

# **APPENDIX B**

Rainfall Intensity Table for Sedgwick County, Kansas

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Intensity values are based on regression analysis of data obtained from NOAA Atlas 14, Volume 8); Return Periods 1-yr through 10-yr based on Point Precipitation Frequency Estimates (Partial Duration Series); Return Periods 25-yr through 1000-yr based on Point Precipitation Frequency Estimates (Annual Maximum Series). Data values used in the regression analysis were obtained from the NOAA Precipitation Frequency Data Server for Wichita-Mid Continent weather station location.

**Table 1 City of Wichita and Sedgwick County, KS Rainfall Intensity Table (Duration 5 min – 120 min)**

| DURATION<br>in hours | DURATION<br>in | Return Period |      |      |       |       |       |        |        |        |         |
|----------------------|----------------|---------------|------|------|-------|-------|-------|--------|--------|--------|---------|
|                      |                | 1-yr          | 2-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr | 200-yr | 500-yr | 1000-yr |
| 0.0833               | 5              | 5.07          | 5.43 | 6.79 | 7.82  | 9.14  | 10.16 | 11.17  | 12.16  | 13.45  | 14.44   |
| 0.1000               | 6              | 4.75          | 5.08 | 6.35 | 7.30  | 8.53  | 9.46  | 10.38  | 11.28  | 12.45  | 13.32   |
| 0.1167               | 7              | 4.47          | 4.78 | 5.97 | 6.87  | 8.02  | 8.88  | 9.73   | 10.56  | 11.64  | 12.44   |
| 0.1333               | 8              | 4.22          | 4.52 | 5.65 | 6.49  | 7.58  | 8.39  | 9.18   | 9.96   | 10.97  | 11.71   |
| 0.1500               | 9              | 4.01          | 4.29 | 5.36 | 6.16  | 7.19  | 7.96  | 8.71   | 9.44   | 10.40  | 11.10   |
| 0.1667               | 10             | 3.82          | 4.09 | 5.11 | 5.87  | 6.86  | 7.59  | 8.30   | 9.00   | 9.91   | 10.57   |
| 0.1833               | 11             | 3.65          | 3.90 | 4.88 | 5.62  | 6.56  | 7.26  | 7.94   | 8.61   | 9.48   | 10.12   |
| 0.2000               | 12             | 3.50          | 3.74 | 4.68 | 5.38  | 6.29  | 6.96  | 7.62   | 8.26   | 9.10   | 9.72    |
| 0.2167               | 13             | 3.36          | 3.59 | 4.50 | 5.18  | 6.05  | 6.70  | 7.33   | 7.95   | 8.76   | 9.36    |
| 0.2333               | 14             | 3.23          | 3.46 | 4.33 | 4.99  | 5.83  | 6.46  | 7.07   | 7.67   | 8.46   | 9.04    |
| 0.2500               | 15             | 3.12          | 3.34 | 4.18 | 4.81  | 5.63  | 6.24  | 6.83   | 7.42   | 8.19   | 8.75    |
