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Acq 041/002 #3 Dorian Haddock Mine file VB

Southern Utah Fuel Company
a subsidiary of The Coastal Corporation
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KEN PAYNE
Vice President &
General Manager

October 11, 1990

Lowell Braxton,
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Mr. Braxton:

Enclosed are update materials for the 4 East Ventilation Portals modification that was submitted to your office on September 11, 1990. The deficiencies pointed out by your staff have been addressed.

A commitment to remove the by-pass culverts has been added in page 3 of the text. Engineering calculation sheets are included for the culvert designs. A drainage basin map is also included as Map 4.

Please approve this modified plan. We would like approval to break out the second portal by October 17, 1990 at the latest. If you have questions regarding this submittal, please feel free to call.

Sincerely,
SOUTHERN UTAH FUEL COMPANY

Ken Payne,
Vice President and General Manager

KP/WKS:jad#117

REVISED 4 EAST VENTILATION PORTALS

INSERTION GUIDE

1. Replace 4 East Ventilation Portal text (2 pages) with new text (3 pages).

2. Replace Map 3 dated February 17, 1988 with new Map 3 dated September 1990.

3. Add engineering calculation pages behind text.

4. Add 4 East Portal Drainage Basin Map, Map 4.

WKS:jad#99

4 EAST VENTILATION PORTALS

These ventilation portals will be used as a ventilation intake and an escapeway for quick escape from the 4 East area of the mine in the event the mine requires evacuation and as a site for an exhausting mine fan. The fan is needed for future mining of the northernmost reserves in the Quitchupah lease. Because of this dual purpose design, a small earthen pad will need to be leveled in the breakout area for the fan installation. No water will be discharged from this portal location. Coastal States Energy Company owns the coal and surface on this parcel. Which is located in the SE¼ of the SW¼ of Section 29, T21S, R5E, SLB&M.

A partial print of the Accord Lakes USGS 7½ minute quadrangle, Map 1, shows the portal location and surface features. A map of SUFCo's underground workings showing the location of the breakouts is included as Map 2. Map 3 is a detail of the portal entries and breakouts.

Our engineering calculations show that about 700 cubic yards of earth will need to be moved to construct the 0.5 acre fan pad shown on Map 3. Figure 1 shows a cross-section through the pad. The fan will be needed in the fall of 1991. It is necessary to construct the pad during October and November 1990 to allow fan construction during early 1991. Diligent efforts will be expended to minimize the amount of disturbance at the site. The pad will be constructed from within the breakout with underground mining equipment using cut and fill techniques. Because of the thinness of the topsoil, small areal extent of disturbance, and the boulder strewn nature of the site, topsoil will not be collected. Topsoil at the site is categorized as loamy-skeletal, mixed, frigid ustic turriorthent. The pad will be constructed at an elevation of 7,435 feet. Quitchupah creek is at an elevation of about 7,360 feet in this area some 200 feet to the southwest.

Two dry washes traverse through the proposed fan area as shown on Map 3. Runoff from precipitation events and snow melt in these washes will be by-passed through culverts. The 100 year 24-hour event for this area is 2.9 inches. This event was used to size the corrugated metal (CMP) pipe culverts. These culverts will have trash racks to prevent plugging.

The portal location was examined by Dr. Hauck of AERC for possible archeological sites. His report is included as Exhibit I. No sites were found. Endangered Plant Studies, a botanical consulting firm, performed a vegetation and soil survey of the proposed site. Dr. Welsh's report is included as Exhibit II. Exhibit III gives further vegetation and soils data as required by the initial completeness review.

Sediment Control Practices

A berm will be constructed around the outer perimeter of the pad surface to a minimum height of one foot. The pad will slope to the northeast where runoff will be treated with silt fence and/or straw bales before leaving the site. Out-slopes of the pad will be revegetated during the first fall season after the pad is constructed. During reclamation, hand terracing and silt fence siltation structures will be utilized to control rills and runoff until vegetation is established.

Right-of-Ways

No special right-of-way surface access is necessary. Construction access will be from within the mine. Electrical power will be routed to the site from East Spring Canyon through the mine such that overhead power lines to the site will not be necessary.

Sealing upon Final Abandonment

A breakout seal will be constructed in each of the breakouts from the inside as shown on the Typical Portal Seal drawing presented in Volume 3 of the M&RP on page 216. These seals will be of a substantial design and constructed of concrete block utilizing a waterproof sealant such that the seal will withstand the hydraulic head that could develop if the entire mine was inundated. Since this work will be done many years in the future, the design will be reviewed with the regulatory authority before such sealing is undertaken. The best economically feasible technology will be used. A currently acceptable design is described below.

