0050

**PACIFIC POWER • UTAH POWER**

324 South State
P.O. Box 26128
Salt Lake City, Utah 84126-0128

PACIFICORP
ELECTRIC OPERATIONS GROUP

ACT/015/018-91A
#2

Please file Drainage
This was replaced by a submittal dated 1/31/92.

RECEIVED
MAY 20 1991
DIVISION OF OIL GAS & MINING

File but this plan was not approved.

May 16, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

**RE: DEFICIENCY RESPONSE, DRAINAGE AMENDMENT, PACIFICORP ELECTRIC OPERATIONS, DEER CREEK MINE, ACT/015/018**

Dear Pamela:

I am enclosing the following information in response to the Division's April 16, 1991 deficiency letter. For clarity, all proposed additions to Appendix IX are resubmitted and each deficiency is written followed by PacifiCorp's response.

1) **INLET AND OUTLET PROTECTION ON BOTH CULVERTS BASED ON EXPECTED HEADWATER AND OUTLET PIPE FLOW VELOCITIES.**

   See Pages 24.2, 24.3 and 24.7. The sediment pond will not discharge at the designed storm events. (See Pages 24.3 and 24.4)

2) **A DRAINAGE MAP OF APPROPRIATE SCALE MUST BE PROVIDED OR REFERENCED TO SHOWING <u>TOTAL</u> DRAINAGE AREA. PLEASE NOTE: THAT THE 6' CULVERT IS JUST DOWNSTREAM OF THE SEDIMENT POND OUTLET AND SUBSEQUENTLY MUST PASS THE EXPECTED PEAK FLOW FROM THE SEDIMENT POND. PLEASE VERIFY THIS IN YOUR CALCULATIONS.**

   Refer to Figure 6 of Appendix IX (1" = 2000') along with Figure 3 (1" = 100') for the total drainage area. Figure 3 is used because the small areas are difficult to see if added to Figure 6.

   Flow calculations for the sediment pond outlet are found on Pages 24.3 and 24.4. The pond is sized for a 10 year/24 hour event (2.25 inches). Discharge from the pond would not occur during the 25 year/6 hour or 10

year/6 hour events.

3) **IT WAS VERIFIED IN THE FIELD THAT THE 5'9" X 8'2" ARCH CULVERT HAS ONLY 4 FEET OF REMAINING HEAD DUE TO SEDIMENT AND BEDLOAD DEPOSITION. PLEASE NOTE THIS IN YOUR CAPACITY CALCULATIONS.**

   Because capacity of the culvert can change by cleaning or with time, putting the present head in the permit would serve no long term purpose. Calculations of all culvert flow capacities are done during inspections if the capacity is in question. This culvert's capacity will be determined in this manner.

4) **REFERENCE TO CHANNEL RECLAMATION FOR THESE CULVERTS, IF APPROPRIATE, MUST BE DOCUMENTED.**

   Reclamation channel information is found on Pages 24.4 and 24.15 - 24.24.

Additional copies will be submitted to the Division upon approval of the amendment.

If you have any questions regarding this submittal, please call Guy Davis at 653-2312 or myself at 220-4584.

Sincerely,

Guy Davis (for)

J. Blake Webster
Permitting Administrator

cc: Amendment File

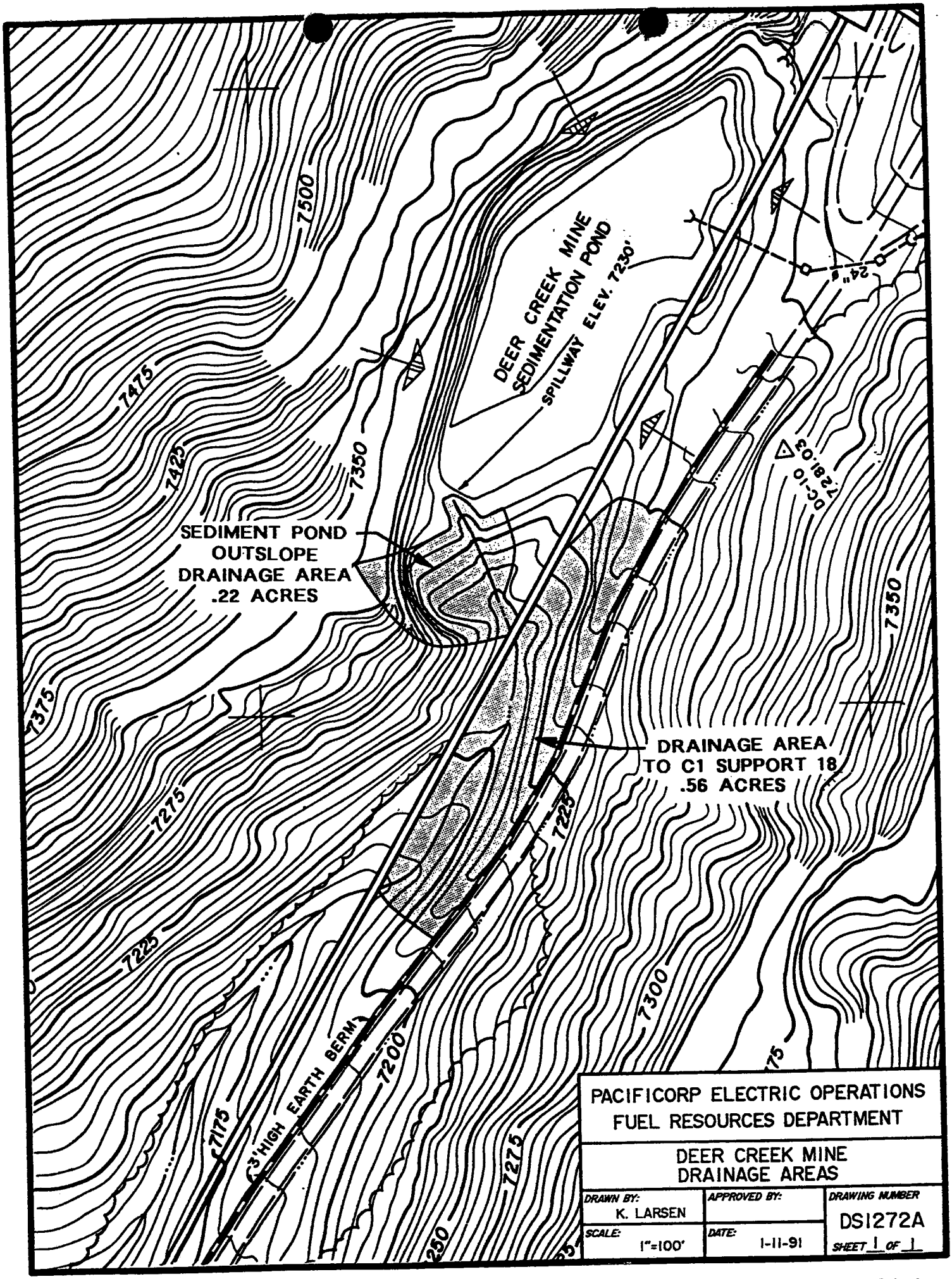

DEER CREEK MINE
SEDIMENTATION POND
SPILLWAY ELEV. 7230'
SEDIMENT POND
OUTSLOPE
DRAINAGE AREA
.22 ACRES
DRAINAGE AREA
TO C1 SUPPORT 18
.56 ACRES
3' HIGH EARTH BERM
24" ø
DC-10
7500
7475
7425
7350
7375
7275
7225
7200
7175
7300
PACIFICORP ELECTRIC OPERATIONS
FUEL RESOURCES DEPARTMENT
DEER CREEK MINE
DRAINAGE AREAS
DRAWN BY: K. LARSEN
APPROVED BY:
DRAWING NUMBER DS1272A
SCALE: 1"=100'
DATE: 1-11-91
SHEET 1 OF 1

FIGURE 3

## APPENDIX 5 SEDIMENT POND OUTSLOPE DRAINAGE AREA

1. Area = .22 Acres (See Figure 3)

2. Time of Concentration

   a. Hydrologic Length 125 ft.

   b. Average Slope 30%

   c. Velocity 5.0 fps (Exhibit A)

   d. Time of Concentration .42 Min. = .007 Hrs.

