Appendix D:
Cost Estimate

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Opinion of Probable Cost Summary (2013 dollars and no escalation provided)

Navy and Water St WWPS & Collection System Modernization Feasibility Study **11-03-14**

	Description	CAD $
Alternative 1: Navy St. Pumping Station is Upgraded to Future Capacity and Water St. PS Remains Operational at Current Capacity		
	General Requirements	$ 294,316
	Percentage of Capital Equipment (excludes collection system)	$ 714,488
	Replacement of Navy St. PS	$ 1,089,150
	Improvements to Water St. PS	$ 63,250
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	$ 1,015,673
	Subtotal Capital Facility (A)	**$ 3,176,877**
	Overhead & Profit (10% of A)	$ 317,688
	MOB/Bond/Insurance (5% of A)	$ 158,844
	Construction Contingency (20% of A)	$ 635,375
	Construction Sequencing Allowance (3% of A)	$ 95,306
	Subtotal Construction (E)	**$ 4,384,090**
	Engineering Design (15% of E) - includes EA, destailed design and contr admin	$ 657,613
	Halton Internal Costs (10% of E)	$ 438,409
	Project Overall Contingency (10% of E)	$ 438,409
	Mid-Year Point of Construction	$ 88,000
	Capital Cost Alternative 1	**$ 6,006,521**
	Whole Life Cost Alternative 1	**$ 13,483,520**
	NPV Alternative 1	**$ 11,229,757**
Alternative 2: Eliminate Navy St. Pumping Station and Divert Total Flows to Water St. PS		
	General Requirements	$ 536,268
	Percentage of Capital Equipment (excludes collection system)	$ 718,286
	Demolition of Navy St PS	$ 185,000
	Replacement of Water St. PS	$ 1,075,150
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	$ 2,690,258
	Subtotal Capital Facility (A)	**$ 5,204,962**
	Overhead & Profit (10% of A)	$ 520,496
	MOB/Bond/Insurance (5% of A)	$ 260,248
	Construction Contingency (20% of A)	$ 1,040,992
	Construction Sequencing Allowance (3% of A)	$ 156,149
	Subtotal Construction (E)	**$ 7,182,848**
	Engineering Design (15% of E) - includes EA, destailed design and contr admin	$ 1,077,427
	Internal Halton Costs (10% of E)	$ 718,285
	Project Overall Contingency (10% of E)	$ 718,285
	Mid-Year Point of Construction	$ 144,000
	Capital Alternative 2	**$ 9,840,844**
	Whole Life Cost Alternative 2	**$ 12,230,288**
	NPV Alternative 2	**$ 11,003,167**
Alternative 3: Navy St. Remains Operational at Current Capacity and Divert Partial Flows to Water St. PS		
	General Requirements	$ 262,133
	Percentage of Capital Equipment (excludes collection system)	$ 339,663
	Improvements to Navy St PS	$ 313,370
	Improvements to Water St. PS	$ 127,750
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)	$ 1,489,880
	Subtotal Capital Facility (A)	**$ 2,532,797**
	Overhead & Profit (10% of A)	$ 253,280
	MOB/Bond/Insurance (5% of A)	$ 126,640
	Contingency (20% of A)	$ 506,559
	Construction Sequencing Allowance (3% of A)	$ 75,984
	Subtotal Construction (E)	**$ 3,495,259**
	Engineering Design (15% of E) - includes EA, destailed design and contr admin	$ 524,289
	Internal Halton Costs (10% of E)	$ 349,526
	Project Overall Contingency (10% of E)	$ 349,526
	Mid-Year Point of Construction	$ 70,000
	Capital Alternative 3	**$ 4,788,600**
	Whole Life Cost Alternative 3	**$ 15,221,780**
	NPV Alternative 3	**$ 13,299,126**

Navy and Water St WWPS & Collection System Modernization Feasibility Study | **BUDGET COST ESTIMATE** | **11-03-14**

Alternative 1: Navy St. Pumping Station is Upgraded to Future Capacity and Water St. PS Remains Operational at Current Capacity

