KINGSTON FOSSIL PLANT
OPTION 1 - WET ASH IN POND & GYPSUM ON PENINSULA
(WITHOUT BUFFER OPTION)

Project name	KIF/05093O1/FLY&BOTTM ASH
Engineer	DAN SMITH
Estimator	C. L. Toney
Labor rate table	KIF 40 2004
Equipment rate table	TVA Equipment
Project	Ash
Plant	KIF
Estimate #	05093O1
PCN #	KIF530
Requesting Engr	Dan Smith
Option	1
Revision	0
Phase	2
Estimate Type	Preliminary
Estimate Accuracy	+/- 20%
Est. Issue Date	12/20/2004
Funding Type	Capital
Unit	N

Notes

Wet ash in pond & gypsum on peninsula (Wet ash in dredge cell/Phase 1, and Phase2. Phase 3 not constructed. Gypsum on peninsula).

All cost are based in 2005 dollars. Additional notes are as follow;

(1) Closure costs not included.

(2) Liner is not required for this option.

(3) Bottom ash columns are subject to change with final design.

(4) Engineering (Incl TVA oversight, subcontracts, and geotechnical investigation) - Assumes 10% of construction cost.

(5) Assuming a disposal rate of 475,600 cy annually (including bottom and fly ash) & gypsum/ash generating 327,360 cy annually.

(6) Single phase power is assumed for pump installed for dredge cell seepage retrofit. 3-phase power is assumed not to be required.

