



A **tyco** International Ltd. Company

Red River - Biota WTP
100MLD Water Treatment Plant
 DAF- Filtration - UV-Chlorine plus residuals treatment
 Conceptual Cost Estimate - Summary

Job No. 89638

17-Feb-08

Item	Description	Quantity	Unit	Unit Price	Extension (\$)
1.0	General Requirements	1	LS	NA	\$ 3,068,000
2.0	Civil and Site Work	1	LS	NA	\$ 1,440,000
3.0	Architectural and Structural	1	LS	NA	\$ 8,760,000
4.0	Process Mechanical	1	LS	NA	\$ 9,450,000
5.0	Building Mechanical	1	LS	NA	\$ 567,500
6.0	Electrical, Instrumentation and Controls	1	LS	NA	\$ 3,260,000
Sub-Total					\$ 26,546,000
Owner Supplied Furniture, Lab Equipment, Etc.					\$ 150,000
Contract Cost					\$ 26,696,000
Contingencies (21%)					\$ 5,607,000
Field Cost (Contract cost plus 21%)					\$ 32,303,000
Non Contract Costs (25%)					\$ 8,076,000
ESTIMATED TOTAL PROJECT COST					\$ 40,379,000

SUMMARY OF TOTAL PROJECT COSTS - EARTH TECH

Features	Construction Cost (2007 dollars)	Annual OM&R
Inlet	\$126,000	\$0.00
Biota Treatment – Coagulation/DAF-Filtration-UV-CL2	\$26,696,000	\$1,661,000
Booster Pump Station	\$3,171,000	\$128,000
Contract Costs	\$29,993,000	
Contingencies (21%+/-)	\$6,299,000	
Field Cost	\$36,292,000	
Non-Contract Costs (25%+/-)	\$9,073,000	
Total Construction / OM&R Costs	\$45,365,000	\$1,789,000

Notes: 1. Costs for Inlet and Booster Pump Station based on DEIS estimate

2. Biota WTP costs include for low lift PS and residuals treatment and dewatering



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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
1.0	GENERAL REQUIREMENTS				
1.1	50% Performance Bonds	1	LS	120,000	\$ 120,000
1.2	Insurance (General Contractor)	1	LS	120,000	\$ 120,000
1.3	Overhead - Indirect Costs (5% of project value)	1	LS	1,174,000	\$ 1,174,000
1.4	Profit (5% of project value)	1	LS	1,174,000	\$ 1,174,000
1.5	Site soft costs	16	months	30,000	\$ 480,000
	TOTAL 1.0 - GENERAL REQUIREMENTS				\$ 3,068,000

Overhead is based on 5% of the project cost before including the construction contingency and general requirements.

The contractor overhead covers office management and support staff, main office costs, etc.

Profit is based on 5% of the total project cost before including the construction contingency and general requirements.

Site soft cost are for construction power, site office, site foreman, first-aid attendant, telephones, site trailers, crew trucks and other miscellaneous support equipment located on-site.



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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
2.0	CIVIL				
2.1	Common Excavation				
2.1.1	<u>WTP Building</u>				
	Common Excavation and Disposal (Granular)	3100	m3	9.0	27,900
	Excavation and Off-Site Disposal (Organics)	2000	m3	15.0	30,000
	Granular Fill from Stockpile	1000	m3	9	9,000
	Till Excavation and Placement	2000	m3	20	40,000
	Total 2.1.1 - Excavation				106,900
2.1.2	<u>Treated Water Wetwell</u>				
	Common Excavation and Disposal (Granular)	1000	m3	9.0	9,000
	Excavation and Off-Site Disposal (Organics)	100	m3	15.0	1,500
	Granular Fill from Stockpile	300	m3	9	2,700
	Till Excavation and Placement	1000	m3	20	20,000
	Total 2.1.2 - Excavation				33,200
2.1.3	<u>Backwash Waste Tank</u>				
	Common Excavation and Disposal (Granular)	1000	m3	9.0	9,000
	Excavation and Off-Site Disposal (Organics)	100	m3	15.0	1,500
	Granular Fill from Stockpile	300	m3	9	2,700
	Till Excavation and Placement	900	m3	20	18,000
	Total 2.1.3 - Excavation				31,200
2.1.4	<u>Chemical Storage Tank Containment</u>				
	Common Excavation and Disposal (Granular)	200	m3	9.0	1,800
	Excavation and Off-Site Disposal (Organics)	100	m3	15.0	1,500
	Granular Fill from Stockpile	300	m3	9	2,700
	Till Excavation and Placement	900	m3	20	18,000
	Total 2.1.4 - Excavation				24,000

