

## Appendix C. Cost Summary Table

This appendix provides a summary table of the estimated capital and operations and maintenance (O&M) costs associated with the CSO Master Plan recommended projects in each District Engineering Plan (DEP). The capital cost and O&M costs shown were developed as described in the Basis of Estimate Technical Memorandum which is included in Appendix C of the Part 2 Technical Report.

The two tables that follow show the capital and comparison based O&M costs of the CSO Master Plan. The capital costs estimates were derived using the methods described in the Basis of Estimate. The estimated capital costs associated with each proposed control option recommended for each specific district are then identified. Upgrades that are not specific to any one control option technology are lumped together under the 'additional' capital cost column. This additional capital cost may include off-take and weir height/location adjustments or additional interconnection construction work required to implement latent storage.

The O&M costs shown are reflective of the 35 year period which was used in the evaluations and comparisons of the different technologies. They are fictional representations of the O&M costs assuming each recommended control option is fully operational in 2019, then providing the cumulative O&M costs over the preceding 35 year period, in 2019 dollars. By providing this O&M estimate from the same project implementation timeframe, the impacts of inflation are not considered, and an O&M cost comparison between different recommended control options can be completed. This will be important as part of the future evaluation and business case approvals completed by the City of Winnipeg to evaluate each of the projects in the CSO Master Plan. Note that the O&M costs calculated in this manner are different from the O&M cost estimates produced as part of the program development of the CSO Master Plan, as documented in the Part 2 Technical Report, and Part 3A. The same 10% allowance applied for future green infrastructure projects in the capital cost estimates are applied to these total comparison based O&M costs.

The capital costs are shown for each proposed project within a sewer district. The costs are reported in terms of Present Value (PV) costs comprised of the following three components:

- 2019 CSO Master Plan Capital Cost – This represents the one-time, fixed expense to construct the sewer system control upgrades and is estimated in 2019 dollars.
- 2019 Total Operations And Maintenance Cost (Over 35-Year Period) – This represents the total required operations and maintenance (O&M) investment estimated in 2019 dollars over the 35 year period, under the assumption the project is complete and incurring O&M costs beginning in 2019.
- 2019 Total Lifecycle Costs – This is the sum of the 2019 CSO Master Plan Capital Cost and the 2019 Total Operations And Maintenance Cost (Over 35-Year Period). These values were used part of the project development process in determining projects to recommend for each specific district.

