AECOM

To	Clinton	Page	1 of 11
CC	Lambton Area Water Supply System		
Subject	Technical Memo – Conceptual Engineering Design Options and Cost Estimate Related to Planned Growth – Financial Plan		
From	JME Maxwell, Semyon Chaymann, Benny Wan		
Date	September 17, 2019	Project Number	60557190

Financial Plan for Paying for Capital Costs Related to Planned Growth

The financial plan for paying for the capital costs associated with the forecast water supply projects is presented in 3 sections. The first section forecasts the water demand over 20 years for each of the Lambton Area Water Supply System (LAWSS) municipalities. The second section then provides the capital cost and timing details of the forecast water supply projects required to meet LAWSS planned growth. The third section has two parts. The first part determines the impact of development charges and changes to the water rate in funding the forecast projects capital costs with a total system based water rate calculation. The second part of this section calculates different changes in the water rate for each municipality based on three different cost allocation methods.

Water Demand Forecast

The demand for water in the LAWSS area is growing (Figure 1). Increase in water demand is driven by growth in population. All the constituent municipalities in the LAWSS area are forecasting growth in population and water demand between 2016 and 2036 (Table 1).

Table 1. LAWSS Annual Water Demand 2016 – 2036 by municipality (m^3)

	2016	2021	2026	2031	2036
City of Sarnia	11,783,918	13,041,235	14,432,315	15,971,971	17,676,091
Town of St. Clair	5,002,432	5,554,656	6,167,641	6,848,044	7,603,809
Village of Point Edward	521,735	577,559	639,179	707,241	782,818
Town of Plympton-Wyoming	792,909	877,503	971,115	1,074,818	1,189,471
Township of Warwick	549,003	790,547	1,138,371	1,639,279	2,360,691
Municipality of Lambton Shores	278,259	311,968	349,756	392,053	439,503
Alvinston	110,359	112,506	114,653	116,800	119,162
Remainder of Lambton County	742,024	821,250	908,850	1,005,682	1,113,035
Sum of LAWSS Municipalities	**19,780,638**	**22,087,224**	**24,721,879**	**27,755,888**	**31,284,579**

Based on discussion with LAWSS, it has been confirmed that the 20-year growth rates provided in the Request for Proposal (RFP) would be used for the analysis. The 2016 water demand was calculated based on flow balance calculations

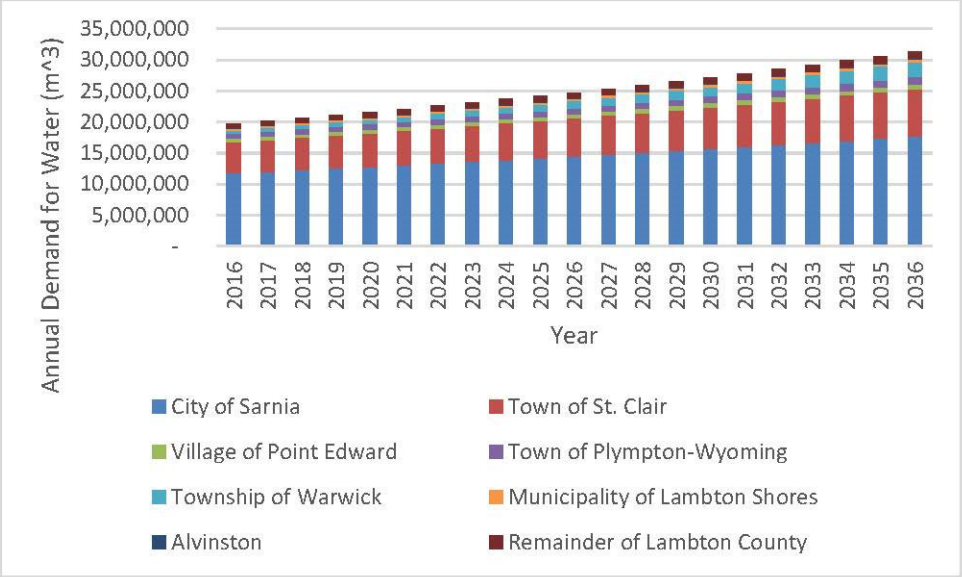

Figure 1. LAWSS Water Demand 2016 – 2036 by municipality

The demand for water across the LAWSS area drives the required engineering and works projects to ensure supply to its constituent municipalities.

