WATER & WASTEWATER RATE STUDY

"Proud History - Progressive Future"

HEMSON Consulting Ltd.

May 2015

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**

I BACKGROUND AND STUDY OBJECTIVE **9**

A. BACKGROUND 9
B. STUDY OBJECTIVE 9

II ASSOCIATED LEGISLATION **13**

A. SUSTAINABLE WATER AND SEWAGE SYSTEMS ACT 13
B. SAFE DRINKING WATER ACT AND ONTARIO REGULATION 453/07 14
C. THE WATER OPPORTUNITIES ACT 15
D. MUNICIPAL ACT 16

III DEMAND ANALYSIS **17**

A. GROWTH FORECAST 17
B. METERED CONNECTIONS 17
C. WATER AND SEWERAGE CONSUMPTION FORECASTS 18

IV OPERATION AND MAINTENANCE COSTS **19**

A. OPERATING EXPENDITURES 19
B. NON-USER RATE REVENUES 20

V INFRASTRUCTURE AND CAPITAL **21**

A. WATER AND WASTE WATER INFRASTRUCTURE 21
B. USER RATE FUNDED CAPITAL EXPENDITURES 24
C. ASSET REHABILITATION AND REPLACEMENT 24

VI RATE STRUCTURES **27**

A. BACKGROUND 27
B. ISSUES TO CONSIDER 27
C. MOVING FORWARD 28

VII CALCULATED RATES **30**

A. CALCULATED WATER RATES 31
B. CALCUATED WASTEWATER RATES 32
C. IMPACT ON A TYPICAL USER 32

VII RECOMMENDATIONS AND FINDINGS **34**

APPENDIX A **35**

EXECUTIVE SUMMARY

A. BACKGROUND AND STUDY OBJECTIVE

In 2011, the Township of Ramara undertook a water and wastewater rate study to complement the municipal water meters installed in 2010. This study identified a new billing structure and recommended rate increases covering the period of 2011 to 2020. Since the completion of the 2011 study, there have been changes to the pattern of water consumption in the Township. Furthermore, the Township's water and wastewater system operating and capital costs have changed. In the fall of 2014, the Township deemed it necessary to review and update the water and wastewater rate study to ensure sufficient revenues were raised to fund the system.

The objective of this study was to review and recommend, as necessary, new water and wastewater rates that address the following:

- Water consumption and wastewater usage by different types of users;
- Total anticipated water and wastewater demand;
- Full recovery of system operating costs;
- Full recovery of capital infrastructure financing needs (net of DC recoveries and customer contributions); and
- Establishment of reserves to fund the rehabilitation and replacement of infrastructure.

The study was also to re-examine the structure of the rates to ensure an equitable and fair treatment of the various user types.

To undertake the analysis, a long term financial planning model covering a 10-year period from 2015 to 2024 was developed to assist the Township in evaluating the adequacy of its provisions for financing the periodic rehabilitation and eventual replacement of its water and wastewater infrastructure.

The analysis and the model are built on the concept of establishing full cost recovery rates consistent with Provincial legislation.

In undertaking this analysis, Hemson Consulting:

- Summarized the detailed inventory database for the existing water and wastewater systems using the Township's PSAB documents;

- Analyzed the Township's water usage patterns using actual meter readings from 2012 to 2014;

- Analyzed the Township's reserve funds and developed a reserve fund financial model to calculate the annual funding needed to meet the long term capital requirements for rehabilitation and replacement of the system;

- Calculated water and wastewater rates which fully recover the costs of providing water and wastewater services in the Township.

B. ASSOCIATED LEGISLATION

- The analysis gives consideration to the *Provincial Sustainable Water and Sewage System Act (SWSSA)*. The Act was repealed as of December 31st 2012, although, the *Water Opportunities Act* will implement the fundamental requirements of the *SWSSA*. Furthermore, in regards to full cost recovery, the analysis also considers the *Safe Drinking Water Act* and associated Ontario regulation *O.Reg 453/07*.

- The Township is given authority to impose user fees for water and wastewater services under Section 391 of the *Municipal Act*.

C. ANTICIPATED DEMAND

Future costs of the Township's water and wastewater system will largely be driven by demand placed on the system by water consumers.

- In 2015, it is anticipated that the Township will bill about 1,750 equivalent connections for water services. This number is expected to increase to 1,990 by 2024.

- Not all users connected to the municipal water system receive wastewater servicing through the Township, and as such, the number of wastewater customers is marginally lower at 1,382 equivalent connections. This number is expected to increase to 1,576 by 2024.

- Based on the historical water meter reading information obtained, the Township could bill approximately 195,000 cubic metres of water in 2015.

- For the purpose of this analysis, wastewater flows were assumed to be equivalent to water flows for the areas serviced by both water and wastewater.

D. OPERATION AND MAINTENANCE COSTS

1. Expenditures

The water and wastewater general operation and maintenance costs used in the analysis are based on the Township 2015 operating budget. The following provides a summary of these expenses.

- Water and wastewater operation and maintenance costs were established based on the Township's 2015 operating budget. Most expenditures were increased annually at a rate of 2 percent to account for inflation. Hydro and utility costs were increased at a rate of 5 percent per annum to reflect historical cost changes.

- The total operating expenditures for the water system in 2015 is $997,300. This figure is expected to increase to $1.24 million by 2024.

- The total operating expenditures for the wastewater system in 2015 is $915,300. This figure is expected to increase to $1.15 million by 2024.

- It should be noted, the debenture payments associated with eliminating the Township` s current deficit is included in these costs.

2. Non-user Rate Revenues

- Non-user rate revenues are budget items which decrease the net operating budget but are not recovered through water or wastewater user rates (i.e. connection charges and water tower fees).

- The Township is forecast to recover approximately $14,800 in 2015 through non-user rate revenues for both the water and wastewater system. Non-user rate revenues were increased annually at a rate of 2 percent to account for inflation.

E. INFRASTRUCTURE AND CAPITAL

1. Water and Wastewater Infrastructure

- The asset information contained in our analysis was gathered from the Township's existing database.

- The replacement value of the Township's total water and wastewater infrastructure inventory exceeds $60.0 million.

- The largest share of water infrastructure is attributed to the treatment plant valued at approximately $10.14 million.

- The largest share of infrastructure in the wastewater system is attributed to linear infrastructure valued at approximately $12.70 million.

2. User Rate Supported Capital

The Township spends capital monies annually for three main purposes, debenture payments for past infrastructure investments, expand or add infrastructure (largely growth-related) and to maintain existing infrastructure in a state of good repair.

- The Township will be responsible for funding the portion of growth-related capital that is not funded from development charges or development contributions (non-growth related portion). It is anticipated that approximately $6.02 million of capital related works will be funded through the utility rates over the next 10-years for both water and wastewater system.

- The Township anticipates funding a portion of future capital projects though debentures for both the water and wastewater system. The principal and interest payments on the debentures have been included in the analysis.

- Existing water and wastewater debts for capital works have also been included in the analysis.

3. Asset Rehabilitation and Replacement

Provisions for infrastructure replacement are calculated for each asset individually based on their remaining useful life. The aggregate of all individual provisions form the required annual contribution to a reserve fund.

- The analysis provides for a gradual phase-in to full funding.

- Over the 10-year period, the Township will contribute approximately $2.36 million to reserves for the eventual rehabilitation and replacement of water and wastewater assets.

F. RATE STRUCTURE

Current billing rates in the Township include a flat fixed charge per quarter plus a variable (i.e. volumetric) rate for each cubic metre of water consumed.

In consultation with Township staff, the current rate structure has been modified to differentiate the fixed fee based on the size of the water meter. The rate structure aims to ensure that the Township continues to generate sufficient funds on an annual basis to cover operating and capital expenditure.

