

CITY OF QUINTE WEST

Water and Wastewater Rate Study

AUGUST 14, 2024



quintewest.ca/water

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Introduction

This Water and Wastewater Rate Study is a document that analyzes the costs associated with providing water and wastewater throughout the City of Quinte West (City) at three different levels of service, and what the rates would need to be to provide those services. The City provides water to the areas of Trenton, Frankford, Batawa, Bayside and Young’s Cove through a fully connected water system comprised of 214 km of pipe and three treatment plants. The wastewater system is made up of five separated systems, each with their own treatment plant and collection systems totalling 136 km of pipe. The City currently charges \$25 per month for water and \$1.37 per cubic meter of water consumed. For wastewater the monthly base charge is \$39 per month and the consumption charge is \$2.20. The volume of wastewater is equal to the volume of water billed, as there are no meters to measure as wastewater leaves a property and enters the wastewater collection system.

2024 Water and Wastewater Rates		
Monthly Charge	Water	Wastewater
Base Charge	25	39*
Consumption Charge	1.37	2.20
Average Monthly Bill (200 m3)		\$124

*Wastewater Base Charges for Young’s Cove / Prince Edward Estates are not part of this study

For commercial customers that have a meter larger than 3/4" a base charge factor is multiplied by the normal base charge. For example, a commercial client with a 2" meter would have a monthly base charge of \$100 (\$25 x 4). Multi-residential customers pay the normal base charge, multiplied by the number of units in the building.

2024 Water and Wastewater Rates	
Meter Size	Base Charge Factor
5/8" & 3/4"	1
1"	1.3
1.5"	2.5
2"	4
3"	8
4"	13
6"	25
8"	40
10"	60
12"	85

Regulations

Safe Drinking Water Act: This act was also passed in 2002 with the purpose to recognize that the people of Ontario are entitled to expect their drinking water to be safe and to provide for the protection of human health and the prevention of drinking water health hazards through the control and regulation of drinking water systems and drinking water testing.

O.Reg 453/07 - Financial Plans: This regulation was made in 2007 under the Safe Drinking Water Act and generally followed the intent of the Sustainable Water and Sewage Systems Act. This regulation requires anyone who is applying for or renewing a municipal drinking-water license to have an approved financially viable financial plan for the drinking-water system. The City's municipal drinking water license is up for renewal September 2025. The financial plan must:

- Apply to a period of at least six years
- Detail the proposed or projected financial position
- Be publicly available, on request, to those who are served the by drinking-water system without charge
- Give a copy to the Ministry of Municipal Affairs and Housing

Service Forecast

To be able to calculate the required water and wastewater rate structure, the City must first forecast the demand for its service. The rates are charged using a monthly base charge and a volumetric rate multiplied by the quantity of water metered. Historical numbers were used to calculate a baseline and growth numbers driven by the City's Official Plan and Water and Wastewater Master Plan were used to forecast consumption required for growth within the serviced areas of the City.

There are trends showing that the average water consumption per person is decreasing over time, to ensure the City is not charging on the best case scenario number a conservation and economic factor of 5% are used to reduce the consumption forecast and give the City a margin of error should significant changes occur in customers behaviors over the study period.

Water		Consumption Forecast (Cubic Meters)									
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Residential	1,484,770	1,501,314	1,518,042	1,534,957	1,552,060	1,569,354	1,586,840	1,604,522	1,622,400	1,640,477
	Commercial	1,599,743	1,609,691	1,619,700	1,629,772	1,639,906	1,650,104	1,660,364	1,670,689	1,681,078	1,691,531
	Sub-total	3,084,513	3,111,005	3,137,742	3,164,729	3,191,966	3,219,457	3,247,205	3,275,211	3,303,478	3,332,008
Less: Conservation Factor	5%	-154,226	-155,550	-156,887	-158,236	-159,598	-160,973	-162,360	-163,761	-165,174	-166,600
Less: Economic Factor	5%	-154,226	-155,550	-156,887	-158,236	-159,598	-160,973	-162,360	-163,761	-165,174	-166,600
	Total	2,776,062	2,799,904	2,823,968	2,848,256	2,872,770	2,897,512	2,922,484	2,947,689	2,973,130	2,998,808

