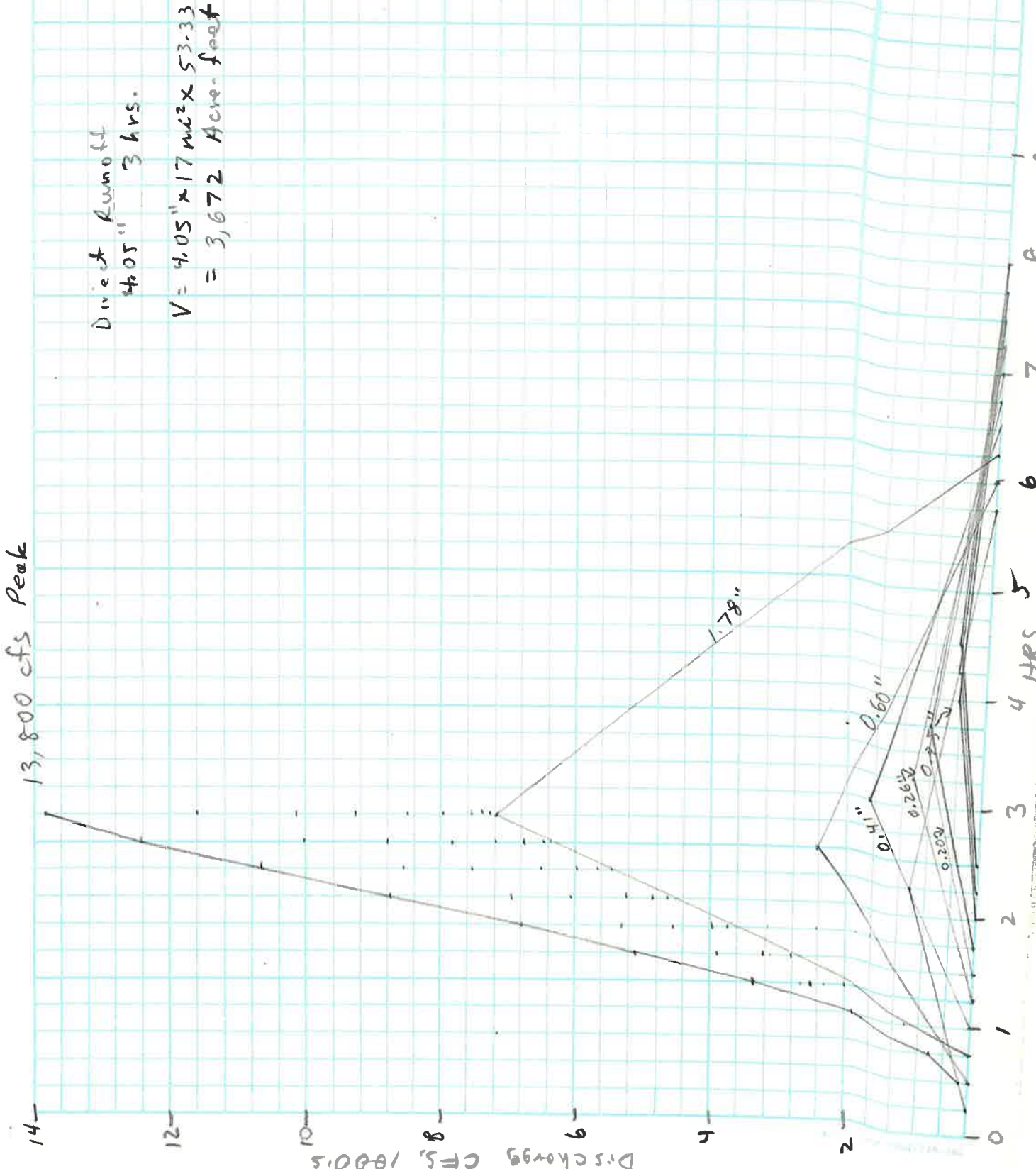


COMPUTATION SHEET

BY DJO	DATE 9/29/87	PROJECT Lake 17	SHEET T 4 OF 4
CHKD BY	DATE	FEATURE Design Flood inflow - Thunders	torrens
DETAILS Assumption A - Medium Risk			



Direct Runoff
4.05" 3 hrs.

$V = 4.05" \times 17 \text{ mi}^2 \times 53.33$
 $= 3,672 \text{ Acre-foot}$

VOID

Lake 17 Hydrology 12/16/87
 including Little Suction Creek Basin
 above Diversion

A1. Area (Duck Creek) = 17 sq. mi.

Area (L. Suction) = $\frac{47}{64}$ sq mi.

