

ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM

Water Rate Study
2021 - 2031



TOWNSHIP OF
Southwold

St. Thomas Area Secondary Water Supply System

2021 - 2031 Water Rate Study

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1 Introduction

The St. Thomas Area Secondary Water Supply System (STASWSS) obtains treated drinking water from the Elgin Area Primary Water Supply System (EAPWSS) and transmits this drinking water to the City of St. Thomas, parts of the Municipality of Central Elgin, and the Township of Southwold, which allows pass-through to the Municipality of Dutton-Dunwich. The STASWSS recovers its costs from its municipal customers through a consumption rate that is applied to the metered volume of water consumed. The STASWSS rate is included in the St. Thomas DWS Water Supply Rate, as described below.

The STASWSS water rate is recovered as a portion of the overall St. Thomas DWS Water Supply Rate for the St. Thomas and Suburban Service Area. The current St. Thomas DWS Water Supply Rate is calculated to reflect 70% of the overall supply to the area being purchased directly from the EAPWSS with 30% being purchased from the STASWSS (i.e. a rate comprising both the Primary and STASWSS rates).

In addition to the St. Thomas DWS Water Supply Rate, the St. Thomas and Suburban Service Area Rate also includes the Common Water Rate and monthly base charge, which is designed to fund common water system infrastructure works over 300 mm in diameter within the St. Thomas Distribution System. Lastly, each municipality is responsible for funding their respective water systems' infrastructure needs smaller than 300 mm in diameter within their respective jurisdictions. The City of St. Thomas imposes a Capital Charge Rate for this funding component.

This study has been prepared to determine the water rates for the STASWSS that are required to fund the operational, maintenance, administrative, rehabilitation and renewals costs in a sustainable manner.

1.1 Background

The City of St. Thomas, as the administering municipality for the Secondary System prepared this water rate study for the water system. This includes an assessment of the full costs of managing the water systems and recovery of those costs through consumption rates. The study period is for eleven (11) years, from 2021 to 2031, inclusive.

A condition of the existing municipal drinking water licence is that the application for renewal of the licence must be submitted to the Ministry of the Environment, Conservation and Parks (MECP) by December 27, 2020. The licence renewal process requires the preparation of an updated financial plan in accordance with O. Reg. 453/07. This document informs the update of the water systems financial plan.

1.2 Study Objectives

The objectives of this study are as follows:

- Forecast future water demands on the St. Thomas Area Secondary Water Supply System (STASWSS) (2021-2031)
- Identify all current and future water system capital needs to assess the immediate and longer-term capital funding requirements

- Identify existing operating costs and estimate future operating costs over the next 10 years (2021-2031).
- Forecast STASWSS water rates for the 10-year forecast period (2021-2031)
- Present the information necessary for preparation of a financial plan in accordance with the requirements of Ontario Regulation 453/07 and the Safe Drinking Water Act 2002.
- Provide a report and presentation to the Board of Management, relative to the findings and recommendations

1.3 Regulatory Changes in Ontario

Provincial requirements governing water services primarily include the following:

- The Safe Drinking Water Act (SDWA);
 - Financial Plan Regulation (O. Reg. 453/07)
 - Licencing of Municipal Drinking Water Systems (O. Reg. 188/07)
- The Municipal Act (MA);
- The Water Opportunities and Conservation Act, 2010 (WOA).
- Infrastructure for Jobs and Prosperity Act, 2015
 - Asset Management Planning for Municipal Infrastructure (O. Reg 588/17)

1.3.1 Safe Drinking Water Act (2002)

The Safe Drinking Water Act, 2002 (SDWA) has significant implications to daily operations as it sets out the water sampling and other operational requirements (in O. Reg. 170/03) for ensuring that the water delivered to consumers is of high quality and safe for consumption. The SDWA has been a major influence over the past decade in terms of adjustments to operational practices and water quality assurance. In addition, there is also a requirement under this Act (O. Reg. 188/07) for drinking water providers to establish a Drinking Water Quality Management System (DWQMS) and obtain licences for their respective water systems. As part of the DWQMS, and as required under O. Reg. 453/07 (Financial Plans Regulation), operating authorities must submit a financial plan for their respective water systems as a condition of licensing. There are also many regulations and guidelines that deal with design and operation standards that mandate certain activities be undertaken as part of service delivery.

1.3.1.1 Financial Plan Regulation (O.Reg. 453/07)

The Financial Plan Regulation (O.Reg. 453/07), under the Safe Drinking Water Act requires that owners of municipal drinking water systems prepare Financial Plans for the drinking water system as a pre-requisite for obtaining a Municipal Drinking Water Licence; a requirement to own, operate and maintain the infrastructure designed to deliver drinking water to homes and businesses. The plan and its approving resolution must be submitted to the Ministry of Municipal Affairs and Housing (MMAH) and must accompany the MDWL renewal application to the Ministry of the Environment, Conservation and Parks (MECP).

A guideline has been provided to assist municipalities in understanding the Provinces direction and provides a detailed discussion on possible approaches to sustainability. The Provinces 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 storm water 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 Life-cycle 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.

The preparation of this Study and the accompanying Financial Plan are consistent with the principles of O. Reg. 453/07 with a flexible, locally-driven approach to achieving financial sustainability.

1.3.1.2 Licensing of Municipal Drinking Water Systems (O.Reg.188/07)

Regulation 188/07, under the Safe Drinking Water Act, 2002 requires Ontario municipalities to apply for and obtain a Municipal Drinking Water Licence (MDWL), which provides the approval and authority to own and operate the Drinking

Water System (DWS). One of the requirements for obtaining and renewing an MDWL is preparing a financial plan in accordance with O. Reg. 453/07. In general, the financial plan must include financial statements on the following:

- The proposed or projected financial position of the drinking water systems;
- The proposed or projected gross cash receipts and gross cash payments;
- The proposed or projected financial operations of the drinking water system; and
- Details on the extent to which the above information applies to the replacement of lead service pipes, if applicable.

1.3.2 The Municipal Act (2002)

The Municipal Act, Part VII, Section 293 requires municipalities to establish reserves for dealing with long-term liabilities. This applies directly to the water systems and the future liabilities associated with their age and condition. The Municipal Act also permits municipalities to establish fees for cost recovery and requires public input prior to any fee adjustments.

1.3.3 The Water Opportunities Act

The WOA was enacted in November 2010 and the regulations are pending. This legislation promotes water conservation and requires municipalities to develop:

- Water conservation plans;
- Sustainability plans for water, wastewater & stormwater management; and
- Asset management plans.

Financial plans are required as a component of the water sustainability and asset management plans.

1.3.4 Infrastructure for Jobs and Prosperity Act, 2015: Asset Management Planning for Municipal Infrastructure (O. Reg 588/17)

On December 13, 2017, the Province approved the regulation that took effect January 1, 2018. Although no provisions take immediate effect, O. Reg 588/2017 sets out new requirements for undertaking asset management planning. The preparation of the new asset management plans have phased-in timelines spanning 6 years.

- July 1, 2019 – all municipal governments to have a finalized initial strategic asset management policy. Section 3 of the regulation sets out 12 matters that this policy must include, and the policy must be reviewed every 5 years.
- July 1, 2021: all municipal governments to have an adopted asset management plan for core assets (roads, bridges and culverts, water, wastewater and stormwater management) that discusses current levels of service and the cost of maintaining those services. The regulation sets out both qualitative descriptions and technical metrics for each of the core assets.

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- July 1, 2023: Municipal governments to an adopted asset management plan for all of its other municipal infrastructure assets, which also discusses current levels of service and the cost of maintaining those services. The municipality is to set the technical metrics and qualitative descriptions for its other assets (e.g., culture and recreation facilities).
- July 1, 2024: The asset management plans shall include a discussion of proposed levels of service, the assumptions related to the proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund the activities.