Water Supply Projects

LAWSS has planned projects that upgrade and expand their water supply system to meet the growth in demand forecast in the next 20 years. The following projects are forecasted to be implemented between 2016 and 2036. The capital costs of these forecasted projects have been included in the financial analysis. These costs and timing of these projects are summarized below (Table 2) and fully detailed in Appendix A.

Table 2. LAWSS Forecast Project Summary

ID	Project List	Location	Conceptual Cost Estimate	In Service By
1A	New Booster Pump Station Studies	London Line and Brigden Road	$161,000	2017
1A	Booster Pump Station	London Line and Brigden Road	$7,567,000	2017
1A	Check Valve for Booster Zone Separation	London Line and Brigden Road	$2,205,700	2031
1A	Watermain twinning	London Line between Brigden Road to ELPS Reservoir	$20,225,625	2026
2A Phase 1	Grid Reinforcement Project - Phase 1	Twinning transmission main through St. Clair Township to Courtright Lane	$38,640,000	2031
2A Phase II	Grid Reinforcement Project - Phase 2	Grid reinforcement through Sarnia along Indian Road	$21,735,000	2026
2B	WLPS Studies	WLPS	$161,000	2017
2B	Revise WLPS Operations and Piping	WLPS	$996,188	2017
2B	B Check Valves for West Lambton Zone Separation		$1,288,000	2017
3B	New watermain Studies	Confederation Line from Fleming Road to Nauvoo Road and Michigan Line from Fleming Road to Nauvoo Road	$161,000	2021

ID	Project List	Location	Conceptual Cost Estimate	In Service By
3B	New watermain	Confederation Line from Fleming Road to Nauvoo Road and Michigan Line from Fleming Road to Nauvoo Road	$179,563,300	2021
5D	Watermain twinning Studies	Fleming Road from ELPS to Queen Street, Lakeshore Road from Queen Street to Townsend Line, Townsend Line from Lakeshore Road to Forest Standpipe	$161,000	2031
5D	Watermain twinning	Fleming Road from ELPS to Queen Street, Lakeshore Road from Queen Street to Townsend Line, Townsend Line from Lakeshore Road to Forest Standpipe	$21,406,560	2031
6B	New watermain Studies	Mandaumin Road between London Line and Confederation Line	$161,000	2026
6B	Watermain interconnection	Wets Lambton – Rural Lands	$16,100	2026
6B	New watermain	Mandaumin Road between London Line and Confederation Line	$2,608,200	2031
Sum of Projects			**$297,056,673**	

Each of the above projects benefits the constituent municipalities disproportionally. Some projects impact on multiple municipalities while others benefit only a single municipality. The following table (Table 3) shows the impact of individual projects on the constituent municipalities.

Table 3. Impact of Forecast Projects on LAWSS Municipalities

	City of Sarnia	Town of St. Clair	Village of Point Edward	Town of Plympton-Wyoming	Township of Warwick	Municipality of Lambton Shores	Alvinston	Remainder of Lambton County	Total Benefit of Project
1A Studies	1.00%			21.00%	58.00%	4.00%		16.00%	**100.00%**
1Ai	1.00%			21.00%	58.00%	4.00%		16.00%	**100.00%**
1Aii	1.00%			21.00%	58.00%	4.00%		16.00%	**100.00%**
1Aiii	1.00%			21.00%	58.00%	4.00%		16.00%	**100.00%**
2Ai		100.00%							**100.00%**
2Aii	50.00%	50.00%							**100.00%**
2B Studies		100.00%							**100.00%**
2Bi		100.00%							**100.00%**
2Bii		100.00%							**100.00%**
3B Studies				9.00%	81.00%			10.00%	**100.00%**
3B				9.00%	81.00%			10.00%	**100.00%**
5D Studies				63.00%		37.00%			**100.00%**
5D				63.00%		37.00%			**100.00%**
6B Studies	100.00%								**100.00%**
6Bi		100.00%							**100.00%**
6Bii	100.00%								**100.00%**

Based on the timing of the forecast water supply projects, the demand for water and other factors a plan for financing the system upgrades has been developed.

