DIVERSION DITCH DESIGN CRITERIA

Diversion Ditch No.	Manning's n	Maximum Channel Slope (S max) ft/ft	Channel Side Slope (m)	Bottom Width (B) ft	Flow Depth (D) at S max ft	Flow Area at S max ft2	Wetted Perimeter at S max ft	Hydraulic Radius at S max ft	Velocity at S max fps	Discharge cfs	Minimum Channel Slope (S min) ft/ft	Flow Depth (D) at S min ft/ft	Freeboard ft	Total Required Channel Depth ft	Comments
6B	0.03	0.059	1.3	2.5	0.34	1.01	3.63	0.28	5.1	5.2	0.018	0.48	1	1.5	Lining required where erosion occurs, D50 = 0.5 ft.
6C	0.03	0.02	2	2.5	0.84	3.51	6.26	0.56	1.8	16.8	0.01	1	0.5	1.5	No lining required
7E	0.03	0.143	0	2.7	0.21	0.56	3.12	0.18	6	3.4	0.04	0.31	0.7	1	No lining required, have received variance since channel has already eroded to bedrock
7G	0.03	0.01	2	0	0.92	1.69	4.11	0.41	2.7	6.1	0.01	0.92	0.58	1.5	No lining required
7H	0.03	0.2	2	3	0.19	0.64	3.85	0.17	5.25	3.37	0.067	0.23	0.5	0.75	Lining required, Riprap D50 = 0.75 ft. for 20% Slopes.
8	0.03		5.25(14)	0.1	0.23	0.3	2.6	0.12	4.1	1.2	0.08	0.25	0.5	0.8	No lining required
9A	0.035	0.12	1	2	2.5	11.25	9.07	1.24	10.4	117	0.03	2.8	0.7	3.5	Lining required, grouted riprap D50 = 1.25 ft
9B	0.024	0.2	-	-	1.5	4.77	5.71	0.84	24.7	118	0.07	1.92	0.6	2.5	Lining required, 60 inch half round CMP in place
10A	0.03	0.03	3	0	0.89	2.38	5.63	0.42	4.83	11.5	-	-	0.6	1.5	lining required at designated locations, D50 = 0.50 ft
10B	0.03	0.02	3	0	1.01	3.04	6.36	0.48	4.28	13	-	-	1	2	No lining required
10C	0.03	0.027	3	0	0.96	2.79	6.1	0.46	4.83	13.5	0.0026	1.5	0.5	2	No lining required
10D	0.03	0.02	3	0	1.1	3.65	6.98	0.52	4.55	16.6	0.004	1.49	1	2.5	No lining required
11	0.03	0.5	1.5	1	0.07	0.08	1.24	0.06	5.4	0.4	0.02	0.17	0.5	0.7	lining required at designated locations, D50 = 0.75 ft
12	0.03	0.143	1.5	2.5	0.19	0.53	3.17	0.17	5.7	3	0.02	0.34	0.6	1	lining required at designated locations, D50 = 0.50 ft
14	0.023	0.26	Half-round dia = 54"		1.04	2.78	4.5	0.62	22.4	62	0.05	1.53	0.7	2.25	Lining required, 54 inch half round CMP in place
15A(1)	0.03	0.13	*	0	0.17	0.12	1.46	0.08	3.3	0.39	0.11	0.17	0.6	0.75	No lining required
15B	0.03	0.1	2	0	0.24	0.12	1.07	0.11	3.4	0.39	0.1	0.24	0.5	0.75	No lining required
UT15	0.03	0.025	*	*	0.2	1.46	8.19	0.18	2.5	3.7	0.025	0.2	0.55	0.75	No lining required