Prepared by: C. Collin
Project Manager: S. Liver

Black & Veatch

No.	Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	2%	$ 43,361	$ -	$ 43,361	
	Supervision	1	%	6%	$ 130,084	$ -	$ 130,084	
	Temporary Facilities	1	%	4%	$ 86,723	$ -	$ 86,723	
	Temporary Utilities	1	%	1%	$ 21,681	$ -	$ 21,681	
	Equipment Rental	1	%	0.5%	$ 10,840	$ 1,626 (15%)	$ 12,466	
	Sub-total General				$ 292,690	$ 1,626	$ 294,316	
	Percentage of Capital Equipment (excludes collection system)							
1	Sitework		%	10%	$ 115,240		$115,240	
2	Excavation, shoring and backfill		%	10%	$ 115,240		$115,240	
3	Yard Piping		%	5%	$ 57,620		$57,620	
4	Metals		%	2%	$ 23,048		$23,048	
5	Additional Finishes		%	5%	$ 57,620		$57,620	
6	Process Piping and Supports		%	5%	$ 57,620		$57,620	
7	Electrical		%	20%	$ 230,480		$230,480	20% for electrical +
8	I&C		%	5%	$ 57,620		$57,620	ductbank cost
	Subtotal capital facility costs						$ 714,488	
	Replacement of Navy St. PS							
	Packaged Pumping Station	1	Lump Sum	$ 375,000	$ 375,000	$ 93,750 (20%)	$ 468,750	
	Concrete Wetwell	360	m3	$ 1,000	$ 360,000		$ 360,000	
	Genset (250 kW)	1	Lump Sum	$ 96,000	$ 96,000	$ 14,400 (15%)	$ 110,400	
	Demolition of Existing PS	1	Lump Sum	$ 150,000	$ 150,000		$ 150,000	
	Sub-total Replacement of Navy St. PS				$ 981,000	$ 108,150	$ 1,089,150	
	Improvements to Water St. PS							
	New Cathodic Protection System	1	Lump Sum	$ 10,000	$ 10,000	$ 1,500 (15%)	$ 11,500	
	Genset (100 kW)	1	Lump Sum	$ 45,000	$ 45,000	$ 6,750 (15%)	$ 51,750	
	Sub-total Improvements to Water St. PS				$ 55,000	$ 8,250	$ 63,250	
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)							
	New 450mm Piping (mixed depth)	60	m	$ 1,448	$ 86,861		$ 86,861	
	MT (shale) along Front, Navy	150	m	$ 4,500	$ 675,000		$ 675,000	
	MT construction shafts	3	each	$ 75,000	$ 225,000		$ 225,000	
	Manhole	3	unit	$ 6,860	$ 20,580	$ 8,232 (40%)	$ 28,812	
	Sub-total Collection System				$ 1,007,441	$ 8,232	$ 1,015,673	
A	**Subtotal capital facility costs (A)**						**$ 3,176,877**	
B	Overhead & Profit (10% of A)			10%			**$ 317,688**	
C	MOB/Bond/Insurance (5% of A)			5%			**$ 158,844**	
D	Construction Contingency (20% of A)			20%			**$ 635,375**	
	Construction Sequencing Allowance (3% of A)			3%			**$ 95,306**	
E	**Total est. construction costs**						**$ 4,384,090**	
	Non-Construction costs							
F	Engineering Design (15% of E) - includes EA, destailed design and contr admin			15%			657,613	
G	Halton Internal Costs (10% of E)			10%			438,409	
H	Project Overall Contingency (10% of E)			10%			438,409	
I	**Total Estimated Capital Costs**						**$ 5,918,521**	

Note:
The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.
This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment, including railway crossings and electrical supply modifications or relocations.

Navy and Water St WWPS & Collection System Modernization Feasibility Study — **BUDGET COST ESTIMATE** — **11-03-14**

Alternative 2: Eliminate Navy St. Pumping Station and Divert Total Flows to Water St. PS