Financing the Forecast Projects

Methodology

In order to pay for the forecasted projects, development charge funding and an increase to the existing LAWSS water rates are required to cover the capital costs of the projects. Financing the forecasted projects is based on summing the total project capital cost, determining what percentage of the projects are related to growth and can be funded through development charges. The remaining costs are then covered by an increase in the LAWSS water rate based on the forecasted water demand.

It is assumed that the rate increase takes effect at the start of the analysis (2016) and remains in place until 2036. The analysis does not take into consideration any incremental changes to operating costs. The analysis is based on non-discounted cash flows, i.e., there is no preference in this analysis for monies that are received sooner rather than later. in other words, there is no Net Present Value (NPV) calculation for future forecast costs. It is also assumed that no interest is earned on surplus funds.

None of the revenue or costs included in this analysis are increased by inflation. All of the costs in this analysis are presented in 2018 dollars. This means that in nominal terms the water rates and other future costs will increase each year at the rate of inflation. This inflation in costs is not represented in this analysis.

Development Charges for funding Growth

A percentage of the $297 million of capital cost associated with the forecasted projects is related to growth. The financing plan assumes that the portion of these projects associated with growth will be paid for by development charges.

The portion of each project associated with new growth is identified below (Table 4). This is used to determine the amount of development charge financing that will be applied to each project.

Table 4. Portion of Forecast Projects related to Growth

	Percentage Related to New Growth
1A Studies	10.00%
1Ai	10.00%
1Aii	10.00%
1Aiii	90.00%
2Ai	10.00%
2Aii	10.00%
2B Studies	10.00%
2Bi	10.00%
2Bii	10.00%
3B Studies	100.00%
3B	100.00%
5D Studies	100.00%
5D	100.00%
6B Studies	90.00%
6Bi	90.00%
6Bii	90.00%

Subtracting the development charge financing from the total capital cost gives us the total amount that needs to be covered through incremental increases to the water rate (Table 5).

Table 5. Forecasted Project Financing Requirements after Development Charge Funding

	Expenditure	DC Funding	To be funded by an increase in Rates
1A Studies	$161,000	$(16,100)	**$144,900**
1Ai	$7,567,000	$(756,700)	**$6,810,300**
1Aii	$2,205,700	$(220,570)	**$1,985,130**
1Aiii	$20,225,625	$(18,203,063)	**$2,022,563**
2Ai	$38,640,000	$(3,864,000)	**$34,776,000**
2Aii	$21,735,000	$(2,173,500)	**$19,561,500**
2B Studies	$161,000	$(16,100)	**$144,900**
2Bi	$996,188	$(99,619)	**$896,569**
2Bii	$1,288,000	$(128,800)	**$1,159,200**
3B Studies	$161,000	$(161,000)	**$-**
3B	$179,563,300	$(179,563,300)	**$-**
5D Studies	$161,000	$(161,000)	**$-**
5D	$21,406,560	$(21,406,560)	**$-**
6B Studies	$161,000	$(144,900)	**$16,100**
6Bi	$16,100	$(14,490)	**$1,610**
6Bii	$2,608,200	$(2,347,380)	**$260,820**
Sum of Projects	**$297,056,673**	**$(229,277,081)**	**$67,779,591**

The financing plan for the LAWSS assumes that 77.18% of the total capital cost will be funded by development charges.

Impact on the Rates

An incremental increase to the LAWSS water rate is required to pay for the $68 million of capital costs associated with the forecast projects not funded by development charges. Between the years of 2016 and 2036 demand for water in the LAWSS system is just over 526 million m^3 of water. If all LAWSS water users pay for the remainder of the forecasted projects capital costs through increases in their rates, there will be a $0.13 / m^3 increase starting in 2016 and remaining in place until 2036 (Table 6).

