

|                                                                                                                                                          |       |   |    |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---|----|----|----|
| <div> <div>NAME</div> <div>PERCENT<sub>A</sub></div> <div>PERCENT<sub>B</sub></div> <div>PERCENT<sub>C</sub></div> <div>PERCENT<sub>D</sub></div> </div> | :=    |   |    |    |    |
|                                                                                                                                                          | W-1   | 0 | 31 | 10 | 59 |
|                                                                                                                                                          | V-3   | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | W-2   | 0 | 32 | 11 | 57 |
|                                                                                                                                                          | X-1   | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | Y-1   | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | Y-2   | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | W-4   | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | W-3   | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | W-5   | 0 | 40 | 13 | 47 |
|                                                                                                                                                          | Z-1   | 0 | 34 | 11 | 54 |
|                                                                                                                                                          | BB-3  | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | BB-4  | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | BB-6  | 0 | 37 | 12 | 51 |
|                                                                                                                                                          | AA-1A | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | CC-3  | 0 | 10 | 10 | 80 |
|                                                                                                                                                          | BB-2A | 0 | 13 | 14 | 73 |
|                                                                                                                                                          | BB-2B | 1 | 67 | 22 | 10 |
|                                                                                                                                                          | BB-5  | 0 | 38 | 13 | 50 |
|                                                                                                                                                          | BB-7  | 0 | 38 | 13 | 49 |
|                                                                                                                                                          | BB-1A | 0 | 10 | 10 | 80 |
|                                                                                                                                                          | BB-1B | 0 | 15 | 5  | 80 |
|                                                                                                                                                          | BB-8  | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | BB-9  | 0 | 33 | 11 | 56 |
|                                                                                                                                                          | BB-10 | 0 | 33 | 11 | 56 |
|                                                                                                                                                          | CC-4  | 0 | 15 | 15 | 70 |
|                                                                                                                                                          | CC-5  | 0 | 35 | 12 | 53 |
|                                                                                                                                                          | CC-7  | 0 | 60 | 20 | 20 |
|                                                                                                                                                          | CC-6  | 0 | 31 | 10 | 59 |
|                                                                                                                                                          | BB-11 | 0 | 46 | 15 | 39 |
|                                                                                                                                                          | BB-12 | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | CC-2  | 0 | 13 | 12 | 75 |
|                                                                                                                                                          | CC-8  | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | CC-10 | 0 | 31 | 10 | 59 |
|                                                                                                                                                          | CC-9  | 0 | 41 | 14 | 46 |
|                                                                                                                                                          | EE-1  | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | EE-2  | 0 | 29 | 10 | 61 |
|                                                                                                                                                          | EE-4  | 0 | 31 | 10 | 59 |
|                                                                                                                                                          | CC-11 | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | CC-1  | 0 | 5  | 5  | 90 |
|                                                                                                                                                          | CC-12 | 0 | 31 | 10 | 58 |
|                                                                                                                                                          | EE-5  | 0 | 30 | 10 | 60 |
|                                                                                                                                                          | GG-1  | 0 | 15 | 15 | 70 |
|                                                                                                                                                          | HH-2  | 0 | 31 | 10 | 58 |
|                                                                                                                                                          | HH-1  | 0 | 15 | 15 | 70 |
|                                                                                                                                                          | JJ-1  | 0 | 10 | 10 | 80 |
|                                                                                                                                                          | KK-1  | 0 | 56 | 14 | 30 |
|                                                                                                                                                          | KK-2  | 0 | 33 | 11 | 57 |
|                                                                                                                                                          | LL-1  | 0 | 40 | 20 | 40 |
|                                                                                                                                                          | MM-1  | 0 | 15 | 15 | 70 |
|                                                                                                                                                          | NN-1  | 0 | 10 | 10 | 80 |
|                                                                                                                                                          | PP-1  | 0 | 15 | 15 | 70 |
|                                                                                                                                                          | QQ-1  | 0 | 20 | 20 | 60 |
|                                                                                                                                                          | RR-1  | 0 | 13 | 39 | 48 |
|                                                                                                                                                          | SS-1  | 0 | 10 | 30 | 60 |
|                                                                                                                                                          | TT-1  | 0 | 10 | 30 | 60 |
|                                                                                                                                                          | UU-1  | 0 | 10 | 10 | 80 |
|                                                                                                                                                          |       |   |    |    |    |
|                                                                                                                                                          |       |   |    |    |    |
|                                                                                                                                                          |       |   |    |    |    |