District	2019 CSO Master Plan Capital Cost											
	Latent Storage	Flap Gate Control	Gravity Flow Control	Control Gate	Screen	Off-line Storage	Storage Tunnel	Sewer Separation	Additional	SUBTOTAL	Green Infrastructure Allowance	TOTAL
ALEXANDER	\$0	\$0	\$1,280,000	\$0	\$2,680,000	\$0	\$0	\$0	\$0	\$3,960,000	\$400,000	\$4,360,000
ARMSTRONG	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$61,080,000	\$0	\$61,080,000	\$6,110,000	\$67,190,000
ASH	\$2,590,000	\$2,340,000	\$0	\$5,100,000	\$2,550,000	\$0	\$0	\$29,100,000	\$0	\$41,680,000	\$4,170,000	\$45,850,000
ASSINI BOINE	\$2,580,000	\$0	\$1,300,000	\$0	\$2,910,000	\$0	\$0	\$0	\$0	\$6,790,000	\$680,000	\$7,470,000
AUBREY	\$5,560,000	\$0	\$0	\$2,920,000	\$2,840,000	\$0	\$0	\$0	\$150,000	\$11,470,000	\$1,150,000	\$12,620,000
BALTIMORE	\$1,480,000	\$0	\$0	\$2,360,000	\$2,850,000	\$0	\$0	\$0	\$0	\$6,690,000	\$670,000	\$7,360,000
BANNATYNE	\$0	\$0	\$1,300,000	\$0	\$3,960,000	\$0	\$0	\$0	\$0	\$5,260,000	\$530,000	\$5,790,000
CLIFTON	\$2,410,000	\$2,420,000	\$0	\$2,730,000	\$2,730,000	\$0	\$0	\$0	\$0	\$10,290,000	\$1,030,000	\$11,320,000
COCKBURN	\$0	\$0	\$0	\$2,650,000	\$2,250,000	\$0	\$0	\$56,280,000	\$0	\$61,180,000	\$6,120,000	\$67,300,000
COLONY	\$2,340,000	\$0	\$1,280,000	\$2,360,000	\$2,790,000	\$0	\$0	\$0	\$0	\$8,770,000	\$880,000	\$9,650,000
CORNISH	\$2,440,000	\$0	\$0	\$2,420,000	\$2,350,000	\$0	\$0	\$0	\$0	\$7,210,000	\$720,000	\$7,930,000
DESPINS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$39,980,000	\$0	\$39,980,000	\$4,000,000	\$43,980,000
DONCASTER	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$49,890,000	\$0	\$49,890,000	\$4,990,000	\$54,880,000
DOUGLAS PARK	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DUMOULIN	\$0	\$0	\$0	\$2,250,000	\$1,920,000	\$0	\$0	\$0	\$0	\$4,170,000	\$420,000	\$4,590,000
FERRY ROAD	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$129,360,000	\$0	\$129,360,000	\$12,940,000	\$142,300,000
HART	\$0	\$0	\$0	\$2,950,000	\$2,330,000	\$0	\$0	\$0	\$0	\$5,280,000	\$530,000	\$5,810,000
HAWTHORNE	\$0	\$0	\$0	\$2,650,000	\$1,990,000	\$0	\$0	\$0	\$0	\$4,640,000	\$460,000	\$5,100,000
JEFFERSON E	\$0	\$0	\$1,280,000	\$3,130,000	\$2,890,000	\$0	\$0	\$145,510,000	\$0	\$152,810,000	\$15,280,000	\$168,090,000
JEFFERSON W	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
JESSIE	\$0	\$0	\$0	\$2,540,000	\$0	\$0	\$0	\$25,900,000	\$0	\$28,440,000	\$2,840,000	\$31,280,000
LA VERENDRYE	\$0	\$0	\$0	\$0	\$0	\$0	\$1,060,000	\$2,080,000	\$0	\$3,140,000	\$310,000	\$3,450,000
LINDEN	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,900,000	\$0	\$10,900,000	\$1,090,000	\$11,990,000
MAGER	\$0	\$0	\$0	\$2,710,000	\$1,590,000	\$0	\$0	\$0	\$0	\$4,300,000	\$430,000	\$4,730,000
MARION	\$2,170,000	\$0	\$0	\$2,730,000	\$0	\$0	\$0	\$0	\$0	\$4,900,000	\$490,000	\$5,390,000
METCALFE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$17,430,000	\$0	\$17,430,000	\$1,740,000	\$19,170,000
MISSION	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$130,320,000	\$0	\$130,320,000	\$13,030,000	\$143,350,000
MOORGATE	\$0	\$0	\$0	\$2,590,000	\$2,450,000	\$0	\$0	\$0	\$0	\$5,040,000	\$500,000	\$5,540,000
MUNROE	\$0	\$0	\$1,280,000	\$2,670,000	\$3,340,000	\$0	\$0	\$0	\$0	\$7,290,000	\$730,000	\$8,020,000
MUNROE ANNEX	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NEWTON	\$0	\$0	\$1,280,000	\$2,550,000	\$1,840,000	\$0	\$0	\$0	\$0	\$5,670,000	\$570,000	\$6,240,000
PARKSIDE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
POLSON	\$0	\$0	\$1,290,000	\$2,540,000	\$0	\$0	\$0	\$0	\$0	\$3,830,000	\$380,000	\$4,210,000
RIVER	\$0	\$0	\$0	\$0	\$2,950,000	\$0	\$0	\$0	\$0	\$2,950,000	\$300,000	\$3,250,000
RIVERBEND	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,590,000	\$0	\$76,590,000	\$7,660,000	\$84,250,000
ROLAND	\$2,790,000	\$0	\$0	\$2,540,000	\$1,990,000	\$0	\$0	\$0	\$0	\$7,320,000	\$730,000	\$8,050,000
SELKIRK	\$1,830,000	\$0	\$1,280,000	\$2,460,000	\$3,030,000	\$0	\$0	\$0	\$0	\$8,600,000	\$860,000	\$9,460,000
ST JOHNS	\$3,140,000	\$0	\$1,350,000	\$2,570,000	\$3,220,000	\$0	\$0	\$0	\$0	\$10,280,000	\$1,030,000	\$11,310,000
STRATHMILLAN	\$0	\$0	\$0	\$2,190,000	\$2,360,000	\$0	\$0	\$0	\$30,000	\$4,580,000	\$460,000	\$5,040,000
SYNDICATE	\$0	\$0	\$0	\$2,360,000	\$1,870,000	\$0	\$0	\$0	\$0	\$4,230,000	\$420,000	\$4,650,000
TUXEDO	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$8,790,000	\$0	\$8,790,000	\$880,000	\$9,670,000
TYLEHURST	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$86,670,000	\$0	\$86,670,000	\$8,670,000	\$95,340,000
WOODHAVEN	\$0	\$0	\$0	\$2,190,000	\$1,840,000	\$0	\$0	\$0	\$0	\$4,030,000	\$400,000	\$4,430,000
<b>TOTAL</b>	<b>\$29,330,000</b>	<b>\$4,760,000</b>	<b>\$12,920,000</b>	<b>\$64,160,000</b>	<b>\$63,520,000</b>	<b>\$0</b>	<b>\$1,060,000</b>	<b>\$869,880,000</b>	<b>\$180,000</b>	<b>\$1,045,810,000</b>	<b>\$104,600,000</b>	<b>\$1,150,410,000</b>

