CPv USING HCM
CONT'D

DETERMINE HCv:

$$HCv = \frac{(Q_{i\,post} - Q_{i\,pre})\,A}{12}$$

$$HCv = \frac{(\overset{0.74}{\cancel{0.73}} - 0.398)\,2.44}{12}$$

$$HCv = \underset{0.069}{\cancel{0.0675}}\ AC\cdot FT \rightarrow \underset{3016}{\cancel{2940}}\ FT^3$$

APPLY Tv PROVIDED BY REFORESTATION, DISCONNECT TO FILTER, & DRY SWALE. TO HCV

$$Tv_{PROVIDED} = 73\ FT^3 + 1418\ FT^3 + 230\ FT^3$$

$$Tv_{PROVIDED} = 1721\ FT^3$$

$$Hcv - Tv_{prov}$$

$$\underset{3016}{\cancel{2940}} - 1721 = \underset{1295}{\cancel{1719}}\ FT^3\ \text{remaining}$$

CPv TREATMENT STANDARD PARTIALLY MET >50% USING HCM.

TREAT REMAINING VOLUME USING EXTENDED DETENTION METHOD.

COMPUTE T_c PER 2.12.4.3 USING WATERSHED LAG.

DEVELOPED FLOW PATH USING 3 BISECTION LINES ON TOPO MAP AND AVERAGED.

① SLOPE = $\frac{8.2}{320}$ = 0.0256

② SLOPE = $\frac{11}{525}$ = 0.02095

④ SLOPE = $\frac{12}{770}$ = 0.0156

Σ = 0.06216 ÷ 3 = 0.0207

Y = 2.07%

DETERMINE FLOW LENGTH:

$$L = 209\ A^{0.6}$$

$$L = 209(2.44)^{0.6}$$

$$L = 356.9\ FT$$

~~CN' = BASED ON WEIGHTED AREA FROM MODEL~~
~~CN = 79~~

~~DETERMINE POST-DEVELOPMENT T_C:~~

$$T_C = \frac{L^{0.8}(S+1)^{0.7}}{1140\ Y^{0.5}}$$

$$T_C = \frac{(356.9)^{0.8}\left[\left(\frac{1000}{79}-10\right)+1\right]^{0.7}}{1140(2.07)^{0.5}}$$

$T_C = 0.167$ HRS → 10 MINS

CALCULATE ADJUSTED CURVE NUMBER PER 2.2.5.3 FOR 1-YR STORM P=2.2 IN.

$$HC_{V\,ACT} = \Sigma T_V$$

$$HC_{V\,ACT} = 73\ FT^3 + 1418\ FT^3 + 230\ FT^3$$

$$HC_{V\,ACT} = 1{,}721\ FT^3 \longrightarrow 0.04\ AC\cdot FT$$

CONVERT $HC_{V\,ACT}$ TO RUNOFF DEPTH:

$$Q_{ACT} = \frac{HC_{V\,ACT} \times 12}{A}$$

$$Q_{ACT} = \frac{\overset{0.04\ AC\cdot FT}{\cancel{1721\ FT^3}} \times 12}{2.44\ AC}$$

$$Q_{ACT} = 0.194\ \text{INCHES}$$

DETERMINE T_C EXISTING CONDITION:

CALCULATE SLOPE AVE. OF PRE-DEVELOPED BASIN

(A) SLOPE = $\frac{10.2}{310}$ = 0.0329

(B) SLOPE = $\frac{8.5}{525}$ = 0.0162

(C) SLOPE = $\frac{6.5}{235}$ = 0.0277

(D) SLOPE = $\frac{2.9}{275}$ = 0.0105

Σ = 0.087 ÷ 4 = 0.0218

Y = 2.18 %

$$T_C = \frac{L^{0.8}\left[\left(\frac{1000}{72} - 10\right) + 1\right]^{0.7}}{1140(2.18)^{0.5}}$$

L = 356.9

PRE DEVELOPED

T_C = 0.199 HRS → 11.9 MINS

PREDEVELOPED RUNOFF 10-YR 24-HR STORM

Q = 5.12 CFS (FROM HYDROCAD)