Table 6. Change required to LAWSS water rate

Net Cost after Capital Funding	$67,779,591.25
Forecast Water Demand (m^3)	526,020,608.82
Change in LAWS rate ($/$m^3$)	$0.13

This incremental change to the water rate, combined with the forecasted projects, results in the following annual (Figure 2) and cumulative (Figure 3) cash flows between 2016 and 2036.

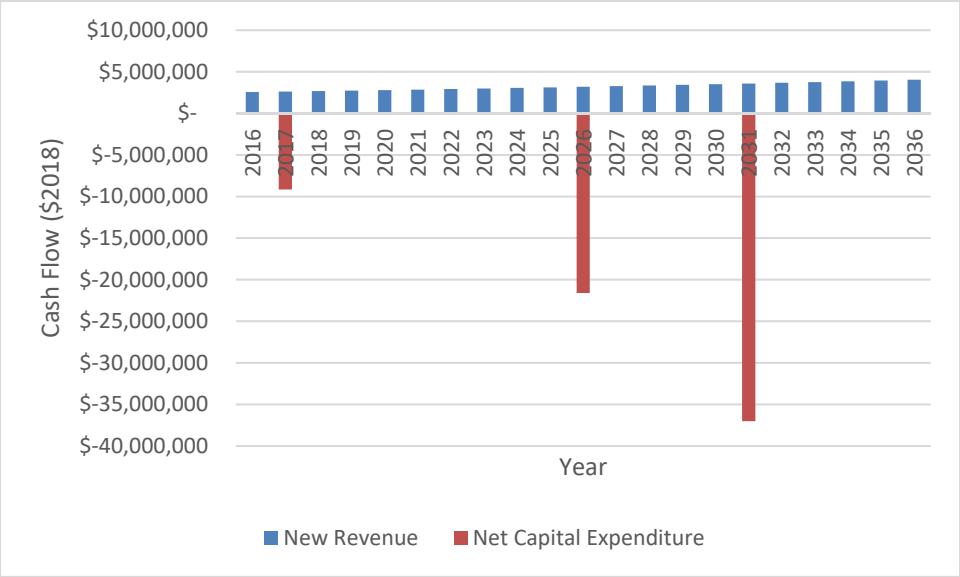

Figure 2. Annual Cash Flow with $0.13/m^3 Increase in Water Rate and Forecast Projects

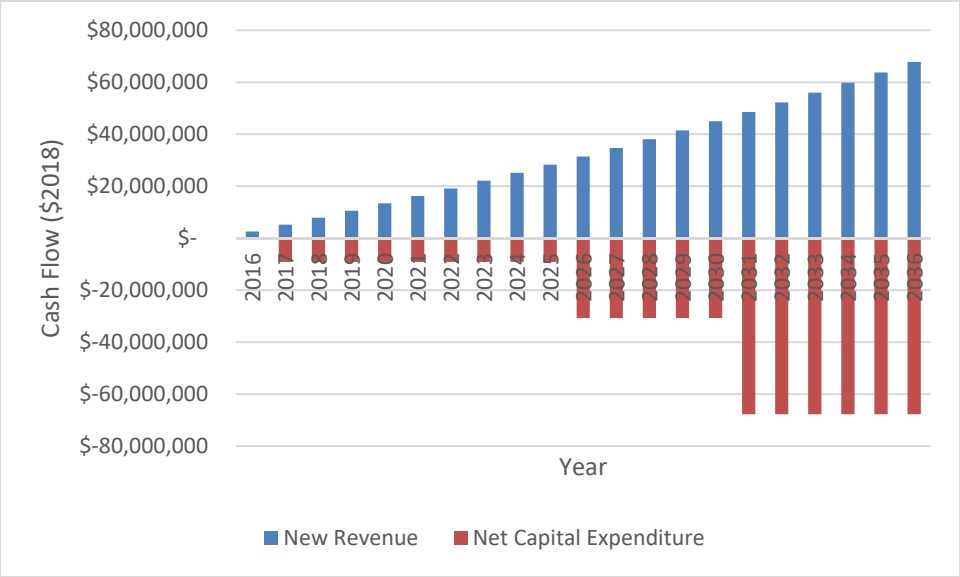

Figure 3. Cumulative Cash Flow with $0.13/m^3 Increase in Water Rate and Forecast Projects