3. Curve Number

   CN = 79 (Exhibit B)

   Natural Slope, Range, Fair, Group C

4. Design Flow

   .42 CFS (See Table 5)

   25 Yr. 6 Hr. Storm Event (R614-301-743.300)

5. Culvert

   6'0" CMP w/headwater depth of 1.0.

   Capacity = 200 CFS (Figure 5, Appendix IX)

   Length = 40'

   Slope of Culvert = 10%

   Trash Rack - None (Due to oversizing of culvert and lack of facilities downstream.)

6. Erosion Protection

   Culvert Inlet

   8" Concrete Headwall - Culvert and Left Side

   Right Side - 12" to 18" Rip-rap

   12" to 18" Rock Rip-rap in Front of Culvert

Flow Velocity:

- Rip-rap Channel Slope - 7%
- Manning's Equation Nomograph (Fig. 4-8 of "Handbook of Steel Drainage and Highway Construction Product".)
- Manning's Coefficient (n) = 0.035
- Velocity = 6.1 ft/sec

Culvert Outlet

24" Rip-rap

Flow Velocity:

- Culvert Slope - 10%
- Manning's Equation Nomograph (See Culvert inlet Information)
- Manning's Coefficient (n) = 0.022
- Velocity = 10.0 ft/sec

7. Sediment Pond Discharge Flow -

Using the total runoff volumes of the 123 acres which flow into the sediment pond for treatment, the sediment pond would completely contain a 25 yr/6 hr precipitation event. No discharge from the pond would occur. The pond is sized to contain a 10 yr/24 hr event, (Calucations for the total runoff volume are found in Appendix VII of the PAP), which is 8.0 acre feet.

The same area would yield a total runoff volume of 4.92 acre feet during a 25 yr/6 hr precipitation event. Calcualtions for the 25 yr/6 hr event are:

Precipitation Depth - 1.8 inches

CN = 81

Formula for total runoff is:

$$Q = \frac{(P - 0.02S)^2}{(P + 0.08S)}$$

Where:

Q = Total Runoff

P = Precipitation

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

Q = .48 inches

$$123 \text{ Acres X } .48 \text{ Inches} = \frac{59.04}{12} = 4.92 \text{ Acre Feet}$$

8. Reclamation Channel

The culvert will be removed at the time of final reclamation of the sediment pond. Reclamation of the sediment pond will fill in the present culvert area and no reclamation channel is planned.

TABLE 5

INPUT SUMMARY
FOR W.S.: SEDIMENT POND OUTSLOPE

| STORM: | WATERSHED: |
|---|---|
| DISTRIBUTION =SCS TYPE 2 | LAND SLOPE = 0.0000 PCT |
| | CURVE NUMBER = 79.00 |
| PRECIP.DEPTH = 1.80 IN | CHANNEL LENGTH = 0.00 FT |
| | TIME OF CONC. = 0.0070 HR |
| DURATION = 6.00 HR | AREA = 0.22 AC |
| NUMBER OF LINES = 6444 | D = 0.0009 HR |

OUTPUT SUMMARY

RUNOFF DEPTH = 0.4054 IN
INITIAL ABSTRACTION = 0.5316 IN
PEAK FLOW = 0.42 CFS ( 1.9044 IPH)
AT T = 3.13 HRS

## APPENDIX 6 CULVERT AT C1 SUPPORT 18 DRAINAGE AREA

1. Area = .56 Acres (See Figure 3)

2. Time of Concentration

   a. Hydrologic Length 375 ft.

   b. Average Slope 40%

   c. Velocity 6.5 fps (Exhibit A)

   d. Time of Concentration .96 Min. = .016 Hrs.

3. Curve Number

   CN = 79 (Exhibit B)

   Natural Slope, Range, Fair, Group C

4. Design Flow

   .52 CFS (See Table 6)

   10 Yr. 6 Hr. Storm Event (R614-301-742.333)

5. Culvert

   a. 8'2" x 5'9" CMP Arched Culvert

   b. Flow Capacity = 420 CFS

      (See Hydrologic Analysis)

   c. Length = 50'

   d. Slope of Culvert = 3%

   e. Trash Rack - None (Due to lack of facilities downstream.)

   f. Because the following Drainage Areas will flow through this culvert the total runoff capacity will include runoff from the following areas. (10 yr/6 hr storm event)

      1. Sediment Pond Outslope (Table 7)
      2. Deer Creek Area IV (Table 8)

3. Deer Drainage Area V (Table 9)
4. Elk Canyon Area VI (Table 10)
5. Drainage Area VIIB (Table 11)

Tables 8 through 11 were calculated using the information for these areas found in this Appendix (Appendix IX).

Drainage Areas were determined by referring to Figure 6 and Drawing DS1272A.

Total Peak Flow of all areas draining to culvert C1 Support 18 is 182.636 CFS. (See Hydrologic Analysis)

6. Erosion Protection

Culvert Inlet

8" Concrete Collar Around Inlet concrete wing on

24" to 36" Rock Rip-rap

Flow Velocity:

- Rip-rap Channel Slope - 7%
- Manning's Equation Nomograph (Fig. 4-8 of "Handbook of Steel Drainage and Highway Construction Product".)
- Manning's Coefficient (n) = 0.035
- Velocity = 6.1 ft/sec

Culvert Outlet

36" to 48" Rock Rip-rap

Flow Velocity:

- Culvert Slope - 3%
- Manning's Equation Nomograph (See Culvert Inlet Information)
- Manning's Coefficient (n) = 0.022
- Velocity = 9.2 ft/sec

DEER CREEK CULVERT AT C1 SUPPORT 18

HYDROLOGIC ANALYSIS

The drainage areas which will flow into the Deer Creek culvert at C1 Support 18 are: Deer Creek Drainage IV, Deer Drainage V, Elk Canyon Drainage VI Sediment Pond Outslope and C1 Support 18. All drainage areas are depicted Figure 6 (Appendix IX) or Drawing DS1272A. All drainages are designed for the 10 year, 6 hour storm event using NOAA Atlas 2, Volume VI, Figure 21. Mine drainage VII B area was not used because this area's drainage is contained in the sediment pond and drainage area VIIA enters the stream below the culvert.

Calculation of peak flows is by the computer program "Storm 1 Program". The input data required by this program includes the area, curve number (CN), time of concentration, storm duration and rainfall depth. (See Table 6 through 11.)