The City of St. Thomas passed resolution endorsing the Strategic Asset Management Policy on May 6, 2019. The Asset Management Policy makes commitments that the Asset Management Plan be utilized to inform the Financial Planning aspects of the Safe Drinking Water Act. This study has been prepared using the Water Asset Listing prepared for the purposes of satisfying O. Reg. 588/17.

2 Data Sources

The primary Sources of data used to prepare this financial plan are listed below. In addition, information was also developed from discussions with input from St. Thomas, Southwold, Central Elgin, and Dutton-Dunwich staff, as required.

Item	Data Source
Asset Life Expectancy	St. Thomas Asset Management Plan Information provided by St. Thomas
Asset Replacement Costs	Recent Construction or Historical Costs, where available, provided in 2014 study, inflated.
Asset Values	St. Thomas Asset Management Plan Information provided by St. Thomas
O&M Cost and Revenue Projections	2020 Operating Budget
Capital Cost Projections	STASWSS 2021-2031 Capital Plan
Investment/Debt/Reserve Balances	Information provided by St. Thomas
Existing Customers	Customer counts provided by Entegrus
Growth	Information provided by St. Thomas, Southwold, and Central Elgin staff.
Water Volumes	Historical Demand Volumes provided by St. Thomas and OCWA. Billed Consumption provided by Entegrus.

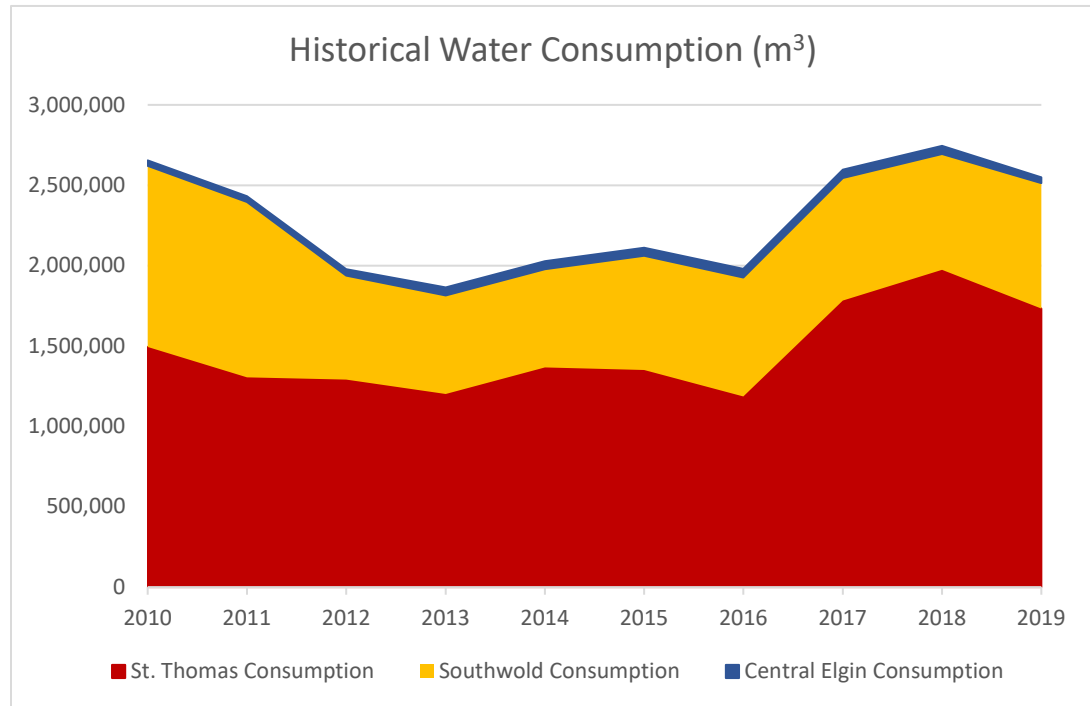
3 Forecasting Growth and Servicing Requirements

The St. Thomas Area Secondary Water Supply System (STASWSS) currently directly supplies water to three municipalities: The City of St. Thomas, The Municipality of Central Elgin and The Township of Southwold. The Municipality of Dutton-Dunwich receives water from the STASWSS through a connection to the Township of Southwold.

3.1 Historical Water Consumption

Consumption data, obtained from Entegrus, for the period of 2010-2019 is summarized in Appendix A and is graphically represented below. As demonstrated in Appendix A, billed water consumption from the STASWSS has swung from a peak in 2010 of 2,655,427 m³ to a low record within the period of 1,863,421 m³ in 2013, returning to record flows in 2018 of 2,744,963 m³.

The decrease in use realized in 2012 is a result of the Ford Plant closure in 2011. The loss of flow resulting from the Ford Plant closure was intended to be offset to some degree by the extension of the service area to the Municipality of Dutton-Dunwich. The Municipality of Dutton-Dunwich is contractually obligated to take a minimum of 400 m³ per day. Discussions with Dutton-Dunwich indicate that they do not intend to take any more than the contracted minimum for the forecast period. As such, this value has been carried forward within the demand forecast directed toward Southwold.



Increased consumption in 2017, 2018 and 2019 on St. Thomas' part is a result of an increased reliance on the STASWSS to feed their distribution system. The St. Thomas' distribution system is fed from the Elgin Area Primary Water Supply System (EAPWSS) and the St. Thomas Area Secondary Water Supply System (STASWSS). It is the City's intention to take 70% of the water demand directly from the EAPWSS and the remaining 30% from the STASWSS. As a result of failing infrastructure providing feed from the EAPWSS, this split has trended toward 50:50 in recent years. With the replacement of the pumps at the Albert Roberts Pumping Station in July 2019, it is the City's intention to return to a 70:30 split.

3.2 Growth and Servicing Requirements

This section summarizes the forecast water demands for the STASWSS for the period of 2021-2031. In developing this forecast, discussions were held with staff from each benefitting municipality to identify factors affecting future demand.

3.2.1 Southwold Demand Forecast

The Township of Southwold’s average consumption over the 5-year period spanning 2015-2019 was 749,421 m³. Southwold is anticipating a period of significant growth over the forecast period. This growth is expected to add more than 500 homes over the 10-year period. At a rate of approximately 50 new homes per year, the new growth is expected that it will account for an additional 7,790 m³ per year of consumption, year over year. As mentioned above, discussions with Dutton-Dunwich indicate that they do not intend to take any more than the contracted minimum for the forecast period. As such, this value has been carried forward within the demand forecast directed toward Southwold.

	Southwold Demand Forecast (m ³)										
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
# of new homes	49	49	49	49	49	49	49	49	49	49	49
Annual Consumption/home	161	161	161	161	161	161	161	161	161	161	161
Forecast Flow due to growth	7,889	7,889	7,889	7,889	7,889	7,889	7,889	7,889	7,889	7,889	7,889
SW EMPS DEMAND FORECAST (m³)	765,199	773,088	780,977	788,866	796,755	804,644	812,533	820,422	828,311	836,200	844,089

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3.2.2 St. Thomas Demand Forecast

The City of St. Thomas' total system demand is satisfied through feeds from the Elgin Area Primary Water Supply System, at the Albert Roberts Pumping Station and the St. Thomas Area Secondary Water Supply System, at 4 possible entry points throughout the city. City-wide consumption over the 5-year period spanning 2015-2019 averaged 3,269,112 m³. It is the City's intention to meet 70% of the demand with water directly from the EAPWSS and 30% from the STASWSS. In recent years this flow split has trended closer to 50:50, however, with the replacement of the pumps at the Albert Roberts Pumping Station in July 2019, it is the City's intention to return to a 70:30 water supply split for the study period. St. Thomas is conservatively anticipating growth at a rate of 1.50% annually for the forecast period. A calculation of Non-revenue water of 14% is included in the determination of total demands on the STASWSS. It should be noted that these water losses primarily occur within the St. Thomas distribution system and as such, do not represent a financial loss to the STASWSS; however are necessary to include, in order to calculate the total water needs being demanded by the St. Thomas DWS. City wide demands and operational strategies will influence the volumes of water delivered through the West and East Chambers. For the purposes of this study, it was assumed flow will be split evenly between two delivery points into the St. Thomas DWS (ie. East and West Chambers).

