

East Grand Forks – WWTF General Overview for Cost Estimate

Preliminary Treatment:

Building approximately 40' x 50' in size with influent flow channels and bypass channels and related fine screen, grit separation, dewatering and pumping equipment. All process equipment, lighting, controls and HVAC systems meeting Class 1 – Division 2 requirements.

Primary Settling:

Concrete clarifiers (2) at 44' diameter based on an up flow loading rate of 600 gallons per day per square foot with 10 foot side wall depth.

Biological Treatment:

Complete mix conventional aeration tanks (2) with fine bubble diffusion supplied by centrifugal aeration blowers and related ancillary equipment.

Secondary Settling:

Concrete clarifiers (2) at 54' diameter based on an up flow loading rate of 400 gallons per day per square foot with a 14 foot side wall depth.

Sludge Processing and Storage:

Building approximately 40' x 60' in size housing aeration blowers, RAS and WAS pumping system, solids transfer pumps and related ancillary equipment. Covered aerobic sludge stabilization tanks (2) with supernatant decanting system and pumps. Solids thickening equipment with related chemical feed and bio-solids storage tank.

Disinfection:

Chlorine gas disinfection system and sulfur dioxide dechlorination system with related booster pumps, monitoring systems, scales and contact tank.

Supplemental Treatment Process:

Liquid chemical feed system for enhanced secondary settling and related phosphorous removal.

Control Building:

Building approximately 30' x 40 feet in size housing WWTF process controls, laboratory facility, office and locker/restroom areas, disinfection area and general storage/maintenance room.

**Present Value Analysis 5% with Decommission of Ponds
March 4, 2013**

	Stand Alone	20 year Interconnect	Plant		Stand Alone	30 year Interconnect	Plant
Construction Total							
Phase IIa	13,188,170	3,117,672	14,100,000		13,188,170	3,117,672	14,100,000
Phase IIb ¹		4,140,420	4,140,420			4,140,420	4,140,420
EALC (35%)²	4,615,860	2,540,332	6,384,147		4,615,860	2,540,332	6,384,147
Construction Total	17,804,030	9,798,424	24,624,567		17,804,030	9,798,424	24,624,567
Lift Station Debt Service		871,000				871,000	
Plant Operations (annual)³		463,184				463,184	
Present Value (x12.462)	-	5,772,199		PV 15.372		7,120,064	
Plant Operations (annual)³	43,485	13,485	250,000		43,485	13,485	250,000
Present Value (x12.462)	541,910	168,050	3,115,500	PV 15.372	668,451	207,291	3,843,000
Phosphorus	120,000				120,000		
Present Value (x12.462)	1,495,440			PV 15.372	1,844,640		
Salvage	(407,342)	(753,780)	(753,780)		(407,342)	(753,780)	(753,780)
Total 20-year Present Value	20,248,722	16,492,453	28,493,847		20,724,463	17,879,560	29,221,347
Difference (%)	18.6%		72.8%		13.7%		63.4%

Notes

¹ Phase IIb may be unnecessary if the MPCA permits sludge to remain in place

² EALC increased to 35 percent per peer review recommendation

³ Peer review commented that \$30,000 for Stand Alone maintenance was low

⁴ Salvage value is a calculation based on MPCA review.

