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ACT/007/004-87D  
file # 2



**CASTLE  
GATE**  
COAL COMPANY

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JUL 21 1987

July 16, 1987

DIVISION OF  
OIL, GAS & MINING

Mr. Lowell Braxton  
Administrator  
Division of Oil, Gas and Mining  
3 Triad Center  
Suite 350  
Salt Lake City, Utah 84180-12

**FILE COPY**

Dear Mr. Braxton:

Enclosed are calculations and drawings which justify the modification of Pond 004 into a drop inlet structure. Castle Gate Coal Company surveyed the as-built ponds in Sowbelly Canyon and found that Pond 004 was 12,000 cubic feet short of the required capacity for a 10 year/24 hour storm event pond volume.

Pursuant to UMC 817.49(i), I propose to modify the existing 18" trickle tube into an 18" drop inlet. The drop inlet at elevation 97.5 will raise the pond volume to 23,345 cubic feet which will correct the deficit. The enclosed design details demonstrate that the pond has adequate volume to treat the runoff from a 10 year/24 hour storm event and safely pass a peak flow from a 25 year/24 hour precipitation event.

This submittal is paged to insert into Chapter III, Section 3.2 of the Mid-Term Permit Review revised MRP. When approved, pages 8a and 8b can be inserted into the MRP.

Sincerely,

*Richard H. Allison, Jr.*  
Richard H. Allison, Jr., P.E.  
Project Supervisor

RHA:jcr

cc5.rha714

Table: 3.2-2A (Revised July 1987)  
Drop Inlet Discharge Design: Pond 004

The following methodology is taken from the S.C.S. Engineering Field Manual Chapter II, IV and VI.

1. Calculate peak inflow into Pond 004 given the following:

Weighted Curve No.  
From Table 3.2-2  
6.1 AC x 85 CN = 518.5  
2.5 AC x 65 CN = 162.5  
681.0

681 - 8.6 = 79.1 Use 79 CN

From page 59 of MRP  
25 yr - 24 hr storm = 2.3"

From page 2-66 Exhibit 2-10 of SCS Manual (Peak Rates of Discharge for Small Watersheds Type II Storm Distribution). For a moderate slope and curve No. of 80 peak discharge is 7 C.F.S.

Therefore, peak discharge of drop inlet from Pond 004 should be 7 C.F.S.

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2. Determine head (h) required to pass 7 C.F.S. at crest elev. 97.5 (Exhibit 11.2). On page 57 of Chapter VII of the MRP. Figure 7-3C is the S.C.S. Chart for determining inlet proportions and required head over inlet. An 18" drop inlet with .6 feet of head over the crest elevation will pass the required 7 C.F.S.
3. Determine if the existing 18" CMP will pass the required 7 C.F.S. given the following:

$Q_h = 7$  C.F.S.  
 $h = .6$  ft.  
 $H = (97.5 - 95.0) \& (.0278 \times 290) \& .6$  ft.  
 $= 2.5' \& 8.06' \& .6' = 11.16$  ft.  
 $N =$  Mannings Coefficient = .029 (Table 3-1 SCS Manual)  
 $K_p = .0621$  ft/ft of pipe (Exhibit 3-4 of SCS Manual)  
 $K_m = K_e \& K_{90} = .5 \& .9 = 1.4$  (Exhibit 3-8 of SCS Manual)  
 $a = 1.77$  sq. ft. (x-section area of pipe)  
 $L = 290'$  (Exhibit 11.2 of MRP)

and from the continuity principle (EQ 3-12 of SCS Manual)

$$Q_{18} = a \sqrt{\frac{2gH}{1 + K_m + K_p L}} = 10.5 \text{ C.F.S.}$$

$Q_h < Q_{18"} \quad \text{Therefore existing 18" pipe is adequate to}$   
 $\text{pass the required 7 C.F.S.}$

4. Determine elevation of freeboard:

Inlet elevation	97.5
Plus elevation of head in feet	<u>.6</u>
Freeboard required	<u>2.0</u>
Required top of embankment	100.1
Elevation	

