.12	$1,511.68	$1,602.38	$1,698.53	$1,800.44	$1,908.46	$2,022.97	$2,144.35	$2,273.01	$2,409.39
Total Annual Revenue	**$52,388**	**$77,010**	**$81,631**	**$86,529**	**$91,720**	**$97,224**	**$103,057**	**$109,241**	**$115,795**	**$122,743**	**$130,107**

500 to 600	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	27	27	27	27	27	27	27	27	27	27	27
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**
Monthly Base Charge	$91.67	$134.76	$142.84	$151.41	$160.50	$170.13	$180.34	$191.16	$202.63	$214.78	$227.67
Annual Base Charge	$1,100.07	$1,617.10	$1,714.13	$1,816.98	$1,926.00	$2,041.56	$2,164.05	$2,293.89	$2,431.52	$2,577.42	$2,732.06
Total Annual Revenue	**$29,702**	**$43,662**	**$46,281**	**$49,058**	**$52,002**	**$55,122**	**$58,429**	**$61,935**	**$65,651**	**$69,590**	**$73,766**

600 to 800	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	33	33	33	33	33	33	33	33	33	33	33
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**	**33**
Monthly Base Charge	$107.91	$158.63	$168.15	$178.24	$188.93	$200.27	$212.29	$225.02	$238.52	$252.84	$268.01
Annual Base Charge	$1,294.96	$1,903.58	$2,017.80	$2,138.87	$2,267.20	$2,403.23	$2,547.42	$2,700.27	$2,862.29	$3,034.02	$3,216.06
Total Annual Revenue	**$42,734**	**$62,818**	**$66,587**	**$70,583**	**$74,818**	**$79,307**	**$84,065**	**$89,109**	**$94,455**	**$100,123**	**$106,130**

800 to 1000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	22	22	22	22	22	22	22	22	22	22	22
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**
Monthly Base Charge	$129.57	$190.46	$201.89	$214.00	$226.84	$240.46	$254.88	$270.18	$286.39	$303.57	$321.78
Annual Base Charge	$1,554.80	$2,285.56	$2,422.69	$2,568.05	$2,722.14	$2,885.46	$3,058.59	$3,242.11	$3,436.63	$3,642.83	$3,861.40
Total Annual Revenue	**$34,206**	**$50,282**	**$53,299**	**$56,497**	**$59,887**	**$63,480**	**$67,289**	**$71,326**	**$75,606**	**$80,142**	**$84,951**

1000 to 1500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	32	32	32	32	32	32	32	32	32	32	32
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**
Monthly Base Charge	$167.46	$246.17	$260.94	$276.59	$293.19	$310.78	$329.43	$349.19	$370.15	$392.35	$415.90
Annual Base Charge	$2,009.53	$2,954.01	$3,131.25	$3,319.13	$3,518.28	$3,729.37	$3,953.14	$4,190.33	$4,441.74	$4,708.25	$4,990.74
Total Annual Revenue	**$64,305**	**$94,528**	**$100,200**	**$106,212**	**$112,585**	**$119,340**	**$126,500**	**$134,090**	**$142,136**	**$150,664**	**$159,704**

1500 to 2000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	23	23	23	23	23	23	23	23	23	23	23
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**23**	**23**	**23**	**23**	**23**	**23**	**23**	**23**	**23**	**23**	**23**
Monthly Base Charge	$221.60	$325.75	$345.29	$366.01	$387.97	$411.25	$435.92	$462.08	$489.80	$519.19	$550.34
Annual Base Charge	$2,659.15	$3,908.95	$4,143.49	$4,392.10	$4,655.62	$4,934.96	$5,231.06	$5,544.92	$5,877.62	$6,230.27	$6,604.09
Total Annual Revenue	**$61,160**	**$89,906**	**$95,300**	**$101,018**	**$107,079**	**$113,504**	**$120,314**	**$127,533**	**$135,185**	**$143,296**	**$151,894**

2000 to 3000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	19	19	19	19	19	19	19	19	19	19	19
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**
Monthly Base Charge	$302.80	$445.11	$471.82	$500.13	$530.14	$561.94	$595.66	$631.40	$669.29	$709.44	$752.01
Annual Base Charge	$3,633.57	$5,341.36	$5,661.84	$6,001.55	$6,361.64	$6,743.34	$7,147.94	$7,576.81	$8,031.42	$8,513.31	$9,024.11
Total Annual Revenue	**$69,038**	**$101,486**	**$107,575**	**$114,029**	**$120,871**	**$128,123**	**$135,811**	**$143,959**	**$152,597**	**$161,753**	**$171,458**

3000 to 4000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	12	12	12	12	12	12	12	12	12	12	12
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Monthly Base Charge	$411.07	$604.27	$640.53	$678.96	$719.69	$762.88	$808.65	$857.17	$908.60	$963.11	$1,020.90
Annual Base Charge	$4,932.81	$7,251.23	$7,686.30	$8,147.48	$8,636.33	$9,154.51	$9,703.78	$10,286.01	$10,903.17	$11,557.36	$12,250.80
Total Annual Revenue	**$59,194**	**$87,015**	**$92,236**	**$97,770**	**$103,636**	**$109,854**	**$116,445**	**$123,432**	**$130,838**	**$138,688**	**$147,010**

4000 to 5000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2	2	2	2	2	2	2	2	2	2	2
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Monthly Base Charge	$519.34	$763.43	$809.23	$857.78	$909.25	$963.81	$1,021.63	$1,082.93	$1,147.91	$1,216.78	$1,289.79
Annual Base Charge	$6,232.04	$9,161.10	$9,710.77	$10,293.41	$10,911.02	$11,565.68	$12,259.62	$12,995.20	$13,774.91	$14,601.40	$15,477.49
Total Annual Revenue	**$12,464**	**$18,322**	**$19,422**	**$20,587**	**$21,822**	**$23,131**	**$24,519**	**$25,990**	**$27,550**	**$29,203**	**$30,955**

5000 to 7500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	10	10	10	10	10	10	10	10	10	10	10
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Monthly Base Charge	$708.81	$1,041.95	$1,104.47	$1,170.73	$1,240.98	$1,315.44	$1,394.36	$1,478.02	$1,566.70	$1,660.71	$1,760.35
Annual Base Charge	$8,505.70	$12,503.38	$13,253.58	$14,048.80	$14,891.72	$15,785.23	$16,732.34	$17,736.28	$18,800.46	$19,928.49	$21,124.19
Total Annual Revenue	**$85,057**	**$125,034**	**$132,536**	**$140,488**	**$148,917**	**$157,852**	**$167,323**	**$177,363**	**$188,005**	**$199,285**	**$211,242**

7500 to 10000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3	3
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Monthly Base Charge	$979.48	$1,439.84	$1,526.23	$1,617.80	$1,714.87	$1,817.76	$1,926.83	$2,042.44	$2,164.98	$2,294.88	$2,432.58
Annual Base Charge	$11,753.78	$17,278.06	$18,314.74	$19,413.63	$20,578.45	$21,813.15	$23,121.94	$24,509.26	$25,979.81	$27,538.60	$29,190.92
Total Annual Revenue	**$35,261**	**$51,834**	**$54,944**	**$58,241**	**$61,735**	**$65,439**	**$69,366**	**$73,528**	**$77,939**	**$82,616**	**$87,573**

10000 to 12000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1	1
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Monthly Base Charge	$1,223.09	$1,797.94	$1,905.82	$2,020.16	$2,141.37	$2,269.86	$2,406.05	$2,550.41	$2,703.44	$2,865.64	$3,037.58
Annual Base Charge	$14,677.06	$21,575.27	$22,869.79	$24,241.98	$25,696.50	$27,238.29	$28,872.58	$30,604.94	$32,441.24	$34,387.71	$36,450.97
Total Annual Revenue	**$14,677**	**$21,575**	**$22,870**	**$24,242**	**$25,696**	**$27,238**	**$28,873**	**$30,605**	**$32,441**	**$34,388**	**$36,451**

12000 to 14161	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3	3
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Monthly Base Charge	$1,448.34	$2,129.06	$2,256.81	$2,392.22	$2,535.75	$2,687.89	$2,849.17	$3,020.12	$3,201.32	$3,393.40	$3,597.01
Annual Base Charge	$17,380.11	$25,548.77	$27,081.69	$28,706.59	$30,428.99	$32,254.73	$34,190.01	$36,241.41	$38,415.90	$40,720.85	$43,164.10
Total Annual Revenue	**$52,140**	**$76,646**	**$81,245**	**$86,120**	**$91,287**	**$96,764**	**$102,570**	**$108,724**	**$115,248**	**$122,163**	**$129,492**

Annual Base Charge %Increase		**47%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**

Table 6-2
Municipality of North Middlesex
Base Charge Forecast – Wastewater

Wastewater	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201
New	-	10	29	48	67	85	102	119	136	153	171
Subtotal Customers	**1,201**	**1,211**	**1,230**	**1,249**	**1,268**	**1,286**	**1,303**	**1,320**	**1,337**	**1,354**	**1,372**
Total Annual Revenue	**$696,186**	**$1,122,191**	**$1,479,330**	**$1,799,775**	**$2,006,790**	**$2,235,644**	**$2,488,479**	**$2,769,525**	**$3,081,895**	**$3,429,044**	**$3,817,325**

0 to 250	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	990	990	990	990	990	990	990	990	990	990	990
New	0	10	29	48	67	85	102	119	136	153	171
Subtotal Customers	**990**	**1,000**	**1,019**	**1,038**	**1,057**	**1,075**	**1,092**	**1,109**	**1,126**	**1,143**	**1,161**
Monthly Base Charge	$43	$69	$90	$108	$119	$130	$143	$158	$174	$191	$210
Annual Base Charge	$518	$829	$1,078	$1,294	$1,423	$1,565	$1,722	$1,894	$2,083	$2,292	$2,521
Total Annual Revenue	**$513,097**	**$829,248**	**$1,098,505**	**$1,342,785**	**$1,504,100**	**$1,682,685**	**$1,880,225**	**$2,100,445**	**$2,345,907**	**$2,619,458**	**$2,926,780**

250 to 300	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	66	66	66	66	66	66	66	66	66	66	66
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**	**66**
Monthly Base Charge	$42	$67	$87	$104	$114	$126	$138	$152	$167	$184	$202
Annual Base Charge	$499	$799	$1,038	$1,246	$1,370	$1,507	$1,658	$1,824	$2,006	$2,207	$2,428
Total Annual Revenue	**$32,943**	**$52,710**	**$68,522**	**$82,227**	**$90,450**	**$99,495**	**$109,444**	**$120,388**	**$132,427**	**$145,670**	**$160,237**

300 to 400	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	84	84	84	84	84	84	84	84	84	84	84
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**84**	**84**	**84**	**84**	**84**	**84**	**84**	**84**	**84**	**84**	**84**
Monthly Base Charge	$37	$59	$77	$92	$101	$111	$122	$135	$148	$163	$179
Annual Base Charge	$442	$707	$919	$1,103	$1,213	$1,334	$1,468	$1,614	$1,776	$1,953	$2,149
Total Annual Revenue	**$37,106**	**$59,369**	**$77,180**	**$92,616**	**$101,878**	**$112,065**	**$123,272**	**$135,599**	**$149,159**	**$164,075**	**$180,482**

400 to 500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	17	17	17	17	17	17	17	17	17	17	17
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**
Monthly Base Charge	$30	$49	$63	$76	$84	$92	$101	$111	$122	$135	$148
Annual Base Charge	$365	$584	$760	$912	$1,003	$1,103	$1,213	$1,335	$1,468	$1,615	$1,776
Total Annual Revenue	**$6,208**	**$9,933**	**$12,913**	**$15,496**	**$17,045**	**$18,750**	**$20,625**	**$22,687**	**$24,956**	**$27,452**	**$30,197**

500 to 600	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	8	8	8	8	8	8	8	8	8	8	8
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Monthly Base Charge	$69	$110	$143	$172	$189	$208	$229	$251	$276	$304	$335
Annual Base Charge	$825	$1,321	$1,717	$2,060	$2,266	$2,493	$2,742	$3,016	$3,318	$3,650	$4,015
Total Annual Revenue	**$6,603**	**$10,565**	**$13,734**	**$16,481**	**$18,129**	**$19,942**	**$21,936**	**$24,130**	**$26,543**	**$29,197**	**$32,117**

600 to 800	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	9	9	9	9	9	9	9	9	9	9	9
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Monthly Base Charge	$83	$133	$173	$207	$228	$251	$276	$303	$333	$367	$404
Annual Base Charge	$996	$1,593	$2,071	$2,485	$2,733	$3,007	$3,307	$3,638	$4,002	$4,402	$4,842
Total Annual Revenue	**$8,960**	**$14,336**	**$18,637**	**$22,364**	**$24,600**	**$27,060**	**$29,766**	**$32,743**	**$36,017**	**$39,619**	**$43,581**

800 to 1000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	5	5	5	5	5	5	5	5	5	5	5
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Monthly Base Charge	$102	$163	$212	$254	$280	$308	$338	$372	$410	$450	$496
Annual Base Charge	$1,222	$1,956	$2,543	$3,051	$3,356	$3,692	$4,061	$4,467	$4,914	$5,405	$5,946
Total Annual Revenue	**$6,112**	**$9,780**	**$12,714**	**$15,256**	**$16,782**	**$18,460**	**$20,306**	**$22,337**	**$24,570**	**$27,027**	**$29,730**

1000 to 1500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	7	7	7	7	7	7	7	7	7	7	7
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**
Monthly Base Charge	$135	$216	$281	$337	$371	$408	$448	$493	$543	$597	$656
Annual Base Charge	$1,620	$2,591	$3,369	$4,042	$4,447	$4,891	$5,380	$5,918	$6,510	$7,161	$7,877
Total Annual Revenue	**$11,337**	**$18,139**	**$23,581**	**$28,297**	**$31,126**	**$34,239**	**$37,663**	**$41,429**	**$45,572**	**$50,129**	**$55,142**

1500 to 2000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	4	4	4	4	4	4	4	4	4	4	4
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
Monthly Base Charge	$182	$292	$379	$455	$500	$550	$605	$666	$733	$806	$886
Annual Base Charge	$2,187	$3,499	$4,549	$5,458	$6,004	$6,605	$7,265	$7,992	$8,791	$9,670	$10,637
Total Annual Revenue	**$8,747**	**$13,996**	**$18,194**	**$21,833**	**$24,017**	**$26,418**	**$29,060**	**$31,966**	**$35,163**	**$38,679**	**$42,547**

2000 to 3000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	3	3	3	3	3	3	3	3	3	3	3
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Monthly Base Charge	$253	$405	$527	$632	$695	$765	$841	$925	$1,018	$1,119	$1,231
Annual Base Charge	$3,038	$4,860	$6,318	$7,582	$8,340	$9,174	$10,092	$11,101	$12,211	$13,432	$14,776
Total Annual Revenue	**$9,113**	**$14,581**	**$18,955**	**$22,747**	**$25,021**	**$27,523**	**$30,276**	**$33,303**	**$36,634**	**$40,297**	**$44,327**

3000 to 4000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2	2	2	2	2	2	2	2	2	2	2
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Monthly Base Charge	$348	$556	$723	$868	$955	$1,050	$1,155	$1,271	$1,398	$1,537	$1,691
Annual Base Charge	$4,172	$6,676	$8,678	$10,414	$11,455	$12,601	$13,861	$15,247	$16,772	$18,449	$20,294
Total Annual Revenue	**$8,345**	**$13,351**	**$17,357**	**$20,828**	**$22,911**	**$25,202**	**$27,722**	**$30,494**	**$33,544**	**$36,898**	**$40,588**

4000 to 5000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1	1
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Monthly Base Charge	$442	$708	$920	$1,104	$1,214	$1,336	$1,469	$1,616	$1,778	$1,955	$2,151
Annual Base Charge	$5,307	$8,491	$11,038	$13,246	$14,570	$16,027	$17,630	$19,393	$21,333	$23,466	$25,812
Total Annual Revenue	**$5,307**	**$8,491**	**$11,038**	**$13,246**	**$14,570**	**$16,027**	**$17,630**	**$19,393**	**$21,333**	**$23,466**	**$25,812**

5000 to 7500	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2	2	2	2	2	2	2	2	2	2	2
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Monthly Base Charge	$608	$972	$1,264	$1,517	$1,668	$1,835	$2,019	$2,221	$2,443	$2,687	$2,956
Annual Base Charge	$7,292	$11,668	$15,168	$18,202	$20,022	$22,024	$24,226	$26,649	$29,314	$32,245	$35,470
Total Annual Revenue	**$14,585**	**$23,335**	**$30,336**	**$36,403**	**$40,043**	**$44,048**	**$48,453**	**$53,298**	**$58,628**	**$64,490**	**$70,939**

7500 to 10000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1	1
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Monthly Base Charge	$844	$1,350	$1,756	$2,107	$2,317	$2,549	$2,804	$3,085	$3,393	$3,732	$4,105
Annual Base Charge	$10,129	$16,206	$21,068	$25,281	$27,809	$30,590	$33,649	$37,014	$40,716	$44,787	$49,266
Total Annual Revenue	**$10,129**	**$16,206**	**$21,068**	**$25,281**	**$27,809**	**$30,590**	**$33,649**	**$37,014**	**$40,716**	**$44,787**	**$49,266**

10000 to 12000	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1	1
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Monthly Base Charge	$1,057	$1,691	$2,198	$2,638	$2,902	$3,192	$3,511	$3,862	$4,248	$4,673	$5,140
Annual Base Charge	$12,681	$20,290	$26,377	$31,653	$34,818	$38,300	$42,130	$46,343	$50,977	$56,075	$61,682
Total Annual Revenue	**$12,681**	**$20,290**	**$26,377**	**$31,653**	**$34,818**	**$38,300**	**$42,130**	**$46,343**	**$50,977**	**$56,075**	**$61,682**

12000 to 14161	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1	1	1	1	1	1	1	1	1	1	1
New	0	0	0	0	0	0	0	0	0	0	0
Subtotal Customers	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Monthly Base Charge	$1,253	$2,006	$2,607	$3,129	$3,442	$3,786	$4,164	$4,581	$5,039	$5,543	$6,097
Annual Base Charge	$15,042	$24,067	$31,287	$37,544	$41,299	$45,429	$49,972	$54,969	$60,466	$66,512	$73,163
Total Annual Revenue	**$15,042**	**$24,067**	**$31,287**	**$37,544**	**$41,299**	**$45,429**	**$49,972**	**$54,969**	**$60,466**	**$66,512**	**$73,163**

Annual Base Charge %Increase		**60%**	**30%**	**20%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**

Chapter 7
Analysis of Water, Wastewater, and Stormwater Rates and Policy Matters

7. Analysis of Water, Wastewater, and Stormwater Rates and Policy Matters

7.1 Introduction

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 (Option 1) and the flat rate (Option 2) over the forecast period. These calculations will be based on the net operating expenditures (the variable costs) provided in Chapter 5, divided by the following:

- Water and Wastewater Option 1 - water consumption forecast and wastewater volumes in excess of 250 cu.m annually provided in section 1.8;
- Water and Wastewater Option 2 – water and wastewater customers by category; and
- Stormwater – total stormwater customers.

7.2 Water Rates

Based on the discussion of rate structures provided in section 6.5 and the recommendation to alter the present structure, the following provides the rate calculations for both options.

7.2.1 Option 1 – 90% Recovery from Base Charge & 10% Recovery from Volume Rate

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 anticipated volumes in excess of 250 cu.m resulting in the forecasted rates. As stated

earlier, the needs for water are significant for the first half of the forecast period and the need to save for lifecycle replacement costs is high. While the bulk of the revenue required is being recovered through the base charges, the volume rates are anticipated to decrease by 55% in 2020 then increase at 6% per year from 2021 to 2029. The volume rates are presented in Table 7-1. Detailed calculations of the volume rates are provided in Appendix D. A summary of the recommended base charge and volume rates along with the total annual bill for an average residential user who consumes 180 cu.m per year are as follows:

Table 7-1
Municipality of North Middlesex
Annual Customer Water Bill – Based on 180 cu.m of usage
Option 1

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Monthly Base Rate	$20.65	$71.15	$75.42	$79.94	$84.74	$89.82	$95.21	$100.92	$106.98	$113.40	$120.20
Constant Rate (for volumes in excess of 250 cu.m)	$1.85	$0.83	$0.88	$0.93	$0.99	$1.05	$1.11	$1.18	$1.25	$1.33	$1.41
Annual Base Rate Bill	**$247.80**	**$853.78**	**$905.00**	**$959.30**	**$1,016.86**	**$1,077.87**	**$1,142.54**	**$1,211.10**	**$1,283.76**	**$1,360.79**	**$1,442.44**
Volume	180	180	180	180	180	180	180	180	180	180	180
Annual Volume Bill	**$333.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Total Annual Bill	**$580.80**	**$853.78**	**$905.00**	**$959.30**	**$1,016.86**	**$1,077.87**	**$1,142.54**	**$1,211.10**	**$1,283.76**	**$1,360.79**	**$1,442.44**
%Increase - Base Rate			6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
%Increase - Volume Rate		-55.2%	6.1%	5.7%	6.5%	6.1%	5.7%	6.3%	5.9%	6.4%	6.0%
%Increase - Total Annual Bill		47.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%

7.2.2 Option 2 – 100% Recovery from Flat Rate & Nominal Volume Rate for Usage in Excess of Three-Year Average

The rates are calculated by taking the net recoverable amounts from Table 5-2 (the product of total expenditures less non-rate revenues) and completes the calculation by dividing them by the anticipated customers in each flat rate category, resulting in the forecasted rates. While 100% of the revenue required is being recovered through the flat rates, a nominal volume rate is set at $1.00 per cu.m for volumes in excess of the three-year average volumes for each property. The recommended annual increase in the water bill for 2020 is 52%, followed by 6% annual increased for the remainder of the forecast period. Detailed calculations of the flat rates are provided in Appendix D. A summary of the recommended flat rates for each category are as follows:

Table 7-2
Municipality of North Middlesex
Annual Customer Flat Rate Water Bill
Option 2

Billing Category (based on 2018 volumes)	2019 Current Bill	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 to 250	581	883	936	992	1,051	1,115	1,181	1,252	1,327	1,407	1,491
250 to 300	757	1,150	1,219	1,292	1,370	1,452	1,539	1,631	1,729	1,833	1,943
300 to 400	895	1,361	1,443	1,529	1,621	1,718	1,821	1,930	2,046	2,169	2,299
400 to 500	1,080	1,642	1,741	1,845	1,956	2,073	2,197	2,329	2,469	2,617	2,774
500 to 600	1,265	1,923	2,039	2,161	2,291	2,428	2,574	2,728	2,892	3,065	3,249
600 to 800	1,543	2,345	2,486	2,635	2,793	2,961	3,138	3,327	3,526	3,738	3,962
800 to 1000	1,913	2,907	3,082	3,267	3,463	3,671	3,891	4,124	4,372	4,634	4,912
1000 to 1500	2,560	3,892	4,125	4,373	4,635	4,913	5,208	5,520	5,852	6,203	6,575
1500 to 2000	3,485	5,298	5,616	5,952	6,310	6,688	7,089	7,515	7,966	8,444	8,950
2000 to 3000	4,873	7,407	7,851	8,322	8,821	9,351	9,912	10,506	11,137	11,805	12,513
3000 to 4000	6,723	10,219	10,832	11,482	12,171	12,901	13,675	14,495	15,365	16,287	17,264
4000 to 5000	8,573	13,031	13,812	14,641	15,520	16,451	17,438	18,484	19,593	20,769	22,015
5000 to 7500	11,810	17,952	19,029	20,170	21,381	22,664	24,023	25,465	26,993	28,612	30,329
7500 to 10000	16,435	24,982	26,481	28,069	29,754	31,539	33,431	35,437	37,563	39,817	42,206
10000 to 12000	20,598	31,309	33,187	35,178	37,289	39,526	41,898	44,412	47,077	49,901	52,895
12000 to 14161	24,447	37,159	39,389	41,752	44,257	46,912	49,727	52,711	55,873	59,226	62,779
Annual Percentage Change		**52%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**

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 calculations for two options.

7.3.1 Option 1 – 90% Recovery from Base Charge & 10% Recovery from Volume Rate

The rates are calculated by taking the net recoverable amounts from Table 5-3 (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 anticipated volumes in excess of 250 cu.m resulting in the forecasted rates. As stated earlier, the needs for wastewater are significant for the first half of the forecast period due to the need for a wastewater treatment plant in Parkhill and the payback of the internal loan from tax-supported reserves. While the bulk of the revenue required is being recovered through the base charges, the volume rates are anticipated to decrease by 41% in 2020 then increase at 2% per year from 2021 to 2029. The volume rates are presented in Table 7-3. Detailed calculations of the volume rates are provided in Appendix E. A summary of the recommended base charge and volume rates along with the total annual bill for an average residential user who consumes 180 cu.m per year are as follows:

Table 7-3
Municipality of North Middlesex
Annual Customer Wastewater Bill – Based on 180 cu.m of usage
Option 1

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Monthly Base Rate	$43.19	$69.10	$89.84	$107.80	$118.58	$130.44	$143.48	$157.83	$173.62	$190.98	$210.08
Constant Rate (for volumes in excess of 250 cu.m)		$1.12	$1.15	$1.17	$1.19	$1.21	$1.23	$1.25	$1.28	$1.31	$1.34
Annual Base Rate Bill	**$518.28**	**$829.25**	**$1,078.02**	**$1,293.63**	**$1,422.99**	**$1,565.29**	**$1,721.82**	**$1,894.00**	**$2,083.40**	**$2,291.74**	**$2,520.91**
Volume	180	180	180	180	180	180	180	180	180	180	180
Annual Volume Bill	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Total Annual Bill	**$518.28**	**$829.25**	**$1,078.02**	**$1,293.63**	**$1,422.99**	**$1,565.29**	**$1,721.82**	**$1,894.00**	**$2,083.40**	**$2,291.74**	**$2,520.91**
%Increase - Base Rate		60.0%	30.0%	20.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
%Increase - Volume Rate			2.4%	1.7%	1.7%	1.7%	1.7%	1.6%	2.4%	2.3%	2.3%
%Increase - Total Annual Bill		60.0%	30.0%	20.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

Note: Current residential charges are Flat Rate only.

7.3.2 Option 2 – 100% Recovery from Flat Rate & Nominal Volume Rate for Usage in Excess of Three-Year Average

The rates are calculated by taking the net recoverable amounts from Table 5-4 (the product of total expenditures less non-rate revenues) and completes the calculation by dividing them by the anticipated customers in each flat rate category, resulting in the forecasted rates. Similar to water, while 100% of the revenue required is being recovered through the flat rates, a nominal volume rate is set at $1.00 per cu.m for volumes in excess of the three-year average volumes for each property. The recommended annual increase in the wastewater bill for 2020 is 60%, followed by 30% for 2021, 25% for 2022, 12% for 2023, 2024, and 2025, then 10% annual increases for the remainder of the forecast period. Detailed calculations of the flat rates are provided in Appendix E. A summary of the recommended flat rates for each category are as follows:

Table 7-4
Municipality of North Middlesex
Annual Customer Flat Rate Wastewater Bill
Option 2

Billing Category (based on 2018 volumes)	2019 Current Bill	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 to 250	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
250 to 300	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
300 to 400	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
400 to 500	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
500 to 600	1,055	1,688	2,194	2,743	3,072	3,441	3,854	4,239	4,663	5,129	5,642
600 to 800	1,340	2,144	2,787	3,484	3,902	4,370	4,895	5,384	5,923	6,515	7,166
800 to 1000	1,720	2,752	3,578	4,472	5,009	5,610	6,283	6,911	7,602	8,362	9,199
1000 to 1500	2,385	3,816	4,961	6,201	6,945	7,779	8,712	9,583	10,541	11,596	12,755
1500 to 2000	3,335	5,336	6,937	8,671	9,712	10,877	12,182	13,400	14,740	16,214	17,836
2000 to 3000	4,760	7,616	9,901	12,376	13,861	15,524	17,387	19,126	21,039	23,143	25,457
3000 to 4000	6,660	10,656	13,853	17,316	19,394	21,721	24,328	26,761	29,437	32,380	35,618
4000 to 5000	8,560	13,696	17,805	22,256	24,927	27,918	31,268	34,395	37,834	41,618	45,780
5000 to 7500	11,885	19,016	24,721	30,901	34,609	38,762	43,414	47,755	52,531	57,784	63,562
7500 to 10000	16,635	26,616	34,601	43,251	48,441	54,254	60,765	66,841	73,525	80,878	88,965
10000 to 12000	20,910	33,456	43,493	54,366	60,890	68,197	76,380	84,018	92,420	101,662	111,828
12000 to 14161	24,863	39,781	51,715	64,644	72,401	81,089	90,820	99,902	109,892	120,881	132,969
Annual Percentage Change		**60%**	**30%**	**25%**	**12%**	**12%**	**12%**	**10%**	**10%**	**10%**	**10%**

7.4 Stormwater Rates

The stormwater rates have been calculated to recover capital costs related to stormwater services provided in the Municipality. These costs are to be recovered via a flat rate imposed on a per property basis. The rates are calculated by taking the net recoverable amounts from Table 5-5 (total expenditures) and completes the calculation by dividing them by the number of properties anticipated in each year. The initial stormwater rate is anticipated to be $5.69 per month and increase 10% to $14.64 per month in 2029. Detailed calculations of the flat rates are provided in Appendix F. A summary of the recommended flat rates for each category are as follows:

Table 7-5
Municipality of North Middlesex
Annual Customer Flat Rate Stormwater Bill

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Monthly Flat Rate	$5.69	$6.26	$6.89	$7.57	$8.33	$9.17	$10.08	$11.09	$12.20	$13.42
Annual Base Rate Bill	**$68.29**	**$75.12**	**$82.63**	**$90.89**	**$99.98**	**$109.98**	**$120.98**	**$133.08**	**$146.39**	**$161.03**
Total Annual Bill	**$68.29**	**$75.12**	**$82.63**	**$90.89**	**$99.98**	**$109.98**	**$120.98**	**$133.08**	**$146.39**	**$161.03**
%Increase - Total Annual Bill		10%	10%	10%	10%	10%	10%	10%	10%	10%

7.5 Forecast of Combined Water, Wastewater, and Stormwater Impact for the Average Residential Customer

Based on the foregoing information, the combined impact of the water, wastewater, and stormwater base charge and volume rate charges, for Option 1, equal to an initial increase of 59% for 2020 then 18% for 2021, 13% for 2022 then approximate increases of 8% to 9% annually for the remainder of the forecast period (2023 to 2029).