**Present Value Analysis 5% without Decommission of the Ponds
March 4, 2013**

	Stand Alone	20 year Interconnect	Plant		Stand Alone	30 year Interconnect	Plant
Construction Total							
Phase IIa	13,188,170	3,117,672	14,100,000		13,188,170	3,117,672	14,100,000
Phase IIb ¹							
EALC (35%)²	4,615,860	1,091,185	4,935,000		4,615,860	1,091,185	4,935,000
Construction Total	17,804,030	4,208,857	19,035,000		17,804,030	4,208,857	19,035,000
Lift Station Debt Service		871,000				871,000	
Plant Operations (annual)³		463,184				463,184	
Present Value (x12.462)	-	5,772,199		PV 15.372		7,120,064	
Plant Operations (annual)³	43,485	13,485	25,000		43,485	13,485	25,000
Present Value (x12.462)	541,910	168,050	311,550	PV 15.372	668,451	207,291	3,843,000
Phosphorus	120,000				120,000		
Present Value (x12.462)	1,495,440			PV 15.372	1,844,640		
Salvage	(407,342)	(753,780)	(753,780)		(407,342)	(753,780)	(753,780)
Total Present Value	20,248,722	11,773,886	20,100,330		20,724,463	13,160,993	23,631,780
Difference (%)	41.9%		70.7%		36.5%		79.6%

Notes

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⁴ Salvage value is a calculation based on MPCA review.

CITY OF EAST GRAND FORKS
MECHANICAL WWTF COST ESTIMATE
1.8 MGD AVERAGE DAILY FLOW

Item No.	Description of Work	Estimated Cost
Division 1		
1.001	Mobilization, Overhead, Administration and Profit (10%)	\$1,200,000
1.002	Insurance (0.5%)	\$60,000
1.003	Bonds (2%)	\$240,000
1.004	Building Permits	\$30,000
Subtotal for Division 1		\$1,530,000

Division 2 (Division 31, 32 & 33)		
2.001	Erosion Control / Silt Fence	\$35,000
2.002	Clear and Grub Site	\$35,000
2.003	Fine Grade and Restore Site	\$35,000
2.004	Process Units Excavation and Backfill	\$600,000
2.009	Landscaping and Seedings	\$40,000
2.010	Chain Link Fence and Gates	\$55,000
2.011	Asphalt Paving and Base Course	\$245,000
2.014	Site Process Piping - Labor & Equipment	\$275,000
2.018	Site Process Piping - Material	\$250,000
2.022	Glass Fused Steel Water Tank - Tank & Dome	\$350,000
2.023	Tank Foundation, Excavation and Concrete	\$150,000
2.024	Manholes & RCP - Labor & Equipment	\$30,000
2.025	Manholes & RCP - Material	\$125,000
Subtotal for	Division 2 (Division 31, 32 & 33)	\$2,225,000

Division 3		
3.001	F/P/I Concrete Control Building	\$45,000
3.002	F/P/I Concrete Primary Clarifier	\$175,000
3.003	F/P/I Concrete Aeration Basins	\$250,000
3.004	F/P/I Concrete Contact Basin	\$125,000
3.005	F/P/I Concrete Secondary Clarifier	\$225,000
3.006	F/P/I Concrete Pump Station	\$40,000
3.007	F/P/I Concrete Aerobic Digestors and Process Bldg.	\$275,000
3.008	F/P/I Concrete Preliminary Treatment Building	\$65,000
3.009	F/P/I Concrete Site Slabs on Grade/Sidewalks	\$50,000
3.010	Rebar Material - Control Building	\$31,000

3.011	Rebar Material - Primary Clarifiers	\$23,000
3.012	Rebar Material - Aeration Basins	\$40,000
3.013	Rebar Material - Contact Basin	\$23,000
3.014	Rebar Material - Secondary Clarifiers	\$37,000
3.015	Rebar Material - Pump Station	\$7,000
3.016	Rebar Material - Aerobic Digesters and Process Bldg.	\$95,000
3.017	Rebar Material - Preliminary Treatment Building	\$13,000
3.018	Rebar Material - Site Slabs on Grade/Sidewalks	\$7,000
3.019	Rebar Labor - Control Building	\$18,000
3.020	Rebar Labor - Primary Clarifier	\$13,000
3.021	Rebar Labor - Aeration Basins	\$23,000
3.022	Rebar Labor - Contact Basin	\$13,000
3.023	Rebar Labor - Secondary Clarifier	\$21,000
3.024	Rebar Labor - Pump Station	\$4,000
3.025	Rebar Labor - Aerobic Digestors and Process Bldg.	\$85,000
3.026	Rebar Labor - Preliminary Treatment Building	\$8,000
3.027	Rebar Labor - Site Slabs on Grade/Sidewalks	\$4,000
3.028	Precast - Control Building	\$65,000
3.029	Precast - Preliminary Treatment Building	\$45,000
3.030	Precast - Process Building	\$70,000
Subtotal for	Division 3	\$1,895,000

