~~041/002~~ 041/002 Pending

0043

Southern Utah Fuel Company
a subsidiary of The Coastal Corporation
P.O. Box P • Salina, Utah 84654 • (801) 529–7428
Mine: (801) 637–4880

KEN PAYNE
Vice President &
General Manager

October 31, 1990

Darron Haddock
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Mr. Haddock:

Enclosed are 13 copies of the update materials for the 4 East Ventilation Portal Breakout Amendment. The designs have been certified and the riprap design is included in the calculation sheets per your October 18, 1990 Conditional Approval Letter.

I would like to thank you and your staff for the quick review and approval of this amendment.

Sincerely,
SOUTHERN UTAH FUEL COMPANY

Ken M. Payne,
Vice President and General Manager

KMP/WKS:jad#128

REVISED 4 EAST VENTILATION PORTALS

INSERTION GUIDE

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

2. Replace Maps 1 and 2 with certified Maps 1 and 2.

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

4. Add engineering calculation pages behind text.

5. 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 for the main drainage. The underlying filter blanket will be 23 inches thick composed of a well graded gravel. The smaller drainage will have a 6 inch thick filter blanket and riprap with D_{50} of four inches. 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.

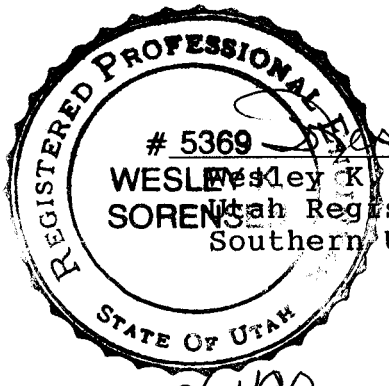
WKS:jad#96

Revised 10/31/90

CERTIFICATION STATEMENT

The hydrologic calculations for the 4 East Portal consisting of pages 1-8 were performed using standard engineering methods by Wesley K. Sorensen, P.E. These calculations represent sound design practice and are correct to the best of my knowledge.

Maps 1-4 accurately represent the layout of the proposed 4 East Portal and drainage structures.



Wesley K. Sorensen

Wesley K. Sorensen, P.E.
Utah Registration No. 5369
Southern Utah Fuel Company

10/31/90

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-juniper	$V \doteq 5$ 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

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

$q_p = 181 cfs$

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 = 1.9 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

t_c = 141 seconds

t_c = 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 CONTRO

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_0

$\frac{Q}{D^{2.5}} = \frac{191}{6^{2.5}} = 2.17$

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

From Fig 7.21 $Y_0 = 0.9$ ft

Use a CSU disapator design per Redbook pg 535 Fig 7.22

USE d_{50} = 1 ft
h_s = 1 ft
Y_o = 0.9 ft
Length = 18 ft of disapator pool
Apron length = 6ft

FINAL CHANNEL DESIGN

P = 1.8 in for 100yr 6hr event.

CN = 75

Area = 445.82 acres (MAIN) A = 12.85 TRIB

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

$$S = 3.33$$

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

$$Q = \frac{[1.8 - 0.2(3.33)]^2}{1.8 + 0.8(3.33)}$$

Q = 0.288 inches

FOR MAIN t_c = 1.16 hrs see pg 1 of calcs.

FOR TRIB t_c = 0.39 hrs see pg 3 of calcs

$q_{Main} = 290(445.8 \times 0.288)/640 = \underline{58.2 \text{ cfs}}$

From pg 7 V ≐ 10 fps From rip rap curve D_{50} = 15 inch

$q_{trib} = 600(12.85)(0.288)/640 = \underline{3.5 \text{ cfs}}$

From pg 7 V ≐ 5 fps From rip rap curve D_{50} = 4 inch

Filter blanket of sand or road base Main = 23 inch

OPEN CHANNEL FLOW
4 EAST FAN PORTAL

WKS
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 31-Oct-90

OPEN CHANNEL FLOW
4 EAST PORTAL DRANIAGES UPON ABANDONMENT
100 YR 6 HR

	MAIN	TRIBUTARY
QUANITY	58.20	3.50
S	0.100	0.100
AREA	6.01	0.70
V	9.69	4.98
DEPTH	0.542	0.206
n	0.030	0.030
FOR TRAPEZODIAL		
B (BOTTOM WIDTH)	10.00	3.00
Z (SIDE SLOPE)	2.00	2.00
A (AREA)	6.01	0.70
R	0.48	0.18
RGT HAND SIDE	58.13	3.51