For Option 2, the recommended annual increase is 62% in 2020, then 17% in 2021, and 16% for 2022. Subsequently, recommended annual increases for the remainder of the forecast period range from 9% to 10%.

Tables 7-6 and 7-7 present the forecast combined annual bill for customers with usage of 180 cu.m per year for both options.

Table 7-6
Municipality of North Middlesex
Combined Annual Water, Wastewater, and Stormwater Bill
Option 1

Option 1 - Base Charge 90% Recovery, Volume Rate 10%

Annual Bill for Residential User with 180 cu.m Volume	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water											
Base Charge	248	854	905	959	1,017	1,078	1,143	1,211	1,284	1,361	1,442
Volume	333	-	-	-	-	-	-	-	-	-	-
Total Water Bill	**581**	**854**	**905**	**959**	**1,017**	**1,078**	**1,143**	**1,211**	**1,284**	**1,361**	**1,442**
Wastewater											
Base Charge	518	829	1,078	1,294	1,423	1,565	1,722	1,894	2,083	2,292	2,521
Volume	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Bill	**518**	**829**	**1,078**	**1,294**	**1,423**	**1,565**	**1,722**	**1,894**	**2,083**	**2,292**	**2,521**
Stormwater - Flat Rate		**68**	**75**	**83**	**91**	**100**	**110**	**121**	**133**	**146**	**161**
Total Combined Bill	**1,099**	**1,751**	**2,058**	**2,336**	**2,531**	**2,743**	**2,974**	**3,226**	**3,500**	**3,799**	**4,124**
Annual Percentage Change		**59%**	**18%**	**13%**	**8%**	**8%**	**8%**	**8%**	**8%**	**9%**	**9%**

Table 7-7
Municipality of North Middlesex
Combined Annual Water, Wastewater, and Stormwater Bill
Option 2

Option 2 - Base Charge 100% Recovery, Volume Rate Charged in Excess of Historic Averages

Annual Bill for Residential User with 180 cu.m Volume	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Water											
Base Charge	248	883	936	992	1,051	1,115	1,181	1,252	1,327	1,407	1,491
Volume	333	-	-	-	-	-	-	-	-	-	-
Total Water Bill	**581**	**883**	**936**	**992**	**1,051**	**1,115**	**1,181**	**1,252**	**1,327**	**1,407**	**1,491**
Wastewater											
Base Charge	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
Volume	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Bill	**518**	**829**	**1,078**	**1,348**	**1,509**	**1,690**	**1,893**	**2,082**	**2,291**	**2,520**	**2,772**
Stormwater - Flat Rate	**-**	**68**	**75**	**83**	**91**	**100**	**110**	**121**	**133**	**146**	**161**
Total Combined Bill	**1,099**	**1,780**	**2,089**	**2,422**	**2,652**	**2,905**	**3,185**	**3,456**	**3,751**	**4,073**	**4,424**
Annual Percentage Change		**62%**	**17%**	**16%**	**9%**	**10%**	**10%**	**9%**	**9%**	**9%**	**9%**

Chapter 8
Recommendations

8. Recommendations

As presented within this report, capital and operating expenditures have been identified and forecast over a ten-year period for water, wastewater, and stormwater services.

Based upon the foregoing, the following recommendations are identified for consideration by Municipal Council:

1. That Council provide for the recovery of all water, wastewater, and stormwater costs through full cost recovery rates.

2. That Council consider the Capital Plan for water, wastewater, and stormwater as provided in Tables 2-1, 2-2, and 2-3 and the associated Capital Financing Plan as set out in Section 4.8.

3. That Council consider the base charges provided in Table 6-1 for water, Table 6-2 for wastewater for Option 1.

4. That Council consider the volume rates for water and wastewater as provided in Tables 7-1 and 7-3 respectively for Option 1 or that Council consider the flat rates for water and wastewater, as provided in Tables 7-2 and 7-4 for Option 2.

5. That Council consider the flat rates for stormwater as provided in Table 7-5.

6. That Council consider updating the Municipality's Development Charges Background Study.

Appendices

Appendix A
Water System Inventory Data

Appendix A: Water System Inventory Data

Table A-1
Municipality of North Middlesex
Water Facilities

Item	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Mount Carmel Reservoir							
Building	1969	100	2069	60,000	49	1,932	-
Piping and valves	1969	40	2020	30,000	0	suggested for 10 year capital	30,000
Reservoir	1969	70	2039	545,000	19	34,761	-
Parkhill Reservoir and Pumping Station							
Parkhill Building	1969	100	2069	363,000	49	11,690	-
Pump 1 (Duty)	1995	30	2025	75,000	5	suggested for 10 year capital	75,000
Pump 2 (Standby)	1995	30	2025	75,000	5	suggested for 10 year capital	75,000
Pump 3 (Maximum Day)	1995	30	2025	105,000	5	suggested for 10 year capital	105,000
Pump 4 (Fire)	1995	30	2025	105,000	5	suggested for 10 year capital	105,000
Parkhill Reservoir	1969	70	2039	1,392,000	19	88,784	-
Piping and valves	1995	40	2035	350,000	15	27,239	-
Diesel Generator	1995	30	2025	85,000	5	suggested for 10 year capital	85,000
Electrical	1995	40	2035	100,000	15	7,783	-
West Williams Pumping Station							
Building	1982	100	2082	450,000	62	12,729	-
Pump 1 (Lead)	2006	30	2036	12,000	16	884	-
Pump 2 (Lag)	2006	30	2036	7,500	16	552	-
Piping and valves	1982	20	2020	50,000	0	suggested for 10 year capital	50,000
Diesel Generator	1982	30	2020	30,000	0	suggested for 10 year capital	30,000
Electrical	1982	40	2022	30,000	2	suggested for 10 year capital	30,000
McGillivray Pumping Station							
Pump 1 (Back up)	2017	30	2047	15,000	27	724	-
Pump 2 (Back up)	2017	30	2047	15,000	27	724	-
Piping and valves	2005	40	2045	50,000	25	2,561	-
Electrical	2005	40	2045	30,000	25	1,537	-
Air valves on transmission main							
Air valves (9)	1994	30	2024	100,000	4	suggested for 10 year capital	100,000
Manhole (9)	1994	70	2064	150,000	44	5,158	-
Drain valves on transmission main							
Drain valves (4)	1994	30	2024	9,000	4	suggested for 10 year capital	9,000
Manhole (4)	1994	70	2064	66,000	44	2,270	-
Air/line valve chambers on transmission main							
Air/Line Valve	1994	30	2024	30,000	4	suggested for 10 year capital	30,000
Manhole	1994	70	2064	50,000	44	1,719	-
Total				**4,379,500**		**201,048**	**724,000**

Table A-2
Municipality of North Middlesex
Watermains

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
1	ADARE DR FROM Brinsley Rd TO Maguire Rd	McGillvray	Rural	2.072	2,072	100	PVC	1975	75	2050	500	1,036,000	30	46,257	-
2	ADARE DR FROM Creamery Rd TO Cassidy Rd	McGillvray	Rural	2.050	2,050	150	PVC	1975	75	2050	500	1,025,000	30	45,766	-
3	ADARE DR FROM Lieury Rd TO Creamery Rd	McGillvray	Rural	2.032	2,032	150	PVC	1975	75	2050	500	1,016,000	30	45,364	-
4	ADARE DR FROM Maguire Rd TO Neil Rd	McGillvray	Rural	2.030	2,030	100	PVC	1975	75	2050	500	1,015,000	30	45,320	-
5	ADARE DR FROM Neil Rd TO Richmond St	McGillvray	Rural	2.057	2,057	50	PVC	1975	75	2050	500	1,028,500	30	45,922	-
6	ADARE DR FROM Richmond St to Coursey Line	McGillvray	Rural	1.118	1,118	50	PVC	1990	75	2065	500	559,000	45	18,955	-
12	AILSA CRAIG MAIN ST FROM Ness St TO ~75m East	Ailsa Craig	Urban	0.103	103	150	PVC	1974	75	2049	950	97,850	29	4,479	-
7	AILSA CRAIG MAIN ST FROM ~75m E of Ness TO East Limits	Ailsa Craig	Urban	0.035	35	150	PVC	1974	75	2049	950	33,250	29	1,522	-
8	AILSA CRAIG MAIN ST FROM ~75m E of Ness TO East Limits	Ailsa Craig	Urban	0.086	86	150	PVC	1974	75	2049	950	81,700	29	3,740	-
13	AILSA CRAIG MAIN ST FROM Old Mill St TO Craig Street	Ailsa Craig	Urban	0.341	341	150	PVC	2010	75	2085	950	323,950	65	8,950	-
10	AILSA CRAIG MAIN ST FROM James St TO ~30m W Ness St	Ailsa Craig	Urban	0.112	112	150	PVC	2010	75	2085	950	106,400	65	2,939	-
9	AILSA CRAIG MAIN ST FROM Craig Street TO Jameson Street	Ailsa Craig	Urban	0.109	109	200	PVC	2010	75	2085	950	103,550	65	2,861	-
11	AILSA CRAIG MAIN ST FROM Jameson St TO Queen Street	Ailsa Craig	Urban	0.124	124	200	PVC	2010	75	2085	950	117,800	65	3,254	-
15	AILSA CRAIG MAIN ST FROM West Limits TO Old Mill St	Ailsa Craig	Urban	0.029	29	150	PVC	2010	75	2085	950	27,550	65	761	-
14	AILSA CRAIG MAIN ST FROM Queen Street TO James St	Ailsa Craig	Urban	0.106	106	150	PVC	2010	75	2085	950	100,700	65	2,782	-
16	ALBERT ST FROM Parkhill King Street TO Broadway Street	Parkhill	Urban	0.138	138	150	PVC	1960	75	2035	950	131,100	15	10,203	-
17	ALLNESS ST FROM Catherine Street TO East End	Parkhill	Urban	0.053	53	150	PVC	1995	75	2070	950	50,350	50	1,602	-
18	ALMA ST FROM Hawthorn Cres TO Queen Ave	East Williams	Rural	0.261	261	150	PVC	2001	75	2076	500	130,500	56	3,895	-
19	ALMA ST FROM North End TO Queens Ave	East Williams	Rural	0.125	125	150	PVC	1976	75	2051	500	62,500	31	2,725	-
20	ANN ST FROM Broadway Street TO Parkhill King St	Parkhill	Urban	0.139	139	200	PVC	1960	75	2035	950	132,050	15	10,277	-
21	ANN ST FROM Leonard Ave TO John Street	Parkhill	Urban	0.250	250	150	Cast Iron	1960	50	2020	950	237,500	0	suggested for 10 year capital forecast	237,500
22	ANNA ST FROM Delaware St TO Eagle St	Parkhill	Urban	0.442	442	150	PVC	1960	75	2035	950	419,900	15	32,679	-
23	ANNIE ADA SHIPLEY ST FROM Stewart St TO Queen St	Ailsa Craig	Urban	0.432	432	150	PVC	1974	75	2049	950	410,400	29	18,787	-
24	ARDROSS ST FROM Catherine St TO East End	Parkhill	Urban	0.108	108	150	PVC	1985	75	2060	950	102,600	40	3,751	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
25	ARDROSS ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.128	128	100	Cast Iron	1955	50	2020	950	121,600	0	suggested for 10 year capital forecast	121,600
26	ARGYLE ST FROM 2 Blocks SW of New Ontario Rd TO New Ontario Rd	East Williams	Rural	0.975	975	150	PVC	1998	75	2073	500	487,500	53	15,002	-
27	ARGYLE ST FROM McCubbin Rd TO 2 Blocks SW of New Ontario Rd	East Williams	Rural	11.241	11,241	100	PVC	1998	75	2073	500	5,620,500	53	172,965	-
28	ATKINSON ST (WEST) FROM Queen St TO West End	Ailsa Craig	Urban	0.094	94	150	PVC	1974	75	2049	950	89,300	29	4,088	-
29	AUSABLE DR FROM Creamery Rd TO Brinsley Rd	McGillvray	Rural	4.385	4,385	100	PVC	1998	75	2073	500	2,192,500	53	67,472	-
30	AUSABLE DR FROM McGillivray Dr TO Lieury Rd	McGillvray	Rural	0.831	831	50	PVC	1998	75	2073	500	415,500	53	12,787	-
31	AUSABLE DR FROM West End TO Maguire Rd	McGillvray	Rural	1.842	1,842	100	PVC	1998	75	2073	500	921,000	53	28,343	-
32	AVENUE DR FROM West End TO Sylvan Rd	Parkhill	Rural	3.027	3,027	150	PVC	1982	75	2057	500	1,513,500	37	58,280	-
48	AUSABLE RD From Kerwood Rd To West then South to Townsend	West Williams	Rural	0.050	50	100	PVC	2003	75	2078	500	25,000	58	732	-
33	BEAR CREEK RD FROM Petty St TO East End	East Williams	Rural	0.980	980	100	PVC	2001	75	2076	500	490,000	56	14,625	-
34	BETHANY ST FROM Station St TO Parkhill Main St	Parkhill	Urban	0.278	278	150	PVC	1960	75	2035	950	264,100	15	20,554	-
39	BORNISH DR FROM West end (Haskett Rd) TO Centre Rd	West Williams	Rural	2.332	2,332	200	PVC	1984	75	2059	500	1,166,000	39	43,342	-
35	BORNISH DR FROM 1 Block East of Roddick Rd TO Kerwood Rd	West Williams	Rural	1.478	1,478	100	PVC	1984	75	2059	500	739,000	39	27,469	-
38	BORNISH DR FROM Sylvan Rd TO Roddick Rd	West Williams	Rural	2.508	2,508	100	PVC	1984	75	2059	500	1,254,000	39	46,613	-
36	BORNISH DR FROM 1.5 Blocks East of Springbank Rd TO Fort Rose Rd	East Williams	Rural	2.862	2,862	100	PVC	1998	75	2073	500	1,431,000	53	44,037	-
37	BORNISH DR FROM Centre Rd TO 1.5 blocks west of Springbank Rd	East Williams	Rural	1.261	1,261	150	PVC	1998	75	2073	500	630,500	53	19,403	-
40	BRINSLEY RD FROM Ausable Dr TO Mount Carmel Dr	McGillvray	Rural	8.758	8,758	100	PVC	1975	75	2050	500	4,379,000	30	195,522	-
41	BROAD ST FROM Parkhill Main St TO Station St	Parkhill	Urban	0.279	279	150	PVC	1960	75	2035	950	265,050	15	20,628	-
42	BROADWAY ST FROM Albert St TO Parkhill Main St	Parkhill	Urban	0.283	283	150	PVC	1960	75	2035	950	268,850	15	20,923	-
43	BROADWAY ST FROM West Park Drive TO Albert St	Parkhill	Urban	0.140	140	150	PVC	2008	75	2083	950	133,000	63	3,732	-
44	BROKEN FRONT RD From Lamon Dr To Elm Tree Dr	West Williams	Rural	0.300	300	50	PVC	1984	75	2059	500	150,000	39	5,576	-
45	BROKEN FRONT RD From Elm Tree Dr To North End	West Williams	Rural	0.300	300	50	PVC	1984	75	2059	500	150,000	39	5,576	-
324	BRUCE ST FROM West St TO King Street	East Williams	Urban	0.063	63	150	PVC	2001	75	2076	950	59,850	56	1,786	-
46	BRUCE ST FROM King St TO Falkirk St	East Williams	Urban	0.243	243	200	PVC	2001	75	2076	950	230,850	56	6,890	-
47	BULLOCK RD FROM Mark Settlement Dr TO Greenway Dr	McGillvray	Rural	3.277	3,277	100	PVC	1975	75	2050	500	1,638,500	30	73,159	-
49	CAMERON RD FROM Creek TO Elm Tree Dr	East Williams	Rural	1.080	1,080	100	PVC	2002	75	2077	500	540,000	57	15,963	-
53	CASSIDY RD FROM Mooresville Dr TO Adare Dr	McGillvray	Rural	0.009	9	100	PVC	1975	75	2050	500	4,500	30	201	-
51	CASSIDY RD FROM Elginfield Rd TO West Corners Dr	McGillvray	Rural	2.084	2,084	150	PVC	1982	75	2057	500	1,042,000	37	40,124	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
52	CASSIDY RD FROM McGillivray Dr TO Mount Carmel Dr	McGillvray	Rural	6.156	6,156	100	PVC	1975	75	2050	500	3,078,000	30	137,432	-
50	CASSIDY RD FROM Ausable Dr TO McGillivray Dr	McGillvray	Rural	1.816	1,816	150	PVC	1982	75	2057	500	908,000	37	34,964	-
56	CASSIDY RD FROM West Corners Dr TO Windsor Rd	McGillvray	Rural	2.067	2,067	150	PVC	1982	75	2057	500	1,033,500	37	39,797	-
54	CASSIDY RD FROM New Ontario TO Elginfield Rd	East Williams	Rural	2.069	2,069	150	PVC	1992	75	2067	500	1,034,500	47	34,157	-
55	CASSIDY RD FROM Queen AVE TO New Ontario Rd	East Williams	Rural	0.722	722	100	PVC	1992	75	2067	500	361,000	47	11,919	-
58	CATHERINE ST FROM Leonard Ave TO Ellen St	Parkhill	Urban	0.339	339	200	PVC	1995	75	2070	950	322,050	50	10,249	-
57	CATHERINE ST FROM Ellen St TO Allness St	Parkhill	Urban	0.070	70	150	PVC	1995	75	2070	950	66,500	50	2,116	-
59	CATHERINE ST FROM South End TO Tain St	Parkhill	Urban	0.165	165	200	PVC	1972	75	2047	950	156,750	27	7,570	-
60	CAUDER ST FROM East Williams St TO Queen Ave	Nairn	Urban	0.120	120	150	PVC	2001	75	2076	950	114,000	56	3,403	-
61	CEDAR SWAMP RD FROM McGillivray Dr TO Mount Caramel Dr	McGillvray	Rural	4.833	4,833	100	PVC	1975	75	2050	500	2,416,500	30	107,897	-
64	CENTRE RD FROM Townsend Line TO 2 Blocks North of Coldstream Rd	East Williams	Rural	8.346	8,346	100	PVC	2012	75	2087	500	4,173,000	67	113,602	-
62	CENTRE RD FROM 2 Blocks North of Coldstream Rd TO Nairn Rd	East Williams	Rural	0.861	861	100	PVC	2002	75	2077	500	430,500	57	12,726	-
63	CENTRE RD FROM Nairn Rd TO Elginfield Rd	East Williams	Rural	2.071	2,071	150	PVC	2002	75	2077	500	1,035,500	57	30,611	-
65	CENTRE ST FROM Duchess Ave TO Westpark Dr	Parkhill	Urban	0.251	251	150	PVC	1985	75	2060	950	238,450	40	8,717	-
66	CHARLTON RD FROM McGuffin Hills Dr TO West Corners Dr	McGillvray	Rural	2.048	2,048	100	PVC	1982	75	2057	500	1,024,000	37	39,431	-
67	CHRISELLE PL FROM Denfield Rd TO Porte St	Clandeboye	Urban	0.255	255	150	PVC	1985	75	2060	950	242,250	40	8,856	-
69	CHURCH ST FROM Queen St TO Ness St	Ailsa Craig	Urban	0.215	215	150	PVC	1974	75	2049	950	204,250	29	9,350	-
68	CHURCH ST FROM Craig Street TO Queen St	Ailsa Craig	Urban	0.256	256	150	PVC	1974	75	2049	950	243,200	29	11,133	-
70	CLANDEBOYE DR FROM Denfield Rd to Richmond St	Clandeboye	Rural	0.155	155	100	PVC	1985	75	2060	500	77,500	40	2,833	-
71	CLANDEBOYE DR FROM Neil Rd TO Denfield Rd	Clandeboye	Rural	2.050	2,050	100	PVC	1975	75	2050	500	1,025,000	30	45,766	-
75	COLDSTREAM RD FROM Kerwood Rd TO Sylvan Rd	West Williams	Rural	5.062	5,062	100	PVC	1984	75	2059	500	2,531,000	39	94,080	-
72	COLDSTREAM RD FROM 1.5 Blocks East of Haskett Rd TO Kerwood Rd	West Williams	Rural	2.822	2,822	100	PVC	1984	75	2059	500	1,411,000	39	52,448	-
74	COLDSTREAM RD FROM Bornish Dr TO 0.5 blocks East of Centre Rd	East Williams	Rural	5.078	5,078	100	PVC	1998	75	2073	500	2,539,000	53	78,135	-
73	COLDSTREAM RD FROM Argyle St TO Petty St	East Williams	Rural	1.716	1,716	150	PVC	1998	75	2073	500	858,000	53	26,404	-
76	CRAIG ST FROM Church St TO Ailsa Craig Main St	Ailsa Craig	Urban	0.129	129	150	PVC	1974	75	2049	950	122,550	29	5,610	-
78	CREAMERY RD FROM Ausable Dr TO Mcgillivray	McGillvray	Rural	0.953	953	50	PVC	1975	75	2050	500	476,500	30	21,276	-
77	CREAMERY RD FROM Ausable Dr TO Mcgillivray	McGillvray	Rural	0.269	269	100	PVC	1975	75	2050	500	134,500	30	6,005	-
79	CREAMERY RD FROM McGillivray Dr TO Mooresville Dr	McGillvray	Rural	1.891	1,891	100	PVC	1982	75	2057	500	945,500	37	36,408	-
80	CREAMERY RD FROM Mooresville Dr TO Mount Carmel Dr	McGillvray	Rural	4.093	4,093	100	PVC	1975	75	2050	500	2,046,500	30	91,376	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
82	DELAWARE ST FROM Hastings St TO William St	Parkhill	Urban	0.230	230	100	PVC	1960	75	2035	950	218,500	15	17,005	-
81	DELAWARE ST FROM CN ROW TO Hastings St	Parkhill	Urban	0.103	103	150	PVC	1983	75	2058	950	97,850	38	3,701	-
83	DENFIELD RD FROM Chriselle Pl TO End	Clandeboye	Urban	0.129	129	50	PVC	1985	75	2060	500	64,500	40	2,358	-
84	DENFIELD RD FROM Clandeboye Dr to Chriselle Pl	Clandeboye	Urban	0.279	279	150	PVC	1985	75	2060	950	265,050	40	9,689	-
87	DENFIELD RD FROM Prince William St TO ~280m S Clandeboye	McGillvray	Rural	1.179	1,179	200	PVC	1975	75	2050	500	589,500	30	26,321	-
85	DENFIELD RD FROM Elginfield Rd TO ~400m South Maple lodge	McGillvray	Rural	2.410	2,410	150	PVC	1978	75	2053	500	1,205,000	33	50,232	-
88	DENFIELD RD FROM Prince William St TO ~280m S Clandeboye	McGillvray	Rural	0.858	858	150	PVC	1975	75	2050	500	429,000	30	19,155	-
86	DENFIELD RD FROM Maple Lodge Dr TO Prince William St	McGillvray	Rural	1.647	1,647	150	PVC	1975	75	2050	500	823,500	30	36,769	-
89	DRUMMOND RD FROM West Corners Dr TO Ausable Dr	McGillvray	Rural	2.071	2,071	75	PVC	1982	75	2057	250	517,750	37	19,937	-
90	DUCHESS AVE FROM Centre St TO Duke St	Parkhill	Urban	0.114	114	150	PVC	1972	75	2047	950	108,300	27	5,230	-
91	DUKE ST FROM Duchess Ave TO West Park Dr	Parkhill	Urban	0.246	246	100	PVC	2013	75	2088	950	233,700	68	6,317	-
92	EAGLE ST FROM Hastings St TO Anna St	Parkhill	Urban	0.124	124	200	PVC	1992	75	2067	950	117,800	47	3,890	-
95	EASEMENT FROM Ausable Dr to West Corners Drive	McGillvray	Rural	0.617	617	200	PVC	1998	75	2073	500	308,500	53	9,494	-
96	EASEMENT FROM Ausable Dr to West Corners Drive	McGillvray	Rural	0.374	374	100	PVC	1998	75	2073	500	187,000	53	5,755	-
93	EASEMENT FROM Ausable Dr to West Corners Drive	McGillvray	Rural	0.194	194	200	PVC	1982	75	2057	500	97,000	37	3,735	-
94	EASEMENT FROM Ausable Dr to West Corners Drive	McGillvray	Rural	0.885	885	200	PVC	1982	75	2057	500	442,500	37	17,039	-
97	EASEMENT FROM Mount Carmel to Parkhill	McGillvray	Rural	10.863	10,863	400	PVC	1994	75	2069	600	6,517,800	49	209,899	-
100	EAST WILLIAMS ST FROM Petty St TO Alma Stt	Nairn	Urban	0.395	395	150	PVC	2001	75	2076	950	375,250	56	11,200	-
99	EAST WILLIAMS ST FROM Cauder St TO Queen St	Nairn	Urban	0.228	228	150	PVC	1976	75	2051	950	216,600	31	9,443	-
98	EAST WILLIAMS ST FROM Alma St TO Cauder St	Nairn	Urban	0.253	253	150	PVC	2001	75	2076	950	240,350	56	7,174	-
103	ELGINFIELD RD FROM Cassidy Rd TO Ailsa Craig Main St (W)	Ailsa Craig	Urban	0.217	217	150	PVC	1982	75	2057	950	206,150	37	7,938	-
106	ELGINFIELD RD FROM McGuffin Hills Dr TO 1.5 Blocks West of Alisa Craig Main St	East Williams	Rural	5.016	5,016	100	PVC	1982	75	2057	500	2,508,000	37	96,575	-
101	ELGINFIELD RD FROM Ailsa Craig Main St (E) TO Brook Rd	Ailsa Craig	Rural	0.018	18	150	PVC	1982	75	2057	500	9,000	37	347	-
108	ELGINFIELD RD FROM Neil Rd TO Denfield Rd	McGillvray	Rural	0.008	8	250	PVC	1982	75	2057	500	4,000	37	154	-
109	ELGINFIELD RD FROM Neil Rd TO Denfield Rd	McGillvray	Rural	0.255	255	300	PVC	1982	75	2057	600	153,000	37	5,892	-
104	ELGINFIELD RD FROM Fortrose Rd TO Centre Rd	East Williams	Rural	4.120	4,120	100	PVC	1992	75	2067	500	2,060,000	47	68,017	-
102	ELGINFIELD RD FROM Brook Rd TO Maguire Rd	McGillvray	Rural	6.388	6,388	200	PVC	1982	75	2057	500	3,194,000	37	122,991	-
115	ELGINFIELD RD FROM Scout Rd TO Sylvan Rd	West Williams	Rural	1.032	1,032	100	PVC	1984	75	2059	500	516,000	39	19,180	-
116	ELGINFIELD RD FROM Sylvan Rd TO Kerwood Rd	West Williams	Rural	5.389	5,389	150	PVC	1984	75	2059	500	2,694,500	39	100,158	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
105	ELGINFIELD RD FROM Kerwood Rd TO Nairn Rd	West Williams	Rural	1.640	1,640	200	PVC	1984	75	2059	500	820,000	39	30,480	-
107	ELGINFIELD RD FROM Nairn Rd TO West Park Dr	Parkhill	Rural	1.813	1,813	200	PVC	1982	75	2057	500	906,500	37	34,906	-
112	ELGINFIELD RD FROM Parkhill Main St TO Centre Rd	Parkhill	Rural	0.695	695	200	PVC	1982	75	2057	500	347,500	37	13,381	-
113	ELGINFIELD RD FROM Parkhill Main St TO Centre Rd	Parkhill	Rural	1.314	1,314	150	PVC	1982	75	2057	500	657,000	37	25,299	-
110	ELGINFIELD RD FROM Neil Rd TO Denfield Rd	McGillvray	Rural	0.833	833	150	PVC	1982	75	2057	500	416,500	37	16,038	-
111	ELGINFIELD RD FROM Neil Rd TO Denfield Rd	McGillvray	Rural	0.010	10	300	PVC	1982	75	2057	600	6,000	37	231	-
114	ELK ST From Hastings St To CN Rail	Parkhill	Urban	0.100	100	50	PVC	1960	75	2035	500	50,000	15	3,891	-
118	ELLEN ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.125	125	150	PVC	1960	75	2035	950	118,750	15	9,242	-
117	ELLEN ST FROM Catherine St TO Mill Craig St	Parkhill	Urban	0.127	127	150	PVC	1989	75	2064	950	120,650	44	4,149	-
119	ELLIOT DR FROM 2115 Elliot Dr TO West Park Dr	Parkhill	Rural	0.077	77	50	PVC	1982	75	2057	500	38,500	37	1,483	-
120	ELLIOT DR FROM Parkhill Main St TO West Park Dr	Parkhill	Rural	0.444	444	200	PVC	1982	75	2057	500	222,000	37	8,549	-
121	ELLIOT DR FROM Sylvan Rd TO West Park Dr	Parkhill	Rural	7.431	7,431	100	PVC	1982	75	2057	500	3,715,500	37	143,072	-
122	ELM TREE DR FROM Broken Front Rd TO Kerwood Rd	West Williams	Rural	5.367	5,367	100	PVC	1984	75	2059	500	2,683,500	39	99,749	-
124	ELM TREE DR FROM Kerwood Rd TO Hodgins Rd	West Williams	Rural	1.229	1,229	150	PVC	1984	75	2059	500	614,500	39	22,842	-
123	ELM TREE DR FROM Hodgins Rd TO Centre Rd	West Williams	Rural	2.857	2,857	100	PVC	1984	75	2059	500	1,428,500	39	53,099	-
125	ELM TREE DR FROM Springbank Rd TO Fort Rose Rd	East Williams	Rural	2.046	2,046	100	PVC	2002	75	2077	500	1,023,000	57	30,241	-
325	ELM TREE DR From Centre Rd To Springbank Rd	East Williams	Rural	1.000	1,000	100	PVC	1995	75	2070	500	500,000	50	15,912	-
126	EMILY ST FROM Station St TO Parkhill Main St	Parkhill	Urban	0.277	277	150	PVC	1960	75	2035	950	263,150	15	20,480	-
127	FALKIRK ST FROM Bruce St TO Wellington St	East Williams	Urban	0.224	224	200	PVC	2001	75	2076	950	212,800	56	6,351	-
129	FERNHILL DR FROM Siddall Rd TO Vanneck Rd	East Williams	Rural	0.700	700	300	PVC	1992	75	2067	600	420,000	47	13,868	-
128	FERNHILL DR FROM New Ontario Rd TO Siddall Rd	East Williams	Rural	2.214	2,214	300	PVC	2001	75	2076	600	1,328,400	56	39,648	-
326	FERNHILL DR From Bear Creek Rd To New Ontario Rd	East Williams	Rural	0.500	500	150	PVC	1998	75	2073	500	250,000	53	7,693	-
327	FERNHILL DR From Bear Creek Rd To New Ontario Rd	East Williams	Rural	0.300	300	150	PVC	2001	75	2076	500	150,000	56	4,477	-
130	FINCH ST FROM Robin St TO Hamilton St	Ailsa Craig	Urban	0.106	106	150	PVC	1974	75	2049	950	100,700	29	4,610	-
131	FORT ROSE RD FROM Coldstream Rd TO New Ontario Road	East Williams	Rural	3.717	3,717	100	PVC	1992	75	2067	500	1,858,500	47	61,364	-
132	FORT ROSE RD FROM Elm Tree Dr TO Coldstream Rd	East Williams	Rural	3.477	3,477	100	PVC	2002	75	2077	500	1,738,500	57	51,392	-
133	GALE RD FROM Argyle St TO King St	East Williams	Urban	0.085	85	150	PVC	2001	75	2076	950	80,750	56	2,410	-
134	GEORGE ST FROM Old Mill St TO Queen St	Ailsa Craig	Urban	0.575	575	200	PVC	1974	75	2049	950	546,250	29	25,006	-
136	GEORGE ST FROM West End TO Old Mill St	Ailsa Craig	Urban	0.064	64	150	PVC	1974	75	2049	950	60,800	29	2,783	-