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
2.1.4	<u>Raw Water Piping Channel</u>				
	Common Excavation and Disposal (Granular)	300	m3	9.0	2,700
	Excavation and Off-Site Disposal (Organics)	100	m3	15.0	1,500
	Granular Fill from Stockpile	300	m3	9	2,700
	Till Excavation and Placement	900	m3	20	18,000
	Total 2.1.4 - Excavation				24,900
2.1.5	<u>Access Road</u>				
	Common Excavation and Embankment	10044	m3	7.5	75,330
	Total 2.1.5 - Excavation				75,330
	Total 2.1 - Common Excavation				295,530
2.2	Fencing				
2.2.1	Fencing - 1.8 m chain link	800	m	55	44,000
2.2.2	Gates	3	LS	3,500	10,500
	Total 2.2 - Fencing				54,500
2.3	Clearing and Grubbing				
2.3.1	Clearing and Grubbing Allowance	1	LS	20,000	20,000
	Total 2.3 - Clearing and Grubbing				20,000
2.4	Roadworks and Grading				
2.4.1	Paved Access Roads (7 m wide)	2800	m2	\$ 20.00	56,000
2.4.2	Paved Parking Areas c/w Granular Base	4500	m2	\$ 25.00	112,500
	Total 2.3 - Roadworks and Grading				168,500
2.5	Yard Piping and Facilities				
2.5.1	Raw Water Connection Allowance	1	LS	200,000	200,000
2.5.2	Treated Water Connection Allowance	1	LS	250,000	250,000
2.5.3	Site Piping Allowance	1	LS	400,000	400,000
2.5.4	Storm Drainage Allowance	1	LS	35,000	35,000
2.5.5	Sanitary Waste Holding Tank and Tile Field	1	LS	20,000	20,000
	Total 2.5 - Yard Piping and Facilities				905,000
	TOTAL 2.0 - CIVIL				1,440,000

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 Conceptual Cost Estimate - Structural

Item	Description	Quantity	Unit	Unit Price	Extension (\$)
3.0	STRUCTURAL				
3.1	Concrete				
3.1.1	<u>Treatment Plant</u>				
	Exterior East wall	300	m3	1,400	420,000
	Exterior West wall	300	m3	1,400	420,000
	Exterior South wall	500	m3	1,400	700,000
	Exterior North wall	300	m3	1,400	420,000
	Base slab	2050	m3	950	1,947,500
	Top slab	1000	m3	1,200	1,200,000
	Total 3.1.1 - Concrete				5,107,500
3.1.2	<u>Main Level - Electrical/Chemical Storage</u>				
	Interior walls, North - South (1)	80	m3	1,400	112,000
	Interior walls, East - West (6)	20	m3	1,400	28,000
	Total 3.1.2 - Concrete				140,000
3.1.3	<u>Second Level - Office/Storage/Dewatering</u>				
	Interior walls, North - South (1)	50	m3	1,400	70,000
	Interior walls, East - West (4)	10	m3	1,400	14,000
	Total 3.1.3 - Concrete				84,000
3.1.4	<u>Second Level - Air Saturators/Compressors</u>				
	Interior walls, North - South (1)	20	m3	1,400	28,000
	Interior walls, East - West (2)	10	m3	1,400	14,000
	Total 3.1.4 - Concrete				42,000