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
1	.35	.36	.37	.38
5	.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

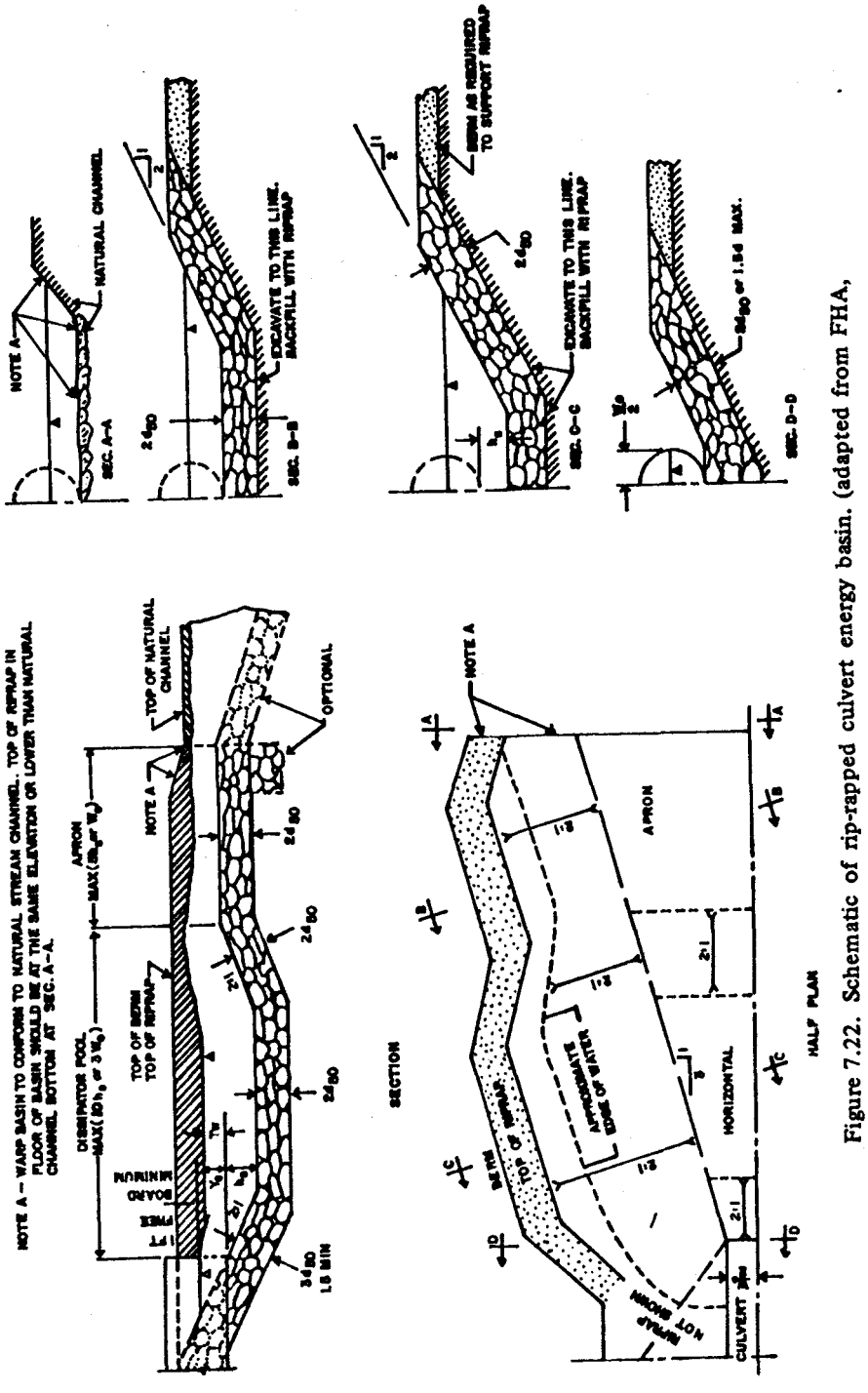
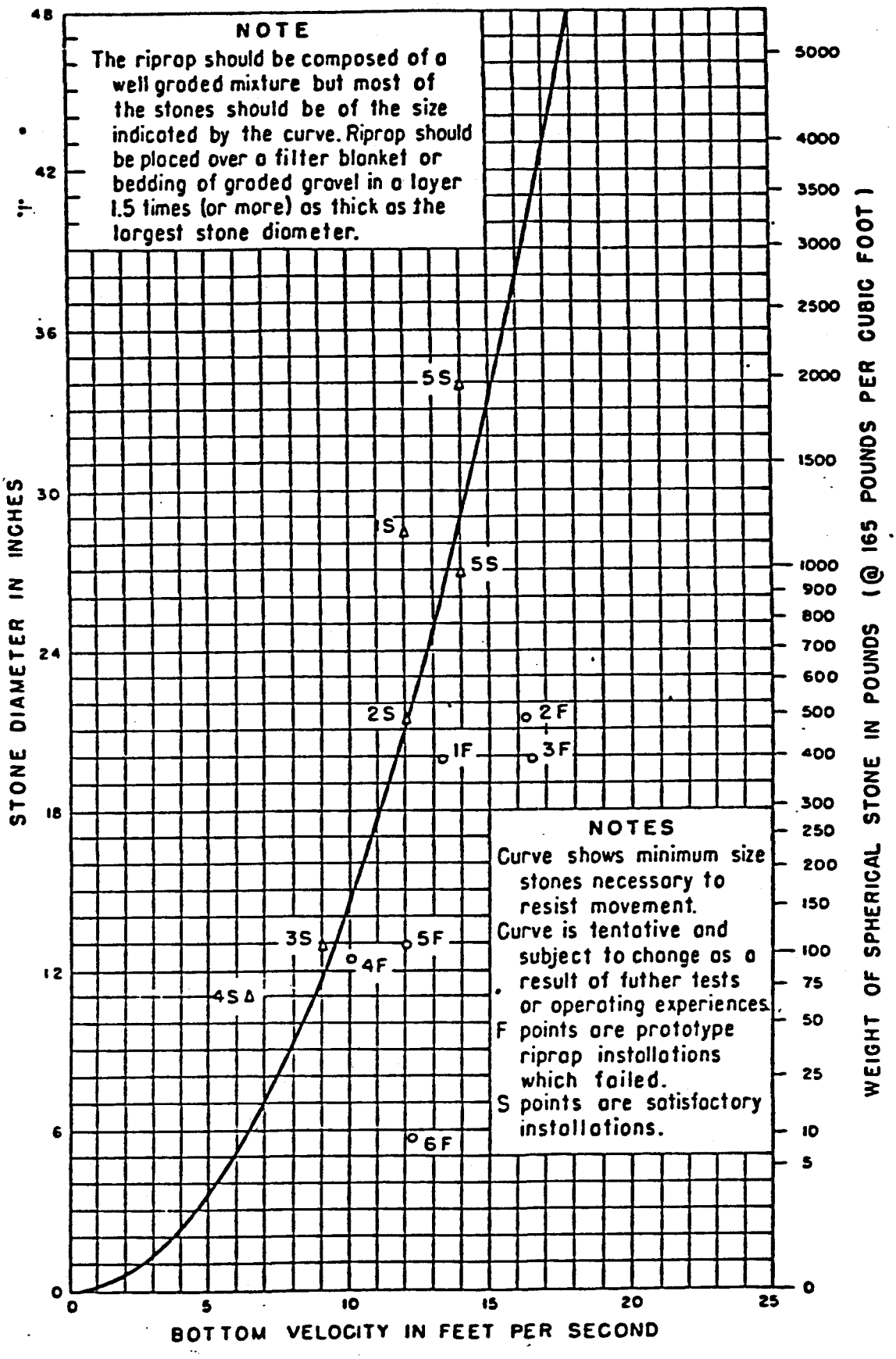


