Watson & Associates ECONOMISTS LTD.

DILLON CONSULTING

Municipality of North Middlesex Water, Wastewater, and Stormwater Rate Study

Council Presentation

March 11, 2020

Study Purpose

- Identify all current and future water, wastewater and stormwater system capital needs;
- Identify cost recovery options for capital;
- Estimate future operating costs over the next 10 years; and
- Recommend new rates to recover the cost of the water, wastewater, and stormwater systems.

Legislation for Water and Wastewater

Since Walkerton, new legislation has been passed by the Province to enhance the provision of services. These include the following:

- Safe Drinking Water Act;
- Sustainable Water and Sewage Systems Act;
- O.Reg. 453/07 - Safe Drinking Water Act;
- Clean Water Act; and
- Water Opportunities Act.

Further Requirements:

- Municipal Infrastructure Strategy
- Infrastructure for Jobs and Prosperity Act, 2015

Water Opportunities Act, 2010

- The Act provides for the following elements:
  - Foster innovative water, wastewater and stormwater technologies, services and practices in the private and public sectors;
  - Prepare Water Conservation Plans to attain water conservation targets to be established by regulations; and
  - Prepare Sustainability Plans for Water, Wastewater and Stormwater Services.

Water Opportunities Act, 2010

- On November 29, 2010, Bill 72, The *Water Opportunities Act,* 2010 received Royal Assent (note: only Regulation 40/11 - Water Technology Acceleration Project has been passed).
- Part 3 of the Act provides for the preparation of sustainability plans:
  - The Act extends from the water financial plans and requires a more detailed review of the water financial plan and requires a full plan for wastewater and storm water services; and
  - Regulations will provide performance targets for each service – these targets may vary based on the jurisdiction of the regulated entity or the class of entity.

Water Opportunities Act, 2010

- The Financial Plan shall include:
  - An asset management plan for the physical infrastructure;
  - A financial plan;
  - For water, a conservation plan;
  - An assessment of risks that may interfere with the future delivery of the municipal service, including, if required by the regulations, the risks posed by climate change and a plan to deal with those risks; and
  - Strategies for maintaining and improving the municipal service to ensure future demand can be satisfied, consider technologies to improve the service and potential increased co-operation with other municipal service providers.
- The rate study would provide inputs required to complete the Financial Plan required for licensing approval

2019 Rates

Municipality of North Middlesex	
2019 - Water Billing Rates	
Base Charge - Monthly	
All Areas	$20.65
Volume Charge	
$ 1.850	per m^3

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

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

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

Note: Currently stormwater is funded through taxes

Customer Profile

Metered	Water	Wastewater	Stormwater
Ward 1 - Parkhill	697	680	699
Ward 2 - Ailsa Craig	391	391	391
Ward 3 - McGillivray	604		
Ward 4 - Nairn/East Williams	337	130	130
Ward 5 - West Williams	320		
Total	**2,349**	**1,201**	**1,220**

Annual Volume Ranges		Total Customers	% of users in range or less (cumulative)
-	250	**1,756**	75%
250	300	**137**	81%
300	400	**216**	90%
400	500	**54**	92%
500	600	**27**	93%
600	14,161	**160**	100%
Total		**2,350**	

Water Forecast Users

Water Customer Forecast	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350	2,350
New - Growth	-	10	29	48	67	85	102	119	136	153	171
Total	**2,350**	**2,360**	**2,379**	**2,398**	**2,417**	**2,435**	**2,452**	**2,469**	**2,486**	**2,503**	**2,521**

Water Volume Forecast (m^3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141	729,141
New - Growth	-	1,800	5,220	8,640	12,060	15,300	18,360	21,420	24,480	27,540	30,780
Total	**729,141**	**730,941**	**734,361**	**737,781**	**741,201**	**744,441**	**747,501**	**750,561**	**753,621**	**756,681**	**759,921**