St. Thomas DWS Demand Forecast (m ³)											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Consumption Total (m3/annum)	3,431,365	3,482,835	3,535,078	3,588,104	3,641,925	3,696,554	3,752,003	3,808,283	3,865,407	3,923,388	3,982,239
% NRW	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
NRW Forecast	485,768	493,055	500,451	507,957	515,577	523,310	531,160	539,127	547,214	555,423	563,754
STDWS Total Demand Forecast	3,917,133	3,975,890	4,035,528	4,096,061	4,157,502	4,219,865	4,283,163	4,347,410	4,412,621	4,478,811	4,545,993
ARBS Demand	2,741,993	2,783,123	2,824,870	2,867,243	2,910,252	2,953,905	2,998,214	3,043,187	3,088,835	3,135,167	3,182,195
East Chamber	587,570	596,383	605,329	614,409	623,625	632,980	642,474	652,112	661,893	671,822	681,899
West Chamber	587,570	596,383	605,329	614,409	623,625	632,980	642,474	652,112	661,893	671,822	681,899
STDWS EMPS DEMAND FORECAST	1,175,140	1,192,767	1,210,658	1,228,818	1,247,251	1,265,959	1,284,949	1,304,223	1,323,786	1,343,643	1,363,798

3.2.3 Central Elgin Demand Forecast

The Municipality of Central Elgin’s average consumption over the 5-year period spanning 2015-2019 was 48,508 m³. Central Elgin anticipates the addition of approximately 120 homes to the distribution system connected to the STASWSS over the study period.

Central Elgin Demand Forecast (2020-2030)											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
# of new homes	21	26	21	20	20	22	0	0	0	0	0
Consumption/home (m3/annum)	161	161	161	161	161	161	161	161	161	161	161
Forecast Flow due to growth (m3/annum)	3,381	4,186	3,381	3,220	3,220	3,542	0	0	0	0	0
CE EMPS DEMAND FORECAST	57,685	61,871	65,252	68,472	71,692	75,234	75,234	75,234	75,234	75,234	75,234

3.3 Total STASWSS Demand Forecast

Annual water demands on the STASWSS are projected to increase approximately 285,000 m³ over the forecast period, from a total demand of 1,998,025 m³ in 2021 to 2,283,122 m³ by 2031.

TOTAL STASWSS DEMAND FORECAST (m ³)											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
STDWS EMPS DEMAND	1,175,140	1,192,767	1,210,658	1,228,818	1,247,251	1,265,959	1,284,949	1,304,223	1,323,786	1,343,643	1,363,798
CE EMPS DEMAND	57,685	61,871	65,252	68,472	71,692	75,234	75,234	75,234	75,234	75,234	75,234
SW EMPS DEMAND	765,199	773,088	780,977	788,866	796,755	804,644	812,533	820,422	828,311	836,200	844,089
TOTAL STASWSS DEMAND	1,998,025	2,027,727	2,056,888	2,086,157	2,115,698	2,145,838	2,172,717	2,199,880	2,227,332	2,255,078	2,283,122

4 Full Cost of Services

The full cost of services assessment identifies the current and future costs (i.e. the full costs) associated with the management of the water system. The key cost areas include:

- Capital Needs, based on the 10-year capital budget;
- Operations and Maintenance (O&M cost projections);
- Lifecycle Replacement Needs (Reserve Funding).

This section of the study is formatted to address cost of water service requirements and supports the complimentary cost recovery plan provided in the subsequent section.

4.1 STASWSS Capital Needs

This section summarizes the capital needs assessments provided by St. Thomas and OCWA staff to ensure a sustainable system and provides a management plan for the long-term integrity of the water supply system. Two iterations of the capital needs forecast were considered by staff when assessing the short-term and long-term capital needs of the STASWSS. Staff indicate there is an upcoming need to begin replacement of the STASWSS transmission main. The Transmission Main Replacement Project represents approximately 80% of the STASWSS entire asset replacement value.

There is currently limited information available on the condition of the STASWSS transmission main. A condition assessment was conducted in 2009 by Echo-logics, however, the resulting report is generally inconclusive.

The STASWSS is in the planning stages of a project to remove the Ford Tower from service. The work required will allow staff to remove a section of the piping and have it analyzed by the manufacturer to gain better insight into the expected remaining life based on a condition assessment, rather than age alone. The main has not had any breaks to date, however, emergency response and recovery to a break on a transmission main of this nature is currently estimated at \$500,000 - \$750,000.

For this assignment, two options were considered to measure the impacts of the upcoming need to replace the STASWSS Transmission Main. Each option includes capital costs for the upgrade and maintenance of the system as identified in St. Thomas' Capital Plan (2021-2031) and OCWA's EMPS Capital Plan (2021-2031). The two (2) options prepared are as follows:

- **Option 1: Initiate Transmission Main Project 2025** (Detailed in Appendix B);
- **Option 2: Defer Transmission Main Project 2036** (Detailed in Appendix C);

4.1.1 Level of Risk

There is a level of risk or financial impact associated with each capital needs option. Inherent in each option are different levels of operational risks with varying financial impacts. The following section summarizes the risk assessment for each option:

Option 1: Initiate Transmission Main Project 2025: Under this option, transmission main replacement would be initiated as soon as practicable and aligned with City's 10-Year Capital Plan, indicating South Edgeware Road is to be reconstructed in 2025. This option requires more aggressive short-term rate increases in order to ensure adequate funds are available to complete the replacement project. Reserve Funds, for the most part, will be drained as they are accrued until 2042, when the transmission main replacement project is complete. This option results in reserve fund contributions consistent with the lifecycle contribution needs over the long-term forecast, by 2028.

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Option 2: Defer Transmission Main Project to 2036: Under this option, initiation of the transmission main replacement would be deferred until 2036. This option allows the reserve fund to accumulate for 10 years prior to initiating the transmission main replacement project. The inherent risk with deferring the Transmission Main Replacement Project is increased prevalence of watermain breaks on the STASWSS. This option also results in reserve fund contributions consistent with the lifecycle contribution needs over the long-term forecast, by 2028.

The table below summarizes the rate increases that would be required under each option. Rate increases in each option are sufficient to allow a sustainable level of capital funding by 2028.

	Required Rate Increases (2021 – 2031)										
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Option 1	6.5%	5.5%	5.5%	3.0%	2.0%	2.0%	2.0%	2.0%	0.0%	0.0%	0.0%
Option 2	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	2.0%	2.0%	0.0%	0.0%	0.0%

4.1.2 Preferred Scenario

The STASWSS transmission main is nearing its theoretical end of life. As such, STASWSS needs to plan for the replacement of the entire transmission main. This is a significant replacement project, representing nearly 80% of the systems total asset replacement value.

The City of St. Thomas 10-year Capital Plan recommends that South Edgeware Road be expanded around 2025. This represents an opportunity for the STASWSS to replace a large section of the main, where road reconstruction costs will already be planned for, representing a significant cost reduction. The replacement of the transmission main will need to be undertaken in sections, over the course of many years.