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135	GEORGE ST FROM Queen St TO Ness St	Ailsa Craig	Urban	0.219	219	150	PVC	1974	75	2049	950	208,050	29	9,524	-
137	GLASGOW ST FROM Centre Rd TO Wyatt Rd	East Williams	Rural	4.121	4,121	100	PVC	2002	75	2077	500	2,060,500	57	60,911	-
138	GLASGOW ST FROM East of Creek TO Centre Rd	West Williams	Rural	1.071	1,071	50	PVC	1984	75	2059	500	535,500	39	19,905	-
139	GLASGOW ST FROM Wyatt Rd TO McCubbin Rd	East Williams	Rural	0.859	859	150	PVC	2002	75	2077	500	429,500	57	12,697	-
140	GODKIN RD FROM McGuffin Hills Dr TO McGillivray Dr	McGillvray	Rural	4.000	4,000	100	PVC	1982	75	2057	500	2,000,000	37	77,014	-
142	GRAND BEND RD FROM Mark Settlement Rd TO Adare Dr	McGillvray	Rural	1.982	1,982	50	PVC	1975	75	2050	500	991,000	30	44,248	-
145	GRAND BEND RD FROM West Corners Dr TO McGillivray Dr	McGillvray	Rural	2.064	2,064	100	PVC	1972	75	2047	500	1,032,000	27	49,838	-
143	GRAND BEND RD FROM McGuffin Hills Dr TO West Corners Dr	McGillvray	Rural	1.405	1,405	100	PVC	1982	75	2057	500	702,500	37	27,051	-
141	GRAND BEND RD FROM Adare Dr TO Corbett Rd	McGillvray	Rural	1.932	1,932	100	PVC	1975	75	2050	500	966,000	30	43,132	-
144	GRAND BEND RD FROM Moray Dr TO Mark Settlement Dr	McGillvray	Rural	1.008	1,008	100	PVC	1982	75	2057	500	504,000	37	19,407	-
148	GREENWAY DR FROM Hutchinson Rd TO Bullock Rd	McGillvray	Rural	2.039	2,039	100	PVC	1975	75	2050	500	1,019,500	30	45,521	-
147	GREENWAY DR FROM Bullock Rd TO Greenway / Grand Bend Rd	McGillvray	Rural	2.069	2,069	150	PVC	1975	75	2050	500	1,034,500	30	46,190	-
146	GREENWAY DR From ~800m E of Hagmier To Hutchinson Rd	McGillvray	Rural	0.514	514	50	PVC	1975	75	2050	500	257,000	30	11,475	-
328	GRIEVES RD FROM McGuffin Hills Dr To West Corners Dr	McGillvray	Rural	0.300	300	50	PVC	1975	75	2050	500	150,000	30	6,697	-
149	GRIEVES RD FROM West Corners Dr TO McGillivray Dr	McGillvray	Rural	2.059	2,059	100	PVC	1975	75	2050	500	1,029,500	30	45,967	-
150	HAMILTON ST FROM Queen St TO Robin St	Ailsa Craig	Urban	0.189	189	150	PVC	1974	75	2049	950	179,550	29	8,220	-
151	HASTINGS ST FROM Parkhill George St TO Eagle St	Parkhill	Urban	0.170	170	200	PVC	1960	75	2035	950	161,500	15	12,569	-
152	HASTINGS ST FROM Parkhill Main St TO Pearl St	Parkhill	Urban	0.127	127	250	PVC	1960	75	2035	950	120,650	15	9,390	-
153	HASTINGS ST FROM Pearl St TO Parkhill George St	Parkhill	Urban	0.376	376	150	PVC	1960	75	2035	950	357,200	15	27,799	-
154	HAWTHORN CRES FROM Alma St TO End	Nairn	Urban	0.361	361	150	PVC	2001	75	2076	950	342,950	56	10,236	-
155	HIGH ST FROM Queen St TO McAndrew St	Ailsa Craig	Urban	0.324	324	150	PVC	1974	75	2049	950	307,800	29	14,091	-
156	HODGINS RD FROM Elm Tree Dr TO Creek	West Williams	Rural	1.028	1,028	50	PVC	1984	75	2059	500	514,000	39	19,106	-
157	HUNGRY HOLLOW RD FROM Sylvan Rd TO Hungry Hallow Corner	West Williams	Rural	0.557	557	100	PVC	1984	75	2059	500	278,500	39	10,352	-
158	HUNGRY HOLLOW RD FROM Sylvan Rd TO Hungry Hallow Corner	West Williams	Rural	0.374	374	150	PVC	1984	75	2059	500	187,000	39	6,951	-
159	HUTCHINSON RD FROM Mark settlement Rd TO Greenway Dr	McGillvray	Rural	2.447	2,447	100	PVC	1975	75	2050	500	1,223,500	30	54,629	-
161	JAMES ST FROM George St TO William St	Ailsa Craig	Urban	0.117	117	150	PVC	1974	75	2049	950	111,150	29	5,088	-
160	JAMES ST FROM Church St TO High St	Ailsa Craig	Urban	0.102	102	150	PVC	1974	75	2049	950	96,900	29	4,436	-
162	JAMESON ST FROM Church St TO Ailsa Craig Main St	Ailsa Craig	Urban	0.179	179	150	PVC	1974	75	2049	950	170,050	29	7,785	-
164	JOHN ST FROM West Park Drive TO Ann St	Parkhill	Urban	0.284	284	150	PVC	2009	75	2084	950	269,800	64	7,511	-

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163	JOHN ST FROM Ann St TO Parkhill Main St	Parkhill	Urban	0.140	140	150	PVC	1992	75	2067	950	133,000	47	4,391	-
166	KERWOOD RD FROM Coldstream Rd TO Elginfield Rd	West Williams	Rural	1.603	1,603	200	PVC	1984	75	2059	500	801,500	39	29,793	-
167	KERWOOD RD FROM River Dr TO Coldstream Dr	West Williams	Rural	4.759	4,759	150	PVC	1984	75	2059	500	2,379,500	39	88,449	-
165	KERWOOD RD FROM Ausable Dr TO McAdam Rd	West Williams	Rural	2.577	2,577	100	PVC	1984	75	2059	500	1,288,500	39	47,895	-
168	KING ST FROM Fernhill DR TO Gale Rd	East Williams	Urban	1.293	1,293	200	PVC	2001	75	2076	950	1,228,350	56	36,662	-
169	LAMON DR FROM Broken Front Rd TO Sylvan Rd	West Williams	Rural	1.769	1,769	50	PVC	1984	75	2059	500	884,500	39	32,878	-
170	LEONARD AVE (Tain W) FROM Ann St TO Parkhill Main St	Parkhill	Urban	0.142	142	150	Cast Iron	1954	50	2020	950	134,900	0	suggested for 10 year capital forecast	134,900
171	LEWIS CT FROM Porte St TO End	Clandeboye	Urban	0.076	76	100	PVC	1985	75	2060	950	72,200	40	2,639	-
173	LIEURY RD FROM Ausable Dr TO Mount Caramel Dr	McGillvray	Rural	6.258	6,258	100	PVC	1975	75	2050	500	3,129,000	30	139,710	-
172	LIEURY RD FROM Adare Dr TO Mount Carmel Dr	McGillvray	Rural	0.041	41	150	PVC	1975	75	2050	500	20,500	30	915	-
174	MAGUIRE RD FROM Ausable Dr TO North Dead End	McGillvray	Rural	0.439	439	150	PVC	1998	75	2073	500	219,500	53	6,755	-
176	MAGUIRE RD FROM McGillivray Dr TO ~40m South of Mooresville Dr	McGillvray	Rural	2.050	2,050	100	PVC	1998	75	2073	500	1,025,000	53	31,543	-
177	MAGUIRE RD FROM Mooresville Dr TO 2.5 Blocks North of Adare Dr	McGillvray	Rural	3.050	3,050	100	PVC	1975	75	2050	500	1,525,000	30	68,091	-
179	MAGUIRE RD FROM West Corners Dr TO Prince William St	McGillvray	Rural	1.629	1,629	100	PVC	1998	75	2073	500	814,500	53	25,065	-
178	MAGUIRE RD FROM Prince William St TO Ausable Dr	McGillvray	Rural	0.678	678	100	PVC	1975	75	2050	500	339,000	30	15,136	-
175	MAGUIRE RD FROM Clandeboye Dr TO McGillivray Dr	McGillvray	Rural	2.026	2,026	100	PVC	1975	75	2050	500	1,013,000	30	45,230	-
188	MAPLE LODGE DR FROM Maguire Rd TO Neil Rd	McGillvray	Rural	0.200	200	100	PVC	1998	75	2073	500	100,000	53	3,077	-
180	MAPLE RD FROM South End TO Petty St	East Williams	Rural	0.229	229	100	PVC	2001	75	2076	500	114,500	56	3,417	-
181	MARK SETTLEMENT DR FROM Prance Rd TO Grand Bend Rd	McGillvray	Rural	5.173	5,173	100	PVC	1975	75	2050	500	2,586,500	30	115,487	-
182	MCADAM RD FROM River Drive (East Side) TO Kerwood Rd	West Williams	Rural	0.300	300	100	PVC	1984	75	2059	500	150,000	39	5,576	-
184	MCCUBBIN RD FROM Glasgow St TO Wyatt Rd	East Williams	Rural	0.541	541	50	PVC	2002	75	2077	500	270,500	57	7,996	-
185	MCCUBBIN RD FROM Petty St TO Glasgow St	East Williams	Rural	0.395	395	150	PVC	2002	75	2077	500	197,500	57	5,838	-
183	MCCUBBIN RD FROM Argyle St TO Petty St	East Williams	Rural	1.703	1,703	100	PVC	2002	75	2077	500	851,500	57	25,171	-
189	MCGILLIVRAY DR FROM Cassidy Rd TO Creamery Rd	McGillvray	Rural	2.400	2,400	100	PVC	1975	75	2050	500	1,200,000	30	53,580	-
187	MCGILLIVRAY DR FROM Cassidy Rd TO Brinsley Rd	McGillvray	Rural	1.716	1,716	150	PVC	1975	75	2050	500	858,000	30	38,310	-
186	MCGILLIVRAY DR FROM Brinsley Rd TO Richmond St	McGillvray	Rural	6.192	6,192	200	PVC	1975	75	2050	500	3,096,000	30	138,236	-
190	MCGILLIVRAY DR FROM Cassidy Rd TO McGillivray Junction	McGillvray	Rural	0.349	349	150	PVC	1975	75	2050	500	174,500	30	7,791	-
192	MCGILLIVRAY DR FROM Lieury Rd TO Creamery Rd	McGillvray	Rural	1.995	1,995	100	PVC	1975	75	2050	500	997,500	30	44,538	-

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191	MCGILLIVRAY DR FROM Grand Bend Rd TO Lieury Rd	McGillvray	Rural	5.623	5,623	100	PVC	1975	75	2050	500	2,811,500	30	125,533	-
194	MCGUFFIN HILLS DR FROM West End TO Grand Bend Rd	McGillvray	Rural	0.174	174	100	PVC	1975	75	2050	500	87,000	30	3,885	-
193	MCGUFFIN HILLS DR FROM Godkin Rd TO Charlton Rd	McGillvray	Rural	2.063	2,063	100	PVC	1982	75	2057	500	1,031,500	37	39,720	-
195	MCINNIS RD FROM South End TO Parkhill Dr	Parkhill	Rural	0.259	259	50	PVC	1982	75	2057	500	129,500	37	4,987	-
196	MCINNIS RD FROM West Corners Dr TO Mark Settlement Dr	McGillvray	Rural	1.029	1,029	100	PVC	1975	75	2050	500	514,500	30	22,972	-
197	MCINTOSH DR FROM Cassidy Rd TO Queens Ave	East Williams	Rural	0.618	618	150	PVC	1976	75	2051	500	309,000	31	13,471	-
198	MCINTOSH DR FROM Nairn Rd TO Cassidy Rd	East Williams	Rural	1.377	1,377	150	PVC	2001	75	2076	500	688,500	56	20,549	-
199	MCLEAN RD FROM Elginfield Rd TO Ausable Dr	McGillvray	Rural	4.129	4,129	100	PVC	1982	75	2057	500	2,064,500	37	79,497	-
200	MCLEISH RD FROM Glasgow St TO North to End	East Williams	Rural	0.507	507	50	PVC	2002	75	2077	500	253,500	57	7,494	-
202	MCLEOD ST FROM East TO Parkhill Main St	Parkhill	Urban	0.198	198	150	PVC	1972	75	2047	950	188,100	27	9,084	-
203	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.101	101	150	PVC	2009	75	2084	950	95,950	64	2,671	-
204	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.418	418	200	PVC	2009	75	2084	950	397,100	64	11,055	-
201	MCLEOD ST EXTENSION FROM McLeod St TO Elginfield Rd	Parkhill	Urban	0.241	241	200	PVC	2010	75	2085	950	228,950	65	6,325	-
205	MICHELLE AVE FROM McLeod St TO South to End	Parkhill	Urban	0.172	172	150	PVC	1991	75	2066	950	163,400	46	5,466	-
207	MILL CRES FROM Queen Ave TO Cemetery Rd	East Williams	Urban	0.097	97	150	PVC	1976	75	2051	950	92,150	31	4,017	-
206	MILL CRES FROM Cemetery Road TO Queen Ave	East Williams	Urban	0.305	305	150	PVC	2001	75	2076	950	289,750	56	8,648	-
208	MILL ST FROM Parkhill Richmond St TO Parkhill Main St	Parkhill	Urban	0.618	618	200	PVC	2002	75	2077	950	587,100	57	17,355	-
209	MILL ST FROM West End TO Parkhill Richmond St	Parkhill	Urban	0.255	255	150	PVC	1989	75	2064	950	242,250	44	8,330	-
210	MILLCRAIG ST FROM Delaware St TO Ellen St	Parkhill	Urban	0.205	205	150	PVC	1991	75	2066	950	194,750	46	6,515	-
211	MILLCRAIG ST FROM East End TO Ellen St	Parkhill	Urban	0.143	143	150	PVC	1991	75	2066	950	135,850	46	4,545	-
213	MOORESVILLE DR From Neil Rd To Richmond St	McGillvray	Rural	0.500	500	100	PVC	1990	75	2065	500	250,000	45	8,477	-
212	MOORESVILLE DR FROM Lieury Rd TO Creamery Rd	McGillvray	Rural	1.962	1,962	50	PVC	1982	75	2057	500	981,000	37	37,775	-
216	MOUNT CARMEL DR FROM Creamery Rd TO Lieury Rd	McGillvray	Rural	1.056	1,056	50	PVC	1975	75	2050	500	528,000	30	23,575	-
215	MOUNT CARMEL DR FROM Creamery Rd TO Brinsley Rd	McGillvray	Rural	5.103	5,103	100	PVC	1975	75	2050	500	2,551,500	30	113,924	-
218	MOUNT CARMEL DR FROM Lieury Rd TO Salem Rd	McGillvray	Rural	0.155	155	100	PVC	1975	75	2050	500	77,500	30	3,460	-
217	MOUNT CARMEL DR FROM Lieury Rd TO Corbett Rd	McGillvray	Rural	6.096	6,096	150	PVC	1975	75	2050	500	3,048,000	30	136,093	-
219	MOUNT CARMEL DR FROM Tasko Dr TO 1 Block West of Neil Rd	McGillvray	Rural	2.853	2,853	100	PVC	1975	75	2050	500	1,426,500	30	63,693	-
214	MOUNT CARMEL DR From Brinsley Rd To Maguire Rd	McGillvray	Rural	0.324	324	100	PVC	1975	75	2050	500	162,000	30	7,233	-
220	NAIRN RD FROM Bornish Dr TO Fort Rose Rd	East Williams	Rural	2.745	2,745	150	PVC	1992	75	2067	500	1,372,500	47	45,317	-

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223	NAIRN RD FROM Springbank Rd TO Centre Rd	East Williams	Rural	3.272	3,272	100	PVC	1992	75	2067	500	1,636,000	47	54,017	-
222	NAIRN RD FROM Petty St TO Cassidy Rd	East Williams	Rural	0.637	637	100	PVC	1992	75	2067	500	318,500	47	10,516	-
221	NAIRN RD FROM Fernhill Drive TO Petty St	East Williams	Rural	3.413	3,413	200	PVC	1992	75	2067	500	1,706,500	47	56,345	-
224	NEIL RD FROM Elginfield Rd TO Maple Lodge Dr	McGillvray	Rural	1.958	1,958	100	PVC	1975	75	2050	500	979,000	30	43,712	-
225	NEIL RD FROM Prince William St TO Mount Carmel Dr	McGillvray	Rural	10.240	10,240	100	PVC	1975	75	2050	500	5,120,000	30	228,608	-
226	NEIL ST FROM King St TO Waterloo St	East Williams	Rural	0.128	128	150	PVC	2001	75	2076	500	64,000	56	1,910	-
227	NESS ST FROM Ailsa Craig Main St TO William St	Ailsa Craig	Urban	0.226	226	150	PVC	1975	75	2050	950	214,700	30	9,586	-
229	NESS ST FROM Ness St To East End	Ailsa Craig	Urban	0.048	48	150	PVC	1975	75	2050	950	45,600	30	2,036	-
228	NESS ST FROM George St TO William St	Ailsa Craig	Urban	0.119	119	150	PVC	1974	75	2049	950	113,050	29	5,175	-
230	NEW ONTARIO RD FROM Fort Rose Rd TO Cassidy Rd	East Williams	Rural	4.100	4,100	100	PVC	1992	75	2067	500	2,050,000	47	67,687	-
232	NEW ONTARIO RD FROM Petty St TO Fernhill Dr	East Williams	Rural	5.202	5,202	300	PVC	2001	75	2076	600	3,121,200	56	93,157	-
231	NEW ONTARIO RD FROM Petty St TO Cassidy Rd	East Williams	Rural	1.564	1,564	150	PVC	2001	75	2076	500	782,000	56	23,340	-
233	NORTH ST FROM Queen Ave TO Cemetery Rd	East Williams	Rural	0.132	132	150	PVC	2001	75	2076	500	66,000	56	1,970	-
234	OLD MILL ST FROM Ailsa Craig Main St TO William St	Ailsa Craig	Urban	0.213	213	150	PVC	1974	75	2049	950	202,350	29	9,263	-
235	PARK ST FROM West Park Drive TO West	Parkhill	Urban	0.195	195	150	PVC	1990	75	2065	950	185,250	45	6,282	-
237	PARKHILL DR FROM Station St TO Parkhill Main St	Parkhill	Urban	0.300	300	200	PVC	1974	75	2049	950	285,000	29	13,047	-
238	PARKHILL DR FROM Station St TO Parkhill Main St	Parkhill	Urban	0.021	21	300	PVC	1974	75	2049	1,200	25,200	29	1,154	-
239	PARKHILL DR FROM Victoria St TO Station St	Parkhill	Urban	0.592	592	150	PVC	1974	75	2049	950	562,400	29	25,746	-
240	PARKHILL DR FROM Victoria St TO Sylvan Rd	Parkhill	Urban	7.508	7,508	150	PVC	1982	75	2057	950	7,132,600	37	274,653	-
236	PARKHILL DR FROM Hall Rd TO Sylvan Rd	Parkhill	Urban	2.050	2,050	100	PVC	1982	75	2057	950	1,947,500	37	74,992	-
241	PARKHILL GEORGE ST FROM Anna St TO William St East	Parkhill	Urban	0.107	107	150	PVC	1984	75	2059	950	101,650	39	3,778	-
244	PARKHILL KING ST FROM West Park Drive TO Ann St	Parkhill	Urban	0.285	285	150	PVC	1993	75	2068	950	270,750	48	8,827	-
242	PARKHILL KING ST FROM Ann St TO Parkhill Main St	Parkhill	Urban	0.138	138	200	PVC	1960	75	2035	950	131,100	15	10,203	-
243	PARKHILL KING ST FROM West End TO West Park Dr	Parkhill	Urban	0.199	199	150	PVC	1960	75	2035	950	189,050	15	14,713	-
246	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	Urban	1.402	1,402	300	PVC	1960	75	2035	1,200	1,682,400	15	130,934	-
245	PARKHILL MAIN ST FROM Elginfield Rd TO McLeod St	Parkhill	Urban	0.359	359	300	Ductile Iron	1988	60	2048	1,200	430,800	28	20,243	-
247	PARKHILL RICHMOND ST FROM Mill St TO North to End	Parkhill	Urban	0.283	283	150	PVC	1995	75	2070	950	268,850	50	8,556	-
248	PARKHILL RICHMOND ST FROM Mill St TO North to End	Parkhill	Urban	0.121	121	150	PVC	1995	75	2070	950	114,950	50	3,658	-
249	PARKHILL RICHMOND ST FROM Mill St TO Parkhill King St	Parkhill	Urban	0.133	133	150	PVC	2002	75	2077	950	126,350	57	3,735	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
250	PEARL ST FROM Hastings St TO William St East	Parkhill	Urban	0.231	231	150	PVC	1960	75	2035	950	219,450	15	17,079	-
263	PETE SEBE RD From Elliot Drive To Parkhill Dr	West Williams	Rural	0.500	500	50	PVC	1982	75	2057	500	250,000	37	9,627	-
251	PETE SEBE RD FROM Elginfield Rd TO Elliot Drive	Parkhill	Rural	2.025	2,025	50	PVC	1982	75	2057	500	1,012,500	37	38,988	-
253	PETTY ST FROM McCubbin Rd TO Nairn Rd	East Williams	Rural	7.302	7,302	150	PVC	2002	75	2077	500	3,651,000	57	107,928	-
254	PETTY ST FROM Nairn Rd TO Maple Rd	East Williams	Rural	1.983	1,983	200	PVC	2002	75	2077	500	991,500	57	29,310	-
252	PETTY ST FROM Maple Rd TO Queen St	East Williams	Rural	2.685	2,685	200	PVC	2001	75	2076	500	1,342,500	56	40,069	-
255	POPLAR HILL RD FROM Petty St TO Fort Rose Rd	East Williams	Rural	2.970	2,970	200	PVC	2002	75	2077	500	1,485,000	57	43,898	-
256	PORTE ST FROM Chriselle Pl TO Bradley Street	Clandeboye	Urban	0.675	675	150	PVC	1985	75	2060	950	641,250	40	23,441	-
258	PRANCE RD FROM West Corners Dr TO Mark Settlement Dr	McGillvray	Rural	2.037	2,037	100	PVC	1982	75	2057	500	1,018,500	37	39,219	-
257	PRANCE RD FROM Parkhill Dr TO West Corners Dr	McGillvray	Rural	2.047	2,047	150	PVC	1982	75	2057	500	1,023,500	37	39,412	-
259	PRINCE ST FROM Elliot Drive TO West Park Dr	Parkhill	Urban	0.244	244	50	PVC	1972	75	2047	500	122,000	27	5,892	-
260	PRINCE WILLIAM ST FROM Maguire Rd TO Neil Rd	McGillvray	Rural	2.093	2,093	100	PVC	1998	75	2073	500	1,046,500	53	32,205	-
261	QUEEN ST FROM Ailsa Craig Main TO Westcorner Dr	Ailsa Craig	Urban	0.749	749	200	PVC	1974	75	2049	950	711,550	29	32,574	-
262	QUEEN ST FROM Ailsa Craig St TO Hamilton St	Ailsa Craig	Urban	0.427	427	200	PVC	2010	75	2085	950	405,650	65	11,207	-
265	QUEEN ST FROM Hamilton St TO South to Petty St	Ailsa Craig	Urban	0.510	510	200	PVC	1974	75	2049	950	484,500	29	22,180	-
266	QUEEN ST FROM West Corners Dr TO CON 5/6 Line	Ailsa Craig	Rural	0.630	630	200	PVC	1982	75	2057	500	315,000	37	12,130	-
267	QUEEN ST FROM West Corners Dr TO CON 5/6 Line	McGillvray	Rural	0.592	592	200	PVC	1982	75	2057	500	296,000	37	11,398	-
268	QUEEN ST FROM West Corners Dr TO CON 5/6 Line	McGillvray	Rural	0.929	929	150	PVC	1982	75	2057	500	464,500	37	17,886	-
269	QUEEN ST FROM West Corners Dr TO CON 5/6 Line	McGillvray	Rural	0.017	17	150	PVC	1982	75	2057	500	8,500	37	327	-
270	QUEENS AVE FROM McIntosh Dr TO Mill Cres	East Williams	Urban	0.288	288	200	PVC	1976	75	2051	950	273,600	31	11,928	-
271	QUEENS AVE FROM Petty St TO Mill Cres	East Williams	Urban	0.801	801	200	PVC	2001	75	2076	950	760,950	56	22,712	-
272	RABBITWOOD CRT FROM Church St TO North to End	Ailsa Craig	Urban	0.101	101	150	PVC	1974	75	2049	950	95,950	29	4,392	-
275	RICHMOND ST FROM Mooresville Dr TO Tasko Drive	McGillvray	Rural	3.429	3,429	100	PVC	1975	75	2050	500	1,714,500	30	76,552	-
274	RICHMOND ST FROM McGillivray Dr TO Mooresville Dr	McGillvray	Rural	2.066	2,066	150	PVC	1975	75	2050	500	1,033,000	30	46,123	-
273	RICHMOND ST FROM Denfield St TO McGillivray Dr	McGillvray	Rural	2.039	2,039	200	PVC	1975	75	2050	500	1,019,500	30	45,521	-
276	RIVER DR FROM Sylvan Rd TO Roddick Rd	West Williams	Rural	4.611	4,611	150	PVC	1984	75	2059	500	2,305,500	39	85,698	-
278	ROBIN ST FROM Queen Ave TO Robin St	Ailsa Craig	Urban	0.189	189	150	PVC	1990	75	2065	950	179,550	45	6,088	-
277	ROBIN ST FROM Finch St TO Hamilton St	Ailsa Craig	Urban	0.105	105	150	PVC	1974	75	2049	950	99,750	29	4,566	-
280	ROSKEEN ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.127	127	150	PVC	1984	75	2059	950	120,650	39	4,485	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
279	ROSKEEN ST FROM Catherine St TO East End	Parkhill	Urban	0.120	120	150	PVC	1984	75	2059	950	114,000	39	4,238	-
281	ROSS RD FROM Petty St TO West to End	East Williams	Rural	0.867	867	100	PVC	1998	75	2073	500	433,500	53	13,340	-
282	SALEM RD FROM McGillvray Dr TO Mount Carmel Dr	McGillvray	Rural	5.675	5,675	100	PVC	1975	75	2050	500	2,837,500	30	126,694	-
283	SCOUT RD FROM Coldstream Rd TO Elginfield Rd	West Williams	Rural	1.171	1,171	100	PVC	1984	75	2059	500	585,500	39	21,764	-
284	SCOUT RD FROM Coldstream Rd TO South End	West Williams	Rural	1.170	1,170	50	PVC	1984	75	2059	500	585,000	39	21,745	-
285	SIDDALL RD FROM Falkirk St TO Fernhill Dr	East Williams	Rural	0.845	845	200	PVC	2001	75	2076	500	422,500	56	12,610	-
286	SPRINGBANK RD FROM Glasgow St TO Elm Tree Dr	East Williams	Rural	0.910	910	100	PVC	1998	75	2073	500	455,000	53	14,002	-
288	STATION ST FROM Parkhill Dr TO North to End	Parkhill	Urban	0.053	53	100	PVC	1960	75	2035	950	50,350	15	3,919	-
289	STATION ST FROM Parkhill Dr TO North to End	Parkhill	Urban	0.085	85	150	PVC	1960	75	2035	950	80,750	15	6,284	-
287	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	Urban	0.612	612	150	PVC	1960	75	2035	950	581,400	15	45,248	-
290	STEWART ST FROM Annie Ada Street TO William St	Ailsa Craig	Urban	0.102	102	150	PVC	1974	75	2049	950	96,900	29	4,436	-
293	SYLVAN RD FROM Townsend Rd TO Hungry Hollow Rd	West Williams	Rural	0.503	503	100	PVC	1984	75	2059	500	251,500	39	9,349	-
291	SYLVAN RD FROM Elginfield Rd TO Parkhill Drive	Parkhill	Rural	4.160	4,160	150	PVC	1982	75	2057	500	2,080,000	37	80,094	-
292	SYLVAN RD FROM Hungry Hallow Rd TO Elginfield Rd	West Williams	Rural	8.473	8,473	150	PVC	1984	75	2059	500	4,236,500	39	157,476	-
296	TAIN ST FROM Parkhill Main St TO Catherine St	Parkhill	Urban	0.127	127	150	PVC	1978	75	2053	950	120,650	33	5,029	-
294	TAIN ST FROM Catherine St TO East End	Parkhill	Urban	0.088	88	150	PVC	1978	75	2053	950	83,600	33	3,485	-
295	TAIN ST FROM Catherine St TO East End	Parkhill	Urban	0.129	129	100	PVC	1978	75	2053	950	122,550	33	5,109	-
297	TASKO DR FROM Richmond St TO Mount Carmel Dr	McGillvray	Rural	0.865	865	100	PVC	1975	75	2050	500	432,500	30	19,311	-
299	TOWNSEND LINE FROM Ausable Rd TO Kerwood Rd	West Williams	Rural	2.031	2,031	100	PVC	2002	75	2077	500	1,015,500	57	30,019	-
300	TOWNSEND LINE FROM East ~570m from Sylvan TO Ausable Dr	West Williams	Rural	2.465	2,465	150	PVC	2002	75	2077	500	1,232,500	57	36,434	-
298	TOWNSEND LINE FROM ~1500m E of Island Rd TO East ~450m	West Williams	Rural	0.711	711	100	PVC	2001	75	2076	500	355,500	56	10,610	-
302	UNION ST FROM Parkhill King St TO Mill St	Parkhill	Urban	0.133	133	200	PVC	1972	75	2047	950	126,350	27	6,102	-
301	UNION ST FROM Mill St TO North ~74m	Parkhill	Urban	0.077	77	100	PVC	1982	75	2057	950	73,150	37	2,817	-
303	UNION ST FROM South of William TO William St W	Parkhill	Urban	0.109	109	150	PVC	2006	75	2081	950	103,550	61	2,954	-
304	VANNECK RD FROM Fernhill Drive TO Elginfield Rd	East Williams	Rural	0.669	669	300	PVC	1992	75	2067	600	401,400	47	13,253	-
305	VICTORIA ST FROM Mill St TO S bend	Parkhill	Urban	0.394	394	150	PVC	1960	75	2035	950	374,300	15	29,130	-
306	WATERLOO ST FROM Bruce St TO Neil Rd	East Williams	Urban	0.220	220	100	PVC	2001	75	2076	950	209,000	56	6,238	-
307	WELLINGTON ST FROM King St TO Siddall Rd	East Williams	Urban	0.256	256	150	PVC	2001	75	2076	950	243,200	56	7,259	-
264	WEST CORNER DR FROM West of Prance to Prance St	McGillvray	Rural	0.200	200	100	PVC	1995	75	2070	500	100,000	50	3,182	-