The area for drainages Sediment Pond Outslope and Culvert at C1 Support 18 was determined by a digitizer, curve numbers were determined from Exhibit B (Appendix IX), Figure 9.6, (from NEH-4) and field inspection of the drainage areas. Area, curve number, hydraulic length and average slope for drainage areas IV, V, and VI were found in Appendix IX, Table A1.

Time of concentration was determined by using the average slope and Exhibit A (Appendix IX) to find the velocity. The time of concentration was then calculated by the following formula:

Hydraulic Length X Velocity X 1 hr./3600 sec. = Time of Concentration in Hours
(ft.) (ft./sec.)

The travel time in the culverts and stream is estimated using the nomograph solution to Manning's Equation, (Figure 4-8, "Handbook of Steel Drainage and Highway Construction Products"). Velocity in ft./sec. is determined by slope values

(elevation change in feet/length in feet) and roughness coefficient values of Table 6-1 (from "Watershed Hydrology"). The natural channel coefficient for Deer Creek is 0.035 and corrugated metal pipe is 0.022. Solution of travel time is flow length/velocity.

Analyzing the peak flows of the designated drainage areas it is determined that the peak combined flow will occur near 3.0 hours. By trial and error it is determined that the combined flow of area IV, V and VI at 3.042 hours, which equals 181.896 cfs, would require .012 hours to travel 625 ft. to the discharge into Deer Creek and the confluence of the Sediment Pond Outslope, arriving at 3.054 hours with 182.116 cfs. This would then require .008 hours to travel 250 ft. to the culvert inlet with the total flow of 182.636 cfs.

The culvert has the downstream slope of approximately 3% with rip-rap protection on the inlet and outlet of the culvert and an 8" concrete collar around the inlet. Maximum flow capacity of the 8'2" x 5'9" arch culvert is 420 cfs with the headwater depth of 1.50 using Chart 2-49, "State Road Hydrolics".

TABLE 6

```
INPUT SUMMARY
   FOR W.S.: CULVERT AT C1 SUPPORT 18
-------------------------------------------------------------
     STORM:                                WATERSHED:
-------------------------------------------------------------
DISTRIBUTION =SCS TYPE 2          LAND SLOPE =    0.0000 PCT
                                  CURVE NUMBER =  79.00
PRECIP.DEPTH =  1.40 IN           CHANNEL LENGTH =      0.00 FT
                                  TIME OF CONC. =  0.0160 HR
DURATION =    6.00 HR             AREA =       0.56 AC
  NUMBER OF LINES =    2828        D =  0.0021 HR
-------------------------------------------------------------

OUTPUT SUMMARY
-------------------------------------------------------------
         RUNOFF DEPTH =  0.2116 IN
         INITIAL ABSTRACTION =  0.5316 IN
            PEAK FLOW =       0.52 CFS      ( 0.9230 IPH)
               AT T =    3.13 HRS
-------------------------------------------------------------
```

TABLE 7

```
INPUT SUMMARY
   FOR W.S.: SEDIMENT POND OUTSLOPE
-------------------------------------------------------------
     STORM:                                WATERSHED:
-------------------------------------------------------------
DISTRIBUTION =SCS TYPE 2          LAND SLOPE =    0.0000 PCT
                                  CURVE NUMBER =  79.00
PRECIP.DEPTH =  1.40 IN           CHANNEL LENGTH =      0.00 FT
                                  TIME OF CONC. =  0.0070 HR
DURATION =    6.00 HR             AREA =       0.22 AC
  NUMBER OF LINES =    6444        D =  0.0009 HR
-------------------------------------------------------------

OUTPUT SUMMARY
-------------------------------------------------------------
         RUNOFF DEPTH =  0.2111 IN
         INITIAL ABSTRACTION =  0.5316 IN
            PEAK FLOW =       0.22 CFS      ( 0.9861 IPH)
               AT T =    3.13 HRS
-------------------------------------------------------------
```

TABLE 8

STORM RUNOFF DETERMINATION
FOR
DEER CREEK DRAINAGE AREA IV

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL-DEPTH = 1.6 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = 3.9 SQ. MILES
RUNOFF CURVE NO. = 69
TIME OF CONCENTRATION = 2.28 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.30 | 0.02 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.61 | 0.04 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.91 | 0.07 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 3.04 | 1.08 | 0.0068 | 0.0163 | 0.0007 | 1.68 |
| 3.34 | 1.23 | 0.0231 | 0.0165 | 0.0029 | 7.41 |
| 3.65 | 1.34 | 0.0396 | 0.0105 | 0.0068 | 17.24 |
| 3.95 | 1.40 | 0.0501 | 0.0083 | 0.0118 | 29.68 |
| 5.78 | 1.59 | 0.0911 | 0.0036 | 0.0290 | 73.09 |
| 6.08 | 1.60 | 0.0947 | 0.0000 | 0.0279 | 70.16 |
| 6.38 | 1.60 | 0.0947 | 0.0000 | 0.0254 | 63.81 |
| 6.69 | 1.60 | 0.0947 | 0.0000 | 0.0218 | 54.86 |
| 6.99 | 1.60 | 0.0947 | 0.0000 | 0.0178 | 44.73 |
| 7.30 | 1.60 | 0.0947 | 0.0000 | 0.0138 | 34.67 |
| 7.60 | 1.60 | 0.0947 | 0.0000 | 0.0102 | 25.63 |
| 7.90 | 1.60 | 0.0947 | 0.0000 | 0.0073 | 18.45 |
| 8.21 | 1.60 | 0.0947 | 0.0000 | 0.0050 | 12.63 |
| 8.51 | 1.60 | 0.0947 | 0.0000 | 0.0032 | 8.02 |
| 8.82 | 1.60 | 0.0947 | 0.0000 | 0.0019 | 4.68 |
| 9.12 | 1.60 | 0.0947 | 0.0000 | 0.0010 | 2.42 |
| 9.42 | 1.60 | 0.0947 | 0.0000 | 0.0004 | 0.95 |
| 9.73 | 1.60 | 0.0947 | 0.0000 | 0.0001 | 0.18 |
| 10.03 | 1.60 | 0.0947 | 0.0000 | 0.0000 | 0.00 |
| 10.34 | 1.60 | 0.0947 | 0.0000 | 0.0000 | 0.00 |
| 10.64 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .095 IN.
INITIAL ABSTRACTION = .899 IN.
PEAK FLOW = 73.708 CFS
TIME TO PEAK = 5.542 HOURS
RUNOFF VOLUME CHECK = .095 IN.