Staff Committee decided preferred scenario would be Option 1. This scenario provides some cost savings in the form of combining portions of the transmission main replacement with the South Edgeware Road Expansion Project and presents the least risk of occurrence of critical pipeline failures requiring emergency repairs. The Staff Committee also indicated a preference to avoid the use of debt, as historically the system has not done so. Rate increases have been recommended that align the forecast annual reserve fund contributions with the lifecycle contribution needs over the long-term forecast by 2028 and will allow for the 2021-2033 Capital Plan to be undertaken without the use of debt. There are numerous reasons that reserve funds may not accumulate as demonstrated herein. Debt use may be required to fund final phases of transmission main replacement.

4.2 Operations and Maintenance Expenditures

The 2020 Operating Budget was provided by City of St. Thomas. The budget identifies the operation and maintenance costs of the STASWSS. Future cost estimates were developed based on current operating and maintenance costs and the potential impact of future capital needs. It was determined that there would not be significant changes to operating or maintenance costs as a result of the implementation of the 2021-2031 Capital Plan, however, it should be noted that a new budget line item will be introduced in 2021, entitled “EMPS Rental”. The EMPS Rental Fee is anticipated to be the result of the execution of an Occupancy Agreement to be initiated January 1, 2021. The Occupancy Agreement clearly identifies EAPWSS as the accountable entity for the operation, maintenance, and asset renewal for the EMPS property, both cells of the terminal reservoir, common EMPS site watermain, EMPS building envelope, facility electrical system, HVAC and septic systems and establishes an annual occupancy fee based on a comprehensive Asset Management Plan. Previously, shared asset renewal expenses required negotiation on each item. For the STASWSS, the overall financial result of the Agreement is more predictable annual operating expenses related to the EMPS. As part of the preparation of this report, anticipated capital expense related to the assets covered by the agreement were removed from the Capital Plan and the Annual Occupancy Fee was added to the Operating Budget.

The costs for each component of the operating budget have been reviewed with City staff to establish forecast inflationary adjustments. The Table below summarizes these assumptions.

Inflation Assumptions		
Description	Inflation	Notes
City Admin Costs	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Job Costing Labour	2.00%	Modestly reduced value, based on 10-yr average CPI increase
CMMS Support Fee	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Secondary Water System - Contractor	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Misc. Contracted Services	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Job Costing Equipment	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Job Costing Subcontractors	2.00%	Modestly reduced value, based on 10-yr average CPI increase
City Own Property Taxes	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Insurance Expense	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Communications	2.00%	Modestly reduced value, based on 10-yr average CPI increase
SCADA Maintenance	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Electricity (Hydro)	5.00%	Based on historical performance
Natural Gas - Heating	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Chemicals	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Job Costing Materials	2.00%	Modestly reduced value, based on 10-yr average CPI increase
EMPS Rental	2.00%	Modestly reduced value, based on 10-yr average CPI increase
Purchase of Water	Forecasted Consumption X Primary Rate	Based on discussions with RWS staff

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Costs for the purchase of water from the EAPWSS have been forecast based on the anticipated water demand, as determined in the section above and the forecasted EAPWSS water rates. The EAPWSS Rate Study currently prepared advises on rates to 2021. Discussions with staff at the EAPWSS indicates that they anticipate rates continuing to increase at a rate of 3% per year for this study period.

Appendix D summarizes the forecast operational, EMPS occupancy and water supply costs for the STASWSS. The cost of water supply is the most significant cost to the STASWSS, representing approximately 80% of Annual Total Operating Expenses. Over the course of the study period, annual water supply costs are anticipated to increase from \$1,791,253 to \$2,750,790.

4.3 Water Infrastructure Replacement (Lifecycle Analysis)

The STASWSS has adopted a philosophy of full cost of servicing. Full cost of servicing, over and above operational and maintenance costs of servicing, includes the collection of funds at a level adequate to cover future system replacement costs, through the establishment of reserve funds.

An Asset Lifecycle Analysis based on asset information contained in the City of St. Thomas' Asset Management Plan was completed to determine the future asset replacement needs. This involved consideration of the following information for the respective assets:

- Historical cost;
- In- service or year of installation;
- Useful life expectancy and anticipated year of replacement
- Replacement costs in 2020 dollars (where recent construction costs estimates were not available, costs were developed by applying 2% inflation annually to the values presented in the System's 2015 Study); and
- Replacement costs in the future year of replacement (estimated by adjusting 2020 replacement costs using 2% inflation).

Detailed Tables are provided in Appendix E.

5 Full Cost Recovery Plan

The Full Cost Recovery Plan, which addresses operation and maintenance, administrative, capital renewal/replacement (lifecycle), new capital, continuous supply, debt and reserve fund costs for the preferred option, Option 1, is presented in this section.

The STAWSS has the following funding sources available to them and are discussed further in the sections below:

- Grant Funding
- Debt Financing
- Reserve Financing
- Operating Revenues

5.1 Grant Funding

Historically, federal/provincial level funding helped with major municipal infrastructure projects. In recent years, funding from these levels of government have dwindled, are typically allocated on a case-by-case basis and are assigned to “shovel-ready” projects. In developing the Cost Recovery Plan, no grant funding has been identified.

5.2 Debt Financing

Issuance of debt allows for financing to be available in the year the project is required, and repayment occurs over the future years. Financing from the Reserve Fund requires that enough funds be available in the reserve in the year the project is undertaken, through annual contributions to the reserve in prior years. Without debt or reserve financing, major rate increases or “spikes” would be required in the project year to raise sufficient funds to cover the project expenditures. As there is no recommendation to use debt as a tool over the planning period, there are no financial costs to the cost recovery plan presented within this study.

5.3 Reserve Financing

Municipalities in Ontario use fund accounting as the basis for budgeting and recording their financial matters. There are two funds, those being the operating fund (to address day-to-day expenditures) and Reserve/Reserve Funds (accumulation of funds set aside for specific purposes).

In its simplest form, a reserve represents monies which are set aside for future known expenditures or for contingent purposes. The establishment of a reserve is at the discretion of Council (or the Board) and represents a financial management tool for smoothing out fluctuations in rates over a period of time.

5.3.1 Capital Funding

Direct Capital Recoveries through the water rate and indirectly through reserves will be the funding sources for the STASWSS Capital Needs and Lifecycle Analysis forecast. Appendix F summarizes the capital funding plan for STASWSS under the preferred option, with approximately \$ 9,048,106 in contributions required from the reserve funds.

5.3.2 Reserve Fund Continuity Forecast

The Board has established a reserve fund for the STASWSS. The projected year-end for 2020 is estimated at \$2,794,768. Consistent with the principles of full cost pricing, the rate analysis assumes that the Board will make these discretionary reserves obligatory reserve funds, so that the fund will be utilized exclusively for this purpose and that the interest will be accumulated on reserve fund balances. As such, the rate analysis assumes an annual interest rate for reserve fund balances in determining the annual lifecycle reserve fund contributions of 2%, a modest reduction of past investment performance of 2.1% over the last 5 years.

The Table below provides the forecast reserve fund continuity statement for the forecast period.

Reserve Fund Continuity (2021-2031)											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Opening Balance	2,794,768	3,234,982	3,245,962	4,014,266	4,778,013	1,362,118	2,107,673	2,999,418	3,939,156	1,068,986	1,969,883
Less: Planned Capital Expenditures	197,667	689,999	15,000	75,000	4,216,692	100,000	-	-	3,753,748	-	-
Transfer to Capital	585,939	650,080	718,685	759,962	789,571	820,312	849,592	879,749	879,870	879,517	878,664
Interest	51,942	50,900	64,619	78,785	11,226	25,242	42,153	59,988	3,708	21,380	39,398
Closing Balance	\$3,234,982	\$3,245,962	\$4,014,266	\$4,778,013	\$1,362,118	\$2,107,673	\$2,999,418	\$3,939,156	\$1,068,986	\$1,969,883	\$2,887,944

5.4 Operating Budget and Water Rate Forecast

Annual Operating expenditures have been forecast based on the 2020 STASWSS operating budget with adjustment for cost inflation. Water Supply costs were forecasted based on Primary Rate Study, discussions with RWS staff, and projected water demands based on anticipated growth in the area.