| 0.2667               | 16             | 3.01          | 3.22 | 4.04 | 4.66  | 5.45  | 6.04  | 6.62   | 7.19   | 7.94   | 8.49    |
| 0.2833               | 17             | 2.92          | 3.12 | 3.92 | 4.51  | 5.28  | 5.86  | 6.42   | 6.98   | 7.71   | 8.25    |
| 0.3000               | 18             | 2.83          | 3.02 | 3.80 | 4.37  | 5.13  | 5.69  | 6.24   | 6.78   | 7.50   | 8.03    |
| 0.3167               | 19             | 2.74          | 2.93 | 3.69 | 4.25  | 4.99  | 5.53  | 6.07   | 6.60   | 7.31   | 7.83    |
| 0.3333               | 20             | 2.67          | 2.85 | 3.58 | 4.13  | 4.85  | 5.38  | 5.91   | 6.43   | 7.13   | 7.64    |
| 0.3500               | 21             | 2.59          | 2.77 | 3.49 | 4.02  | 4.73  | 5.25  | 5.76   | 6.28   | 6.96   | 7.46    |
| 0.3667               | 22             | 2.52          | 2.70 | 3.40 | 3.92  | 4.61  | 5.12  | 5.63   | 6.13   | 6.80   | 7.30    |
| 0.3833               | 23             | 2.46          | 2.63 | 3.32 | 3.83  | 4.50  | 5.00  | 5.50   | 6.00   | 6.65   | 7.14    |
| 0.4000               | 24             | 2.40          | 2.57 | 3.24 | 3.74  | 4.40  | 4.89  | 5.38   | 5.87   | 6.52   | 7.00    |
| 0.4167               | 25             | 2.34          | 2.51 | 3.16 | 3.65  | 4.30  | 4.78  | 5.27   | 5.75   | 6.39   | 6.87    |
| 0.4333               | 26             | 2.29          | 2.45 | 3.09 | 3.57  | 4.21  | 4.68  | 5.16   | 5.63   | 6.26   | 6.74    |
| 0.4500               | 27             | 2.24          | 2.40 | 3.02 | 3.50  | 4.12  | 4.59  | 5.06   | 5.53   | 6.15   | 6.62    |
| 0.4667               | 28             | 2.19          | 2.34 | 2.96 | 3.42  | 4.04  | 4.50  | 4.96   | 5.42   | 6.04   | 6.50    |
| 0.4833               | 29             | 2.15          | 2.30 | 2.90 | 3.35  | 3.96  | 4.42  | 4.87   | 5.33   | 5.94   | 6.39    |
| 0.5000               | 30             | 2.10          | 2.25 | 2.84 | 3.29  | 3.89  | 4.33  | 4.78   | 5.24   | 5.84   | 6.29    |
| 0.5167               | 31             | 2.06          | 2.20 | 2.79 | 3.23  | 3.82  | 4.26  | 4.70   | 5.15   | 5.74   | 6.19    |
| 0.5333               | 32             | 2.02          | 2.16 | 2.74 | 3.17  | 3.75  | 4.18  | 4.62   | 5.06   | 5.65   | 6.10    |
| 0.5500               | 33             | 1.98          | 2.12 | 2.69 | 3.11  | 3.68  | 4.11  | 4.55   | 4.98   | 5.57   | 6.01    |
| 0.5667               | 34             | 1.95          | 2.08 | 2.64 | 3.06  | 3.62  | 4.05  | 4.48   | 4.91   | 5.48   | 5.92    |