Division 4		
4.001	Masonry - Control Building	\$85,000
4.002	Masonry - Preliminary Treatment Building	\$45,000
4.003	Masonry - Process Sludge Handling Building	\$105,000
4.004	Masonry - Interior Partitions	\$20,000
Subtotal for	Division 4	\$255,000

Division 5		
5.001	Misc Metals - Material	\$285,000
5.002	Misc Metals - Labor	\$260,000
Subtotal for	Division 5	\$545,000

Division 6		
6.001	Rough Capentry	\$10,000
6.002	Architectural Wood Casework	\$20,000
Subtotal for	Division 6	\$30,000

Division 7		
7.001	Waterproofing	\$60,000
7.002	Insulation - Roof, wall and foundation	\$7,500
7.003	EIFS & Stucco of Masonry Walls	\$135,000
7.004	Membrane Roof and Flashings - Control Building	\$70,000
7.005	Membrane Roof and Flashings - Preliminary Treatment	\$26,500
7.006	Membrane Roof and Flashings - Contact Basin	\$8,000
7.007	Building Flashing and Gutter Systems	\$8,000
7.008	Caulking	\$20,000
Subtotal for	Division 7	\$335,000

Division 8		
8.001	Doors, Frames and Hardware	\$30,000
8.002	Overhead Doors	\$20,000
8.003	Aluminum Access hatches	\$28,000
8.004	Aluminum Frames / Glass / Glazing	\$7,000
Subtotal for	Division 8	\$85,000

Division 9		
9.001	Painting - Control Building	\$85,000
9.002	Painting - Preliminary Treatment Building	\$30,000
9.003	Painting - Contact Basin	\$4,000
9.004	Painting - Primary Clarifiers	\$18,000
9.005	Painting - Secondary Clarifiers	\$20,000
9.006	Painting - Process Piping Systems	\$155,000
9.007	Painting - Pumps and Equipment	\$45,000
9.008	Control Building Acoustical Ceilings	\$15,000
9.009	Reinous Flooring	\$8,000
Subtotal for	Division 9	\$380,000

Division 10		
10.001	Toilet Compartments and Accessories	\$6,000
10.002	Fire Protection and Fire Extinguishers	\$7,000
10.003	Benches, Tables and Cabinets	\$7,000
10.004	Lockers	\$8,000
Subtotal for	Division 10	\$28,000

Division 11		
11.001	Loading Dock Bumpers	\$4,000
11.002	Lab Equipment	\$15,000
11.003	Scissor Lift Table	\$25,000
Subtotal for	Division 11	\$44,000

Division 12		
12.001	Metal Lab Casework	\$20,000
12.002	Furnishings and Lab Equipment	\$40,000
12.003	Site Furnishings and Equipment	\$75,000
Subtotal for	Division 12	\$135,000

Division 13		
13.001	Aluminum Domes - Primary Clarifiers	\$210,000
13.002	Aluminum Domes - Secondary Clarifiers	\$230,000
13.003	Aluminum Domes - Aeration Basin	\$125,000
13.004	Wood Pole Storage Building	\$180,000
Subtotal for	Division 13	\$745,000

Division 22 & 23		
22.001	Fabricated Materials	\$25,000
22.002	Duct Field Materials	\$12,000
22.003	Piping Materials	\$45,000
22.004	Sheet Metal Labor	\$65,000
22.005	Piping Labor	\$95,000
22.006	Start Up Labor	\$8,000
22.007	Air Handlers/Heat Pumps	\$35,000
22.008	Louvers and Exhaust Fans	\$32,000
22.009	Pumps/Air Mgt	\$63,000
22.010	Boiler Units	\$135,000
22.011	Plumbing Fixtures	\$35,000
22.012	Insulation	\$42,000
22.013	HVAC Controls	\$105,000
22.014	Balancing	\$10,000
22.015	HVAC Subcontractor General Administration	\$33,000
Subtotal for	Division 22 & 23	\$740,000