# PEAK RATES OF DISCHARGE FOR SMALL WATERSHEDS

## TYPE II STORM DISTRIBUTION

2-66

SLOPES - MODERATE  
CURVE NUMBER - 80

24 HOUR RAINFALL FROM US WB TP-40

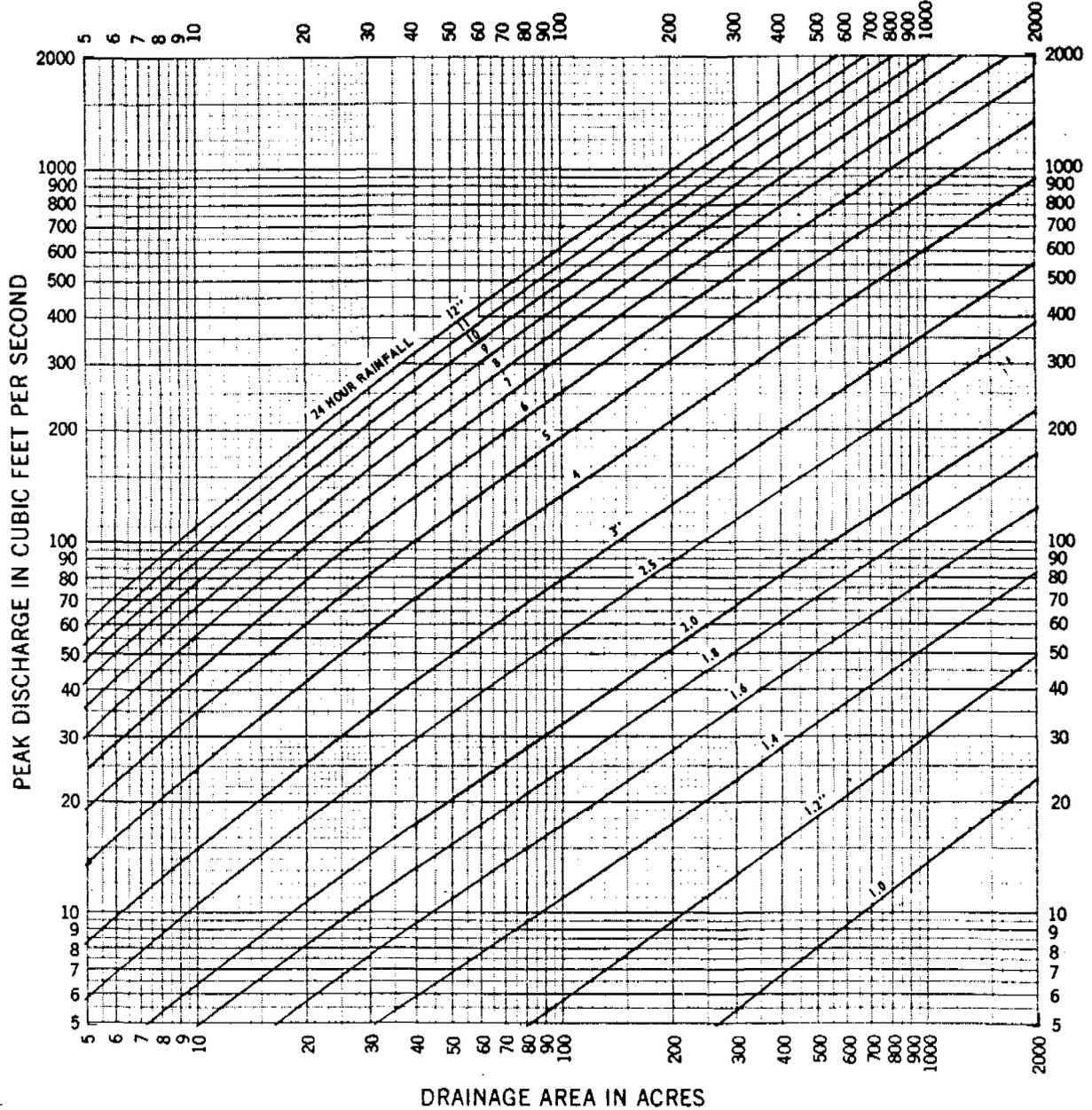


Exhibit 2-10

REFERENCE

"Chapter 2, Engineering Field Manual  
for Conservation Practices"

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
ENGINEERING DIVISION - HYDROLOGY BRANCH

STANDARD DWG. NO.

ES-1027

SHEET 12 OF 21

DATE 2-15-71