The water and wastewater rates have been calculated to promote customer control and water conservation measures. As such, a fixed or minimum charge is calculated to recover 65% of the operating, capital, rehabilitation and replacement costs of the water system. A consumption based charge is then calculated to recover the remaining 35% of costs. This rate structure allows the customer to control the amount they would pay based on the amount of water consumed. For wastewater service, a similar rate structure is employed.

The Township of Ramara can fully recover all costs related to the water and wastewater system through the sale of water and wastewater.

G. CALCULATED RATES

1. Water

The required user rate revenue for the Ramara water system in 2015 is forecast to be $1.22 million. This is the amount of revenue which must be collected through the sale of water to fully recover the operating, capital, rehabilitation and replacement costs of the water system.

The calculated rates derived to recover these costs, are included in the table below:

Calculated Water Rates Township of Ramara		
	2015	
Meter Size	Fixed Fee (Quarterly)	Consumption Charge per m^3
Less than 1″	$99.73	$2.18
1″	$139.62	$2.18
2″	$289.22	$2.18

2. Wastewater

The required user rate revenue for the Ramara wastewater system in 2015 is forecast to be $977,600. This is the amount of revenue which must be collected through wastewater charges to fully recover the operating, capital, rehabilitation and replacement costs of the wastewater system.

The calculated rates derived to recover these costs, are included in the table below:

Calculated Wastewater Rates Township of Ramara		
	2015	
Meter Size	**Fixed Fee (Quarterly)**	**Consumption Charge per m^3**
Less than 1″	$112.97	$2.34
1″	$158.16	$2.34
2″	$327.62	$2.34

In addition to the water and wastewater fees calculated in this report, the Township levies additional fees to cover the cost of individual system deficits that existed prior to 2007. These additional levies are anticipated to end by 2017.

3. Impact on a Typical User

The following table represents the change in the annual water and wastewater bill on a sample of typical users in the Township.

Rate Impact on a Typical Residential User [1] Township of Ramara					
User Type	**Annual Consumption (in m^3)**	**2014 Annual Charge**	**2015 Calculated**		
			Annual Charge	**$ Change**	**% Change**
Household 1 ***(Less than 1" Meter"***	200	$1,596	$1,754	$158	10%
Household 2 ***(Less than 1" Meter)***	300	$2,014	$2,206	$192	10%
Non-residential ***(1" Meter)***	300	$2,014	$2,547	$533	26%

Note 1: This table does not include the additional fees levied on each system to cover the cost of individual system deficits that existed prior to 2007

H. RECOMMENDATIONS AND FINDINGS

Based upon the findings of the analysis, the following recommendations are put forth for consideration.

- Ensure that the rates fully fund all of the Township's anticipated annual costs including all operating costs and capital financing needs and the repayment of existing water and wastewater deficits.

- The Township continues to evaluate the timing of capital-related projects to align with development charges revenues and other funding sources as a means to mitigate the use of debenture financing.

- The Township continues to seek for operational efficiencies in an effort to reduce the utility rate funding requirement moving forward.

- The Township establishes rates which are fair and equitable to all users of the system, while ensuring a fiscally sustainable revenue stream to fully fund expenditures

- The Township closely monitors monthly consumption figures by connections and on a system-wide basis.

- The rates include a provision for the repair and ultimate replacement of water and wastewater infrastructure.

- Development charges received should be used to fund the portion of the growth-related works being supported through the utility rates in the interim.

- Any surplus revenue generated from the user rates should be transferred into a Water Stabilization Reserve Fund as means to offset any potential operating budget variances (i.e. unseasonable cool/wet summers, conservation initiatives, etc.). Surplus revenue can also be used to pay down the existing system deficits.

- The rates are competitive with surrounding municipalities.

I BACKGROUND AND STUDY OBJECTIVE

A. BACKGROUND

The Township of Ramara is located on the North East shore of Lake Simcoe in the County Simcoe. The Township has a current population of approximately 9,500 persons.

The Ramara water system has approximately 1,710 billable connections. The environmental services department consists of 7 water systems and 2 wastewater treatment systems.

In 2011, the Township of Ramara undertook a water and wastewater rate study to complement the municipal water meters installed in 2010. This study identified a new billing structure and recommended rate increases covering the period of 2011 to 2020. Since the completion of the 2011 study, there have been changes to the pattern of water consumption in the Township. Furthermore, the Township's water and wastewater system operating and capital costs have changed. In the fall of 2014, the Township deemed it necessary to review and update the water and wastewater rate study to ensure sufficient revenues were raised to fund the system.

B. STUDY OBJECTIVE

The objective of this study was to review and recommend, as necessary, new water and wastewater rates that address the full cost of providing services. As part of this process, a review of the existing structure was undertaken to ensure an equitable and fair treatment of the various user types was employed. The analysis and model are built on full cost recovery rates consistent with Provincial legislation.

The first step in a study of this nature is to establish a population and household forecast as this is the basis for determining anticipated water consumption and wastewater generation levels. The study period for this analysis examines the period from 2015 through 2024.

In keeping with the Township's full cost recovery policy and the requirements set forth in *Ontario Regulation 453/07* regarding the preparation of a water financial plan to ensure a financially viable water system, the Township's current water and

wastewater rates, reserves and annual operating and capital budgets are analyzed. Based on this analysis, the financial position of the Township's water and wastewater systems is determined. During this exercise, all non-growth related costs that require funding from the Township, is incorporated into the user rates analysis.

The next step in the study process is to develop a strategy for the Township to achieve full cost recovery for its water and wastewater. As part of this process, the existing rate structure was modified to provide greater equitability to the various user types while ensuring the Township generates sufficient revenues to cover annual costs.

The final step in the process is to evaluate the impacts of implementing the full cost recovery rates to the residents and businesses of the Township.

A financial model was developed to undertake the analysis. The model serves as a dynamic rate setting tool. Using the model, the Township is able to perform sensitivity analyses of water and wastewater rates, rate structure and also phase-in options. The model calculates future capital expenditure requirements and projects future operating and maintenance costs. It also calculates the water and wastewater rates necessary to recover the full costs of the Township's water and wastewater systems. The following process diagrams illustrate the overall approach.

