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File: ACT/015/002, #7
#3
#15/10/11
MAY

COAL SYSTEMS, Inc.

CONSULTING ENGINEERS

P.O. BOX 17117
SALT LAKE CITY, UTAH 84117

L. G. MANWARING, P.E.
PRESIDENT

AREA CODE 801
261-4500

October 4, 1984

RECEIVED

OCT 05 1984

DIVISION OF OIL
GAS & MINING

Ms. Sandy Pruitt
Mining Field Specialist
Division Oil, Gas and Mining
State of Utah - Natural Resources
Salt Lake City, Ut. 84114

Re: J. B. King Mine
ACT/015/002, Folder #7

Dear Ms. Pruitt:

Attached are two sets of items prepared for abatement of violation NOV N84-2-18-2 resulting from an inspection of the mine site August 30, 1984. Areas of concern, and actions taken are as follows:

1. Existing run-off control ditches along the northeast side of the access road (toe of refuse pile) were cleaned out prior to September 19 as instructed. The ditches were made considerably deeper than originally constructed; new ditch cross-sections are shown on accompanying Dwg. No. 4050-5-S.

Debris was also cleaned out of the entrance to the 25 in. culvert leading to the sedimentation pond.

2. Two large catch basins have been installed at the in-flow and out-flow ends of the 30 in. culvert. Details are shown on Dwg. No. 4050-5-S. Note that these sumps have been lined with at least 18 in. of riprap to prevent their erosion and to assist in future clean-outs.
3. To assist in control of sheet flooding originating in the mine yard area, another diversion ditch has been installed along the southwest side of the access road. Its location and a typical cross-section are shown on Dwg. No. 4050-5-S. This ditch discharges into the outlet catch-basin at the end of the 30 in. culvert.

Also noted on the drawing is a "proposed water diversion dip". This type of design would be effective in preventing flow from the yard area directly into the opening of the access road. As we discussed by phone, it was suggested that this structure be installed after mine start-up should a continuing problem exist.



Ms. Sandy Pruitt
October 4, 1984
Page 2

4. The above improvements have been added to accompanying Dwg. No. 4050-5-13-R. In addition, survey station locations have been noted on the refuse pile drainage ditch and the southwest diversion ditch. This will provide for better coordination with Tables 1 and 2 of UMC 784.22 (DOC).
5. Several changes to the narrative portion of UMC 784.22 (DOC) have also been made. In addition, several minor errors were noted on Tables 1 and 2 and these, too, have been corrected. Copies of the new narrative and Tables are included for your use.

We hope you find this information satisfactory for the purpose of abating this violation. Please call should there be further questions.

Sincerely,

COAL SYSTEMS, Inc.



L. G. Manwaring, P.E.
President

LGM/blm

cc: D. Nelson, S. J. Groves & Sons Co., Lexington

Attachments with 2 maps

Southwest Boundary Diversion Ditch

An intercept ditch has been designed and constructed for the purpose of collecting and diverting surface runoff from the undisturbed area as well as a portion of the disturbed area. See Dwg. 4050-5-19-R (DOC 817.46)*. The ditch design complies with UMC 817.43 (a)(c)(f). Design criteria for a permanent diversion was used, although during reclamation, part of the diversion will be altered. Design details are as follows:

1. General Conditions

- o A limited amount of poor quality watershed soil and vegetation in undisturbed watershed area
- o High topographic relief between the head and toe of the undisturbed watershed area
- o Low annual precipitation

2. Watershed Details

- o Length (L) = 2200 ft (0.42 miles) (See Dwg. 4050-5-19-R)
- o Difference in elevation (H) = 6600 - 6280 = 320 ft
- o Delay time (t_c) (Ref. 1)

$$t_c \text{ (hrs)} = \left[\frac{11.9 L^3}{H} \right]^{0.385}$$

$$t_c = \left[\frac{11.9 \times 0.42^3}{320} \right]^{0.385}$$

$$t_c \approx 6 \text{ min}$$

- o Rainfall intensity (i)

(for 10-year, 24-hour precipitation event)

using $t = 6$ min.

$i = 0.23$ in. (Ref. 2)

- o Runoff coefficient C (Ref. 1)

$C = 0.7$

- o Area (A) sum of areas II and III (See Dwg. 4050-5-19-R)

$A = 9 + 34.2$

$A = 43.2$ acres

3. Peak runoff for ditch design (Ref. 1)

- o Rational method to find peak flow rates

$Q = CiA$ (cfs)

$Q = (0.7)(.23)(43.2)$

$Q = 7.0$ cfs

4. Ditch Profile and Data

Detailed profiles of the diversion are illustrated in Dwgs. 4050-5-3K through 4050-5-30. The 0+00 station is located at the discharge end of the 30 in. culvert, as shown in Dwg. 4050-5-13-R.*

Table 1 at the end of this section, illustrates the maximum capacity, the depth of flow and velocity for the required capacity flow of each section of the ditch for the given ditch geometry and runoff conditions.

5. General Comments

Between station 0+00 and 1+00 the diversion ditch handles the watershed from the undisturbed area and a portion of the disturbed area, as well as the inflow from the diver-

UMC 784.22 (DOC)

TABLE 1
SOUTHWEST BOUNDARY DITCH

COAL SYSTEMS, Inc.
4050-5

STATION	SPECIFICATIONS			FLOW AT MAXIMUM CAPACITY with 6 in. freeboard				FLOW AT REQUIRED CAPACITY Q = 7 cfs	
	Beginning at 30 in. culvert	Dist. (ft)	Elev. (ft)	Slope (EI/Dist)	Area (ft ²)	R	Quantity (cfs) n=0.04	Velocity (fps) n=0.04	Velocity (fps) n=0.04
0+00 - 1+00	100	-1.4	0.014	28.3	1.7	180.2	6.4	2.2	5
1+00 - 2+00	100	2.3	0.023	12.4	1.3	83.1	6.7	3.3	7
2+00 - 3+00	100	5.1	0.051	10.3	1.1	94.1	9.1	4.5	6
3+00 - 4+00	100	4.0	0.040	12.1	1.3	107.3	8.9	3.8	5
4+00 - 5+00	100	4.4	0.044	9.6	1.2	82.6	8.6	4.2	6
5+00 - 6+00	100	3.4	0.034	7.6	1.0	53.5	7.0	3.9	7
6+00 - 7+00	100	0.2	0.002	14.6	1.4	30.7	2.1	1.4	12
7+00 - 8+00	100	1.4	0.014	7.7	1.0	33.7	4.4	2.7	7
8+00 - 9+00	100	0.5	0.005	14.3	1.2	41.5	2.9	1.6	6
9+00 - 10+00	100	3.8	0.038	13.1	1.4	117.4	8.9	3.7	5
10+00 - 11+00	100	1.7	0.017	6.8	0.9	31.3	4.6	3.0	8
11+00 - 12+00	100	5.3	0.053	6.2	0.9	50.6	8.2	4.8	7
12+00 - 12+	300	50.0	0.167	9.0	1.1	148.4	16.5	6.2	4