Water Purchases	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Billable Volumes	729,141	730,941	734,361	737,781	741,201	744,441	747,501	750,561	753,621	756,681	759,921
Consumed Water as a % of Purchased Water	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
Total Purchased Water	1,358,852	1,362,206	1,368,580	1,374,954	1,381,327	1,387,365	1,393,068	1,398,771	1,404,474	1,410,176	1,416,214
Purchased Water Rates	0.4991	0.5141	0.5295	0.5454	0.5618	0.5787	0.5961	0.6140	0.6324	0.6450	0.6579
Total	**678,203**	**700,310**	**724,663**	**749,900**	**776,030**	**802,868**	**830,408**	**858,845**	**888,189**	**909,564**	**931,728**

Customer = Household

Wastewater and Stormwater Forecast Users

Wastewater Customer Forecast	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201
New - Growth	-	10	29	48	67	85	102	119	136	153	171
Total	**1,201**	**1,211**	**1,230**	**1,249**	**1,268**	**1,286**	**1,303**	**1,320**	**1,337**	**1,354**	**1,372**

Wastewater Flows Forecast (m^3)	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363	275,363
New	-	1,800	5,220	8,640	12,060	15,300	18,360	21,420	24,480	27,540	30,780
Total	**275,363**	**277,163**	**280,583**	**284,003**	**287,423**	**290,663**	**293,723**	**296,783**	**299,843**	**302,903**	**306,143**

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

Stormwater Customer Forecast	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Existing	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220	1,220
New - Growth	-	10	29	48	67	85	102	119	136	153	171
Total	**1,220**	**1,230**	**1,249**	**1,268**	**1,287**	**1,305**	**1,322**	**1,339**	**1,356**	**1,373**	**1,391**

Capital Infrastructure

- Capital needs were developed by Municipality staff based on anticipated needs through work with Dillon Consulting.
- Works were identified based on the 2019 budget, the 2020 to 2029 capital forecast, and review of capital infrastructure replacement
- Capital works were identified by
  - Need;
  - Timing; and
  - Costs.

Water System Capital Needs 2020 – 2029

(Uninflated $)

Description	Total 2020 to 2029	Years Undertaken
Capital Expenditures		
SCADA IMPLEMNTATION West Williams Booster station	150,000	2020
SCADA, Electrical, Process Overhaul Parkhill Resevoir	425,000	2021 to 2022
SCADA, Electrical, Process Overhaul Mt.Carmel Resevoir	350,000	2022 to 2023
METER PIT INSTALLTIONS	1,760,000	2020 to 2029
WATER DISTRIBUTION MASTER PLAN	50,000	2020
DENFIELD RD PRESSURE PROJECT (WIP from 2019)	300,000	2020
WATERMAIN REPLACEMENT (Leonard Ave- tain to PH Main St)	134,900	2021
WATERMAIN REPLACEMENT (Andross - Catherine to PH Main St)	121,600	2022
WATERMAIN REPLACEMENT (PH Main St - Elginfield to Parkhill Drive)	2,113,200	2023
WATERMAIN REPLACEMENT (Ann St - Leonard to John)	237,500	2024
WATER TOWER INSTALLATION	5,000,000	2020 to 2022
MCGILIVARAY BOOSTER STATION	25,000	2027
MT.CARMEL RESEVOIR	160,500	2021 to 2025
PARKHILL RESEVOIR	484,000	2020 to 2025 & 2027
Waterline Takeoffs	1,500,000	2020 to 2029
Lifecycle:		
Water Facilities	724,000	2020, 2022, 2024, 2025
Hydrants	532,000	2020, 2022, 2024, 2025, 2026, 2028
Total Capital Needs	**14,067,700**	

Wastewater Capital System Needs 2020–2029

(Uninflated $)

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

Stormwater Capital System Needs 2020–2029

(Uninflated $)

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

Capital Financing Options

- ✓ Reserves
- ✓ Development Charges
- ✓ Debt
- ✓ Operating Budget Transfers (Funding Reserves)
- Grants
- Municipal Act (Part 12)