Figure 1
Full Cost of Services Model

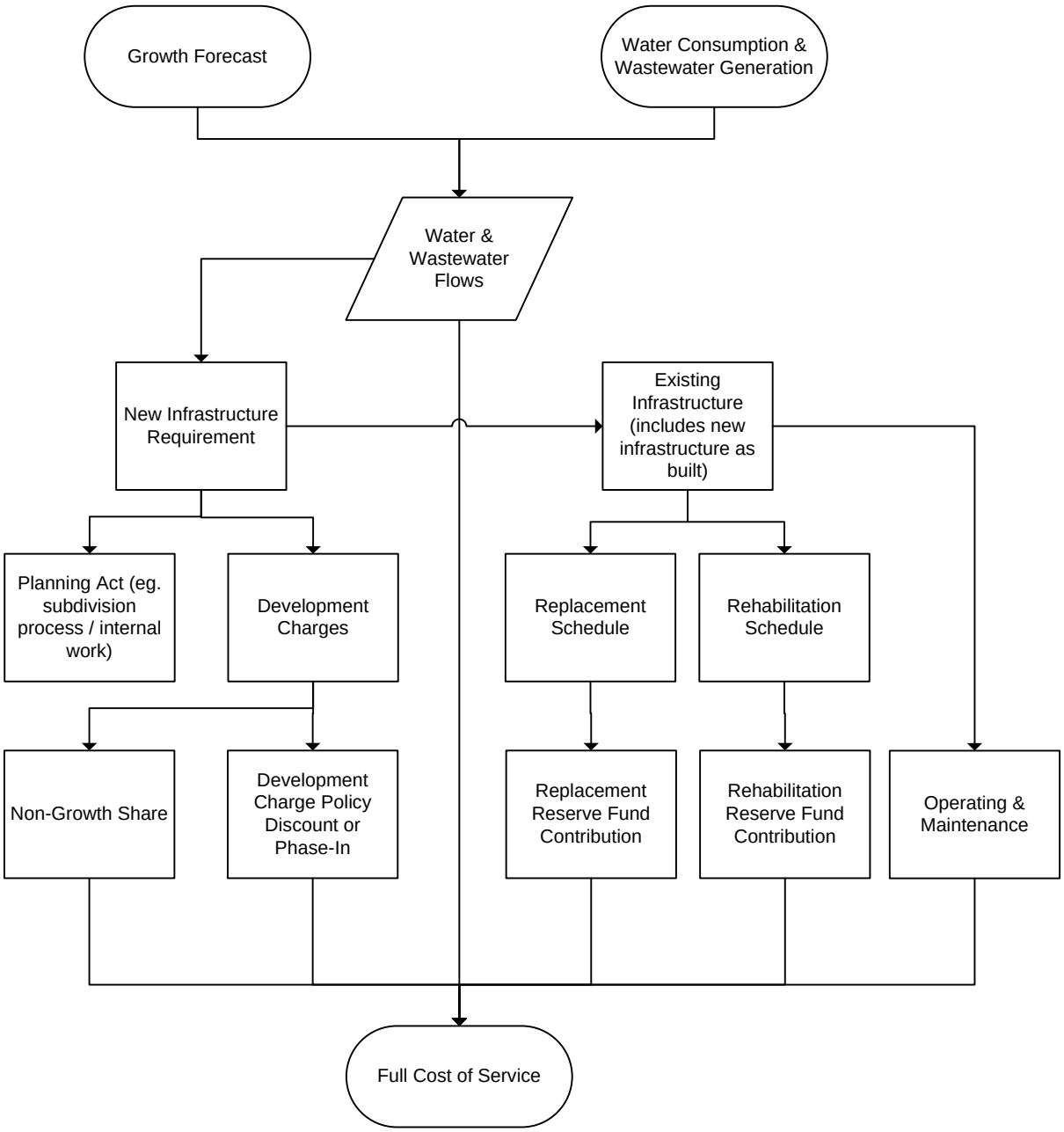
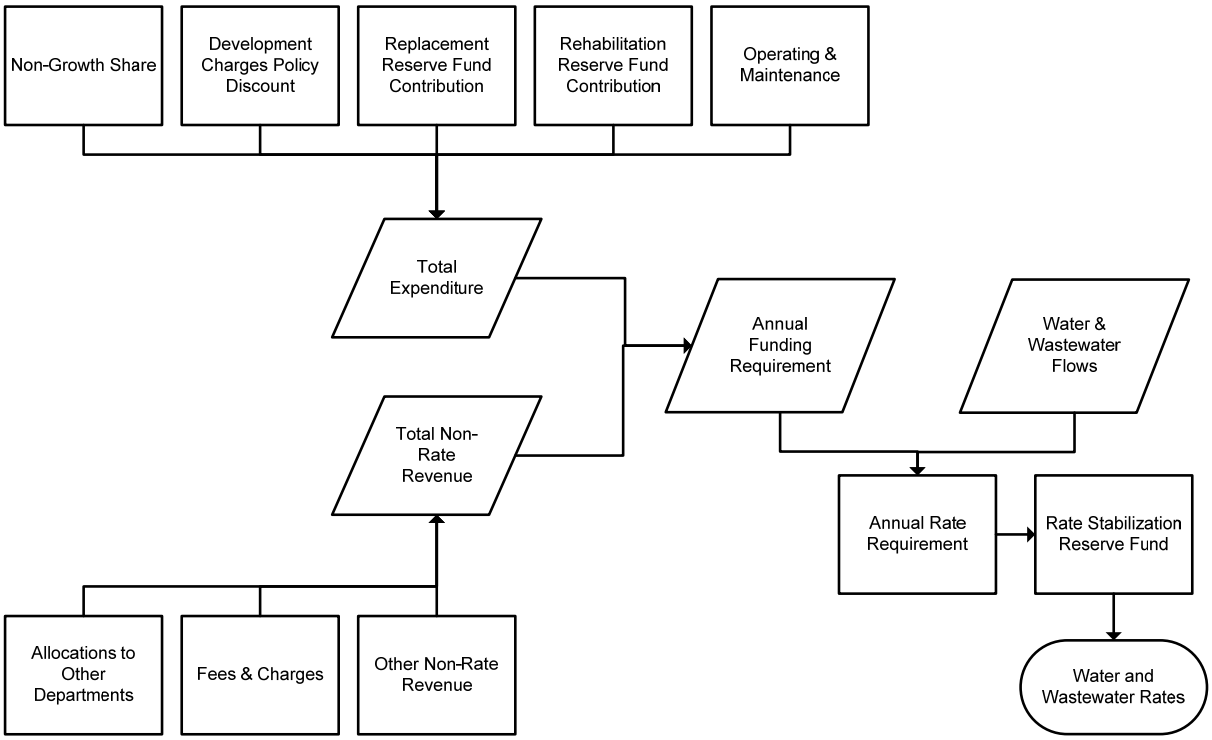


Figure 2
Cost Recovery Plan Model



II ASSOCIATED LEGISLATION

The municipal delivery of water and sanitary sewer services has undergone significant change in Ontario in recent years, triggered by the Walkerton tragedy in 2000, investigations into the cause of the tragedy, and subsequent legislative reforms. Among the reforms were the *Sustainable Water and Sewage Systems Act* (*SWSSA*) (repealed December 31st, 2012) and the *Safe Drinking Water Act* (*SDWA*) of 2002.

A. SUSTAINABLE WATER AND SEWAGE SYSTEMS ACT

The analysis gives consideration to the Provincial *Sustainable Water and Sewage System Act*, which although repealed, brief details of its intent provide a context and understanding of subsequent legislation cited further in the Report. The *Act* would have required municipalities to implement full cost pricing and preparation of two reports: first, a Full Cost of Services Report, and secondly; a Cost Recovery Plan.

The Full Cost of Services Report provides an inventory and asset management plan, ensuring the integrity of the water and wastewater infrastructure. The full cost of services includes:

> *"the source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs"– Sustainable Water and Sewer Systems Act, 2002, S.O. 2002, c.29, s.3 (7)*

The Report addresses the full cost of providing water and wastewater services, including provisions for the periodic rehabilitation and eventual replacement of the water and wastewater infrastructure.

The *Act* would have also required municipalities to develop a Cost Recovery Plan. The Cost Recovery Plan consists of a revenue plan, identifying the revenue requirements to finance the system. The plan includes the development of water and wastewater rates which will fund the expansion, upgrading, rehabilitation, replacement, operation and maintenance of the water and wastewater systems. Financing, administrative and all other relevant costs related to providing the services are also included. This Plan will be the basis of a strategy to ensure water and wastewater services are fully funded.

B. SAFE DRINKING WATER ACT AND ONTARIO REGULATION 453/07

Following the key recommendations outlined in part two of the Walkerton Inquiry Report, the *Safe Drinking Water Act* was passed in December, 2002. One of the main requirements of the *SDWA* is the mandatory licensing of municipal water providers. A municipal drinking water licence to the owner of a municipal drinking water system would be issued if these five requirements are satisfied:

1. a drinking water works permit has been issued for the system;
2. the operational plans for the system satisfy the requirements in the Director's directions;
3. the system will be operated by an accredited operating authority;
4. the financial plans for the system, if required, satisfy the requirements under this *Act*;
5. a permit to take water has been issued under the *Ontario Water Resources Act*

In 2007, the Ministry of the Environment (MOE) passed *Ontario Regulation 453/07*. This regulation requires all owners of municipal residential drinking water systems to report on the systems' financial information for a period of at least six years. The financial plan is intended to be one of the key requirements for obtaining a municipal drinking water licence as described above. The plan must include detailed schedules that set out the systems Statement of Operations, Statement of Financial Position and Statement of Cash Flow for each year the financial plan applies.

