

## **APPENDIX H: HYDROGRAPH RISE TIME**

The hydrograph Rise Time ( $T_r$ ) is determined in the following manner:

- a. For  $T_c \leq 60$  minutes, read the corresponding value for  $T_r$  from Table K-1.
- b. For  $T_c > 60$  minutes, determine  $T_r$  from the following equation:

Equation K.1 
$$T_r = \frac{0.7869 P_n T_c}{P_c}$$

Where;

- $T_r$  = hydrograph rise time, in hours;
- $T_c$  = time of concentration, in hours;
- $P_n$  = \*n-hour precipitation depth, in inches; and,
- $P_c$  = \*\*precipitation depth at  $T_c$ , in inches.

\*n-hour refers to the 2-, 3-, 6-, 12-, or 24-hour precipitation depths, where "n" should normally be the smallest of these values which is greater than  $T_c$ .

\*\* $P_c$  is calculated by linear interpolation between the calculated rainfall depths which bracket  $T_c$ . (e.g., if  $T_c = 2.5$  hours then  $P_c$  is halfway between the 2-hour and 3-hour rainfall depths).

**Hydrograph Rise Times for  $T_c \leq 60$  Minutes**  
 ( $T_c$  and  $T_r$  are in minutes)

$T_c$	$T_r$	$T_c$	$T_r$
5	13.6	33	31.9
6	14.2	34	32.3
7	15.0	35	33.0
8	15.8	36	33.5
9	16.6	37	34.2
10	17.5	38	34.7
11	18.1	39	35.2
12	18.7	40	36.0
13	19.4	41	36.6
14	19.9	42	37.2
15	20.7	43	37.8
16	21.3	44	38.4
17	21.9	45	38.7
18	22.5	46	39.3
19	23.1	47	40.0
20	23.7	48	40.4
21	24.5	49	41.1
22	25.0	50	41.8
23	25.7	51	42.2
24	26.2	52	42.9
25	27.0	53	43.3
26	27.6	54	43.7
27	28.1	55	44.5
28	28.8	56	45.0
29	29.3	57	45.4
30	29.9	58	46.3
31	30.7	59	46.7
32	31.3	60	47.2

Table K.1 Hydrograph Rise Times for  $T_c \leq 60$  minutes