Reserve Balances – December 31, 2019

Reserve	Estimated Dec. 31, 2019
Water	
Capital Reserve	1,503,638
Development Charges Reserve Fund	23,540
Lifecycle Reserve Fund	-
Wastewater	
Capital Reserve	484,036
Development Charges Reserve Fund	466,661
Lifecycle Reserve Fund	-
Stormwater	
Capital Reserve	-
Development Charges Reserve Fund	20,220
Lifecycle Reserve Fund	-

Rate Structure Options in Report

Water and Wastewater

- Two Options are Provided:
  1. Option 1 – Base Charge and Volume Rate for volume in excess of 250 cu.m per year – Where base charge covers 90% of anticipated costs
  2. Option 2 – Base Charge and Volume Rate – Where base charge covers 100% of anticipated costs and a premium of $1 per cu.m is applied for volumes in excess of historical averages

Stormwater

- One Rate Structure is Provided:
  1. Flat rate only

Note: charges calculated on combined system

Proposed Capital Financing Programs 2020-2029

Inflated $

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

Lifecycle Infrastructure Costs

- The age of the water system dates back to the early 1950's;
- The age of the wastewater system date back to the early 1980's;
- Total replacement value of existing water infrastructure is $264.11 million;
- Total replacement value of existing wastewater infrastructure is $53.16 million;
- Total replacement value of existing stormwater infrastructure is $35.00 million;
- This provides for a "per customer" investment by the Municipality of:

Service	Total Replacement Value	# of Existing Users	Amount Invested per User ($)
Water	264,108,140	2,349	$112,434
Wastewater	53,156,745	1,201	$44,260
Stormwater	34,998,000	1,220	$28,687
Total	**317,264,884**		**$156,695**

Summary of Water and Wastewater Asset Inventory

Area	Total Replacement Value	Suggested amount to be included in 10-year forecast based on estimated life	Amount included in 10-year forecast	Net Replacement for Future Lifecycle	Annual Lifecycle Replacement
Water					
Water Facilities	4,379,500	724,000			201,048
Watermains	257,421,400	494,000	3,908,000	260,200,140	9,967,418
Hydrants	1,099,000	532,000			29,938
Meters	1,208,240	-			65,910
Total Water	**264,108,140**	**1,750,000**	**3,908,000**	**260,200,140**	**10,264,314**
Wastewater					
Wastewater Facilities	17,269,000	703,932	13,169,568	39,987,176	680,920
Sanitary Sewers	35,887,745	-			1,362,191
Total Wastewater	**53,156,745**	**703,932**	**13,169,568**	**39,987,176**	**2,043,111**
Stormwater					
Stormwater Linear	34,998,000	-	-	34,998,000	1,363,151
Total Stormwater	**34,998,000**	**-**	**-**	**34,998,000**	**1,363,151**
Total	**352,262,884**	**2,453,932**	**17,077,568**	**335,185,316**	**13,670,575**

