

**Alternative Design Concept 1 - Expand Mechanical Plant Without use of Lagoons**

	Description	Unit	Quantity	Material		Installation		Total Material & Installation	Comments
				Unit Cost	Total Material Cost	% of Material Cost	Total Installation Cost		
Civil	Service Road Extension	LS	1	\$ 200,000	\$ 200,000	50%	\$ 100,000	\$ 300,000	
	Outfall Relocation	LS	1	\$ 100,000	\$ 100,000	50%	\$ 50,000	\$ 150,000	
	Sludge Loading Relocation	LS	1	\$ 200,000	\$ 200,000	0%	\$ -	\$ 200,000	
	<b>Civil Total</b>							<b>\$ 650,000</b>	
Structural	Filter Building Extension	m2	85.5	\$ 3,600	\$ 307,800	20%	\$ 61,560	\$ 370,000	
	Grit Channel Bypass	LS	1	\$ 100,000	\$ 100,000	included		\$ 100,000	
	<b>Structural Total</b>	LS	1	\$ 160,000	\$ 160,000	25%	\$ 40,000	<b>\$ 470,000</b>	
Process	Raw Sewage Pumping	each	2.00	\$25,000.00	\$ 50,000	50%	\$ 25,000	\$ 75,000	
	Screening	LS	1.00	\$250,000.00	\$ 250,000	included		\$ 250,000	
	Secondary Treatment + Digester	LS	1.00	\$3,000,000.00	\$ 3,000,000	included		\$ 3,000,000	
	EQ Pumps	each	2.00	\$25,000.00	\$ 50,000			\$ 50,000	
	Tertiary Treatment	LS	1.00	\$2,500,000.00	\$ 2,500,000	included		\$ 2,500,000	
	Disinfection	each	2.00	\$150,000.00	\$ 300,000	121%	\$ 361,800	\$ 662,000	
	Biosolids Storage	LS	1.00	\$515,000.00	\$ 515,000	50%	\$ 257,500	\$ 773,000	
	Biosolids Mixing	LS	1.00	\$160,000.00	\$ 160,000	50%	\$ 80,000	\$ 240,000	
	Equipment Rental	LS	1.00	\$300,000.00	\$ 300,000	included		\$ 300,000	
	<b>Process Total</b>							<b>\$ 7,850,000</b>	
Other	Building Mechanical								
	Controls								
	Electrical								
	<b>Other Total</b>							<b>\$ 1,800,000</b>	

<b>CAPITAL COSTS</b>	
<b>SUB TOTAL CAPITAL COSTS = \$</b>	<b>10,770,000</b>
<b>Engineering (20%) = \$</b>	<b>2,154,000</b>
<b>Contingency (30%) = \$</b>	<b>3,231,000</b>
<b>General Contracts Overhead (20%) = \$</b>	<b>2,154,000</b>
<b>TOTAL CAPITAL COSTS = \$</b>	<b>18,309,000</b>

<b>Operation &amp; Maintenance Cost</b>						
<b>Alternative 1</b>						
	Description	Unit	Quantity	Unit Cost (\$)	Annual Cost	Comments
	Chemical Consumption Cost	kg	3,358	\$ 0.21	\$ 705	Increased by 2384 kg/yr at 0.\$21 /kg
	Energy (Aeration for SBR+Digester)	kWh	138000	\$ 0.12	\$ 16,560	\$0.12/kWh (Weighted average of electricity costs from Ontario Energy Board), 138,000 kWh (Napier Reid)
	Energy (UV)	kWh	17520	\$ 0.13	\$ 2,278	2.1 kW average power draw, 8760 operating hours
	Pumping (Raw Sewage+EQ)	kWh	65479	\$ 0.13	\$ 8,512	
	Sludge Management	tonne	48	\$ 150	\$ 7,200	\$150/dry tonne for biosolids management
	<b>Total O&amp;M Cost</b>				<b>\$ 35,255</b>	
				<b>SUB TOTAL O&amp;M COSTS = \$</b>	<b>36,000</b>	
				<b>Contingency (30%) = \$</b>	<b>10,800</b>	
				<b>TOTAL O&amp;M COSTS = \$</b>	<b>46,800</b>	