District	2019 Total Operations and Maintenance Cost (Over 35-year Period)												TOTAL LIFECYCLE COST
	Latent Storage	Flap Gate Control	Gravity Flow Control	Control Gate	Screen	Off-line Storage	Storage Tunnel	Sewer Separation	Additional	SUBTOTAL	Green Infrastructure Allowance	TOTAL	
ALEXANDER	\$0	\$0	\$740,000	\$0	\$650,000	\$0	\$0	\$0	\$0	\$1,390,000	\$140,000	\$1,530,000	\$5,890,000
ARMSTRONG	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,220,000	\$0	\$1,220,000	\$120,000	\$1,340,000	\$68,530,000
ASH	\$1,550,000	\$710,000	\$0	\$1,320,000	\$1,190,000	\$0	\$0	\$370,000	\$0	\$5,140,000	\$510,000	\$5,650,000	\$51,500,000
ASSINIBOINE	\$1,600,000	\$0	\$740,000	\$0	\$740,000	\$0	\$0	\$0	\$0	\$3,080,000	\$310,000	\$3,390,000	\$10,860,000
AUBREY	\$3,690,000	\$0	\$0	\$990,000	\$1,100,000	\$0	\$0	\$0	\$20,000	\$5,800,000	\$580,000	\$6,380,000	\$19,000,000
BALTIMORE	\$1,190,000	\$0	\$0	\$900,000	\$1,120,000	\$0	\$0	\$0	\$0	\$3,210,000	\$320,000	\$3,530,000	\$10,890,000
BANNATYNE	\$0	\$0	\$740,000	\$0	\$1,080,000	\$0	\$0	\$0	\$0	\$1,820,000	\$180,000	\$2,000,000	\$7,790,000
CLIFTON	\$1,860,000	\$900,000	\$0	\$900,000	\$1,040,000	\$0	\$0	\$0	\$0	\$4,700,000	\$470,000	\$5,170,000	\$16,490,000
COCKBURN	\$0	\$0	\$0	\$890,000	\$730,000	\$0	\$0	\$720,000	\$0	\$2,340,000	\$230,000	\$2,570,000	\$69,870,000
COLONY	\$1,640,000	\$0	\$740,000	\$940,000	\$1,170,000	\$0	\$0	\$0	\$0	\$4,490,000	\$450,000	\$4,940,000	\$14,590,000
CORNISH	\$1,520,000	\$0	\$0	\$950,000	\$1,150,000	\$0	\$0	\$0	\$0	\$3,620,000	\$360,000	\$3,980,000	\$11,910,000
DESPINS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$510,000	\$0	\$510,000	\$50,000	\$560,000	\$44,540,000
DONCASTER	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$640,000	\$0	\$640,000	\$60,000	\$700,000	\$55,580,000
DOUGLAS PARK	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DUMOULIN	\$0	\$0	\$0	\$880,000	\$970,000	\$0	\$0	\$0	\$0	\$1,850,000	\$190,000	\$2,040,000	\$6,630,000
FERRY ROAD	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,650,000	\$0	\$1,650,000	\$170,000	\$1,820,000	\$144,120,000
HART	\$0	\$0	\$0	\$1,010,000	\$1,150,000	\$0	\$0	\$0	\$0	\$2,160,000	\$220,000	\$2,380,000	\$8,190,000
HAWTHORNE	\$0	\$0	\$0	\$940,000	\$1,080,000	\$0	\$0	\$0	\$0	\$2,020,000	\$200,000	\$2,220,000	\$7,320,000
JEFFERSON E	\$0	\$0	\$740,000	\$940,000	\$710,000	\$0	\$0	\$1,860,000	\$0	\$4,250,000	\$430,000	\$4,680,000	\$172,770,000
JEFFERSON W	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
JESSIE	\$0	\$0	\$0	\$960,000	\$0	\$0	\$0	\$330,000	\$0	\$1,290,000	\$130,000	\$1,420,000	\$32,700,000