Wastewater		Consumption Forecast (Cubic Meters)									
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	Residential	1,208,725	1,222,193	1,235,811	1,249,581	1,263,504	1,277,583	1,291,818	1,306,212	1,320,767	1,335,483
	Commercial	996,401	1,002,596	1,008,831	1,015,104	1,021,416	1,027,768	1,034,159	1,040,589	1,047,060	1,053,571
	Sub-total	2,205,125	2,224,789	2,244,642	2,264,685	2,284,921	2,305,351	2,325,977	2,346,801	2,367,827	2,389,054
Less: Conservation Factor	5%	-110,256	-111,239	-112,232	-113,234	-114,246	-115,268	-116,299	-117,340	-118,391	-119,453
Less: Economic Factor	5%	-110,256	-111,239	-112,232	-113,234	-114,246	-115,268	-116,299	-117,340	-118,391	-119,453
	Total	1,984,613	2,002,310	2,020,178	2,038,217	2,056,429	2,074,815	2,093,379	2,112,121	2,131,044	2,150,149

Operating Costs

The operating costs forecasted for the years 2025 and 2026 were taken directly from the internal staff operating budget used to put together the 2024 Water and Wastewater budget book approved by council in late 2023. There have been some adjustments made by staff in preparation for this Water and Wastewater rate study.

It is important to note these costs are assuming there is not a relining program approved. Depending on the amount of money allocated to a relining program there could be potential operating cost reductions, please see Water Loss and Wastewater Inflow & Infiltration sections below for more details.

Water	Operating Cost Forecast (Not Including Debt)									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	1,678,150	1,829,200	1,884,076	1,940,598	1,998,816	2,058,781	2,120,544	2,184,160	2,249,685	2,317,176
Treatment Plants	3,178,900	3,269,600	3,367,688	3,468,719	3,572,780	3,679,964	3,790,363	3,904,073	4,021,196	4,141,831
Distribution	1,685,270	1,718,375	1,769,926	1,823,024	1,877,715	1,934,046	1,992,068	2,051,830	2,113,385	2,176,786
Meter Service	285,200	290,500	299,215	308,191	317,437	326,960	336,769	346,872	357,278	367,997
Other	175,550	175,550	180,817	186,241	191,828	197,583	203,511	209,616	215,904	222,381
Depreciation	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000
Sub-total	8,753,070	9,033,225	9,251,722	9,476,773	9,708,576	9,947,334	10,193,255	10,446,551	10,707,448	10,976,171
Less Depreciation	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000	-1,750,000
Total	7,003,070	7,283,225	7,501,722	7,726,773	7,958,576	8,197,334	8,443,255	8,696,551	8,957,448	9,226,171

Wastewater	Operating Cost Forecast (Not Including Debt)									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Administration	1,551,165	1,698,815	1,749,779	1,802,273	1,856,341	1,912,031	1,969,392	2,028,474	2,089,328	2,152,008
Treatment Plants	4,147,300	4,231,300	4,358,239	4,488,986	4,623,656	4,762,365	4,905,236	5,052,393	5,203,965	5,360,084
Distribution	404,100	410,600	422,918	435,606	448,674	462,134	475,998	490,278	504,986	520,136
Rodding	45,300	45,300	46,659	48,059	49,501	50,986	52,515	54,091	55,713	57,385
Depreciation	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000	1,955,000
Sub-total	8,102,865	8,341,015	8,532,595	8,729,924	8,933,172	9,142,516	9,358,141	9,580,236	9,808,992	10,044,613
Less Depreciation	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000	-1,955,000
Total	6,147,865	6,386,015	6,577,595	6,774,924	6,978,172	7,187,516	7,403,141	7,625,236	7,853,992	8,089,613

Capital Costs

A 20-year capital plan was developed and used for this rate study, the plan was designed to address the needs of the City as it continues to grow as well as the rehabilitation of the existing aging infrastructure. The primary inputs for this plan are the city’s asset management plan and draft development charge background study, with some additional updates from staff.

Projects to facilitate growth were updated to match the draft development charge background study that was brought to council in June of 2024. It is important to note that any changes to the development charge background study could have a significant impact on the rate study. Water and wastewater facility rehabilitation spend was based on the historical average, the City is currently undergoing facility assessments and will start to incorporate that data as they are completed.

The City is also proposing starting a new relining program; this is where a liner is pulled through an existing deteriorated pipe to help extend its lifespan by essentially creating a new pipe within the old one. This project would decrease water loss and wastewater inflow and infiltration, saving the City money on treatment and adding capacity back into these systems. Relining also helps extend the life of the City’s assets and is an efficient use of money costing only \$16 per meter for a year of useful life as opposed to \$19 per meter for a full pipe replacement.



