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Birmingham Coal & Coke Company, Inc.
Old Union #2 Mine, P-3962
Detailed Design Plan Basin 115

4.8 Inches, 25 Year - 6 Hour,

SCS 6 Hour

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General Information

Storm Information:

Storm Type:	SCS 6 Hour
Design Storm:	25 yr - 6 hr
Rainfall Depth:	4.800 inches

Particle Size Distribution:

Size (mm)	Topsoil	Spoil
3.0000	100.000%	100.000%
2.0000	98.000%	92.000%
1.0000	96.000%	78.000%
0.5000	94.000%	54.000%
0.3000	88.000%	43.000%
0.2000	80.000%	34.000%
0.1000	68.000%	22.000%
0.0500	49.000%	15.000%
0.0300	36.000%	9.000%
0.0200	28.000%	5.000%
0.0100	14.000%	4.000%
0.0050	5.000%	3.000%
0.0030	4.000%	2.500%
0.0010	2.000%	2.000%
0.0001	0.001%	0.001%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Basin 115

#1
Pond

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#1	In	84.000	84.000	112.70	12.57	3,237.8	519,508	397.66	127.99
	Out			48.18	12.57	128.2	16,961	0.33	0.14

Particle Size Distribution(s) at Each Structure

Structure #1:

Size (mm)	In	Out
3.0000	100.000%	100.000%
2.0000	92.020%	100.000%
1.0000	78.056%	100.000%
0.5000	54.116%	100.000%
0.3000	43.144%	100.000%
0.2000	34.167%	100.000%
0.1000	22.198%	100.000%
0.0500	15.146%	100.000%
0.0300	9.113%	100.000%
0.0200	5.093%	100.000%
0.0100	4.043%	100.000%
0.0050	3.011%	76.064%
0.0030	2.509%	63.371%
0.0010	2.002%	50.583%
0.0001	0.001%	0.025%

Structure Detail:

Structure #1 (Pond)

Basin 115

Pond Inputs:

Initial Pool Elev:	1,017.10 ft
Initial Pool:	2.27 ac-ft
*Sediment Storage:	2.40 ac-ft
Dead Space:	20.00 %

**Sediment capacity calculated from 0.150 times disturbed area*

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
48.00	130.00	2.00	0.0240	1,017.10	0.90	0.00

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
1,020.40	20.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	1,020.31 ft
H'graph Detention Time:	1.10 hrs
Pond Model:	CSTRS
Dewater Time:	0.77 days
Trap Efficiency:	96.04 %

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
1,014.09	0.589	0.000	0.000		Top of Sed. Storage
1,014.40	0.620	0.187	0.000		
1,014.50	0.629	0.250	0.000		
1,014.55	0.634	0.281	0.000		
1,014.60	0.639	0.313	0.000		
1,014.78	0.658	0.430	0.000		
1,015.00	0.680	0.577	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
1,015.40	0.726	0.858	0.000		
1,015.50	0.738	0.931	0.000		
1,015.55	0.744	0.968	0.000		
1,016.00	0.798	1.315	0.000		
1,016.50	0.860	1.730	0.000		
1,017.00	0.925	2.176	0.000		
1,017.10	0.938	2.269	0.000		Spillway #1
1,017.50	0.991	2.655	2.120	13.30	
1,018.00	1.061	3.168	7.157	1.50	
1,018.50	1.132	3.716	13.876	0.70	
1,018.70	1.161	3.945	16.956	0.20	
1,018.90	1.191	4.180	20.232	0.20	
1,019.00	1.206	4.300	21.942	0.10	
1,019.30	1.251	4.668	27.335	0.55	
1,019.40	1.267	4.794	29.220	0.20	
1,019.50	1.282	4.922	31.144	0.20	
1,020.00	1.360	5.582	41.366	0.85	
1,020.30	1.401	5.996	47.946	0.65	
1,020.31	1.403	6.011	48.180	0.10	Peak Stage
1,020.40	1.415	6.137	50.211		Spillway #2
1,020.50	1.429	6.279	54.466		
1,020.60	1.443	6.423	58.758		
1,021.00	1.499	7.011	76.259		
1,021.10	1.513	7.162	82.155		
1,021.50	1.571	7.778	113.165		
1,022.00	1.644	8.582	160.111		
1,022.50	1.719	9.423	217.374		
1,023.00	1.796	10.301	284.398		
1,023.50	1.874	11.219	361.435		
1,024.00	1.955	12.176	446.994		
1,024.50	2.036	13.174	542.926		
1,025.00	2.120	14.213	650.409		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
1,014.09	0.000	0.000	0.000
1,014.40	0.000	0.000	0.000
1,014.50	0.000	0.000	0.000
1,014.55	0.000	0.000	0.000

