

Project: GLWA US EPA AD Project
Facility: GLWA WRRF
Detail: Biosolids Cost Estimate Alternative 3a - Update

Complex A (Existing Primary Thickeners)

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
TPS to P-Release pumps	\$ 116,613	2	Ea	\$ 233,226	\$ 46,645	\$ 279,871
TPS to Hydrolysis cooling pumps	\$ 116,613	2	Ea	\$ 233,226	\$ 46,645	\$ 279,871
PS1 TPS to DSST pumps	\$ 116,613	4	Ea	\$ 466,452	\$ 93,290	\$ 559,742
Subtotal						\$ 1,119,485

Thickeners)

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
TWAS to P-Release pumps	\$ 116,613	5	Ea	\$ 583,065	\$ 116,613	\$ 699,678
Subtotal						\$ 699,678

High Strength Feedstock

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
High Strength Feedstock Storage Tanks	\$ 274,222	2	Ea	\$ 548,444	\$ -	\$ 548,444
HSF tank excavation	\$ 28	47	CY	\$ 1,280	\$ 240	\$ 1,520
HSF tank backfill with crushed stone	\$ 65	47	CY	\$ 3,015	\$ 603	\$ 3,618
HSF tank foundation	\$ 777	70	CY	\$ 54,274	\$ 10,855	\$ 65,129
High Strength Feedstock mixing	\$ 68,089	2	Ea	\$ 136,178	\$ 20,427	\$ 156,605
High Strength Feedstock Feed Pumps	\$ 21,846	2	Ea	\$ 43,691	\$ 8,738	\$ 52,429
Odor Control	\$ 47,254	1	Ea	\$ 47,254	\$ 14,176	\$ 61,430
HSF Building	\$ 389	900	Sf	\$ 349,839		\$ 349,839
HSF Building Piles	\$ 162	960	LF	\$ 155,484		\$ 155,484
HSF Tank Piles	\$ 162	1080	LF	\$ 174,920		\$ 174,920
Subtotal						\$ 1,569,418

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P-Release (Phosphorous Recovery System)

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
P-Release Building	\$ 259	2500	SF	\$ 647,850		\$ 647,850
P-Release tank mixing pumps	\$ 131,514	2	Ea	\$ 263,027	\$ 39,454	\$ 302,481
Pre-dewatering Centrifuge Feed Pumps	\$ 39,439	6	Ea	\$ 236,633	\$ 59,158	\$ 295,791
Phosphorus release tanks	\$ 911,603	2	Ea	\$ 1,823,205		\$ 1,823,205
P-release tank excavation	\$ 25	315	CY	\$ 7,866	\$ 2,407	\$ 10,273
p-release tank backfill with crushed stone	\$ 65	315	CY	\$ 20,383	\$ 4,077	\$ 24,460
p-release tank foundation	\$ 777	472	CY	\$ 366,893	\$ 73,379	\$ 440,272
Odor Control	\$ 84,091	1	Ea	\$ 84,091	\$ 25,227	\$ 109,318
P-Release Tank Piles	\$ 162	2520	LF	\$ 408,146		\$ 408,146
P-Release Building Piles	\$ 162	540	LF	\$ 87,460		\$ 87,460
					Subtotal	\$ 4,149,255

Sludge Screening, Pre-dewatering, and Thermal Hydrolysis Process (THP) Area

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
Sludge screens	\$ 325,000	6	Ea	\$ 1,950,000	\$ 1,555,744	\$ 3,505,744
Pre-dewatering centrifuges	\$ 777,420	6	Ea	\$ 4,664,520	\$ 1,399,356	\$ 6,063,876
Polymer Feed System	\$ 142,725	2	Ea	\$ 285,450	\$ 57,090	\$ 342,541
THP System	\$ 9,069,900	2	Ea	\$ 18,139,800	\$ 3,627,960	\$ 21,767,760
THP Building (with screens and pre-dewatering)	\$ 389	19200	SF	\$ 7,463,232		\$ 7,463,232
Digester Gas Treatment & Boiler Building	\$ 389	5600	SF	\$ 2,176,776		\$ 2,176,776
Hot water boilers for digesters	\$ 64,785	2	Ea	\$ 129,570	\$ 64,785	\$ 194,355
THP Building Piles	\$ 162	14820	LF	\$ 2,400,284		\$ 2,400,284
Digester Gas Treatment & Boiler Building Piles	\$ 162	4620	LF	\$ 748,267		\$ 748,267
					Subtotal	\$ 44,662,835

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Anaerobic Digesters and Digester Equipment Building