Define the Initial Abstraction Values for Each Treatment Type- From Table E-4 of SSCAFCA DPM

IA<sub>A</sub> := 0.65

IA<sub>B</sub> := 0.5

IA<sub>C</sub> := 0.35

IA<sub>D</sub> := 0.10

j := 0..57

$$IA_J := \frac{IA_A \cdot PERCENT_{A_J} + IA_B \cdot PERCENT_{B_J} + IA_C \cdot PERCENT_{C_J}}{PERCENT_{A_J} + PERCENT_{B_J} + PERCENT_{C_J}}$$

$$INF_J := \frac{INF_A \cdot PERCENT_{A_J} + INF_B \cdot PERCENT_{B_J} + INF_C \cdot PERCENT_{C_J}}{PERCENT_{A_J} + PERCENT_{B_J} + PERCENT_{C_J}}$$

Define the Infiltration Value for Each Treatment Type -  
From Table E-4 of SSCAFCA DPM

$INF_A := 1.67$        $INF_B := 1.25$        $INF_C := 0.83$

Initial Abstraction Results

| SUB-BASIN | IA       | INF      |
|-----------|----------|----------|
| V-1       | 0.4625   | 1.145    |
| V-2       | 0.4625   | 1.145    |
| W-1       | 0.4625   | 1.145    |
| V-3       | 0.4625   | 1.145    |
| W-2       | 0.4625   | 1.145    |
| X-1       | 0.4625   | 1.145    |
| Y-1       | 0.4625   | 1.145    |
| Y-2       | 0.4625   | 1.145    |
| W-4       | 0.4625   | 1.145    |
| W-3       | 0.4625   | 1.145    |
| W-5       | 0.4625   | 1.145    |
| Z-1       | 0.4625   | 1.145    |
| BB-3      | 0.4625   | 1.145    |
| BB-4      | 0.4625   | 1.145    |
| BB-6      | 0.4625   | 1.145    |
| AA-1A     | 0.4625   | 1.145    |
| CC-3      | 0.4250   | 1.040    |
| BB-2A     | 0.422222 | 1.032222 |
| BB-2B     | 0.465    | 1.152    |
| BB-5      | 0.4625   | 1.145    |
| BB-7      | 0.4625   | 1.145    |
| BB-1A     | 0.423858 | 1.036804 |
| BB-1B     | 0.4625   | 1.145    |
| BB-8      | 0.4625   | 1.145    |
| BB-9      | 0.4625   | 1.145    |
| BB-10     | 0.4625   | 1.145    |
| CC-4      | 0.425    | 1.04     |
| CC-5      | 0.4625   | 1.145    |
| CC-7      | 0.4625   | 1.145    |
| CC-6      | 0.4625   | 1.145    |
| BB-11     | 0.4625   | 1.145    |
| BB-12     | 0.4625   | 1.145    |
| CC-2      | 0.428    | 1.0484   |
| CC-8      | 0.4625   | 1.145    |
| CC-10     | 0.4625   | 1.145    |
| CC-9      | 0.4625   | 1.145    |
| EE-1      | 0.4625   | 1.145    |
| EE-2      | 0.4625   | 1.145    |
| EE-4      | 0.4625   | 1.145    |
| CC-11     | 0.4625   | 1.145    |
| CC-1      | 0.425    | 1.04     |
| CC-12     | 0.4625   | 1.145    |
| EE-5      | 0.4625   | 1.145    |
| GG-1      | 0.425    | 1.04     |
| HH-2      | 0.4625   | 1.145    |
| HH-1      | 0.425    | 1.04     |
| JJ-1      | 0.425    | 1.04     |
| KK-1      | 0.47     | 1.166    |
| KK-2      | 0.4625   | 1.145    |
| LL-1      | 0.45     | 1.11     |
| MM-1      | 0.425    | 1.04     |
| NN-1      | 0.425    | 1.04     |
| PP-1      | 0.425    | 1.04     |
| QQ-1      | 0.425    | 1.04     |
| RR-1      | 0.3875   | 0.935    |
| SS-1      | 0.3875   | 0.935    |
| TT-1      | 0.3875   | 0.935    |
| UU-1      | 0.425    | 1.04     |

(NAME IA INF)

This starts the portion of the sheet to calculate the Storage Coefficient (R).