Alternative Rate Calculations

Three alternatives to calculating a uniform rate increase across LAWSS were considered. Each of the three alternatives are based on having a separate increase in rate by LAWSS municipality. A separate rate for each LAWSS municipality was calculated based on: 2016 population, 2016 water demand, the proportional benefit to the municipality from the forecasted projects.

Municipal Rate Increase based on 2016 Population

In this financing scenario the total net system costs after development charges were proportionally divided by each municipality's 2016 population. The water demand forecast by municipality from 2016 – 2036 was then used to calculate unique rate increases for each municipality (Table 7).

Table 7. Increase in Rate by Municipality based on 2016 Population.

	2016 Population	2016 Population (%)	Proportion of Net Cost	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/m^3)
City of Sarnia	69,198	60.48%	$40,992,266	305,607,629	$0.13
Town of St. Clair	14,179	12.39%	$8,399,511	130,670,429	$0.06
Village of Point Edward	1,916	1.67%	$1,135,021	13,533,556	$0.08
Town of Plympton-Wyoming	7,448	6.51%	$4,412,128	20,564,315	$0.21
Township of Warwick	3,532	3.09%	$2,092,325	26,570,068	$0.08
Municipality of Lambton Shores	2,656	2.32%	$1,573,390	7,422,168	$0.21
Alvinston	2,443	2.14%	$1,447,211	2,408,356	$0.60
Remainder of Lambton County	13,045	11.40%	$7,727,739	19,244,088	$0.40
Sum of LAWSS Municipalities	114,417	100.00%	$67,779,591	526,020,609	$0.13

Municipal Rate Increase based on 2016 Water Demand

In this financing scenario the total net system costs after development charges were proportionally divided by each municipality's 2016 water Demand. The water demand forecast by municipality from 2016 – 2036 was then used to calculate unique rate increases for each municipality (Table 9).

Table 8. Increase in Rate by Municipality based on 2016 Water Demand.

	2016 Water Demand	2016 Water Demand (%)	Proportion of Net Cost	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/m^3)
City of Sarnia	11,783,918	59.57%	$40,378,329	305,607,629	$0.13
Town of St. Clair	5,002,432	25.29%	$17,141,147	130,670,429	$0.13
Village of Point Edward	521,735	2.64%	$1,787,759	13,533,556	$0.13
Town of Plympton-Wyoming	792,909	4.01%	$2,716,952	20,564,315	$0.13
Township of Warwick	549,003	2.78%	$1,881,193	26,570,068	$0.07
Municipality of Lambton Shores	278,259	1.41%	$953,471	7,422,168	$0.13
Alvinston	110,359	0.56%	$378,151	2,408,356	$0.16
Remainder of Lambton County	742,024	3.75%	$2,542,590	19,244,088	$0.13
Sum of LAWSS Municipalities	**19,780,638**	**100.00%**	**$67,779,591**	**526,020,609**	**$0.13**

Municipal Rate Increase based on the aggregated proportionate benefit from the Forecast projects

In this financing scenario the individual forecast project costs after development charges were proportionally divided by the proportion of benefit they provided to each municipality (Table 8 - above). The proportionate costs were then aggregated and combined with the water demand forecast by municipality from 2016 – 2036 to calculate unique rate increases for each municipality (Table 9).

Table 9. Increase in Rate by Municipality based on Forecast Project Benefit to Municipality.

