

Appendix 'H'
**Booster Pumping Station and Storage Upgrades: Opinion
of Probable Costs**

Booster Pumping Station Upgrades – Opinion of Probable Costs

Alternative 1.6: Increase firm capacity at Mountain Rd BPS to 104 L/s		
Component	Opinion of Probable Cost	Notes
Civil/Siteworks	\$100,000	New concrete base for new back-up generator, footing and slab on grade for the new building, grading work, connections to existing inlet and outlet watermains and decommissioning of the existing station.
Building	\$75,000	Construction of a new building made of concrete block walls and steel roof.
Mechanical (Process)	\$300,000	Existing firm capacity is 46 L/s with largest pump out of service. The booster pumps are "canned pumps" and it would not be possible to double the flow with the existing cans. It is recommended to build a new pump station beside the existing pump station. The new pump station would be equipped with three (3) pumps having a capacity each of 52 L/s. Assume discharge pressure of 40 psi. Complete with new piping and valves.
Mechanical (Building)	\$25,000	Building ventilation work and plumbing work.
Electrical	\$120,000	New service entrance, metering, MCC and electrical distribution. Assume new back-up generator with capacity of 100 kW c/w new transfer switch. Assume an outdoor installation inside a weatherproof and soundproof enclosure.
Instrumentation and Control	\$75,000	New instruments and control panel with PLC and VFDs (assume 30 Hp). Connection to SCADA system.
Land Acquisition (if required)	\$0	Not required.
Subtotal	\$695,000	
General Requirements (2) (9.5%)	\$66,025	
Engineering and Contingency (22%)	\$152,900	
Total	\$913,925	

Alternative 1.7: Increase firm capacity of Arrowhead Rd. BPS to 104 L/s		
Component	Opinion of Probable Cost	Notes
Civil/Siteworks	\$20,000	New concrete base for new pump, new concrete base for new back-up generator and some grading work.
Building	\$10,000	Minor work. Block some existing openings for ventilation ducts.
Mechanical (Process)	\$100,000	Existing firm capacity is 68 L/s with largest pump out of service. I propose the addition of a fourth pump with a capacity of 36 L/s. Assuming there is enough room beside pump No. 1 and the existing by-pass piping. Modifications to existing piping will be required (suction and discharge headers).
Mechanical (Building)	\$10,000	Minor work. Remove existing ventilation ducts for existing back-up generator.
Electrical	\$150,000	Modifications to existing MCCs, power feed to the new motor, new VFD (30-40 Hp), new back-up generator and new transfer switch. The existing back-up generator has a capacity of 75 kW. New back-up generator could be 125 kW. Assume an outdoor installation inside a weatherproof and soundproof enclosure.
Instrumentation and Control	\$25,000	Modifications to the existing PLC and SCADA and integration of new pump into control narrative.
Land Acquisition (if required)	\$0	Not required.
Subtotal	\$315,000	
General Requirements (2) (9.5%)	\$29,925	
Engineering and Contingency (22%)	\$69,300	
Total	\$414,225	

Alternative 2.2a: Increase firm capacity at 10th Line BPS to 130 L/s (max day + fire flow)		
Component	Opinion of Probable Cost	Notes
Civil/Siteworks	\$50,000	Minor work to existing pump bases.
Building	\$0	Not required.
Mechanical (Process)	\$150,000	Existing firm capacity is 100 L/s with largest pump out of service. I propose the replacement of three (3) existing pumps with three larger pumps having a capacity each of 40 L/s. Modifications to existing individual piping will be required (suction and discharge). Assume suction and discharge headers are OK.
Mechanical (Building)	\$0	Not required.
Electrical	\$150,000	Modifications to existing MCCs, power feed to the new motors, new VFDs (15-20 Hp). Assume new 200 kva generator in outdoor enclosure.
Instrumentation and Control	\$30,000	Modifications to the existing sequence to incorporate the change to the pumps arrangement.
Land Acquisition (if required)	\$0	Not required.
Subtotal	\$380,000	
General Requirements (2) (9.5%)	\$36,100	
Engineering and Contingency (22%)	\$83,600	
Total	\$499,700	