TABLE 5

# STORM RUNOFF DETERMINATION
# FOR
# DEER DRAINAGE AREA V

INPUT SUMMARY:

| | |
|---|---|
| DISTRIBUTION = SCS TYPE II | RUNOFF AREA = .186 SQ. MILES |
| RAINFALL DEPTH = 1.6 INCHES | RUNOFF CURVE NO. = 91 |
| STORM DURATION = 6 HOURS | TIME OF CONCENTRATION = .14 HRS. |

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.02 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.04 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.06 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.07 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.09 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.97 | 1.01 | 0.3640 | 0.0201 | 0.9731 | 116.81 |
| 2.99 | 1.04 | 0.3842 | 0.0165 | 0.9926 | 119.14 |
| 3.01 | 1.06 | 0.4007 | 0.0068 | 1.0048 | 120.61 |
| 3.02 | 1.07 | 0.4075 | 0.0069 | 0.9939 | 119.29 |
| 3.04 | 1.08 | 0.4144 | 0.0069 | 0.9595 | 115.17 |
| 3.06 | 1.09 | 0.4213 | 0.0069 | 0.9015 | 108.21 |
| 3.08 | 1.10 | 0.4282 | 0.0069 | 0.8196 | 98.38 |
| 3.10 | 1.11 | 0.4351 | 0.0070 | 0.7236 | 86.85 |
| 6.16 | 1.60 | 0.8222 | 0.0000 | 0.0088 | 1.05 |
| 6.18 | 1.60 | 0.8222 | 0.0000 | 0.0052 | 0.62 |
| 6.20 | 1.60 | 0.8222 | 0.0000 | 0.0025 | 0.31 |
| 6.22 | 1.60 | 0.8222 | 0.0000 | 0.0009 | 0.10 |
| 6.23 | 1.60 | 0.8222 | 0.0000 | 0.0001 | 0.02 |
| 6.25 | 1.60 | 0.8222 | 0.0000 | 0.0000 | 0.00 |
| 6.27 | 1.60 | 0.8222 | 0.0000 | 0.0000 | 0.00 |
| 6.29 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

| | |
|---|---|
| TOTAL RUNOFF DEPTH = .822 IN. | TIME TO PEAK = 3.006 HOURS |
| INITIAL ABSTRACTION = .198 IN. | RUNOFF VOLUME CHECK = .824 IN. |
| PEAK FLOW = 120.606 CFS | |

TABLE 10

STORM RUNOFF DETERMINATION
FOR
ELK CANYON DRAINAGE AREA VI

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 1.6 INCHES
STORM DURATION = 6 HOURS

RUNOFF AREA = .71 SQ. MILES
RUNOFF CURVE NO. = 76
TIME OF CONCENTRATION = .28 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.04 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.07 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.11 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.15 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.19 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.22 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.26 | 0.02 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.30 | 0.02 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.91 | 0.92 | 0.0243 | 0.0100 | 0.0439 | 20.10 |
| 2.95 | 0.98 | 0.0343 | 0.0115 | 0.0700 | 32.06 |
| 2.99 | 1.04 | 0.0458 | 0.0072 | 0.1014 | 46.46 |
| 3.02 | 1.07 | 0.0531 | 0.0044 | 0.1323 | 60.61 |
| 3.06 | 1.09 | 0.0575 | 0.0046 | 0.1581 | 72.43 |
| 3.10 | 1.11 | 0.0621 | 0.0047 | 0.1768 | 80.99 |
| 3.14 | 1.13 | 0.0668 | 0.0049 | 0.1864 | 85.41 |
| 3.17 | 1.14 | 0.0717 | 0.0050 | 0.1852 | 84.83 |
| 3.21 | 1.16 | 0.0768 | 0.0052 | 0.1786 | 81.85 |
| 3.25 | 1.18 | 0.0820 | 0.0053 | 0.1709 | 78.32 |
| 3.29 | 1.20 | 0.0873 | 0.0055 | 0.1628 | 74.59 |
| 6.23 | 1.60 | 0.2273 | 0.0000 | 0.0102 | 4.69 |
| 6.27 | 1.60 | 0.2273 | 0.0000 | 0.0074 | 3.37 |
| 6.31 | 1.60 | 0.2273 | 0.0000 | 0.0050 | 2.27 |
| 6.35 | 1.60 | 0.2273 | 0.0000 | 0.0030 | 1.39 |
| 6.38 | 1.60 | 0.2273 | 0.0000 | 0.0016 | 0.73 |
| 6.42 | 1.60 | 0.2273 | 0.0000 | 0.0006 | 0.28 |
| 6.46 | 1.60 | 0.2273 | 0.0000 | 0.0001 | 0.05 |
| 6.50 | 1.60 | 0.2273 | 0.0000 | 0.0000 | 0.00 |
| 6.53 | 1.60 | 0.2273 | 0.0000 | 0.0000 | 0.00 |
| 6.57 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .227 IN.
INITIAL ABSTRACTION = .632 IN.
PEAK FLOW = 85.78 CFS

TIME TO PEAK = 3.15 HOURS
RUNOFF VOLUME CHECK = .228 IN.

TABLE 11

STORM RUNOFF DETERMINATION
FOR
DRAINAGE AREA VIIB

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 1.6 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = .054 SQ. MILES
RUNOFF CURVE NO. = 90
TIME OF CONCENTRATION = .117 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.02 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.03 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.05 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.06 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.08 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.09 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.96 | 1.00 | 0.3207 | 0.0158 | 0.9194 | 32.04 |
| 2.98 | 1.02 | 0.3365 | 0.0160 | 0.9360 | 32.62 |
| 3.00 | 1.05 | 0.3525 | 0.0087 | 0.9520 | 33.18 |
| 3.01 | 1.06 | 0.3612 | 0.0054 | 0.9530 | 33.21 |
| 3.03 | 1.07 | 0.3666 | 0.0054 | 0.9323 | 32.49 |
| 3.04 | 1.08 | 0.3720 | 0.0054 | 0.8896 | 31.00 |
| 3.06 | 1.09 | 0.3775 | 0.0055 | 0.8247 | 28.74 |
| 3.07 | 1.09 | 0.3829 | 0.0055 | 0.7374 | 25.70 |
| 3.09 | 1.10 | 0.3884 | 0.0055 | 0.6503 | 22.66 |
| 6.16 | 1.60 | 0.7627 | 0.0000 | 0.0029 | 0.10 |
| 6.18 | 1.60 | 0.7627 | 0.0000 | 0.0011 | 0.04 |
| 6.19 | 1.60 | 0.7627 | 0.0000 | 0.0002 | 0.01 |
| 6.21 | 1.60 | 0.7627 | 0.0000 | 0.0000 | 0.00 |
| 6.22 | 1.60 | 0.7627 | 0.0000 | 0.0000 | 0.00 |
| 6.24 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .763 IN.
INITIAL ABSTRACTION = .222 IN.
PEAK FLOW = 33.288 CFS
TIME TO PEAK = 3.004 HOURS
RUNOFF VOLUME CHECK = .764 IN.

DEER CREEK RECLAIMED CHANNEL AT C1 SUPPORT 18

HYDROLOGIC ANALYSIS

The drainage areas which will flow into the reclaimed channel at C1 Support 18 are shown on Figure 6 (Appendix IX) and Drawing DS1272A. All drainages were designed for the 100 year, 6 hour storm event using NOAA Atlas 2, Volume VI, Figure 24 (See Tables 12-17).

Calculation of peak flow is by the computer program "Storm 1 Program". The input data (area, curve number and time of concentration) for areas IV, V, VI and VIIB were found in Appendix IX, Table A1. Data for Sediment Pond Outslope and C1 Support 18 drainage areas are found in Appendix 5 and 6.

Travel time in the stream is estimated using the nomograph solution to Manning's equation, (Figure 4-8, "Handbook of Steel Drainage and Highway Construction Products"). Velocity in ft/sec is determined by slope values and roughness coefficient values from Table 6-1, "Watershed Hydrology". The natural channel coefficient for Deer Creek is 0.035.