ID	Street Description	Zone	Urban or Rural	Length (km)	Length (m)	Diameter (mm)	Material	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
308	WEST CORNER DR FROM Drummond Rd TO Charlton Rd	McGillvray	Rural	5.753	5,753	100	PVC	1982	75	2057	500	2,876,500	37	110,765	-
309	WEST CORNER DR FROM Godkin Rd TO Charlton Rd	McGillvray	Rural	0.372	372	50	PVC	1982	75	2057	500	186,000	37	7,162	-
313	WEST CORNER DR FROM West Corners Dr TO Maguire Rd	McGillvray	Rural	2.315	2,315	100	PVC	1982	75	2057	500	1,157,500	37	44,572	-
311	WEST CORNER DR FROM Grieves Rd TO Godkin Rd	McGillvray	Rural	2.055	2,055	100	PVC	1982	75	2057	500	1,027,500	37	39,566	-
310	WEST CORNER DR FROM Grand Bend Rd TO Grieves Rd	McGillvray	Rural	2.072	2,072	100	PVC	1975	75	2050	500	1,036,000	30	46,257	-
312	WEST CORNER DR FROM Prance Rd TO Grand Bend Rd	McGillvray	Rural	6.152	6,152	100	PVC	1975	75	2050	500	3,076,000	30	137,343	-
316	WEST PARK DR FROM Prince St TO Parkhill King St	Parkhill	Urban	0.110	110	150	PVC	2008	75	2083	950	104,500	63	2,932	-
315	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	Urban	0.908	908	200	PVC	2008	75	2083	950	862,600	63	24,203	-
314	WEST PARK DR FROM Elginfield Rd TO Elliot Drive	Parkhill	Urban	0.242	242	200	PVC	1982	75	2057	950	229,900	37	8,853	-
329	WEST STREET FROM Bruce St to West	Carlise	Urban	0.250	250	150	PVC	1998	75	2073	950	237,500	53	7,309	-
319	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	Urban	1.304	1,304	150	PVC	1974	75	2049	950	1,238,800	29	56,710	-
320	WILLIAM ST FROM James St TO Ness St	Ailsa Craig	Urban	0.108	108	150	PVC	1975	75	2050	950	102,600	30	4,581	-
318	WILLIAM ST E FROM Parkhill Main St TO Delaware St	Parkhill	Urban	0.228	228	150	PVC	1960	75	2035	950	216,600	15	16,857	-
317	WILLIAM ST E FROM Delaware St TO Parkhill George St	Parkhill	Urban	0.273	273	150	PVC	1989	75	2064	950	259,350	44	8,919	-
322	WILLIAM ST W FROM Union St TO Station St	Parkhill	Urban	0.135	135	150	PVC	2006	75	2081	950	128,250	61	3,658	-
321	WILLIAM ST W FROM Station St TO Parkhill Main St	Parkhill	Urban	0.279	279	150	PVC	1960	75	2035	950	265,050	15	20,628	-
323	WYATT RD FROM Centre Rd TO Mccubbin Rd	East Williams	Rural	2.004	2,004	100	PVC	2002	75	2077	500	1,002,000	57	29,620	-
Total				**473.76**	**473,760**							**257,421,400**		**9,967,418**	**494,000**

Table A-3
Municipality of North Middlesex
Hydrants

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
1	AILSA CRAIG MAIN ST FROM ~75m E of Ness TO East Limits	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
2	AILSA CRAIG MAIN ST FROM Ness St TO ~75m East	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
3	AILSA CRAIG MAIN ST FROM Old Mill St TO Craig Street	Ailsa Craig	2010	50	2060	7,000	40	256	-
4	AILSA CRAIG MAIN ST FROM Old Mill St TO Craig Street	Ailsa Craig	2010	50	2060	7,000	40	256	-
5	AILSA CRAIG MAIN ST FROM Old Mill St TO Craig Street	Ailsa Craig	2010	50	2060	7,000	40	256	-
6	AILSA CRAIG MAIN ST FROM West Limits to Old Mill St	Ailsa Craig	2010	50	2060	7,000	40	256	-
7	ALBERT ST FROM Parkhill King Street TO Broadway Street	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
8	ALLNESS ST FROM Cartherine Street TO East End	Parkhill	1995	50	2045	7,000	25	359	-
9	ALMA ST FROM Hawthorn Cres TO Queen Ave	Nairn	2001	50	2051	7,000	31	305	-
10	ANN ST FROM Broadway Street TO Parkhill King st	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
11	ANN ST FROM Broadway Street TO Parkhill King st	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
12	ANN ST FROM Leonard Ave TO John Street	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
13	ANNA ST FROM Delaware St TO Eagle St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
14	ANNA ST FROM Delaware St TO Eagle St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
15	ANNIE ADA SHIPLEY ST FROM Stewart St TO Queen St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
16	ANNIE ADA SHIPLEY ST FROM Stewart St TO Queen St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
17	BROAD ST FROM Parkhill Main St TO Station St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
18	BRUCE ST FROM King St TO Falkirk St	Carlise	2001	50	2051	7,000	31	305	-
19	CATHERINE ST FROM Ellen St TO Allness St	Parkhill	1995	50	2045	7,000	25	359	-
20	CATHERINE ST FROM Leonard Ave TO Ellen St	Parkhill	1995	50	2045	7,000	25	359	-
21	CENTRE ST FROM Duchess Ave TO Westpark Dr	Parkhill	1985	50	2035	7,000	15	545	-
22	CHURCH ST FROM Craig Street TO Queen St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
23	CHURCH ST FROM Queen St TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
24	CLANDEBOYE DR FROM Neil Rd TO Denfield Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
25	CREAMERY RD FROM Ausable Dr TO Mcgillivray	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
26	DELAWARE ST FROM CN ROW TO Hastings St	Parkhill	1983	50	2033	7,000	13	617	-

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
27	DELAWARE ST FROM Hastings St TO William St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
28	DENFIELD RD FROM Elginfield Rd TO ~400m South Maple lodge	Rural	1978	50	2028	7,000	8	suggested for 10 year capital forecast	7,000
29	DENFIELD RD FROM Elginfield Rd TO ~400m South Maple lodge	Rural	1978	50	2028	7,000	8	suggested for 10 year capital forecast	7,000
30	DUKE ST FROM Duchess Ave TO West Park Dr	Parkhill	2013	50	2063	7,000	43	244	-
31	EAST WILLIAMS ST FROM Alma St TO Cauder St	Nairn	2001	50	2051	7,000	31	305	-
32	EAST WILLIAMS ST FROM Cauder St TO Queen St	Nairn	1976	50	2026	7,000	6	suggested for 10 year capital forecast	7,000
33	EAST WILLIAMS ST FROM Cauder St TO Queen St	Nairn	1976	50	2026	7,000	6	suggested for 10 year capital forecast	7,000
34	EAST WILLIAMS ST FROM Petty St TO Alma Stt	Nairn	2001	50	2051	7,000	31	305	-
35	EAST WILLIAMS ST FROM Petty St TO Alma Stt	Nairn	2001	50	2051	7,000	31	305	-
36	EAST WILLIAMS ST FROM Petty St TO Alma Stt	Nairn	2001	50	2051	7,000	31	305	-
37	ELGINFIELD RD FROM Brook Rd TO Maguire Rd	Rural	1982	50	2032	7,000	12	662	-
38	ELGINFIELD RD FROM Brook Rd TO Maguire Rd	Rural	1982	50	2032	7,000	12	662	-
39	ELGINFIELD RD FROM Cassidy Rd TO Ailsa Craig Main St (W)	Ailsa Craig	1982	50	2032	7,000	12	662	-
40	ELGINFIELD RD FROM Parkhill Main St TO Centre Rd	Rural	1982	50	2032	7,000	12	662	-
41	ELGINFIELD RD FROM Parkhill Main St TO Centre Rd	Parkhill	1982	50	2032	7,000	12	662	-
42	ELGINFIELD RD FROM Scout Rd TO Sylvan Rd	Rural	1984	50	2034	7,000	14	578	-
43	ELM TREE DR FROM Kerwood Rd TO Hodgins Rd	Rural	1984	50	2034	7,000	14	578	-
44	EMILY ST FROM Station St TO Parkhill Main St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
45	FALKIRK ST FROM Bruce St TO Wellington St	Carlise	2001	50	2051	7,000	31	305	-
46	GEORGE ST FROM Old Mill St TO Queen St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
47	GEORGE ST FROM Old Mill St TO Queen St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
48	GEORGE ST FROM Queen St TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
49	GEORGE ST FROM West End TO Old Mill St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
50	GREENWAY DR FROM Bullock Rd TO Greenway / Grand Bend Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
51	GREENWAY DR FROM Bullock Rd TO Greenway / Grand Bend Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
52	HAMILTON ST FROM Queen St TO Robin St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
53	HASTINGS ST FROM Parkhill George St TO Eagle St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
54	HASTINGS ST FROM Parkhill George St TO Eagle St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
55	HASTINGS ST FROM Parkhill Main St TO Pearl St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
56	HASTINGS ST FROM Pearl St TO Parkhill George St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
57	HASTINGS ST FROM Pearl St TO Parkhill George St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
58	HAWTHORN CRES FROM Alma St TO End	Nairn	2001	50	2051	7,000	31	305	-
59	HAWTHORN CRES FROM Alma St TO End	Nairn	2001	50	2051	7,000	31	305	-
60	JAMES ST FROM Church St TO High St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
61	JAMESON ST FROM Church St TO Ailsa Craig Main St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
62	JOHN ST FROM West Park Drive TO Ann St	Parkhill	2009	50	2059	7,000	39	260	-
63	MCGILLIVRAY DR FROM Cassidy Rd TO Brinsley Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
64	MCGILLIVRAY DR FROM Cassidy Rd TO Brinsley Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
65	MCLEOD ST EXTENSION FROM McLeod St TO Elginfield Rd	Parkhill	2010	50	2060	7,000	40	256	-
66	MCLEOD ST FROM East TO Parkhill Main St	Parkhill	1972	50	2022	7,000	2	suggested for 10 year capital forecast	7,000
67	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	2009	50	2059	7,000	39	260	-
68	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	2009	50	2059	7,000	39	260	-
69	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	2009	50	2059	7,000	39	260	-
70	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	2009	50	2059	7,000	39	260	-
71	MCLEOD ST FROM Parkhill Main St TO Catherine St	Parkhill	2009	50	2059	7,000	39	260	-
72	MILL CRES FROM Cemetery Road TO Queen Ave	Nairn	2001	50	2051	7,000	31	305	-
73	MILL CRES FROM Cemetery Road TO Queen Ave	Nairn	2001	50	2051	7,000	31	305	-
74	MILL ST FROM Parkhill Richmond St TO Parkhill Main St	Parkhill	2002	50	2052	7,000	32	298	-
75	MILL ST FROM Parkhill Richmond St TO Parkhill Main St	Parkhill	2002	50	2052	7,000	32	298	-
76	MILL ST FROM Parkhill Richmond St TO Parkhill Main St	Parkhill	2002	50	2052	7,000	32	298	-
77	MILL ST FROM West End TO Parkhill Richmond St	Parkhill	1989	50	2039	7,000	19	446	-
78	MILLCRAIG ST FROM Delaware St TO Ellen St	Parkhill	1991	50	2041	7,000	21	411	-
79	MILLCRAIG ST FROM East End TO Ellen St	Parkhill	1991	50	2041	7,000	21	411	-
80	MOUNT CARMEL DR FROM Lieury Rd TO Salem Rd	Rural	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
81	NAIRN RD FROM Bornish Dr TO Fort Rose Rd	Rural	1992	50	2042	7,000	22	396	-
82	NAIRN RD FROM Fernhill Drive TO Petty St	Rural	1992	50	2042	7,000	22	396	-

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
83	NESS ST FROM Ailsa Craig Main St TO William St	Ailsa Craig	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
84	NESS ST FROM Ness St to East End	Ailsa Craig	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
85	NEW ONTARIO RD FROM Petty St TO Cassidy Rd	Rural	2001	50	2051	7,000	31	305	-
86	NEW ONTARIO RD FROM Petty St TO Cassidy Rd	Rural	2001	50	2051	7,000	31	305	-
87	NEW ONTARIO RD FROM Petty St TO Fernhill Dr	Rural	2001	50	2051	7,000	31	305	-
88	NEW ONTARIO RD FROM Petty St TO Fernhill Dr	Rural	2001	50	2051	7,000	31	305	-
89	NEW ONTARIO RD FROM Petty St TO Fernhill Dr	Rural	2001	50	2051	7,000	31	305	-
90	NORTH ST FROM Queen Ave TO Cemetery Rd	Nairn	2001	50	2051	7,000	31	305	-
91	PARK ST FROM West Park Drive TO West	Parkhill	1990	50	2040	7,000	20	428	-
92	PARK ST FROM West Park Drive TO West	Parkhill	1990	50	2040	7,000	20	428	-
93	PARKHILL KING ST FROM West End TO West Park Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
94	PARKHILL KING ST FROM West End TO West Park Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
95	PARKHILL KING ST FROM West Park Drive TO Ann St	Parkhill	1993	50	2043	7,000	23	383	-
96	PARKHILL MAIN ST FROM Elginfield Rd TO McLeod St	Parkhill	1988	50	2038	7,000	18	467	-
97	PARKHILL MAIN ST FROM Elginfield Rd TO McLeod St	Parkhill	1988	50	2038	7,000	18	467	-
98	PARKHILL MAIN ST FROM Elginfield Rd TO McLeod St	Parkhill	1988	50	2038	7,000	18	467	-
99	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
100	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
101	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
102	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
103	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
104	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
105	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
106	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
107	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
108	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
109	PARKHILL MAIN ST FROM Mcleod St TO Parkhill Drive	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
110	PARKHILL RICHMOND ST FROM Mill St TO North to End	Parkhill	1995	50	2045	7,000	25	359	-

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
111	PARKHILL RICHMOND ST FROM Mill St TO North to End	Parkhill	1995	50	2045	7,000	25	359	-
112	PEARL ST FROM Hastings St TO William St East	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
113	PETTY ST FROM Maple Rd TO Queen St	Rural	2001	50	2051	7,000	31	305	-
114	PETTY ST FROM Maple Rd TO Queen St	Rural	2001	50	2051	7,000	31	305	-
115	PETTY ST FROM Nairn Rd TO Maple Rd	Rural	2002	50	2052	7,000	32	298	-
116	POPLAR HILL RD FROM Petty St TO Fort Rose Rd	Rural	2002	50	2052	7,000	32	298	-
117	PRANCE RD FROM West Corners Dr TO Mark Settlement Dr	Rural	1982	50	2032	7,000	12	662	-
118	QUEEN ST FROM Ailsa Craig Main TO Westcorner Dr	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
119	QUEEN ST FROM Ailsa Craig Main TO Westcorner Dr	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
120	QUEEN ST FROM Ailsa Craig Main TO Westcorner Dr	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
121	QUEEN ST FROM Hamilton St TO South to Petty St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
122	QUEEN ST FROM Hamilton St TO South to Petty St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
123	QUEEN ST FROM Hamilton St TO South to Petty St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
124	QUEEN ST FROM West Corners Dr TO CON 5/6 Line	Rural	1982	50	2032	7,000	12	662	-
125	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
126	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
127	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
128	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
129	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
130	QUEENS AVE FROM Petty St TO Mill Cres	Nairn	2001	50	2051	7,000	31	305	-
131	ROBIN ST FROM Queen Ave TO Robin St	Ailsa Craig	1990	50	2040	7,000	20	428	-
132	ROSKEEN ST FROM Catherine St TO East End	Parkhill	1984	50	2034	7,000	14	578	-
133	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	2002	50	2052	7,000	32	298	-
134	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
135	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
136	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
137	STATION ST FROM Mill St TO Parkhill Dr	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
138	STATION ST FROM Parkhill Dr TO North to End	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
139	TAIN ST FROM Catherine St TO East End	Parkhill	1978	50	2028	7,000	8	suggested for 10 year capital forecast	7,000
140	UNION ST FROM South of William TO William St W	Parkhill	2006	50	2056	7,000	36	275	-
141	VICTORIA ST FROM Mill St TO S bend	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000

ID	Street Description	Zone	Year Installed	Estimated Life	Replacement Year	Hydrant Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
142	WEST PARK DR FROM Elginfield Rd TO Elliot Drive	Parkhill	1982	50	2032	7,000	12	662	-
143	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	2008	50	2058	7,000	38	265	-
144	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	2008	50	2058	7,000	38	265	-
145	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	2008	50	2058	7,000	38	265	-
146	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	2008	50	2058	7,000	38	265	-
147	WEST PARK DR FROM Elliot Dr TO Prince St	Parkhill	2008	50	2058	7,000	38	265	-
148	WILLIAM ST E FROM Delaware St TO Parkhill George St	Parkhill	1989	50	2039	7,000	19	446	-
149	WILLIAM ST E FROM Parkhill Main St TO Delaware St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
150	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
151	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
152	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
153	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
154	WILLIAM ST FROM Elginfield Rd TO Ness St	Ailsa Craig	1974	50	2024	7,000	4	suggested for 10 year capital forecast	7,000
155	WILLIAM ST FROM James St TO Ness St	Ailsa Craig	1975	50	2025	7,000	5	suggested for 10 year capital forecast	7,000
156	WILLIAM ST W FROM Station St TO Parkhill Main St	Parkhill	1960	50	2020	7,000	0	suggested for 10 year capital forecast	7,000
157	WILLIAM ST W FROM Union St TO Station St	Parkhill	2006	50	2056	7,000	36	275	-
Total						**1,099,000**		**29,938**	**532,000**

Table A-4
Municipality of North Middlesex
Meters

Year of Install	Number of Water Meters	Year Installed	Estimated Life	Replacement Year	Meter Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
pre 2003	7	2000	35	2035	3,639	15	283	-
2003-2004	14	2003	35	2038	7,279	18	485	-
2004-2006	2	2004	35	2039	1,040	19	66	-
2005-2007	259	2005	35	2040	134,653	20	8,235	-
2007-2009	141	2007	35	2042	73,305	22	4,151	-
2008-2013	1,565	2008	35	2043	813,638	23	44,480	-
2013-2016	336	2013	35	2048	174,685	28	8,208	-
	2,324				**1,208,240**		**65,910**	**-**

Appendix B
Wastewater System Inventory Data

Appendix B: Wastewater System Inventory Data

Table B-1
Municipality of North Middlesex
Wastewater Facilities

Item	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Parkhill Lagoons							
Headworks	1978	40	2020	112,432	0	suggested for 10 year capital forecast	112,432
Site Works	1978	100	2078	7,945,164	58	232,687	-
Structural/Architectural	1978	100	2078	157,404	58	4,610	-
Ailsa Craig WWTP							
Headworks	2006	30	2036	941,832	16	69,366	-
Transfer Pump Station	2006	30	2036	22,786	16	1,678	-
Extended Aeration	2006	30	2036	478,511	16	35,242	-
Secondary Treatment	2006	30	2036	698,779	16	51,465	-
Tertiary Treatment	2006	30	2036	987,405	16	72,722	-
Chemical Systems	2006	30	2036	136,718	16	10,069	-
Site Works	2006	100	2106	683,588	86	16,716	-
Structural/Architectural	2006	50	2056	2,977,405	36	116,812	-
Electrical	2006	40	2046	729,160	26	36,239	-
Mechanical	2006	40	2046	303,817	26	15,099	-
Nairn Pumping Stations (Bear Creek and New Ontario Pumping Stations and Forcemain)							
Forcemain 38mm	2003	75	2078	60,000	58	1,757	-
Forcemain 50mm	2003	75	2078	100,000	58	2,929	-
Forcemain 75mm	2003	75	2078	36,000	58	1,054	-
Bear Creek Rd Pumping station	2003	20	2023	100,000	3	suggested for 10 year capital forecast	100,000
Bear Creek Wet Well	2003	50	2053	40,000	33	1,667	-
New Ontario Road Pumping station	2003	20	2023	100,000	3	suggested for 10 year capital forecast	100,000
New Ontario Wet Well	2003	50	2053	40,000	33	1,667	-
Station Street Pumping Station							

Item	Year Installed	Estimated Life	Replacement Year	Replacement Cost	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Wet Well	1994	50	2044	40,000	24	2,115	-
Pump 1	1994	20	2020	10,500	0	suggested for 10 year capital forecast	10,500
Pump 2	1994	20	2020	10,500	0	suggested for 10 year capital forecast	10,500
Piping and valves	1994	20	2020	10,500	0	suggested for 10 year capital forecast	10,500
By-Pass Valve Chamber	1994	50	2044	6,500	24	344	-
Station Street Electrical	1994	40	2034	30,000	14	2,478	-
William Street Pumping Station and Forcemain							
Forcemain	2013	75	2088	85,000	68	2,298	-
Pump 1	1980	20	2020	15,000	0	suggested for 10 year capital forecast	15,000
Pump 2	1980	20	2020	15,000	0	suggested for 10 year capital forecast	15,000
Pump 3 (Stand by pump)	1980	20	2020	15,000	0	suggested for 10 year capital forecast	15,000
Piping and valves	1980	20	2020	50,000	0	suggested for 10 year capital forecast	50,000
Electrical	1980	40	2020	30,000	0	suggested for 10 year capital forecast	30,000
Victoria Street Pumping Station							
Building	1978	100	2078	65,000	58	1,904	-
Wet Well	1978	50	2028	40,000	8	suggested for 10 year capital forecast	40,000
Pump 1	1978	20	2020	25,000	0	suggested for 10 year capital forecast	25,000
Pump 2	1978	20	2020	25,000	0	suggested for 10 year capital forecast	25,000
Piping and valves	1978	20	2020	50,000	0	suggested for 10 year capital forecast	50,000
Electrical	1978	40	2020	30,000	0	suggested for 10 year capital forecast	30,000
Diesel Generator	1978	30	2020	65,000	0	suggested for 10 year capital forecast	65,000
Total				**17,269,000**		**680,920**	**703,932**