Prepared by: C. Collin
Project Manager: S. Liver

Black & Veatch

No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	2%	$ 79,008	$ -	$ 79,008	
	Supervision	1	%	6%	$ 237,025	$ -	$ 237,025	
	Temporary Facilities	1	%	4%	$ 158,016	$ -	$ 158,016	
	Temporary Utilities	1	%	1%	$ 39,504	$ -	$ 39,504	
	Equipment Rental	1	%	0.5%	$ 19,752	$ 2,963 (15%)	$ 22,715	
	Sub-total General				$ 533,305	$ 2,963	$ 536,268	
	Percentage of Capital Equipment (excludes collection system)							
1	Sitework		%	10%	$ 126,015		$126,015	
2	Excavation, shoring and backfill		%	10%	$ 126,015		$126,015	
3	Yard Piping		%	5%	$ 63,008		$63,008	
4	Metals		%	2%	$ 25,203		$25,203	
5	Additional Finishes		%	5%	$ 63,008		$63,008	
6	Process Piping and Supports		%	5%	$ 63,008		$63,008	
7	Electrical		%	15%	$ 189,023		$189,023	
8	I&C		%	5%	$ 63,008		$63,008	
	Subtotal capital facility costs						$ 718,286	
	Demolition of Navy St PS							
	Demolition of Existing PS	1	Lump Sum	$ 150,000	$ 150,000		$ 150,000	
	Landscaping	1	Lump Sum	$ 15,000	$ 15,000		$ 15,000	
	Sewage Lift Connection	1	Lump Sum	$ 20,000	$ 20,000		$ 20,000	
	Sub-total Replacement of Navy St. PS				$ 185,000	$ -	$ 185,000	
	Replacement of Water St. PS							
	Packaged Pumping Station	1	Lump Sum	$ 375,000	$ 375,000	$ 93,750 (25%)	$ 468,750	
	Concrete Wetwell	396	m3	$ 1,000	$ 396,000		$ 396,000	
	Genset (250 kW)	1	Lump Sum	$ 96,000	$ 96,000	$ 14,400 (15%)	$ 110,400	
	Demolition of Existing PS	1	Lump Sum	$ 100,000	$ 100,000		$ 100,000	
	Sub-total Improvements to Water St. PS				$ 196,000	$ 14,400	$ 1,075,150	
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)							
	New 450mm Piping	450	m	$ 551	$ 248,040		$ 248,040	Shallow pipe.
	New 450mm Piping	90	m	$ 2,344	$ 210,974		$ 210,974	Deep pipe
	New 300mm Forcemain	135	m	$ 468	$ 63,180		$ 63,180	Shallow pipe.
	MT along Front	110	m	$ 4,500	$ 495,000		$ 495,000	
	MT along William	90	m	$ 4,500	$ 405,000		$ 405,000	
	MT along Navy	160	m	$ 4,500	$ 720,000		$ 720,000	
	MT construction shafts	5	each	$ 75,000	$ 375,000		$ 375,000	
	New 150mm Piping	120	m	$ 962	$ 115,440		$ 115,440	
	Manhole	6	unit	$ 6,860	$ 41,160	$ 16,464 (40%)	$ 57,624	
	Sub-total Collection System				$ 2,673,794	$ 16,464	$ 2,690,258	
5								
A	**Subtotal capital facility costs (A)**						**$ 5,204,962**	
B	Overhead & Profit (10% of A)			10%			**$ 520,496**	
C	MOB/Bond/Insurance (5% of A)			5%			**$ 260,248**	
D	Construction Contingency (20% of A)			20%			**$ 1,040,992**	
	Construction Sequencing Allowance (3% of A)			3%			**$ 156,149**	
E	**Total est. construction costs**						**$ 7,182,848**	
	Non-Construction costs (E)							
F	Engineering Design (15% of E) - includes EA, destailed design and contr admin			15%			1,077,427.20	
G	Internal Halton Costs (10% of E)			10%			718,284.80	
H	Project Overall Contingency (10% of E)			10%			718,284.80	
I	**Total Estimated Capital Costs**						**$ 9,696,845**	

Note:
The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.
This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment, including railway crossings and electrical supply modifications or relocations.

Navy and Water St WWPS & Collection System Modernization Feasibility Study | **BUDGET COST ESTIMATE** | **11-03-14**

Alternative 3: Navy St. Remains Operational at Current Capacity and Divert Partial Flows to Water St. PS