In compliance with 30 CFR 75.1711-2, seals will be installed in the entry as soon as mining is completed and the mine is to be abandoned. Prior to installation, all loose material within three feet of the seal area will be removed from the roof, rib, and floor. The mine entry seal will be made of solid concrete blocks (average minimum compressive strength of 1,800 psi; tested in accordance with A.S.T.M. C-140-70) and mortar (one part cement, three parts sand, and no more than seven gallons of water per sack of cement).

The seal will be installed in the following manner: The seal will be recessed at least 16 inches deep into the rib and 12 inches deep into the floor. No recess will be made into the roof. The blocks will be at least six inches high except on the top course, and eight inches wide. The blocks will be laid and mortared in a transverse pattern. In the bottom course, each block will be laid with the long axis parallel to the

rib. The long axis in succeeding courses will be perpendicular to the long axis block in the preceding course. An interlaced pilaster will be constructed in the center. The seals will have a total thickness of at least 16 inches. The entry will then be backfilled and graded to the approximate slope of the area surrounding the portal entry. For details, see Figures 783.13/A and 783.18/B.

Reclamation

The 4 East breakout area will consist of two portals located on a south-facing slope in the pinon-juniper community type. This community is very similar to the other portal sites. Vegetation and soils information are contained in Exhibit II. The disturbed area at the site will be so small as to create minimal disturbance to the surrounding vegetative communities.

Reclamation activities will consist of removing both the 24 inch and 72 inch CMP's. The ephemeral stream channels will be returned to trapezodial cross-sections that will pass the 100 year 6-hour precipitation event. Such a cross section for the main drainage would have a bottom width of 10 feet with side slopes of 2h:1v and a depth of 2 feet. The smaller drainage would have a bottom width of 3 feet with side slopes of 2h:1v and a depth of 1 foot. Riprap with a D_{50} of 1 foot will be used. After the CMP's have been removed the portal openings will be backfilled and sealed. After sealing and burial of the portal openings, scarification of the slope by hand raking will take place. Then the appropriate amounts of the seed mix given in Exhibits II and III will be planted. Seeding will take place during late fall for optimal success. Establishment of shrub species will take place by natural reinvasion.

WKS:jad#96

Revised 10/11/90

9/6/90
& 10/11/90

Runoff Calculations – 4 EAST PORTAL DRY WASH

$P = 2.9$ in for 100 yr – 24 hr

$CN \doteq 75$

Area = 445.82 acres

$$S = \frac{1000}{CN} - 10$$

$$S = \frac{1000}{75} - 10$$

$$S = 3.33$$

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

$$Q = \frac{(2.9 - 0.2(3.33))^2}{2.9 + 0.8(3.33)}$$

$$Q = 0.897 \text{ inches}$$

Time of concentration, t_c

$L = 1519$	8801 → 8560	$d = 1500$ ft	$s = 16\%$ grass - sparse	$V \doteq 4$ fps
$L = 4202$	8560 → 8440	$d = 4200$ ft	$s = 2.9\%$ grass & sage	$V \doteq 1.3$ fps
$L = 2775$	8440 → 7800	$d = 2700$ ft	$s = 23.7\%$ pinyon-rock	$V \doteq 5$ fps

$$t_c = \sum_{i=1}^{3} \frac{L_i}{V_i} \qquad \text{where } L_i = \sqrt{d_i^2 + h_i^2}$$

$t_c = 69.45$ minutes

$t_c = 1.16$ hrs

$q_p' = 290 cfs/mi^2/in$ from fig 2.40 A HSFDA pg 115

$q_p = q_p' A Q$ A = area mi^2

Q = runoff volume inches

$q_p = 290(445.8)(0.897)/640$

$q_p = \underline{181 cfs}$

Culvert Design

ASSUME HEAD WALL & WINGWALLS square-edged concrete w/ trash rack @ 60°.

$\frac{HW}{D} = 1.0$

From Figure 4-28 inlet control HB steel

Dia = 72" Length = 210ft S = 10% drainage

or 7'-0" x 5'-1" squash

from Fig 4-30 outlet control H.B.S.D.

H = 4.19 ft with culvert flowing full.

TW = 1.33 ft pg 4/5

MAKE INLET AT LEAST 2 ft higher than culvert.

FOR 72" Area = 28.27 ft^2 ⇒ V = 6.4 ft/sec

FOR 7-0" x 5'-1" Area = 26.00 ft^2 ⇒ V = 6.96 ft/sec

$HW = H + TW - LS_0 - \frac{V^2}{2g}$

HW < 0 ⇒ inlet control

Runoff Calculations - small wash near prospect workings

P = 2.9 in for 100 yr - 24 hr event

CN = 75

Area = 12.85

Q = 0.897 in see dry wash calcs.