Table B-2
Municipality of North Middlesex
Sanitary Sewers

ID	Street	From	To	Length (km)	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
279	Mill Craig St	Delaware St	Elk St	0.060	60	50	HDPE	1996	75	2071	500	30,059	51	946	-
277	Mill Craig St	Elk St	Parkhill George St	0.006	6	50	HDPE	1996	75	2071	500	2,953	51	93	-
276	Mill Craig St	Delaware St	Elk St	0.003	3	50	HDPE	1996	75	2071	500	1,480	51	47	-
281	Mill Craig St	Elk St	Parkhill George St	0.021	21	50	HDPE	1996	75	2071	500	10,348	51	326	-
283	Mill Craig St	Elk St	Parkhill George St	0.022	22	50	HDPE	1996	75	2071	500	10,890	51	343	-
284	Mill Craig St	Elk St	Parkhill George St	0.004	4	50	HDPE	1996	75	2071	500	1,839	51	58	-
343	Atkinson St	Queen St	End	0.077	77	50	HDPE	1980	75	2055	500	38,500	35	1,540	-
344	Victoria St	Parkhill Dr	End	0.582	582	200	PVC	1980	75	2055	1,300	756,600	35	30,266	-
111	Albert St	John St	Broadway St	0.082	82	200	PVC	1980	75	2055	1,300	106,990	35	4,280	-
112	Albert St	End of Street	John St	0.091	91	200	PVC	1980	75	2055	1,300	118,469	35	4,739	-
1	Ailsa Craig Main St	Village Limit	Mc Andrew St	0.090	90	200	PVC	1980	75	2055	1,300	117,177	35	4,687	-
2	Ailsa Craig Main St	Mc Andrew	Ness St	0.105	105	200	PVC	1980	75	2055	1,300	136,890	35	5,476	-
3	Ailsa Craig Main St	Ness St	James St East	0.114	114	200	PVC	1980	75	2055	1,300	148,680	35	5,948	-
4	Ailsa Craig Main St	James St East	Queen St	0.112	112	200	PVC	1980	75	2055	1,300	146,051	35	5,842	-
5	Ailsa Craig Main St	Queen St	Jameson St	0.111	111	200	PVC	1980	75	2055	1,300	144,896	35	5,796	-
6	Ailsa Craig Main St	Jameson St	Craig St	0.112	112	200	PVC	1980	75	2055	1,300	145,860	35	5,835	-
7	Ailsa Craig Main St	Craig St	Henderson St	0.089	89	400	AC CL4000	1980	60	2040	1,400	124,600	20	7,620	-
8	Ailsa Craig Main St	Henderson St	Stewart St	0.084	84	400	AC CL3300	1980	60	2040	1,400	117,460	20	7,183	-
9	Ailsa Craig Main St	Stewart St	Oldmill St	0.089	89	400	AC CL3300	1980	60	2040	1,400	124,460	20	7,612	-
10	Ailsa Craig Main St	Stewart St	Oldmill St	0.088	88	400	AC CL3300	1980	60	2040	1,400	123,620	20	7,560	-
302	Allness St	End	Catherine St	0.051	51	200	PVC	1980	75	2055	1,300	66,300	35	2,652	-
257	Alma St	East Williams St	Queens Ave	0.041	41	250	PVC	2007	75	2082	1,300	53,560	62	1,515	-
258	Alma St	East Williams St	Queens Ave	0.066	66	250	PVC	2007	75	2082	1,300	85,800	62	2,427	-
259	Alma St	East Williams St	Queens Ave	0.055	55	250	PVC	2007	75	2082	1,300	71,477	62	2,022	-
260	Alma St	Hawthorne St	East Williams St	0.090	90	250	PVC	2007	75	2082	1,300	117,000	62	3,310	-
261	Alma St	Hawthorne St	Hawthorne St	0.006	6	250	PVC	2007	75	2082	1,300	7,800	62	221	-
269	Alma St	End of Street	Queens Ave	0.119	119	200	PVC	2007	75	2082	1,300	154,440	62	4,369	-
82	Ann St	Parkhill King St	Broadway St	0.070	70	250	PVC	1980	75	2055	1,300	91,533	35	3,662	-
83	Ann St	Parkhill King St	Broadway St	0.070	70	250	PVC	1980	75	2055	1,300	91,130	35	3,645	-
113	Ann St	John St	Broadway St	0.035	35	200	PVC	1980	75	2055	1,300	45,565	35	1,823	-
123	Ann St	Leonard St	John St	0.085	85	200	PVC	1980	75	2055	1,300	110,552	35	4,422	-

ID	Street	From	To	Length (km)	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
124	Ann St	Leonard St	John St	0.085	85	200	PVC	1980	75	2055	1,300	110,942	35	4,438	-
125	Ann St	Leonard St	John St	0.086	86	200	PVC	1980	75	2055	1,300	111,345	35	4,454	-
164	Anna St	Delaware St	Pearl St	0.105	105	200	PVC	1980	75	2055	1,300	136,305	35	5,453	-
166	Anna St	Elk St	Delaware St	0.078	78	200	PVC	1980	75	2055	1,300	101,829	35	4,073	-
167	Anna St	Elk St	Delaware St	0.076	76	200	PVC	1980	75	2055	1,300	98,267	35	3,931	-
168	Anna St	Parkhill George St	Elk St	0.117	117	200	PVC	1980	75	2055	1,300	152,152	35	6,086	-
169	Anna St	Eagle St	Parkhill George St	0.088	88	200	PVC	1980	75	2055	1,300	114,907	35	4,597	-
170	Anna St	Eagle St	Parkhill George St	0.082	82	200	PVC	1980	75	2055	1,300	106,197	35	4,248	-
173	Anna St	Pearl St	Parkhill Main St	0.094	94	200	PVC	1980	75	2055	1,300	122,434	35	4,898	-
48	Annie Ada Shipley St	Henderson St	Craig St	0.089	89	300	PVC	1980	75	2055	1,400	124,320	35	4,973	-
50	Annie Ada Shipley St	Craig St	Jameson St	0.112	112	300	PVC	1980	75	2055	1,400	157,080	35	6,284	-
51	Annie Ada Shipley St	Jamenson St	Queen St	0.112	112	300	PVC	1980	75	2055	1,400	157,080	35	6,284	-
105	Ardross St	Parkhill Main St	Catherine St	0.053	53	200	PVC	1980	75	2055	1,300	69,264	35	2,771	-
106	Ardross St	Catherine St	End of Street	0.113	113	200	PVC	1980	75	2055	1,300	146,887	35	5,876	-
239	Bear Creek Rd	Argyle St	Petty St	0.103	103	200	PVC	2007	75	2082	1,300	133,250	62	3,769	-
240	Bear Creek Rd	Argyle St	Petty St	0.060	60	250	PVC	2007	75	2082	1,300	78,650	62	2,225	-
145	Bethany St	Parkhill Main St	Station St	0.093	93	200	PVC	1980	75	2055	1,300	120,458	35	4,819	-
146	Bethany St	Parkhill Main St	Station St	0.091	91	200	PVC	1980	75	2055	1,300	118,079	35	4,723	-
147	bethany St	Parkhill Main St	Station St	0.097	97	200	PVC	1980	75	2055	1,300	126,009	35	5,041	-
190	Broad St	Parkhill Main St	Station St	0.105	105	200	PVC	1980	75	2055	1,300	135,915	35	5,437	-
189	Broad St	Parkhill Main St	Station St	0.102	102	200	PVC	1980	75	2055	1,300	133,133	35	5,326	-
75	Broadway St	Albert St	West Park Dr	0.069	69	450	PVC	1980	75	2055	1,550	106,919	35	4,277	-
76	Broadway St	Albert St	West Park Dr	0.069	69	450	PVC	1980	75	2055	1,550	107,431	35	4,297	-
77	Broadway St	Ann St	Albert St	0.073	73	375	PVC	1980	75	2055	1,400	102,844	35	4,114	-
78	Broadway St	Ann St	Albert St	0.069	69	375	PVC	1980	75	2055	1,400	96,432	35	3,857	-
79	Broadway St	Parkhill main St	Ann St	0.071	71	375	PVC	1980	75	2055	1,400	98,994	35	3,960	-
80	Broadway St	Parkhill main St	Ann St	0.070	70	375	PVC	1980	75	2055	1,400	98,140	35	3,926	-
99	Catherine St	Rosskeen St	Ellen St	0.117	117	200	PVC	1980	75	2055	1,300	152,152	35	6,086	-
100	Catherine St	Ardross St	Rosskeen St	0.116	116	200	PVC	1980	75	2055	1,300	150,969	35	6,039	-
101	Catherine St	Tain St	Ardross St	0.040	40	200	PVC	1980	75	2055	1,300	51,909	35	2,076	-
110	Catherine St	McLeod St	Tain St	0.095	95	200	PVC	1980	75	2055	1,300	123,240	35	4,930	-
338	Catherine St	End	McLeod St	0.041	41	200	PVC	2010	75	2085	1,300	53,040	65	1,465	-
301	Catherine St	Allness	Ellen St	0.069	69	200	PVC	1980	75	2055	1,300	89,700	35	3,588	-
274	Cauder St	Queens Ave	East Williams St	0.082	82	200	PVC	2007	75	2082	1,300	106,600	62	3,015	-
138	Centre St	Elliot St	Westpark Dr	0.111	111	200	PVC	1980	75	2055	1,300	144,625	35	5,785	-

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139	Centre St	Duchess Ave	Elliot St	0.115	115	200	PVC	1980	75	2055	1,300	149,383	35	5,976	-
34	Church St	Craig St	Queen St	0.115	115	300	PVC	1980	75	2055	1,400	161,000	35	6,440	-
35	Church St	Jameson St	Queen St	0.063	63	300	PVC	1980	75	2055	1,400	88,200	35	3,528	-
36	Church St	Jameson St	Queen St	0.071	71	300	PVC	1980	75	2055	1,400	99,120	35	3,965	-
37	Church St	Queen St	James St	0.109	109	200	PVC	1980	75	2055	1,300	142,220	35	5,689	-
38	Church St	Rabbit Wood Crt	Ness St	0.075	75	200	PVC	1980	75	2055	1,300	97,110	35	3,885	-
306	Church St	Ness St	Rabbitwood Ct	0.037	37	200	PVC	1980	75	2055	1,300	48,490	35	1,940	-
197	Clara St	Parkhill Richmond St	Victoria St	0.120	120	200	PVC	1980	75	2055	1,300	156,520	35	6,261	-
32	Craig St	George St	Alisa Craig Main St	0.063	63	200	PVC	1980	75	2055	1,300	81,900	35	3,276	-
33	Craig St	Alisa Craig St	Church St	0.113	113	300	PVC	1980	75	2055	1,400	158,620	35	6,345	-
49	Craig St	Annie Ada Shipley St	William St	0.052	52	200	PVC	1980	75	2055	1,300	67,860	35	2,715	-
165	Delaware St	William St E	Anna St	0.040	40	200	PVC	1980	75	2055	1,300	51,506	35	2,060	-
280	Delaware St	Hastings St	Millcraig St	0.025	25	38	HDPE	1996	75	2071	500	12,348	51	388	-
135	Duke St	Elliot St	Westpark Dr	0.084	84	200	PVC	1980	75	2055	1,300	108,563	35	4,343	-
136	Duke St	Elliot St	Westpark Dr	0.084	84	200	PVC	1980	75	2055	1,300	109,356	35	4,374	-
137	Duke St	Duchess Ave	Elliot St	0.083	83	200	PVC	1980	75	2055	1,300	108,173	35	4,327	-
67	Easement 1	Union St	Richmond St	0.119	119	525	Concrete	1980	60	2040	1,550	184,295	20	11,271	-
68	Easement 1	Station St	Union St	0.122	122	300	PVC	1980	75	2055	1,400	171,108	35	6,845	-
69	Easement 1	Station St	Union St	0.049	49	300	PVC	1980	75	2055	1,400	68,698	35	2,748	-
70	Easement 1	Union St	Richmond St	0.123	123	525	Concrete	1980	60	2040	1,550	190,387	20	11,643	-
71	Easement 1	Union St	Richmond St	0.123	123	525	Concrete	1980	60	2040	1,550	189,922	20	11,615	-
72	Easement 1	Union St	Richmond St	0.109	109	525	Concrete	1980	60	2040	1,550	169,136	20	10,344	-
191	Easement 3	Victoria St	Easement 1	0.046	46	200	PVC	1980	75	2055	1,300	59,826	35	2,393	-
192	Easement 3	Victoria St	Easement 1	0.065	65	200	PVC	1980	75	2055	1,300	84,006	35	3,360	-
251	East Williams St	East Williams St	Queens Ave	0.107	107	200	PVC	2007	75	2082	1,300	138,840	62	3,927	-
252	East Williams St	East Williams St	East Williams St	0.011	11	200	PVC	2007	75	2082	1,300	14,430	62	408	-
253	East Williams St	Cauder St	East Williams St	0.107	107	200	PVC	2007	75	2082	1,300	138,450	62	3,916	-
254	East Williams St	Alma St	Cauder St	0.093	93	200	PVC	2007	75	2082	1,300	121,030	62	3,424	-
255	East Williams St	Cauder St	Alma St	0.078	78	200	PVC	2007	75	2082	1,300	100,750	62	2,850	-
256	East Williams St	Cauder St	Alma St	0.093	93	200	PVC	2007	75	2082	1,300	120,900	62	3,420	-
266	East Williams St	Petty St	Alma St	0.113	113	200	PVC	2007	75	2082	1,300	146,900	62	4,155	-
267	East Williams St	Petty St	Alma St	0.118	118	200	PVC	2007	75	2082	1,300	153,400	62	4,339	-
268	East Williams St	Petty St	Alma St	0.119	119	200	PVC	2007	75	2082	1,300	154,830	62	4,380	-
286	Elginfield Rd	Parkhill Main St	McLeod St	0.060	60	150	PVC	1986	75	2061	1,300	78,297	41	2,816	-
278	Elk St	Hastings St	Mill Craig St	0.025	25	50	HDPE	1996	75	2071	500	12,353	51	389	-

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275	Elk St	Hastings St	Mill Craig St	0.039	39	50	HDPE	1996	75	2071	500	19,730	51	621	-
282	Elk St	Hastings St	Mill Craig St	0.025	25	38	HDPE	1996	75	2071	500	12,340	51	388	-
285	Elk St	Hastings St	Mill Craig St	0.065	65	38	HDPE	1996	75	2071	500	32,412	51	1,020	-
185	Elk St S	CNR	Hastings St	0.092	92	200	PVC	1980	75	2055	1,300	120,055	35	4,802	-
345	Elk St	Anna St	Hastings St	0.122	122	200	PVC	1980	75	2055	1,300	158,600	35	6,344	-
95	Ellen St	Catherine St	Parkhill Main St	0.059	59	200	PVC	1980	75	2055	1,300	76,479	35	3,059	-
96	Ellen St	Catherine St	Parkhill Main St	0.066	66	200	PVC	1980	75	2055	1,300	85,189	35	3,408	-
97	Ellen St	Millcraig St	Catherine St	0.060	60	200	PVC	1980	75	2055	1,300	78,455	35	3,138	-
98	Ellen St	Millcraig St	Catherine St	0.066	66	200	PVC	1980	75	2055	1,300	86,385	35	3,456	-
152	Emily St	Parkhill Main St	Station St	0.094	94	200	PVC	1980	75	2055	1,300	121,641	35	4,866	-
153	Emily St	Parkhill Main St	Station St	0.091	91	200	PVC	1980	75	2055	1,300	118,872	35	4,755	-
154	Emily St	Parkhill Main St	Station St	0.094	94	200	PVC	1980	75	2055	1,300	122,434	35	4,898	-
320	Finch St	Hamilton	Robin	0.110	110	200	PVC	1993	75	2068	1,300	143,000	48	4,662	-
13	George St	Oldmill St	Permanent Easement	0.070	70	200	PVC	1980	75	2055	1,300	91,390	35	3,656	-
14	George St	Jjames St	Oldmill St	0.114	114	200	PVC	1980	75	2055	1,300	147,810	35	5,913	-
15	George St	Henderson St	Stewart St	0.114	114	200	PVC	1980	75	2055	1,300	147,810	35	5,913	-
16	George St	Craig St	Henderson St	0.116	116	200	PVC	1980	75	2055	1,300	150,930	35	6,038	-
17	George St	Jameson St	Craig St	0.117	117	200	PVC	1980	75	2055	1,300	152,620	35	6,105	-
18	George St	Queen St	George St	0.113	113	200	PVC	1980	75	2055	1,300	147,160	35	5,887	-
19	George St	James St	Queen St	0.113	113	200	PVC	1980	75	2055	1,300	146,640	35	5,866	-
20	George St	Ness St	James St	0.071	71	200	PVC	1980	75	2055	1,300	91,910	35	3,677	-
21	George St	Ness St	Ness St	0.072	72	200	PVC	1980	75	2055	1,300	93,860	35	3,755	-
319	Hamilton St	Robin	Finch	0.080	80	200	PVC	1993	75	2068	1,300	103,350	48	3,369	-
318	Hamilton St	End	Robin St	0.032	32	200	PVC	1993	75	2068	1,300	41,600	48	1,356	-
321	Hamilton St	Queen St	Finch	0.050	50	200	PVC	1993	75	2068	1,300	64,350	48	2,098	-
180	Hastings St	Pearl St	Parkhill Main St	0.063	63	200	PVC	1980	75	2055	1,300	81,627	35	3,265	-
181	Hastings St	Pearl St	Parkhill Main St	0.063	63	200	PVC	1980	75	2055	1,300	81,627	35	3,265	-
182	Hastings St	Delaware St	Pearl St	0.104	104	200	PVC	1980	75	2055	1,300	134,719	35	5,389	-
183	Hastings St	Elk St	Delaware St	0.106	106	200	PVC	1980	75	2055	1,300	138,294	35	5,532	-
184	Hastings St	Elk St N	Elk St S	0.046	46	200	PVC	1980	75	2055	1,300	59,826	35	2,393	-
186	Hastings St	Parkhill George St	Elk St N	0.119	119	200	PVC	1980	75	2055	1,300	154,934	35	6,198	-
187	Hastings St	Eagle St	Parkhill George St	0.089	89	200	PVC	1980	75	2055	1,300	116,103	35	4,644	-
188	Hastings St	Eagle St	Parkhill George St	0.080	80	200	PVC	1980	75	2055	1,300	104,611	35	4,185	-
262	Hawthorne St	Hawthorne St	Alma St	0.093	93	200	PVC	2007	75	2082	1,300	120,900	62	3,420	-
263	Hawthorne St	Hawthorne St	Alma St	0.100	100	200	PVC	2007	75	2082	1,300	129,610	62	3,666	-

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264	Hawthorne St	Hawthorne St	Alma St	0.102	102	200	PVC	2007	75	2082	1,300	132,600	62	3,751	-
265	Hawthorne St	Hawthorne St	Hawthorne St	0.058	58	200	PVC	2007	75	2082	1,300	74,750	62	2,114	-
47	Henderson St	William St	Annie Ada Shipley St	0.113	113	300	PVC	1980	75	2055	1,300	146,380	35	5,856	-
43	HIgh St	Queen St	James St	0.113	113	200	PVC	1980	75	2055	1,300	146,250	35	5,850	-
44	High St	James St	Ness St	0.110	110	200	PVC	1980	75	2055	1,300	142,610	35	5,705	-
45	High St	Ness St	McAndrew St	0.108	108	200	PVC	1980	75	2055	1,300	140,790	35	5,632	-
24	James St	George St	William St	0.074	74	200	PVC	1980	75	2055	1,300	96,720	35	3,869	-
61	James St	High St	Church St	0.071	71	200	PVC	1980	75	2055	1,300	92,560	35	3,703	-
62	James St	High St	Main St	0.040	40	200	PVC	1980	75	2055	1,300	51,610	35	2,065	-
40	Jameson St	Alisa Craig Main St	Church St	0.130	130	200	PVC	1980	75	2055	1,300	168,350	35	6,734	-
114	John St	Westpark Dr	Albert St	0.090	90	200	PVC	1980	75	2055	1,300	116,896	35	4,676	-
120	John St	Ann St	Albert St	0.074	74	200	PVC	1980	75	2055	1,300	96,291	35	3,852	-
121	John St	Ann St	Albert St	0.071	71	200	PVC	1980	75	2055	1,300	91,923	35	3,677	-
122	John St	Parkhill Main St	Ann ST	0.122	122	200	PVC	1980	75	2055	1,300	158,886	35	6,356	-
115	McLeod St	Michelle Ave	Parkhill Main St	0.079	79	200	PVC	1980	75	2055	1,300	103,222	35	4,129	-
116	McLeod St	Michelle Ave	Parkhill Main St	0.077	77	200	PVC	1980	75	2055	1,300	100,646	35	4,026	-
339	McLeod St	Catherine St	End	0.091	91	200	PVC	2010	75	2085	1,300	118,690	65	3,279	-
340	McLeod St	Catherine St	End	0.090	90	200	PVC	2010	75	2085	1,300	117,000	65	3,232	-
341	McLeod St	Catherine St	End	0.097	97	200	PVC	2010	75	2085	1,300	125,970	65	3,480	-
117	Michelle Ave	Cul-d-sac	McLeod St	0.053	53	200	PVC	1980	75	2055	1,300	69,342	35	2,774	-
118	Michelle Ave	Cul-d-sac	McLeod St	0.053	53	200	PVC	1980	75	2055	1,300	69,342	35	2,774	-
119	Michelle Ave	Cul-d-sac	Mcleod St	0.054	54	200	PVC	1980	75	2055	1,300	70,525	35	2,821	-
271	Mill Cres	Mill Cres	Queens Ave	0.101	101	200	PVC	2007	75	2082	1,300	130,650	62	3,696	-
272	Mill Cres	Mill Cres	Mill Cres	0.041	41	200	PVC	2007	75	2082	1,300	53,300	62	1,508	-
273	Mill Cres	Mill Cres	Mill Cres	0.120	120	200	PVC	2007	75	2082	1,300	156,515	62	4,427	-
58	Mill St	Parkhill Main St	Station St	0.094	94	200	PVC	1980	75	2055	1,300	121,641	35	4,866	-
178	Mill St	Parkhill Main St	Station St	0.092	92	200	PVC	1980	75	2055	1,300	119,665	35	4,787	-
179	Mill St	Parkhill Main St	Station St	0.093	93	200	PVC	1980	75	2055	1,300	121,349	35	4,854	-
200	Mill St	Parkhill Richmond St	Victoria St	0.087	87	200	PVC	1980	75	2055	1,300	112,528	35	4,501	-
201	Mill St	Victoria St	Township of West Williams	0.094	94	200	PVC	1980	75	2055	1,300	122,837	35	4,914	-
202	Mill St	Station St	Union St	0.059	59	200	PVC	1980	75	2055	1,300	77,272	35	3,091	-
203	Mill St	Parkhill Richmond St	Union St	0.085	85	200	PVC	1980	75	2055	1,300	110,552	35	4,422	-
204	Mill St	Parkhill Richmond St	Union St	0.086	86	200	PVC	1980	75	2055	1,300	111,735	35	4,470	-
22	Ness St	George St	William St	0.071	71	200	PVC	1980	75	2055	1,300	91,780	35	3,671	-
39	Ness St	Church St	High St	0.045	45	200	PVC	1980	75	2055	1,300	58,370	35	2,335	-

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346	New Ontario Road	Petty St	26829 New Ontario	0.550	550	75	PVC	2007	75	2082	500	275,000	62	7,779	-
270	North St	Cemetery rd	Queens Ave	0.120	120	200	PVC	2007	75	2082	1,300	156,000	62	4,413	-
11	Oldmill St	Alisa Craig main St	George St	0.114	114	400	AC CL3300	1980	60	2040	1,400	158,900	20	9,718	-
12	Oldmill St	George St	William St	0.109	109	400	AC CL4000	1980	60	2040	1,400	152,320	20	9,315	-
161	Parkhill George St	Anna St	William St E	0.047	47	200	PVC	1980	75	2055	1,300	61,412	35	2,457	-
84	Parkhill King St	Parkhill Main St	Ann St	0.069	69	250	PVC	1980	75	2055	1,300	89,180	35	3,567	-
85	Parkhill King St	Parkhill Main St	Ann St	0.072	72	250	PVC	1980	75	2055	1,300	93,509	35	3,741	-
130	Parkhill King St	Elliot St	Union St	0.106	106	200	PVC	1980	75	2055	1,300	138,294	35	5,532	-
131	Parkhill King St	West St	Elliot St	0.115	115	200	PVC	1980	75	2055	1,300	149,773	35	5,991	-
171	Parkhill King St	Albert St	Westpark Dr	0.123	123	200	PVC	1980	75	2055	1,300	159,289	35	6,372	-
81	Parkhill main St	Roskeen St	Ellen St	0.115	115	300	PVC	1980	75	2055	1,400	160,440	35	6,418	-
177	Parkhill Main St	CNR	Mill St	0.072	72	200	PVC	1980	75	2055	1,300	93,119	35	3,725	-
86	Parkhill Main St	Hastings St	Parkhill king St	0.015	15	200	PVC	1980	75	2055	1,300	19,019	35	761	-
87	Parkhill Main St	Broadway St	Parkhill King St	0.100	100	200	PVC	1980	75	2055	1,300	129,961	35	5,199	-
88	Parkhill Main St	Ardross St	Rosskeen St	0.119	119	300	PVC	1980	75	2055	1,400	167,272	35	6,691	-
89	Parkhill Main St	Tain St	Ardross St	0.112	112	250	PVC	1980	75	2055	1,300	145,028	35	5,801	-
90	Parkhill Main St	Mcleod St	Tain St	0.084	84	250	PVC	1980	75	2055	1,300	109,759	35	4,391	-
91	Parkhill Main St	Mcleod St	Tain St	0.081	81	250	PVC	1980	75	2055	1,300	105,794	35	4,232	-
92	Parkhill Main St	Elginfield	Mcleod St	0.112	112	200	PVC	1980	75	2055	1,300	146,211	35	5,849	-
93	Parkhill Main St	Elginfield Rd	Mcleod St	0.113	113	200	PVC	1980	75	2055	1,300	147,407	35	5,897	-
94	Parkhill Main St	Elginfield Rd	Mcleod St	0.110	110	200	PVC	1980	75	2055	1,300	143,039	35	5,722	-
287	Parkhill Main St	McLeod St	Elginfield Rd	0.029	29	150	Steel Pipe	1986	75	2061	1,300	37,674	41	1,355	-
148	Parkhill Main St	William St W	Bethany St	0.110	110	200	PVC	1980	75	2055	1,300	143,442	35	5,738	-
149	Parkhill Main St	Emily St	William St W	0.082	82	200	PVC	1980	75	2055	1,300	106,990	35	4,280	-
172	Parkhill Main St	Broad St	Emily St	0.105	105	200	PVC	1980	75	2055	1,300	135,915	35	5,437	-
174	Parkhill Main St	Hastings St	Anna St	0.078	78	200	PVC	1980	75	2055	1,300	101,439	35	4,058	-
175	Parkhill Main St	Anna St	Hastings St	0.046	46	200	PVC	1980	75	2055	1,300	60,229	35	2,409	-
176	Parkhill Main St	Hastings St	Mill St	0.023	23	200	PVC	1980	75	2055	1,300	29,770	35	1,191	-
198	Parkhill Richmond St	Easement 1	Clara St	0.077	77	200	PVC	1980	75	2055	1,300	99,450	35	3,978	-
199	Parkhill Richmond St	Mill St	Clara St	0.122	122	200	PVC	1980	75	2055	1,300	158,470	35	6,339	-
162	Pearl St	Anna St	William St E	0.107	107	200	PVC	1980	75	2055	1,300	139,074	35	5,563	-
163	Pearl St	Hastings St	Anna St	0.074	74	200	PVC	1980	75	2055	1,300	96,291	35	3,852	-
290	Pearl St	End	Hastings St	0.061	61	200	PVC	1980	75	2055	1,300	79,161	35	3,167	-
205	Petty St	East Williams St	Queens Ave	0.105	105	200	PVC	2007	75	2082	1,300	136,240	62	3,854	-
206	Petty St	East Williams St	Queens Ave	0.066	66	250	PVC	2007	75	2082	1,300	86,193	62	2,438	-