Prepared by: C. Collin
Project Manager: S. Liver

Black & Veatch

No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization		%	2%	$ 38,620	$ -	$ 38,620	
	Supervision		%	6%	$ 115,860	$ -	$ 115,860	
	Temporary Facilities	1	%	4%	$ 77,240	$ -	$ 77,240	
	Temporary Utilities	1	%	1%	$ 19,310	$ -	$ 19,310	
	Equipment Rental	1	%	0.5%	$ 9,655	$ 1,448 (15%)	$ 11,103	
	Sub-total General				$ 260,685	$ 1,448	$ 262,133	
	Percentage of Capital Equipment (excludes collection system)							
1	Sitework		%	15%	$ 66,168		$66,168	
2	Excavation, shoring and backfill		%	10%	$ 44,112		$44,112	
3	Yard Piping		%	10%	$ 44,112		$44,112	
4	Metals		%	2%	$ 8,822		$8,822	
5	Additional Finishes		%	5%	$ 22,056		$22,056	
6	Process Piping and Supports		%	5%	$ 22,056		$22,056	
7	Electrical		%	25%	$ 110,280		$110,280	25% for electrical +
8	I&C		%	5%	$ 22,056		$22,056	ductbank cost (x2)
	Subtotal capital facility costs						$ 339,663	
	Improvements to Navy St PS							
	Genset (125 kW)	1	Lump Sum	$ 54,000	$ 54,000	$ 8,100 (15%)	$ 62,100	
	Concrete Wetwell Expansion	79	m3	$ 1,500	$ 118,500		$ 118,500	Higher unit cost for
	Refurbish existing sub-structure	1	Lump Sum	$ 100,000	$ 100,000		$ 100,000	smaller size
	Building services improvements	6	m2	$ 800	$ 4,770		$ 4,770	
	Brick finishing	70	m2	$ 400	$ 28,000		$ 28,000	
	Sub-total Improvements Navy St. PS				$ 305,270	$ 8,100	$ 313,370	
	Improvements to Water St. PS							
	Replace Pumps	2	unit	$ 30,000	$ 60,000	$ 4,500 (15%)	$ 64,500	
	Cathodic Protection System	1	Lump Sum	$ 10,000	$ 10,000	$ 1,500 (15%)	$ 11,500	
	Genset (100 kW)	1	Lump Sum	$ 45,000	$ 45,000	$ 6,750 (15%)	$ 51,750	
	Sub-total Improvements to Water St. PS				$ 45,000	$ 6,750	$ 127,750	
	Collection System (includes site work, excavation, shoring, backfill, and asphalt restoration)							
	New 200mm Piping	230	m	$ 1,076	$ 247,572		$ 247,572	mixed depth
	MT along Navy and William	170	m	$ 4,500	$ 765,000		$ 765,000	
	MT construction shafts	3	each	$ 75,000	$ 225,000		$ 225,000	
	New 350mm Piping	400	m	$ 511	$ 204,256		$ 204,256	Shallow pipe
	New 150mm Piping	20	m	$ 962	$ 19,240		$ 19,240	
	Manhole	3	unit	$ 6,860	$ 20,580	$ 8,232 (40%)	$ 28,812	
	Sub-total Collection System				$ 1,481,648	$ 8,232	$ 1,489,880	
A	**Subtotal capital facility costs**						**$ 2,532,797**	
B	Overhead & Profit (10% of A)			10%			**$ 253,280**	
C	MOB/Bond/Insurance (5% of A)			5%			**$ 126,640**	
D	Contingency (20% of A)			20%			**$ 506,559**	
	Construction Sequencing Allowance (3% of A)			3%			**$ 75,984**	
E	**Total est. construction costs**						**$ 3,495,259**	
	Non-Construction costs							
F	Engineering Design (15% of E) - includes EA, destailed design and contr admin			15%			524,288.89	
G	Internal Halton Costs (10% of E)			10%			349,525.93	
H	Project Overall Contingency (10% of E)			10%			349,525.93	
I	**Total Estimated Capital Costs**						**$ 4,718,601**	

Note:
The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.
This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment,