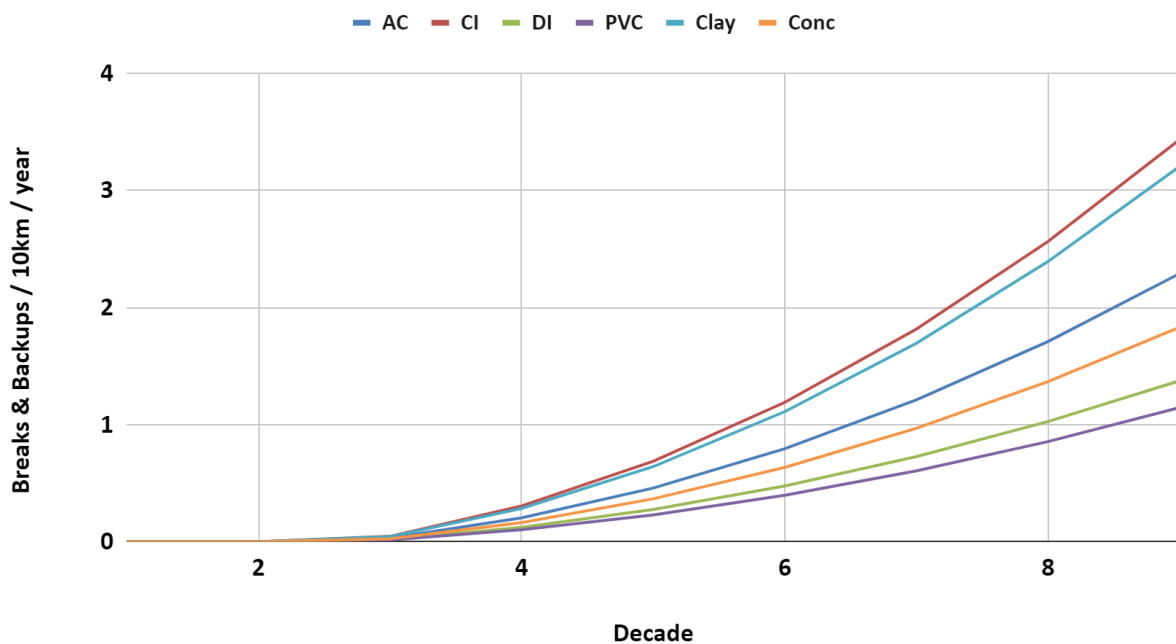
Project Type	Avg Cost / m	Lifespan	Cost / m / year
Full Replacement	1,920	100	19
Relining	730	45	16

Water Main Breaks and Sewer Backups

To help determine the required capital spend, it is important to consider the level of service the City would like to provide. One performance category is the reliability of the water distribution and wastewater collection systems. We can track this by using historical water main breaks and sewer backups to help predict what we expect to happen in the future.

To do this, the last four years of work orders were analyzed and sorted by the age and materials of the pipes. There are very clear trends that were observed, with pipe performance getting exponentially worse as they approach the end of their useful life. There were also clear differences depending on the material of the pipe, with a material like PVC performing better than Cast Iron pipes.

Pipe Breaks & Backups by Age and Material



Right now the City of Quinte West has averaged 17 breaks and backups over the last four years, which is in line with what the curves in the chart above would show. However, if the City were to just let the pipe system age without doing any rehabilitation work, the expected breaks and backups would double to 35 per year. Below multiple alternatives of capital spend will be provided with the breaks and backups per year calculated for each to allow council to make a fully informed decision on the level of service they wish to provide.

Water Loss

Another way the City can measure the reliability of the water distribution system is by the amount of water loss. Water loss is the difference in the amount of water the treatment plant produces and the amount of water that is billed. For example, the 2022 Water Audit showed that all of the Quinte West water treatment plants produced just over 5.5 million cubic meters of treated water, but only billed for just under 3.2 million cubic meters. Some unbilled consumption is authorized, like water used for splash pads, water main flushing or fire flow testing. Old water meters can also drive this difference up with reading inaccuracies as parts in the meter deteriorate, however the City has recently completed a project to replace all of the old meters which should reduce much of that water loss. By far the biggest reason for water loss however, is water leaking out of pipes. By increasing funding for water main replacements and relining the City could reduce the amount of water loss and save on the variable costs associated with treating that water.