As the regulation is under the *SDWA*, the preparation of the plan is mandatory for water and encouraged for wastewater. The financial plans must be approved by Council Resolution (or governing body) indicating that the drinking water system is "financially viable". In general, the financial principles of the regulations follow the intent of the *SWSSA* to move municipalities towards financial sustainability.

The Township has met this requirement through the 2011 Water Financial Plan submitted to the MOE as one of the requirements for obtaining a municipal drinking water licence. The plan was prepared consistent with the requirements of *the Safe Drinking Water Act* and its associated regulation (*O. Reg 453/07*).

C. THE WATER OPPORTUNITIES ACT

Bill 72, Water Opportunities and Water Conservation Act 2010 an *Act* to enact the *Water Opportunities Act* received Royal Assent on November 29, 2010.

The *Water Opportunities Act* is designed to help strengthen Ontario's leadership in water protection and move Ontario municipalities forward, towards achieving water sustainability. The Act was created to deliver three outcomes:

- make Ontario the North American leader in the development and sale of water conservation and treatment technologies;
- encourage sustainable infrastructure and conservation planning using made-in-Ontario technologies to solve water, wastewater, and stormwater infrastructure challenges; and
- encourage all Ontarians to use water more wisely.

The *Act* also requires a more detailed review of the water financial plan in addition to a full plan for wastewater and stormwater services. Prescribed entities will prepare a municipal sustainability plan which will include:

- an asset management plan;
- a financial plan;
- a water conservation plan;
- strategies for maintaining and improving the service, including technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario's water resources; and
- a risk assessment.

As noted above, a Sustainable Financial Plan for Water Systems has been approved by Council and submitted to the MOE in compliance with the *Safe Water Drinking Act, 2002* and associated regulation *(O.Reg. 453/07)*. Additional sustainability plans for wastewater and stormwater services as well as a more detailed review of the water financial plan can be prepared once regulations are in place.

Although the notion of "full cost recovery" is not currently mandated by Provincial legislation, the recent regulation (*O.reg 453/07*) put forth under the *SDWA* direct

Council to ensure the water systems are financially viable and sustainable. As noted earlier, it is expected that the provisions of the *Water Opportunities Act* will employ the primary requirements of the *SWSSA* once all regulations are implemented. Therefore, it is fiscally responsible that municipalities work toward recovering the full cost of providing water and wastewater services.

D. MUNICIPAL ACT

The Township is given authority to impose user fees for water and wastewater services under Section 391 of the *Municipal Act*. The accompanying regulation, *Ontario Regulation 584/06* sets out the conditions by which a municipality must administer the fees. When developing water and wastewater rates, the requirements outlined in *Ontario Regulation 584/06* must be adhered to.

III DEMAND ANALYSIS

Future costs of the Township's water and wastewater system will largely be driven by demands placed on the system by water consumers. A forecast of future consumption demands must therefore be developed.

A. GROWTH FORECAST

The population growth forecast used in this study was based on the Township's most recent Development Charge Background Study completed in 2015. The Township's current census population of 9,500 persons is expected to increase to about 10,900 persons by 2024.

B. METERED CONNECTIONS

At year-end 2014, the Township had approximately 1,713 billable connections that receive water services, which represents about 1,740 equivalent connections (Table 1). The calculation of the utility rates is based on equivalent connections; in 2015, it is anticipated that the Township will bill about 1,750 equivalent connections for water services. This number is expected to increase to 1,990 by 2024.

Table 1

Equivalent Water Connection: Year-end 2014

Township of Ramara

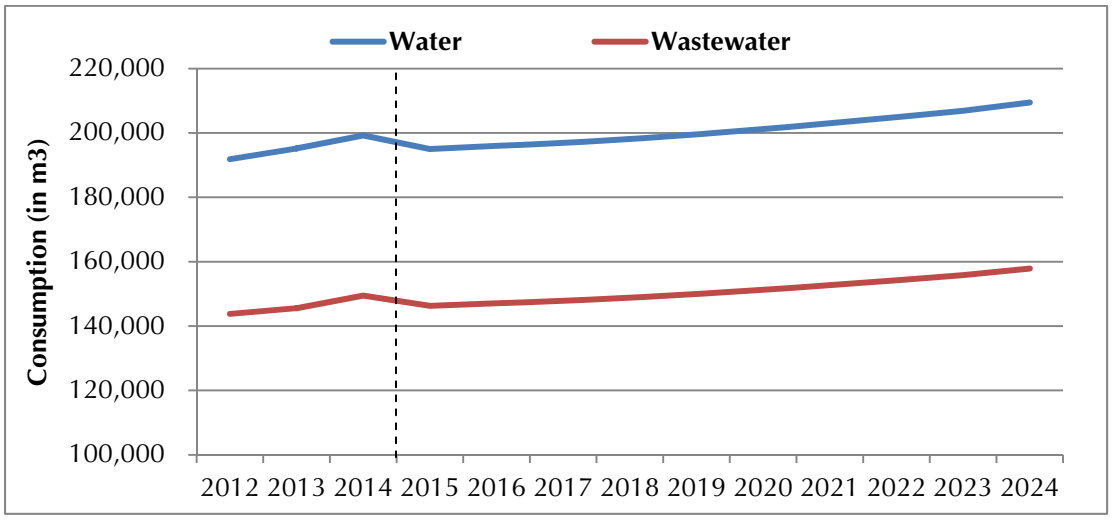
Meter Size	Total Billable Connections[1]	Equivalency Factor	Total Equivalent Connections
Less than 1″	1,687	1.0	1,687
1″	15	1.4	21
1.5″	0	1.8	0
2″	11	2.9	32
Total	**1,713**		**1,740**

Note 1 Includes multi-unit (or non-residential) properties where one connection services a number of units.
Note 2: Equivalency factors based on similar structures in Ontario and the AWWA

Not all users connected to the municipal water system receive wastewater servicing through the Township, and as such, the number of wastewater customers is marginally lower at 1,382 equivalent connections (in 2015). This number is expected to increase to 1,576 by 2024.

C. WATER AND SEWERAGE CONSUMPTION FORECASTS

The 2015 and long-term water demand forecast was developed using the actual 2012 to 2014 metered consumption data provided. Generally, water consumption is anticipated to increase at a moderate rate throughout the 10-year planning period to reflect a decline in the average water consumption per connection representing current conservation practice and a declining household population. Unlike water consumption, wastewater flows are not metered. For the purposes of this analysis, wastewater flows were assumed to be equivalent to water flows for the serviced connections. This assumption allows for an equitable distribution of the wastewater system costs to users. The figure below illustrates the forecast of metered[1] water throughout the planning period to 2024. In 2015, the Township is anticipated to bill approximately 195,000 m^3 of water.



Details regarding the connections and forecast of consumption for the water and wastewater systems are set out in the detailed rate calculations illustrated in Appendix A.

[1] *For the purpose of setting a utility rate, only the water that is billed to the end-user is incorporated into the analysis and used to calculate new utility rates. This is referred to as billable (or metered) water.*

IV OPERATION AND MAINTENANCE COSTS

The total revenue the Township needs to collect through user rates is calculated by netting off the non-user rate revenues from total expenditures.

A. OPERATING EXPENDITURES

Using the Township's 2015 operating budgets, most expenditure were increased annually at a rate of 2 percent to account for inflation. Hydro and utility costs were increased at a rate of 5 per cent per annum to reflect historical trends. The Township does not anticipate any new costs related to the systems operations and maintenance, therefore, only annual inflation adjustments were made to the operating expenditures throughout the planning period. As of year-end 2014, the Township had accumulated a deficit of about $1.42 million for both the water and wastewater system. This analysis includes the repayment of the Townships existing deficit on each the water and wastewater system, the deficit is anticipated to be paid off by the end of the planning period, in 2024.