New Booster Pumping Station in Craigleith Capacity = 233 L/s		
Component	Opinion of Probable Cost	Notes
Civil/Siteworks	\$150,000	New concrete base for new back-up generator, footing and slab on grade for the new building, grading work and connections to existing inlet and outlet watermains.
Building	\$150,000	Construction of a new building made of concrete block walls and steel roof.
Mechanical (Process)	\$500,000	Assume a total of five (5) pumps having a capacity each of 60 L/s for a firm capacity of 240 L/s. Assume discharge pressure of 60 psi. Complete with new piping and valves. Add a sodium hypochlorite system for rechlorination.
Mechanical (Building)	\$50,000	Building ventilation work and plumbing work.
Electrical	\$300,000	New service entrance, metering, MCC, VFDs (assume 50 Hp motors) and electrical distribution. Assume new back-up generator with capacity of 200 kW c/w new transfer switch. Assume an outdoor installation inside a weatherproof and soundproof enclosure.
Instrumentation and Control	\$50,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Not required.
Subtotal	\$1,200,000	
General Requirements (2) (9.5%)	\$114,000	
Engineering and Contingency (22%)	\$264,000	
Total	\$1,578,000	

Storage Upgrades – Opinion of Probable Cost

Alternative 2.2: Construct new 2,700 m3 elevated tank at site of existing Victoria St. Tower		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$150,000	Includes excavation, backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Elevated Tank (glass-fused-to steel)	\$2,200,000	Estimated cost from supplier.
Foundation	\$150,000	Assume some bedrock.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$250,000	Internal piping and rechlorination and mixing equipment.
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Not required at existing site.
Premium to Construct Downtown (10%)	\$284,500	
Subtotal	\$3,129,500	DC chages had \$3.2M (I don't think it includes foundation)
General Requirements (2) (9.5%)	\$297,000	
Engineering and Contingency (22%)	\$688,000	
Total	\$4,100,000	

Alternative 2.6/2.9: Construct new 1,700 m3 in-ground storage at 10th line BPS		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$150,000	Includes excavation (other than bedrock), backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Cast-in-Place Concrete Reservoir	\$1,900,000	Includes concrete and access hatches. Assume a unit cost of \$1000/m3. The reservoir should include two (2) cells. Assume all excavation is bedrock and assume bedrock excavation is \$100/m3.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$80,000	Internal piping and rechlorination equipment (no mixing equipment).
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Not required at existing site.
Subtotal	\$2,225,000	
General Requirements (2) (9.5%)	\$211,000	
Engineering and Contingency (22%)	\$490,000	
Total	\$2,900,000	

Alternative 2.6/2.7: Construct new 1,000 m3 elevated tank at existing Victoria St. Tower		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$120,000	Includes excavation, backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Elevated Tank (glass-fused-to steel)	\$1,800,000	Estimated cost from supplier.
Foundation	\$120,000	Assume some bedrock.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$180,000	Internal piping and rechlorination and mixing equipment.
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Not required at existing site.
Premium to Construct Downtown (10%)	\$231,500	
Subtotal	\$2,315,000	
General Requirements (2) (9.5%)	\$220,000	
Engineering and Contingency (22%)	\$509,000	
Total	\$3,000,000	

Alternative 2.7: Construct new 1,700 m3 in-ground reservoir on the west side of Lora Bay		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$250,000	Includes excavation (other than bedrock), backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Cast-in-Place Concrete Reservoir	\$2,000,000	Includes concrete and access hatches. Assume a unit cost of \$1000/m3. The reservoir should include two (2) cells. Assume all excavation is bedrock and assume bedrock excavation is \$150/m3.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$80,000	Internal piping and rechlorination equipment (no mixing equipment).
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$200,000	Based on MPAC of nearby property
Subtotal	\$2,625,000	
General Requirements (2) (9.5%)	\$249,000	
Engineering and Contingency (22%)	\$578,000	
Total	\$3,500,000	