Analyzing the peak flows of the drainage areas it is determined that the peak combined flow will occur near 3.0 hours. By trial and error it is determined that the combined flow of areas IV, V, VI and VIIB at 3.038 hours, which equals 467.637 cfs, would require .018 hours to travel to the confluence of Sediment Pond Outslope area, arriving at 3.056 hours with 468.167 cfs. This would then require .008 hours to travel 250 ft to the C1 Support 18 Channel, arriving at 3.064 hours with 469.477 cfs total flow.

Designs for the reclaimed channel are found on Figures 7 through 8.

## TABLE 12

```
INPUT SUMMARY
   FOR W.S.: SEDIMENT POND OUTSLOPE
-----------------------------------------------------------------
     STORM:                                   WATERSHED:
-----------------------------------------------------------------
DISTRIBUTION =SCS TYPE 2          LAND SLOPE =    0.0000 PCT
                                  CURVE NUMBER =  79.00
PRECIP.DEPTH =  2.00 IN           CHANNEL LENGTH =      0.00 FT
                                  TIME OF CONC. =  0.0070 HR
DURATION =    6.00 HR             AREA =        0.22 AC
  NUMBER OF LINES =    6444       D =  0.0009 HR
-----------------------------------------------------------------

OUTPUT SUMMARY
-----------------------------------------------------------------
         RUNOFF DEPTH =  0.5173 IN
         INITIAL ABSTRACTION =  0.5316 IN
            PEAK FLOW =       0.53 CFS       ( 2.4111 IPH)
               AT T =    3.13 HRS
-----------------------------------------------------------------
```

## TABLE 13

```
INPUT SUMMARY
   FOR W.S.: CULVERT AT C1 SUPPORT 18
-----------------------------------------------------------------
     STORM:                                   WATERSHED:
-----------------------------------------------------------------
DISTRIBUTION =SCS TYPE 2          LAND SLOPE =    0.0000 PCT
                                  CURVE NUMBER =  79.00
PRECIP.DEPTH =  2.00 IN           CHANNEL LENGTH =      0.00 FT
                                  TIME OF CONC. =  0.0160 HR
DURATION =    6.00 HR             AREA =        0.56 AC
  NUMBER OF LINES =    2828       D =  0.0021 HR
-----------------------------------------------------------------

OUTPUT SUMMARY
-----------------------------------------------------------------
         RUNOFF DEPTH =  0.5182 IN
         INITIAL ABSTRACTION =  0.5316 IN
            PEAK FLOW =       1.31 CFS       ( 2.3166 IPH)
               AT T =    3.13 HRS
-----------------------------------------------------------------
```

TABLE 14

# STORM RUNOFF DETERMINATION FOR DEER CREEK DRAINAGE IV

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 2.2 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = 3.9 SQ. MILES
RUNOFF CURVE NO. = 69
TIME OF CONCENTRATION = 2.28 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.30 | 0.03 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.61 | 0.06 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.91 | 0.10 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 1.22 | 0.14 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 1.52 | 0.18 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 1.82 | 0.23 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.13 | 0.30 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.43 | 0.38 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 2.74 | 0.89 | 0.0000 | 0.0667 | 0.0000 | 0.00 |
| 3.04 | 1.48 | 0.0667 | 0.0530 | 0.0066 | 16.56 |
| 3.34 | 1.69 | 0.1197 | 0.0444 | 0.0184 | 46.29 |
| 3.65 | 1.84 | 0.1641 | 0.0263 | 0.0346 | 87.04 |
| 3.95 | 1.92 | 0.1903 | 0.0198 | 0.0534 | 134.31 |
| 4.26 | 1.98 | 0.2102 | 0.0191 | 0.0741 | 186.51 |
| 4.56 | 2.03 | 0.2293 | 0.0197 | 0.0862 | 216.96 |
| 4.86 | 2.09 | 0.2490 | 0.0147 | 0.0919 | 231.24 |
| 5.17 | 2.13 | 0.2637 | 0.0103 | 0.0920 | 231.53 |
| 5.47 | 2.15 | 0.2740 | 0.0105 | 0.0890 | 223.95 |
| 5.78 | 2.18 | 0.2845 | 0.0078 | 0.0839 | 211.09 |
| 6.08 | 2.20 | 0.2923 | 0.0000 | 0.0765 | 192.59 |
| 6.38 | 2.20 | 0.2923 | 0.0000 | 0.0661 | 166.23 |
| 6.69 | 2.20 | 0.2923 | 0.0000 | 0.0533 | 134.05 |
| 6.99 | 2.20 | 0.2923 | 0.0000 | 0.0415 | 104.39 |
| 7.30 | 2.20 | 0.2923 | 0.0000 | 0.0314 | 79.13 |
| 7.60 | 2.20 | 0.2923 | 0.0000 | 0.0230 | 57.82 |
| 7.90 | 2.20 | 0.2923 | 0.0000 | 0.0164 | 41.32 |
| 8.21 | 2.20 | 0.2923 | 0.0000 | 0.0112 | 28.09 |
| 8.51 | 2.20 | 0.2923 | 0.0000 | 0.0071 | 17.75 |
| 8.82 | 2.20 | 0.2923 | 0.0000 | 0.0041 | 10.31 |
| 9.12 | 2.20 | 0.2923 | 0.0000 | 0.0021 | 5.32 |
| 9.42 | 2.20 | 0.2923 | 0.0000 | 0.0008 | 2.07 |
| 9.73 | 2.20 | 0.2923 | 0.0000 | 0.0002 | 0.39 |
| 10.03 | 2.20 | 0.2923 | 0.0000 | 0.0000 | 0.00 |
| 10.34 | 2.20 | 0.2923 | 0.0000 | 0.0000 | 0.00 |
| 10.64 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .292 IN.
INITIAL ABSTRACTION = .899 IN.
PEAK FLOW = 232.377 CFS
TIME TO PEAK = 5.027 HOURS
RUNOFF VOLUME CHECK = .293 IN.

TABLE 15

STORM RUNOFF DETERMINATION
FOR
DEER DRAINAGE V

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 2.2 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = .186 SQ. MILES
RUNOFF CURVE NO. = 91
TIME OF CONCENTRATION = .14 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.02 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.04 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 3.01 | 1.46 | 0.7043 | 0.0106 | 1.6012 | 192.19 |
| 3.02 | 1.47 | 0.7149 | 0.0106 | 1.5763 | 189.21 |
| 3.04 | 1.48 | 0.7255 | 0.0107 | 1.5157 | 181.93 |
| 3.06 | 1.50 | 0.7362 | 0.0107 | 1.4190 | 170.33 |
| 3.08 | 1.51 | 0.7469 | 0.0107 | 1.2861 | 154.38 |
| 3.10 | 1.52 | 0.7576 | 0.0108 | 1.1323 | 135.91 |
| 3.12 | 1.53 | 0.7684 | 0.0108 | 0.9967 | 119.63 |
| 3.14 | 1.55 | 0.7791 | 0.0108 | 0.8796 | 105.58 |
| 3.15 | 1.56 | 0.7899 | 0.0108 | 0.7814 | 93.79 |
| 3.17 | 1.57 | 0.8008 | 0.0109 | 0.7023 | 84.30 |
| 3.19 | 1.59 | 0.8116 | 0.0109 | 0.6428 | 77.15 |
| 6.18 | 2.20 | 1.3402 | 0.0000 | 0.0077 | 0.92 |
| 6.20 | 2.20 | 1.3402 | 0.0000 | 0.0038 | 0.45 |
| 6.22 | 2.20 | 1.3402 | 0.0000 | 0.0013 | 0.15 |
| 6.23 | 2.20 | 1.3402 | 0.0000 | 0.0002 | 0.02 |
| 6.25 | 2.20 | 1.3402 | 0.0000 | 0.0000 | 0.00 |
| 6.27 | 2.20 | 1.3402 | 0.0000 | 0.0000 | 0.00 |
| 6.29 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = 1.34 IN.
INITIAL ABSTRACTION = .198 IN.
PEAK FLOW = 192.267 CFS
TIME TO PEAK = 3.002 HOURS
RUNOFF VOLUME CHECK = 1.343 IN.