Report format

Sorted by 'Location/Activity'
'Detail' summary

Location	Activity	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
01												
	Erosion Controls/S P											
		Erect Silt Fence	1,000.00 lf	0.069	68.57 mh	1,994	502	-	317	-	2.81	2,813
		Geotextile (Nonwoven) Erosion Protection Channel	4,300.00 sy	0.016	68.80 mh	1,963	5,772	-	175	-	1.84	7,911
		D50 9" Riprap	5,215.00 tn	0.320	1,668.80 mh	49,667	53,037	-	26,865	-	24.85	129,568
		3" Stone, 1' Thick To Prevent Erosion (Assume 105 pcf)	2,004.00 tn	0.096	192.38 mh	6,058	18,190	-	3,066	-	13.63	27,312
		Stg 1-6 CMP Mtl Spillway (1/2 of 48" Dia Riser Stand Pipe @ 128 Ft/Ea)	4.00 ea	166.084	664.33 mh	*20,450*	*20,198*	-	*2,795*	-	10,860.64	43,443
		Cut (Excavation For Placement Of 48" Dia Half-Round Pipe) 43 bcy	52.00 cy	0.400	20.80 mh	599	-	-	177	-	14.91	776
		Fill With 1032 CompactedCrushed Stone	93.00 tn	0.400	37.20 mh	1,107	804	-	599	-	28.99	2,510
		30" Diameter CMP Culvert	1,000.00 lf	0.600	600.00 mh	17,487	26,442	-	3,682	-	47.61	47,611
		Bedding For 30" CMP, 6" Thick	135.00 tn	0.500	67.50 mh	1,943	1,284	-	230	-	25.61	3,457
		30" Diameter CMP Stand Pipe (4Pipes @ 6 Stages w/30' Per Stage)	720.00 lf	0.750	540.00 mh	16,623	19,038	-	2,279	-	52.70	37,940
		D50 9" Riprap Outlet For Metal Spillway	53.00 tn	0.320	16.96 mh	505	539	-	273	-	24.85	1,317
		Galvanized Corrugated Metal Anti-Seep Collar	16.00 ea	16.000	256.00 mh	7,461	4,882	-	1,571	-	869.59	13,914
		Erosion Controls/S P			**4,201.35 hrs**	**125,853**	**150,687**		**42,029**			**318,569**
		01			***4,201.35 hrs***	***125,853***	***150,687***		***42,029***			***318,569***
02												
	Seed/Mulch											
		Seed/Mulch Disturbed Areas	26.00 ac		-	-	-	64,619	-	-	2,485.34	64,619
		Seed/Mulch			**hrs**			**64,619**				**64,619**
		02			***hrs***			***64,619***				***64,619***
03												
	South Access Road											
		1032 Crushed Stone Base, 8" Depth	3,520.00 tn	0.120	422.40 mh	13,739	31,950	-	4,147	-	14.16	49,836
		South Access Road			**422.40 hrs**	**13,739**	**31,950**		**4,147**			**49,836**
		03			***422.40 hrs***	***13,739***	***31,950***		***4,147***			***49,836***
04												
	Perimeter Road											
		1032 Roller Compacted Crushed Stone Base, 6" Depth	6,885.00 tn	0.120	826.20 mh	26,872	62,493	-	8,112	-	14.16	97,478
		Perimeter Road			**826.20 hrs**	**26,872**	**62,493**		**8,112**			**97,478**
		04			***826.20 hrs***	***26,872***	***62,493***		***8,112***			***97,478***
05												
	Instl Drns/Swan Pond											
		6" Dia Pipe Bollards	24.00 ea	1.500	36.00 mh	1,036	4,882	-	245	-	256.78	6,163
		PVC Monitoring Wells	6.00 ea		-	-	-	12,324	-	-	2,054.00	12,324
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 772)	474.00 lf	0.200	94.80 mh	2,587	785	-	403	-	7.96	3,774
		Crushed Stone, Bedding 6" Depth	16.00 tn	0.500	8.00 mh	230	152	-	27	-	25.61	410
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 780)	520.00 lf	0.200	104.00 mh	2,833	861	-	442	-	7.96	4,141
		Crushed Stone, Bedding 6" Depth	18.00 tn	0.500	9.00 mh	259	171	-	31	-	25.61	461
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 792)	491.00 lf	0.200	98.20 mh	2,680	813	-	417	-	7.96	3,910
		Crushed Stone, Bedding 6" Depth	17.00 tn	0.500	8.50 mh	245	162	-	29	-	25.61	435