	Proportionate Cost based on Benefit	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/m^3)
City of Sarnia	$10,167,299	305,607,629	$0.03
Town of St. Clair	$46,759,029	130,670,429	$0.36
Village of Point Edward	$-	13,533,556	$-
Town of Plympton-Wyoming	$2,302,207	20,564,315	$0.11
Township of Warwick	$6,358,478	26,570,068	$0.24
Municipality of Lambton Shores	$438,516	7,422,168	$0.06
Alvinston	$-	2,408,356	$-
Remainder of Lambton County	$1,754,063	19,244,088	$0.09
Sum of LAWSS Municipalities	**$67,779,591**	**526,020,609**	**$0.13**

Conclusion

In order to cover the capital costs of the LAWSS forecast projects after development charge funding an increase of $0.13 / m^3 is required to the water rate. If the increase to the water rate will vary by municipality based on the three alternative allocation methods that were explored, water rate increases could vary from zero to $0.33 m^3 depending on the municipality.

Development charges are the major funding source for the forecasted projects. Development charge funding accounts for 77% or $229 million of the $297 million of capital cost associated with the forecasted projects. If no development charge funding was in place, rates could see over a four-fold increase over the change in rate that has been calculated in this financing plan.

The funding for 23% of the capital costs of the forecasted projects covered by an increase in the water rate is highly dependent on the water demand forecast. If water demand is greater than forecast, the forecasted projects' capital costs may be fully funded before the 20 year timeframe. If water demand is less than forecast, LAWSS may find that the full capital costs of these projects has not been recovered in the timeframe of the analysis.