Navy and Water St WWPS & Collection System Modernization Feasibility Study

BUDGET COST ESTIMATE

11-03-14

Alternative 1 & 3 - Cost to Replace Water St to be Considered in Whole Life Cost

Prepared by: G. Nunes and J. Stevenson
Project Manager: Brian R. Edwards

Black & Veatch

No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	2%	$ 18,132	$ -	$ 18,132	
	Supervision	1	%	6%	$ 54,395	$ -	$ 54,395	
	Temporary Facilities	1	%	4%	$ 36,264	$ -	$ 36,264	
	Temporary Utilities	1	%	1%	$ 9,066	$ -	$ 9,066	
	Equipment Rental	1	%	0.5%	$ 4,533	$ 680 (15%)	$ 5,213	
	Sub-total General						$ 123,070	
	Percentage of Capital Equipment							
1	Sitework		%	10%	$ 90,659		$90,659	
2	Excavation, shoring and backfill		%	10%	$ 90,659		$90,659	
3	Yard Piping		%	5%	$ 45,329		$45,329	
4	Metals		%	2%	$ 18,132		$18,132	
5	Additional Finishes		%	5%	$ 45,329		$45,329	
6	Process Piping and Supports		%	5%	$ 45,329		$45,329	
7	Electrical		%	15%	$ 135,988		$135,988	
8	I&C		%	5%	$ 45,329		$45,329	
	Subtotal capital facility costs						$ 516,756	
	Replacement of Water St. PS							
	Packaged Pumping Station	1	Lump Sum	$ 187,500	$ 187,500	$ 46,875 (25%)	$ 234,375	
	Concrete Wetwell	158	m3	$ 1,000	$ 158,000		$ 158,000	
	Demolition of Existing PS	1	Lump Sum	$ 100,000	$ 100,000		$ 100,000	
	Genset (200 kW)	1	Lump Sum	$ 90,000	$ 90,000	$ 22,500 (25%)	$ 112,500	
	Relocation of Water St. PS							
	New 450mm Piping	50	m	$ 551	$ 27,560		$ 27,560	Shallow pipe.
	New 450mm Piping	90	m	$ 2,344	$ 210,974		$ 210,974	Deep pipe
	New 300mm Forcemain	135	m	$ 468	$ 63,180		$ 63,180	Shallow pipe.
	Sub-total Improvements to Water St. PS						$ 906,589	
A	**Subtotal capital facility costs (A)**						**$ 1,546,415**	
B	Overhead & Profit (10% of A)			10%			**$ 154,641**	
C	MOB/Bond/Insurance (5% of A)			5%			**$ 77,321**	
D	Contingency (20% of A)			20%			**$ 309,283**	
	Construction Sequencing Allowance (3% of A)			3%			**$ 46,392**	
E	**Total est. construction costs**						**$ 2,134,053**	
	Non-Construction costs (E)							
F	Engineering Design (15% of E) - includes EA, destailed design and contr admin			15%			320,107.88	
G	Halton Internal Costs (10% of E)			10%			213,405.25	
	Project Overall Contingency (10% of E)			10%			213,405.25	
	Mid-Year Point of Construction (0.5 years, 3%)						43,000.00	
H	**Total Estimated Capital Costs**						**$ 2,923,971**	

Note:
The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.
This estimate does not include any costs for acquiring the necessary permits or Rights-of-way for the above specified equipment,

Navy and Water St WWPS & Collection System Modernization Feasibility Study

BUDGET COST ESTIMATE

11-03-14

Alternative 3 - Cost to Replace Navy St PS to be Considered in Whole Life Cost

Prepared by: G. Nunes and J. Stevenson
Project Manager: Brian R. Edwards

Black & Veatch

No.	Major Equipment Description	Quantity	Unit	Unit Cost	Total Cost	Equipment Installation (15% unless indicated)	Total	Comments
	General Requirements							
	Mobilization	1	%	2%	$ 20,866	$ -	$ 20,866	
	Supervision	1	%	6%	$ 62,599	$ -	$ 62,599	
	Temporary Facilities	1	%	4%	$ 41,733	$ -	$ 41,733	
	Temporary Utilities	1	%	1%	$ 10,433	$ -	$ 10,433	
	Equipment Rental	1	%	0.5%	$ 5,217	$ 782 (15%)	$ 5,999	
	Sub-total General						**$ 141,630**	
	Percentage of Capital Equipment							
1	Sitework		%	10%	$ 104,331		$104,331	
2	Excavation, shoring and backfill		%	10%	$ 104,331		$104,331	
3	Yard Piping		%	5%	$ 52,166		$52,166	
4	Metals		%	2%	$ 20,866		$20,866	
5	Additional Finishes		%	5%	$ 52,166		$52,166	
6	Process Piping and Supports		%	5%	$ 52,166		$52,166	
7	Electrical		%	20%	$ 208,663		$208,663	20% for electrical +
8	I&C		%	5%	$ 52,166		$52,166	ductbank cost
	Subtotal capital facility costs						**$ 646,854**	
	Replacement of Navy St. PS							
	Packaged Pumping Station	1	Lump Sum	$ 356,250	$ 356,250	$ 89,063 (25%)	$ 445,313	
	Concrete Wetwell	328	m3	$ 1,000	$ 328,000		$ 328,000	
	Demolition of Existing PS	1	Lump Sum	$ 150,000	$ 150,000		$ 150,000	
	Genset (250 kW)	1	Lump Sum	$ 96,000	$ 96,000	$ 24,000 (25%)	$ 120,000	
	Sub-total Replacement of Navy St. PS						**$ 1,043,313**	
A	**Subtotal capital facility costs (A)**						**$ 1,831,796**	
B	Overhead & Profit (10% of A)			10%			**$ 183,180**	
C	MOB/Bond/Insurance (5% of A)			5%			**$ 91,590**	
D	Contingency (20% of A)			20%			**$ 366,359**	
	Construction Sequencing Allowance (3% of A)			3%			**$ 54,954**	
E	**Total est. construction costs**						**$ 2,527,878**	
	Non-Construction costs							
F	Engineering Design (15% of E) - includes EA, destailed design and contr admin			15%			379,181.76	
G	Halton Internal Costs (10% of E)			10%			252,787.84	
	Project Overall Contingency (10% of E)			10%			252,787.84	
	Mid-Year Point of Construction (0.5 years, 3%)						51,000.00	
H	**Total Estimated Capital Costs**						**$ 3,463,636**	