Capital related expenditures and lifecycle reserve fund contributions have been forecast to provide funding for the capital needs for the 10-year forecast period, and to align reserve fund contributions with the theoretical lifecycle contributions to address the capital replacement needs beyond 2031.

Operating Expenditures are anticipated to increase from \$2,323,524 to \$3,457,728 over the forecast period. Appendix G summarizes the forecast annual operating budget and net water billing recovery annually.

St. Thomas Area Secondary Water Supply System 2021 - 2031 Water Rate Study

The table below demonstrates the forecast total STASWSS water billing recovery annually and divides this amount by the forecast water consumption to calculate the STASWSS bulk billing rates. It is noted that this rate comprises both the EAPWSS Water Rate and the STASWSS Water Rate. As noted above, the EAPWSS is forecast to increase at an annual rate of 3% annually.. Thus, the STASWSS Water Rate is forecast to increase by 6.5% in 2021; 5.5% for 2022 and 2023; 3.0% for 2024; 2% for the years 2025-2028, followed by 3 years of no anticipated rate increase. The forecast rate increases take the rates from \$0.5597 in 2021 to \$0.6945 by 2028, which is anticipated to remain in place for 4 years.

Water Rate Forecast (2021 - 2031)											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Billing Recoveries	\$2,909,463	\$3,069,666	\$3,237,588	\$3,382,168	\$3,519,389	\$3,662,568	3,805,195	\$3,953,372	\$4,076,381	\$4,203,992	\$4,336,392
STASWSS Demand Forecast (m ³)	1,998,025	2,027,727	2,056,888	2,086,157	2,115,698	2,145,838	2,172,717	2,199,880	2,227,332	2,255,078	2,283,122
Secondary Bulk Billing Rate (Primary Rate + Secondary Rate)	\$ 1.4562	\$ 1.5138	\$ 1.5740	\$ 1.6212	\$ 1.6635	\$ 1.7068	\$ 1.7514	\$ 1.7971	\$ 1.8302	\$ 1.8642	\$ 1.8993
Primary Water Rate Forecast	\$ 0.8965	\$ 0.9234	\$ 0.9511	\$ 0.9796	\$ 1.0090	\$ 1.0393	\$ 1.0705	\$ 1.1026	\$ 1.1357	\$ 1.1697	\$ 1.2048
PROPOSED Secondary Rate	\$ 0.5597	\$ 0.5904	\$ 0.6229	\$ 0.6416	\$ 0.6544	\$ 0.6675	\$ 0.6809	\$ 0.6945	\$ 0.6945	\$ 0.6945	\$ 0.6945

5.5 Water Rate Impact

As noted in the introduction, the STASWSS water rate is applied as a portion of the overall St. Thomas DWS Water Supply Rate for the St. Thomas and Suburban Service Area. The forecast St. Thomas DWS Water Supply Rate is calculated to reflect 70% of the overall supply to the area being purchased directly from the Primary System with 30% being purchased from the Secondary System (i.e. a rate comprising both the EAPWSS and STASWSS rates).

In addition to the St. Thomas DWS Water Supply Rate, the St. Thomas and Suburban Service Area Rate also includes the Common Water Rate and monthly base charge, which is designed to fund common water system infrastructure works over 300 mm in diameter. Lastly, each municipality is responsible for funding their respective infrastructure needs smaller than 300 mm in diameter within their respective jurisdictions. The City of St. Thomas imposes a Capital Charge Rate for this funding component.

The Table below summarizes the impact of the forecast STASWSS rate on typical residential customers in the City of St. Thomas. For illustration purposes, it is assumed that the typical residential customer consumes 167 m³ annually. Focusing on the St. Thomas and Suburban Service Area component of the overall rate, which is comprised of the St. Thomas DWS Water Supply Rate and the Common Water Rate, the impact on a typical residential customer is forecast to increase at 3-% annually (or approximately \$6.00 per customer annually). However, the annual water bill increase attributable to increases in the STASWSS water rate amount to approximately \$1.00 - \$1.50 annually of the total bill average annual increase of \$7.48, representing an increase of less than 1% of a residents overall annual bill each year.

St. Thomas Area Secondary Water Supply System
2021 - 2031 Water Rate Study

	Residential Customer –Water Rate Impact										
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Primary Water Rate Forecast	0.8965	0.9234	0.9511	0.9796	1.0090	1.0393	1.0705	1.1026	1.1357	1.1697	1.2048
PROPOSED Secondary Rate	0.5597	0.5904	0.6229	0.6416	0.6544	0.6675	0.6809	0.6945	0.6945	0.6945	0.6945
St. Thomas DWS Water Supply Rate (Blended; 100% Primary 30% Secondary)	1.0644	1.1005	1.1380	1.1721	1.2054	1.2396	1.2747	1.3109	1.3440	1.3781	1.4132
Annual Water Bill (167 m3/yr)	177.76	183.79	190.04	195.74	201.30	207.01	212.88	218.93	224.45	230.14	236.00
Annual Water Bill Attributable to STASWSS	28.04	29.58	31.21	32.14	32.79	33.44	34.11	34.79	34.79	34.79	34.79
Total Water Bill Increase	6.07	6.03	6.25	5.70	5.55	5.71	5.88	6.05	5.52	5.69	5.86
Annual Water Bill Increase (attributable to STASWSS)	1.71	1.54	1.63	0.94	0.64	0.66	0.67	0.68	0.00	0.00	0.00
Total Annual Bill % Increase	0.96%	0.84%	0.86%	0.48%	0.32%	0.32%	0.31%	0.31%	0.00%	0.00%	0.00%

6 Recommendations

That the Board consider and adopt the recommended STASWSS Water Rates provided to fund the costs of water supply for the STASWSS

That the Board consider the capital plan for water as provided in Section 2 and the associated capital funding plan as set out in section 3.

Appendix A: Historical Water Consumption (2010-2019)