Appendix A. LAWSS Forecast Project Details

		Proposed Works										
		Item	Description	Unit	Quantity	Unit Price	Proposed Works Sub-Total	Contractor OH + Profit	Contingency	Proposed Works Total	Engineering Total	Grand Total
1A Studies	Item 1	0.1	Preliminary Study	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
	Item 2	0.2	Environmental Approvals & Mitigation	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
1Ai	Item 1	1.2	BPS inline	LS	1.00	$4,500,000.00	$4,500,000	$450,000	$1,350,000	$6,300,000	$945,000	$7,245,000
	Item 2	1.1	Connections - at each end	LS	2.00	$100,000.00	$200,000	$20,000	$60,000	$280,000	$42,000	$322,000
1Aii	Item 1	1.4	Water course/ railroad crossings (allowance)	m	200.00	$3,350.00	$670,000	$67,000	$201,000	$938,000	$140,700	$1,078,700
	Item 2	1.5	Air release chambers	ea	2.00	$100,000.00	$200,000	$20,000	$60,000	$280,000	$42,000	$322,000
	Item 3	1.6	Check valves	LS	2.00	$200,000.00	$400,000	$40,000	$120,000	$560,000	$84,000	$644,000
	Item 4	1.7	Connections - hydrants; local	LS	20.00	$5,000.00	$100,000	$10,000	$30,000	$140,000	$21,000	$161,000
1Aiii	Item 1	1.3	CPP - 600mm - watermain twinning on London Line between Brigden Road to ELPS Reservoir	m	7,500.00	$1,675.00	$12,562,500	$1,256,250	$3,768,750	$17,587,500	$2,638,125	$20,225,625
2Ai	Item 1			LS	1.00	$24,000,000.00	$24,000,000	$2,400,000	$7,200,000	$33,600,000	$5,040,000	$38,640,000
2Aii	Item 1			LS	1.00	$13,500,000.00	$13,500,000	$1,350,000	$4,050,000	$18,900,000	$2,835,000	$21,735,000
2B Studies	Item 1	0.1	Preliminary Study	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
	Item 2	0.2	Environmental Approvals & Mitigation	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
2Bi	Item 1	1.3	CPP - 600mm - yard piping	m	250.00	$1,675.00	$418,750	$41,875	$125,625	$586,250	$87,938	$674,188
	Item 2	1.3	Connections	LS	2.00	$100,000.00	$200,000	$20,000	$60,000	$280,000	$42,000	$322,000
2Bii	Item 1	1.6	Check valves	LS	4.00	$200,000.00	$800,000	$80,000	$240,000	$1,120,000	$168,000	$1,288,000
3B Studies	Item 1	0.1	Preliminary Study	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
	Item 2	0.2	Environmental Approvals & Mitigation	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
3B	Item 1	1.1	Connections - at each end	LS	4.00	$100,000.00	$400,000	$40,000	$120,000	$560,000	$84,000	$644,000
	Item 2	1.2	East Lambton PS upgrade - new pumps	LS	1.00	$3,000,000.00	$3,000,000	$300,000	$900,000	$4,200,000	$630,000	$4,830,000
	Item 3	1.3	CPP - 600mm - watermain twinning	m	62,600.00	$1,675.00	$104,855,000	$10,485,500	$31,456,500	$146,797,000	$22,019,550	$168,816,550
	Item 4	1.4	Water course/ railroad crossings (allowance)	m	500.00	$3,350.00	$1,675,000	$167,500	$502,500	$2,345,000	$351,750	$2,696,750
	Item 5	1.5	Air release chambers	ea	6.00	$100,000.00	$600,000	$60,000	$180,000	$840,000	$126,000	$966,000
	Item 6	1.6	Check valves	LS	2.00	$200,000.00	$400,000	$40,000	$120,000	$560,000	$84,000	$644,000
	Item 7	1.7	Connections - hydrants; local	LS	120.00	$5,000.00	$600,000	$60,000	$180,000	$840,000	$126,000	$966,000
5D Studies	Item 1	0.1	Preliminary Study	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
	Item 2	0.2	Environmental Approvals & Mitigation	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
5D	Item 1	1.1	Connections - at each end	LS	2.00	$100,000.00	$200,000	$20,000	$60,000	$280,000	$42,000	$322,000
	Item 2	1.3	CPP - 450mm - watermain twinning	m	10,000.00	$1,200.00	$12,000,000	$1,200,000	$3,600,000	$16,800,000	$2,520,000	$19,320,000
	Item 3	1.4	Water course/ railroad crossings (allowance)	m	200.00	$2,480.00	$496,000	$49,600	$148,800	$694,400	$104,160	$798,560
	Item 4	1.5	Air release chambers	ea	3.00	$100,000.00	$300,000	$30,000	$90,000	$420,000	$63,000	$483,000
	Item 5	1.6	Check valves	LS	1.00	$200,000.00	$200,000	$20,000	$60,000	$280,000	$42,000	$322,000
	Item 6	1.7	Connections - hydrants; local	LS	20.00	$5,000.00	$100,000	$10,000	$30,000	$140,000	$21,000	$161,000
6B Studies	Item 1	0.1	Preliminary Study	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
	Item 2	0.2	Environmental Approvals & Mitigation	L.S.	1.00	$50,000.00	$50,000	$5,000	$15,000	$70,000	$10,500	$80,500
6Bi	Item 1	1.3	Watermain interconnection - West Lambton rural lands; 200mm watermain	m	50.00	$200.00	$10,000	$1,000	$3,000	$14,000	$2,100	$16,100
6Bii	Item 1	1.4	New watermain - Mandaumin Road between London Line and Confederation Line; 300mm	m	2,700.00	$600.00	$1,620,000	$162,000	$486,000	$2,268,000	$340,200	$2,608,200

Appendix B. The impact on water rates assuming no development charge funding

If all of the capital improvement costs needed to be recovered through rates, and no development charge funding was available, this appendix explores the impacts on LAWSS rates. In the base financial model 77.18% of the capital cost is assumed to be covered through development charges. This alternative scenario assumes that none of this funding is available.

Impact on the Rates

An incremental increase to the LAWSS water rate would be required to pay for the full $297 million of capital costs associated with the forecasted projects not funded by development charges. Between the years of 2016 and 2036 demand for water in the LAWSS system is just over 526 million m^3 of water. If all LAWSS water users pay for the full forecasted projects' capital costs through increases in their rates there would be a $0.56 / m^3 increase starting in 2016 and remaining in place until 2036 (Table B1).

Table B1. Change required to LAWSS water rate, assuming no Development Charge funding

Net Cost after Capital Funding	$297,056,672.50
Forecast Water Demand (m^3)	526,020,608.82
Change in LAWS rate ($/$m^3$)	$0.56

Alternative Rate Calculations

The removal of development charge funding would impact the three alternatives to calculate a uniform rate increase across the LAWSS. A separate rate for each LAWSS municipality was re-calculated, assuming no development charges based on: 2016 population, 2016 water demand, the proportional benefit to the municipality from the forecasted projects.