Time of concentration

L = 1124 8400 - 7800 d = 950 ft s = 63% · pinyon-rock v = 8 ft/s

tc = 141 seconds

tc = 0.39 hrs

q_p' = 600 csm/inch fig 2.40 AHSFDA pg 115

$q_p = (600)(12.85)(0.897)/640$

q_p = 10.81 cfs.

Culvert design

Assume head wall & wingwalls square-edged concrete w/ trash rack @ 60°

$\frac{HW}{D} = 1.0$

From Figure 4-28 inlet control H.B. STEEL

Dia = 24" length = 140 ft S = 0.10 drainage

FROM Fig 4-30 outlet control H.B.S.D.

$L' = L(\frac{n'}{n})$ = $L' = 140(0.44)$ = 62 ft

H = 0.7 ft ⇒ MAKE HEAD WALL AT LEAST 1 ft higher than culvert

Exit velocity for 24": $A = 3.142 ft^2$

$V = Q/A$

$V = \frac{10.81}{3.142}$

$V = 3.44$ ft/sec

$HW = H + TW - LS - V_1^2/2g$

$HW = 0.7 + 1.33 - (140)(.10) - \frac{3.44^2}{64.4} = HW < 0$

$\Rightarrow$ INLET CONTROL

Energy Dissipater

Note: Both 72" & 24" will discharge into same dissipater.

$Q_{72} = 181$ cfs

$Q_{24} = 11$ cfs

$Q_T = 192$ cfs

Channel downstream of dissipater has a slope of 16%. Slope transition into natural channel at 5%. Using a trapezodial channel $b = 10$ ft, $z = 2$, depth = 2 ft.

From oaks 10/11/90. $Q = 192$ cfs $d = 1.33$ ft

TAIL WATER DEPTH $TW = d = 1.33$ ft

Brink depth Y_o

$\frac{Q}{D^{2.5}} = \frac{191}{B^{2.5}} = 2.17$

$\frac{TW}{D} = \frac{1.33}{6} = 0.22$

From Fig 7.21 $Y_o = 0.9$ ft

Use a CSU dissapator design per Redbook pg 535 Fig 7.22

Use d_{50} = 1 ft

h_s = 1 ft

Y_0 = 0.9 ft

Length = 18 ft of dissapator pool

Apron length = 6 ft

OPEN CHANNEL FLOW WKS
4 EAST FAN PORTAL 10/11/90

	100 YR	
QUANITY	192.00	
S	0.050	
AREA	16.84	
V	11.40	
DEPTH	1.330	
n	0.030	
FOR TRAPEZODIAL		DESIGN
B (BOTTOM WIDTH)	10.00	10
Z (SIDE SLOPE)	2.00	2
A (AREA)	16.84	28.00
R	1.06	1.48
DEPTH	1.33	2
RGT HAND SIDE QUANITY	193.89	

W.K. SORENSEN 11-Oct-90

OPEN CHANNEL FLOW
4 EAST PORTAL DRANIAGES UPON ABANDONMENT
100 YR 24 HR

	MAIN	TRIBUTARY
QUANITY	181.00	11.00
S	0.100	0.100
AREA	12.71	1.52
V	14.25	7.24
DEPTH	1.050	0.400
n	0.030	0.030
FOR TRAPEZODIAL		
B (BOTTOM WIDTH)	10.00	3.00
Z (SIDE SLOPE)	2.00	2.00
A (AREA)	12.71	1.52
R	0.86	0.32
RGT HAND SIDE	181.09	11.11

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low
) = pipe diameter.

	.06	.07	.08	.09
	.02	.02	.03	.04
7	.08	.09	.10	.10
5	.16	.17	.18	.19
	.25	.26	.27	.28
4	.35	.36	.37	.38
	.45	.46	.47	.48
4	.55	.56	.57	.58
3	.64	.65	.66	.67
1	.72	.72	.73	.74
7	.78	.78	.78	.78

ıp energy dissipators is based
: University (FHA, 1975b).
s that scour hole geometry
(Q), brink depth (Y_o), and
ıd that the riprapped scour
nergy dissipator if the ratio
ıan 0.75. For greater ratios
through the basin creating a
the downstream channel re-

/n in Figure 7.22. The basin
urface of the riprapped floor
vert exit. The ratio of scour
ın 2 and less than 4. Energy
whichever is greater and the
chever is greater. W_o is equal
r the barrel width for a box