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207	Petty St	East Williams St	Queens Ave	0.047	47	250	PVC	2007	75	2082	1,300	60,596	62	1,714	-
208	Petty St	Queens Ave	Bear Creek Rd	0.097	97	250	PVC	2007	75	2082	1,300	126,490	62	3,578	-
209	Petty St	Petty St	Petty St	0.011	11	200	PVC	2007	75	2082	1,300	14,210	62	402	-
210	Petty St	Petty St	Petty St	0.003	3	300	PVC	2007	75	2082	1,400	4,200	62	119	-
211	Petty St	Bear Creek Rd	Queens Ave	0.079	79	200	PVC	2007	75	2082	1,300	102,227	62	2,892	-
212	Petty St	Bear Creek Rd	Queens Ave	0.077	77	200	PVC	2007	75	2082	1,300	100,268	62	2,836	-
213	Petty St	Bear Creek Rd	Queens Ave	0.078	78	200	PVC	2007	75	2082	1,300	101,924	62	2,883	-
214	Petty St	Maple Rd	Bear Creek Rd	0.107	107	200	PVC	2007	75	2082	1,300	138,840	62	3,927	-
215	Petty St	Maple Rd	Bear Creek Rd	0.106	106	200	PVC	2007	75	2082	1,300	137,548	62	3,891	-
216	Petty St	Maple Rd	New Ontario Rd	0.093	93	250	PVC	2007	75	2082	1,300	120,510	62	3,409	-
217	Petty St	Maple Rd	New Ontario Rd	0.093	93	250	PVC	2007	75	2082	1,300	120,380	62	3,405	-
218	Petty St	Maple Rd	New Ontario Rd	0.101	101	250	PVC	2007	75	2082	1,300	130,910	62	3,703	-
219	Petty St	Maple Rd	New Ontario Rd	0.097	97	250	PVC	2007	75	2082	1,300	126,360	62	3,574	-
220	Petty St	Petty St- East	Petty St- West	0.026	26	250	PVC	2007	75	2082	1,300	33,280	62	941	-
221	Petty St	Maple Rd	New Ontario Rd	0.110	110	250	PVC	2007	75	2082	1,300	142,740	62	4,038	-
222	Petty St	Maple Rd	New Ontario Rd	0.111	111	250	PVC	2007	75	2082	1,300	143,672	62	4,064	-
223	Petty St	Maple Rd	New Ontario Rd	0.110	110	250	PVC	2007	75	2082	1,300	143,133	62	4,049	-
224	Petty St	Maple Rd	New Ontario Rd	0.110	110	250	PVC	2007	75	2082	1,300	143,000	62	4,045	-
225	Petty St	Maple Rd	New Ontario Rd	0.116	116	250	PVC	2007	75	2082	1,300	150,540	62	4,258	-
226	Petty St	Petty St	Petty St- Ditch	0.009	9	250	STEEL	2007	75	2082	1,300	11,570	62	327	-
227	Petty St	Maple Rd	New Ontario Rd	0.187	187	250	PVC	2007	75	2082	1,300	242,550	62	6,861	-
228	Petty St	Maple Rd	New Ontario Rd	0.120	120	250	PVC	2007	75	2082	1,300	156,390	62	4,424	-
229	Petty St	Maple Rd	New Ontario Rd	0.120	120	250	PVC	2007	75	2082	1,300	155,610	62	4,402	-
230	Petty St	Maple Rd	New Ontario Rd	0.118	118	250	PVC	2007	75	2082	1,300	153,660	62	4,346	-
231	Petty St	New Ontario Rd	Future Wastewater Pumping	0.031	31	250	PVC	2007	75	2082	1,300	40,560	62	1,147	-
232	Petty St	New Ontario Rd	Mary St	0.121	121	250	PVC	2007	75	2082	1,300	156,650	62	4,431	-
233	Petty St	New Ontario Rd	Mary St	0.118	118	250	PVC	2007	75	2082	1,300	153,400	62	4,339	-
234	Petty St	New Ontario Rd	Mary St	0.119	119	250	PVC	2007	75	2082	1,300	154,830	62	4,380	-
235	Petty St	New Ontario Rd	Mary St	0.119	119	250	PVC	2007	75	2082	1,300	154,700	62	4,376	-
236	Petty St	New Ontario Rd	Mary St	0.089	89	250	PVC	2007	75	2082	1,300	115,700	62	3,273	-
237	Petty St	New Ontario Rd	Mary St	0.061	61	250	PVC	2007	75	2082	1,300	79,300	62	2,243	-
238	Petty St	New Ontario Rd	Mary St	0.103	103	250	PVC	2007	75	2082	1,300	134,290	62	3,799	-
132	Prince St	Elliot St	West park Dr	0.086	86	200	PVC	1980	75	2055	1,300	111,345	35	4,454	-
133	Prince St	West St	Elliot St	0.086	86	200	PVC	1980	75	2055	1,300	111,735	35	4,470	-
134	Prince St	West St	Elliot St	0.085	85	200	PVC	1980	75	2055	1,300	110,552	35	4,422	-

ID	Street	From	To	Length (km)	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
41	Queen St	Alisa Craig Main St	High St	0.107	107	200	PVC	1980	75	2055	1,300	138,450	35	5,538	-
46	Queen St	George St	Alisa Craig main St	0.057	57	200	PVC	1980	75	2055	1,300	74,100	35	2,964	-
53	Queen St	Annie Ada Shipley St	William St	0.059	59	200	PVC	1980	75	2055	1,300	76,050	35	3,042	-
54	Queen St	Annie Ada Shipley St	Hamilton St	0.111	111	250	PVC	1980	75	2055	1,300	144,040	35	5,762	-
55	Queen St	Hamilton St	Atkinson St	0.111	111	250	PVC	1980	75	2055	1,300	143,780	35	5,752	-
56	Queen St	Atkinson St	Eleanor St	0.109	109	250	PVC	1980	75	2055	1,300	141,310	35	5,653	-
57	Queen St	Eleanor St	Mary St	0.109	109	250	PVC	1980	75	2055	1,300	142,090	35	5,684	-
42	Queen St	High St	Church St	0.071	71	200	PVC	1980	75	2055	1,300	92,430	35	3,697	-
296	Queen St	End	Church	0.063	63	200	PVC	1980	75	2055	1,300	81,900	35	3,276	-
241	Queens Ave	Alma St	Petty St	0.098	98	250	PVC	2007	75	2082	1,300	126,750	62	3,585	-
242	Queens Ave	Alma St	Petty St	0.117	117	250	PVC	2007	75	2082	1,300	152,100	62	4,302	-
243	Queens Ave	Alma St	Petty St	0.109	109	250	PVC	2007	75	2082	1,300	142,090	62	4,019	-
244	Queens Ave	Alma St W	Alma St	0.061	61	250	PVC	2007	75	2082	1,300	79,170	62	2,239	-
245	Queens Ave	North St	Alma St W	0.059	59	250	PVC	2007	75	2082	1,300	76,700	62	2,170	-
246	Queens Ave	Mill St	North St	0.078	78	250	PVC	2007	75	2082	1,300	102,050	62	2,887	-
247	Queens Ave	Cauder St	Mill St	0.118	118	250	PVC	2007	75	2082	1,300	153,530	62	4,343	-
248	Queens Ave	Cauder St	Mill St	0.084	84	250	PVC	2007	75	2082	1,300	108,940	62	3,082	-
249	Queens Ave	East Williams St	Cauder St	0.120	120	250	PVC	2007	75	2082	1,300	156,000	62	4,413	-
250	Queens Ave	Mill Cres	East Williams St	0.021	21	200	PVC	2007	75	2082	1,300	27,300	62	772	-
304	Rabbit Wood Crt	End	Church St	0.081	81	200	PVC	1990	75	2065	1,300	104,910	45	3,557	-
52	Robin St	Queen St	Finch St	0.057	57	200	PVC	1980	75	2055	1,300	74,620	35	2,985	-
314	Robin St	Finch St	Queen St	0.056	56	200	PVC	1993	75	2068	1,300	72,800	48	2,373	-
315	Robin St	Hamilton St	Finch St	0.073	73	200	PVC	1993	75	2068	1,300	94,770	48	3,090	-
316	Robin St	Hamilton St	Finch St	0.013	13	200	PVC	1993	75	2068	1,300	16,640	48	542	-
317	Robin St	Hamilton St	Finch St	0.099	99	200	PVC	1993	75	2068	1,300	129,285	48	4,215	-
102	Rosskeen St	End of Street	Catherine St	0.072	72	200	PVC	1980	75	2055	1,300	93,509	35	3,741	-
103	Rosskeen St	End of Street	Catherine St	0.074	74	200	PVC	1980	75	2055	1,300	95,888	35	3,836	-
104	Rosskeen St	Catherine St	Parkhill Main St	0.096	96	200	PVC	1980	75	2055	1,300	125,216	35	5,009	-
140	Station St	Mill St	Broad St	0.055	55	200	PVC	1980	75	2055	1,300	71,318	35	2,853	-
141	Station St	Mill St	Broad St	0.079	79	250	PVC	1980	75	2055	1,300	102,622	35	4,105	-
142	Station St	Emily St	Broad St	0.109	109	250	PVC	1980	75	2055	1,300	142,246	35	5,690	-
143	Station St	William St W	Emily St	0.109	109	200	PVC	1980	75	2055	1,300	141,063	35	5,643	-
144	Station St	Bethany St	William St W	0.107	107	200	PVC	1980	75	2055	1,300	139,477	35	5,579	-
59	Station St	Bethany St	Parkhill Dr	0.114	114	200	PVC	1989	75	2064	1,300	148,283	44	5,099	-
299	Station St	Bethany St	Parkhill Dr	0.099	99	200	PVC	1994	75	2069	1,300	128,214	49	4,129	-

ID	Street	From	To	Length (km)	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
342	Station St	Parkhill Dr	End	0.075	75	200	PVC	1994	75	2069	1,300	96,913	49	3,121	-
288	Station St	Parkhill Dr	End	0.005	5	200	PVC	1994	75	2069	1,300	7,095	49	228	-
289	Station St	Parkhill Dr	End	0.129	129	100	PVC-Force Main	1994	75	2069	1,300	167,492	49	5,394	-
107	Tain St	Catherine St	Parkhill Main St	0.059	59	200	PVC	1980	75	2055	1,300	76,466	35	3,059	-
108	Tain St	Catherine St	Parkhill Main St	0.065	65	200	PVC	1980	75	2055	1,300	84,396	35	3,376	-
109	Tain St	End	Catherine St	0.113	113	200	PVC	1980	75	2055	1,300	147,004	35	5,880	-
300	Tain St	End	Catherine St	0.074	74	200	PVC	1980	75	2055	1,300	95,981	35	3,839	-
63	Union St	Parkhill King St	Mill St	0.067	67	525	Concrete	1980	60	2040	1,550	104,173	20	6,371	-
64	Union St	Parkhill King St	Mill St	0.068	68	525	Concrete	1980	60	2040	1,550	105,307	20	6,440	-
65	Union St	Parkhill King St	Mill St	0.109	109	525	Concrete	1980	60	2040	1,550	169,415	20	10,361	-
66	Union St	Parkhill King St	Mill St	0.041	41	525	Concrete	1980	60	2040	1,550	64,062	20	3,918	-
193	Victoria St	Clara St	Victoria St	0.104	104	200	PVC	1980	75	2055	1,300	135,122	35	5,405	-
194	Victoria St	Clara St	Vicotia St	0.104	104	200	PVC	1980	75	2055	1,300	134,727	35	5,389	-
195	Victoria St	Mill St	Clara St	0.088	88	200	PVC	1980	75	2055	1,300	114,517	35	4,581	-
196	Victoria St	Mill St	Clara St	0.090	90	200	PVC	1980	75	2055	1,300	117,286	35	4,692	-
73	West Park Dr	Prince St	Parkhill King St	0.120	120	525	Concrete	1980	60	2040	1,550	186,372	20	11,398	-
74	West Park Dr	Broadway St	Prince St	0.019	19	525	Concrete	1980	60	2040	1,550	28,907	20	1,768	-
291	West Park Dr	McLeod	Park	0.065	65	250	PVC	2010	75	2085	1,300	84,890	65	2,345	-
292	West Park Dr	Park St	Elliot St	0.055	55	250	PVC	2010	75	2085	1,300	71,500	65	1,975	-
293	West Park Dr	Park St	Elliot St	0.119	119	250	PVC	2010	75	2085	1,300	154,960	65	4,281	-
294	West Park Dr	Park St	Elliot St	0.095	95	200	PVC	2010	75	2085	1,300	123,110	65	3,401	-
295	West Park Dr	Park St	Elliot St	0.105	105	200	PVC	2010	75	2085	1,300	136,890	65	3,782	-
126	West Park Dr	Duke St	Broadway St	0.102	102	300	PVC	1980	75	2055	1,400	142,100	35	5,684	-
127	West Park Dr	Centre St	Duke St	0.122	122	300	PVC	1980	75	2055	1,400	170,268	35	6,811	-
128	West Park Dr	Park St	Centre St	0.111	111	250	PVC	1980	75	2055	1,300	144,625	35	5,785	-
129	West Park Dr	Park St	Centre St	0.112	112	250	PVC	1980	75	2055	1,300	146,211	35	5,849	-
23	William St	Ness St	James St	0.115	115	200	PVC	1980	75	2055	1,300	148,980	35	5,960	-
25	William St	Queen St	James St	0.110	110	200	PVC	1980	75	2055	1,300	143,520	35	5,741	-
26	William St	Queen St	Jameson St	0.114	114	200	PVC	1980	75	2055	1,300	147,940	35	5,918	-
31	William St	Oldmill ST	End Contract	0.072	72	200	PVC	1980	75	2055	1,300	93,600	35	3,744	-
30	William St	Stewart St	Oldmill St	0.074	74	200	PVC	1980	75	2055	1,300	96,338	35	3,854	-
29	William St	Henderson St	Stewart St	0.087	87	200	PVC	1980	75	2055	1,300	113,683	35	4,548	-
28	William St	Craig St	Henderson St	0.092	92	200	PVC	1980	75	2055	1,300	119,879	35	4,795	-
27	William St	Jameson St	Craig St	0.110	110	200	PVC	1980	75	2055	1,300	142,740	35	5,710	-
155	William St E	Pearl St	Parkhill Main St	0.062	62	200	PVC	1980	75	2055	1,300	80,431	35	3,217	-

ID	Street	From	To	Length (km)	Length (m)	Diameter (mm)	Material	Year Installed	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
156	William St E	Pearl St	Parkhill Main St	0.062	62	200	PVC	1980	75	2055	1,300	81,224	35	3,249	-
157	William St E	Delaware St	Pearl St	0.105	105	200	PVC	1980	75	2055	1,300	137,098	35	5,484	-
158	William St E	Parkhill George St	Delaware St	0.089	89	200	PVC	1980	75	2055	1,300	115,310	35	4,613	-
159	William St E	Parkhill George St	Delaware St	0.090	90	200	PVC	1980	75	2055	1,300	117,286	35	4,692	-
160	William St E	Parkhill George St	Delaware St	0.090	90	200	PVC	1980	75	2055	1,300	116,493	35	4,660	-
150	William St W	Parkhill main St	Station St	0.122	122	200	PVC	1980	75	2055	1,300	158,106	35	6,325	-
151	William St W	Parkhill Main St	Station St	0.120	120	200	PVC	1980	75	2055	1,300	155,727	35	6,229	-
Total				**27.81**	**27,807**							**35,887,745**		**1,362,191**	**-**

Appendix C
Stormwater System Inventory Data

Appendix C: Stormwater System Inventory Data

Table C-1
Municipality of North Middlesex
Stormwater Infrastructure

Area	Length (km)	Length (m)	Diameter (mm)	Year Installed (Range)	Year Installed (Midpoint)	Estimated Life	Replacement Year	Replacement Cost / m	Total Main Replacement Costs	Years until Replacement	Annual Lifecycle Contribution	Amount to be included in 10 year Forecast
Parkhill	16.429	16,429	150-1350	1940-2008	1974	80	2054	1,500	24,643,500	34	1,005,915	-
Ailsa Craig	5.355	5,355	200-750	1977-1990	1984	80	2064	1,500	8,032,500	44	276,221	-
Nairn	1.548	1,548	200-1050	1976-1989	1983	80	2063	1,500	2,322,000	43	81,014	-
Total		**23,332**							**34,998,000**		**1,363,151**	**-**

Appendix D
Detailed Water Rate Calculations

Appendix D: Detailed Water Rate Calculations

Table D-1
Municipality of North Middlesex
Capital Budget Forecast (uninflated $)

Description	Budget 2019	Total	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
SCADA IMPLEMNTATION West Williams Booster station	93,300	150,000	150,000	-	-	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Parkhill Resevoir	-	425,000	-	75,000	350,000	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	-	350,000	-	-	75,000	275,000	-	-	-	-	-	-
METER PIT INSTALLTIONS	176,000	1,760,000	176,000	176,000	176,000	176,000	176,000	176,000	176,000	176,000	176,000	176,000
WATER DISTRIBUTION MASTER PLAN	50,000	50,000	50,000	-	-	-	-	-	-	-	-	-
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	200,000	300,000	300,000	-	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	-	134,900	-	134,900	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	-	121,600	-	-	121,600	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	-	2,113,200	-	-	-	2,113,200	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	-	237,500	-	-	-	-	237,500	-	-	-	-	-
WATER TOWER INSTALLATION	-	5,000,000	350,000	3,000,000	1,650,000	-	-	-	-	-	-	-
MCGILIVARAY BOOSTER STATION	-	25,000	-	-	-	-	-	-	-	25,000	-	-
MT.CARMEL RESEVOIR	-	160,500	-	12,500	25,500	20,500	28,000	74,000	-	-	-	-
PARKHILL RESEVOIR	-	484,001	125,000	26,000	32,500	54,000	57,500	69,000	-	120,001	-	-
Waterline Takeoffs	-	1,500,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
		-										
Lifecycle:		-										
Water Facilities		724,000	110,000	-	30,000	-	139,000	445,000	-	-	-	-
Hydrants		532,000	252,000	-	7,000	-	168,000	70,000	14,000	-	21,000	-
		-										
Total Capital Expenditures	**519,300**	**14,067,701**	**1,663,000**	**3,574,400**	**2,617,600**	**2,788,700**	**956,000**	**984,000**	**340,000**	**471,001**	**347,000**	**326,000**

Table D-2
Municipality of North Middlesex
Capital Budget Forecast (inflated $)

Description	Budget 2019	Total	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
SCADA IMPLEMNTATION West Williams Booster station	93,300	153,000	153,000	-	-	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Parkhill Resevoir	-	449,000	-	78,000	371,000	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	-	378,000	-	-	80,000	298,000	-	-	-	-	-	-
METER PIT INSTALLTIONS	176,000	1,966,000	180,000	183,000	187,000	191,000	194,000	198,000	202,000	206,000	210,000	215,000
WATER DISTRIBUTION MASTER PLAN	50,000	51,000	51,000	-	-	-	-	-	-	-	-	-
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	200,000	306,000	306,000	-	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	-	140,000	-	140,000	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	-	129,000	-	-	129,000	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	-	2,287,000	-	-	-	2,287,000	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	-	262,000	-	-	-	-	262,000	-	-	-	-	-
WATER TOWER INSTALLATION	-	5,229,000	357,000	3,121,000	1,751,000	-	-	-	-	-	-	-
MCGILIVARAY BOOSTER STATION	-	29,000	-	-	-	-	-	-	-	29,000	-	-
MT.CARMEL RESEVOIR	-	176,000	-	13,000	27,000	22,000	31,000	83,000	-	-	-	-
PARKHILL RESEVOIR	-	529,000	128,000	27,000	34,000	58,000	63,000	78,000	-	141,000	-	-
Waterline Takeoffs	-	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Lifecycle:		-	-	-	-	-	-	-	-	-	-	-
Water Facilities		798,000	112,000	-	32,000	-	153,000	501,000	-	-	-	-
Hydrants		569,000	257,000	-	7,000	-	185,000	79,000	16,000	-	25,000	-
Total Capital Expenditures	**519,300**	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**
Capital Financing												
Provincial/Federal Grants		-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	369,300	7,646,000	281,000	1,549,500	1,885,500	2,502,000	359,000	330,000	172,000	205,000	179,000	183,000
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	150,000	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	998,000	-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Water Capital Reserve	-	6,482,000	1,416,000	2,168,500	852,500	516,000	357,000	198,000	202,000	347,000	210,000	215,000
Total Capital Financing	**519,300**	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**

Table D-3
Municipality of North Middlesex
Schedule of Non-growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		281,000		14,804	14,804	14,804	14,804	14,804	14,804	14,804	14,804	14,804
2021		1,549,500			81,630	81,630	81,630	81,630	81,630	81,630	81,630	81,630
2022		1,885,500				99,331	99,331	99,331	99,331	99,331	99,331	99,331
2023		2,502,000					131,810	131,810	131,810	131,810	131,810	131,810
2024		359,000						18,913	18,913	18,913	18,913	18,913
2025		330,000							17,385	17,385	17,385	17,385
2026		172,000								9,061	9,061	9,061
2027		205,000									10,800	10,800
2028		179,000										9,430
2029		183,000										
Total Annual Debt Charges	-	**7,646,000**	**-**	**14,804**	**96,434**	**195,765**	**327,575**	**346,488**	**363,873**	**372,934**	**383,734**	**393,164**

Table D-4
Municipality of North Middlesex
Water Capital Reserve Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	1,230,877		1,503,638	1,323,271	229,933	353,656	483,342	619,092	760,961	1,098,419	1,470,422	1,841,749
Transfer from Operating	243,278		1,288,187	1,149,154	1,047,789	714,709	559,110	403,946	517,920	690,171	545,214	535,242
Transfer to Capital	-		1,416,000	2,168,500	852,500	516,000	357,000	198,000	202,000	347,000	210,000	215,000
Repayment to Tax-supported Accounts	-		78,500	78,500	78,500	78,500	78,500	78,997	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**1,474,155**		**1,297,324**	**225,424**	**346,722**	**473,865**	**606,953**	**746,040**	**1,076,881**	**1,441,590**	**1,805,636**	**2,161,990**
Interest	29,483		25,946	4,508	6,934	9,477	12,139	14,921	21,538	28,832	36,113	43,240
Repayment Balance	448,957		377,866	305,353	231,391	155,948	78,997	0	0	0	0	0

Table D-5
Municipality of North Middlesex
Water Development Charge Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	22,597		23,540	32,701	42,216	52,100	62,362	72,643	83,304	94,368	105,844	118,316
Development Charge Proceeds	482		8,520	8,687	8,863	9,039	8,857	9,027	9,214	9,401	10,152	10,350
Transfer to Capital	-		-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**23,079**		**32,060**	**41,388**	**51,079**	**61,139**	**71,219**	**81,670**	**92,518**	**103,769**	**115,996**	**128,666**
Interest	462		641	828	1,022	1,223	1,424	1,633	1,850	2,075	2,320	2,573
Required from Development Charges	-		-	-	-	-	-	-	-	-	-	-

Table D-6
Municipality of North Middlesex
Water Lifecycle Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance			-	1,289	268,907	656,803	1,477,467	2,150,149	2,894,322	4,274,493	5,704,538	7,489,698
Transfer from Operating	-		1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Transfer to Capital	-		-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**-**		**1,263**	**263,635**	**643,925**	**1,448,497**	**2,107,989**	**2,837,571**	**4,190,679**	**5,592,684**	**7,342,841**	**9,376,701**
Interest	-		25	5,273	12,878	28,970	42,160	56,751	83,814	111,854	146,857	187,534

Table D-7
Municipality of North Middlesex
Water Operating Forecast

Description	Budget 2019	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures											
Operating Costs											
Salaries & Wages	94,000	118,174	121,129	124,157	127,261	130,442	133,703	137,046	140,472	143,984	147,584
Mileage	200	400	408	416	424	433	442	450	459	469	478
Meal Expenses - all	200	250	255	260	265	271	276	282	287	293	299
Confrence & Conventions	-	900	918	936	955	974	994	1,014	1,034	1,054	1,076
Office Supplies - office/shop	2,500	250	255	260	265	271	276	282	287	293	299
Computer Supplies	-	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	-	250	258	265	273	281	290	299	307	317	326
County IT Proportional Share	-	500	515	530	546	563	580	597	615	633	652
Education & Training - all	500	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	6,800	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier - ALL	2,000	150	153	156	159	162	166	169	172	176	179
Memberships - ALL	1,500	1,000	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195
Advertising	2,000	250	255	260	265	271	276	282	287	293	299
Telephone - office/shop	700	125	130	135	141	146	152	158	164	171	178
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Materials Purchased misc shop supplies	2,000	500	515	530	546	563	580	597	615	633	652
Meter Pits	-	79,250	81,628	84,076	86,599	89,197	91,872	94,629	97,468	100,392	103,403
Vehicle Maintenance	-	1,750	1,803	1,857	1,912	1,970	2,029	2,090	2,152	2,217	2,283
Vehicle Fuel	-	4,900	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871
Vehicle Replacement	-	12,000	12,480	12,979	13,498	14,038	14,600	15,184	15,791	16,423	17,080
Equip Repairs/Maintenance-shop	2,000	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Small Tools		1,000	1,300	1,690	2,197	2,856	3,713	4,827	6,275	8,157	10,604
Service/Curb Stop Repairs		41,795	43,258	44,772	46,339	47,961	49,639	51,377	53,175	55,036	56,962
Backflow Program		20,475	21,192	21,933	22,701	23,496	24,318	25,169	26,050	26,962	27,905
Road Repair & Restoration		27,500	28,463	29,459	30,490	31,557	32,661	33,805	34,988	36,212	37,480
Meter Reading/Billing		14,520	14,702	14,888	15,078	15,272	15,470	15,673	15,880	16,091	16,307
Water Meter Miantenance		7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Valve Maintenance		62,390	64,574	66,834	69,173	71,594	74,100	76,693	79,378	82,156	85,031
Final Reads		5,550	-	-	-	-	-	-	-	-	-
Watermain Breaks		56,000	57,960	59,989	62,088	64,261	66,510	68,838	71,248	73,741	76,322
Water Line Maintenance		41,750	43,211	44,724	46,289	47,909	49,586	51,321	53,118	54,977	56,901
Generator Maintenance & Inspection		5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Hydrant Maintenance		25,000	25,875	26,781	27,718	28,688	29,692	30,731	31,807	32,920	34,072
Program Support Costs		1,500	1,553	1,607	1,663	1,721	1,782	1,844	1,908	1,975	2,044
SCADA Support/Maintenance		11,590	11,996	12,415	12,850	13,300	13,765	14,247	14,746	15,262	15,796
Rate Study		2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
Water Loss Identification		49,920	51,667	53,476	55,347	57,284	59,289	61,364	63,512	65,735	68,036
Photocopier	450	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance (Keystone)	5,000	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	45,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	15,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Hydro	50,000	59,648	61,736	63,897	66,133	68,448	70,844	73,323	75,889	78,546	81,295
Insurance Premiums	9,395	15,940	16,497	17,075	17,672	18,291	18,931	19,594	20,280	20,989	21,724
Building Repairs & Maintenance	2,500	9,000	9,315	9,641	9,978	10,328	10,689	11,063	11,451	11,851	12,266
Telephone	2,200	6,240	6,365	6,492	6,622	6,754	6,889	7,027	7,168	7,311	7,457
Water Purchased	650,000	700,310	724,663	749,900	776,030	802,868	830,408	858,845	888,189	909,564	931,728
Equipment Repairs & Maintenance	5,000	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Contracted Services	508,299	575,171	593,236	611,935	631,287	651,318	672,049	693,505	715,713	738,698	762,487
Disruptions		60,000	62,100	64,274	66,523	68,851	71,261	73,755	76,337	79,009	81,774
Professional - Engineering	180,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Contracted Services-Equip. Exp.	20,000	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Customer Acct Write Offs	200	200	200	200	200	200	200	200	200	200	200
Property Taxes	6,000	1,172	2,461	2,584	2,714	2,849	2,992	3,141	3,298	3,463	3,636
Sub Total Operating	**1,775,594**	**2,060,134**	**2,123,395**	**2,193,885**	**2,266,915**	**2,342,388**	**2,420,395**	**2,501,249**	**2,585,095**	**2,663,217**	**2,744,566**
Capital-Related											
Existing Debt (Principal) - Growth Related											
Existing Debt (Interest) - Growth Related											
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related											
Existing Debt (Interest) - Non-Growth Related											
New Non-Growth Related Debt (Principal)		-	5,671	37,127	76,386	129,363	140,813	152,049	160,462	169,814	178,946
New Non-Growth Related Debt (Interest)		-	9,133	59,307	119,379	198,212	205,675	211,823	212,472	213,919	214,218
Transfer to Capital	150,000	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	243,278	1,288,187	1,149,154	1,047,789	714,709	559,110	403,946	517,920	690,171	545,214	535,242
Sub Total Capital Related	**393,278**	**1,288,187**	**1,163,957**	**1,144,223**	**910,474**	**886,685**	**750,434**	**881,793**	**1,063,105**	**928,948**	**928,405**
Total Expenditures	**2,168,872**	**3,348,321**	**3,287,352**	**3,338,108**	**3,177,389**	**3,229,073**	**3,170,828**	**3,383,042**	**3,648,200**	**3,592,164**	**3,672,971**
Revenues											
Base Charge	591,499	2,824,264	3,001,865	3,181,977	3,372,895	3,575,269	3,789,785	4,017,172	4,258,203	4,513,695	4,784,517
Other Revenue			-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF formula	146,112	149,000	152,000	155,000	158,100	161,300	164,500	167,800	171,200	174,600	178,100
Water/Sewer Final Reads	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
Returned Cheque Charges	150	200	200	200	200	200	200	200	200	200	200
Utility Penalty Charges	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300
Sale of Waterline Parts and Meters	8,000	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Misc. Utility Revenue	200	200	200	200	200	200	200	200	200	200	200
Water Connection & Insp. Fees	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
Reconnection Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Contributions from Water Capital Reserve	-	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**819,961**	**3,057,364**	**3,239,665**	**3,424,477**	**3,620,295**	**3,827,669**	**4,047,185**	**4,279,672**	**4,526,003**	**4,786,895**	**5,063,217**
Water Billing Recovery - Operating	**1,348,911**	**290,957**	**47,687**	**(86,369)**	**(442,906)**	**(598,596)**	**(876,357)**	**(896,631)**	**(877,803)**	**(1,194,730)**	**(1,390,245)**
Lifecycle Reserve Contribution ($)		1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Water Billing Recovery - Total	**1,348,911**	**292,220**	**310,033**	**327,649**	**348,787**	**369,926**	**391,065**	**415,726**	**440,388**	**468,573**	**496,758**