Note:
The Order-of-Magnitude cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Whole Life Cost and Net Present Value

11-03-14

Alternative 1: Navy St. Pumping Station is Upgraded to Future Capacity and Water St. PS Remains Operational at Current Capacity

Capital Costs

Cost Item	CAD $
Construction	
Subtotal capital facility costs (A)	$3,176,877
Overhead & Profit (10% of A)	$317,688
MOB/Bond/Insurance (5% of A)	$158,844
Construction Contingency (20% of A)	$635,375
Construction Sequencing Allowance (3% of A)	$95,306
Construction sub total	$4,384,090
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destailed des	$657,613
Halton Internal Costs (10% of E)	$438,409
Project Overall Contingency (10% of E)	$438,409
Non-construction sub total	$1,534,431
Mid-Year Point of Construction	$88,000
(mid-year, %)	(0.5 years, 3.0%)
Total (no contingency applied)	**$6,006,521**

Routine O&M Costs

Cost Item	Note	Power (kw)	$per kwh[1]	Usage factor[2]	Annual Cost[3]
Navy St PS	S&L selection	60	0.1	0.6	$31,536
Water St PS	Existing Pumps	30	0.1	0.9	$23,652
Staff time	1 operator				$45,000
Transport					$10,000
Electrics maintenance					$5,000
Mechanical maintenance					$5,000
Civil maintenance					$3,000
Security/safety					$10,000
Administration costs					$1,000
Total					**$134,188**

1. The annual power costs were calculated using rate of 0.1$/kWh.
2. Usage factor applied for expected frequency of use.
   Average operation 2 pumps at Navy St. PS; considering 1 hr retention time in wetwell at peak instantaneous flows.
   Average operation 2 pumps at Water St. PS; considering 15 min retention time in wetwell at peak instantaneous flows.
3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

Periodic Maintenance Costs

Cost Item	Frequency	Cost	Note
Electrics	every 30 years	$30,000	per pmp group
Controls	every 15 years	$15,000	
Pumps and accessories	every 30 years	$193,200	per pmp group
Building services	every 20 years	$20,000	per building
Civil refurbishment	every 30 years	$100,000	
Replacement of Water St. PS	every 50 years	$2,923,971	from original construction

Discount Rate	0.05

Whole Life Cost

Yr	Note	Annual O&M	Capital and Refurbishment Costs			Annual Cost	PV
0	Capital Investiment	$134,188	$6,006,521			$6,140,709	$6,140,709
1		$134,188				$134,188	$127,798
2		$134,188				$134,188	$121,712
3	Replace Water St. PS due to age, built in 1967.	$134,188	$2,923,971			$3,058,159	$3,039,888
4		$134,188				$134,188	$110,397
5		$134,188				$134,188	$105,140
6		$134,188				$134,188	$100,133
7		$134,188				$134,188	$95,365
8		$134,188				$134,188	$90,824
9		$134,188				$134,188	$86,499
10		$134,188				$134,188	$82,380
11		$134,188				$134,188	$78,457
12		$134,188				$134,188	$74,721
13		$134,188				$134,188	$71,163
14		$134,188				$134,188	$67,774
15	Controls for new Navy St. PS	$134,188	$15,000			$149,188	$71,762
16		$134,188				$134,188	$61,473
17		$134,188				$134,188	$58,546
18	Controls for new Water St. PS	$134,188	$15,000			$149,188	$61,991
19		$134,188				$134,188	$53,103
20	Building services for new Navy St PS	$134,188	$20,000			$154,188	$58,112
21		$134,188				$134,188	$48,166
22		$134,188				$134,188	$45,872
23	Building services for new Water St PS	$134,188	$20,000			$154,188	$50,199
24		$134,188				$134,188	$41,607
25		$134,188				$134,188	$39,626
26		$134,188				$134,188	$37,739
27		$134,188				$134,188	$35,942
28		$134,188				$134,188	$34,231
29		$134,188				$134,188	$32,600
30	Major refurb Navy St.PS - elect, pmps and civil	$134,188	$30,000	$193,200	$100,000	$457,388	$105,829
Total						**$13,483,520**	**$11,229,757**