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 810)	1,282.00 lf	0.200	256.40 mh	6,998	2,122	-	1,089	-	7.96	10,208
		Crushed Stone, Bedding 6" Depth	43.00 tn	0.500	21.50 mh	619	409	-	73	-	25.61	1,101
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 817)	1,218.00 lf	0.200	243.60 mh	6,648	2,016	-	1,034	-	7.96	9,699
		Crushed Stone, Bedding 6" Depth	41.00 tn	0.500	20.50 mh	590	390	-	70	-	25.61	1,050
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 825)	1,180.00 lf	0.200	236.00 mh	6,441	1,953	-	1,002	-	7.96	9,396
		Crushed Stone, Bedding 6" Depth	40.00 tn	0.500	20.00 mh	578	380	-	68	-	25.61	1,024
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 832)	1,160.00 lf	0.200	232.00 mh	6,332	1,920	-	985	-	7.96	9,237
		Crushed Stone, Bedding 6" Depth	39.00 tn	0.500	19.50 mh	561	371	-	66	-	25.61	999
		Cut For 6" Dia Non-Perforated HDPE (17,658 bcy)	21,190.00 cy	0.200	4,238.00 mh	121,995	-	-	36,025	-	7.46	158,020
		Backfill For 6" Dia Non-Perforated HDPE (12,361 bcy)	14,833.00 cy	0.250	3,708.25 mh	106,748	-	-	44,481	-	10.20	151,227
		Cut For 6" Dia Perforated HDPE (18,186 bcy)	21,824.00 cy	0.200	4,364.80 mh	125,648	-	-	37,103	-	7.46	162,748
		Backfill For 6" Dia Perforated HDPE (12,730 bcy)	15,276.00 cy	0.250	3,819.00 mh	109,934	-	-	45,810	-	10.20	155,744
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 763)	2,000.00 lf	0.200	400.00 mh	10,917	3,310	-	1,698	-	7.96	15,926
		1081 Crushed Stone	378.00 tn	0.150	56.70 mh	1,632	3,431	-	482	-	14.67	5,545
		Geotextile Woven Monofilament	1,556.00 sy	0.021	32.01 mh	913	3,151	-	109	-	2.68	4,173
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 772)	3,790.00 lf	0.200	758.00 mh	20,688	6,273	-	3,218	-	7.96	30,179
		1081 Crushed Stone	716.00 tn	0.150	107.40 mh	3,092	6,499	-	913	-	14.67	10,503
		Geotextile Woven Monofilament	2,948.00 sy	0.021	60.64 mh	1,730	5,969	-	206	-	2.68	7,905
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 780)	4,160.00 lf	0.200	832.00 mh	22,707	6,886	-	3,532	-	7.96	33,125
		1081 Crushed Stone	786.00 tn	0.150	117.90 mh	3,394	7,134	-	1,002	-	14.67	11,530
		Geotextile Woven Monofilament	3,236.00 sy	0.021	66.56 mh	1,899	5,552	-	226	-	2.68	8,678
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 792)	3,925.00 lf	0.200	785.00 mh	21,425	6,497	-	3,333	-	7.96	31,254
		1081 Crushed Stone	742.00 tn	0.150	111.30 mh	3,204	6,735	-	946	-	14.67	10,885
		Geotextile Woven Monofilament	3,053.00 sy	0.021	62.80 mh	1,792	6,182	-	214	-	2.68	8,187
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 810)	6,410.00 lf	0.200	1,282.00 mh	34,989	10,610	-	5,443	-	7.96	51,042
		1081 Crushed Stone	1,211.00 tn	0.150	181.65 mh	5,229	10,992	-	1,544	-	14.67	17,765
		Geotextile Woven Monofilament	4,986.00 sy	0.021	102.56 mh	2,926	10,096	-	349	-	2.68	13,371
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 817)	6,090.00 lf	0.200	1,218.00 mh	33,242	10,080	-	5,171	-	7.96	48,494
		1081 Crushed Stone	1,151.00 tn	0.150	172.65 mh	4,970	10,447	-	1,468	-	14.67	16,885
		Geotextile Woven Monofilament	4,737.00 sy	0.021	97.44 mh	2,780	9,592	-	331	-	2.68	12,703
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 825)	5,900.00 lf	0.200	1,180.00 mh	32,205	9,765	-	5,010	-	7.96	46,981