Figure 7.22. Schematic of rip-rapped culvert energy basin. (adapted from FHA, 1975b)



Curve to determine maximum stone size in riprap mixture

8000

7400

7800

8400

4 EAST VENTILATION
PORTAL LOCATION

T14

8200

8656

Creek

7600

RECEIVED
NOV 05 1990
DIVISION OF
OIL, GAS & MINING

REGISTERED PROFESSIONAL ENGINEER
5369
WESLEY K.
SORENSEN
STATE OF UTAH
11/31/90

T21SR5E SLB&M

25 32
30 31

N

SOUTHERN UTAH FUEL CO.
MINE NUMBER ONE

PROPOSED FAN PORTAL LOCATION

DATE SEPT. 17, 1987	SCALE 1" = 500'
DRAWN BY	DRAWING NO. MAP 1

SOUTHERN UTAH FUEL CO.	
MINE NUMBER ONE	
4 EAST VENTILATION PORTAL	
DATE NOV. 20, 87	SCALE 1" = 1000'
DRAWN BY S.K.S.	DRAWING NO. MAP 2

N

4 EAST PORTAL

4 NORTH

3 EAST

3 NORTH

2 EAST

2 NORTH

NO MAINS

3 WEST

2 WEST

ONE NORTH

ONE WEST

REGISTERED PROFESSIONAL ENGINEER
5641
WESLF SORENSEN
STATE OF UTAH
10/31/90

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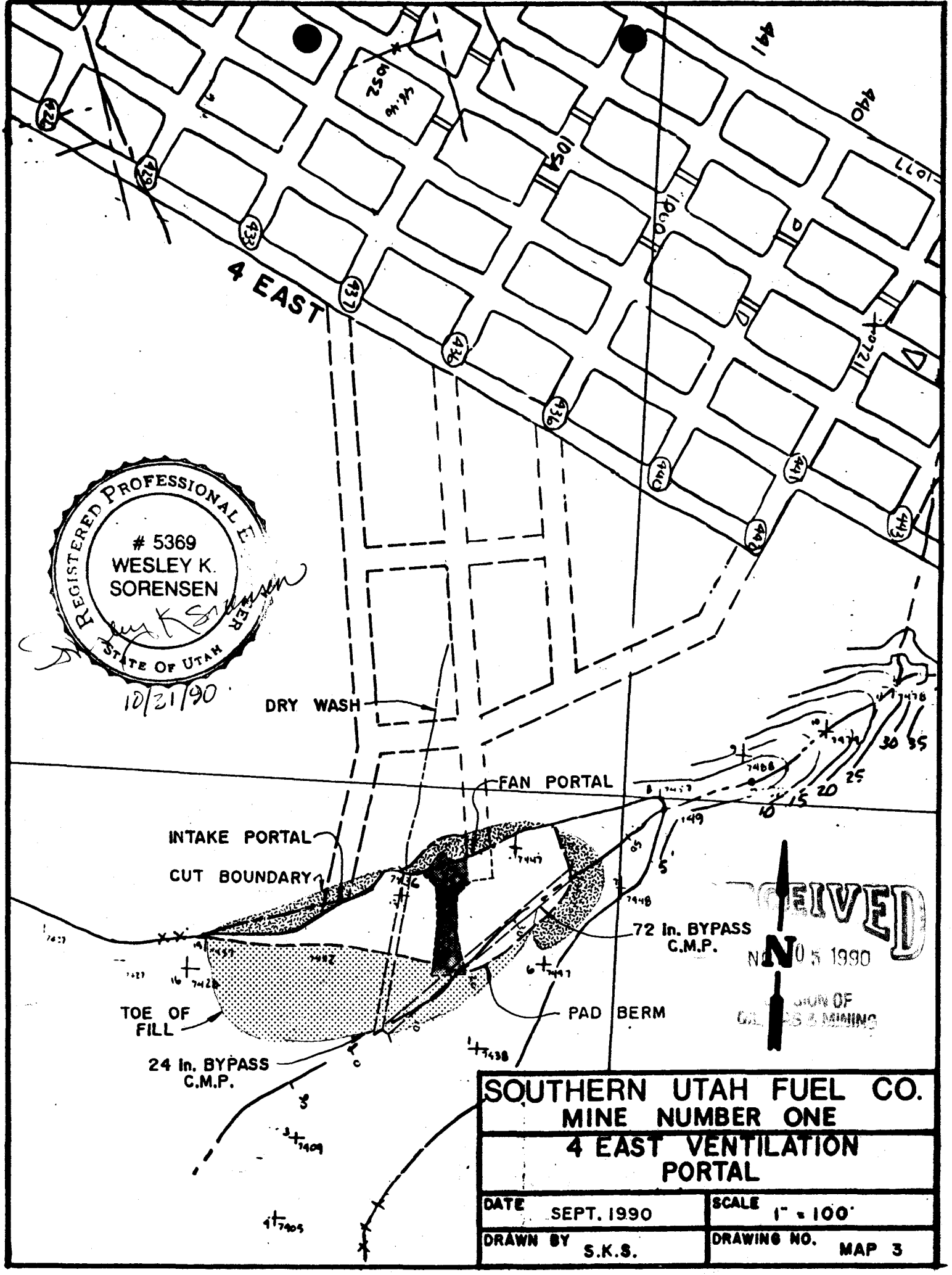
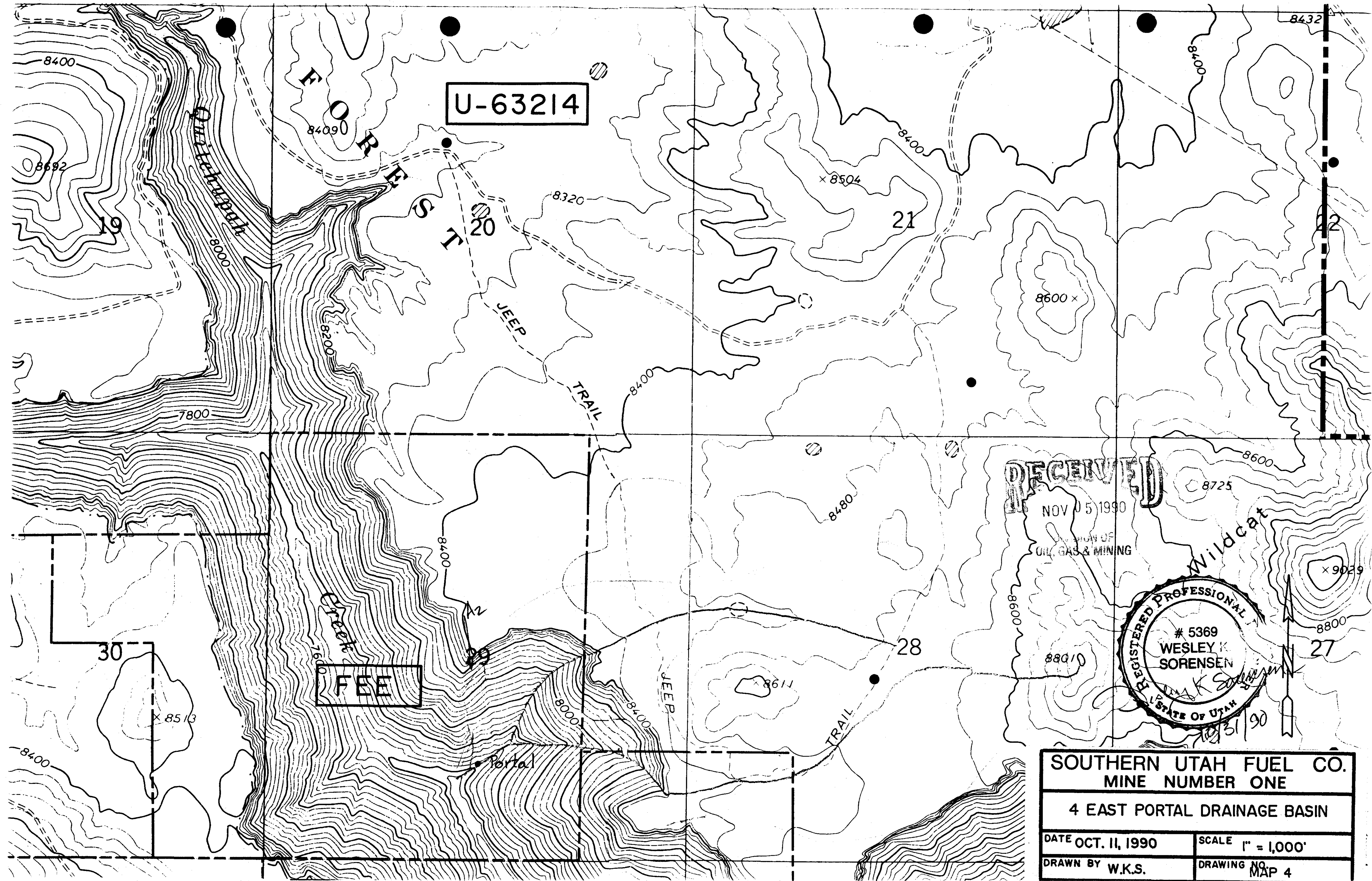
NOV 05 1990
DIVISION OF
OIL, GAS & MINING



SOUTHERN UTAH FUEL CO.
MINE NUMBER ONE
4 EAST VENTILATION PORTAL

DATE SEPT. 1990	SCALE 1" = 100'
DRAWN BY S.K.S.	DRAWING NO. MAP 3



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