TABLE 16

STORM RUNOFF DETERMINATION
FOR
ELK CANYON DRAINAGE AREA VI

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 2.2 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = .71 SQ. MILES
RUNOFF CURVE NO. = 76
TIME OF CONCENTRATION = .28 HRS.

HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.04 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.07 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 3.02 | 1.47 | 0.1755 | 0.0100 | 0.4477 | 205.14 |
| 3.06 | 1.50 | 0.1855 | 0.0102 | 0.4898 | 224.43 |
| 3.10 | 1.52 | 0.1956 | 0.0104 | 0.5105 | 233.92 |
| 3.14 | 1.55 | 0.2060 | 0.0106 | 0.5077 | 232.64 |
| 3.17 | 1.57 | 0.2166 | 0.0108 | 0.4804 | 220.10 |
| 3.21 | 1.60 | 0.2274 | 0.0110 | 0.4442 | 203.53 |
| 6.27 | 2.20 | 0.5205 | 0.0000 | 0.0135 | 6.20 |
| 6.31 | 2.20 | 0.5205 | 0.0000 | 0.0091 | 4.18 |
| 6.35 | 2.20 | 0.5205 | 0.0000 | 0.0056 | 2.56 |
| 6.38 | 2.20 | 0.5205 | 0.0000 | 0.0029 | 1.34 |
| 6.42 | 2.20 | 0.5205 | 0.0000 | 0.0011 | 0.52 |
| 6.46 | 2.20 | 0.5205 | 0.0000 | 0.0002 | 0.10 |
| 6.50 | 2.20 | 0.5205 | 0.0000 | 0.0000 | 0.00 |
| 6.53 | 2.20 | 0.5205 | 0.0000 | 0.0000 | 0.00 |
| 6.57 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = .52 IN.
INITIAL ABSTRACTION = .632 IN.
PEAK FLOW = 234.699 CFS
TIME TO PEAK = 3.113 HOURS
RUNOFF VOLUME CHECK = .522 IN.

TABLE 17

STORM RUNOFF DETERMINATION
FOR
DRAINAGE VIIB

INPUT SUMMARY:

DISTRIBUTION = SCS TYPE II
RAINFALL DEPTH = 2.2 INCHES
STORM DURATION = 6 HOURS
RUNOFF AREA = .054 SQ. MILES
RUNOFF CURVE NO. = 90
TIME OF CONCENTRATION = .117 HRS.

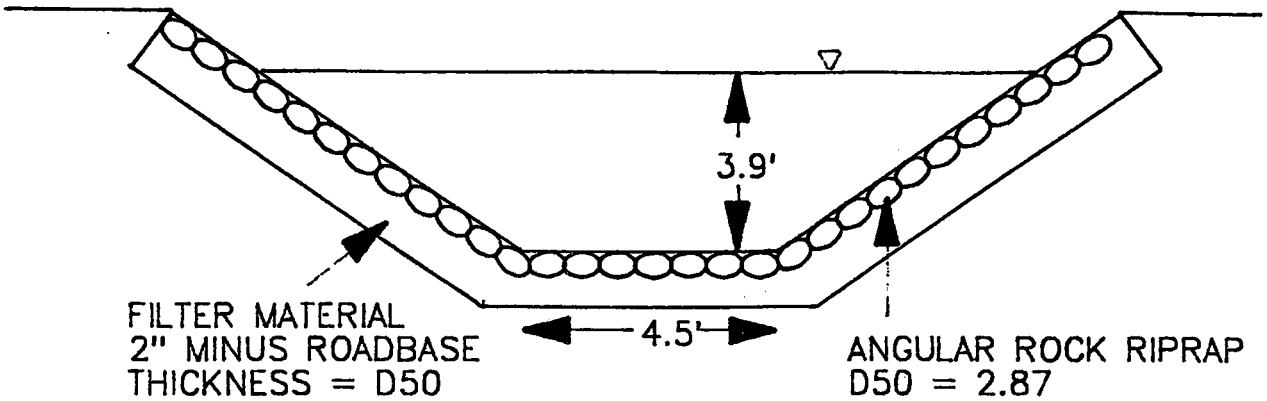
HYDROGRAPH ORDINATES:

| TIME (HR) | PPT (IN) | CUM. FLOW (IN) | DEL. FLOW (IN) | FLOW RATE (IN/HR) | FLOW RATE (CFS) |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.02 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.03 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.05 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.06 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 0.08 | 0.01 | 0.0000 | 0.0000 | 0.0000 | 0.00 |
| 3.01 | 1.46 | 0.6520 | 0.0085 | 1.5400 | 53.67 |
| 3.03 | 1.47 | 0.6605 | 0.0086 | 1.5006 | 52.29 |
| 3.04 | 1.48 | 0.6690 | 0.0086 | 1.4270 | 49.73 |
| 3.06 | 1.49 | 0.6776 | 0.0086 | 1.3189 | 45.96 |
| 3.07 | 1.50 | 0.6862 | 0.0086 | 1.1761 | 40.99 |
| 3.09 | 1.51 | 0.6949 | 0.0086 | 1.0347 | 36.06 |
| 3.10 | 1.53 | 0.7035 | 0.0087 | 0.9111 | 31.75 |
| 3.12 | 1.54 | 0.7122 | 0.0087 | 0.8055 | 28.07 |
| 3.14 | 1.55 | 0.7209 | 0.0087 | 0.7184 | 25.03 |
| 3.15 | 1.56 | 0.7296 | 0.0087 | 0.6498 | 22.64 |
| 3.17 | 1.57 | 0.7383 | 0.0087 | 0.6002 | 20.91 |
| 3.18 | 1.58 | 0.7470 | 0.0088 | 0.5696 | 19.85 |
| 3.20 | 1.59 | 0.7558 | 0.0088 | 0.5585 | 19.46 |
| 3.21 | 1.60 | 0.7646 | 0.0088 | 0.5578 | 19.44 |
| 6.10 | 2.20 | 1.2663 | 0.0000 | 0.0288 | 1.00 |
| 6.12 | 2.20 | 1.2663 | 0.0000 | 0.0206 | 0.72 |
| 6.13 | 2.20 | 1.2663 | 0.0000 | 0.0138 | 0.48 |
| 6.15 | 2.20 | 1.2663 | 0.0000 | 0.0083 | 0.29 |
| 6.16 | 2.20 | 1.2663 | 0.0000 | 0.0043 | 0.15 |
| 6.18 | 2.20 | 1.2663 | 0.0000 | 0.0016 | 0.06 |
| 6.19 | 2.20 | 1.2663 | 0.0000 | 0.0003 | 0.01 |
| 6.21 | 2.20 | 1.2663 | 0.0000 | 0.0000 | 0.00 |
| 6.22 | 2.20 | 1.2663 | 0.0000 | 0.0000 | 0.00 |
| 6.24 | 0.00 | 0.0000 | 0.0000 | 0.0000 | 0.00 |