Location	Activity	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
	Instl Drns/Swan Pond											
		1081 Crushed Stone	1,115.00 tn	0.150	167.25 mh	4,814	10,121	-	1,422	-	14.67	16,357
		Geotextile Woven Monofilament	4,589.00 sy	0.021	94.40 mh	2,693	9,292	-	321	-	2.68	12,306
		6" Dia Perforated HDPE Perimeter Underdrain (EL. 832)	5,800.00 lf	0.200	1,160.00 mh	31,659	9,600	-	4,925	-	7.96	46,185
		1081 Crushed Stone	1,096.00 tn	0.150	164.40 mh	4,732	9,948	-	1,397	-	14.67	16,078
		Geotextile Woven Monofilament	4,511.00 sy	0.021	92.79 mh	2,647	9,134	-	316	-	2.68	12,097
		12" Dia Force Main HDPE Perimeter Underdrain (EL. 763)	2,580.00 lf	0.250	645.00 mh	17,604	13,087	-	2,741	-	12.96	33,432
		1081 Crushed Stone	575.00 tn	0.150	86.25 mh	2,483	5,219	-	733	-	14.67	8,435
		Submersible Pumping Station Equipment Package	1.00 ls	56.000	56.00 mh	2,266	5,085	-	209	-	7,560.57	7,561
		60" Diameter Catch Basin (Precast)	1.00 ea	60.000	60.00 mh	1,810	3,051	-	478	-	5,338.36	5,338
		Geotextile Woven Monofilament	2,293.00 sy	0.021	47.17 mh	1,348	4,643	-	160	-	2.68	6,149
		Grout Seal Storm Drain - 24" Diameter (Pump & Plug)	54.00 cy	1.000	54.00 mh	1,515	2,856	-	499	-	90.19	4,870
		Seal Weld 1/4" Thick A-36 Steel Plate	2.00 ea	4.000	8.00 mh	304	102	-	80	-	243.02	486
		Grout Seal Storm Drain - 24" Diameter (Pump & Plug)	53.00 cy	1.000	53.00 mh	1,487	2,803	-	490	-	90.19	4,780
		Seal Weld 1/4" Thick A-36 Steel Plate	2.00 ea	4.000	8.00 mh	304	102	-	80	-	243.02	486
		Grout Seal Storm Drain - 24" Diameter (Pump & Plug)	23.00 cy	1.000	23.00 mh	645	1,216	-	212	-	90.19	2,074
		Seal Weld 1/4" Thick A-36 Steel Plate	2.00 ea	4.000	8.00 mh	304	102	-	80	-	243.02	486
		24" CMP Storm Drain	38.00 lf	0.480	18.24 mh	498	773	-	68	-	35.24	1,339
		Excavation For 24" Dia Pipe (25 bcy)	30.00 cy	0.200	6.00 mh	173	-	-	77	-	8.31	249
		Backfill For 24" Diameter CMP (17 bcy)	21.00 cy	0.320	6.72 mh	193	-	-	166	-	17.13	360
		Bedding For 24" Culvert	4.00 tn	0.500	2.00 mh	58	38	-	7	-	25.61	102
		36" CMP Storm Drain	72.00 lf	0.600	43.20 mh	1,259	2,709	-	265	-	58.80	4,233
		Excavation For 36" Dia Pipe (67 bcy)	81.00 cy	0.200	16.20 mh	466	-	-	207	-	8.31	673
		Backfill For 36" Diameter CMP (47 bcy)	57.00 cy	0.320	18.24 mh	525	-	-	451	-	17.13	976
		Bedding For 36" Culvert	9.00 tn	0.500	4.50 mh	130	86	-	15	-	25.61	230
		Anchor Trench - Excavate Into Borrow Area (8,650 bcy)	10,380.00 cy	0.200	2,076.00 mh	59,760	-	-	26,469	-	8.31	86,229
		Upper & Lower LLDPE Geomembrane	110,688.00 sy	0.050	5,534.40 mh	157,885	247,853	-	14,113	-	3.79	419,651
		Sediment Trap (3,630 bcy)	4,356.00 cy	0.040	174.24 mh	5,807	-	-	4,582	-	2.39	10,389
		Instl Drns/Swan Pond			**35,789.66 hrs**	**1,016,066**	**495,205**	**12,324**	**265,158**			**1,788,753**
		05			***35,789.66 hrs***	***1,016,066***	***495,205***	***12,324***	***265,158***			***1,788,753***
06												
	Drg Cell/P1 Opr Cost											
		Elv. 810 To Elv. 866	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Bottom Ash Dike Fill	822,416.00 cy	1,300.000	478.78 cd	1,159,419	-	-	966,986	-	3.42	2,126,405
		Dredge	4,853,654.00 cy		-	-	-	7,631,580	-	-	1.57	7,631,580
		Wet Dip And Stack	678,848.00 cy	375.000	1,810.26 cd	531,659	-	-	1,264,903	-	2.65	1,796,563
		Disposal Life (Assume Dike & Dredge Ash)	***12.90 yr***		-	-	-	-	-	-	***0.00***	***0***
		Drg Cell/P1 Opr Cost			**48,954.36 hrs**	**1,691,078**		**7,631,580**	**2,231,890**			**11,554,547**
		06			***48,954.36 hrs***	***1,691,078***		***7,631,580***	***2,231,890***			***11,554,547***
07												
	Gypsum Stk Peninsula											
		Clear And Grub	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Clear And Grub	90.00 ac	72.000	6,480.00 mh	193,775	-	-	160,944	-	3,941.32	354,719
		Strip 1 ft Vegetation And Topsoil - Spoil At Stockpile	129,000.00 cy	0.020	2,580.00 mh	79,380	-	-	82,236	-	1.25	161,618
		Gypsum Stk Peninsula			**9,060.00 hrs**	**273,155**			**243,181**			**516,336**
		07			***9,060.00 hrs***	***273,155***			***243,181***			***516,336***
08												
	Erosion Controls											
		Erect Silt Fence (Trench Bottom OF Fence, 10% Hay Bales)	4,900.00 lf	0.069	335.99 mh	9,769	2,462	-	1,554	-	2.81	13,784
		Cut For Stormwater Runoff Pond (2,000 bcy)	2,400.00 cy	800.000	3.00 cd	3,199	-	-	2,525	-	2.39	5,724
		Cleanout Stormwater Runoff Pond (2,300 bcy)	2,760.00 cy	383.333	7.20 cd	3,839	-	-	2,350	-	2.24	6,189
		Fill For Stormwater Runoff Pond (12,000 bcy)	14,400.00 cy	1,904.000	7.56 cd	22,757	-	-	24,725	-	3.30	47,482
		Riprap For Stormwater Runoff Pond	4,300.00 tn	0.200	860.00 mh	25,595	43,731	-	18,441	-	20.41	87,767
		Pipe Bedding	20.00 tn	0.500	10.00 mh	288	199	-	34	-	26.03	521
		72 " Dia. CMP For Outlet Structure	6.00 lf	2.000	12.00 mh	337	1,851	-	70	-	376.24	2,257
		48 " Dia. CMP For Riser For Outlet Structure	7.00 lf	1.091	7.64 mh	214	936	-	45	-	170.64	1,195
		48 " Dia. CMP Outlet Pipe (Principle Spillway)	150.00 lf	0.620	93.00 mh	2,610	7,404	-	542	-	70.37	10,556
		Cut Holes In Riser	3.00 ea	1.000	3.00 mh	74	-	-	16	-	29.92	90
		Composite Concrete For Riser Base (Assume 7' x 7' x 2')	4.00 cy	10.000	40.00 mh	1,294	823	-	105	-	555.30	2,221
		Anti-Seep Collars (Assume Concrete)	7.00 ea	75.000	525.00 mh	16,984	5,076	-	1,373	-	3,347.60	23,433
		Erosion Controls			**2,763.38 hrs**	**86,962**	**62,480**		**51,777**			**201,219**
		08			***2,763.38 hrs***	***86,962***	***62,480***		***51,777***			***201,219***
09												
	Roads											
		Bottom Ash (South Access Road)	2,400.00 cy	1,904.000	1.26 cd	3,052	-	-	3,118	-	2.57	6,170
		Crushed Stone Base (South Access Road)	2,900.00 tn	0.120	348.00 mh	11,319	26,323	-	3,417	-	14.16	41,058
		Crushed Stone Base (Permanent Parking Lot Paved Stone)	340.00 tn	0.120	40.80 mh	1,327	3,086	-	401	-	14.16	4,814
		Roads			**479.56 hrs**	**15,698**	**29,409**		**6,935**			**52,042**
		09			***479.56 hrs***	***15,698***	***29,409***		***6,935***			***52,042***
10												
	Fencing											