	2010 Actual	2011 Actual	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Reading from EMPS (m³)	2,611,264	2,488,557	2,082,008	1,947,745	2,289,430	2,227,571	2,137,710	2,756,129	2,904,229	2,808,875
~ St. Thomas Consumption ~										
East Chamber	794,010	753,174	720,048	573,379	877,249	826,797	731,909	1,040,776	1,061,278	1,218,526
West Chamber	700,478	551,244	571,127	628,418	481,110	524,012	453,929	742,299	903,519	487,921
St. George and Lynhurst Park	---	---	75	110	115	10	185	245	375	45
Fingal Line (Southwold WDS)	---	---	---	---	7,507	---	---	---	8,958	25,610
Subtotal - St. T Consumption (m³)	1,494,488	1,304,418	1,291,250	1,201,907	1,365,981	1,350,819	1,186,023	1,783,320	1,974,130	1,732,102
~ Southwold Consumption ~										
Home on Wellington - 1 meter	109	125	101	113	155	158	205	165	107	87
Wellington transmission main	655	1,580	1,275	1,010	1,475	695	1,070	1,570	1,155	850
St. George St. and Lynhurst Park - credit	0	0	75	-115	-115	-10	-185	-245	-375	-45
Homes - 7 - on Ford Line	1,195	1,170	1,095	790	805	1,030	875	820	940	1,180
Ferndale Subdivision - Large	10	5	10	10	15	0	35	105	30	25
Ferndale Subdivision - Small	30,880	27,460	27,390	25,855	29,815	24,625	24,810	25,860	24,390	23,740
New Ford Line Chamber			702	436	331	527	631	592	592	605
Talbotville	87,690	64,675	48,435	52,230	51,980	57,695	61,715	63,655	62,375	65,000
Northstar Windows	3,939	3,416	3,811	4,245	4,940	5,802	6,164	6,466	7,757	5,657
Shedden/Fingal	414,933	451,925	469,249	442,962	443,892	494,976	532,450	551,220	534,903	599,774
Homes - 3 - ... - 1 meter	3,668	3,894	3,501	2,363	3,476	2,531	2,923	2,736	1,920	1,698
JRI - 2" meter	2,253	1,293	1,211	1,263	859	421	265	127	73	101
JRI - 5/8" meter	68	190	139	99	135	384	66	59	160	86
Homes - 3 - 1 meter	520	740	760	950	650	810	1,030	1,520	575	20
Home - Bradish - 1 meter	466	302	341	290	240	230	226	298	491	333
Clinton Line (Ford)	579,387	534,405	87,582	79,951	81,248	119,766	108,374	106,205	93,924	107,532
Fingal Line (Return to St. Thomas)	---	---	---	---	-7,507	---	---	---	-8,958	-25,610
Subtotal - SW Consumption (m³)	1,125,887	1,091,289	645,677	612,452	612,394	709,640	740,654	761,153	720,059	781,033
~ Central Elgin Consumption ~										
Lynhurst Subdivision - Lower	889	1,716	1,470	440	337	373	520	465	655	610
Lynhurst Subdivision - Upper	28,415	27,885	34,450	43,721	42,514	43,255	43,740	43,595	44,385	30,082
Dalewood Conservation Area	2,765	3,485	1,895	2,005	2,275	3,625	7,190	4,400	2,550	2,695
Homes - 4 including "castle" - 1 meter	655	665	685	605	695	510	435	790	675	635
Turner Rd - 11 homes -meter 1	182	171	154	138	122	108	114	105	101	96
Turner Rd - 11 homes -meter 2	358	335	382	382	391	443	241	242	348	401
Turner Rd - 11 homes -meter 3	350	322	394	412	436	356	360	293	324	346
Turner Rd - 11 homes -meter 4	398	299	325	378	474	253	300	293	388	260
Turner Rd - 11 homes -meter 5	147	132	124	154	160	216	199	181	202	197
Turner Rd - 11 homes -meter 6	243	220	409	299	271	199	193	201	213	174
Turner Rd - 11 homes -meter 7	---	---	---	---	---	---	---	133	86	79
Turner Rd - 11 homes -meter 8	154	95	87	81	79	70	84	60	54	50
Turner Rd - 11 homes -meter 9	243	224	259	251	334	301	263	277	388	286
Turner Rd - 11 homes -meter 10	---	---	---	---	---	---	---	186	115	196
Turner Rd - 11 homes -meter 11	---	---	---	---	---	---	---	174	164	165
Homes - 2 - 1 meter	253	202	194	196	175	158	140	184	126	144
Subtotal - CE Consumption (m³)	35,052	35,751	40,828	49,062	48,263	49,867	53,779	51,579	50,774	36,416
Total Billed Consumption (m³)	2,655,427	2,431,458	1,977,755	1,863,421	2,026,638	2,110,326	1,980,456	2,596,052	2,744,963	2,549,551

Appendix B: 2021-2031 Capital Plan (Option 1)

		Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pumps 1,2,3	Pump 1 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 2 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 3 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 1 Suction Valve	10,000		10,000									
	Pump 2 Suction Valve	10,000		10,000									
	Pump 3 Suction Valve	10,000		10,000									
	Total Pump 1	13,333	0	13,333	0	0	0	0	0	0	0	0	0
Total Pump 2	13,333	0	13,333	0	0	0	0	0	0	0	0	0	0
Total Pump 3	13,333	0	13,333	0	0	0	0	0	0	0	0	0	0
Generator	Generator Engine Major Reconditioning	25,000				25,000							
	Diesel Demo and make good	15,000			15,000								
	Total Generator	40,000	0	0	15,000	25,000	0	0	0	0	0	0	0
Chlorination	Chlorinator System Upgrade - Eng.	20,000					20,000						
	Chlorinator System Upgrade	100,000						100,000					
	Total Chlorination	120,000	0	0	0	0	20,000	100,000	0	0	0	0	0
Internal Piping	Steel Piping Replacement	50,000				50,000							
	Total Internal Piping	50,000	0	0	0	50,000	0	0	0	0	0	0	0
Chambers	WCC Secondary Chamber	65,307					65,307						
	WCF001 Chamber #46	65,307					65,307						
	WCF002 Chamber #47	65,307					65,307						
	WCF003 Chamber #48	65,307					65,307						
	WCF004 Chamber #49	65,307					65,307						
	WCF005 Chamber #50	70,690									70,690		
	WCF006 Chamber #51	70,690									70,690		
	WCF012 Chamber #2A	60,334	60,334										
	WCF013 Chamber #3	60,334	60,334										
Total Chambers	588,583	120,667	0	0	0	0	326,535	0	0	0	141,381	0	0
Ford Tower	Valves	77,000	77,000										
	Ford Tower Decommissioning	500,000		500,000									
	Total Ford Tower	577,000	77,000	500,000	0	0	0	0	0	0	0	0	0
E & W Chambers	East Chamber	139,943					139,943						
	West Chamber	151,479									151,479		
	Total E & W Chambers	291,422	0	0	0	0	139,943	0	0	0	151,479	0	0
Transmission Main	Transmission Main (500 mm)	0											
	Transmission Main (750 mm)	7,191,103					3,730,214				3,460,889		
	Total Transmission Main	7,191,103	0	0	0	0	3,730,214	0	0	0	3,460,889	0	0
Planning and Studies	Watermain Replacement Study	150,000		150,000									
	Total Planning and Studies	150,000	0	150,000	0	0	0	0	0	0	0	0	0

Appendix C: 2021-2031 Capital Plan (Option 2)

		Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pumps 1,2,3	Pump 1 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 2 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 3 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333									
	Pump 1 Suction Valve	10,000		10,000									
	Pump 2 Suction Valve	10,000		10,000									
	Pump 3 Suction Valve	10,000		10,000									
	Total Pump 1	13,333	0	13,333	0	0	0	0	0	0	0	0	0
Total Pump 2	13,333	0	13,333	0	0	0	0	0	0	0	0	0	0
Total Pump 3	13,333	0	13,333	0	0	0	0	0	0	0	0	0	0
Generator	Generator Engine Major Reconditioning	25,000				25,000							
	Diesel Demo and make good	15,000			15,000								
	Total Generator	40,000	0	0	15,000	25,000	0	0	0	0	0	0	0
Chlorination	Chlorinator System Upgrade - Eng.	20,000					20,000						
	Chlorinator System Upgrade	100,000						100,000					
	Total Chlorination	120,000	0	0	0	0	20,000	100,000	0	0	0	0	0
Internal Piping	Steel Piping Replacement	50,000				50,000							
	Internal Piping	50,000	0	0	0	50,000	0	0	0	0	0	0	0
Chambers	WCF012 Chamber #2A	60,334	60,334										
	WCF013 Chamber #3	60,334	60,334										
	Total Chambers	120,667	120,667	0	0	0	0	0	0	0	0	0	0
Ford Tower	Valves	77,000	77,000										
	Ford Tower Decommissioning	500,000		500,000									
	Total Ford Tower	577,000	77,000	500,000	0	0	0	0	0	0	0	0	0
E & W Chambers	East Chamber	0											
	West Chamber	0											
	Total E & W Chambers	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Main	Transmission Main (500 mm)	0											
	Transmission Main (750 mm)	0											
	Total Transmission Main	0	0	0	0	0	0	0	0	0	0	0	0
Planning and Studies	Watermain Replacement Study	150,000		150,000									
	Total Planning and Studies	150,000	0	150,000	0	0	0	0	0	0	0	0	0