Bring in the calculated Tc values from other files.

$t_c :=$

|       |       |
|-------|-------|
|       |       |
| V-1   | 0.222 |
| V-2   | 0.246 |
| W-1   | 0.287 |
| V-3   | 0.373 |
| W-2   | 0.309 |
| X-1   | 0.204 |
| Y-1   | 0.133 |
| Y-2   | 0.303 |
| W-4   | 0.42  |
| W-3   | 0.216 |
| W-5   | 0.21  |
| Z-1   | 0.245 |
| BB-3  | 0.208 |
| BB-4  | 0.34  |
| BB-6  | 0.295 |
| AA-1A | 0.177 |
| CC-3  | 0.287 |
| BB-2A | 0.501 |
| BB-2B | 0.398 |
| BB-5  | 0.303 |
| BB-7  | 0.354 |
| BB-1A | 0.177 |
| BB-1B | 0.322 |
| BB-8  | 0.294 |
| BB-9  | 0.248 |
| BB-10 | 0.147 |
| CC-4  | 0.208 |
| CC-5  | 0.273 |
| CC-7  | 0.133 |
| CC-6  | 0.135 |
| BB-11 | 0.211 |
| BB-12 | 0.428 |
| CC-2  | 0.238 |
| CC-8  | 0.191 |
| CC-10 | 0.351 |
| CC-9  | 0.425 |
| EE-1  | 0.235 |
| EE-2  | 0.597 |
| EE-4  | 0.191 |
| CC-11 | 0.151 |
| CC-1  | 0.133 |
| CC-12 | 0.223 |
| EE-5  | 0.445 |
| GG-1  | 0.209 |
| HH-2  | 0.751 |
| HH-1  | 0.282 |
| JJ-1  | 0.14  |
| KK-1  | 0.247 |
| KK-2  | 0.447 |
| LL-1  | 0.231 |
| MM-1  | 0.216 |
| NN-1  | 0.152 |
| PP-1  | 0.177 |
| QQ-1  | 0.138 |
| RR-1  | 0.13  |
| SS-1  | 0.19  |
| TT-1  | 0.22  |
| UU-1  | 0.24  |
|       |       |

NAME

Per the SSCAFCA DPM an adjustment is required to the traditional tc in order to make the hydrograph mimic a hydrograph computed in AHYMO. The adjustment is to multiply the tc by 2/3.

$$t_{c\_mod,j} := \begin{cases} 0.1333 & \text{if } t_{c,j} \leq 0.20 \\ \left(t_{c,j} \cdot \frac{2}{3}\right) & \text{otherwise} \end{cases}$$

|       |          |
|-------|----------|
| V-1   | 0.148    |
| V-2   | 0.164    |
| W-1   | 0.191333 |
| V-3   | 0.248667 |
| W-2   | 0.206    |
| X-1   | 0.136    |
| Y-1   | 0.1333   |
| Y-2   | 0.202    |
| W-4   | 0.28     |
| W-3   | 0.144    |
| W-5   | 0.14     |
| Z-1   | 0.163333 |
| BB-3  | 0.138667 |
| BB-4  | 0.226667 |
| BB-6  | 0.196667 |
| AA-1A | 0.1333   |
| CC-3  | 0.191333 |
| BB-2A | 0.334    |
| BB-2B | 0.265333 |
| BB-5  | 0.202    |
| BB-7  | 0.236    |
| BB-1A | 0.1333   |
| BB-1B | 0.214667 |
| BB-8  | 0.196    |
| BB-9  | 0.165333 |
| BB-10 | 0.1333   |
| CC-4  | 0.138667 |
| CC-5  | 0.182    |
| CC-7  | 0.1333   |
| CC-6  | 0.1333   |
| BB-11 | 0.140667 |
| BB-12 | 0.285333 |
| CC-2  | 0.158667 |
| CC-8  | 0.1333   |
| CC-10 | 0.234    |
| CC-9  | 0.283333 |
| EE-1  | 0.156667 |
| EE-2  | 0.398    |
| EE-4  | 0.1333   |
| CC-11 | 0.1333   |
| CC-1  | 0.1333   |
| CC-12 | 0.148667 |
| EE-5  | 0.296667 |
| GG-1  | 0.139333 |
| HH-2  | 0.500667 |
| HH-1  | 0.188    |
| JJ-1  | 0.1333   |
| KK-1  | 0.164667 |
| KK-2  | 0.298    |
| LL-1  | 0.154    |
| MM-1  | 0.144    |
| NN-1  | 0.1333   |
| PP-1  | 0.1333   |
| QQ-1  | 0.1333   |
| RR-1  | 0.1333   |
| SS-1  | 0.1333   |
| TT-1  | 0.146667 |
| UU-1  | 0.16     |
|       |          |
|       |          |