Location	Activity	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
	Fencing											
		New Fencing (Including Grounding)	200.00 lf		-	-	-	4,211	-	-	21.05	4,211
		Personnel Swinging Gate	1.00 ea		-	-	-	370	-	-	369.72	370
		Sliding Gate, 20 Ft Wide, With Motorized Operator	1.00 ea		-	-	-	17,459	-	-	17,459.00	17,459
		Fencing			hrs			22,039				22,039
		10			***hrs***			***22,039***				***22,039***
11												
	Seed/Mulch											
		Seed/Mulch Disturbed Areas	25.00 ac		-	-	-	62,134	-	-	2,485.34	62,134
		Seed/Mulch			hrs			62,134				62,134
		11			***hrs***			***62,134***				***62,134***
13												
	Gypsum Disp Facility											
		Disposal Facility Construction	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Cut And Fill Balance (189,719 bcy)	227,663.00 cy	2,800.000	81.31 cd	244,655	-	-	265,808	-	2.24	510,463
		Cut & Spoil Select Cut For Future 1 Ft Clay Layer In Final Cover	145,001.00 cy	1,904.000	76.16 cd	186,178	-	-	196,528	-	2.50	362,707
		Riprap For Ditch	23,500.00 tn	0.200	4,700.00 mh	139,881	238,995	-	100,781	-	20.41	479,657
		Ditch For Riprap (24' wide x 2' deep)	7,300.00 lf	0.044	320.03 mh	10,911	-	-	12,904	-	3.26	23,816
		Geotextile (If Riprap Is Used)	19,500.00 sy	0.015	292.50 mh	8,420	26,029	-	995	-	1.82	35,443
		Perimeter Road Surfacing - Bottom Ash	2,400.00 cy	1,904.000	1.26 cd	3,052	-	-	3,118	-	2.57	6,170
		Perimeter Road Surfacing - Crushed Stone	2,900.00 tn	0.120	348.00 mh	11,319	26,323	-	3,417	-	14.16	41,058
		Drainage Layer (1 Ft Thick) For Liner (No. 57 Stone)	168,000.00 tn	0.096	16,128.00 mh	507,694	1,452,276	-	257,040	-	13.20	2,217,010
		Geotextile For Underdrain Pipe	5,700.00 sy	0.011	59.85 mh	1,723	7,608	-	203	-	1.67	9,535
		8" Dia. HDPE, SDR 17 Perforated Pipe	6,400.00 lf	0.200	1,280.00 mh	34,935	10,593	-	5,439	-	7.96	50,967
		8" Dia. HDPE Standard Fittings	50.00 ea	0.200	10.00 mh	248	407	-	-	-	13.10	655
		Concrete Anchors For Underdrain Piping	85.00 ea	12.500	1,062.50 mh	34,373	10,157	-	2,778	-	556.58	47,309
		Proofroll Subgrade	70.00 ac	7.000	10.00 cd	8,497	-	-	4,080	-	179.67	12,577
		Gypsum Disp Facility			**36,560.74 hrs**	**1,171,887**	**1,772,388**		**853,092**			**3,797,367**
		13			***36,560.74 hrs***	***1,171,887***	***1,772,388***		***853,092***			***3,797,367***
14												
	Gyp On Peninsula Cst											
		Allowance For Karst Geologic Features	1.00 ls		-	-	-	513,500	-	-	513,500.00	513,500
		Addition Geotechnical Investigation	1.00 ls		-	-	-	102,700	-	-	102,700.00	102,700
		Cut For Underdrain System	4,407.00 cy	0.200	881.40 mh	25,372	-	-	7,492	-	7.46	32,864
		6" Dia Perforated HDPE Perimeter Underdrains	59,491.00 lf	0.200	11,898.20 mh	324,733	98,488	-	50,517	-	7.96	473,718
		Fill For Underdrain System	3,525.00 cy	0.250	881.25 mh	25,368	-	-	10,571	-	10.20	35,939
		1081 Crushed Stone, 6" Depth (110 pcf)	3,272.00 tn	0.150	490.80 mh	14,128	29,899	-	4,172	-	14.67	47,999
		Cut For Lateral Outlet Pipes	551.00 cy	0.200	110.20 mh	3,172	-	-	937	-	7.46	4,109
		6" Dia Non- Perforated HDPE Lateral Outlet Pipes	7,436.00 lf	0.200	1,487.20 mh	40,590	12,308	-	6,314	-	7.96	59,212
		Fill For Lateral Outlet Pipes	441.00 cy	0.250	110.25 mh	3,174	-	-	1,322	-	10.20	4,496
		1081 Crushed Stone, 6" Depth (110 pcf)	409.00 tn	0.150	61.35 mh	1,766	3,712	-	521	-	14.67	6,000
		Gypsum Disposal Stack (Wet Sluice)	***5,535,853.00 cy***		-	-	-	-	-	-	***0.00***	***0***
		Wet Cast Gypsum Gypsum Dike	1,011,347.00 cy	375.000	2,696.93 cd	792,065	-	-	1,884,452	-	2.65	2,676,517
		Cut Rim Ditches	114,575.00 cy	375.000	305.53 cd	89,733	-	-	213,489	-	2.65	303,221
		Life Of Gypsum Disposal Stack	***20.00 yrs***		-	-	-	-	-	-	***0.00***	***0***
		Gyp On Peninsula Cst			**39,940.32 hrs**	**1,320,101**	**144,187**	**616,200**	**2,179,787**			**4,260,275**
		14			***39,940.32 hrs***	***1,320,101***	***144,187***	***616,200***	***2,179,787***			***4,260,275***
15												
	Construction Parking											
		Silt Fence	1,000.00 lf	0.020	20.00 mh	526	320	-	-	-	0.85	846
		Cut And Fill Balance (500 bcy)	600.00 cy	2,800.000	0.21 cd	645	-	-	701	-	2.24	1,345
		Cut & Spoil Additional Material	400.00 cy	1,904.000	0.21 cd	458	-	-	542	-	2.50	1,001
		Crushed Stone Base	1,400.00 tn	0.120	168.00 mh	5,464	12,707	-	1,650	-	14.16	19,821
		Construction Parking			**220.30 hrs**	**7,093**	**13,028**		**2,892**			**23,013**
		15			***220.30 hrs***	***7,093***	***13,028***		***2,892***			***23,013***
17												
	Ph 2 Base Construct											
		Base Layers	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Cut For Dredge Cell (268,500 bcy)	322,200.00 cy	0.040	12,888.00 mh	429,505	-	-	338,937	-	2.39	768,442
		Compacted Fly Ash Base (Fill)	573,650.00 cy	1,300.000	441.27 cd	1,058,579	-	-	891,223	-	3.42	1,959,802
		Proofroll Subgrade	177,100.00 sy	28,111.100	6.30 cd	5,353	-	-	2,570	-	0.05	7,923
		2.5' Thick Bottom Ash Layer	152,717.00 cy	1,300.000	117.47 cd	284,477	-	-	237,261	-	3.42	521,738
		0.5' Thick Fly Ash Filter Layer	30,543.00 cy	1,300.000	23.49 cd	56,895	-	-	47,452	-	3.42	104,346
		18" Dia Coarse Bottom Ash Drain Columns (haul 2 miles, 1,100 bcy)	16,920.00 lf		-	-	-	347,537	-	-	20.54	347,537
		Roto Till Fly Ash Layer	177,100.00 sy	1,400.000	126.50 cd	74,304	-	-	20,645	-	0.54	94,949
		Bottom Ash Dike Fill	163,614.00 cy	1,300.000	125.86 cd	304,775	-	-	254,191	-	3.42	558,966
		4" Diameter Perforated PVC Pipe (Underdrains) SDR 17.5	26,082.00 lf	0.070	1,825.74 mh	49,829	40,942	-	7,762	-	3.78	98,533
		Trenching For The Drain System (4" Dia Underdrains), 966 bcy	1,160.00 cy	0.200	232.00 mh	6,678	-	-	1,972	-	7.46	8,650
		Strip Existing 1' Soil Cover (Phase 1 Expansion), 19,133 bcy	22,960.00 cy	800.000	28.70 cd	14,128	-	-	14,930	-	1.27	29,058
		Anchor Trench Cut	1,306.00 cy	0.200	261.20 mh	7,519	-	-	3,330	-	8.31	10,849
		Anchor Trench Fill & Compact	1,242.00 cy	0.320	397.44 mh	11,441	-	-	9,835	-	17.13	21,275