Division 26, 27 & 40		
26.001	Electrical and Special Permits	\$3,500
26.002	Tools/Equipment Rental	\$7,500
26.003	Misc Job Expenses	\$10,000
26.004	Rough in Material	\$55,000
26.005	Misc Materials	\$50,000
26.006	Electrical Generator 250 KVA	\$120,000
26.007	Control Building Power and Lighting	\$180,000
26.008	Preliminary Treatment Building Power and Lighting	\$60,000
26.009	Sludge Recirculation Electrical	\$7,000
26.010	Disinfection and Contact Building Power and Lighting	\$25,000
26.011	Gravity Belt Thickener Power	\$10,000
26.012	Fire and Gas Detection Systems	\$15,000
26.013	Storage Bulding Power and Lighting	\$14,000
26.014	Low Voltange Distribution System and Equipment	\$26,000
26.015	Fiber/SCADA	\$6,000
26.016	WWTP Generator Electrical Conduit and Wire	\$14,000
26.017	Site Electrical Excavation	\$35,000
26.018	WWTF Control System	\$230,000
26.019	Emergency Lighting Systems	\$35,000
26.020	Motor Control	\$145,000
26.021	Instruments	\$62,000
26.022	Electrical Distribution	\$75,000
26.023	Site Lighting and Power Distribution	\$15,000
Subtotal for	Division 26, 27 & 40	\$1,200,000

Division 44		
44.001	44 4210 - Process Pipe - Interior - Material	\$350,000
44.002	44 4210 - Process Pipe - Interior - Labor	\$300,000
44.003	44 4215 - Process Valves - Interior	\$150,000
44.004	44 4215 - Slide Gates	\$18,000
44.005	44 4215 - Flumes and Meters	\$35,000
44.006	Misc Process Piping - Materials, Hangers and Gaskets	\$60,000
44.007	Misc Process Piping - Labor	\$40,000
44.008	44 4219 - Aeration Blowers	\$270,000
44.009	44 4410 - Submersible Pumps	\$80,000
44.010	44 4411 - Non-potable Booster Pump System	\$20,000
44.011	44 4412 - Wastewater Pumps	\$120,000
44.012	44 4416 Double Disc Pumps	\$250,000
Subtotal for	Division 44	\$1,693,000

Division 46		
46.001	44 2000 - Preliminary Treatment Fine Screen and Grit	\$320,000
46.002	46 2113 - Chain & Rake Bar Screen	\$55,000
46.003	46 3111 - Chlorine Gas Feed System	\$35,000
46.004	46 3113 - Sulfur Dioxide Gas Feed System	\$26,000
46.006	46 3333 - Polymer Feed System	\$15,000
46.007	46 3341 - Chemical Tanks	\$15,000
46.008	46 4122 - Sludge Mixing and Handling System	\$275,000
46.009	46 4123 - Submersible Mixers	\$29,000
46.010	46 4321 - Clarifier Equipment - Preliminary	\$450,000
46.011	46 4321 - Clarifier Equipment - Final	\$500,000
46.012	46 5121 - Fine Bubble Aeration	\$400,000
46.013	46 7116 - Gravity Belt Thickener	\$115,000
Subtotal for	Division 46	\$2,235,000

TOTAL ESTIMATED CONSTRUCTION COSTS	\$14,100,000
E/A/L/C - 35% of Estimated Construction Costs	\$4,935,000
TOTAL PROJECT BUDGET	\$19,035,000
FUTURE TERTIARY TREATMENT (PHOSPHORUS REMOVAL)	\$2,500,000