Water - 2023 Internal Data				
Treatment Plant	Volume (m3)	Hydro	Chemicals	Variable Costs/ m3
Trenton WTP	3,484,950	313,558	249,977	0.16
Bayside WTP	1,308,807	178,573	164,937	0.26
Frankford WTP	469,708	137,490	83,342	0.47
Total	5,263,465	629,621	498,256	0.21

Over the last five years an average of 36% of the water treated in Quinte West ends up lost. The industry has an ideal benchmark of 10% water loss, however this is an unrealistic target for most municipalities. Some of the best municipalities are around 20% water loss, and would be a reasonable target for the City of Quinte West. By reaching this goal, the potential long-term savings would be \$194k per year in hydro and chemical costs.

Water			
Year	Consumption Billed	Consumption Treated	Water Loss
2023	3,216,919	5,263,465	2,046,546
2022	3,295,141	5,535,504	2,240,363
2021	3,325,764	5,174,937	1,849,174
2020	3,638,079	5,708,243	2,070,163
2019	3,685,929	5,255,342	1,569,412
5 Year Avg Water Loss %			36.3%
Goal Water Loss %			20.0%
Potential Yearly Savings			193,704

Wastewater Inflow & Infiltration

The City can also measure the reliability of the wastewater collection system through the amount of inflow and infiltration. Wastewater inflow and infiltration is when groundwater enters the sewer system, and is brought to the wastewater treatment plant and is treated. This amount of inflow and infiltration can fluctuate fairly significantly year over year depending on the amount of rain. Similar to water, by increasing funding for wastewater pipe replacements and relining the City could reduce the amount of inflow and infiltration significantly and save on the variable costs associated with treating that water.

Wastewater - 2023 Internal Data				
Treatment Plant	Volume (m3)	Hydro	Chemicals	Variable Costs/ m3
Batawa WWTP	172,301	36,000	8,000	0.26
Frankford WWTP	891,654	159,300	32,000	0.21
Stonecrest WWTP	43,018	49,300	23,100	1.68
Trenton WWTP	4,456,832	527,000	287,000	0.18
Youngs Cove WWTP	19,924	47,500	26,800	3.73
Total	5,583,729	819,100	376,900	0.21

Over the last five years an average of 56% of the wastewater treated in Quinte West comes from groundwater. If the City of Quinte West could lower this number to the same 20% goal as we used for water, the potential long-term savings would be \$427k per year in hydro and chemical costs.

Wastewater			
Year	Consumption Billed	Consumption Treated	I & I
2023	2,236,400	5,583,729	3,347,329
2022	2,319,654	4,912,982	2,593,328
2021	2,362,036	4,803,079	2,441,042
2020	2,497,971	5,151,060	2,653,089
2019	2,415,136	6,426,700	4,011,563
5 Year Avg I & I %			56.0%
Goal I & I %			20.0%
Potential Yearly Savings			426,715

Proposed Level of Service

Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure requires municipalities to have an approved asset management plan stating the levels of service it proposes to provide over the next 10 years, by July 1, 2025. Three proposed level of service scenarios are described below, detailing the financial and service level impacts.

These proposed levels of service really target the water distribution and wastewater collection systems. The City is looking for feedback from council and the public on what level of service they would like to provide, and understand the different risks associated with different amounts of funding. Below are some assumptions that the City made and are the same in all three scenarios listed below.

Assumptions

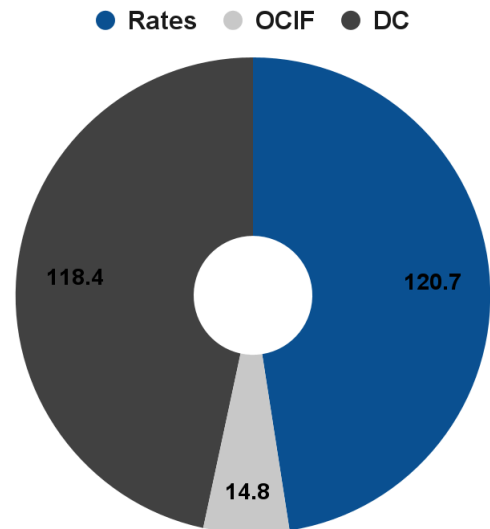
- **Outside funding (OCIF, Development Charges):** Ontario Community Infrastructure Fund (OCIF) funding was kept at 2024 levels for the forecast period, and development charges were taken directly from draft development charge background study brought to council in June of 2024 in all scenarios.
- **Consumption forecast:** It was assumed consumption would be the same in all scenarios.
- **Growth related infrastructure projects:** It was assumed that all growth projects would be fully funded in all scenarios.
- **Facility rehabilitation projects:** Staff decided that capital projects at treatment plants should be fully funded in any scenario, the risks associated with underfunding these projects is not tolerable.
- **Debt required for rehabilitation projects:** All scenarios were kept to the same level of debt for rehabilitation projects so that they could be compared apples to apples.
- **Commercial / Industrial consumption:** Amount of commercial and industrial consumption stays at 2024 levels, does not jump back up to historical average.
- **DC Exemptions:** It was assumed that 15% of collectible DC's charges will be exempt due to Affordable Housing and Rental Housing exemptions.