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
3.1.5	<u>Flocculation Tank/DAF/Filter Tank</u>				
	Interior walls, North - South (36)	600	m3	1,400	840,000
	Interior walls, East - West (5)	300	m3	1,400	420,000
	Total 3.1.5 - Concrete				1,260,000
3.1.6	<u>Gullets</u>				
	DAF Float				
	Walls	40	m3	1,600	64,000
	Base	20	m3	1,600	32,000
	Filter Backwash				
	Walls	60	m3	1,600	96,000
	Base	50	m3	1,600	80,000
	Total 3.1.6 - Concrete				272,000
3.1.7	<u>DAF Sludge Storage Tank</u>				
	Interior walls, North - South	20	m3	1,400	28,000
	Interior walls, East - West	50	m3	1,400	70,000
	Total 3.1.7 - Concrete				98,000
3.1.8	<u>Backwash Waste Storage Tank</u>				
	Interior walls, North - South	20	m3	1,400	28,000
	Interior walls, East - West	50	m3	1,400	70,000
	Total 3.1.8 - Concrete				98,000
3.1.9	<u>Treated Water Wetwell</u>				
	Interior walls, North - South	20	m3	1,400	28,000
	Interior walls, East - West	30	m3	1,400	42,000
	Total - 3.1.9				70,000
	Total 3.1 - Concrete				7,171,500

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
3.2	Buildings				
3.2.1	<u>WTP</u>				
	Masonry block				
	Exterior East wall	200	m2	175	35,000
	Exterior West wall	200	m2	175	35,000
	Exterior South wall	300	m2	175	52,500
	Exterior North wall	300	m2	175	52,500
	Chlorine store and building	200	m2	175	35,000
	Interior walls	900	m2	175	157,500
	Roof (steel truss, q-deck, and metal cladding)	3200	m2	170	544,000
	Metal Wall Cladding	1200	m2	75	90,000
	Administration Area & Architectural Finishes	1	LS	200,000	200,000
	Total 3.2.1 - WTP Building				1,201,500
	Total 3.2 - Buildings				1,201,500
3.3	Miscellaneous Metals				
3.3.1	Miscellaneous Metals Allowance (Handrails, Grating, Etc)				
	Handrails around walkways and stairs	360	m	300	108,000
3.3.2	Metal Stairs	180	risers	350	63,000
	Total 3.3 - Miscellaneous Metals				171,000
3.4	Doors, Windows, and Hatches				
3.4.1	Single Door	5	ea	4,000	20,000
3.4.2	Double Door	13	ea	7,500	97,500
3.4.3	Insulated Rolling Overhead Door	2	ea	10,000	20,000
3.4.4	Access Hatches	10	m2	2,500	25,000
3.4.5	Window Allowance	1	LS	50,000	50,000
	Total 3.4 - Doors, Windows and Hatches				212,500
	TOTAL 3.0 - STRUCTURAL				8,760,000

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
4.0	PROCESS MECHANICAL				
4.1	Mechanical Equipment				
4.1.1	<u>Flocculators</u>				
	Supply	24	ea	18,900	453,600
	Miscellaneous support metal	6	ea	7,500	45,000
	Installation	1	LS	75,000	75,000
	Total 4.1.1 - Flocculators				573,600
4.1.2	<u>DAF/F Control Valves</u>				
	Supply	1	LS	153,000	153,000
	Installation	1	LS	75,000	75,000
	Total 4.1.2 - DAF/F Control Valves				228,000
4.1.3	<u>Dissolved Air Flotation</u>				
	Supply (saturators, recycle pumps, compressor, control panel, etc)	1	LS	1,300,000	1,300,000
	Installation	1	LS	195,000	195,000
	Total 4.1.3 - Dissolved Air Flotation				1,495,000
4.1.4	<u>Filters</u>				
	Supply (underdrains, troughs, media, freight)	840	m2	2,000.0	1,680,000
	Installation	1	LS	252,000	252,000
	Total 4.1.4 - Filters				1,932,000
4.1.5	<u>Backwash Water DAF</u>				
	Package (tank, recycle pumps, compressor, saturators, control panel, etc)	1	ea	345,000	345,000
	Installation	1	LS	52,000	52,000
	Total 4.1.5 - Backwash Water DAF				397,000