Alternative 2.9: Construct new 1000 m3 in-ground reservoir at the Thornbury reservoir		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$120,000	Includes excavation (other than bedrock), backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Cast-in-Place Concrete Reservoir	\$1,100,000	Includes concrete and access hatches. Assume a unit cost of \$1000/m3. The reservoir should include two (2) cells. Assume all excavation is bedrock and assume bedrock excavation is \$100/m3.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$80,000	Internal piping and rechlorination equipment (no mixing equipment).
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Assumed on Town property
Subtotal	\$1,395,000	
General Requirements (2) (9.5%)	\$133,000	
Engineering and Contingency (22%)	\$307,000	
Total	\$1,800,000	

Alternative 3.2: Add 3,300 m3 of additional below grade storage near the Happy Valley Reservoir site		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$200,000	Includes excavation (other than bedrock), backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Cast-in-Place Concrete Reservoir	\$3,800,000	Includes concrete and access hatches. Assume a unit cost of \$1000/m3. The reservoir should include two (2) cells. Assume all excavation is bedrock and assume bedrock excavation is \$150/m3.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$150,000	Internal piping, rechlorination equipment (no mixing equipment) and junction with existing reservoir.
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$400,000	Based on MPAC of nearby property
Subtotal	\$4,645,000	
General Requirements (2) (9.5%)	\$441,000	
Engineering and Contingency (22%)	\$1,022,000	
Total	\$6,100,000	

Alternative 3.4: Construct new 3,300 m3 elevated tank at new site in Craigleith		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$250,000	Includes excavation, backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Elevated Tank (glass-fused-to steel)	\$2,800,000	Estimated cost from supplier.
Foundation	\$200,000	Assume some bedrock.
Building	\$30,000	Small steel prefabricated building for chlorination equipment.
Mechanical (Process)	\$250,000	Internal piping and rechlorination and mixing equipment.
Mechanical (Building)	\$10,000	Small ventilation system.
Electrical	\$30,000	New service entrance, metering and electrical distribution. No back-up power.
Instrumentation and Control	\$25,000	New instruments and control panel with PLC. Connection to SCADA system.
Land Acquisition (if required)	\$0	Assume on Town owned land
Subtotal	\$3,595,000	
General Requirements (2) (9.5%)	\$342,000	
Engineering and Contingency (22%)	\$791,000	
Total	\$4,700,000	

Alternative 3.5: Construct new 3,300 m3 in-ground reservoir with PS at new site in Craigleith		
Component	Opinion of Probable Cost⁽¹⁾	Notes
Civil/Siteworks	\$200,000	Includes excavation (other than bedrock), backfill, grading, foundation and slab on grade for new building, underground pipe works and access road.
Cast-in-Place Concrete Reservoir	\$2,800,000	Includes concrete and access hatches. Assume a unit cost of \$750/m3. The reservoir should include two (2) cells. Assume all excavation is bedrock and assume bedrock excavation is \$100/m3.
Building	\$0	Included with the new Craigleith booster pumping station.
Mechanical (Process)	\$100,000	Internal piping and rechlorination equipment (no mixing equipment).
Mechanical (Building)	\$0	Included with the new Craigleith booster pumping station.
Electrical	\$0	
Instrumentation and Control	\$0	
Land Acquisition (if required)	\$0	Assume on Town owned land
Subtotal	\$3,100,000	
General Requirements (2) (9.5%)	\$295,000	
Engineering and Contingency (22%)	\$682,000	
Total	\$4,100,000	



www.jlrichards.ca

Ottawa

864 Lady Ellen Place
Ottawa ON Canada
K1Z 5M2
Tel: 613 728-3571
ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424
kingston@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174
sudbury@jlrichards.ca

Timmins

834 Mountjoy Street S, PO Box 10
Timmins ON Canada
P4N 7C5
Tel: 705 360-1899
timmins@jlrichards.ca

North Bay

200-175 Progress Road
North Bay ON Canada
P1A 0B8
Tel: 705 495-7597
northbay@jlrichards.ca

Hawkesbury

372 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287
hawkesbury@jlrichards.ca

Guelph

107-450 Speedvale Ave. W
Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713
guelph@jlrichards.ca