Option 1 - Maintain current service level

The first option maintains the current service level. It follows the ideal spend recommended by asset management, this means pipes will be replaced when they reach the end of their useful life and a relining program would be started.

This option supports the City's water system working as effectively as possible to meet current and anticipated future demand, and reduces the risk of water main breaks and service disruptions. This option would require an increase to the average monthly water bill of \$8.30 or 5.2% per year over the next 10 years.

10 Year Spend by Funding Source



	Water / Wastewater Rate Projections									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Base Charge	28	31	34	35	36	37	38	39	41	42
Sewer Base Charge	41	42	43	44	46	47	48	50	51	53
Water Consumption Rate	1.59	1.83	2.07	2.29	2.50	2.70	2.78	2.86	2.95	3.04
Sewer Consumption Rate	2.40	2.61	2.85	3.08	3.17	3.26	3.36	3.46	3.57	3.67

Monthly Bill: Average Family (3 people)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Monthly Bill	135	147	159	169	176	184	189	195	201	207
Y/Y Variance (%)	9.7%	8.5%	8.1%	6.2%	4.4%	4.2%	3.0%	3.0%	3.0%	3.0%
Y/Y Variance (\$)	12.0	11.6	11.9	9.9	7.4	7.4	5.5	5.7	5.8	6.0

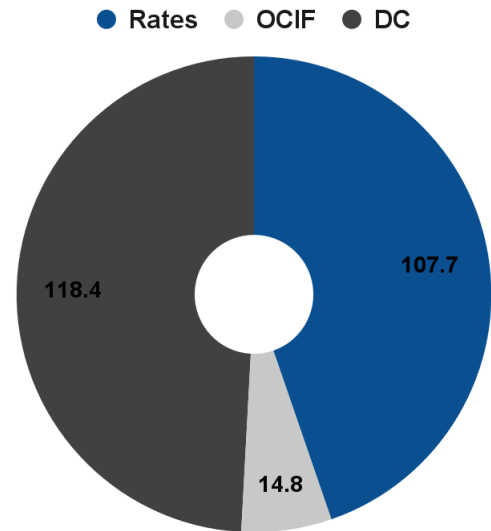
Option 1 - Maintain current service level			
Level of Service	Goal	Current Performance	20 Year Performance
Water pipe breaks per year	10.0	10.0	10.2
Sewer backups per year	8.0	7.7	7.5
Water loss	20%	36%	20%
Wastewater inflow & infiltration	20%	56%	20%
Water pipe age	45	36	45
Wastewater pipe age	45	40	42

Option 2 - Reduce current service level

The second option reduces the current service levels the City provides. It only funds 75% of the ideal spend recommended by asset management and a smaller pipe relining program.

This option maintains some ability to meet anticipated future demand levels and limit the risk of service disruptions, but makes some sacrifices including delaying replacing pipes until after their expected useful life. This option would require an increase of an average monthly water bill of \$7.10 or 4.6% per year over the next 10 years.

10 Year Spend by Funding Source



	Water / Wastewater Rate Projections									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Base Charge	27	28	29	30	31	31	32	33	34	35
Sewer Base Charge	40	41	42	43	44	44	45	47	48	50
Water Consumption Rate	1.59	1.83	2.07	2.29	2.50	2.70	2.78	2.86	2.95	3.04
Sewer Consumption Rate	2.38	2.57	2.77	2.99	3.08	3.18	3.27	3.37	3.47	3.57

Monthly Bill: Average Family (3 people)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	133	142	152	161	168	173	178	183	189	195
Y/Y Variance (%)	7.8%	6.9%	6.6%	6.3%	4.3%	2.9%	3.0%	3.0%	3.0%	3.0%
Y/Y Variance (\$)	9.6	9.1	9.4	9.5	6.9	4.9	5.2	5.3	5.5	5.7