**Alternative Design Concept 2 - Use Existing Lagoon for Equalization**

	Description	Unit	Quantity	Material		Installation			Comments
				Unit Cost	Total Material Cost	% of Material Cost	Total Installation Cost		
Civil	Service Road Extension	LS	1	\$ 200,000	\$ 200,000	50%	\$ 100,000	\$ 300,000	
	Outfall Relocation	LS	1	\$ 100,000	\$ 100,000	50%	\$ 50,000	\$ 150,000	
	Sludge Loading Relocation	LS	1	\$ 200,000	\$ 200,000	0%	\$ -	\$ 200,000	
	<b>Civil Total</b>							<b>\$ 650,000</b>	
Structural	Filter Building Extension	m2	85.5	\$ 3,600	\$ 307,800	20%	\$ 61,560	\$ 370,000	
	Grit Channel Bypass	LS	0	\$ 100,000	\$ -	included		\$ -	
	<b>Structural Total</b>	LS	1	\$ 160,000	\$ 160,000	25%	\$ 40,000	<b>\$ 370,000</b>	
Lagoon	Lagoon Rehabilitation	LS	1	\$ 700,000	\$ 700,000	included		\$ 770,000	*carried for evaluation
	Earth Works	LS	1	\$ 600,000	\$ 600,000	included		\$ 600,000	*carried for evaluation
	Pump Station	LS	1	\$ 400,000	\$ 400,000	included		\$ 400,000	*carried for evaluation
	Yard Piping	LS	1	\$ 500,000	\$ 500,000	included		\$ 500,000	*carried for evaluation
	Other – Building Mechanical, Controls, Electrical	LS	1	\$ 800,000	\$ 800,000	included		\$ 800,000	*carried for evaluation
	<b>Lagoon Total</b>							<b>\$ 3,070,000</b>	
Process	Raw Sewage Pumping	each	0.00	\$25,000.00	\$ -	50%	\$ -	\$ -	
	Screening	LS	0.00	\$200,000.00	\$ -	included		\$ -	
	Secondary Treatment + Digester	LS	1.00	\$3,000,000.00	\$ 3,000,000	included		\$ 3,000,000	
	EQ Pumps	each	2.00	\$25,000.00	\$ 50,000			\$ 50,000	
	Tertiary Treatment	LS	1.00	\$1,300,000.00	\$ 1,300,000	included		\$ 1,300,000	
	Disinfection	each	0.00	\$113,350.00	\$ -	121%	\$ -	\$ -	
	Biosolids Storage	LS	1.00	\$515,000.00	\$ 515,000	50%	\$ 257,500	\$ 773,000	
	Biosolids Mixing	LS	1.00	\$160,000.00	\$ 160,000	50%	\$ 80,000	\$ 240,000	\$ 1,013,000
	Equipment Rental	LS	1.00	\$50,000.00	\$ 50,000	included		\$ 50,000	
	<b>Process Total</b>							<b>\$ 5,413,000</b>	
Other	Building Mechanical								
	Controls								
	Electrical								
	<b>Other Total</b>							<b>\$ 1,000,000</b>	
<b>CAPITAL COSTS</b>									
								<b>SUB TOTAL CAPITAL COSTS = \$</b>	<b>10,503,000</b>
								<b>Engineering (20%) = \$</b>	<b>2,100,600</b>
								<b>Contingency (30%) = \$</b>	<b>3,150,900</b>
								<b>General Contracts Overhead (20%) = \$</b>	<b>2,100,600</b>
								<b>TOTAL CAPITAL COSTS = \$</b>	<b>17,855,000</b>

**Operation & Maintenance Cost**

Alternative 2						
	Description	Unit	Quantity	Unit Cost (\$)	Annual Cost	Comments
	Chemical Consumption Cost	kg	3,358	\$ 0.21	\$ 705	Increased by 2384 kg/yr at 0.\$21 /kg
	Energy (Aeration for SBR+Digester)	kWh	138000	\$ 0.12	\$ 16,560	\$0.12/kWh (Weighted average of electricity costs from Ontario Energy Board), 138,000 kWh (Napier Reid)
	Energy (UV)	kWh	0	\$ 0.13	\$ -	Use existing system
	Pumping (EQ+Lagoon Pumps)	kWh	30497	\$ 0.13	\$ 3,965	
	Lagoon Flushing	LS	2	\$ 5,000.00	\$ 10,000	
	Sludge Management	tonne	48	\$ 150	\$ 7,200	\$150/dry tonne for biosolids management
	<b>Total O&amp;M Cost</b>				<b>\$ 38,430</b>	
					<b>SUB TOTAL O&amp;M COSTS = \$</b>	<b>39,000</b>
					<b>Contingency (30%) = \$</b>	<b>11,700</b>
					<b>TOTAL O&amp;M COSTS = \$</b>	<b>50,700</b>