The total operating expenditures for the water system in 2015 is projected to be $997,300. The projected operating costs are expected to increase to $1.24 million by 2024.

The total operating expenditures for the wastewater system in 2015 is projected to be $915,300. The projected operating costs are expected to increase to $1.15 million by 2024.

Table 2
Anticipated Operating & Maintenance Costs

	Budget	Projected Costs	
	2015	2019	2024
Water	$ 997,266	$ 1,095,684	$1,237,512
Wastewater	$ 915,295	$ 1,010,014	$1,148,551

B. NON-USER RATE REVENUES

Non-user rate revenues are budget items which decrease the net operating budget but which are not recovered through water or wastewater user rates. Examples of non-user rate revenues are frontage and connection charges, water tower fees and other minor revenues. For the purposes of this study, a 2 percent inflation rate is also applied to non-user rate revenues annually.

The Ramara water and wastewater system is forecast to recover approximately $14,800 in 2015 through non-user rate revenues such as connection charges, frontage fees and other various sources of non-user rate revenues.

Detailed operating expenditures and non-user rate revenues for the water and wastewater systems are set out in the detailed rate calculations illustrated in Appendix A.

V INFRASTRUCTURE AND CAPITAL

A. WATER AND WASTE WATER INFRASTRUCTURE

The information contained in the analysis was gathered from the Township's existing database. The information is used not only to describe, but also define the quantity, age and replacement value of the existing infrastructure. The inventory was grouped into seventeen main asset categories, nine of which relate to water servicing and the remaining eight to wastewater servicing.

Table 3
Water & Wastewater Asset Categories

Water	Wastewater
Watermains	Sewer mains
Buildings	Buildings
Hydrants	Manhole
Service Connections	Service Connections
Valves	Forcemains
Sample Stations	Pumping Stations
Water Wells	WW Treatment Plant
Treatment Plant	WW Treatment Plant and Equipment
Water Meters	

The Ramara system has a replacement value of about $60.60 million. Both the water and wastewater system are relatively young as nearly 70% of infrastructure has a remaining useful life of 10 years or more.

The largest share of water infrastructure by replacement value is attributed to treatment plants, which is valued at approximately $10.14 million, and accounts for over 40% of the infrastructure related to Ramara's water systems.

Over 60% of the Township's water infrastructure has a remaining useful life of 10 years or more. Although the life-cycles of the infrastructure have considerably long lives, approximately 15.7% of the water infrastructure is overdue, by virtue of its design life, and is required to be replaced.

Table 4
Ramara Water System Assets
Value by Asset Category

Asset Category	Value ($000)	Share
Water Buildings	$1.80	7.5%
Watermains	$6.88	28.5%
Hydrants	$0.68	2.8%
Service Connections	$3.18	13.2%
Valves, Blow-Offs	$0.28	1.1%
Sample Stations	$.05	0.2%
Water Wells	$0.39	1.6%
Treatment Plant	$10.14	42.0%
Water Meters	$0.77	3.2%
TOTAL	**$24.18**	

Table 5
Ramara Water System Assets
Remaining Life

Category Description	Total Value ($000)	% of Total
0 Years, Overdue	$3.80	15.7%
0 to 9 years	$4.72	19.5%
10 to 19 years	$6.81	28.2%
20 to 29 years	$7.54	31.2%
30 to 39 years	$0.49	2.0%
40 to 49 years	$0.42	1.7%
50 years or more	$0.40	1.6%

The largest share of wastewater infrastructure by replacement value is attributed to linear infrastructure, which is valued at $12.70 million.

Approximately 70% of the Township's wastewater infrastructure has a remaining useful life of over 10 years in age. Although, approximately, 15.8% of wastewater infrastructure is overdue, by virtue of its design life, and is due to be replaced.

Table 6
Ramara Wastewater System Assets
Value by Asset Category

Asset Category	Value ($000)	Share
Buildings	$0.87	2.4%
Sewermains	$12.70	34.9%
Service Connections	$2.74	7.5%
Manhole	$1.28	3.5%
Forecemain	$3.27	9.0%
Pumping Stations	$3.02	8.3%
WW Treatment Plant	$6.51	17.9%
Machinery and Equipment	$6.04	16.6%
TOTAL	**$36.42**	

Table 7
Ramara Wastewater System Assets
Remaining Life

Category Description	Total Value ($000)	% of Total
0 Years, Overdue	$5.75	15.8%
0 to 9 years	$5.43	14.9%
10 to 19 years	$8.02	22.0%
20 to 29 years	$3.28	9.0%
30 to 39 years	$6.85	18.8%
40 to 49 years	$5.71	15.7%
50 years or more	$1.38	3.8%

B. USER RATE FUNDED CAPITAL EXPENDITURES

Over the next 10 year period, additional infrastructure will be required to support growth within the Township. Infrastructure related to growth will receive funding through development charge revenues and other developer contributions.

A development charge policy discount would result in a revenue shortfall and therefore any policy discount would need to be recovered through the user rates. Capital improvements and financing costs related to non-growth related infrastructure are also the responsibility of the Township. These costs will need to be funded through user rates.

The utility rate funded capital expenditures, which the Township will be responsible for funding, is summarized in the table below. It should be noted that debenture financing would be required to undertake the capital works as identified by the Township, which exceeds $11.0 million. The table below represents the capital related costs net of debenture financing received to undertake the program, but includes the principal and interest components of the repayment schedule. Overall, approximately $6.02 million is anticipated to be funded through the utility rates for capital related expenditures.

Table 8
10-year User Rate Supported Capital Expenditures

	User Rate Supported
Water	$2.67 million
Wastewater	$ 3.35 million

C. ASSET REHABILITATION AND REPLACEMENT

In addition to annual operating and maintenance costs, the water and wastewater infrastructure will require periodic rehabilitation and eventually need to be replaced. Capital expenditures to carry out the rehabilitation and replacement of the aging infrastructure are not growth related and therefore would not receive funding through development charge revenues or other developer contributions. When the assets require rehabilitation or are due for replacement, the source of funds are

essentially limited to reserves or contributions from operating. In maintaining a user-pay approach, it is important for the Township to build sufficient reserves for the scheduled replacement of infrastructure through contributions from operating.

1. Provisions for Infrastructure Rehabilitation and Replacement

The rehabilitation and replacement schedules were created using the tangible capital asset data provided by the Township. Provisions for infrastructure replacement are initially calculated for each asset based on their remaining useful life and the anticipated cost of replacement. The aggregate of all individual provisions form the required annual contribution to a reserve fund. A full cost approach is employed to calculate the annual reserve fund contributions. This approach is recognized as a fair approach to charging customers for the use of these assets. As current assets are used by customers, provisions are made for the eventual replacement of these assets. Essentially, customers are paying for the assets they are using. In calculating the annual provisions, a number of assumptions are made to account for inflation, interest and the Township's policies and practices. A 2 percent inflation rate and a 3.5 percent investment rate are assumed throughout this analysis.

The combined total of all the individual annual provisions for water and assets is the contribution requirement the Township must make to the water infrastructure reserve funds each year. The same concept applies to wastewater assets and the wastewater infrastructure replacement reserve fund. This ensures adequate funds are available for asset replacements as scheduled. The total annual contribution decreases as infrastructure is replaced because the number of payments is reset to the number of years between required replacements for that particular asset's lifecycle. These changes result in fluctuations to the annual contributions and ultimately the user rates. Implementing the decreasing contribution amounts would also require a large increase in the user rates in the first year.

To mitigate an impractical increase of the user rates, reserve fund contributions are phased in gradually over the analysis. By the end of the planning period, 2024, the Township will be making a more significant annual contribution to the reserves providing for a funding source for future infrastructure repair and replacement.

Table 9
Reserve Contributions

	2016 Contribution	2024 Contribution
Water	$90,552	$480,615
Wastewater	$0	$116,168

Note: Contributions to reserves for the wastewater system begin in 2017

By the end of the planning period, the reserve fund balances calculated using the stabilized method leaves the Township in a position to move forward. Table 10 illustrates the calculated reserve balance at the end of the 10-year period.