Location	Activity	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
	Ph 2 Base Construct											
		2.0' Thick Bottom Ash Blanket Drain	24,640.00 cy	1,300.000	18.95 cd	45,899	-	-	38,281	-	3.42	84,179
		1.0' Thick Filter Drain Ash Layer	12,320.00 cy	1,300.000	9.48 cd	22,949	-	-	19,140	-	3.42	42,090
		Geomembrane	36,960.00 sy	0.050	1,848.00 mh	52,720	82,694	-	4,712	-	3.79	140,126
		Perforated Pipe ADS Drain Tube, 6" Diameter	4,946.00 lf	0.200	989.20 mh	26,998	8,186	-	4,200	-	7.96	39,384
		Geotextile For Underdrain	4,121.00 sy	0.021	84.77 mh	2,418	8,344	-	288	-	2.68	11,051
		#57 Stone For Outlet pipe Bedding (135 pcf)	1,001.00 tn	0.150	150.15 mh	4,322	9,086	-	1,276	-	14.67	14,684
		Solid Outlet Pipe ADS Drain 6" Diameter	1,236.00 lf	0.200	247.20 mh	6,747	2,046	-	1,050	-	7.96	9,842
		#57 Stone For Outlet pipe Bedding (135 pcf)	250.00 tn	0.150	37.50 mh	1,079	2,269	-	319	-	14.67	3,667
		6" Dia Non-Perf HDPE Corrugated Tubing Lateral Outlet Pipes (EL. 760)	302.00 lf	0.200	60.40 mh	1,648	500	-	256	-	7.96	2,405
		1081Crushed Stone, Bedding 6" Depth	10.00 tn	0.500	5.00 mh	144	95	-	17	-	25.61	256
		6" Dia Perforated HDPE Drain (EL. 760)	1,512.00 lf	0.200	302.40 mh	8,253	2,503	-	1,284	-	7.96	12,040
		1081Crushed Stone	286.00 tn	0.500	143.00 mh	4,116	2,720	-	487	-	25.61	7,323
		Geotextile Woven Monofilament	1,176.00 sy	0.021	24.19 mh	690	2,381	-	82	-	2.68	3,154
		Cut For Underdrain System	224.00 cy	0.200	44.80 mh	1,290	-	-	381	-	7.46	1,670
		Backfill For Underdrain System	168.00 cy	0.250	42.00 mh	1,209	-	-	504	-	10.20	1,713
		Certification	1.00 ls		-	-	-	-	-	31,500	31,500.00	31,500
		QA/QC For Construction Of Diposal Facility	1.00 ls		-	-	-	470,247	-	-	470,246.87	470,247
		Ph 2 Base Construct			**75,247.27 hrs**	**2,493,966**	**161,766**	**817,784**	**1,902,386**	**31,500**		**5,407,402**
		17			***75,247.27 hrs***	***2,493,966***	***161,766***	***817,784***	***1,902,386***	***31,500***		***5,407,402***
18												
	Temp Slope Protect											
		Cut For Ditch (5,815 bcy)	6,978.00 cy	1,200.000	5.82 cd	10,981	-	-	12,281	-	3.33	23,262
		D50 9" Riprap	4,239.00 tn	0.320	1,356.48 mh	40,371	43,111	-	21,837	-	24.85	105,319
		Seed Ditch	6,978.00 sy		-	-	-	3,583	-	-	0.51	3,583
		Jute Matting	6,978.00 sy	0.012	83.74 mh	2,389	5,464	-	427	-	1.19	8,280
		Temp Slope Protect			**1,765.86 hrs**	**53,741**	**48,575**	**3,583**	**34,545**			**140,445**
		18			***1,765.86 hrs***	***53,741***	***48,575***	***3,583***	***34,545***			***140,445***
19												
	Riprap Stilling Basn											
		Riprap D50 Size 9"	2,344.00 tn	0.320	750.08 mh	22,324	23,838	-	12,075	-	24.85	58,237
		Cut For Basin (3,582 bcy)	4,300.00 cy	1,200.000	3.58 cd	6,767	-	-	7,420	-	3.30	14,186
		Riprap Stilling Basn			**950.75 hrs**	**29,091**	**23,838**		**19,495**			**72,424**
		19			***950.75 hrs***	***29,091***	***23,838***		***19,495***			***72,424***
20												
	Ph 2 Initial Constr											
		Dredge Ash	451,295.00 cy		-	-	-	709,588	-	-	1.57	709,588