**Alternative Design Concept 3 - Use Existing Lagoons for Secondary Effluent Storage**

	Description	Unit	Quantity	Material		Installation		Total Material & Installation	Comments
				Unit Cost	Total Material Cost	% of Material Cost	Total Installation Cost		
Civil	Service Road Extension	LS	1	\$ 200,000	\$ 200,000	50%	\$ 100,000	\$ 300,000	
	Outfall Relocation	LS	1	\$ 100,000	\$ 100,000	50%	\$ 50,000	\$ 150,000	
	Sludge Loading Relocation	LS	1	\$ 200,000	\$ 200,000	0%	\$ -	\$ 200,000	
	<b>Civil Total</b>							<b>\$ 650,000</b>	
Structural	Filter Building Extension	m2	40	\$ 3,600	\$ 144,000	20%	\$ 28,800	\$ 173,000	
	Grit Channel Bypass	LS	1	\$ 100,000	\$ 100,000	included		\$ 100,000	
	<b>Structural Total</b>	LS	1	\$ 160,000	\$ 160,000	25%	\$ 40,000	<b>\$ 273,000</b>	
Lagoon	Lagoon Rehabilitation	LS	1	\$ 1,400,000	\$ 1,400,000	included		\$ 1,540,000	*carried for evaluation
	Earth Works	LS	1	\$ 600,000	\$ 600,000	included		\$ 600,000	*carried for evaluation
	Pump Station	LS	1	\$ 400,000	\$ 400,000	included		\$ 400,000	*carried for evaluation
	Yard Piping	LS	1	\$ 500,000	\$ 500,000	included		\$ 500,000	*carried for evaluation
	Other – Building Mechanical, Controls, Electrical	LS	1	\$ 800,000	\$ 800,000	included		\$ 800,000	*carried for evaluation
	<b>Lagoon Total</b>							<b>\$ 3,840,000</b>	
Process	Raw Sewage Pumping	each	2.00	\$25,000.00	\$ 50,000	50%	\$ 25,000	\$ 75,000	
	Screening	LS	1.00	\$250,000.00	\$ 250,000	included		\$ 250,000	
	Secondary Treatment + Digester	LS	1.00	\$3,000,000.00	\$ 3,000,000	included		\$ 3,000,000	
	EQ Pumps	each	2.00	\$25,000.00	\$ 50,000			\$ 50,000	
	Tertiary Treatment	LS	1.00	\$1,300,000.00	\$ 1,300,000	included		\$ 1,300,000	
	Disinfection	each	2.00	\$150,000.00	\$ 300,000	121%	\$ 361,800	\$ 662,000	
	Biosolids Storage	LS	1.00	\$515,000.00	\$ 515,000	50%	\$ 257,500	\$ 773,000	
	Biosolids Mixing	LS	1.00	\$160,000.00	\$ 160,000	50%	\$ 80,000	\$ 240,000	
	Equipment Rental	LS	1.00	\$300,000.00	\$ 300,000	included		\$ 300,000	
<b>Process Total</b>							<b>\$ 6,650,000</b>		
Other	Building Mechanical								
	Controls								
	Electrical								
	<b>Other Total</b>							<b>\$ 1,800,000</b>	

<b>CAPITAL COSTS</b>	
<b>SUB TOTAL CAPITAL COSTS =</b>	<b>\$ 13,213,000</b>
<b>Engineering (20%) =</b>	<b>\$ 2,642,600</b>
<b>Contingency (30%) =</b>	<b>\$ 3,963,900</b>
<b>General Contracts Overhead (20%) =</b>	<b>\$ 2,642,600</b>
<b>TOTAL CAPITAL COSTS =</b>	<b>\$ 22,462,000</b>

<b>Operation &amp; Maintenance Cost</b>						
<b>Alternative 3</b>						
	Description	Unit	Quantity	Unit Cost (\$)	Annual Cost	Comments
	Chemical Consumption Cost	kg	3,358	\$ 0.21	\$ 705	Increased by 2384 kg/yr at 0.\$21 /kg
	Energy (Aeration for SBR+Digester)	kWh	138000	\$ 0.12	\$ 16,560	\$0.12/kWh (Weighted average of electricity costs from Ontario Energy Board), 138,000 kWh (Napier Reid)
	Energy (UV)	kWh	17520	\$ 0.13	\$ 2,278	2.1 kW average power draw, 8760 operating hours
	Pumping (EQ+Lagoon Pumps)	kWh	56689	\$ 0.13	\$ 7,370	
	Sludge Management	tonne	48	\$ 150	\$ 7,200	\$150/dry tonne for biosolids management
	<b>Total O&amp;M Cost</b>				<b>\$ 34,112</b>	
<b>SUB TOTAL O&amp;M COSTS =</b>					<b>\$ 35,000</b>	
<b>Contingency (30%) =</b>					<b>\$ 10,500</b>	
<b>TOTAL O&amp;M COSTS =</b>					<b>\$ 45,500</b>	