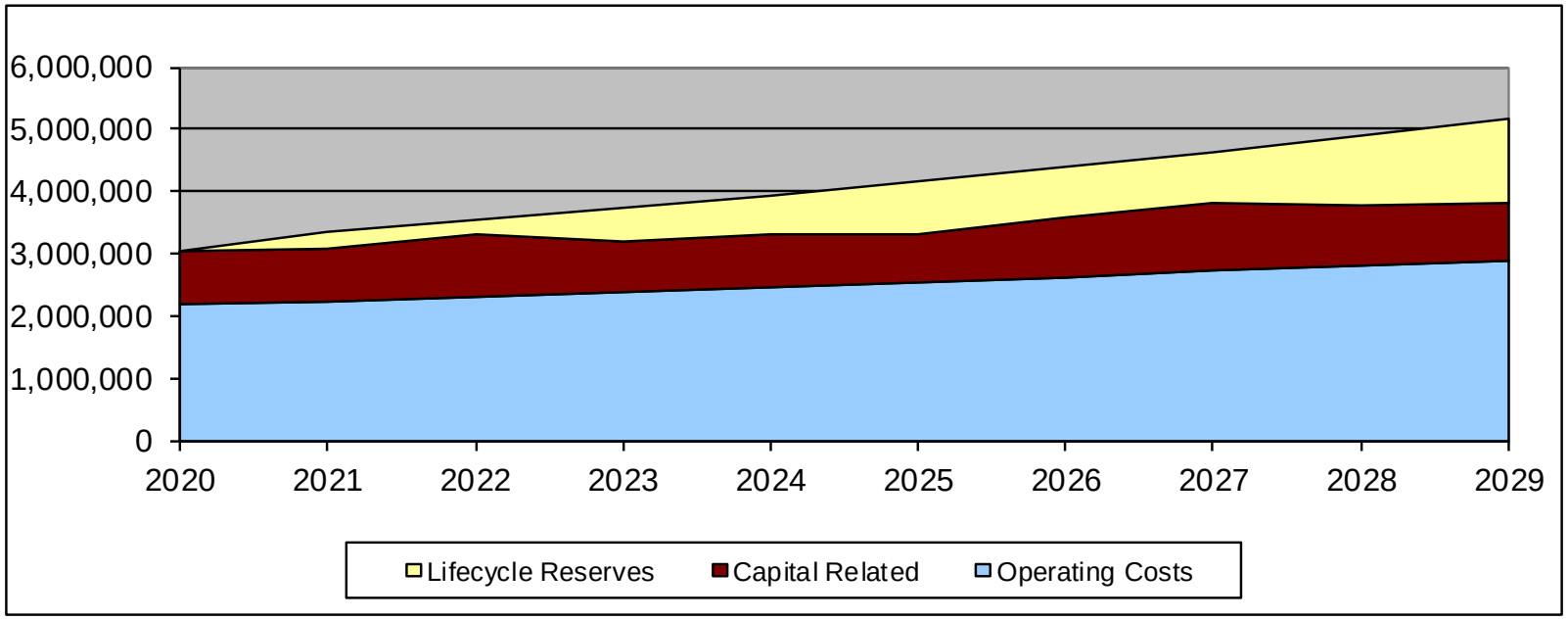
Investment per customer is $112,386 for water and $44,260 for wastewater and $28,687 for stormwater

Operating Budgets

- Operating expenditures are increasing over the forecast to recognize:
  - Inflationary Impacts
    - 3% to 3.5% for most operating expenditures

Water Operating Budget

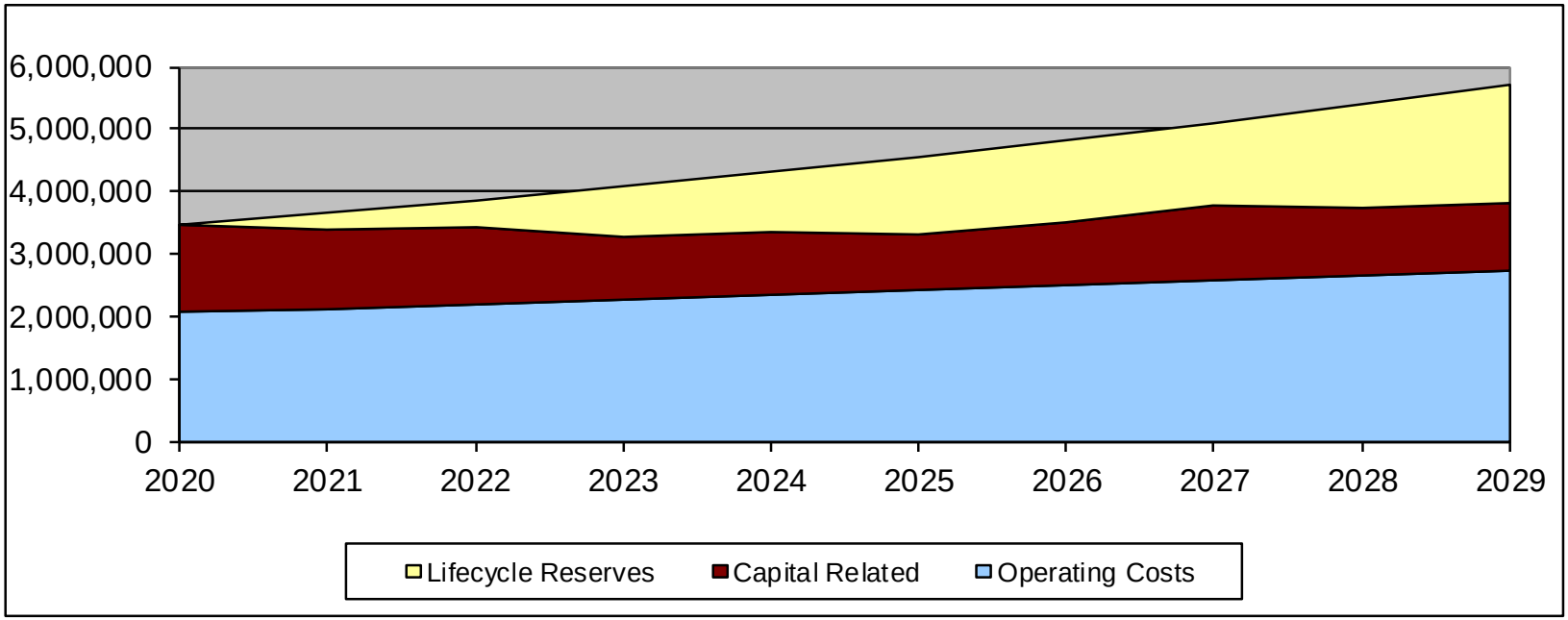
Option 1 – Base Charge (90%) and Volume Rate



Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Operating Costs	2,060,134	2,123,395	2,193,885	2,266,915	2,342,388	2,420,395	2,501,249	2,585,095	2,663,217	2,744,566
Capital Related	1,288,187	1,163,957	1,144,223	910,474	886,685	750,434	881,793	1,063,105	928,948	928,405
Lifecycle Reserves	1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Total	**3,349,584**	**3,549,698**	**3,752,125**	**3,969,083**	**4,197,595**	**4,438,250**	**4,695,399**	**4,966,391**	**5,255,468**	**5,559,974**

Water Operating Budget

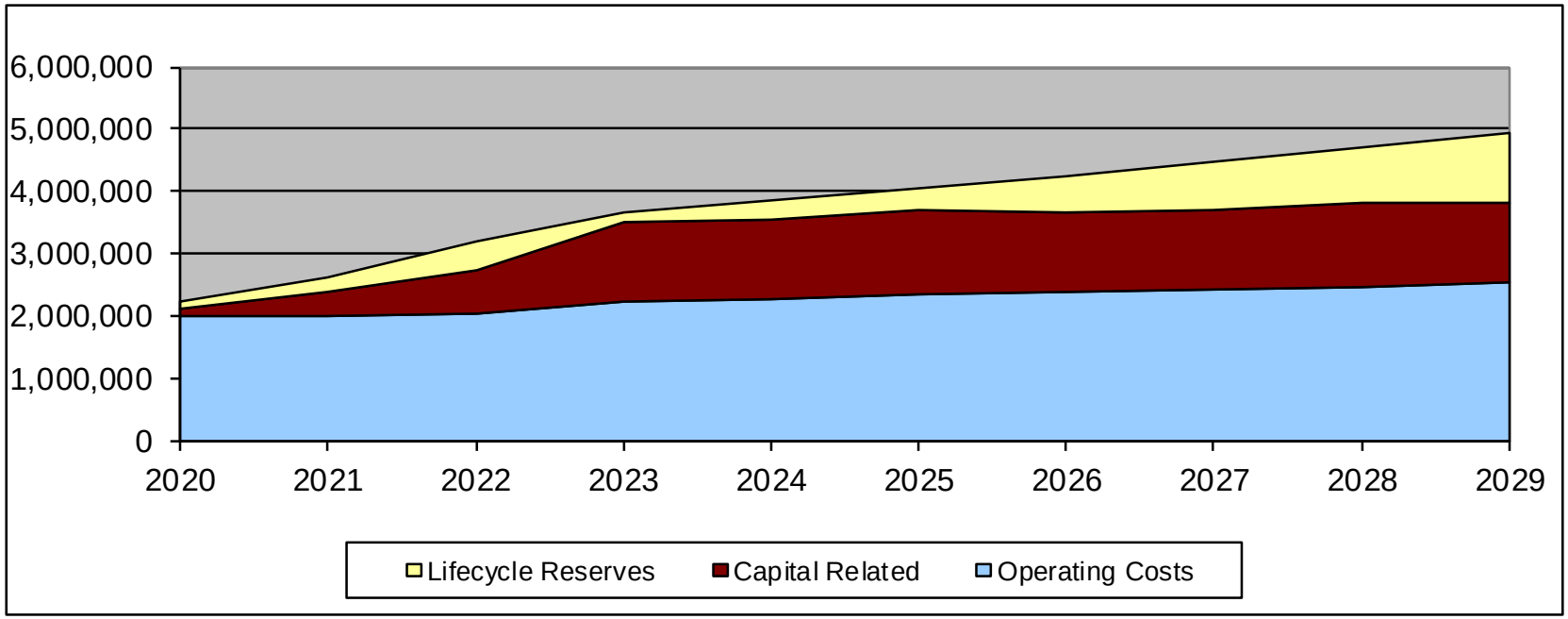
Option 2 – Base Charge (100%) and Volume Rate



Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Operating Costs	2,060,134	2,123,395	2,193,885	2,266,915	2,342,388	2,420,395	2,501,249	2,585,095	2,663,217	2,744,566
Capital Related	1,388,404	1,261,763	1,248,883	1,019,935	1,002,502	874,256	1,011,847	1,201,244	1,073,614	1,081,681
Lifecycle Reserves	1,263	262,346	414,017	791,694	968,522	1,267,422	1,312,357	1,318,191	1,663,303	1,887,003
Total	**3,449,802**	**3,647,504**	**3,856,786**	**4,078,543**	**4,313,412**	**4,562,073**	**4,825,453**	**5,104,530**	**5,400,134**	**5,713,250**

Wastewater Operating Budget

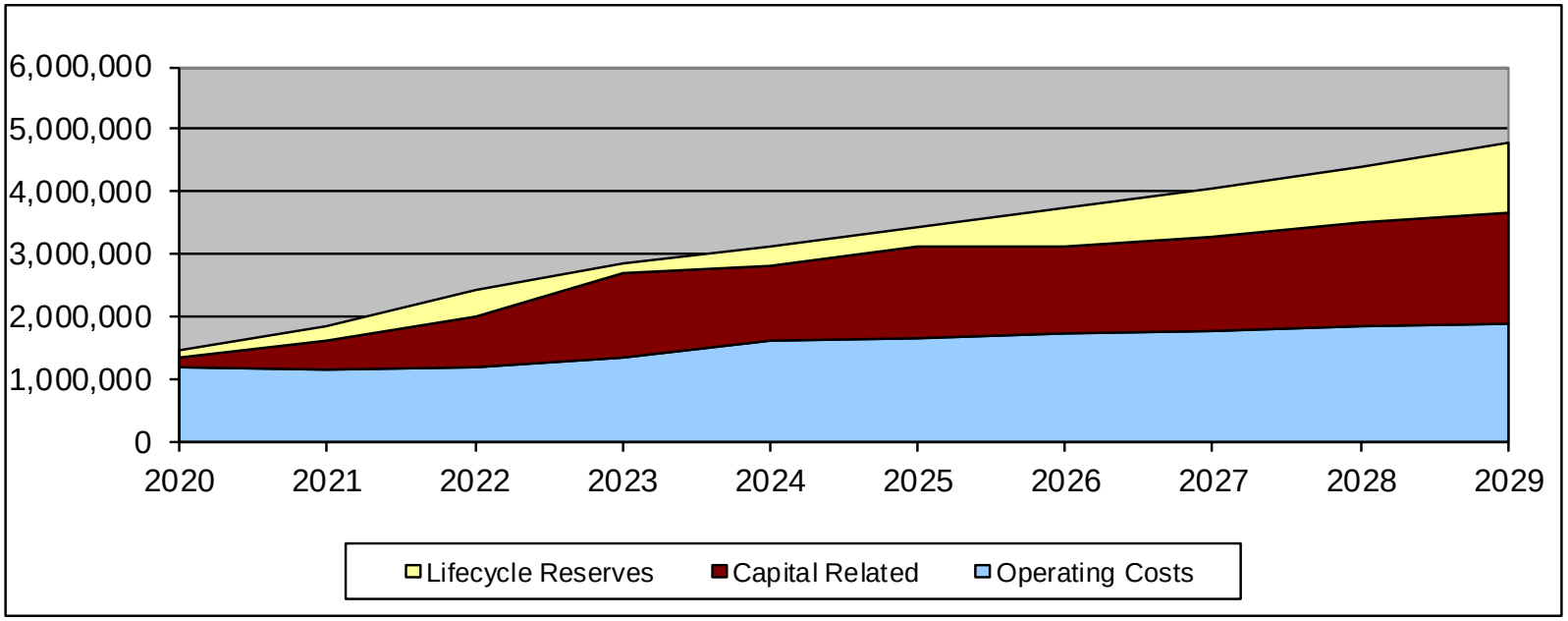
Option 1 – Base Charge (90%) and Volume Rate



Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Operating Costs	1,190,151	1,140,728	1,184,190	1,321,787	1,593,674	1,648,707	1,706,028	1,765,737	1,827,936	1,892,733
Capital Related	419,031	721,158	974,375	1,517,371	1,347,621	1,524,658	1,486,085	1,582,312	1,759,794	1,858,124
Lifecycle Reserves	100,000	224,240	442,209	166,729	303,692	334,704	607,247	777,651	899,089	1,138,211
Total	**1,709,182**	**2,086,125**	**2,600,774**	**3,005,887**	**3,244,987**	**3,508,068**	**3,799,361**	**4,125,700**	**4,486,819**	**4,889,069**

Wastewater Operating Budget

Option 2 – Base Charge (100%) and Volume Rate



Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Operating Costs	1,190,151	1,140,728	1,184,190	1,321,787	1,593,674	1,648,707	1,706,028	1,765,737	1,827,936	1,892,733
Capital Related	150,846	461,418	793,323	1,365,535	1,231,817	1,454,687	1,418,099	1,505,258	1,670,274	1,749,543
Lifecycle Reserves	100,000	224,227	442,202	167,156	305,142	336,150	603,945	774,340	895,775	1,134,881
Total	**1,440,997**	**1,826,373**	**2,419,715**	**2,854,477**	**3,130,633**	**3,439,543**	**3,728,073**	**4,045,335**	**4,393,984**	**4,777,158**