16Ba	0.022	0.10	2	1.0	0.18	0.25	1.81	0.14	5.7	1.4	0.04	0.23	0.5	0.75	Rough concrete lining in place
16Ea	0.022	0.10	2(16)	1.0	0.18	0.25	1.83	0.14	5.6	1.4	0.04	0.23	0.5	0.75	Rough concrete lining in place
16(13)	0.03	0.06	4(14)	0.7	0.3	0.39	2.62	0.15	3.6	1.4	0.04	0.33	0.5	0.8	No lining required
UT16	0.03	0.02	*	*	0.21	1.31	6.61	0.2	2.4	3.1	0.015	0.23	0.52	0.75	No lining required
17A(2)	0.03	0.1	2	0	0.18	0.07	0.82	0.08	3	0.24	0.05	0.21	0.5	0.7	No lining required
17B	0.03	0.1	2	1	0.23	0.34	2.03	0.17	4.7	1.6(3)	0.05	0.28	0.5	0.8	No lining required
18A	0.03	0.019	1.5	0	0.62	0.58	2.24	0.26	2.8	1.6	0.003	0.88	0.5	1.4	No lining required
18B	0.03	0.005	1.5	0	0.43	0.27	1.53	0.18	1.1	0.3	0.005	0.43	0.6	1	No lining required
18C	0.03	0.05	1.5	0	0.57	0.49	2.07	0.24	4.3	2.1	0.038	0.6	0.5	1.1	No lining required
18D	0.03	0.085	1.5	3	0.17	0.54	3.6	0.15	4.1	2.2	0.022	0.25	0.5	0.8	No lining required
18E	0.03	0.12	1.5	3	0.15	0.48	3.54	0.14	4.55	2.2	0.05	0.19	0.8	1	No lining required
24	0.01	0.091	1	2	0.27	0.62	2.77	0.22	16.6	10.3	0.029	0.38	1.1	1.5	Lining required, conveyor belt liner in place
27	0.025	0.008	25 & 1.5	0	0.15	0.29	3.97	0.07	0.9	0.26	-	-	0.85	1	No lining required
28	0.025	0.008	25 & 1.5	0	0.18	0.44	4.89	0.09	1.09	0.47	-	-	0.82	1	No lining required
29	0.025	0.008	25 & 1.5	0	0.17	0.38	4.54	0.08	0.97	0.37	-	-	0.83	1	No lining required
30	0.025	0.008	25 & 1.5	0	0.19	0.48	5.1	0.09	1.09	0.52	-	-	0.81	1	No lining required
32	0.03	0.1	2.6(14)	0.6	0.09	0.07	1.11	0.07	2.07	0.2	0.1	0.09	0.5	0.6	No lining required
33	0.03	0.06	6.7(14)	0.6	0.07	0.07	1.56	0.05	1.6	0.12	0.06	0.07	0.5	0.6	Lining required, riprap D50 = 1.0 ft
34	0.025	0.057	1.5	2	0.09	0.2	2.32	0.09	2.7	0.56	-	-	0.91	1	No lining required
35	0.025	0.005	1	0	0.46	0.21	1.3	0.16	1.25	0.26	-	-	1.04	1.5	No lining required
36	0.025	0.005	1	0	0.41	0.16	1.13	0.14	1.15	0.19	-	-	0.99	1.4	No lining required
37	0.025	0.074	1	0	0.31	0.09	0.85	0.11	3.7	0.35	-	-	0.99	1.3	No lining required
38	0.025	0.074	1	2	0.13	0.28	4.96	0.06	3.9	1.09	-	-	1.07	1.2	No lining required
39	0.025	0.074	1	0	0.16	0.03	0.49	0.06	2.58	0.06	-	-	1.04	1.2	No lining required
40	0.025	0.208	50 & 1	0	0.05	0.05	2.28	0.03	2.15	0.11	-	-	0.95	1	No lining required
41	0.03	0.029	3	0	0.48	0.7	3.05	0.23	3.15	2.2	-	-	1	1.5	No lining required
42A	0.03	0.1	3	0	0.2	0.12	1.28	0.1	3.28	0.4	-	-	0.8	1	No lining required