| 0.5833               | 35             | 1.91          | 2.05 | 2.59 | 3.01  | 3.56  | 3.98  | 4.41   | 4.83   | 5.40   | 5.84    |
| 0.6000               | 36             | 1.88          | 2.01 | 2.55 | 2.96  | 3.50  | 3.92  | 4.34   | 4.76   | 5.33   | 5.76    |
| 0.6167               | 37             | 1.85          | 1.98 | 2.51 | 2.91  | 3.45  | 3.86  | 4.28   | 4.70   | 5.26   | 5.69    |
| 0.6333               | 38             | 1.82          | 1.94 | 2.47 | 2.86  | 3.40  | 3.80  | 4.22   | 4.63   | 5.19   | 5.61    |
| 0.6500               | 39             | 1.79          | 1.91 | 2.43 | 2.82  | 3.35  | 3.75  | 4.16   | 4.57   | 5.12   | 5.54    |
| 0.6667               | 40             | 1.76          | 1.88 | 2.39 | 2.78  | 3.30  | 3.70  | 4.10   | 4.51   | 5.06   | 5.48    |
| 0.6833               | 41             | 1.73          | 1.85 | 2.36 | 2.74  | 3.25  | 3.65  | 4.05   | 4.45   | 4.99   | 5.41    |
| 0.7000               | 42             | 1.71          | 1.83 | 2.32 | 2.70  | 3.21  | 3.60  | 3.99   | 4.39   | 4.93   | 5.35    |
| 0.7167               | 43             | 1.68          | 1.80 | 2.29 | 2.66  | 3.16  | 3.55  | 3.94   | 4.34   | 4.88   | 5.29    |
| 0.7333               | 44             | 1.66          | 1.77 | 2.26 | 2.62  | 3.12  | 3.51  | 3.89   | 4.29   | 4.82   | 5.23    |
| 0.7500               | 45             | 1.63          | 1.75 | 2.22 | 2.59  | 3.08  | 3.46  | 3.85   | 4.24   | 4.76   | 5.17    |
| 0.7667               | 46             | 1.61          | 1.72 | 2.19 | 2.55  | 3.04  | 3.42  | 3.80   | 4.19   | 4.71   | 5.12    |
| 0.7833               | 47             | 1.59          | 1.70 | 2.17 | 2.52  | 3.00  | 3.38  | 3.76   | 4.14   | 4.66   | 5.07    |
| 0.8000               | 48             | 1.57          | 1.68 | 2.14 | 2.49  | 2.97  | 3.34  | 3.71   | 4.10   | 4.61   | 5.01    |
| 0.8167               | 49             | 1.55          | 1.66 | 2.11 | 2.46  | 2.93  | 3.30  | 3.67   | 4.05   | 4.56   | 4.96    |
| 0.8333               | 50             | 1.53          | 1.63 | 2.08 | 2.43  | 2.90  | 3.26  | 3.63   | 4.01   | 4.52   | 4.92    |
| 0.8500               | 51             | 1.51          | 1.61 | 2.06 | 2.40  | 2.86  | 3.22  | 3.59   | 3.97   | 4.47   | 4.87    |
| 0.8667               | 52             | 1.49          | 1.59 | 2.03 | 2.37  | 2.83  | 3.19  | 3.56   | 3.93   | 4.43   | 4.82    |
| 0.8833               | 53             | 1.47          | 1.57 | 2.01 | 2.34  | 2.80  | 3.16  | 3.52   | 3.89   | 4.39   | 4.78    |
| 0.9000               | 54             | 1.45          | 1.56 | 1.99 | 2.32  | 2.77  | 3.12  | 3.48   | 3.85   | 4.35   | 4.74    |