OUTPUT SUMMARY:

TOTAL RUNOFF DEPTH = 1.266 IN.
TIME TO PEAK = 2.999 HOURS
INITIAL ABSTRACTION = .222 IN.
RUNOFF VOLUME CHECK = 1.269 IN.
PEAK FLOW = 53.887 CFS

# DEER CREEK MINE
# RECLAIMED CHANNEL
# C1 SUPPORT 18




*** NO SCALE**

Q = 469.5 cfs
n = 0.035
S = 0.03
b = 4.5'

$$K' = \frac{Qn}{b^{8/3} S^{1/2}}$$

K' = 1.74

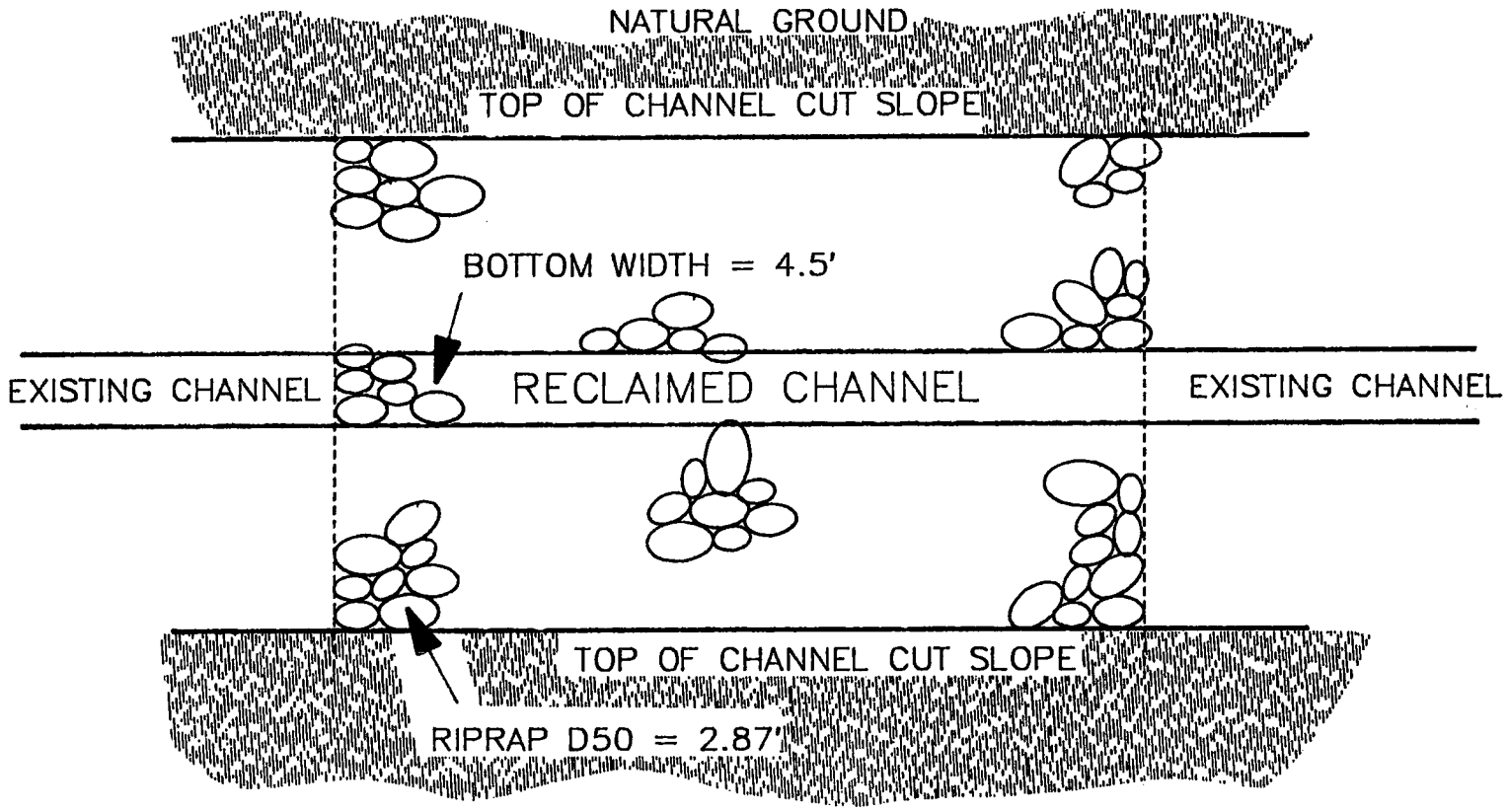
**FROM CHART (Capacity of Trapizoidal Channel, Exhibit D)**

$$\frac{d}{b} = 0.86$$

b = 4.5'
d =0.86 X 4.5'
d = 3.87'

24.21
FIGURE 7

# PLAN VIEW OF RECLAIMED CHANNEL C1 SUPPORT 18




* NO SCALE

FIGURE 8

C1 SUPPORT 18 CHANNEL

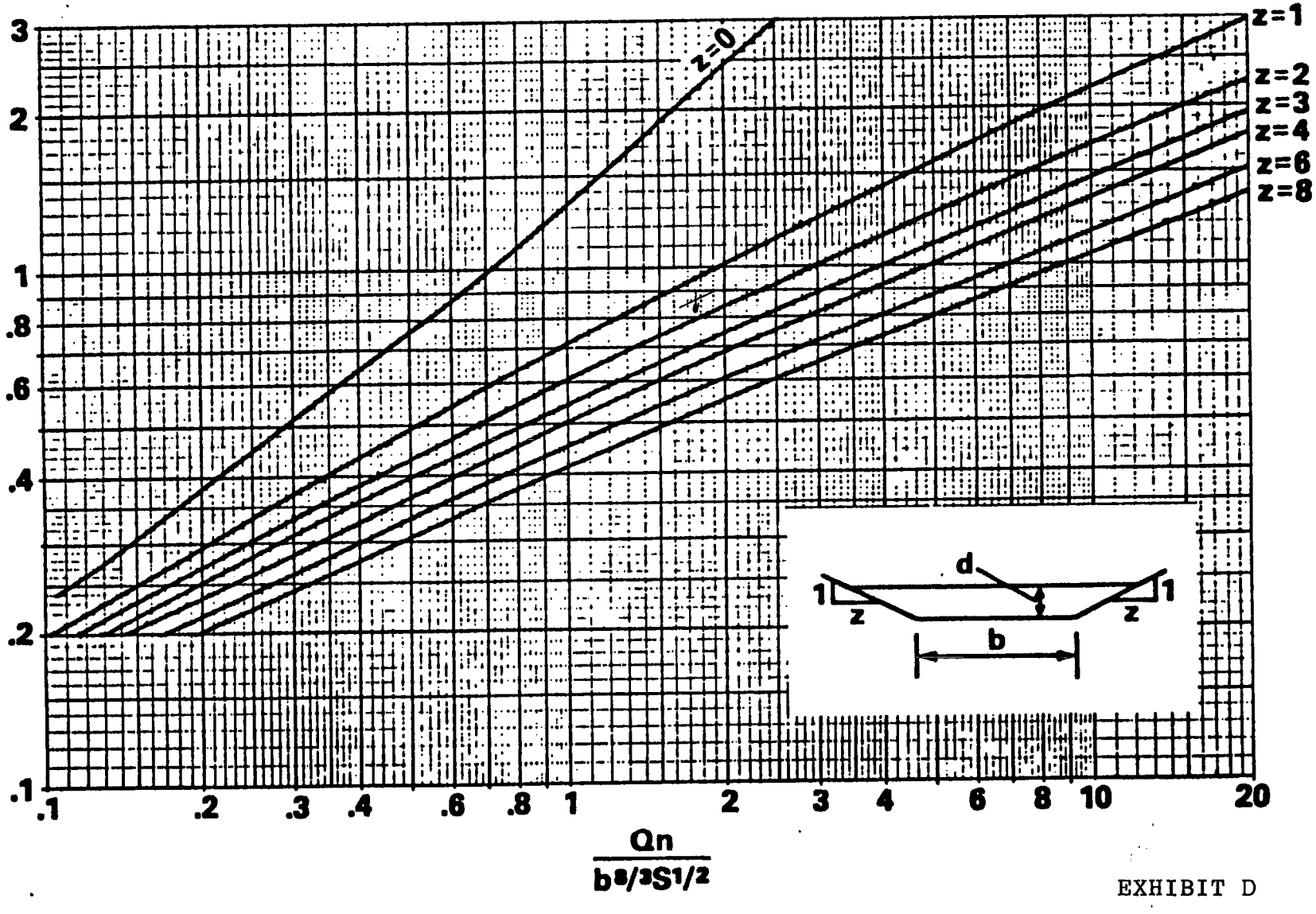
R I P R A P  S I Z I N G  F O R
T R A P A Z O I D A L  D I T C H E S