Appendix D: Operating Budget Forecast

DESCRIPTION	STASWSS Operating Budget Forecast (Inflated)										
	2021 FORECAST	2022 FORECAST	2023 FORECAST	2024 FORECAST	2025 FORECAST	2026 FORECAST	2027 FORECAST	2028 FORECAST	2029 FORECAST	2030 FORECAST	2031 FORECAST
<u>Operating</u>											
E/S Wage Allocation	47,195	48,139	49,102	50,084	51,086	52,108	53,150	54,213	55,297	56,403	57,531
Job Costing Labour	48,960	49,939	50,938	51,957	52,996	54,056	55,137	56,240	57,364	58,512	59,682
CMMS Support Fee	3,009	3,069	3,131	3,193	3,257	3,322	3,389	3,456	3,526	3,596	3,668
Secondary Water System - Contractor	102,000	104,040	106,121	108,243	110,408	112,616	114,869	117,166	119,509	121,899	124,337
Misc. Contracted Services	35,700	36,414	37,142	37,885	38,643	39,416	40,204	41,008	41,828	42,665	43,518
Job Costing Equipment	8,670	8,843	9,020	9,201	9,385	9,572	9,764	9,959	10,158	10,361	10,569
Job Costing Subcontractors	20,400	20,808	21,224	21,649	22,082	22,523	22,974	23,433	23,902	24,380	24,867
City Own Property Taxes	4,998	5,098	5,200	5,304	5,410	5,518	5,629	5,741	5,856	5,973	6,093
Insurance Expense	17,768	18,124	18,486	18,856	19,233	19,618	20,010	20,410	20,819	21,235	21,660
Communications	20,400	20,808	21,224	21,649	22,082	22,523	22,974	23,433	23,902	24,380	24,867
SCADA Maintenance	10,200	10,404	10,612	10,824	11,041	11,262	11,487	11,717	11,951	12,190	12,434
Electricity (Hydro)	141,750	148,838	156,279	164,093	172,298	180,913	189,959	199,456	209,429	219,901	230,896
Natural Gas - Heating	5,100	5,202	5,306	5,412	5,520	5,631	5,743	5,858	5,975	6,095	6,217
Chemicals	5,100	5,202	5,306	5,412	5,520	5,631	5,743	5,858	5,975	6,095	6,217
Job Costing Materials	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195	1,219	1,243
Subtotal Operating	\$472,271	\$485,969	\$500,153	\$514,845	\$530,064	\$545,835	\$562,179	\$579,121	\$596,687	\$614,904	\$633,799
<u>Purchase of Water</u>											
Primary Supply Rate Forecast	0.8965	0.9234	0.9511	0.9796	1.0090	1.0393	1.0705	1.1026	1.1357	1.1697	1.2048
Forecasted Water Demand (m3)	1,998,025	2,027,727	2,056,888	2,086,157	2,115,698	2,145,838	2,172,717	2,199,880	2,227,332	2,255,078	2,283,122
Subtotal Purchase of Water	\$1,791,253	\$1,872,418	\$1,956,326	\$2,043,689	\$2,134,808	\$2,230,176	\$2,325,854	\$2,425,580	\$2,529,525	\$2,637,866	\$2,750,790
<u>EMPS Rental</u>											
Elgin Rental Fee	60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706	73,140
Subtotal EMPS Rental	\$60,000	\$61,200	\$62,424	\$63,672	\$64,946	\$66,245	\$67,570	\$68,921	\$70,300	\$71,706	\$73,140
TOTAL OPERATING EXPENDITURES	\$2,323,524	\$2,419,587	\$2,518,903	\$2,622,206	\$2,729,818	\$2,842,256	\$2,955,603	\$3,073,622	\$3,196,511	\$3,324,475	\$3,457,728

Appendix E: STASWSS Lifecycle Analysis

	Replacement Value (Inflated)	Useful Life	Next Renewal year	Replacement Value (2020)	2021-2031 Annual Lifecycle Contribution
EMPS					
Pump No 1 (now with VFD)	190,992	40	2098	89,993	3,030
Pump No 2 (now with VFD)	190,992	40	2098	89,993	3,030
Pump No 3 (now with VFD)	190,992	40	2098	89,993	3,030
Generator	839,467	25	2043	532,353	25,343
MCC/SCADA	280,192	30	2053	145,764	6,659
Chlorination Equipment	559,741	25	2060	253,501	16,898
Subtotal (EMPS)				1,201,596	57,992
Meter Chambers/Tower					
Secondary Chamber	93,274	70	2037	59,151	584
Chamber #46	93,274	70	2037	59,151	584
Chamber #47	93,274	70	2037	59,151	584
Chamber #48	93,274	70	2037	59,151	584
Chamber #49	93,274	70	2037	59,151	584
Chamber #50	93,274	70	2037	59,151	584
Chamber #51	93,274	70	2037	59,151	584
Chamber #1	93,274	70	2037	59,151	584
Chamber #2	93,274	70	2037	59,151	584
Chamber #2A	93,274	70	2037	59,151	584
Chamber #3	93,274	70	2037	59,151	584
Chamber #4	93,274	70	2037	59,151	584
Chamber #5	93,274	70	2037	59,151	584
Chamber #6	93,274	70	2037	59,151	584
Chamber #7	93,274	70	2037	59,151	584
Chamber #8	93,274	70	2037	59,151	584
Chamber #9	93,274	70	2037	59,151	584
Chamber #10	93,274	70	2037	59,151	584
Chamber #11	93,274	70	2037	59,151	584
Chamber #12	93,274	70	2037	59,151	584
Chamber #13	93,274	70	2037	59,151	584
Wellington Transmission Main	93,274	70	2037	59,151	584
Lynhurst Subdivision	93,274	70	2037	59,151	584
St. George Street	93,274	70	2037	59,151	584
F023D	93,274	70	2037	59,151	584
Chamber #14	93,274	70	2037	59,151	584
No chamber number	261,154	70	2037	165,612	1,636
Chamber #15	93,274	70	2037	59,151	584
Chamber #16	93,274	70	2037	59,151	584
Chamber #17	93,274	70	2037	59,151	584
F027A	93,274	70	2037	59,151	584
Chamber #18	93,274	70	2037	59,151	584
Chamber #19	93,274	70	2037	59,151	584
Chamber #20	93,274	70	2037	59,151	584
F030A	93,274	70	2037	59,151	584
Chamber #21	93,274	70	2037	59,151	584
Chamber #22	93,274	70	2037	59,151	584
F033	93,274	70	2037	59,151	584
Chamber #23	93,274	70	2037	59,151	584
F033B	93,274	70	2037	59,151	584
Chamber #24	93,274	70	2037	59,151	584
Chamber #25	93,274	70	2037	59,151	584
C.N. Chamber	93,274	70	2037	59,151	584
Chamber	93,274	70	2037	59,151	584
Southwold #1	93,274	70	2037	59,151	584
Subtotal (Meter Chambers)				2,768,237	27,344
E&W					
East Chamber	441,328	55	2083	126,751	4,249
West Chamber	441,328	55	2083	126,751	4,249
Subtotal (E&W Chambers)				253,501	8,498
Transmission Main					
Transmission Main (500mm)	22,373,172	75	2118	3,213,000	122,628
Transmission main (750 mm)	120,991,309	75	2118	17,375,501	663,157
Subtotal (Transmission Main)				20,588,501	785,785
Total				\$24,811,835	\$879,619

