Appendix B - Fall Creek

PEAK DISCHARGES FOR SELECTED FREQUENCIES

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Watershed Name: FALL CR

PEAK DISCHARGE CALCULATION BY PREDICTION EQUATION

Peak discharges for the ungaged watershed have been determined from a set of hydrologic prediction equations derived using generalized least squares. The models relate peak discharges to physical watershed characteristics such as area and precipitation. The equations take this form:

```
Q(T)=(10.0^C0(T))*(CHR1^C1(T))* . . . (CHRn^Cn(T))
-------------------------------------------------
   Q(T)  =  Peak Discharge for Return Period T
   Cx(T) =  Coefficient x for Return Period T
   CHR1  =  The First Watershed Characteristic
   CHRn  =  The nth Watershed Characteristic
-------------------------------------------------
   Note: * = multiplication, ^ = exponentiation
```

For this ungaged watershed, peak discharges were estimated using prediction equations for this flood region:

WESTERN INTERIOR WATERSHEDS - > 2875 FEET AND < 3125 FEET

WATERSHED ELEVATION = 2980 FEET

For western interior watersheds with mean elevations between 2875 and 3125 feet, peaks are calculated as a weighted average of peaks estimated by the prediction equation for interior watersheds above 3000 feet and the prediction equation for interior watersheds below 3000 feet - using this equation:

```
-------------------------------------------------------------
        Qw(T)=Ql(T)*(3125-E)/250 + Qh(T)*(E-2875)/250
-------------------------------------------------------------
Qw(T) = Weighted Average Peak Discharge for Return Period T
Ql(T) = Peak Discharge for Return Period T for Low Elevation
Qh(T) = Peak Discharge for Return Period T for High Elevation
E     = Mean Watershed Elevation
-------------------------------------------------------------
            Note: * = multiplication, / = division
```

Prediction Equation for Interior Watersheds < 3000 Feet

```
-------------------------------------------------------------------------
Q(T)=(10.0^C0(T))*(X1^C1(T))*(X2^C2(T)*(X3^C3(T))*(X4^C4(T))*(X5^C5(T))
-------------------------------------------------------------------------
    Q(T)   =  Peak Discharge for Return Period T
    Cx(T)  =  Coefficient x for Return Period T
    X1     =  Drainage area                          (square miles)
    X2     =  Mean watershed slope                   (degrees)
    X3     =  2-year 24-hour precipitation intensity (inches)
    X4     =
    X5     =
-------------------------------------------------------------------------
              Note: * = multiplication, ^ = exponentiation
```

Prediction Equation Coefficients

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Return Period T	Coefficients C0(T)	C1(T)	C2(T)	C3(T)	C4(T)	C5(T)
2	9.607E-01	9.004E-01	4.695E-01	8.481E-01		
5	1.162E+00	9.042E-01	4.735E-01	7.355E-01		
10	1.267E+00	9.064E-01	4.688E-01	6.937E-01		
20	1.351E+00	9.081E-01	4.633E-01	6.651E-01		
25	1.375E+00	9.086E-01	4.615E-01	6.578E-01		
50	1.443E+00	9.101E-01	4.559E-01	6.390E-01		
100	1.503E+00	9.114E-01	4.501E-01	6.252E-01		
500	1.620E+00	9.141E-01	4.365E-01	6.059E-01		

Required Watershed Characteristics

Drainage area	(square miles)	3.550
Mean watershed slope	(degrees)	23.800
2-year 24-hour precipitation intensity	(inches)	2.870

Prediction Equation for Interior Watersheds > 3000 Feet

Q(T)=(10.0^C0(T))*(X1^C1(T))*(X2^C2(T)*(X3^C3(T))*(X4^C4(T))*(X5^C5(T))

Q(T)	=	Peak Discharge for Return Period T	
Cx(T)	=	Coefficient x for Return Period T	
X1	=	Drainage area	(square miles)
X2	=	Mean watershed slope	(degrees)
X3	=	2-year 24-hour precipitation intensity	(inches)
X4	=	Mean minimum January temperature	(degrees F)
X5	=	Mean maximum January temperature	(degrees F)