General Type 5 storms - Assumption A

A2. General, Zone C ^{p. 50} Fig 17. 6 hr point = 12"

A3. Soil Group C, $CN = 86$ for pasture - poor condition ^{p. 536 Table A-2}

A4. Determine T_c $T_c = \left[\frac{11.9 L^3}{H} \right]^{0.385}$ Fig 30 p. 71
 $L =$ length of water course, miles
 $H =$ elevation difference, in feet

$L = 19$ mi $H = 3345 - 3021 = 324$

$T_c = \left[\frac{11.9 \cdot 19^3}{324} \right]^{0.385}$

$= 8.40$ hrs

$V = 19 \text{ mi} \cdot \frac{5280 \text{ ft}}{\text{mi}} \cdot \frac{1 \text{ hr}}{8.40 \text{ hr}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} = 3.3 \text{ fps}$

B2 b Assumption A, inflow design flood, general storm

B2(b)(1) reduction factor = 3.6 Fig 23 p. 56
 reduction = $1/3.6 = .278$

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B 2(b)(1) Area = 64 sq. mi.

Area reduction = .94 Fig. 19 p. 51

PMP (local) = $94 \times 12 = 11.28''$

Time, hrs	% 6 hr PMP	Accum PMP, in.	Incremental PMP	hours by magnitude	Incremental PMP	Accum PMP
1	49	5.53	5.53	6	0.90	0.90
2	64	7.22	1.69	4	1.02	1.92
3	75	8.46	1.24	3	1.24	3.16
4	84	9.48	1.02	1	5.53	8.69
5	92	10.38	0.90	2	1.69	10.38
6	100	11.28	0.90	5	0.90	11.28
12	136	15.34	4.06	7	4.06	15.34
24	170	20.08	4.74	8	4.74	20.08
48	238	25.72	5.64	7	5.64	25.72

Time, hrs.	Accum PMP	Accum $\text{\textcircled{1}}$ reduced rain	Assumption A - Design Storm	
			Accum $\text{\textcircled{2}}$ rain	Inc. rain
1	0.90	0.25	0.6	0.6
2	1.92	0.53	1.2	0.6
3	3.16	0.88	2.0	0.8
4	8.69	2.41	5.6	3.6
5	10.38	2.88	6.6	1.0
6	11.28	3.13	7.2	0.6
12	15.34	4.26	9.8	2.6
24	20.08	5.58	12.8	3.0
48	25.72	7.14	16.4	3.6

$\text{\textcircled{1}}$ - reduction factor = 0.6 Fig 23 p. 56

$\text{\textcircled{2}}$ - Av. column = 1.3

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General Type Storm Assumption A
Retention loss rate = 0.12 iph p. 64

B262 CN = 86 AMC-II Table A-2 p. 536
CN = 94 AMC-III Table A-7 p. 543

Time Ending hour	Incr design rain	Accum Design rain	Direct Runoff ↓		Incr loss	
			Accum	Incr		
1	0.6	0.6	0.31	0.31	0.29	
2	0.6	1.2	0.67	0.36	0.24	
3	0.8	2.0	1.35	0.68	0.12	— Abandon curve
4	3.6	5.6	4.83	3.48	0.12	
5	1.0	6.6	5.71	0.88	0.12	
6	0.6	7.2	6.19	0.48	0.12	
12	2.6	9.8	8.07	1.88	0.72	
24	3.0	12.8	9.63	1.56	1.44	
48	3.6	16.4	10.35	0.72	2.88	

B2(6)(3) Complete Flood Computation

$T_c = 8.40$ hrs.

$D = 1$ hr. $D = 6$ hrs.

$d = 1$ inch

Compute T_p , T_b , q_p

1 hr.

6 hrs.

$T_p = \frac{D}{2} + 0.6 T_c = \frac{1}{2} + 0.6 \cdot 8.4 = 5.54$

$\frac{6}{2} + 0.6 \cdot 8.4 = 8.04$

$T_b = 2.67 \cdot T_p = 2.67 \cdot 5.54 = 14.79$

$2.67 \cdot 8.04 = 21.47$

$q_p = \frac{484 \cdot A \cdot Q}{T_p} = \frac{484 \cdot 64.1}{5.54} = 5591$ cfs

$q_p = \frac{484 \cdot 64.1}{8.04} = 3853$ cfs

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General Type Storms Assumption A

B. 2(b)(3) Compute Triang. Hydrograph for each increment of excess
 Prepare Plotting Table, Plot Hydrograph

Time Ending hr	Incre Runoff	Op for 1" hydro	Op for Incre runoff	Incremental Hydrographs			
				Begin Time	Peak Time	End Time	
1	0.31	5591	1733	0	5.5	14.8	↓
2	0.36		2013	1	6.5	15.8	↓
3	0.68		3802	2	7.5	16.8	↓
4	3.48		19457	3	8.5	17.8	↓
5	0.88		4920	4	9.5	18.8	
6	0.48	5591	2684	5	10.5	19.8	
12	1.88	3853	7244	6	14.0	27.5	↓
24							
48							