		Initial Disposal Life	***0.90 yrs***		-	-	-	-	-	-	***0.00***	***0***
		Perforated Pipe ADS Drain Tube, 6" Diameter	7,370.00 lf	0.200	1,474.00 mh	40,229	12,199	-	6,258	-	7.96	58,686
		Geotextile For Underdrain	6,142.00 sy	0.021	126.34 mh	3,604	12,437	-	430	-	2.68	16,471
		#57 Stone For Outlet pipe Bedding (135 pcf)	1,492.00 tn	0.150	223.80 mh	6,442	13,542	-	1,902	-	14.67	21,887
		Solid Outlet Pipe ADS Drain 6" Diameter	1,658.00 lf	0.200	331.60 mh	9,050	2,744	-	1,408	-	7.96	13,202
		#57 Stone For Outlet pipe Bedding (135 pcf)	336.00 tn	0.150	50.40 mh	1,451	3,050	-	428	-	14.67	4,929
		Ph 2 Initial Constr			**2,206.14 hrs**	**60,777**	**43,972**	**709,588**	**10,427**			**824,763**
		20			***2,206.14 hrs***	***60,777***	***43,972***	***709,588***	***10,427***			***824,763***
22												
	Ph 2 Operationl Cost											
		Stage 1 (3 To 1 Side Slopes)	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Compacted Fly Ash Dike Fill (50% F. A. & 50% B. A.)	255,189.00 cy	1,300.000	196.30 cd	475,359	-	-	396,462	-	3.42	871,821
		Dredge Ash	1,334,496.00 cy		-	-	-	2,098,277	-	-	1.57	2,098,277
		Stage 1 Disposal Life (Assume Dike & Dredge Ash)	***3.30 yrs***		-	-	-	-	-	-	***0.00***	***0***
		Perforated Pipe ADS Drain Tube, 6" Diameter	11,495.00 lf	0.200	2,299.00 mh	62,746	19,026	-	9,761	-	7.96	91,533
		Geotextile For Underdrain	9,579.00 sy	0.021	197.04 mh	5,621	19,396	-	670	-	2.68	25,687
		#57 Stone For Outlet pipe Bedding (135 pcf)	2,328.00 tn	0.150	349.20 mh	10,052	21,131	-	2,968	-	14.67	34,151
		Solid Outlet Pipe ADS Drain 6" Diameter	2,586.00 lf	0.200	517.20 mh	14,116	4,280	-	2,196	-	7.96	20,592
		#57 Stone For Outlet Pipe Bedding (135 pcf)	524.00 tn	0.150	78.60 mh	2,263	4,756	-	668	-	14.67	7,687
		Ph 2 Operationl Cost			**17,574.59 hrs**	**570,156**	**68,589**	**2,098,277**	**412,725**			**3,149,748**
		22			***17,574.59 hrs***	***570,156***	***68,589***	***2,098,277***	***412,725***			***3,149,748***
23												
	Ph 2 Operationl Cost											
		Stage 2 (3 To 1 Side Slopes)	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Compacted Fly Ash Dike Fill (50% F. A. & 50% B. A.)	263,403.00 cy	1,300.000	202.62 cd	490,659	-	-	409,223	-	3.42	899,883
		Dredge Ash	1,509,673.00 cy		-	-	-	2,373,715	-	-	1.57	2,373,715
		Stage 2 Disposal Life (Assume Dike & Dredge Ash)	***3.70 yrs***		-	-	-	-	-	-	***0.00***	***0***
		Perforated Pipe ADS Drain Tube, 6" Diameter	11,865.00 lf	0.200	2,373.00 mh	64,765	19,639	-	10,075	-	7.96	94,479
		Geotextile For Underdrain	9,888.00 sy	0.021	203.40 mh	5,802	20,022	-	692	-	2.68	26,516
		#57 Stone For Outlet pipe Bedding (135 pcf)	2,403.00 tn	0.150	360.45 mh	10,376	21,811	-	3,064	-	14.67	35,251
		Solid Outlet Pipe ADS Drain 6" Diameter	2,670.00 lf	0.200	534.00 mh	14,574	4,419	-	2,267	-	7.96	21,261
		#57 Stone For Outlet Pipe Bedding (135 pcf)	541.00 tn	0.150	81.15 mh	2,336	4,911	-	690	-	14.67	7,936
		Ph 2 Operationl Cost			**18,140.47 hrs**	**588,514**	**70,801**	**2,373,715**	**426,011**			**3,459,041**