Table 10
Calculated Reserve Balance at End of Period

Water	$ 1,901,176
Wastewater	$ 457,300

VI RATE STRUCTURES

Various water and wastewater rate structures are in place across Ontario municipalities. The varying rate structures include flat rates, constant rates, humpback block rates, declining block rates and inclining block rates. Rate structures may also include fixed or minimum charges. The implementation of a particular rate structure depends on a number of factors including administrative and financial factors.

A. BACKGROUND

The Township currently has in place a fixed fee charge per connection (or billable unit in some cases), in addition to a consumption based charge which is applied to each cubic meter of water used. Additionally, the Township employs a vacant land water fee levied per quarter. Wastewater in Ramara is billed in a similar form to the water rates.

B. ISSUES TO CONSIDER

Various rate structures were evaluated as part of the study and key objectives were targeted in evaluating a rate structure and calculating rates.

1. Cost Recovery

In determining water and wastewater rates, the full costs of providing services are recovered. The costs are to include, operation and maintenance, periodic rehabilitation and non-growth related capital costs, including the cost of long-term sustainability of infrastructure through reserve fund contributions.

2. Equity

A 'user-pay' approach was used in selecting a rate structure and calculating water and wastewater rates. An entirely equitable approach is considerably more difficult to apply when not all connections are metered and also when water and wastewater systems vary greatly in age, value and size.

3. Conservation

Considering the direction of environmental awareness, it is important in determining a rate structure, if and when practical to do so, that measures which promote conservation be taken into account. It is also important to recognize that not all users have the ability to change their levels of consumption and as such, should not be penalized.

4. Administration

An important part of a rate structure is transparency to both the users and service provider. Also, easing administrative requirements may reduce the overall administrative cost, which would ultimately provide for a reduction of rates.

5. Economic Development

While recognizing the importance of the above objectives, it is also important to maintain the Township's attractiveness to industry's which may rely heavily on water and or wastewater service to conduct business. A rate structure must allow the Township to continue to be competitive from an economic development perspective.

C. MOVING FORWARD

In consultation with Township staff, the current rate structure has been modified to differentiate the fixed fee based on the size of the water meter. The rate structure aims to ensure that the Township continues to generate sufficient funds on an annual basis to cover operating and capital expenditures.

The fixed charge is calculated to be differentiated by meter size, as opposed to the current methodology of all connections levied a uniform rate. Differentiating the rate by meter size equitably distributes customer related costs among the various customer classes by recognizing factors that are generally responsible for the costs being incurred.

The water and wastewater rates have been calculated to promote customer control and water conservation measures. As such, a fixed or minimum charge is calculated to recover 65% of the operating, capital, rehabilitation and replacement costs of the water and wastewater systems. A consumption based charge is then calculated to recover the remaining 35% of costs. A rate structure which allows the customer to control the amount they would pay based on the amount of water consumed. It is

anticipated the Township continue to charge vacant land a water fee which would be equal to the fixed charge (less than 1" meter size).

In addition to the water and wastewater fees calculated in this report, the Township levies additional fees to cover the cost of individual system deficits that existed prior to 2007. These additional fees are expected to continue until 2017, at this point, all systems will be levied the same fee for water and wastewater service.

The water and wastewater rate structure proposed is shown in the table below.

Table 11

Proposed Rate Structure

Township of Ramara

All Accounts	Cost Recovery	Charge	Basis of Fee
Fixed Fee	65% of all costs	$ per quarter	Fee levied regardless of the amount of water consumed Fixed Fee differentiated by Meter Size
Volumetric Rate: *Constant Rate Structure*	35% of all costs	$ per cubic metre	Fee levied on the amount of water consumed

VII CALCULATED RATES

In calculating the water and wastewater rates, a number of assumptions were applied. The water and wastewater rates are calculated to fully recover the cost of operating the system and identified in year capital needs. Furthermore, the rates begin to provide for contributions to asset replacement reserves. It is important to note that the repayment of the Township's existing deficit is included in the analysis, and the deficit is to be recovered through the user rates over the planning period.

The Table below provides a summary of the 2015 rate funding requirement for each the water and wastewater system. The net rate funding need represents the amount of money that must be funded through the utility rates.

Table 12
Calculation of the 2015 Net Rate Funding Requirement

Ref #	Categories	Water	Wastewater
1	General Operating and Maintenance (including repayment of accumulated deficit)	$997,266	$915,295
2	Non-Growth Capital and Debenture Requirements[1]	$233,875	$63,350
3	Contribution to reserve for future repair and replacement of infrastructure [2]	$0	$0
4	*Less: Non-metered Rate Revenue*	*$13,808*	*$1,000*
	Total Net Rate Funding Need = (1+2+3-4)	**$1,217,333**	**$977,645**

Note 1: This represents the capital expenditures after any debenture financing received. The principal and interest related to any debentures received is incorporated into the analysis.
Note 2: Contributions to reserves are anticipated to commence in 2016 for water and 2017 for wastewater.

An immediate implementation of a rate that fully funded the calculated asset rehabilitation and replacement contributions would result in significant impacts to all users in the Township. The analysis is based on providing for a gradual movement towards full rates. These contributions, when combined with the Township's

ongoing capital works, will demonstrate a significant movement to long-term full cost recovery rates.

The fixed quarterly rate is set to fund 65% of the net expenditure needs. The consumption rates fund the balance, 35%, of the net expenditure needs. This relationship is maintained throughout the planning period.

Existing Deficits – In addition to the water and wastewater fees proposed in this report, the Township levies additional fees to cover the cost of individual system deficits that existed prior to 2007.

Vacant Lots – It is anticipated the Township continue to charge vacant land a water fee which would be equal to the fixed charge (less than 1" meter size).

A. CALCULATED WATER RATES

The required user rate revenue for the Ramara water system in 2015 is forecast to be $1.22 million. This is the amount of revenue which must be collected through the sale of water to fully recover the operating, capital, rehabilitation and replacement costs of the water system.

Table 13
Calculated Water Rates
Township of Ramara

	2015	
Meter Size	**Fixed Fee (Quarterly)**	**Consumption Charge per m3**
Less than 1"	$99.73	$2.18
1"	$139.62	$2.18
2"	$289.22	$2.18

The detailed calculations of the water rates are outlined in Appendix A.

B. CALCUATED WASTEWATER RATES

The required user rate revenue for the Ramara wastewater system in 2015 is forecast to be about $977,600. This is the amount of revenue which must be collected through wastewater charges to fully recover the operating, capital, rehabilitation and replacement costs of the wastewater system.

Detailed calculations of the wastewater rates are outlined in Appendix A.

Table 14
Calculated Wastewater Rates
Township of Ramara

	2015	
Meter Size	**Fixed Fee (Quarterly)**	**Consumption Charge per m3**
Less than 1″	$112.97	$2.34
1″	$158.16	$2.34
2″	$327.62	$2.34

C. IMPACT ON A TYPICAL USER

Table 15 presents a comparison of the newly calculated water and wastewater rates with the rates in force for 2014. The following tables illustrate the sensitivity of the total calculated fees for water and wastewater based upon different household consumption patterns.

Overall, the water and wastewater rates are increasing in Ramara. The level of increase is different among each consumer and customer class as a portion of the rates are reliant on water use and reflective of the size of the meter.

Table 15

Rate Impact on a Typical Residential User [1]
Township of Ramara

User Type	Annual Consumption (in m^3)	2014 Annual Charge	2015 Calculated		
			Annual Charge	$ Change	% Change
Household 1 *(Less than 1 Meter")*	200	$1,596	$1,754	$158	10%
Household 2 *(Less than 1" Meter)*	300	$2,014	$2,206	$192	10%
Non-residential *(1" Meter)*	300	$2,014	$2,547	$533	26%

Note 1: This table does not include the additional fees levied on each system to cover the cost of individual system deficits that existed prior to 2007.