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
Anaerobic Digesters	\$ 19,500,000	5	Ea	\$ 97,500,000		\$ 97,500,000
Digester tank excavation	\$ 15	5146	CY	\$ 77,183	\$ 90,827	\$ 168,010
Digester tank backfill with crushed stone	\$ 65	5146	CY	\$ 333,353	\$ 66,671	\$ 400,023
Digester tank foundation	\$ 777	7718	CY	\$ 6,000,347	\$ 1,200,069	\$ 7,200,416
Digester Mixing	\$ 321,981	5	Ea	\$ 1,609,907	\$ 241,486	\$ 1,851,393
Digested Sludge to DSST pumps	\$ 116,148	3	Ea	\$ 348,444	\$ 69,689	\$ 418,132
Heat Exchangers	\$ 84,221	5	Ea	\$ 421,103	\$ 84,221	\$ 505,323
Digester Equipment Building	\$ 389	30600	SF	\$ 11,894,526		\$ 11,894,526
Digester Tank Piles	\$ 243	42300	LF	\$ 10,276,362		\$ 10,276,362
Digester Equipment Building Piles	\$ 243	11400	LF	\$ 2,769,516		\$ 2,769,516

Subtotal \$ 132,983,702

Biogas Equipment and Handling

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
Gas off-take	\$ 259,140	5	Ea	\$ 1,295,700	\$ 259,140	\$ 1,554,840
Flare	\$ 349,839	2	Ea	\$ 699,678	\$ 139,936	\$ 839,614
Dryer burner upgrades for DG		1	LS			\$ 388,710
Gas compressor	\$ 1,501,954	3	Ea	\$ 4,505,862	\$ 1,493,778	\$ 5,999,640
Compressed gas storage	\$ 4,146,240	1	Ea	\$ 4,146,240		\$ 4,146,240
Compressed Gas Storage Piles	\$ 97	2220	LF	\$ 215,717		\$ 215,717

Subtotal \$ 13,144,761

Digested Sludge Storage

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
Digested Sludge Storage Tanks	\$ 5,200,000	2	Ea	\$ 10,400,000		\$ 10,400,000
DSS tank excavation	\$ 28	1826	CY	\$ 51,130	\$ 8,494	\$ 59,624
DSS tank backfill with crushed stone	\$ 65	1826	CY	\$ 118,303	\$ 23,661	\$ 141,963
DSS tank foundation	\$ 324	2739	CY	\$ 887,269	\$ 177,454	\$ 1,064,723
BDF loop feed pumps	\$ 116,148	3	Ea	\$ 348,444	\$ 69,689	\$ 418,132
Sludge Storage Mixing	\$ 278,576	2	Ea	\$ 557,151	\$ 83,573	\$ 640,724
Sludge Storage Building	\$ 389	5000	SF	\$ 1,943,550		\$ 1,943,550
Sludge Storage Tank Piles	\$ 243	13080	LF	\$ 3,177,704		\$ 3,177,704
Sludge Storage Building Piles	\$ 243	2160	LF	\$ 524,758		\$ 524,758

Subtotal \$ 18,371,178

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P-Recovery

Equipment Name	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
P-Recovery Pump Station	\$ 155,484	2	Ea	\$ 310,968	\$ 155,484	\$ 466,452
P-Recovery Building	\$ 389	30000	SF	\$ 11,661,300		\$ 11,661,300
P-Recovery System	\$ 15,020,658	3	Ea	\$ 45,061,974	\$ 5,589,666	\$ 50,651,640
P-Recovery Building Piles	\$ 97	7260	LF	\$ 705,509		\$ 705,509
Subtotal						\$ 63,484,901

Lump Sum Adders

Discipline	Unit Cost	Quantity	Units	Material Cost (total)	Labor Cost (total)	Total Cost
Yard and Process Piping		1	LS			\$ 20,182,800
Site/Civil		1	LS			\$ 10,495,389
Instrumentation		1	LS			\$ 8,292,480
Electrical		1	LS			\$ 24,229,590
TOTAL CONSTRUCTION COSTS						\$ 343,385,471

Direct Construction Cost (2024 dollars)	\$	343,385,471
Direct Construction Cost (2027 dollars - assuming 3% inflation)	\$	375,217,304
Indirect Costs, (% of direct construction costs) Note #1		
General Conditions Overhead and Profit	25%	\$ 93,804,326
Total Contract Cost, (Sum of Direct Construction Cost and Indirect Costs)	\$	469,021,630
Contingencies Note #2		
Project Contingency (% of Total Contract Costs)	48%	\$ 226,552,857
(Sum of Total Contract Costs and Contingencies)	\$	695,574,488
Soft Costs (% of Total Contract Costs and Contingencies)		
Engineering, Legal and Administration	25%	\$ 171,546,300
Total Project Cost		
(Total Construction Cost, Contingencies, and Total Soft Cost)	\$	867,120,788

Note 1

THP system includes:

- THP train with 1 pulper, 4 reactors, 1 flash tank
- Two Pulper recirculation/reactor feed pumps
- Two digester feed pumps
- Steam boiler
- Sludge Hopper with pulper feed pumps

Note 2

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P-recovery system includes:

- Magnesium and Sodium Hydroxide feed systems
- Acid cleaning system
- Three struvite precipitation reactors
- Recycle Pump
- Circular vibrating screen
- Dust handling system
- Fluidized bed dryer
- Product Storage silo