Table D-8
Municipality of North Middlesex
Water Volume Rate Forecast

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Water Billing Recovery	1,940,410	292,220	310,033	327,649	348,787	369,926	391,065	415,726	440,388	468,573	496,758
Share of Recovery for Volume Rate		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Water Billing Recovery - Volume Rate	1,348,911	292,220	310,033	327,649	348,787	369,926	391,065	415,726	440,388	468,573	496,758
Total Volume Above 250 cu.m (excl. 2019)	729,141	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310
Constant Rate	**1.85**	**0.83**	**0.88**	**0.93**	**0.99**	**1.05**	**1.11**	**1.18**	**1.25**	**1.33**	**1.41**
Annual Percentage Change - Volume Rate		**-55%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**

Table D-9
Municipality of North Middlesex
Capital Budget Forecast (inflated $)

Description	Budget	Total	Forecast									
	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
SCADA IMPLEMNTATION West Williams Booster station	93,300	153,000	153,000	-	-	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Parkhill Resevoir	-	449,000	-	78,000	371,000	-	-	-	-	-	-	-
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	-	378,000	-	-	80,000	298,000	-	-	-	-	-	-
METER PIT INSTALLTIONS	176,000	1,966,000	180,000	183,000	187,000	191,000	194,000	198,000	202,000	206,000	210,000	215,000
WATER DISTRIBUTION MASTER PLAN	50,000	51,000	51,000	-	-	-	-	-	-	-	-	-
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	200,000	306,000	306,000	-	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	-	140,000	-	140,000	-	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	-	129,000	-	-	129,000	-	-	-	-	-	-	-
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	-	2,287,000	-	-	-	2,287,000	-	-	-	-	-	-
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	-	262,000	-	-	-	-	262,000	-	-	-	-	-
WATER TOWER INSTALLATION	-	5,229,000	357,000	3,121,000	1,751,000	-	-	-	-	-	-	-
MCGILIVARAY BOOSTER STATION	-	29,000	-	-	-	-	-	-	-	29,000	-	-
MT.CARMEL RESEVOIR	-	176,000	-	13,000	27,000	22,000	31,000	83,000	-	-	-	-
PARKHILL RESEVOIR	-	529,000	128,000	27,000	34,000	58,000	63,000	78,000	-	141,000	-	-
Waterline Takeoffs	-	1,675,000	153,000	156,000	159,000	162,000	166,000	169,000	172,000	176,000	179,000	183,000
Lifecycle:		-	-	-	-	-	-	-	-	-	-	-
Water Facilities		798,000	112,000	-	32,000	-	153,000	501,000	-	-	-	-
Hydrants		569,000	257,000	-	7,000	-	185,000	79,000	16,000	-	25,000	-
Total Capital Expenditures	**519,300**	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**
Capital Financing												
Provincial/Federal Grants		-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	369,300	6,161,500	-	1,621,500	1,770,000	2,375,500	219,000	175,500	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	150,000	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	998,000	-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Water Capital Reserve	-	7,966,500	1,697,000	2,096,500	968,000	642,500	497,000	352,500	374,000	552,000	389,000	398,000
Total Capital Financing	**519,300**	**15,126,000**	**1,697,000**	**3,718,000**	**2,777,000**	**3,018,000**	**1,054,000**	**1,108,000**	**390,000**	**552,000**	**414,000**	**398,000**

Table D-10
Municipality of North Middlesex
Schedule of Non-growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		-		-	-	-	-	-	-	-	-	-
2021		1,621,500			85,423	85,423	85,423	85,423	85,423	85,423	85,423	85,423
2022		1,770,000				93,247	93,247	93,247	93,247	93,247	93,247	93,247
2023		2,375,500					125,145	125,145	125,145	125,145	125,145	125,145
2024		219,000						11,537	11,537	11,537	11,537	11,537
2025		175,500							9,246	9,246	9,246	9,246
2026		-								-	-	-
2027		-									-	-
2028		-										-
2029		-										
Total Annual Debt Charges	-	**6,161,500**	**-**	**-**	**85,423**	**178,670**	**303,815**	**315,353**	**324,598**	**324,598**	**324,598**	**324,598**

Table D-11
Municipality of North Middlesex
Water Capital Reserve Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	1,230,877		1,503,638	1,138,873	230,149	354,051	483,802	619,128	761,465	1,096,208	1,449,271	1,845,473
Transfer from Operating	243,278		1,388,404	1,261,763	1,163,460	841,265	698,687	558,904	687,249	876,646	749,016	757,083
Transfer to Capital	-		1,697,000	2,096,500	968,000	642,500	497,000	352,500	374,000	552,000	389,000	398,000
Repayment to Tax-supported Accounts			78,500	78,500	78,500	78,500	78,500	78,997	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**1,474,155**		**1,116,542**	**225,636**	**347,109**	**474,315**	**606,988**	**746,535**	**1,074,714**	**1,420,854**	**1,809,287**	**2,204,555**
Interest	29,483		22,331	4,513	6,942	9,486	12,140	14,931	21,494	28,417	36,186	44,091
Repayment Balance	448,957		377,866	305,353	231,391	155,948	78,997	0	0	0	0	0

Table D-12
Municipality of North Middlesex
Water Development Charge Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	22,597		23,540	32,701	42,216	52,100	62,362	72,643	83,304	94,368	105,844	118,316
Development Charge Proceeds	482		8,520	8,687	8,863	9,039	8,857	9,027	9,214	9,401	10,152	10,350
Transfer to Capital	-		-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**23,079**		**32,060**	**41,388**	**51,079**	**61,139**	**71,219**	**81,670**	**92,518**	**103,769**	**115,996**	**128,666**
Interest	462		641	828	1,022	1,223	1,424	1,633	1,850	2,075	2,320	2,573
Required from Development Charges	-		-	-	-	-	-	-	-	-	-	-

Table D-13
Municipality of North Middlesex
Water Lifecycle Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance			-	1,289	268,907	656,803	1,477,467	2,150,149	2,894,322	4,274,493	5,704,538	7,489,698
Transfer from Operating	-		1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Transfer to Capital	-		-	-	39,000	-	338,000	580,000	16,000	-	25,000	-
Transfer to Operating	-		-	-	-	-	-	-	-	-	-	-
Closing Balance	**-**		**1,263**	**263,635**	**643,925**	**1,448,497**	**2,107,989**	**2,837,571**	**4,190,679**	**5,592,684**	**7,342,841**	**9,376,701**
Interest	-		25	5,273	12,878	28,970	42,160	56,751	83,814	111,854	146,857	187,534

Table D-14
Municipality of North Middlesex
Water Operating Forecast

Description	Budget 2019	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures											
Operating Costs											
Salaries & Wages	94,000	118,174	121,129	124,157	127,261	130,442	133,703	137,046	140,472	143,984	147,584
Mileage	200	400	408	416	424	433	442	450	459	469	478
Meal Expenses - all	200	250	255	260	265	271	276	282	287	293	299
Confrence & Conventions	-	900	918	936	955	974	994	1,014	1,034	1,054	1,076
Office Supplies - office/shop	2,500	250	255	260	265	271	276	282	287	293	299
Computer Supplies	-	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	-	250	258	265	273	281	290	299	307	317	326
County IT Proportional Share	-	500	515	530	546	563	580	597	615	633	652
Education & Training - all	500	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	6,800	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier - ALL	2,000	150	153	156	159	162	166	169	172	176	179
Memberships - ALL	1,500	1,000	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195
Advertising	2,000	250	255	260	265	271	276	282	287	293	299
Telephone - office/shop	700	125	130	135	141	146	152	158	164	171	178
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Materials Purchased misc shop supplies	2,000	500	515	530	546	563	580	597	615	633	652
Meter Pits	-	79,250	81,628	84,076	86,599	89,197	91,872	94,629	97,468	100,392	103,403
Vehicle Maintenance	-	1,750	1,803	1,857	1,912	1,970	2,029	2,090	2,152	2,217	2,283
Vehicle Fuel	-	4,900	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871
Vehicle Replacement	-	12,000	12,480	12,979	13,498	14,038	14,600	15,184	15,791	16,423	17,080
Equip Repairs/Maintenance-shop	2,000	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Small Tools		1,000	1,300	1,690	2,197	2,856	3,713	4,827	6,275	8,157	10,604
Service/Curb Stop Repairs		41,795	43,258	44,772	46,339	47,961	49,639	51,377	53,175	55,036	56,962
Backflow Program		20,475	21,192	21,933	22,701	23,496	24,318	25,169	26,050	26,962	27,905
Road Repair & Restoration		27,500	28,463	29,459	30,490	31,557	32,661	33,805	34,988	36,212	37,480
Meter Reading/Billing		14,520	14,702	14,888	15,078	15,272	15,470	15,673	15,880	16,091	16,307
Water Meter Miantenance		7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Valve Maintenance		62,390	64,574	66,834	69,173	71,594	74,100	76,693	79,378	82,156	85,031
Final Reads		5,550	-	-	-	-	-	-	-	-	-
Watermain Breaks		56,000	57,960	59,989	62,088	64,261	66,510	68,838	71,248	73,741	76,322
Water Line Maintenance		41,750	43,211	44,724	46,289	47,909	49,586	51,321	53,118	54,977	56,901
Generator Maintenance & Inspection		5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Hydrant Maintenance		25,000	25,875	26,781	27,718	28,688	29,692	30,731	31,807	32,920	34,072
Program Support Costs		1,500	1,553	1,607	1,663	1,721	1,782	1,844	1,908	1,975	2,044
SCADA Support/Maintenance		11,590	11,996	12,415	12,850	13,300	13,765	14,247	14,746	15,262	15,796
Rate Study		2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
Water Loss Identification		49,920	51,667	53,476	55,347	57,284	59,289	61,364	63,512	65,735	68,036
Photocopier	450	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance (Keystone)	5,000	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	45,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	15,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Hydro	50,000	59,648	61,736	63,897	66,133	68,448	70,844	73,323	75,889	78,546	81,295
Insurance Premiums	9,395	15,940	16,497	17,075	17,672	18,291	18,931	19,594	20,280	20,989	21,724
Building Repairs & Maintenance	2,500	9,000	9,315	9,641	9,978	10,328	10,689	11,063	11,451	11,851	12,266
Telephone	2,200	6,240	6,365	6,492	6,622	6,754	6,889	7,027	7,168	7,311	7,457
Water Purchased	650,000	700,310	724,663	749,900	776,030	802,868	830,408	858,845	888,189	909,564	931,728
Equipment Repairs & Maintenance	5,000	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Contracted Services	508,299	575,171	593,236	611,935	631,287	651,318	672,049	693,505	715,713	738,698	762,487
Disruptions		60,000	62,100	64,274	66,523	68,851	71,261	73,755	76,337	79,009	81,774
Professional - Engineering	180,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Contracted Services-Equip. Exp.	20,000	5,000	5,175	5,356	5,544	5,738	5,938	6,146	6,361	6,584	6,814
Customer Acct Write Offs	200	200	200	200	200	200	200	200	200	200	200
Property Taxes	6,000	1,172	2,461	2,584	2,714	2,849	2,992	3,141	3,298	3,463	3,636
Sub Total Operating	**1,775,594**	**2,060,134**	**2,123,395**	**2,193,885**	**2,266,915**	**2,342,388**	**2,420,395**	**2,501,249**	**2,585,095**	**2,663,217**	**2,744,566**
Capital-Related											
Existing Debt (Principal) - Growth Related											
Existing Debt (Interest) - Growth Related											
New Growth Related Debt (Principal)		-	-	-	-	-	-	-	-	-	-
New Growth Related Debt (Interest)		-	-	-	-	-	-	-	-	-	-
Existing Debt (Principal) - Non-Growth Related											
Existing Debt (Interest) - Non-Growth Related											
New Non-Growth Related Debt (Principal)		-	-	32,725	69,510	119,711	128,021	135,724	140,135	144,689	149,391
New Non-Growth Related Debt (Interest)		-	-	52,699	109,160	184,105	187,332	188,875	184,464	179,909	175,207
Transfer to Capital	150,000	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	243,278	1,388,404	1,261,763	1,163,460	841,265	698,687	558,904	687,249	876,646	749,016	757,083
Sub Total Capital Related	**393,278**	**1,388,404**	**1,261,763**	**1,248,883**	**1,019,935**	**1,002,502**	**874,256**	**1,011,847**	**1,201,244**	**1,073,614**	**1,081,681**
Total Expenditures	**2,168,872**	**3,448,538**	**3,385,158**	**3,442,769**	**3,286,850**	**3,344,890**	**3,294,651**	**3,513,096**	**3,786,339**	**3,736,831**	**3,826,247**
Revenues											
Base Charge	591,499										
Other Revenue			-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF formula	146,112	149,000	152,000	155,000	158,100	161,300	164,500	167,800	171,200	174,600	178,100
Water/Sewer Final Reads	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000
Returned Cheque Charges	150	200	200	200	200	200	200	200	200	200	200
Utility Penalty Charges	20,000	20,400	20,800	21,200	21,600	22,000	22,400	22,800	23,300	23,800	24,300
Sale of Waterline Parts and Meters	8,000	8,200	8,400	8,600	8,800	9,000	9,200	9,400	9,600	9,800	10,000
Misc. Utility Revenue	200	200	200	200	200	200	200	200	200	200	200
Water Connection & Insp. Fees	50,000	51,000	52,000	53,000	54,100	55,200	56,300	57,400	58,500	59,700	60,900
Reconnection Fees	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Contributions from Water Capital Reserve	-	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**819,961**	**233,100**	**237,800**	**242,500**	**247,400**	**252,400**	**257,400**	**262,500**	**267,800**	**273,200**	**278,700**
Water Billing Recovery - Operating	**1,348,911**	**3,215,438**	**3,147,358**	**3,200,269**	**3,039,450**	**3,092,490**	**3,037,251**	**3,250,596**	**3,518,539**	**3,463,631**	**3,547,547**
Lifecycle Reserve Contribution ($)		1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Water Billing Recovery - Total	**1,348,911**	**3,216,702**	**3,409,704**	**3,614,286**	**3,831,143**	**4,061,012**	**4,304,673**	**4,562,953**	**4,836,730**	**5,126,934**	**5,434,550**

Table D-15
Municipality of North Middlesex
Water Flat Rate Forecast

Annual Flat Rate Category	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 to 250	883	936	992	1,051	1,115	1,181	1,252	1,327	1,407	1,491
250 to 300	1,150	1,219	1,292	1,370	1,452	1,539	1,631	1,729	1,833	1,943
300 to 400	1,361	1,443	1,529	1,621	1,718	1,821	1,930	2,046	2,169	2,299
400 to 500	1,642	1,741	1,845	1,956	2,073	2,197	2,329	2,469	2,617	2,774
500 to 600	1,923	2,039	2,161	2,291	2,428	2,574	2,728	2,892	3,065	3,249
600 to 800	2,345	2,486	2,635	2,793	2,961	3,138	3,327	3,526	3,738	3,962
800 to 1000	2,907	3,082	3,267	3,463	3,671	3,891	4,124	4,372	4,634	4,912
1000 to 1500	3,892	4,125	4,373	4,635	4,913	5,208	5,520	5,852	6,203	6,575
1500 to 2000	5,298	5,616	5,952	6,310	6,688	7,089	7,515	7,966	8,444	8,950
2000 to 3000	7,407	7,851	8,322	8,821	9,351	9,912	10,506	11,137	11,805	12,513
3000 to 4000	10,219	10,832	11,482	12,171	12,901	13,675	14,495	15,365	16,287	17,264
4000 to 5000	13,031	13,812	14,641	15,520	16,451	17,438	18,484	19,593	20,769	22,015
5000 to 7500	17,952	19,029	20,170	21,381	22,664	24,023	25,465	26,993	28,612	30,329
7500 to 10000	24,982	26,481	28,069	29,754	31,539	33,431	35,437	37,563	39,817	42,206
10000 to 12000	31,309	33,187	35,178	37,289	39,526	41,898	44,412	47,077	49,901	52,895
12000 to 14161	37,159	39,389	41,752	44,257	46,912	49,727	52,711	55,873	59,226	62,779
Annual Percentage Change	**52%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**
Total Revenue	**3,216,702**	**3,409,704**	**3,614,286**	**3,831,143**	**4,061,012**	**4,304,673**	**4,562,953**	**4,836,730**	**5,126,934**	**5,434,550**

Appendix E
Detailed Wastewater Rate Calculations

Appendix E: Detailed Wastewater Rate Calculations

Table E-1
Municipality of North Middlesex
Capital Budget Forecast (uninflated $)

Description	Budget 2019	Total	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
WASTEWATER COLLECTION MASTER PLAN	50,000	35,000	35,000	-	-	-	-	-	-	-	-	-
WASTEWATER COLLECTION WORKS	-	280,000	41,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500	26,500
PARKHILL WWTP	-	18,000,000	2,000,000	8,000,000	8,000,000	-	-	-	-	-	-	-
BEAR CREEK PUMPING STATION	-	168,500	3,500	7,000	25,000	24,000	9,000	-	100,000	-	-	-
NEW ONTARIO PUMPING STATION	-	193,500	28,500	7,000	25,000	24,000	9,000	-	-	100,000	-	-
WILLIAM ST PUMPING STATION	-	308,500	55,000	57,000	60,000	10,000	10,000	16,500	-	-	100,000	-
VICTORIA ST PUMPING STATION	-	522,500	3,500	3,500	3,500	405,000	3,500	3,500	-	-	-	100,000
STATION ST PUMPING STATION	-	241,500	-	-	-	-	125,000	100,000	5,500	5,500	5,500	-
AC WWTP	-	3,083,500	97,000	539,000	42,000	93,000	657,000	331,100	331,100	331,100	331,100	331,100
		-										
Total Capital Expenditures	**50,000**	**22,833,000**	**2,264,000**	**8,640,000**	**8,182,000**	**582,500**	**840,000**	**477,600**	**463,100**	**463,100**	**463,100**	**457,600**

Option 1 – 90% Recovery from Base Charges, 10% from Volume Rate

Table E-2
Municipality of North Middlesex
Capital Budget Forecast (inflated $)

Description	Budget 2019	Total	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
WASTEWATER COLLECTION MASTER PLAN	50,000	36,000	36,000	-	-	-	-	-	-	-	-	-
WASTEWATER COLLECTION WORKS	-	311,000	42,000	28,000	28,000	29,000	29,000	30,000	30,000	31,000	32,000	32,000
PARKHILL WWTP	-	18,853,000	2,040,000	8,323,000	8,490,000	-	-	-	-	-	-	-
BEAR CREEK PUMPING STATION	-	189,000	4,000	7,000	27,000	26,000	10,000	-	115,000	-	-	-
NEW ONTARIO PUMPING STATION	-	216,000	29,000	7,000	27,000	26,000	10,000	-	-	117,000	-	-
WILLIAM ST PUMPING STATION	-	340,000	56,000	59,000	64,000	11,000	11,000	19,000	-	-	120,000	-
VICTORIA ST PUMPING STATION	-	580,000	4,000	4,000	4,000	438,000	4,000	4,000	-	-	-	122,000
STATION ST PUMPING STATION	-	270,000	-	-	-	-	138,000	113,000	6,000	6,000	7,000	-
AC WWTP	-	3,472,000	99,000	561,000	45,000	101,000	725,000	373,000	380,000	388,000	396,000	404,000
Total Capital Expenditures	**50,000**	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**
Capital Financing												
Provincial/Federal Gas Tax		1,100,000	1,100,000									
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	10,831,439	-	5,151,077	5,101,362	579,000	-	-	-	-	-	-
Growth Related Debenture Requirements	-	7,918,260	856,800	3,495,660	3,565,800	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Capital Reserve	50,000	4,417,301	353,200	342,263	17,838	52,000	927,000	539,000	531,000	542,000	555,000	558,000
Total Capital Financing	**50,000**	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**

Table E-3
Municipality of North Middlesex
Schedule of Non-growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		-		-	-	-	-	-	-	-	-	-
2021		5,151,077			271,368	271,368	271,368	271,368	271,368	271,368	271,368	271,368
2022		5,101,362				268,749	268,749	268,749	268,749	268,749	268,749	268,749
2023		579,000					30,503	30,503	30,503	30,503	30,503	30,503
2024		-						-	-	-	-	-
2025		-							-	-	-	-
2026		-								-	-	-
2027		-									-	-
2028		-										-
2029		-										
Total Annual Debt Charges	-	**10,831,439**	**-**	**-**	**271,368**	**540,116**	**570,619**	**570,619**	**570,619**	**570,619**	**570,619**	**570,619**

Table E-4
Municipality of North Middlesex
Schedule of Growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		856,800		45,138	45,138	45,138	45,138	45,138	45,138	45,138	45,138	45,138
2021		3,495,660			184,157	184,157	184,157	184,157	184,157	184,157	184,157	184,157
2022		3,565,800				187,852	187,852	187,852	187,852	187,852	187,852	187,852
2023		-					-	-	-	-	-	-
2024		-						-	-	-	-	-
2025		-							-	-	-	-
2026		-								-	-	-
2027		-									-	-
2028		-										-
2029		-										
Total Annual Debt Charges	-	**7,918,260**	**-**	**45,138**	**229,295**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**

Table E-5
Municipality of North Middlesex
Wastewater Capital Reserve Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	567,545		484,036	438,465	665,266	1,021,163	1,437,456	765,317	656,073	513,459	454,925	562,992
Transfer from Operating	-		419,031	676,020	473,712	560,107	359,855	536,891	498,319	594,546	772,027	870,358
Transfer to Capital	50,000		353,200	342,263	17,838	52,000	927,000	539,000	531,000	542,000	555,000	558,000
Repayment to Tax-supported Accounts			120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Transfer to Operating	43,000		-	-	-	-	-	-	-	-	-	-
Closing Balance	**474,545**		**429,867**	**652,222**	**1,001,140**	**1,409,271**	**750,311**	**643,209**	**503,392**	**446,005**	**551,953**	**755,350**
Interest	9,491		8,597	13,044	20,023	28,185	15,006	12,864	10,068	8,920	11,039	15,107
Repayment Balance	3,131,682		3,011,682	2,891,682	2,771,682	2,651,682	2,531,682	2,411,682	2,291,682	2,171,682	2,051,682	1,931,682

Table E-6
Municipality of North Middlesex
Wastewater Development Charge Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	453,496		466,661	554,333	599,290	458,904	125,739	0	0	(0)	0	(0)
Development Charge Proceeds	4,015		76,804	78,343	79,911	81,517	83,144	84,809	86,510	88,232	94,696	96,588
Transfer From Lifecycle Reserve Fund			-	-	-	-	208,265	332,339	330,637	328,916	322,451	320,560
Transfer to Capital			-	-	-	-	-	-	-	-	-	-
Transfer to Operating			-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Closing Balance	**457,511**		**543,464**	**587,539**	**449,906**	**123,273**	**0**	**0**	**(0)**	**0**	**(0)**	**0**
Interest	9,150		10,869	11,751	8,998	2,465	0	0	(0)	0	(0)	0
Required from Development Charges	-		856,800	3,495,660	3,565,800	-	-	-	-	-	-	-

Table E-7
Municipality of North Middlesex
Wastewater Lifecycle Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance			-	102,000	332,765	790,473	976,346	1,093,208	1,117,485	1,421,976	1,908,126	2,534,459
Transfer from Operating	-		100,000	224,240	442,209	166,729	303,692	334,704	607,247	777,651	899,089	1,138,211
Transfer to Capital			-	-	-	-	-	-	-	-	-	-
Transfer to Operating			-	-	-	-	-	-	-	-	-	-
Transfer to DC Reserve Fund			-	-	-		208,265	332,339	330,637	328,916	322,451	320,560
Closing Balance	**-**		**100,000**	**326,240**	**774,973**	**957,202**	**1,071,773**	**1,095,573**	**1,394,095**	**1,870,711**	**2,484,764**	**3,352,110**
Interest	-		2,000	6,525	15,499	19,144	21,435	21,911	27,882	37,414	49,695	67,042

Table E-8
Municipality of North Middlesex
Wastewater Operating Forecast

Description	Budget	Forecast									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures											
Operating Costs											
Ward 1											
Salaries & Wages	19,500	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Mileage	-	400	412	424	437	450	464	478	492	507	522
Meal Expenses- ALL	-	250	258	265	273	281	290	299	307	317	326
Confrence & Conventions	-	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Office Supplies-office/shop	500	250	258	265	273	281	290	299	307	317	326
Computer Supplies	-	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	-	250	258	265	273	281	290	299	307	317	326
Couty IT Proportional Share	-	500	515	530	546	563	580	597	615	633	652
Education & Training-all	1,500	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	750	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	750	150	153	156	159	162	166	169	172	176	179
Memberships-ALL	-	1,000	1,027	1,055	1,083	1,113	1,143	1,175	1,207	1,240	1,274
Advertising/Communications	500	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	350	63	65	68	70	73	76	79	82	86	89
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Materials Purchased Misc Shop supplies	-	500	515	530	546	563	580	597	615	633	652
Photocopier	100	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance(Keystone)	100	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	1,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	1,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	-	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Vehicle Fuel	-	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	-	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	-	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Hydro	7,300	9,261	9,693	10,146	10,653	241,186	253,245	265,907	279,202	293,163	307,821
Insurance Premiums	2,121	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Materials Purchased	50,000	500	518	536	554	574	594	615	636	658	681
Equipment Rental	-	500	518	536	554	574	594	615	636	658	681
Small Tools	-	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	-	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Sanitary Locates	-	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	-	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs		740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	-	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	-	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	-	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Generator Maintenance & Inspection	-	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Lagoon Chemical Discharge	-	60,000	68,775	72,214	-	-	-	-	-	-	-
Equip Repairs /Maintenance-shop	-	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Repairs & Maintenance (System)	60,000	23,000	23,805	24,638	25,501	26,393	27,317	28,273	29,262	30,287	31,347
Sewage Pump/Life Repairs & Maintenance	10,000	24,000	24,840	25,709	26,609	27,541	28,504	29,502	30,535	31,603	32,710
Contracted Services	234,308	64,505	36,231	37,499	207,003	207,003	207,003	207,003	207,003	207,003	207,003
Contracted Services-Equip. Exp.	15,000	66,000	68,310	70,701	73,175	75,737	78,387	81,131	83,970	86,909	89,951
Property Tax	15,000	9,283	9,515	9,774	10,041	10,315	10,596	10,886	11,183	11,489	11,804
Ward 2											
Salaries & Wages	-	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Confrence & Conventions	-	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Meal Expenses- ALL	-	250	258	265	273	281	290	299	307	317	326
Office Supplies-office/shop	-	250	258	265	273	281	290	299	307	317	326
Education & Training-all	-	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	-	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	-	150	153	156	159	162	166	169	172	176	179
Professional - Audit-QMS/MOE	-	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	-	150	153	156	159	162	166	169	172	176	179
Advertising/Communications	-	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	-	63	65	68	70	73	76	79	82	86	89
Photocopier	-	200	207	214	222	230	238	246	254	263	273
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Prog Maint & Enhance(Keystone)	-	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	-	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering		2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs		1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Fuel		2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance		875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement		6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Equipment Rental		500	518	536	554	574	594	615	636	658	681
Small Tools		500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration		7,871	8,146	8,432	8,727	9,032	9,348	9,675	10,014	10,365	10,727
Sanitary Locates		2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance		37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs		740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance		10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study		2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections		15,371	15,909	16,466	17,042	17,639	18,256	18,895	19,556	20,241	20,949
Sewer Debenture Debt - Interest	37,000	37,700	-	-	-	-	-	-	-	-	-
Hydro	140,000	228,643	239,659	251,226	263,371	276,123	289,513	303,572	318,335	333,835	350,110
Insurance Premiums	18,790	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Telephone-office/shop	1,700	63	65	68	70	73	76	79	82	86	89
Equip Repairs /Maintenance-shop	-	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Generator Maintenance & Inspection	-	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Equipment-Servicing & Inspection	34,000	15,750	16,301	16,872	17,462	18,073	18,706	19,361	20,038	20,740	21,466
Sewage Pump/Life Repairs & Maintenance	25,000	14,500	15,008	15,533	16,076	16,639	17,221	17,824	18,448	19,094	19,762
Contracted Services	204,084	236,703	214,455	221,961	229,730	237,770	246,092	254,706	263,620	272,847	282,397
Contracted Services-Equip. Exp.	12,378	8,500	8,798	9,105	9,424	9,754	10,095	10,449	10,814	11,193	11,585
Property Taxes	65,000	7,261	7,442	7,628	7,819	8,015	8,215	8,420	8,631	8,847	9,068
Sub Total Operating	**962,932**	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**