VII RECOMMENDATIONS AND FINDINGS

The calculated rates presented establish water and wastewater rates to all users of the system which are fair and equitable. The analysis considers the direction of environmental awareness; as a result, a rate structure which promotes customer control and water conservation measures has been taken into account.

The analysis included in this report ensures that the water and wastewater rates fully fund all of the Township's anticipated annual costs including all operating costs and capital financing needs and debt repayment requirements. It is fiscally prudent that the Township include a provision for the eventual repair and ultimate replacement of water and wastewater infrastructure. An immediate implementation of a rate that fully funded the calculated asset rehabilitation and replacement contributions would result in significant impacts to all users in the Township. The analysis demonstrates an increasing annual contribution to reserves for asset rehabilitation and replacement. These contributions, when combined with the Township ongoing capital works, will demonstrate a significant movement towards long-term full cost recovery rates.

In addition to establishing a reserve for the future capital asset repair and replacement of infrastructure, the Township should create a Water Stabilization Reserve to minimize fluctuations on the user rates and to manage cash flow. Any surplus revenue generated from the user rates should be transferred into the water stabilization reserve fund in an effort to offset future unforeseen expenditure requirements, revenue shortfalls (i.e. unseasonable cool and/or wet summers, economic recession, etc.). This surplus revenue can also be used to pay down the existing system deficits.

The results of this study are in part, Hemson and Township staff best estimates of what could transpire in the short-to-medium tern using the data available. It is especially important that the Township continue to monitor all consumption data on a monthly basis to identify usage trends and variance in the projections to ensure costs and revenues are managed accordingly. To that end, the Township should continue to evaluate the timing of capital-related projects to align with development charges revenues and other funding sources as a means to mitigate the use of debenture financing where possible.

APPENDIX A

DETAILED CALCULATIONS

TOWNSHIP OF RAMARA
2015 WATER & SEWER RATE STUDY
WATER AND SEWER RATE CALCULATIONS - SUMMARY
WATER SERVICES

Water Services	**2015 Budget**	**2016 Projected**	**2017 Projected**	**2018 Projected**	**2019 Projected**	**2020 Projected**	**2021 Projected**	**2022 Projected**	**2023 Projected**	**2024 Projected**
Expenditures										
Operating										
Annual Gross Operating Expenditures	$ 907,700	$ 931,173	$ 955,381	$ 980,353	$ 1,006,118	$ 1,032,705	$ 1,060,148	$ 1,088,479	$ 1,117,733	$ 1,147,946
Current Outstanding Debt	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777	$ 16,777
Deficit recovery (accumulated as of Yr-end 2014)	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789	$ 72,789
Subtotal Annual Gross Operating Expenditures	*$ 997,266*	*$ 1,020,739*	*$ 1,044,947*	*$ 1,069,919*	*$ 1,095,684*	*$ 1,122,271*	*$ 1,149,714*	*$ 1,178,045*	*$ 1,207,299*	*$ 1,237,512*
Capital										
Net In-Year Capital Related Expenditures	$ 599,050	$ 176,738	$ 344,295	$ 252,410	$ 226,448	$ 380,418	$ 174,219	$ 228,854	$ 235,772	$ 192,186
Debenture Financing (received for capital works)	$ (365,175)	$ -	$ (63,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Debenture Payments (New Debt for Capital)	$ -	$ 28,165	$ 28,165	$ 33,024	$ 33,024	$ 33,024	$ 33,024	$ 33,024	$ 33,024	$ 33,024
Sub-total Capital	***$ 233,875***	***$ 204,903***	***$ 309,460***	***$ 285,434***	***$ 259,472***	***$ 413,442***	***$ 207,243***	***$ 261,878***	***$ 268,796***	***$ 225,210***
Asset Replacement Reserve Contribution										
Calculated Annual Contribution	$ 2,229,010	$ 2,227,063	$ 2,187,281	$ 2,134,684	$ 1,493,548	$ 1,490,577	$ 1,360,111	$ 1,361,072	$ 1,352,473	$ 1,350,386
Contribution Smoothing - %	0%	4%	1%	4%	11%	4%	23%	23%	27%	36%
Contribution Smoothing - $	$ (2,229,010)	$ (2,136,541)	$ (2,156,927)	$ (2,040,871)	$ (1,336,161)	$ (1,437,798)	$ (1,046,163)	$ (1,047,746)	$ (984,040)	$ (869,771)
Sub-total Asset Replacement Contribution	***$ -***	***$ 90,522***	***$ 30,355***	***$ 93,813***	***$ 157,387***	***$ 52,779***	***$ 313,947***	***$ 313,326***	***$ 368,433***	***$ 480,615***
Total Capital Expenditures	**$ 233,875**	**$ 295,425**	**$ 339,815**	**$ 379,247**	**$ 416,859**	**$ 466,221**	**$ 521,191**	**$ 575,204**	**$ 637,229**	**$ 705,826**
Total Annual Expenditures	***$ 1,231,141***	***$ 1,316,164***	***$ 1,384,762***	***$ 1,449,167***	***$ 1,512,543***	***$ 1,588,493***	***$ 1,670,905***	***$ 1,753,249***	***$ 1,844,528***	***$ 1,943,338***
Revenues										
Grant Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Non-User Rate Revenues	$ (13,808)	$ (13,990)	$ (14,175)	$ (14,364)	$ (9,843)	$ (10,040)	$ (10,240)	$ (10,445)	$ (10,654)	$ (10,867)
Total Non-User Rate Revenues	***$ (13,808)***	***$ (13,990)***	***$ (14,175)***	***$ (14,364)***	***$ (9,843)***	***$ (10,040)***	***$ (10,240)***	***$ (10,445)***	***$ (10,654)***	***$ (10,867)***
Net Rate Funding Need	**$ 1,217,333**	**$ 1,302,174**	**$ 1,370,587**	**$ 1,434,802**	**$ 1,502,700**	**$ 1,578,453**	**$ 1,660,665**	**$ 1,742,804**	**$ 1,833,874**	**$ 1,932,471**

TOWNSHIP OF RAMARA
2015 WATER & SEWER RATE STUDY
WATER AND SEWER RATE CALCULATIONS - SUMMARY
WATER SERVICES

User Rates	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Fixed Quarterly										
Quarterly Fixed Fee per Equivalent Unit	$99.73	$107.04	$112.88	$117.76	$122.22	$127.11	$132.35	$137.35	$142.79	$148.20
Number of Equivalent Metered Connections	*1,749*	*1,758*	*1,771*	*1,781*	*1,808*	*1,838*	*1,870*	*1,905*	*1,942*	*1,990*
Number of Vacant Lots	*207*	*205*	*202*	*199*	*190*	*180*	*169*	*157*	*145*	*129*
Total Annual Fixed Revenue	**$ 780,315**	**$ 840,462**	**$ 890,882**	**$ 932,621**	**$ 976,755**	**$ 1,025,995**	**$ 1,079,432**	**$ 1,132,823**	**$ 1,192,018**	**$ 1,256,106**
Fixed Fee Cost Recovery	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*
Non-Metered Properties	$ 10,951	$ 5,951	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Consumption Charge										
Consumption Charge Cost Recovery	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*
Funding Requirement	$ 426,067	$ 455,761	$ 479,705	$ 502,181	$ 525,945	$ 552,458	$ 581,233	$ 609,981	$ 641,856	$ 676,365
Total Annual Billed Consumption (m3)	195,000	196,000	197,000	198,100	199,500	201,250	203,000	204,900	206,900	209,450
Charge Per Cubic Metre	$2.18	$2.33	$2.44	$2.53	$2.64	$2.75	$2.86	$2.98	$3.10	$3.23
Total Revenue Generated	**$ 1,217,333**	**$ 1,302,174**	**$ 1,370,587**	**$ 1,434,802**	**$ 1,502,700**	**$ 1,578,453**	**$ 1,660,665**	**$ 1,742,804**	**$ 1,833,874**	**$ 1,932,471**