(NAME t<sub>c\_mod</sub>)

Now the Storage Coefficient (R) can be calculated

$$R_{\text{my}} := 1.165 \cdot t_{c\_mod\_j} \cdot \left[ \left( INF_j \right)^{0.45} - \left( IA_j \right)^{1.4} \cdot \left( \frac{PERCENT_{D_j}}{100} \right)^{0.4} \right]$$

SUMMARY TABLE with R values

Alternative Method for Calculating R based on Stantec's  
"Technical Documentation for use of HEC-HMS with the  
Development Process Manual

$$R_{\text{stan}_j} := 1.165 \cdot t_{c\_j} \cdot \left[ \left( INF_j \right)^{0.45} - \left( IA_j \right)^{1.4} \cdot \left( \frac{PERCENT_{D_j}}{100} \right)^{0.4} \right]$$

Per Conversations with Stantec and SSCAFCA this is not  
their intended methodology. The strict DPM method should  
be used, not what is shown in Stantec's background manual.

|       | IA    | INF   | t <sub>c</sub> | t <sub>c_mod</sub> | R       | R <sub>stan</sub> |
|-------|-------|-------|----------------|--------------------|---------|-------------------|
| V-1   | 0.463 | 1.145 | 0.222          | 0.148              | 0.13653 | 0.204799          |
| V-2   | 0.463 | 1.145 | 0.246          | 0.164              | 0.15155 | 0.227325          |
| W-1   | 0.463 | 1.145 | 0.287          | 0.191              | 0.17560 | 0.263402          |
| V-3   | 0.463 | 1.145 | 0.373          | 0.249              | 0.22712 | 0.340686          |
| W-2   | 0.463 | 1.145 | 0.309          | 0.206              | 0.19000 | 0.285002          |
| X-1   | 0.463 | 1.145 | 0.204          | 0.136              | 0.12456 | 0.186843          |
| Y-1   | 0.463 | 1.145 | 0.133          | 0.133              | 0.12169 | 0.121421          |
| Y-2   | 0.463 | 1.145 | 0.303          | 0.202              | 0.18448 | 0.276715          |
| W-4   | 0.463 | 1.145 | 0.42           | 0.280              | 0.25625 | 0.384375          |
| W-3   | 0.463 | 1.145 | 0.216          | 0.144              | 0.13171 | 0.197561          |
| W-5   | 0.463 | 1.145 | 0.21           | 0.140              | 0.13237 | 0.198549          |
| Z-1   | 0.463 | 1.145 | 0.245          | 0.163              | 0.15154 | 0.227311          |
| BB-3  | 0.463 | 1.145 | 0.208          | 0.139              | 0.12691 | 0.190361          |
| BB-4  | 0.463 | 1.145 | 0.34           | 0.227              | 0.20763 | 0.311451          |
| BB-6  | 0.463 | 1.145 | 0.295          | 0.197              | 0.18420 | 0.276293          |
| AA-1A | 0.463 | 1.145 | 0.177          | 0.133              | 0.12204 | 0.16205           |
| CC-3  | 0.425 | 1.04  | 0.287          | 0.191              | 0.16534 | 0.248011          |
| BB-2A | 0.422 | 1.032 | 0.501          | 0.334              | 0.29210 | 0.43815           |
| BB-2B | 0.465 | 1.152 | 0.398          | 0.265              | 0.28731 | 0.430965          |
| BB-5  | 0.463 | 1.145 | 0.303          | 0.202              | 0.18957 | 0.284356          |
| BB-7  | 0.463 | 1.145 | 0.354          | 0.236              | 0.22202 | 0.333032          |
| BB-1A | 0.424 | 1.037 | 0.177          | 0.133              | 0.11513 | 0.152878          |
| BB-1B | 0.463 | 1.145 | 0.322          | 0.215              | 0.18809 | 0.282132          |
| BB-8  | 0.463 | 1.145 | 0.294          | 0.196              | 0.17893 | 0.268395          |