| 0.9167               | 55             | 1.43          | 1.54 | 1.96 | 2.29  | 2.74  | 3.09  | 3.45   | 3.81   | 4.31   | 4.69    |
| 0.9333               | 56             | 1.42          | 1.52 | 1.94 | 2.27  | 2.71  | 3.06  | 3.41   | 3.78   | 4.27   | 4.65    |
| 0.9500               | 57             | 1.40          | 1.50 | 1.92 | 2.24  | 2.68  | 3.03  | 3.38   | 3.74   | 4.23   | 4.61    |
| 0.9667               | 58             | 1.39          | 1.49 | 1.90 | 2.22  | 2.65  | 3.00  | 3.35   | 3.71   | 4.19   | 4.57    |
| 0.9833               | 59             | 1.37          | 1.47 | 1.88 | 2.19  | 2.63  | 2.97  | 3.32   | 3.67   | 4.16   | 4.54    |

**Appendix B**

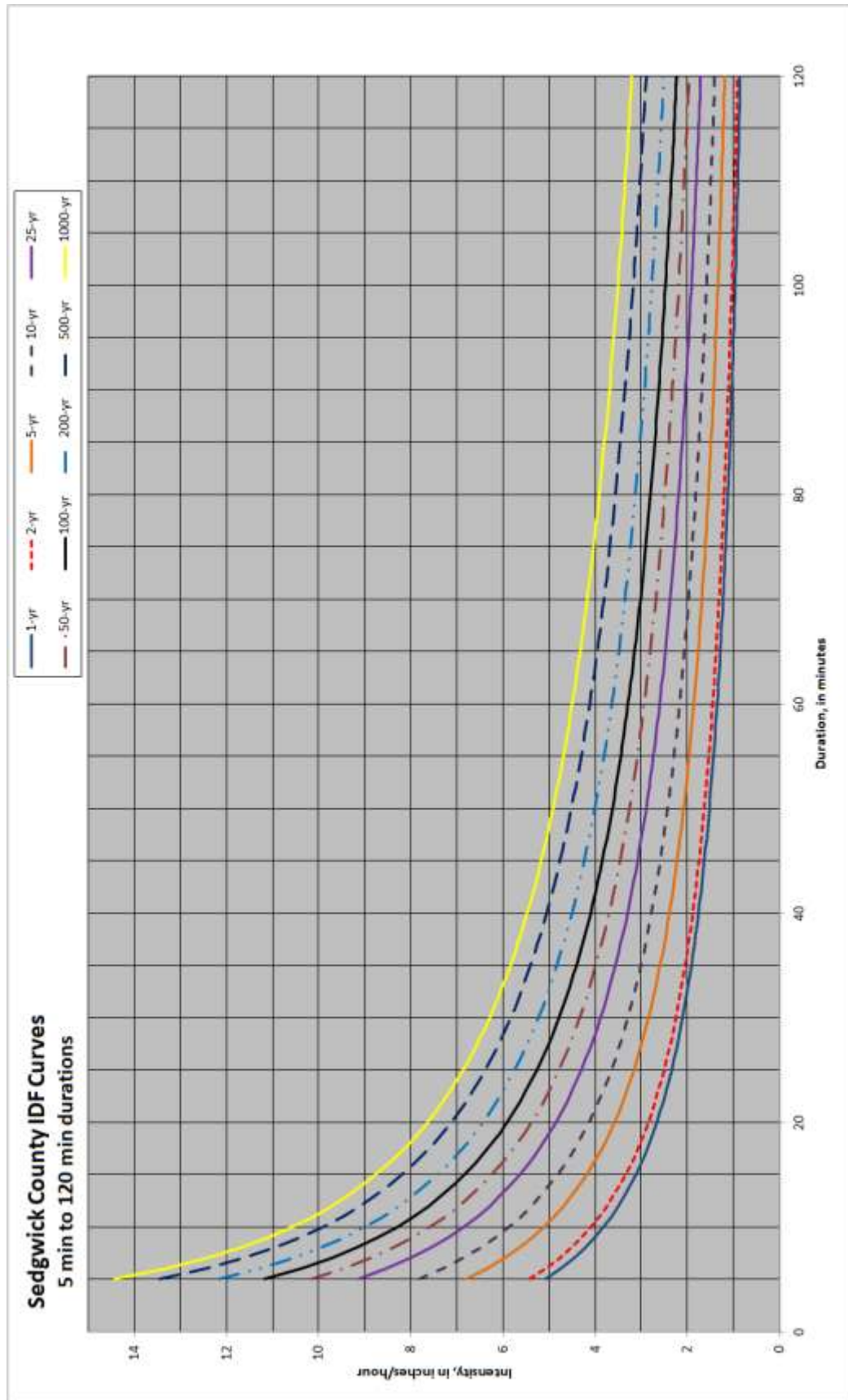
| DURATION<br>in hours | DURATION<br>in | Return Period |      |      |       |       |       |        |        |        |         |
|----------------------|----------------|---------------|------|------|-------|-------|-------|--------|--------|--------|---------|
|                      |                | 1-yr          | 2-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr | 200-yr | 500-yr | 1000-yr |
| 1.0000               | 60             | 1.36          | 1.45 | 1.86 | 2.17  | 2.60  | 2.94  | 3.29   | 3.64   | 4.12   | 4.50    |
| 1.0167               | 61             | 1.34          | 1.44 | 1.84 | 2.15  | 2.58  | 2.91  | 3.26   | 3.61   | 4.09   | 4.46    |
| 1.0333               | 62             | 1.33          | 1.42 | 1.82 | 2.13  | 2.55  | 2.88  | 3.23   | 3.58   | 4.05   | 4.43    |
| 1.0500               | 63             | 1.31          | 1.41 | 1.80 | 2.11  | 2.53  | 2.86  | 3.20   | 3.55   | 4.02   | 4.39    |
| 1.0667               | 64             | 1.30          | 1.39 | 1.78 | 2.09  | 2.50  | 2.83  | 3.17   | 3.52   | 3.99   | 4.36    |
| 1.0833               | 65             | 1.29          | 1.38 | 1.77 | 2.07  | 2.48  | 2.81  | 3.14   | 3.49   | 3.96   | 4.33    |
| 1.1000               | 66             | 1.27          | 1.36 | 1.75 | 2.05  | 2.46  | 2.78  | 3.12   | 3.46   | 3.93   | 4.30    |
| 1.1167               | 67             | 1.26          | 1.35 | 1.73 | 2.03  | 2.44  | 2.76  | 3.09   | 3.43   | 3.90   | 4.26    |
| 1.1333               | 68             | 1.25          | 1.34 | 1.72 | 2.01  | 2.41  | 2.74  | 3.07   | 3.41   | 3.87   | 4.23    |
| 1.1500               | 69             | 1.24          | 1.33 | 1.70 | 1.99  | 2.39  | 2.71  | 3.04   | 3.38   | 3.84   | 4.20    |
| 1.1667               | 70             | 1.22          | 1.31 | 1.69 | 1.97  | 2.37  | 2.69  | 3.02   | 3.35   | 3.81   | 4.18    |