ENTER LISTED PARAMETERS
1. FLOW RATE (CFS) 469.5
2. CHANNEL SLOPE .03
3. BOTTOM WIDTH (FT) 4.5
4. SIDE SLOPE .66
5. PHI ANGLE 42
6. SPECIFIC GRAVITY OF RIPRAP 2.65

DESIRED SAFETY FACTOR FOR CHANNEL BOTTOM 1
DESIRED SAFETY FACTOR FOR CHANNEL BANKS 1

| VELOCITY | DEPTH | D50 | S.F. BTM | S.F. BANK |
|---|---|---|---|---|
| 9.754 | 4.344 | 2.8705 | 1.636 | .953 |

# Capacity of Trapezoidal Channel




FROM MANUAL OF INSTRUCTION,

EXHIBIT D

MAP SCALE: 100
CONTOUR INTERVAL: 5

Name: 1

AREA: 0.23 acres

HYDRAULIC LENGTH: 121.09 ft.

CONTOUR # 7295 : 41.89 ft.
SUM OF CONTOURS: 1653.80 ft.

[PRESS 'C' to continue 'R' to redo contours? [ [
[[[

SHED NAME: 1

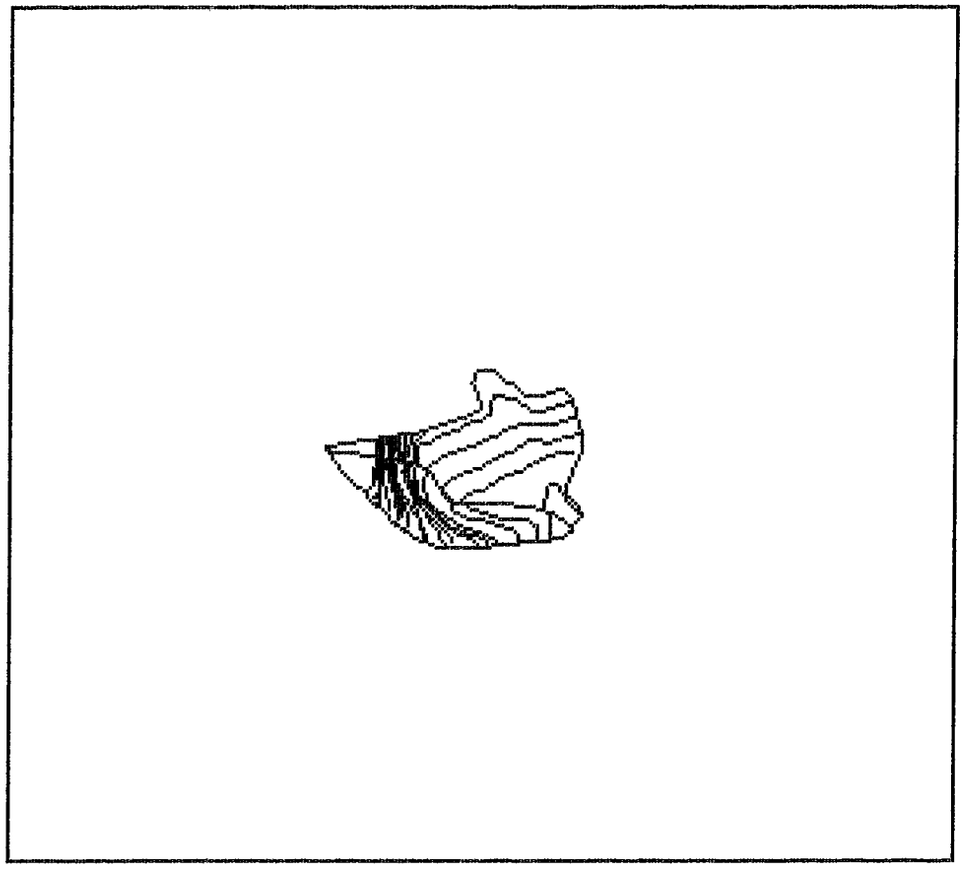
AREA: 0.23 Acres HYDRAULIC LENGTH: 151.64 Ft. SLOPE: 78.28 %

KIRPITCH: 0.010

USBR/KIRPITCH: 0.010

HATHAWAY: 0.103

KENTS: 0.014



MAP SCALE: 100
CONTOUR INTERVAL: 5

Name: 1

AREA: 0.23 acres

HYDRAULIC LENGTH: 151.64 ft.

CONTOUR # 7295 : 36.81 ft.
SUM OF CONTOURS: 1541.79 ft.

DIGITIZE CONTOUR #: 7300

PRESS 'C' to continue 'R' to redo contours?

```
VDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD7
:Project Title          = none                                                      :
:WATERSHED HYDROGRAPH                                                               :
:     Inflow into structure #  1                                                    :
:     Structure type:          Null                                                 :
:                                                                                   :
:                                                                                   :
:-- Watershed data for watershed # 1                                                :
:    Curve number          =    79.0                                                :
:    Area                  =     0.2 acres                                          :
:    Hydraulic length      =  125.00 feet                                           :
:    Elevation change      =     0.0 feet.                                          :
:    Concentration time    =    0.01 hours                                          :
:    Unit hydrograph type = Disturbed                                                :
:                                                                                   :
:-- Total Area            =     0.2 acres                                           :
:                                                                                   :
:-- Storm data                                                                       :
:    Total precipitation   =     1.8 inches                                         :
:    Storm type            = SCS 6 hour design storm                                 :
:    Peak Discharge        =    0.06 cfs                                            :
:    Discharge volume      =    0.01 acre ft                                        :
:                                                                                   :
: <press return to continue or {esc} to skip detail printout>                       :
SDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD=
```