Table E-8 (continued)
Municipality of North Middlesex
Wastewater Operating Forecast

Description	Budget 2019	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sub Total Operating	**962,932**	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**
Capital-Related											
Existing Debt (Principal) - Growth Related											
Existing Debt (Interest) - Growth Related											
New Growth Related Debt (Principal)		-	17,292	88,402	163,239	168,544	174,022	179,678	185,517	191,547	197,772
New Growth Related Debt (Interest)		-	27,846	140,893	253,908	248,603	243,125	237,470	231,630	225,601	219,376
Existing Debt (Principal) - Non-Growth Related											
Existing Debt (Interest) - Non-Growth Related											
New Non-Growth Related Debt (Principal)		-	-	103,958	210,290	228,810	236,246	243,924	251,852	260,037	268,488
New Non-Growth Related Debt (Interest)		-	-	167,410	329,826	341,809	334,372	326,694	318,767	310,582	302,130
Transfer to Capital		-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve		419,031	676,020	473,712	560,107	359,855	536,891	498,319	594,546	772,027	870,358
Sub Total Capital Related	**-**	**419,031**	**721,158**	**974,375**	**1,517,371**	**1,347,621**	**1,524,658**	**1,486,085**	**1,582,312**	**1,759,794**	**1,858,124**
Total Expenditures	**962,932**	**1,609,182**	**1,861,885**	**2,158,565**	**2,839,158**	**2,941,295**	**3,173,364**	**3,192,114**	**3,348,049**	**3,587,730**	**3,750,858**
Revenues											
Flat Rate User Charges	622,320	1,122,191	1,479,330	1,799,775	2,006,790	2,235,644	2,488,479	2,769,525	3,081,895	3,429,044	3,817,325
Ward 1											
Provincial Grants - OCIF Formula	73,056	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #1 Utility Penalty	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500	500
Debt Paid by Ratepayers	37,000	37,700									
Ward 2 & 4		-	-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF Formula	73,056	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #2 Utility Penalty	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500	500
Contributions from Development Charges Reserve	-	-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Contributions from Capital Reserve	43,000	-	-	-	-	-	-	-	-	-	-
Contributions from Lifecycle Reserve Fund		-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**852,932**	**1,313,391**	**1,680,968**	**2,188,570**	**2,586,637**	**2,818,691**	**3,074,727**	**3,358,973**	**3,674,743**	**4,025,292**	**4,416,973**
Wastewater Billing Recovery - Operating	**110,000**	**295,791**	**180,917**	**(30,005)**	**252,520**	**122,604**	**98,638**	**(166,859)**	**(326,694)**	**(437,562)**	**(666,115)**
Lifecycle Reserve Contribution ($)		100,000	224,240	442,209	166,729	303,692	334,704	607,247	777,651	899,089	1,138,211
Wastewater Billing Recovery - Total	**110,000**	**395,791**	**405,157**	**412,203**	**419,249**	**426,296**	**433,342**	**440,388**	**450,957**	**461,527**	**472,096**

Table E-9
Municipality of North Middlesex
Wastewater Volume Rate Forecast

Description	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Wastewater Billing Recovery	732,320	395,791	405,157	412,203	419,249	426,296	433,342	440,388	450,957	461,527	472,096
Total Volume Above 250 cu.m (excl. 2019)	57,895	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310	352,310
Constant Rate	**1.90**	**1.12**	**1.15**	**1.17**	**1.19**	**1.21**	**1.23**	**1.25**	**1.28**	**1.31**	**1.34**
Annual Percentage Change		**-41%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**	**2%**

Table E-10
Municipality of North Middlesex
Capital Budget Forecast (inflated $)

Description	Budget 2019	Total	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
WASTEWATER COLLECTION MASTER PLAN	50,000	36,000	36,000	-	-	-	-	-	-	-	-	-
WASTEWATER COLLECTION WORKS	-	311,000	42,000	28,000	28,000	29,000	29,000	30,000	30,000	31,000	32,000	32,000
PARKHILL WWTP	-	18,853,000	2,040,000	8,323,000	8,490,000	-	-	-	-	-	-	-
BEAR CREEK PUMPING STATION	-	189,000	4,000	7,000	27,000	26,000	10,000	-	115,000	-	-	-
NEW ONTARIO PUMPING STATION	-	216,000	29,000	7,000	27,000	26,000	10,000	-	-	117,000	-	-
WILLIAM ST PUMPING STATION	-	340,000	56,000	59,000	64,000	11,000	11,000	19,000	-	-	120,000	-
VICTORIA ST PUMPING STATION	-	580,000	4,000	4,000	4,000	438,000	4,000	4,000	-	-	-	122,000
STATION ST PUMPING STATION	-	270,000	-	-	-	-	138,000	113,000	6,000	6,000	7,000	-
AC WWTP	-	3,472,000	99,000	561,000	45,000	101,000	725,000	373,000	380,000	388,000	396,000	404,000
Total Capital Expenditures	**50,000**	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**
Capital Financing												
Provincial/Federal Gas Tax		1,100,000	1,100,000									
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	12,170,540	-	5,493,340	5,119,200	631,000	927,000	-	-	-	-	-
Growth Related Debenture Requirements	-	7,918,260	856,800	3,495,660	3,565,800	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-	-
Wastewater Capital Reserve	50,000	3,078,200	353,200	-	-	-	-	539,000	531,000	542,000	555,000	558,000
Total Capital Financing	**50,000**	**24,267,000**	**2,310,000**	**8,989,000**	**8,685,000**	**631,000**	**927,000**	**539,000**	**531,000**	**542,000**	**555,000**	**558,000**

Table E-11
Municipality of North Middlesex
Schedule of Non-growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		-		-	-	-	-	-	-	-	-	-
2021		5,493,340			289,399	289,399	289,399	289,399	289,399	289,399	289,399	289,399
2022		5,119,200				269,688	269,688	269,688	269,688	269,688	269,688	269,688
2023		631,000					33,242	33,242	33,242	33,242	33,242	33,242
2024		927,000						48,836	48,836	48,836	48,836	48,836
2025		-							-	-	-	-
2026		-								-	-	-
2027		-									-	-
2028		-										-
2029		-										
Total Annual Debt Charges	-	**12,170,540**	**-**	**-**	**289,399**	**559,087**	**592,329**	**641,165**	**641,165**	**641,165**	**641,165**	**641,165**

Table E-12
Municipality of North Middlesex
Schedule of Growth Related Debenture Repayments

Debenture Year	2019	Principal (Inflated)	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2020		856,800		45,138	45,138	45,138	45,138	45,138	45,138	45,138	45,138	45,138
2021		3,495,660			184,157	184,157	184,157	184,157	184,157	184,157	184,157	184,157
2022		3,565,800				187,852	187,852	187,852	187,852	187,852	187,852	187,852
2023		-					-	-	-	-	-	-
2024		-						-	-	-	-	-
2025		-							-	-	-	-
2026		-								-	-	-
2027		-									-	-
2028		-										-
2029		-										
Total Annual Debt Charges	-	**7,918,260**	**-**	**45,138**	**229,295**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**	**417,148**

Table E-13
Municipality of North Middlesex
Wastewater Capital Reserve Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	567,545		484,036	164,916	470,420	637,551	924,988	1,047,875	800,955	519,936	310,980	252,899
Transfer from Operating	-		150,846	416,281	274,629	389,301	222,341	396,374	359,787	446,946	611,961	691,231
Transfer to Capital	50,000		353,200					539,000	531,000	542,000	555,000	558,000
Repayment to Tax-supported Accounts			120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Transfer to Operating	43,000		-	-	-	-	-	-	-	-	-	-
Closing Balance	**474,545**		**161,682**	**461,197**	**625,050**	**906,851**	**1,027,329**	**785,250**	**509,741**	**304,882**	**247,941**	**266,130**
Interest	9,491		3,234	9,224	12,501	18,137	20,547	15,705	10,195	6,098	4,959	5,323
Repayment Balance	3,131,682		3,011,682	2,891,682	2,771,682	2,651,682	2,531,682	2,411,682	2,291,682	2,171,682	2,051,682	1,931,682

Table E-14
Municipality of North Middlesex
Wastewater Development Charge Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	453,496		466,661	554,333	599,290	458,904	125,739	0	0	(0)	0	(0)
Development Charge Proceeds	4,015		76,804	78,343	79,911	81,517	83,144	84,809	86,510	88,232	94,696	96,588
Transfer From Lifecycle Reserve Fund			-	-	-	-	208,265	332,339	330,637	328,916	322,451	320,560
Transfer to Capital			-	-	-	-	-	-	-	-	-	-
Transfer to Operating			-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Closing Balance	**457,511**		**543,464**	**587,539**	**449,906**	**123,273**	**0**	**0**	**(0)**	**0**	**(0)**	**0**
Interest	9,150		10,869	11,751	8,998	2,465	0	0	(0)	0	(0)	0
Required from Development Charges	-		856,800	3,495,660	3,565,800	-	-	-	-	-	-	-

Table E-15
Municipality of North Middlesex
Wastewater Lifecycle Reserve Fund Continuity

Description	2019		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance			-	102,000	332,752	790,453	976,761	1,095,111	1,120,900	1,422,093	1,904,867	2,527,755
Transfer from Operating	-		100,000	224,227	442,202	167,156	305,142	336,150	603,945	774,340	895,775	1,134,881
Transfer to Capital			-	-	-	-	-	-	-	-	-	-
Transfer to Operating			-	-	-	-	-	-	-	-	-	-
Transfer to DC Reserve Fund							208,265	332,339	330,637	328,916	322,451	320,560
Closing Balance	**-**		**100,000**	**326,227**	**774,954**	**957,609**	**1,073,638**	**1,098,922**	**1,394,208**	**1,867,517**	**2,478,191**	**3,342,076**
Interest	-		2,000	6,525	15,499	19,152	21,473	21,978	27,884	37,350	49,564	66,842

Table E-16
Municipality of North Middlesex
Wastewater Operating Forecast

Description	Budget 2019	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures											
Operating Costs											
Ward 1											
Salaries & Wages	19,500	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Mileage	-	400	412	424	437	450	464	478	492	507	522
Meal Expenses- ALL	-	250	258	265	273	281	290	299	307	317	326
Confrence & Conventions	-	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Office Supplies-office/shop	500	250	258	265	273	281	290	299	307	317	326
Computer Supplies	-	500	515	530	546	563	580	597	615	633	652
Computer Maintenance	-	250	258	265	273	281	290	299	307	317	326
Couty IT Proportional Share	-	500	515	530	546	563	580	597	615	633	652
Education & Training-all	1,500	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	750	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	750	150	153	156	159	162	166	169	172	176	179
Memberships-ALL	-	1,000	1,027	1,055	1,083	1,113	1,143	1,175	1,207	1,240	1,274
Advertising/Communications	500	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	350	63	65	68	70	73	76	79	82	86	89
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Materials Purchased Misc Shop supplies	-	500	515	530	546	563	580	597	615	633	652
Photocopier	100	200	207	214	222	230	238	246	254	263	273
Prog Maint & Enhance(Keystone)	100	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	1,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering	1,000	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs	-	1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Vehicle Fuel	-	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance	-	875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement	-	6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Hydro	7,300	9,261	9,693	10,146	10,653	241,186	253,245	265,907	279,202	293,163	307,821
Insurance Premiums	2,121	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Materials Purchased	50,000	500	518	536	554	574	594	615	636	658	681
Equipment Rental	-	500	518	536	554	574	594	615	636	658	681
Small Tools	-	500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration	-	7,500	7,763	8,034	8,315	8,606	8,908	9,219	9,542	9,876	10,222
Sanitary Locates	-	2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance	-	37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs		740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance	-	10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study	-	2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections	-	15,000	15,525	16,068	16,631	17,213	17,815	18,439	19,084	19,752	20,443
Generator Maintenance & Inspection	-	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Lagoon Chemical Discharge	-	60,000	68,775	72,214	-	-	-	-	-	-	-
Equip Repairs /Maintenance-shop	-	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Repairs & Maintenance (System)	60,000	23,000	23,805	24,638	25,501	26,393	27,317	28,273	29,262	30,287	31,347
Sewage Pump/Life Repairs & Maintenance	10,000	24,000	24,840	25,709	26,609	27,541	28,504	29,502	30,535	31,603	32,710
Contracted Services	234,308	64,505	36,231	37,499	207,003	207,003	207,003	207,003	207,003	207,003	207,003
Contracted Services-Equip. Exp.	15,000	66,000	68,310	70,701	73,175	75,737	78,387	81,131	83,970	86,909	89,951
Property Tax	15,000	9,283	9,515	9,774	10,041	10,315	10,596	10,886	11,183	11,489	11,804
Ward 2											
Salaries & Wages	-	72,642	74,821	77,066	79,378	81,759	84,212	86,739	89,341	92,021	94,782
Confrence & Conventions	-	900	927	955	983	1,013	1,043	1,075	1,107	1,140	1,174
Meal Expenses- ALL	-	250	258	265	273	281	290	299	307	317	326
Office Supplies-office/shop	-	250	258	265	273	281	290	299	307	317	326
Education & Training-all	-	1,700	1,751	1,804	1,858	1,913	1,971	2,030	2,091	2,154	2,218
Professional - Audit-QMS/MOE	-	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566
Postage & Courier-ALL	-	150	153	156	159	162	166	169	172	176	179
Advertising/Communications	-	250	258	265	273	281	290	299	307	317	326
Telephone-office/shop	-	63	65	68	70	73	76	79	82	86	89
Photocopier	-	200	207	214	222	230	238	246	254	263	273
Clothing Allowances & Safetywear	-	300	312	324	337	351	365	380	395	411	427
Prog Maint & Enhance(Keystone)	-	750	776	803	832	861	891	922	954	988	1,022
Professional - Consulting	-	2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Professional - Engineering		2,500	2,588	2,678	2,772	2,869	2,969	3,073	3,181	3,292	3,407
Vehicle Parts & Repairs		1,200	1,242	1,285	1,330	1,377	1,425	1,475	1,527	1,580	1,635
Fuel		2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936
Vehicle Maintenance		875	901	928	956	985	1,014	1,045	1,076	1,108	1,142
Vehicle Replacement		6,000	6,240	6,490	6,749	7,019	7,300	7,592	7,896	8,211	8,540
Equipment Rental		500	518	536	554	574	594	615	636	658	681
Small Tools		500	518	536	554	574	594	615	636	658	681
Road Repair & Restoration		7,871	8,146	8,432	8,727	9,032	9,348	9,675	10,014	10,365	10,727
Sanitary Locates		2,692	2,786	2,883	2,984	3,089	3,197	3,309	3,424	3,544	3,668
Sanitary Line Maintenance		37,000	38,295	39,635	41,023	42,458	43,944	45,482	47,074	48,722	50,427
Program Support Costs		740	766	793	820	849	879	910	941	974	1,009
SCADA Support/Maintenance		10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Rate Study		2,664	2,744	2,826	2,911	2,998	3,088	3,181	3,276	3,375	3,476
I&I/ CCTV Inspections		15,371	15,909	16,466	17,042	17,639	18,256	18,895	19,556	20,241	20,949
Sewer Debenture Debt - Interest	37,000	37,700	-	-	-	-	-	-	-	-	-
Hydro	140,000	228,643	239,659	251,226	263,371	276,123	289,513	303,572	318,335	333,835	350,110
Insurance Premiums	18,790	7,970	8,249	8,537	8,836	9,145	9,466	9,797	10,140	10,495	10,862
Telephone-office/shop	1,700	63	65	68	70	73	76	79	82	86	89
Equip Repairs /Maintenance-shop	-	5,500	5,775	6,064	6,367	6,685	7,020	7,371	7,739	8,126	8,532
Generator Maintenance & Inspection		10,000	10,350	10,712	11,087	11,475	11,877	12,293	12,723	13,168	13,629
Equipment-Servicing & Inspection	34,000	15,750	16,301	16,872	17,462	18,073	18,706	19,361	20,038	20,740	21,466
Sewage Pump/Life Repairs & Maintenance	25,000	14,500	15,008	15,533	16,076	16,639	17,221	17,824	18,448	19,094	19,762
Contracted Services	204,084	236,703	214,455	221,961	229,730	237,770	246,092	254,706	263,620	272,847	282,397
Contracted Services-Equip. Exp.	12,378	8,500	8,798	9,105	9,424	9,754	10,095	10,449	10,814	11,193	11,585
Property Taxes	65,000	7,261	7,442	7,628	7,819	8,015	8,215	8,420	8,631	8,847	9,068
Sub Total Operating	**962,932**	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**

Table E-16 (continued)
Municipality of North Middlesex
Wastewater Operating Forecast

Description	Budget 2019	Forecast 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sub Total Operating	**962,932**	**1,190,151**	**1,140,728**	**1,184,190**	**1,321,787**	**1,593,674**	**1,648,707**	**1,706,028**	**1,765,737**	**1,827,936**	**1,892,733**
Capital-Related											
Existing Debt (Principal) - Growth Related											
Existing Debt (Interest) - Growth Related											
New Growth Related Debt (Principal)		-	17,292	88,402	163,239	168,544	174,022	179,678	185,517	191,547	197,772
New Growth Related Debt (Interest)		-	27,846	140,893	253,908	248,603	243,125	237,470	231,630	225,601	219,376
Existing Debt (Principal) - Non-Growth Related											
Existing Debt (Interest) - Non-Growth Related											
New Non-Growth Related Debt (Principal)		-	-	110,865	217,782	237,595	264,025	272,606	281,466	290,613	300,058
New Non-Growth Related Debt (Interest)		-	-	178,534	341,304	354,734	377,140	368,559	359,699	350,552	341,107
Transfer to Capital		-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve		150,846	416,281	274,629	389,301	222,341	396,374	359,787	446,946	611,961	691,231
Sub Total Capital Related	**-**	**150,846**	**461,418**	**793,323**	**1,365,535**	**1,231,817**	**1,454,687**	**1,418,099**	**1,505,258**	**1,670,274**	**1,749,543**
Total Expenditures	**962,932**	**1,340,997**	**1,602,146**	**1,977,513**	**2,687,321**	**2,825,491**	**3,103,394**	**3,124,127**	**3,270,995**	**3,498,210**	**3,642,277**
Revenues											
Flat Rate User Charges	622,320										
Ward 1											
Provincial Grants - OCIF Formula	73,056	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #1 Utility Penalty	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500	500
Debt Paid by Ratepayers	37,000	37,700									
Ward 2 & 4		-	-	-	-	-	-	-	-	-	-
Provincial Grants - OCIF Formula	73,056	74,500	76,000	77,500	79,100	80,700	82,300	83,900	85,600	87,300	89,000
Ward #2 Utility Penalty	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Connections Permits & Insp. Fees	500	500	500	500	500	500	500	500	500	500	500
Contributions from Development Charges Reserve Fund	-	-	45,138	229,295	417,148	417,148	417,148	417,148	417,148	417,148	417,148
Contributions from Capital Reserve	43,000	-	-	-	-	-	-	-	-	-	-
Contributions from Lifecycle Reserve Fund		-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**852,932**	**191,200**	**201,638**	**388,795**	**579,848**	**583,048**	**586,248**	**589,448**	**592,848**	**596,248**	**599,648**
Wastewater Billing Recovery - Operating	**110,000**	**1,149,797**	**1,400,508**	**1,588,718**	**2,107,474**	**2,242,443**	**2,517,146**	**2,534,680**	**2,678,148**	**2,901,962**	**3,042,629**
Lifecycle Reserve Contribution ($)		100,000	224,227	442,202	167,156	305,142	336,150	603,945	774,340	895,775	1,134,881
Wastewater Billing Recovery - Total	**110,000**	**1,249,797**	**1,624,736**	**2,030,920**	**2,274,630**	**2,547,586**	**2,853,296**	**3,138,625**	**3,452,488**	**3,797,737**	**4,177,510**

Table E-17
Municipality of North Middlesex
Wastewater Flat Rate Forecast

Annual Flat Rate Category	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
0 to 250	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
250 to 300	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
300 to 400	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
400 to 500	518	829	1,078	1,348	1,509	1,690	1,893	2,082	2,291	2,520	2,772
500 to 600	1,055	1,688	2,194	2,743	3,072	3,441	3,854	4,239	4,663	5,129	5,642
600 to 800	1,340	2,144	2,787	3,484	3,902	4,370	4,895	5,384	5,923	6,515	7,166
800 to 1000	1,720	2,752	3,578	4,472	5,009	5,610	6,283	6,911	7,602	8,362	9,199
1000 to 1500	2,385	3,816	4,961	6,201	6,945	7,779	8,712	9,583	10,541	11,596	12,755
1500 to 2000	3,335	5,336	6,937	8,671	9,712	10,877	12,182	13,400	14,740	16,214	17,836
2000 to 3000	4,760	7,616	9,901	12,376	13,861	15,524	17,387	19,126	21,039	23,143	25,457
3000 to 4000	6,660	10,656	13,853	17,316	19,394	21,721	24,328	26,761	29,437	32,380	35,618
4000 to 5000	8,560	13,696	17,805	22,256	24,927	27,918	31,268	34,395	37,834	41,618	45,780
5000 to 7500	11,885	19,016	24,721	30,901	34,609	38,762	43,414	47,755	52,531	57,784	63,562
7500 to 10000	16,635	26,616	34,601	43,251	48,441	54,254	60,765	66,841	73,525	80,878	88,965
10000 to 12000	20,910	33,456	43,493	54,366	60,890	68,197	76,380	84,018	92,420	101,662	111,828
12000 to 14161	24,863	39,781	51,715	64,644	72,401	81,089	90,820	99,902	109,892	120,881	132,969
Annual Percentage Change		**60%**	**30%**	**25%**	**12%**	**12%**	**12%**	**10%**	**10%**	**10%**	**10%**
Total Revenue		**1,249,797**	**1,624,736**	**2,030,920**	**2,274,630**	**2,547,586**	**2,853,296**	**3,138,625**	**3,452,488**	**3,797,737**	**4,177,510**

Appendix F
Detailed Stormwater Rate Calculations

Appendix F: Detailed Stormwater Rate Calculations

Table F-1
Municipality of North Middlesex
Capital Budget Forecast (uninflated $)

Description	Budget 2019	Total	Forecast									
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures												
STORMWATER COLLECTION MASTER PLAN	50,000	270,900	82,500	38,500	89,900	40,000	20,000	-	-	-	-	-
WESTWOOD ESTATES STORM POND	-	30,000	-	-	-	-	-	-	-	-	15,000	15,000
		-										
Total Capital Expenditures	**50,000**	**300,900**	**82,500**	**38,500**	**89,900**	**40,000**	**20,000**	**-**	**-**	**-**	**15,000**	**15,000**

Table F-2
Municipality of North Middlesex
Capital Budget Forecast (inflated $)

Description	Total	Forecast									
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital Expenditures											
STORMWATER COLLECTION MASTER PLAN	284,000	84,000	40,000	95,000	43,000	22,000	-	-	-	-	-
WESTWOOD ESTATES STORM POND	36,000	-	-	-	-	-	-	-	-	18,000	18,000
Total Capital Expenditures	**320,000**	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Capital Financing											
Provincial/Federal Grants	-										
Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Non-Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Growth Related Debenture Requirements	-	-	-	-	-	-	-	-	-	-	-
Operating Contributions	-	-	-	-	-	-	-	-	-	-	-
Lifecycle Reserve Fund	-	-	-	-	-	-	-	-	-	-	-
Stormwater Reserve	320,000	84,000	40,000	95,000	43,000	22,000	-	-	-	18,000	18,000
Total Capital Financing	**320,000**	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**

Table F-3
Municipality of North Middlesex
Stormwater Capital Reserve Continuity

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	-	-	-	-	-	-	-	-	-	-
Transfer from Operating	84,000	40,000	95,000	43,000	22,000	-	-	-	18,000	18,000
Transfer to Capital	84,000	40,000	95,000	43,000	22,000				18,000	18,000
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Interest	-	-	-	-	-	-	-	-	-	-

Table F-4
Municipality of North Middlesex
Stormwater Development Charge Reserve Fund Continuity

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	20,220	29,315	38,762	48,577	58,769	68,978	79,565	90,555	101,955	114,349
Development Charge Proceeds	8,520	8,687	8,863	9,039	8,857	9,027	9,214	9,401	10,152	10,350
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	**28,740**	**38,002**	**47,625**	**57,616**	**67,626**	**78,005**	**88,779**	**99,956**	**112,107**	**124,699**
Interest	575	760	952	1,152	1,353	1,560	1,776	1,999	2,242	2,494
Required from Development Charges	-	-	-	-	-	-	-	-	-	-

Table F-5
Municipality of North Middlesex
Stormwater Lifecycle Reserve Fund Continuity

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Opening Balance	-	-	54,901	65,970	142,744	256,242	409,669	583,094	778,822	981,051
Transfer from Operating	-	53,825	9,775	73,975	108,474	145,394	161,992	180,456	182,993	205,993
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Operating	-	-	-	-	-	-	-	-	-	-
Closing Balance	**-**	**53,825**	**64,676**	**139,945**	**251,218**	**401,636**	**571,661**	**763,551**	**961,815**	**1,187,044**
Interest	-	1,076	1,294	2,799	5,024	8,033	11,433	15,271	19,236	23,741

Table F-6
Municipality of North Middlesex
Stormwater Operating Forecast

Description	Forecast									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Expenditures										
Capital-Related										
Transfer to Capital	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Reserve	84,000	40,000	95,000	43,000	22,000				18,000	18,000
Transfer to Rate Stabilization Reserve	-	-	-	-	-	-	-	-	-	-
Sub Total Capital Related	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Total Expenditures	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Revenues										
Other Revenue		-	-	-	-	-	-	-	-	-
Contributions from Development Charges Reserve Fund	-	-	-	-	-	-	-	-	-	-
Contributions from Reserves / Reserve Funds	-	-	-	-	-	-	-	-	-	-
Contributions from Rate Stabilization Reserve	-	-	-	-	-	-	-	-	-	-
Total Operating Revenue	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Stormwater Billing Recovery - Operating	**84,000**	**40,000**	**95,000**	**43,000**	**22,000**	**-**	**-**	**-**	**18,000**	**18,000**
Lifecycle Reserve Contribution ($)	-	53,825	9,775	73,975	108,474	145,394	161,992	180,456	182,993	205,993
Stormwater Billing Recovery - Total	**84,000**	**93,825**	**104,775**	**116,975**	**130,474**	**145,394**	**161,992**	**180,456**	**200,993**	**223,993**

Table F-7
Municipality of North Middlesex
Stormwater Flat Rate Forecast

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Stormwater Billing Recovery	84,000	93,825	104,775	116,975	130,474	145,394	161,992	180,456	200,993	223,993
Total Number of Customers	1,230	1,249	1,268	1,287	1,305	1,322	1,339	1,356	1,373	1,391
Annual Flat Rate	**68.29**	**75.12**	**82.63**	**90.89**	**99.98**	**109.98**	**120.98**	**133.08**	**146.39**	**161.03**
Monthly Flat Rate	**5.69**	**6.26**	**6.89**	**7.57**	**8.33**	**9.17**	**10.08**	**11.09**	**12.20**	**13.42**
Annual Percentage Change		**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**	**10%**
Annual Dollar Change		**6.83**	**7.51**	**8.26**	**9.09**	**10.00**	**11.00**	**12.10**	**13.31**	**14.64**