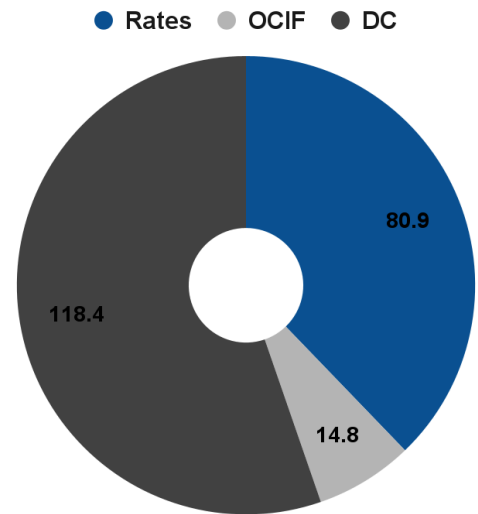
Option 2 - Reduce current service level			
Level of Service	Goal	Current Performance	20 Year Performance
Water pipe breaks per year	10.0	10.0	11.8
Sewer backups per year	8.0	7.7	8.7
Water loss	20%	36%	24%
Wastewater inflow & infiltration	20%	56%	29%
Water pipe age	45	36	48
Wastewater pipe age	45	40	46

Option 3 - Keep rates low, risk service delivery

The third option keeps rates as low as possible. This means there will only be enough to replace a couple hundred meters of pipe and nothing leftover for a relining program.

This option limits system maintenance work, delays pipeline replacement until well beyond their useful life, and risks increased water loss and more frequent service disruptions. This option would require an increase of an average monthly water bill of \$5.40 or 3.7% per year over the next 10 years.

10 Year Spend by Funding Source



	Water / Wastewater Rate Projections									
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Base Charge	25	26	26	27	27	28	28	29	29	30
Sewer Base Charge	40	40	41	42	43	43	44	45	46	47
Water Consumption Rate	1.56	1.75	1.92	2.12	2.20	2.29	2.38	2.48	2.58	2.68
Sewer Consumption Rate	2.33	2.47	2.57	2.67	2.78	2.89	3.01	3.13	3.25	3.38

Monthly Bill: Average Family (3 people)	130	137	142	149	153	158	162	167	172	178
Y/Y Variance (%)	5.3%	5.1%	4.2%	4.3%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Y/Y Variance (\$)	6.5	6.6	5.8	6.1	4.4	4.6	4.7	4.9	5.1	5.2

Option 3 - Keep rates low, risk service delivery			
Level of Service	Goal	Current Performance	20 Year Performance
Water pipe breaks per year	10.0	10.0	18.2
Sewer backups per year	8.0	7.7	12.9
Water loss	20%	36%	36%
Wastewater inflow & infiltration	20%	56%	56%
Water pipe age	45	36	54
Wastewater pipe age	45	40	54

Overview of Options

The average Quinte West Water and Wastewater bill has increased 18% between 2020 and 2024, with the last rate study done in 2017. This is while the non-residential construction index has increased 33%, operating costs have increased 26%, commercial/industrial consumption has fallen well below historical levels and major growth related projects need to be undertaken. The City is also expected to end 2024 with a little less than \$7 million in water and wastewater capital reserves, and debt at elevated levels.

The three proposed levels of service in this study highlight the differences in the quality of service provided by the City with increased capital spend, and the financial impact that will have on customers.

If the City wishes to minimize risk in its water and wastewater infrastructure, while also reducing water loss and wastewater I&I it will require an average bill increase of 5.2% over the next ten years. If the City wishes to make steps towards reaching its asset management goals, but feels getting to full ideal spend is not tolerable in the short term it could increase the average bill by 4.6% a year to reach 75% of its ideal spend. Finally, if it wishes to continue spending as it has historically, accepting that the quality of the service they are providing will drop significantly, the average bill will need to increase an average of 3.7% over the next ten years.

	Maintain current service level	Reduce current service level	Keep rates low, risk service delivery
Current average bill	124	124	124
2034 average bill	207	195	178
Average yearly increase	5.2%	4.6%	3.7%
Water pipe breaks per year	10.2	11.8	18.2
Sewer backups per year	7.5	8.7	12.9
2044 repairs per year	17.7	20.5	31.1
Water loss	20%	24%	36%
Wastewater I&I	20%	29%	56%
2044 total loss and I&I	20%	27%	46%
Water pipe age	45	48	54
Wastewater pipe age	42	46	54
2044 avg age of pipes	44	47	54