Appendix F: 2021 - 2031 Capital Works and Financing Plan

	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pumps 1,2,3	Pump 1 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333								
	Pump 2 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333								
	Pump 3 Discharge Control Valve Rebuilding and PRV Surge	3,333		3,333								
	Pump 1 Suction Valve	10,000		10,000								
	Pump 2 Suction Valve	10,000		10,000								
	Pump 3 Suction Valve	10,000		10,000								
	Total Pump 1	13,333	0	13,333	0	0	0	0	0	0	0	0
Total Pump 2	13,333	0	13,333	0	0	0	0	0	0	0	0	0
Total Pump 3	13,333	0	13,333	0	0	0	0	0	0	0	0	0
Generator	Generator Engine Major Reconditioning	25,000				25,000						
	Diesel Demo and make good	15,000			15,000							
Total Generator	40,000	0	0	15,000	25,000	0	0	0	0	0	0	0
Chlorination	Chlorinator System Upgrade - Eng.	20,000					20,000					
	Chlorinator System Upgrade	100,000					100,000					
Total Chlorination	120,000	0	0	0	0	20,000	100,000	0	0	0	0	0
Internal Piping	Steel Piping Replacement	50,000				50,000						
	Total Internal Piping	50,000	0	0	0	50,000	0	0	0	0	0	0
Chambers	WCC Secondary Chamber	65,307					65,307					
	WCF001 Chamber #46	65,307					65,307					
	WCF002 Chamber #47	65,307					65,307					
	WCF003 Chamber #48	65,307					65,307					
	WCF004 Chamber #49	65,307					65,307					
	WCF005 Chamber #50	70,690								70,690		
	WCF006 Chamber #51	70,690								70,690		
	WCF012 Chamber #2A	60,334	60,334									
	WCF013 Chamber #3	60,334	60,334									
Total Chambers	588,583	120,667	0	0	0	326,535	0	0	0	141,381	0	0
Ford Tower	Valves	77,000	77,000									
	Ford Tower Decommissioning	500,000		500,000								
Total Ford Tower	577,000	77,000	500,000	0	0	0	0	0	0	0	0	0
E & W Chambers	East Chamber	139,943					139,943					
	West Chamber	151,479								151,479		
Total E & W Chambers	291,422	0	0	0	0	139,943	0	0	0	151,479	0	0
Transmission Main	Transmission Main (500 mm)	0										
	Transmission Main (750 mm)	7,191,103					3,730,214			3,460,889		
Total Transmission Main	7,191,103	0	0	0	0	3,730,214	0	0	0	3,460,889	0	0
Planning and Studies	Watermain Replacement Study	150,000		150,000								
	Total Planning and Studies	150,000	0	150,000	0	0	0	0	0	0	0	0
Capital Plan Financing	Provincial/Federal Grants	-	-	-	-	-	-	-	-	-	-	-
	Debentures	-	-	-	-	-	-	-	-	-	-	-
	Water Reserve	9,048,106	197,667	689,999	15,000	75,000	4,216,692	100,000	-	3,753,748	-	-
	Total Capital Plan Financing	9,048,106	197,667	689,999	15,000	75,000	4,216,692	100,000	-	3,753,748	-	-

Appendix G: STASWSS Operating Expense and Revenue Forecast

DESCRIPTION	2021 FORECAST	2022 FORECAST	2023 FORECAST	2024 FORECAST	2025 FORECAST	2026 FORECAST	2027 FORECAST	2028 FORECAST	2029 FORECAST	2030 FORECAST	2031 FORECAST
<u>Operating</u>											
E/S Wage Allocation	47,195	48,139	49,102	50,084	51,086	52,108	53,150	54,213	55,297	56,403	57,531
Job Costing Labour	48,960	49,939	50,938	51,957	52,996	54,056	55,137	56,240	57,364	58,512	59,682
CMMS Support Fee	3,009	3,069	3,131	3,193	3,257	3,322	3,389	3,456	3,526	3,596	3,668
Secondary Water System - Contractor	102,000	104,040	106,121	108,243	110,408	112,616	114,869	117,166	119,509	121,899	124,337
Misc. Contracted Services	35,700	36,414	37,142	37,885	38,643	39,416	40,204	41,008	41,828	42,665	43,518
Job Costing Equipment	8,670	8,843	9,020	9,201	9,385	9,572	9,764	9,959	10,158	10,361	10,569
Job Costing Subcontractors	20,400	20,808	21,224	21,649	22,082	22,523	22,974	23,433	23,902	24,380	24,867
City Own Property Taxes	4,998	5,098	5,200	5,304	5,410	5,518	5,629	5,741	5,856	5,973	6,093
Insurance Expense	17,768	18,124	18,486	18,856	19,233	19,618	20,010	20,410	20,819	21,235	21,660
Communications	20,400	20,808	21,224	21,649	22,082	22,523	22,974	23,433	23,902	24,380	24,867
SCADA Maintenance	10,200	10,404	10,612	10,824	11,041	11,262	11,487	11,717	11,951	12,190	12,434
Electricity (Hydro)	141,750	148,838	156,279	164,093	172,298	180,913	189,959	199,456	209,429	219,901	230,896
Natural Gas - Heating	5,100	5,202	5,306	5,412	5,520	5,631	5,743	5,858	5,975	6,095	6,217
Chemicals	5,100	5,202	5,306	5,412	5,520	5,631	5,743	5,858	5,975	6,095	6,217
Job Costing Materials	1,020	1,040	1,061	1,082	1,104	1,126	1,149	1,172	1,195	1,219	1,243
Subtotal Operating	\$472,271	\$485,969	\$500,153	\$514,845	\$530,064	\$545,835	\$562,179	\$579,121	\$596,687	\$614,904	\$633,799
<u>Purchase of Water</u>											
Primary Supply Rate Forecast	0.8965	0.9234	0.9511	0.9796	1.0090	1.0393	1.0705	1.1026	1.1357	1.1697	1.2048
Forecasted Water Demand (m3)	1,998,025	2,027,727	2,056,888	2,086,157	2,115,698	2,145,838	2,172,717	2,199,880	2,227,332	2,255,078	2,283,122
Subtotal Purchase of Water	\$1,791,253	\$1,872,418	\$1,956,326	\$2,043,689	\$2,134,808	\$2,230,176	\$2,325,854	\$2,425,580	\$2,529,525	\$2,637,866	\$2,750,790
<u>EMPS Rental</u>											
Elgin Rental Fee	60,000	61,200	62,424	63,672	64,946	66,245	67,570	68,921	70,300	71,706	73,140
Subtotal EMPS Rental	\$60,000	\$61,200	\$62,424	\$63,672	\$64,946	\$66,245	\$67,570	\$68,921	\$70,300	\$71,706	\$73,140
TOTAL OPERATING EXPENDITURES	\$2,323,524	\$2,419,587	\$2,518,903	\$2,622,206	\$2,729,818	\$2,842,256	\$2,955,603	\$3,073,622	\$3,196,511	\$3,324,475	\$3,457,728
<u>Revenues</u>											
Total Operating Revenue	-	-	-	-	-	-	-	-	-	-	-
Water Billing Recovery	2,909,463	3,069,666	3,237,588	3,382,168	3,519,389	3,662,568	3,805,195	3,953,372	4,076,381	4,203,992	4,336,392
Reserve Fund Interest	51,942	50,900	64,619	78,785	11,226	25,242	42,153	59,988	3,708	21,380	39,398
TOTAL REVENUE	\$2,961,405	\$3,120,566	\$3,302,207	\$3,460,953	\$3,530,615	\$3,687,810	\$3,847,348	\$4,013,360	\$4,080,090	\$4,225,372	\$4,375,789