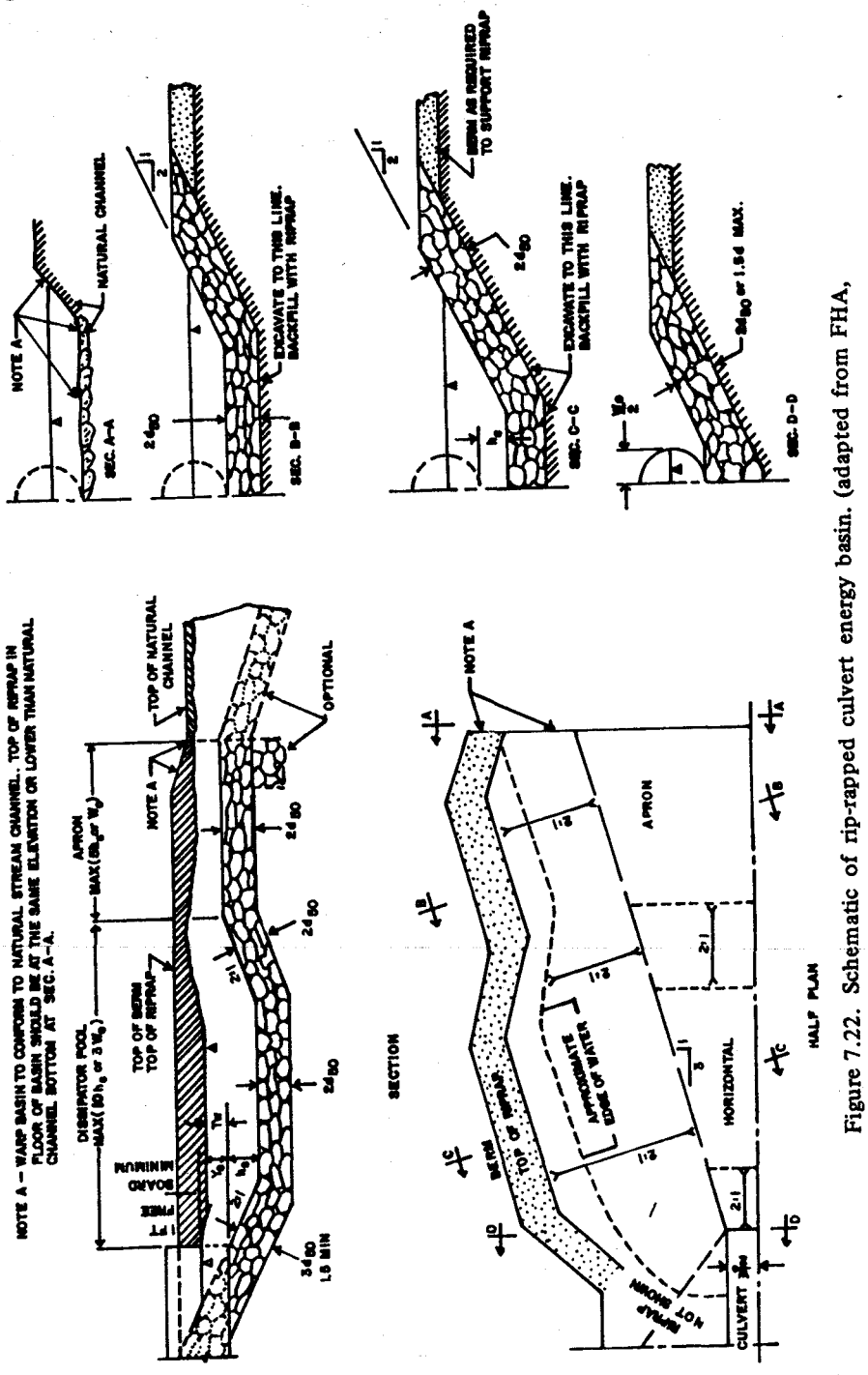

Figure 7.22. Schematic of rip-rapped culvert energy basin. (adapted from FHA, 1975b)

U-63214

FEE

FEE

Quitchupah Creek

JEEP TRAIL

JEEP TRAIL

Portal

19

20

21

22

27

28

29

30

8400

8320

8000

8200

7800

8600

8725

8480

8611

8801

8513

SOUTHERN UTAH FUEL CO. MINE NUMBER ONE	
4 EAST PORTAL DRAINAGE BASIN	
DATE OCT. 11, 1990	SCALE 1" = 1,000'
DRAWN BY W.K.S.	DRAWING NO. MAP 4