Note: * = multiplication, ^ = exponentiation

Prediction Equation Coefficients

Return Period T	Coefficients C0(T)	C1(T)	C2(T)	C3(T)	C4(T)	C5(T)
2	-2.506E+00	1.021E+00	8.124E-01	2.050E+00	3.541E+00	-1.867E+00
5	-2.107E+00	1.020E+00	9.022E-01	1.649E+00	3.611E+00	-2.017E+00
10	-1.811E+00	1.021E+00	9.506E-01	1.471E+00	3.620E+00	-2.137E+00
20	-1.551E+00	1.021E+00	9.844E-01	1.352E+00	3.623E+00	-2.246E+00
25	-1.475E+00	1.021E+00	9.930E-01	1.321E+00	3.624E+00	-2.278E+00
50	-1.260E+00	1.022E+00	1.014E+00	1.243E+00	3.624E+00	-2.366E+00
100	-1.071E+00	1.022E+00	1.030E+00	1.182E+00	3.621E+00	-2.440E+00
500	-7.047E-01	1.023E+00	1.053E+00	1.079E+00	3.601E+00	-2.566E+00

Required Watershed Characteristics

Drainage area	(square miles)	3.550
Mean watershed slope	(degrees)	23.800
2-year 24-hour precipitation intensity	(inches)	2.870
Mean minimum January temperature	(degrees F)	31.600
Mean maximum January temperature	(degrees F)	44.500

PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

Return	Weighted	< 3000 ft	> 3000 ft

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Period years	Peak Flow cfs	95% Confidenc Lower Limit cfs	95% Confidenc Upper Limit cfs	Peak Flow cfs	95% Confidenc Lower Limit cfs	95% Confidenc Upper Limit cfs	Peak Flow cfs	95% Confidenc Lower Limit cfs	95% Confidenc Upper Limit cfs
2	269	136	530	310	165	581	221	105	468
5	401	212	761	445	238	833	348	180	672
10	491	260	927	535	284	1010	435	230	823
20	577	303	1100	621	324	1190	521	276	983
25	604	316	1150	648	337	1250	549	290	1040
50	689	355	1340	731	373	1430	635	331	1220
100	774	391	1540	814	406	1630	723	370	1410
500	975	464	2050	1000	476	2120	937	449	1960

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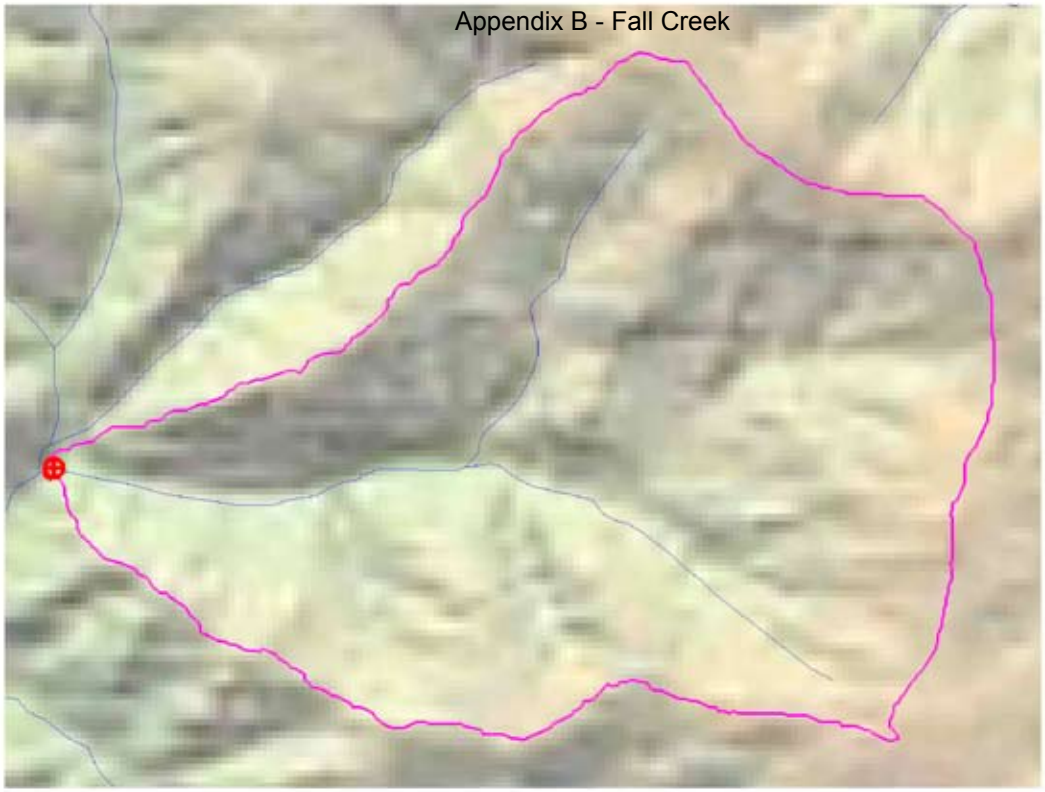

Pour point

Watershed boundary

N

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