| 1.1833               | 71             | 1.21          | 1.30 | 1.67 | 1.96  | 2.35  | 2.67  | 2.99   | 3.33   | 3.78   | 4.15    |
| 1.2000               | 72             | 1.20          | 1.29 | 1.65 | 1.94  | 2.33  | 2.65  | 2.97   | 3.30   | 3.76   | 4.12    |
| 1.2167               | 73             | 1.19          | 1.28 | 1.64 | 1.92  | 2.31  | 2.63  | 2.95   | 3.28   | 3.73   | 4.09    |
| 1.2333               | 74             | 1.18          | 1.27 | 1.63 | 1.91  | 2.30  | 2.61  | 2.93   | 3.26   | 3.70   | 4.06    |
| 1.2500               | 75             | 1.17          | 1.25 | 1.61 | 1.89  | 2.28  | 2.59  | 2.91   | 3.23   | 3.68   | 4.04    |
| 1.2667               | 76             | 1.16          | 1.24 | 1.60 | 1.88  | 2.26  | 2.57  | 2.88   | 3.21   | 3.66   | 4.01    |
| 1.2833               | 77             | 1.15          | 1.23 | 1.59 | 1.86  | 2.24  | 2.55  | 2.86   | 3.19   | 3.63   | 3.99    |
| 1.3000               | 78             | 1.14          | 1.22 | 1.57 | 1.85  | 2.22  | 2.53  | 2.84   | 3.17   | 3.61   | 3.96    |
| 1.3167               | 79             | 1.13          | 1.21 | 1.56 | 1.83  | 2.21  | 2.51  | 2.82   | 3.15   | 3.58   | 3.94    |
| 1.3333               | 80             | 1.12          | 1.20 | 1.55 | 1.82  | 2.19  | 2.49  | 2.80   | 3.12   | 3.56   | 3.91    |
| 1.3500               | 81             | 1.11          | 1.19 | 1.53 | 1.80  | 2.17  | 2.47  | 2.78   | 3.10   | 3.54   | 3.89    |
| 1.3667               | 82             | 1.10          | 1.18 | 1.52 | 1.79  | 2.16  | 2.46  | 2.76   | 3.08   | 3.52   | 3.87    |
| 1.3833               | 83             | 1.09          | 1.17 | 1.51 | 1.77  | 2.14  | 2.44  | 2.75   | 3.06   | 3.49   | 3.84    |
| 1.4000               | 84             | 1.08          | 1.16 | 1.50 | 1.76  | 2.13  | 2.42  | 2.73   | 3.04   | 3.47   | 3.82    |
| 1.4167               | 85             | 1.08          | 1.15 | 1.49 | 1.75  | 2.11  | 2.41  | 2.71   | 3.02   | 3.45   | 3.80    |
| 1.4333               | 86             | 1.07          | 1.15 | 1.48 | 1.74  | 2.10  | 2.39  | 2.69   | 3.01   | 3.43   | 3.78    |
| 1.4500               | 87             | 1.06          | 1.14 | 1.47 | 1.72  | 2.08  | 2.37  | 2.68   | 2.99   | 3.41   | 3.76    |
| 1.4667               | 88             | 1.05          | 1.13 | 1.45 | 1.71  | 2.07  | 2.36  | 2.66   | 2.97   | 3.39   | 3.73    |
| 1.4833               | 89             | 1.04          | 1.12 | 1.44 | 1.70  | 2.05  | 2.34  | 2.64   | 2.95   | 3.37   | 3.71    |