Average Annual Residential Bill – 180 cu.m

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

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

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

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

Factors Resulting in Calculated Rates
Water

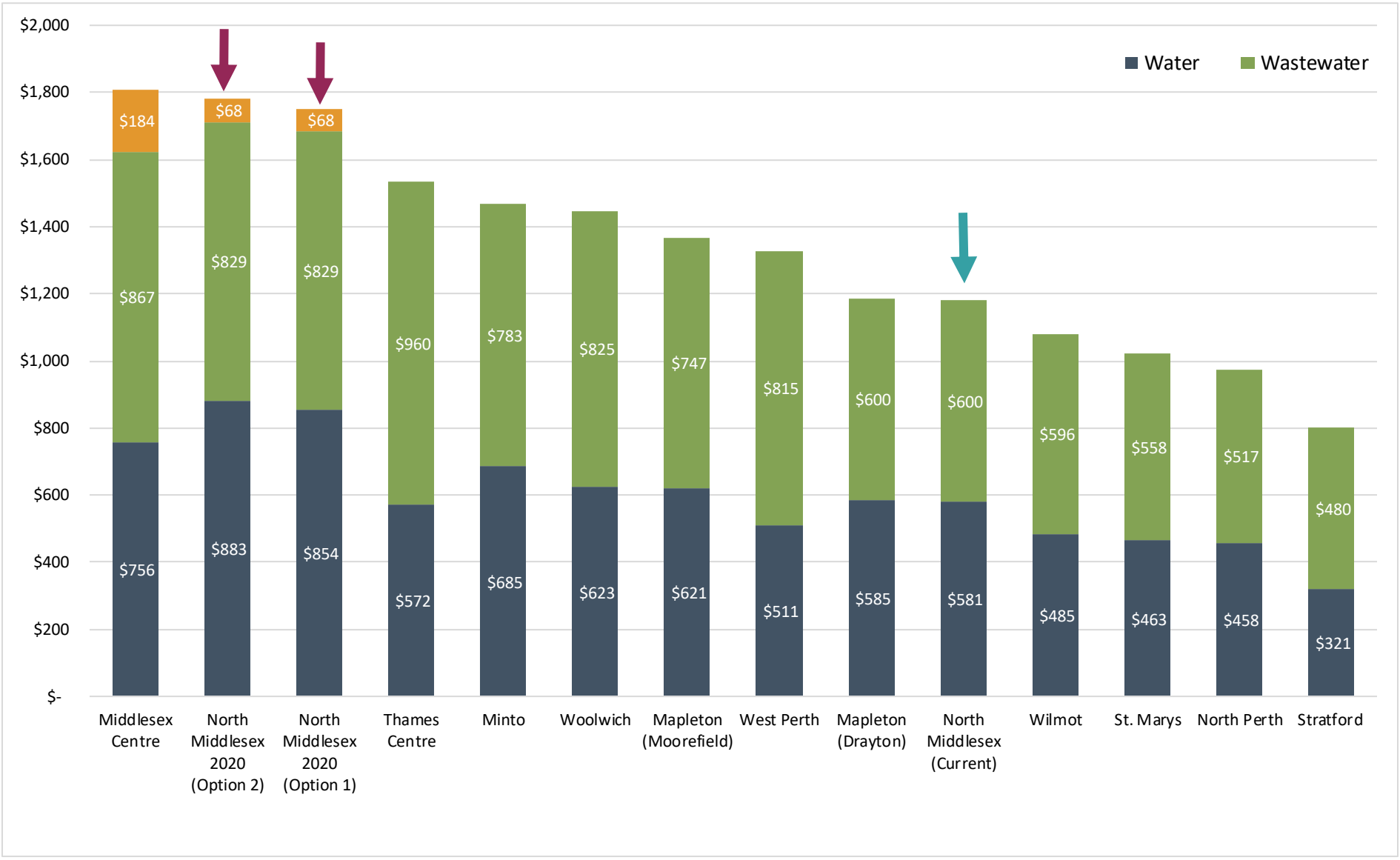
- High Rate of Water Loss – approximately 50% annually
- Lifecycle Costs for Water - The Municipality has an extensive amount of linear water infrastructure. The length of watermains in the Municipality totals 473.76km which provides for a total lifecycle replacement cost of approximately $257.42 million with a customer count of only 2,350
- Large Capital Costs – Water tower (~$5.23M)

Factors Resulting in Calculated Rates

Wastewater

- Large Capital Costs – Parkhill WWTP (~$18M) in next couple years to address capacity constraints (i.e. sludge) and to foster growth
- Allocation of Costs Previously Funded Through Taxes

Comparison of Residential Annual Water, Wastewater, and Stormwater Bill (based on 180 cu.m)



Matters for Council's Consideration

1. Engage the Province as soon as possible to discuss funding assistance
2. Consider the Capital Program;
3. Consider the Operating Program;
4. Consider the Proposed Water Rates and Options;
5. Consider the Proposed Wastewater Rates and Options;
6. Consider the Proposed Stormwater Rates; and
7. Consider updating the Municipality's Development Charges Background Study.