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
1,014.60	0.000	0.000	0.000
1,014.78	0.000	0.000	0.000
1,015.00	0.000	0.000	0.000
1,015.40	0.000	0.000	0.000
1,015.50	0.000	0.000	0.000
1,015.55	0.000	0.000	0.000
1,016.00	0.000	0.000	0.000
1,016.50	0.000	0.000	0.000
1,017.00	0.000	0.000	0.000
1,017.10	0.000	0.000	0.000
1,017.50	(3)>2.120	0.000	2.120
1,018.00	(3)>7.157	0.000	7.157
1,018.50	(3)>13.876	0.000	13.876
1,018.70	(3)>16.956	0.000	16.956
1,018.90	(3)>20.232	0.000	20.232
1,019.00	(3)>21.942	0.000	21.942
1,019.30	(3)>27.335	0.000	27.335
1,019.40	(3)>29.220	0.000	29.220
1,019.50	(3)>31.144	0.000	31.144
1,020.00	(3)>41.366	0.000	41.366
1,020.30	(3)>47.946	0.000	47.946
1,020.40	(3)>50.211	0.000	50.211
1,020.50	(3)>52.508	1.958	54.466
1,020.60	(3)>54.842	3.917	58.758
1,021.00	(3)>64.506	11.753	76.259
1,021.10	(3)>67.004	15.151	82.155
1,021.50	(3)>77.314	35.852	113.165
1,022.00	(5)>88.955	71.155	160.111
1,022.50	(5)>99.245	118.128	217.374
1,023.00	(5)>108.637	175.760	284.398
1,023.50	(6)>117.205	244.230	361.435
1,024.00	(6)>123.192	323.802	446.994
1,024.50	(6)>128.143	414.783	542.926
1,025.00	(6)>132.908	517.501	650.409

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	67.000	0.261	0.044	0.277	70.000	M	75.47	8.445
	2	16.000	0.034	0.000	0.000	81.000	F	45.20	3.724
	3	1.000	0.001	0.000	0.000	100.000	F	3.72	0.398
	Σ	**84.000**						**112.70**	**12.567**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#1	1	0.320	400.00	8.90	0.0030	1.0000	1	8.8	1,150	0.74	0.49
	2	0.240	200.00	33.00	0.9000	1.0000	2	3,229.6	719,539	551.09	378.95
	3	0.001	100.00	0.01	0.0001	1.0000	1	0.0	0	0.00	0.00
	Σ							**3,237.8**	**519,508**	**397.66**	**127.99**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	1. Forest with heavy ground litter	12.41	50.00	403.00	0.890	0.125
		7. Paved area and small upland gullies	5.42	125.00	2,308.01	4.680	0.136
#1	**1**	**Time of Concentration:**					**0.261**
#1	2	5. Nearly bare and untilled, and alluvial valley fans	26.32	50.00	190.00	5.120	0.010
		7. Paved area and small upland gullies	10.38	60.00	578.00	6.480	0.024
#1	**2**	**Time of Concentration:**					**0.034**
#1	3	5. Nearly bare and untilled, and alluvial valley fans	4.59	10.00	218.00	2.140	0.028
		8. Large gullies, diversions, and low flowing streams	11.00	80.00	727.00	9.950	0.020
#1	**3**	**Time of Concentration:**					**0.001**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	4.48	15.00	335.00	2.110	0.044

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	**1**	**Muskingum K:**					**0.044**