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
4.1.6	<u>DAF Float Pumps</u>				
	Positive Displacement Pump	3	ea	16,000	48,000
	Valves (check and isolation valve per pump)	3	ea	5,000	15,000
	Installation	1	LS	9,000	9,000
	Total 4.1.6 - DAF Float Pumps				72,000
4.1.7	<u>Dewatering</u>				
	Centrifuge and equipment	2	LS	186,000	372,000
	Shoot and holding bin	2	LS	21,200	42,400
	Installation	1	LS	62,000	62,000
	Total 4.1.7 - Dewatering				476,400
4.1.8	<u>Filter Backwash Water Pumps</u>				
	Pumps	2	ea	42,200	84,400
	Valves (check and isolation valve per pump)	2	ea	13,000	26,000
	Installation	1	LS	17,000	17,000
	Total 4.1.8 - Filter Backwash Water Pumps				127,400
4.1.9	<u>DAF Recycle Pumps</u>				
	Pumps	6	ea	10,000	60,000
	Valves (check and isolation valve per pump)	6	ea	3,500	21,000
	Installation	1	LS	12,000	7,500
	Total 4.1.9 - DAF Recycle Pumps				88,500
4.1.10	<u>Backwash DAF Clarifier Feed Pumps</u>				
	Pumps	2	ea	4,100	8,200
	Valves (check and isolation valve per pump)	2	ea	1,500	3,000
	Installation	1	LS	2,000	2,000
	Total 4.1.10 - Backwash DAF Clarifier Feed Pumps				13,200
4.1.11	<u>Backwash DAF Clarifier Effluent Pumps</u>				
	Pumps	2	ea	4,100	8,200
	Valves (check and isolation valve per pump)	2	ea	1,500	3,000
	Installation	1	LS	2,000	2,000
	Total 4.1.11 - Backwash DAF Clarifier Effluent Pumps				13,200

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
4.1.12	<u>Chemical Systems</u>				
	PolymerSystem	2	ea	50,000	100,000
	Coagulant System	4	ea	20,000	80,000
	Storage Tanks	4	ea	25,000	100,000
	Installation	1	LS	42,000	42,000
	Total 4.1.12 - Chemical Systems				322,000
4.1.13	<u>Aeration Blowers and Instrument Air</u>				
	Aeration Blowers	1	ea	30,800	30,800
	Instrument air equipment	2	ea	6,100	12,200
	Installation and miscellaneous Piping	1	LS	10,000	10,000
	Total 4.1.13 - Aeration Blowers and Instrument Air				53,000
4.1.14	<u>Waste Storage Tank Mixers</u>				
	Submersible Mixers	4	ea	10,125	40,500
	Mixer Installation	1	LS	6,000	6,000
	Total 4.1.14 - Waste Storage Tank Mixers				46,500
4.1.15	<u>Flash Mix Assembly</u>				
	Pumps	2	ea	4,100	8,200
	Valves (check and isolation valve per pump)	2	ea	1,500	3,000
	Installation	1	ea	2,000	2,000
	Total 4.1.15 - Flash Mix Assembly				13,200
4.1.16	<u>UV System</u>				
	Reactors, Cleaning System, Control Panel	1	LS	1,420,950	1,420,950
	Installation (20% of equipment cost for estimate)	1	LS	284,000	284,000
	Total 4.1.16 - UV System				1,704,950
	Total 4.1.17 - Low Lift Pumps				
	Pumps	4	ea	45,000	180,000
	Valves (check and isolation valve per pump)	8	ea	3,500	28,000
	Installation	1	LS	52,000	52,000
	Total 4.1.17 - Low Lift Pumps				260,000
	TOTAL 4.1 - Mechanical Equipment				7,815,950

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
4.2	<u>Piping, Fittings, Valves</u>				
	Process Piping Allowance	1	LS	1,100,000	1,100,000
	Installation allowance	1	LS	275,000	275,000
	Total 4.2 - Piping, Fittings and Valves				1,375,000
4.3	Chlorination Equipment				
4.3.1	Chlorination Equipment - Clarified water system	1	LS	180,000	180,000
4.3.2	Chlorine booster pumps (2 duplex sets)	2	LS	2,000	4,000
4.3.3	Chlorine room hoist and trolley	1	LS	25,000	25,000
4.3.4	Chlorine equipment installation	1	LS	50,000	50,000
	Total 4.3 - Chlorination Equipment Relocation				259,000
	TOTAL 4.0 - PROCESS MECHANICAL				9,450,000

All the shown supply prices were determined by marking up the quoted value by 10% to cover known miscellaneous items associated with the equipment but not included in the quotation. PST was added to all the quoted amounts.