42B	0.03	0.1	3	0	0.27	0.22	1.73	0.13	4.01	0.9	-	-	0.7	1	No lining required
42C	0.03	0.075	3	0	0.3	0.27	1.9	0.14	3.7	1	-	-	0.7	1	No lining required
42D	0.03	0.05	3	0	0.32	0.31	2.05	0.15	3.18	1	-	-	0.7	1	No lining required
45	0.03	0.2	2(5)	0	0.11	0.07	1.35	0.05	3.1	0.22	-	-	0.6	0.75	No lining required
70A	0.03(9)	0.095	1.8	0	0.64	0.74	2.64	0.28	5.6	4.1	0.095	0.64	0.56	1.2	Lining required, grouted riprap D50 = 0.75 ft
70B	0.035	0.08	2	0	0.71	1.01	3.19	0.32	5.6	5.7	0.08	0.71	0.54	1.25	Lining required, grouted riprap D50 = 0.50 ft
70C	0.035	0.11	2	0	0.69	0.95	3.09	0.31	6.4	6.1	0.11	0.69	0.56	1.25	Lining required, grouted riprap D50 = 0.75 ft
71A	0.03	0.125	2	0	0.3	0.18	1.35	0.13	4.7	0.85	0.125	0.3	0.5	0.8	No lining required
71B	0.03	0.125	2	0	0.3	0.18	1.35	0.13	4.7	0.85	0.125	0.3	0.5	0.8	No lining required
72A(10)	0.038	0.29	2	3	0.13	0.42	3.58	0.12	5.5	2.3	0.06	0.42	0.98	1.4	Lining required, riprap D50 = 0.75 ft
72B(11)	0.035	0.125	2	2	0.39	1.08	3.74	0.29	6.6	7.2	0.125	0.39	1.11	1.5	Lining required, riprap D50 = 0.50 ft
72C(11)	0.035	0.065	2	2	0.47	1.38	4.1	0.34	5.2	7.2	0.065	0.47	1.03	1.5	Lining required, riprap D50 = 0.50 ft
74A	0.03	0.09	*	*	0.12	0.12	1.24	0.09	3.1	0.36	0.09	0.12	0.48	0.6	No lining required
75A	0.03	0.83	2	0	0.34	0.23	1.53	0.15	4.1	0.96	0.05	0.38	0.62	1	No lining required
75B	0.03	0.83	2	0	0.34	0.23	1.53	0.15	4.1	0.96	0.05	0.38	0.62	1	No lining required
76	0.03	0.12	6.3(14)	0.1	0.13	0.12	1.79	0.7	3	0.35	0.12	0.13	0.5	0.63	No lining required
77	0.03	0.08	*	*	0.32	0.29	1.95	0.15	4.1	1.2	0.06	0.31	0.69	1	No lining required
78	0.03	0.085	*	0	0.25	0.22	3.69	0.6	2.2	0.48	0.085	0.25	0.5	0.75	No lining required
79	0.03	0.05	2	0	0.33	0.22	1.48	0.15	3	0.65	0.05	0.33	0.67	1	No lining required
80A	0.038	0.65	2	6	0.62	4.52	8.79	0.51	6.4	29	0.05	0.67	0.33	1	Lining required, riprap D50 = 0.75 ft
80B	0.03	0.01	10	10	0.62	10	22.4	0.45	2.9	29	0.01	0.62	0.38	1	No lining required
80C	0.042	0.24	2	10	0.34	3.62	11.5	0.32	8	29	0.24	0.34	0.66	1	Lining required, riprap D50 = 2.00 ft
81	0.04	0.33	2	2	0.12	0.26	2.52	0.1	4.7	1.2	0.25	0.12	0.5	0.75	Lining required, riprap D50 = 1.0 ft
82A	0.03	0.016	2	0	0.24	0.12	1.09	0.11	1.4	0.17	0.005	0.31	0.44	0.75	No lining required
82B	0.03	0.09	2	0	0.28	0.16	1.26	0.13	3.75	0.6	0.0015	0.61	0.39	1	No lining required