| BB-9  | 0.463 | 1.145 | 0.248          | 0.165              | 0.15270 | 0.229052          |
| BB-10 | 0.463 | 1.145 | 0.147          | 0.133              | 0.12330 | 0.135971          |
| CC-4  | 0.425 | 1.040 | 0.208          | 0.139              | 0.12215 | 0.183223          |
| CC-5  | 0.463 | 1.145 | 0.273          | 0.182              | 0.16933 | 0.253996          |
| CC-7  | 0.463 | 1.145 | 0.133          | 0.133              | 0.13747 | 0.137156          |
| CC-6  | 0.463 | 1.145 | 0.135          | 0.133              | 0.12229 | 0.123852          |
| BB-11 | 0.463 | 1.145 | 0.211          | 0.141              | 0.13595 | 0.203929          |
| BB-12 | 0.463 | 1.145 | 0.428          | 0.285              | 0.26127 | 0.391903          |
| CC-2  | 0.428 | 1.048 | 0.238          | 0.159              | 0.13860 | 0.207904          |
| CC-8  | 0.463 | 1.145 | 0.191          | 0.133              | 0.12181 | 0.17453           |
| CC-10 | 0.463 | 1.145 | 0.351          | 0.234              | 0.21457 | 0.321858          |
| CC-9  | 0.463 | 1.145 | 0.425          | 0.283              | 0.26864 | 0.402954          |
| EE-1  | 0.463 | 1.145 | 0.235          | 0.157              | 0.14305 | 0.214568          |
| EE-2  | 0.463 | 1.145 | 0.597          | 0.398              | 0.36335 | 0.545031          |
| EE-4  | 0.463 | 1.145 | 0.191          | 0.133              | 0.12231 | 0.175258          |
| CC-11 | 0.463 | 1.145 | 0.151          | 0.133              | 0.12196 | 0.138154          |
| CC-1  | 0.425 | 1.040 | 0.133          | 0.133              | 0.11312 | 0.112869          |
| CC-12 | 0.463 | 1.145 | 0.223          | 0.149              | 0.13660 | 0.204897          |
| EE-5  | 0.463 | 1.145 | 0.445          | 0.297              | 0.27152 | 0.407279          |
| GG-1  | 0.425 | 1.040 | 0.209          | 0.139              | 0.12274 | 0.184103          |
| HH-2  | 0.463 | 1.145 | 0.751          | 0.501              | 0.46042 | 0.690633          |
| HH-1  | 0.425 | 1.040 | 0.282          | 0.188              | 0.16560 | 0.248407          |
| JJ-1  | 0.425 | 1.040 | 0.140          | 0.133              | 0.11519 | 0.120981          |
| KK-1  | 0.470 | 1.166 | 0.247          | 0.165              | 0.16438 | 0.246571          |
| KK-2  | 0.463 | 1.145 | 0.447          | 0.298              | 0.27504 | 0.412553          |
| LL-1  | 0.450 | 1.110 | 0.231          | 0.154              | 0.14738 | 0.221065          |
| MM-1  | 0.425 | 1.040 | 0.216          | 0.144              | 0.12685 | 0.19027           |
| NN-1  | 0.425 | 1.040 | 0.152          | 0.133              | 0.11519 | 0.131351          |
| PP-1  | 0.425 | 1.040 | 0.177          | 0.133              | 0.11742 | 0.155915          |
| QQ-1  | 0.425 | 1.040 | 0.138          | 0.133              | 0.11985 | 0.124077          |
| RR-1  | 0.388 | 0.935 | 0.130          | 0.133              | 0.11996 | 0.116992          |
| SS-1  | 0.388 | 0.935 | 0.190          | 0.133              | 0.11709 | 0.166901          |
| TT-1  | 0.388 | 0.935 | 0.220          | 0.147              | 0.12884 | 0.193254          |
| UU-1  | 0.425 | 1.040 | 0.240          | 0.160              | 0.13826 | 0.207396          |

(NAME IA INF t<sub>c</sub> t<sub>c\_mod</sub> R R<sub>stan</sub>)