Whole Life Cost and Net Present Value

11-03-14

Alternative 2: Eliminate Navy St. Pumping Station and Divert Total Flows to Water St. PS

Capital Costs

Cost Item	
Construction	
Subtotal capital facility costs (A)	$5,204,962
Overhead & Profit (10% of A)	$520,496
MOB/Bond/Insurance (5% of A)	$260,248
Construction Contingency (20% of A)	$1,040,992
Construction Sequencing Allowance (3% of A)	$156,149
Construction sub total	$7,182,847.56
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destailed	$1,077,427.13
Internal Halton Costs (10% of E)	$718,285
Project Overall Contingency (10% of E)	$718,285
Non-construction sub total	$2,513,997
Mid-Year Point of Construction	$144,000
(mid-year, %)	(0.5 years, 3.0%)
Total (no contingency applied)	**$9,840,844**

Routine O&M Costs

Cost Item	Note	Power (kw)	$per kwh[1]	Usage factor[2]	Annual cost[3]
Water St PS	S&L selection	40	0.1	0.6	$21,024
Staff time	Part-time operator				$22,500
Transport	70% Alt 1				$7,000
Electrics maintenance	70% Alt 1				$3,500
Mechanical maintenance	70% Alt 1				$3,500
Civil maintenance	70% Alt 1				$2,000
Security/safety	50% Alt 1				$5,000
Administration costs	Alt 1				$1,000
Total					**$65,524**

1. The annual power costs were calculated using rate of 0.1$/kWh.
2. Usage factor applied for expected frequency of use.
   Average operation 2 pumps at Water St. PS; considering 1 hr retention time in wetwell at peak instantaneous flows.
3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

PeriodicMaintenance Costs

Cost Item	Frequency	Cost	Note
Electrics	every 30 years	30,000	per pmp group
Controls	every 15 years	15,000	
Pumps and accessories	every 30 years	193,200	per pmp group
Building services	every 20 years	20,000	per building
Civil refurbishment	every 30 years	100,000	

Discount Rate	0.05

Whole Life Cost

Year	Note	Annual O&M	Capital and Refurbishment Costs			Annual Cost	PV
0	Capital investment	$65,524	$9,840,844			$9,906,368	$9,906,368
1		$65,524				$65,524	$62,404
2		$65,524				$65,524	$59,432
3		$65,524				$65,524	$56,602
4		$65,524				$65,524	$53,907
5		$65,524				$65,524	$51,340
6		$65,524				$65,524	$48,895
7		$65,524				$65,524	$46,567
8		$65,524				$65,524	$44,349
9		$65,524				$65,524	$42,237
10		$65,524				$65,524	$40,226
11		$65,524				$65,524	$38,311
12		$65,524				$65,524	$36,486
13		$65,524				$65,524	$34,749
14		$65,524				$65,524	$33,094
15	Controls for Water St PS	$65,524	$15,000			$80,524	$38,733
16		$65,524				$65,524	$30,017
17		$65,524				$65,524	$28,588
18		$65,524				$65,524	$27,227
19		$65,524				$65,524	$25,930
20	Building for Water St PS	$65,524	$20,000			$85,524	$32,233
21		$65,524				$65,524	$23,519
22		$65,524				$65,524	$22,399
23		$65,524				$65,524	$21,333
24		$65,524				$65,524	$20,317
25		$65,524				$65,524	$19,349
26		$65,524				$65,524	$18,428
27		$65,524				$65,524	$17,550
28		$65,524				$65,524	$16,715
29		$65,524				$65,524	$15,919
30	Major refurb Water St PS elect, pmps and civil	$65,524	$30,000	$193,200	$100,000	$388,724	$89,942
Total						**$12,230,288**	**$11,003,167**