Location	Activity	Description	Takeoff Quantity	Labor Productivity	Labor Quantity	Labor Amount	Material Amount	Sub Amount	Equip Amount	Other Amount	Total Cost/Unit	Total Amount
		23			***18,140.47 hrs***	***588,514***	***70,801***	***2,373,715***	***426,011***			***3,459,041***
24												
	Ph 2 Operationl Cost											
		Stage 3 (3 To 1 Side Slopes)	***1.00 lot***		-	-	-	-	-	-	***0.00***	***0***
		Compacted Fly Ash Dike Fil (50% F. A. & 50% B. A.)	227,106.00 cy	1.300.000	174.70 cd	423,046	-	-	352,832	-	3.42	775,879
		Dredge Ash	1,344,916.00 cy		-	-	-	2,114,661	-	-	1.57	2,114,661
		Stage 3 Disposal Life (Assume Dike & Dredge Ash)	***3.30 yrs***		-	-	-	-	-	-	***0.00***	***0***
		Perforated Pipe ADS Drain Tube, 6" Diameter	10,230.00 lf	0.200	2,046.00 mh	55,841	16,932	-	8,687	-	7.96	81,460
		Geotextile For Underdrain	8,525.00 sy	0.021	175.36 mh	5,003	17,262	-	597	-	2.68	22,861
		#57 Stone For Outlet Pipe Bedding (135 pcf)	2,072.00 ln	0.150	310.80 mh	8,947	18,807	-	2,642	-	14.67	30,395
		Solid Outlet Pipe ADS Drain 6" Diameter	2,302.00 lf	0.200	460.40 mh	12,566	3,810	-	1,955	-	7.96	18,330
		#57 Stone For Outlet Pipe Bedding (135 pcf)	466.00 ln	0.150	69.90 mh	2,012	4,230	-	594	-	14.67	6,836
		Ph 2 Operationl Cost			**15,640.64 hrs**	**507,414**	**61,041**	**2,114,661**	**367,306**			**3,050,423**
		24			***15,640.64 hrs***	***507,414***	***61,041***	***2,114,661***	***367,306***			***3,050,423***
xCONST FACILITY												
	Construct Facilities											
		Mobilize, Drug Test, Misc Other, & Demobilize	1.00 ls	11,746.522	11,746.52 mh	380,000	-	-	***205,000***	0	585,000.00	585,000
		Construct Facilities			**11,746.52 hrs**	**380,000**			**205,000**			**585,000**
		xCONST FACILITY			***11,746.52 hrs***	***380,000***			***205,000***			***585,000***
zNON MANUAL												
	Non-Manual											
		Non Manual	1.00 ls	22,630.560	22,630.56 mh	1,131,528	-	-	-	-	1,131,528.00	1,131,528
		Non-Manual			**22,630.56 hrs**	**1,131,528**						**1,131,528**
		zNON MANUAL			***22,630.56 hrs***	***1,131,528***						***1,131,528***

Estimate Totals

Labor	11,563,690		345,121.056	hrs			
Material	3,240,410						
Subcontract	16,526,504						
Equipment	9,266,896		233,704.578	hrs			
Other	31,500						
	40,629,000	40,629,000					
Engineered Materials - Ph 2			100.000	%		C	
Adjustment - Engr Materials			(100.000)	%		C	
		40,629,000					
Environmental Costs			100.000	%		C	
Adjustment Environmental			(100.000)	%		C	
		40,629,000					
FPG Civil Engrg - Phase 2	30,076		0.207	% @	42.00	A	716
Non-TVA Engr - Phase 2	564,068		2.270	% @	72.00	A	7,834
FPG Proj Cntrl Cost - Phase 2	977		0.007	% @	42.00	A	23
FPG Proj Cntrl Sched - Phase 2	2,927		0.020	% @	42.00	A	70
FPG Estimating - Phase 2	976		0.007	% @	42.00	A	23
FPG Engr Records - Phase 2	976		0.007	% @	42.00	A	23
	600,000	41,229,000					
Rounding						L	
		41,229,000					
	Total	***41,229,000***					