LA VERENDRYE	\$0	\$0	\$0	\$0	\$0	\$0	\$210,000	\$30,000	\$0	\$240,000	\$20,000	\$260,000	\$3,710,000
LINDEN	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,000	\$0	\$140,000	\$10,000	\$150,000	\$12,140,000
MAGER	\$0	\$0	\$0	\$880,000	\$640,000	\$0	\$0	\$0	\$0	\$1,520,000	\$150,000	\$1,670,000	\$6,400,000
MARION	\$1,600,000	\$0	\$0	\$1,010,000	\$0	\$0	\$0	\$0	\$0	\$2,610,000	\$260,000	\$2,870,000	\$8,260,000
METCALFE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$350,000	\$0	\$350,000	\$40,000	\$390,000	\$19,560,000
MISSION	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,660,000	\$0	\$1,660,000	\$170,000	\$1,830,000	\$145,180,000
MOORGATE	\$0	\$0	\$0	\$940,000	\$1,100,000	\$0	\$0	\$0	\$0	\$2,040,000	\$200,000	\$2,240,000	\$7,780,000
MUNROE	\$0	\$0	\$740,000	\$990,000	\$1,230,000	\$0	\$0	\$0	\$0	\$2,960,000	\$300,000	\$3,260,000	\$11,280,000
MUNROE ANNEX	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
NEWTON	\$0	\$0	\$740,000	\$860,000	\$660,000	\$0	\$0	\$0	\$0	\$2,260,000	\$230,000	\$2,490,000	\$8,730,000
PARKSIDE	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
POLSON	\$0	\$0	\$740,000	\$860,000	\$0	\$0	\$0	\$0	\$0	\$1,600,000	\$160,000	\$1,760,000	\$5,970,000
RIVER	\$0	\$0	\$0	\$0	\$950,000	\$0	\$0	\$0	\$0	\$950,000	\$100,000	\$1,050,000	\$4,300,000
RIVERBEND	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$980,000	\$0	\$980,000	\$100,000	\$1,080,000	\$85,330,000
ROLAND	\$1,780,000	\$0	\$0	\$850,000	\$660,000	\$0	\$0	\$0	\$0	\$3,290,000	\$330,000	\$3,620,000	\$11,670,000
SELKIRK	\$1,510,000	\$0	\$740,000	\$930,000	\$1,130,000	\$0	\$0	\$0	\$0	\$4,310,000	\$430,000	\$4,740,000	\$14,200,000
ST JOHNS	\$1,890,000	\$0	\$740,000	\$940,000	\$1,040,000	\$0	\$0	\$0	\$0	\$4,610,000	\$460,000	\$5,070,000	\$16,380,000
STRATHMILLAN	\$0	\$0	\$0	\$840,000	\$1,020,000	\$0	\$0	\$0	\$0	\$1,860,000	\$190,000	\$2,050,000	\$7,090,000
SYNDICATE	\$0	\$0	\$0	\$920,000	\$1,120,000	\$0	\$0	\$0	\$0	\$2,040,000	\$200,000	\$2,240,000	\$6,890,000
TUXEDO	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$110,000	\$0	\$110,000	\$10,000	\$120,000	\$9,790,000
TYLEHURST	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,110,000	\$0	\$1,110,000	\$110,000	\$1,220,000	\$96,560,000
WOODHAVEN	\$0	\$0	\$0	\$840,000	\$1,040,000	\$0	\$0	\$0	\$0	\$1,880,000	\$190,000	\$2,070,000	\$6,500,000
<b>TOTAL</b>	<b>\$19,830,000</b>	<b>\$1,610,000</b>	<b>\$7,400,000</b>	<b>\$22,480,000</b>	<b>\$24,470,000</b>	<b>\$0</b>	<b>\$210,000</b>	<b>\$11,680,000</b>	<b>\$20,000</b>	<b>\$87,700,000</b>	<b>\$8,780,000</b>	<b>\$96,480,000</b>	<b>\$1,246,890,000</b>