

Appendix B - Little Zigzag River PEAK DISCHARGES FOR SELECTED FREQUENCIES

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Watershed Name: LITTLE ZIGZAG CAN

PEAK DISCHARGE CALCULATION BY PREDICTION EQUATION

Peak discharges for the unaged 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:

$$Q(T) = (10.0^{C_0(T)}) * (CHR_1^{C_1(T)}) * \dots * (CHR_n^{C_n(T)})$$

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

WESTERN INTERIOR WATERSHEDS - > 3125 FEET

WATERSHED ELEVATION = 4860 FEET

For western interior watersheds with mean elevations above 3125 feet, peaks are estimated using the prediction equations for western interior watersheds above 3000 feet.

Prediction Equation for Interior Watersheds > 3000 Feet

$$Q(T) = (10.0^{C_0(T)}) * (X_1^{C_1(T)}) * (X_2^{C_2(T)}) * (X_3^{C_3(T)}) * (X_4^{C_4(T)}) * (X_5^{C_5(T)})$$

 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					
T	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

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500 -7.047E-01 1.023E+00 1.053E+00 1.079E+00 3.601E+00 -2.566E+00

Required Watershed Characteristics

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Drainage area (square miles) 4.080
Mean watershed slope (degrees) 11.800
2-year 24-hour precipitation intensity (inches) 3.330
Mean minimum January temperature (degrees F) 23.700
Mean maximum January temperature (degrees F) 33.800
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WARNING: WATERSHED CHARACTERISTICS ARE OUT OF BOUNDS

One or more of the required watershed characteristics is an extrapolation from the set used to develop the regression equations.

PEAK DISCHARGES HAVE BEEN CALCULATED, BUT SHOULD BE USED WITH CAUTION.

WESTERN INTERIOR WATERSHEDS - < 2875 FEET Bounds on Required Watershed Characteristics

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Drainage area (square miles) 0.22 to 3964.94
Mean watershed slope (degrees) 6.24 to 27.97
2-year 24-hour precipitation intensity (inches) 1.71 to 4.34
Mean minimum January temperature (degrees F) 20.46 to 33.99
Mean maximum January temperature (degrees F) 33.85 to 47.30
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PEAK DISCHARGE ESTIMATES BASED ON PREDICTION EQUATIONS

Return Period years	Peak Flow cfs	95% Confidence	
		Lower Limit cfs	Upper Limit cfs
2	118	56.1	248
5	168	87.2	322
10	204	108	383
20	241	128	452
25	253	134	476
50	292	153	557
100	333	171	649
500	436	209	906

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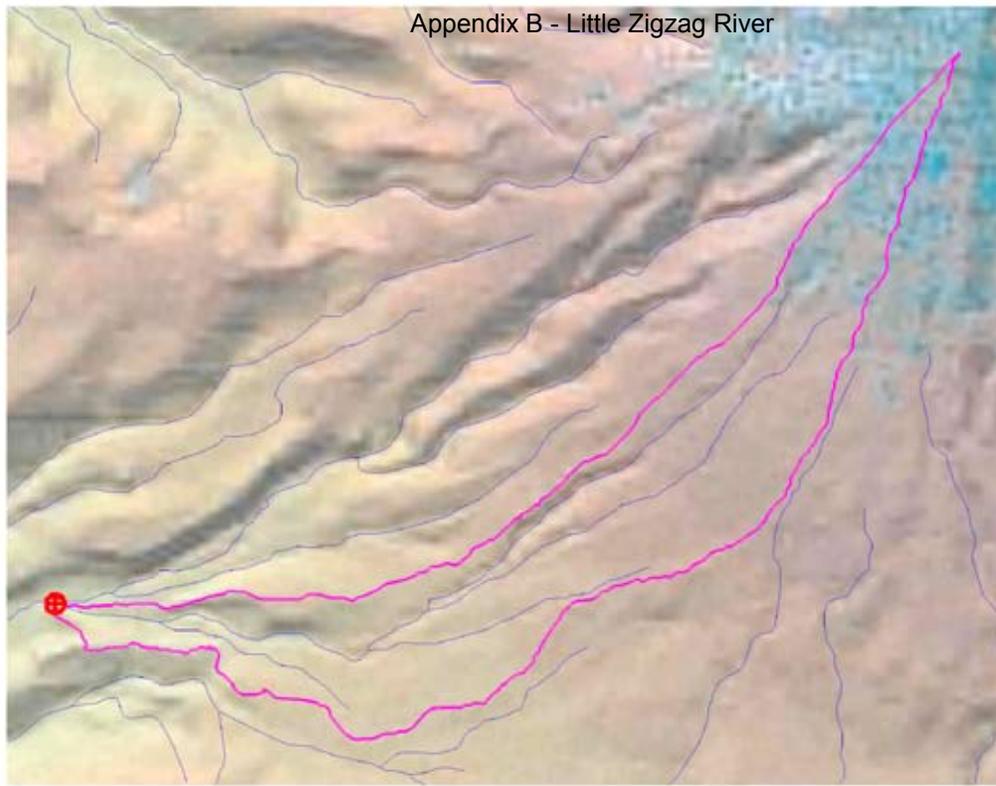
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Culvert Scour Assessment



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