Whole Life Cost and Net Present Value

11-03-14

Alternative 3: Navy St. Remains Operational at Current Capacity and Divert Partial Flows to Water St. PS

Capital Costs

Cost Item	
Construction	
Subtotal capital facility costs	$2,532,797
Overhead & Profit (10% of A)	$253,280
MOB/Bond/Insurance (5% of A)	$126,640
Contingency (20% of A)	$506,559
Construction Sequencing Allowance (3% of A)	$75,984
Construction sub total	$3,495,259
Non-construction (E)	
Engineering Design (15% of E) - includes EA, destaile	$524,289
Internal Halton Costs (10% of E)	$349,526
Project Overall Contingency (10% of E)	$349,526
Non-construction sub total	$1,223,341
Mid-Year Point of Construction (mid-year, %)	$70,000 (0.5 years, 3.0%)
Total (no contingency applied)	**$4,788,600**

Routine O&M costs

Cost Item	Note	Power (kw)	$per kwh[1]	Usage factor[2]	Annual cost[3]
Navy St PS		68	0.1	0.6	$35,741
Water St PS		30	0.1	0.6	$15,768
Staff time	1 operator				$45,000
Transport	Alt 1				$10,000
Electrics maintenance	Alt 1				$5,000
Mechanical maintenance	Alt 1				$5,000
Civil maintenance	Alt 1				$3,000
Security/safety	Alt 1				$10,000
Administration costs	Alt 1				$1,000
Total					**$130,509**

1. The annual power costs were calculated using rate of 0.1$/kWh.
2. Usage factor applied for expected frequency of use.
   Average operation 2 pumps at Water St. PS; considering 15 min retention time in wetwell at peak instantaneous flows.
3. The annual cost of operation is the power consumption x power cost x usage factor (frequency of use).

Periodic maintenance costs

Cost Item	Frequency	Cost Navy	Cost Water	Note
Electrics	every 30 years	30,000.00	20,000.00	per pup group
Controls	every 15 years	15,000.00	10,000.00	
Pumps and accessories	every 30 years	124,200.00	82,800.00	per pup group
Building services	every 20 years	25,000.00	25,000.00	per building
Civil refurbishment	every 30 years	100,000.00	70,000.00	
Replacement of Pumping Station	every 50 years	$3,463,636	$2,923,971	from original construction
Credit for equipment re-use	every 50 years		-$25,200	

Discount Rate	0.05

Whole life cost

Year	Note	Annual O&M	Capital and refurbishment costs		Annual cost	PV
0	Capital Invstment	$130,509	$4,788,600		$4,919,109	$4,919,109
1		$130,509			$130,509	$124,294
2		$130,509			$130,509	$118,375
3	Replace Water St. PS due to age, built in 1967.	$130,509	$2,923,971	-$25,200	$3,029,280	$3,011,509
4		$130,509			$130,509	$107,370
5		$130,509			$130,509	$102,257
6		$130,509			$130,509	$97,388
7		$130,509			$130,509	$92,750
8		$130,509			$130,509	$88,333
9		$130,509			$130,509	$84,127
10		$130,509			$130,509	$80,121
11		$130,509			$130,509	$76,306
12		$130,509			$130,509	$72,672
13		$130,509			$130,509	$69,212
14		$130,509			$130,509	$65,916
15	Controls for Navy St PS	$130,509	$15,000		$145,509	$69,992
16		$130,509			$130,509	$59,788
17		$130,509			$130,509	$56,941
18	Controls for new Water St. PS	$130,509	$10,000		$140,509	$58,384
19		$130,509			$130,509	$51,647
20		$130,509			$130,509	$49,187
21	Replace Navy St. PS due to age, built in 1985.	$130,509	$3,463,636	$0	$3,594,145	$3,510,481
22		$130,509			$130,509	$44,614
23		$130,509			$130,509	$42,490
24		$130,509			$130,509	$40,467
25		$130,509			$130,509	$38,540
26		$130,509			$130,509	$36,704
27		$130,509			$130,509	$34,957
28		$130,509			$130,509	$33,292
29		$130,509			$130,509	$31,707
30		$130,509			$130,509	$30,197
Total					**$15,221,780**	**$13,299,126**