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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
5.0	BUILDING MECHANICAL				
5.1	<u>Building Heating and Ventilation</u>				
5.1.1	Process Area (AHU)	2	ea	75,000	150,000
5.1.2	Office and Administration (AHU)	1	ea	50,000	50,000
5.1.3	Electrical Room (AHU)	1	ea	35,000	35,000
5.1.4	Ducting and Installation	1	LS	125,000	125,000
5.1.5	Heating and Ventilation Controls	1	ea	7,500	7,500
5.1.6	Reservoir Building - HVAC	1	ea	50,000	50,000
5.1.7	Chlorine area	1	ea	50,000	50,000
	Total 5.1 - Building Heating and Ventilation				467,500
5.2	<u>Plumbing</u>				
5.2.1	Domestic Plumbing Allowance	1	LS	100,000	100,000
	Total 5.2 - Plumbing				100,000
	TOTAL 5.0 - BUILDING MECHANICAL				567,500

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Item	Description	Quantity	Unit	Unit Price	Extension (\$)
6.0	ELECTRICAL AND INSTRUMENTATION				
6.1	Electrical				
6.1.1	Electrical Service and Hydro Connection Fees	1	LS	225,000	\$ 225,000.00
6.1.2	Outdoor Sub-station	1	LS	25,000	\$ 25,000.00
6.1.3	MCC and Power Distribution	1	LS	450,000	\$ 450,000.00
6.1.4	Power Factor Correction Unit	1	LS	50,000	\$ 50,000.00
6.1.5	Panelboards & UPS & ByPass	1	LS	35,000	\$ 35,000.00
6.1.6	Exterior Stand-By Generator	1	LS	450,000	\$ 450,000.00
6.1.7	Transfer Switch	1	LS	15,000	\$ 15,000.00
6.1.8	Exterior Duct banks & Manholes	1	LS	50,000	\$ 50,000.00
6.1.9	Power feeders to Process Loads	1	LS	300,000	\$ 300,000.00
6.1.10	Field Miscellaneous	1	LS	50,000	\$ 50,000.00
6.1.11	Cable Tray and Grounding Installation	1	LS	260,000	\$ 260,000.00
6.1.12	Security & F/A system H/W	1	LS	75,000	\$ 75,000.00
6.1.13	Testing, Commissioning and Start-up	1	LS	35,000	\$ 35,000.00
	Total 6.1 - Electrical				2,020,000
6.2	Instrumentation				
6.2.1	SCADA Control H/W - Including Panelboards & PLC	1	LS	150,000	\$ 150,000.00
6.2.2	SCADA HMI H/W - OI Stations and support	1	LS	30,000	\$ 30,000.00
6.2.3	SCADA Software & Integrator cost	1	LS	275,000	\$ 275,000.00
6.2.4	Field Instruments	1	LS	450,000	\$ 450,000.00
6.2.5	Field components for Local Control Panels	1	LS	55,000	\$ 55,000.00
6.2.6	Instrumentation wiring - Standard + Profibus Backbone	1	LS	140,000	\$ 140,000.00
6.2.7	Fielbus Topology Field Wiring & Connection Install	1	LS	35,000	\$ 35,000.00
6.2.8	Instrumentation Tubing & Stands	1	LS	25,000	\$ 25,000.00
6.2.9	Testing Commissioning and Start-up	1	LS	40,000	\$ 40,000.00
6.2.10	SCADA Telemetry Upgrades	1	LS	40,000	\$ 40,000.00
	Total 6.2 - Instrumentation				1,240,000
	TOTAL 6.0 - ELECTRICAL & INSTRUMENTATION				3,260,000