Municipal Rate Increase based on 2016 Population and no Development Charges

In this financing scenario the total net system costs were proportionally divided by each municipality's 2016 population. The water demand forecast by municipality from 2016 – 2036 was then used to calculate unique rate increases for each municipality (Table B2).

Table B2. Increase in Rate by Municipality based on 2016 Population assuming no Development Charge funding

	2016 Population	2016 Population (%)	Proportion of Net Cost	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/$m^3$)
City of Sarnia	69,198	60.48%	$179,656,237	305,607,629	$0.59
Town of St. Clair	14,179	12.39%	$36,812,419	130,670,429	$0.28
Village of Point Edward	1,916	1.67%	$4,974,441	13,533,556	$0.37
Town of Plympton-Wyoming	7,448	6.51%	$19,336,970	20,564,315	$0.94
Township of Warwick	3,532	3.09%	$9,170,002	26,570,068	$0.35
Municipality of Lambton Shores	2,656	2.32%	$6,895,676	7,422,168	$0.93
Alvinston	2,443	2.14%	$6,342,672	2,408,356	$2.63
Remainder of Lambton County	13,045	11.40%	$33,868,256	19,244,088	$1.76
Sum of LAWSS Municipalities	**114,417**	**100.00%**	**297,056,673**	**526,020,609**	**$0.56**

Municipal Rate Increase based on 2016 Water Demand assuming no Development Charge funding.

In this financing scenario the total net system costs were proportionally divided by each municipality's 2016 water Demand. The water demand forecast by municipality from 2016 – 2036 was then used to calculate unique rate increases for each municipality (Table B3).

Table B3. Increase in Rate by Municipality based on 2016 Water Demand.

	2016 Water Demand	2016 Water Demand (%)	Proportion of Net Cost	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/m^3)
City of Sarnia	11,783,918	59.57%	$176,965,542	305,607,629	$0.58
Town of St. Clair	5,002,432	25.29%	$75,124,265	130,670,429	$0.57
Village of Point Edward	521,735	2.64%	$7,835,185	13,533,556	$0.58
Town of Plympton-Wyoming	792,909	4.01%	$11,907,546	20,564,315	$0.58
Township of Warwick	549,003	2.78%	$8,244,678	26,570,068	$0.31
Municipality of Lambton Shores	278,259	1.41%	$4,178,765	7,422,168	$0.56
Alvinston	110,359	0.56%	$1,657,319	2,408,356	$0.69
Remainder of Lambton County	742,024	3.75%	$11,143,374	19,244,088	$0.58
Sum of LAWSS Municipalities	**19,780,638**	**100.00%**	**$297,056,673**	**526,020,609**	**$0.56**

Municipal Rate Increase based on the aggregated proportionate benefit from the Forecast projects assuming no development charges

In this financing scenario the individual forecasted project costs were proportionally divided by the proportion of benefit they provided to each municipality. The proportionate costs were then aggregated and combined with the water demand forecast by municipality from 2016 – 2036 to calculate unique rate increases for each municipality (Table B4).

Table B4. Increase in Rate by Municipality based on Forecast Project Benefit to Municipality assuming no Development Charges

	Proportionate Cost based on Benefit	2016 – 2036 Water Demand Forecast	Change in Water Rate ($/m^3)
City of Sarnia	$13,938,293	305,607,629	$0.05
Town of St. Clair	$51,968,788	130,670,429	$0.40
Village of Point Edward	$-	13,533,556	$-
Town of Plympton-Wyoming	$36,096,208	20,564,315	$1.76
Township of Warwick	$163,069,092	26,570,068	$6.14
Municipality of Lambton Shores	$9,186,370	7,422,168	$1.24
Alvinston	$-	2,408,356	$-
Remainder of Lambton County	$22,797,922	19,244,088	$1.18
Sum of LAWSS Municipalities	**$297,056,673**	**526,020,609**	**$0.56**