NOTE:
See Exhibit 761b for design data regarding the River Gas road ditches.

* Natural side slope and bottom width varies.
(1) Ditch design based on area tributary to ditch 15B.
(2) Ditch design taken from previous calculations for ditch No. 17
(3) Ditch 44 contributes 1.4 cfs of total 1.6 cfs reported by ditch 17B
(4) Channel consists of roadway and berm : M1 =2, M2 = 15
(5) Channel consists of roadway and berm : M1 = 2, M2 = 10
(9) Mannings n for minimum slope is 0.03
(10) Maximum channel slope design taken from west interceptor ditch for Thickener Tank Using Settling Ponds". Information giver in same repert. North interceptor n = 0.035, b = 2, V max = 6.0 fps and a riprap D50 = 0.5 feet.
(11) Ditch design based on area tributary to ditch 72D
(13) Includes ditches 16A through 16F
(14) Averaged
(15) Construction of this ditch is progressive as refuse pile is enlarged.

NOTES:
1) DUE TO CONGESTION AT THIS MAP SCALE, THE SMALL DRAINAGE BASIN BOUNDRIES FOR DITCHES 10A, 24, 42B, 42C, 42D, 70A, 70B, 70C, 74A, 75A, AND 75B ARE NOT SHOWN.
2) THE DRAINAGE DIVIDE SEPARATING PONDS 5 AND 9 AS SHOWN ON THIS MAP TERMINATES AT THE EASTERN DIVIDE TO DITCH 7E. AS THE COAL REFUSE PILE EXPANDS, THE LOWER PORTIONS OF DITCH 7E WILL BE REMOVED AND THE POND DRAINAGE DIVIDE WILL CONTINUE WESTWARD UNTIL IT INTERSECTS UNDISTURBED DRAINAGE DITCH 6B.
3) LINE DITCH 16B-16E W/0.5' ROUNDED ROCK CEMENTED IN PLACE.

LEGEND

PRIMARY ROAD
SECONDARY ROAD
TRAIL
BRIDGE, CULVERT
RAILROAD
BUILDINGS, STRUCTURES
LAKE, POND
RIVER, STREAM
FENCE
CONTOURS
TREE LINES
TRAVERSE STATION
HORIZONTAL CONTROL
VERTICAL CONTROL
PHOTO CENTER
DRILL HOLE
SPOT ELEVATION
WATER SPOT
NEW LOCAL COORDINATE GRID TICK
SECTION CORNER
SWAMP
MINE PORTAL
DOWN SPOUT
CATCH BASIN
LIGHT POLE
POWER POLE
UNLINED DITCH SECTION AND DITCH NUMBER
LINED DITCH SECTION AND DITCH NUMBER
DITCH DRAINAGE BASIN DIVIDE
SEDIMENT POND DRAINAGE BASIN DIVIDE
SEDIMENT TRAP
CULVERT
BERM
SILT FENCE

FILE: G:\UC569\07\DWG\731-720B.DWG 3-20-00

NOTE:
SEE TABLE 526.1a FOR EXISTING FACILITIES NAMES.

NORTH

200 100 0 200

RECEIVED
APR 04 2000
DIVISION OF OIL, GAS AND MINING

REGISTERED PROFESSIONAL ENGINEER
No. 168246
RICHARD B. WHITE
3/31/2000
STATE OF UTAH

RAG

REVISION/HISTORY

BY	DATE	DESCRIPTION
	12-7-95	UPDATE

STARPOINT MINE
SURFACE WATER AND SEDIMENTATION CONTROL FACILITIES MAP

INCORPORATED
EFFECTIVE:
APR 26 2000
DIVISION OIL, GAS AND MINING

PLATEAU MINING CORPORATION

847 NW HIGHWAY 191 HELPER, UTAH 84526
PHONE: (435) 472-0475

F-12

MAP 731.720b