**Alternative Design Concept 4 - Use Existing Lagoons for Tertiary Effluent Storage**

	Description	Unit	Quantity	Material		Installation		Total Material & Installation	Comments
				Unit Cost	Total Material Cost	% of Material Cost	Total Installation Cost		
Civil	Service Road Extension	LS	1	\$ 200,000	\$ 200,000	50%	\$ 100,000	\$ 300,000	
	Outfall Relocation	LS	1	\$ 100,000	\$ 100,000	50%	\$ 50,000	\$ 150,000	
	Sludge Loading Relocation	LS	1	\$ 200,000	\$ 200,000	0%	\$ -	\$ 200,000	
	<b>Civil Total</b>							<b>\$ 650,000</b>	
Structural	Filter Building Extension	m2	40	\$ 3,600	\$ 144,000	20%	\$ 28,800	\$ 173,000	
	Grit Channel Bypass	LS	1	\$ 100,000	\$ 100,000	included		\$ 100,000	
	<b>Structural Total</b>	LS	1	\$ 160,000	\$ 160,000	25%	\$ 40,000	<b>\$ 273,000</b>	
Lagoon	Lagoon Rehabilitation	LS	1	\$ 1,400,000	\$ 1,400,000	included		\$ 1,540,000	*carried for evaluation
	Earth Works	LS	1	\$ 600,000	\$ 600,000	included		\$ 600,000	*carried for evaluation
	Pump Station	LS	1	\$ 400,000	\$ 400,000	included		\$ 400,000	*carried for evaluation
	Yard Piping	LS	1	\$ 500,000	\$ 500,000	included		\$ 500,000	*carried for evaluation
	Other – Building Mechanical, Controls, Electrical	LS	1	\$ 800,000	\$ 800,000	included		\$ 800,000	*carried for evaluation
	<b>Lagoon Total</b>							<b>\$ 3,840,000</b>	
Process	Raw Sewage Pumping	each	2.00	\$25,000.00	\$ 50,000	50%	\$ 25,000	\$ 75,000	
	Screening	LS	1.00	\$250,000.00	\$ 250,000	included		\$ 250,000	
	Secondary Treatment + Digester	LS	1.00	\$3,000,000.00	\$ 3,000,000	included		\$ 3,000,000	
	EQ Pumps	each	2.00	\$25,000.00	\$ 50,000			\$ 50,000	
	Tertiary Treatment	LS	1.00	\$1,000,000.00	\$ 1,000,000	included		\$ 1,000,000	
	Disinfection	each	2.00	\$150,000.00	\$ 300,000	121%	\$ 361,800	\$ 662,000	
	Biosolids Storage	LS	1.00	\$515,000.00	\$ 515,000	50%	\$ 257,500	\$ 773,000	
	Biosolids Mixing	LS	1.00	\$160,000.00	\$ 160,000	50%	\$ 80,000	\$ 240,000	
	Equipment Rental	LS	1.00	\$300,000.00	\$ 300,000	included		\$ 300,000	
<b>Process Total</b>							<b>\$ 6,350,000</b>		
Other	Building Mechanical								
	Controls								
	Electrical								
	<b>Other Total</b>							<b>\$ 1,800,000</b>	

<b>CAPITAL COSTS</b>							
<b>SUB TOTAL CAPITAL COSTS = \$ 12,913,000</b>							
<b>Engineering (20%) = \$ 2,582,600</b>							
<b>Contingency (30%) = \$ 3,873,900</b>							
<b>General Contracts Overhead (20%) = \$ 2,582,600</b>							
<b>TOTAL CAPITAL COSTS = \$ 21,952,000</b>							

**Operation & Maintenance Cost**

Alternative 4						
Description	Unit	Quantity	Unit Cost (\$)	Annual Cost	Comments	
Chemical Consumption Cost	kg	3,358	\$ 0.21	\$ 705	Increased by 2384 kg/yr at 0.\$21 /kg	
Energy (Aeration for SBR+Digester)	kWh	138000	\$ 0.12	\$ 16,560	\$0.12/kWh (Weighted average of electricity costs from Ontario Energy Board), 138,000 kWh (Napier Reid)	
Energy (UV)	kWh	17520	\$ 0.13	\$ 2,278	2.1 kW average power draw, 8760 operating hours	
Pumping (Raw Sewage+EQ+Lagoon Pumps)		56689	\$ 0.13	\$ 7,370		
Sludge Management	tonne	48	\$ 150	\$ 7,200	\$150/dry tonne for biosolids management	
<b>Total O&amp;M Cost</b>				<b>\$ 34,112</b>		
<b>SUB TOTAL O&amp;M COSTS = \$ 35,000</b>						
<b>Contingency (30%) = \$ 10,500</b>						
<b>TOTAL O&amp;M COSTS = \$ 45,500</b>						