Annual Charge Per Typical Occupied House (200m3/year)										
Fixed Charge	$ 399	$ 428	$ 452	$ 471	$ 489	$ 508	$ 529	$ 549	$ 571	$ 593
Consumption	$ 436	$ 466	$ 488	$ 506	$ 528	$ 550	$ 572	$ 596	$ 620	$ 646
Total Annual Charge	**$ 835**	**$ 894**	**$ 940**	**$ 977**	**$ 1,017**	**$ 1,058**	**$ 1,101**	**$ 1,145**	**$ 1,191**	**$ 1,239**
Difference in annual charge ($)	*$ 75*	*$ 59*	*$ 45*	*$ 38*	*$ 40*	*$ 42*	*$ 43*	*$ 44*	*$ 46*	*$ 48*
Difference in annual charge (%)	*9.9%*	*7%*	*5%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*	*4%*

TOWNSHIP OF RAMARA
2015 WATER & SEWER RATE STUDY
WATER AND SEWER RATE CALCULATIONS - SUMMARY
WASTEWATER SERVICES

Wastewater Services	**2015 Budget**	**2016 Projected**	**2017 Projected**	**2018 Projected**	**2019 Projected**	**2020 Projected**	**2021 Projected**	**2022 Projected**	**2023 Projected**	**2024 Projected**
Expenditures										
Operating										
Annual Gross Operating Expenditures	$ 793,900	$ 816,378	$ 839,636	$ 863,705	$ 888,619	$ 914,414	$ 941,126	$ 968,793	$ 997,456	$ 1,027,156
Current Outstanding Debt	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693	$ 36,693
Deficit recovery (accumulated as of Yr-end 2014)	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702	$ 84,702
Subtotal Annual Gross Operating Expenditures	*$ 915,295*	*$ 937,773*	*$ 961,030*	*$ 985,100*	*$ 1,010,014*	*$ 1,035,809*	*$ 1,062,520*	*$ 1,090,188*	*$ 1,118,850*	*$ 1,148,551*
Capital										
Net In-Year Capital Related Expenditures	$ 489,550	$ 1,843,678	$ 1,946,269	$ 656,777	$ 303,770	$ 2,689,337	$ 121,832	$ 112,545	$ 126,844	$ 120,620
Debenture Financing (received for capital works)	$ (426,200)	$ (1,755,100)	$ (1,950,000)	$ (758,800)	$ (407,000)	$ (2,750,000)	$ (318,000)	$ (260,000)	$ (216,400)	$ (140,000)
Annual Debtenture Payments (New Debt for Capital)	$ -	$ 32,872	$ 168,240	$ 318,641	$ 377,166	$ 408,557	$ 620,661	$ 645,188	$ 665,241	$ 681,932
Sub-total Capital	***$ 63,350***	***$ 121,450***	***$ 164,509***	***$ 216,618***	***$ 273,936***	***$ 347,894***	***$ 424,493***	***$ 497,733***	***$ 575,685***	***$ 662,552***
Asset Replacement Reserve Contribution										
Calculated Annual Contribution	$ 3,025,399	$ 2,773,370	$ 2,042,941	$ 1,719,009	$ 1,680,400	$ 1,542,398	$ 1,542,398	$ 1,542,398	$ 1,533,076	$ 1,528,523
Contribution Smoothing - %	0%	0%	1%	1%	3%	3%	4%	5%	6%	8%
Contribution Smoothing - $	$ (3,025,399)	$ (2,773,370)	$ (2,032,522)	$ (1,697,522)	$ (1,638,390)	$ (1,490,728)	$ (1,486,872)	$ (1,472,528)	$ (1,442,931)	$ (1,412,356)
Sub-total Asset Replacement Contribution	***$ -***	***$ -***	***$ 10,419***	***$ 21,488***	***$ 42,010***	***$ 51,670***	***$ 55,526***	***$ 69,871***	***$ 90,145***	***$ 116,168***
Total Capital Expenditures	***$ 63,350***	***$ 121,450***	***$ 174,928***	***$ 238,106***	***$ 315,946***	***$ 399,565***	***$ 480,019***	***$ 567,603***	***$ 665,830***	***$ 778,720***
Total Annual Expenditures	***$ 978,645***	***$ 1,059,223***	***$ 1,135,959***	***$ 1,223,205***	***$ 1,325,960***	***$ 1,435,374***	***$ 1,542,540***	***$ 1,657,791***	***$ 1,784,680***	***$ 1,927,270***
Revenues										
Grant Funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Non-Rate Revenues	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)	$ (1,000)
Total Non-User Rate Revenues	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***	***$ (1,000)***
Net Rate Funding Need	**$ 977,645**	**$ 1,058,223**	**$ 1,134,959**	**$ 1,222,205**	**$ 1,324,960**	**$ 1,434,374**	**$ 1,541,540**	**$ 1,656,791**	**$ 1,783,680**	**$ 1,926,270**

TOWNSHIP OF RAMARA
2015 WATER & SEWER RATE STUDY
WATER AND SEWER RATE CALCULATIONS - SUMMARY
WASTEWATER SERVICES

User Rates	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Fixed Quarterly										
Quarterly Fixed Fee per Equivalent Unit	$112.97	$122.64	$131.74	$141.06	$150.56	$160.31	$169.26	$178.53	$188.46	$198.62
Number of Equivalent Metered Connections	1,382	1,390	1,400	1,408	1,430	1,454	1,480	1,508	1,538	1,576
Total Annual Fixed Revenue	**$ 624,481**	**$ 681,857**	**$ 737,723**	**$ 794,433**	**$ 861,224**	**$ 932,343**	**$ 1,002,001**	**$ 1,076,914**	**$ 1,159,392**	**$ 1,252,076**
Fixed Fee Cost Recovery	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*
Revenue - Non-Metered Properties	$ 10,988	$ 5,988	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Consumption Charge										
Consumption Charge Cost Recovery	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*
Funding Requirement	$ 342,176	$ 370,378	$ 397,236	$ 427,772	$ 463,736	$ 502,031	$ 539,539	$ 579,877	$ 624,288	$ 674,194
Total Annual Billed Consumption (m3)	146,300	147,100	147,900	148,780	149,980	151,300	152,700	154,220	155,820	157,860
Charge Per Cubic Metre	$2.34	$2.52	$2.69	$2.88	$3.09	$3.32	$3.53	$3.76	$4.01	$4.27
Total Revenue Generated	**$ 977,645**	**$ 1,058,223**	**$ 1,134,959**	**$ 1,222,205**	**$ 1,324,960**	**$ 1,434,374**	**$ 1,541,540**	**$ 1,656,791**	**$ 1,783,680**	**$ 1,926,270**

Annual Charge Per Typical Occupied House (200m3/year)										
Wastewater Service										
Fixed Charge	$ 452	$ 491	$ 527	$ 564	$ 602	$ 641	$ 677	$ 714	$ 754	$ 794
Consumption	$ 468	$ 504	$ 538	$ 576	$ 618	$ 664	$ 706	$ 752	$ 802	$ 854
Total Annual Charge	**$ 920**	**$ 995**	**$ 1,065**	**$ 1,140**	**$ 1,220**	**$ 1,305**	**$ 1,383**	**$ 1,466**	**$ 1,556**	**$ 1,648**
Difference in annual charge ($)	*$ 84*	*$ 75*	*$ 70*	*$ 75*	*$ 80*	*$ 85*	*$ 78*	*$ 83*	*$ 90*	*$ 93*
Difference in annual charge (%)	*10.01%*	*8%*	*7%*	*7%*	*7%*	*7%*	*6%*	*6%*	*6%*	*6%*