| 1.5000               | 90             | 1.04          | 1.11 | 1.43 | 1.69  | 2.04  | 2.33  | 2.63   | 2.93   | 3.35   | 3.69    |
| 1.5167               | 91             | 1.03          | 1.10 | 1.42 | 1.68  | 2.03  | 2.31  | 2.61   | 2.92   | 3.33   | 3.67    |
| 1.5333               | 92             | 1.02          | 1.09 | 1.41 | 1.66  | 2.01  | 2.30  | 2.59   | 2.90   | 3.32   | 3.65    |
| 1.5500               | 93             | 1.01          | 1.09 | 1.40 | 1.65  | 2.00  | 2.28  | 2.58   | 2.88   | 3.30   | 3.64    |
| 1.5667               | 94             | 1.01          | 1.08 | 1.39 | 1.64  | 1.99  | 2.27  | 2.56   | 2.87   | 3.28   | 3.62    |
| 1.5833               | 95             | 1.00          | 1.07 | 1.38 | 1.63  | 1.97  | 2.25  | 2.55   | 2.85   | 3.26   | 3.60    |
| 1.6000               | 96             | 0.99          | 1.06 | 1.37 | 1.62  | 1.96  | 2.24  | 2.53   | 2.83   | 3.25   | 3.58    |
| 1.6167               | 97             | 0.98          | 1.06 | 1.37 | 1.61  | 1.95  | 2.23  | 2.52   | 2.82   | 3.23   | 3.56    |
| 1.6333               | 98             | 0.98          | 1.05 | 1.36 | 1.60  | 1.94  | 2.21  | 2.50   | 2.80   | 3.21   | 3.54    |
| 1.6500               | 99             | 0.97          | 1.04 | 1.35 | 1.59  | 1.93  | 2.20  | 2.49   | 2.79   | 3.19   | 3.53    |
| 1.6667               | 100            | 0.96          | 1.04 | 1.34 | 1.58  | 1.91  | 2.19  | 2.48   | 2.77   | 3.18   | 3.51    |
| 1.6833               | 101            | 0.96          | 1.03 | 1.33 | 1.57  | 1.90  | 2.18  | 2.46   | 2.76   | 3.16   | 3.49    |
| 1.7000               | 102            | 0.95          | 1.02 | 1.32 | 1.56  | 1.89  | 2.16  | 2.45   | 2.74   | 3.15   | 3.48    |
| 1.7167               | 103            | 0.95          | 1.01 | 1.31 | 1.55  | 1.88  | 2.15  | 2.43   | 2.73   | 3.13   | 3.46    |
| 1.7333               | 104            | 0.94          | 1.01 | 1.30 | 1.54  | 1.87  | 2.14  | 2.42   | 2.71   | 3.12   | 3.44    |
| 1.7500               | 105            | 0.93          | 1.00 | 1.30 | 1.53  | 1.86  | 2.13  | 2.41   | 2.70   | 3.10   | 3.43    |
| 1.7667               | 106            | 0.93          | 1.00 | 1.29 | 1.52  | 1.85  | 2.12  | 2.40   | 2.69   | 3.09   | 3.41    |
| 1.7833               | 107            | 0.92          | 0.99 | 1.28 | 1.51  | 1.84  | 2.10  | 2.38   | 2.67   | 3.07   | 3.40    |
| 1.8000               | 108            | 0.92          | 0.98 | 1.27 | 1.50  | 1.83  | 2.09  | 2.37   | 2.66   | 3.06   | 3.38    |
| 1.8167               | 109            | 0.91          | 0.98 | 1.27 | 1.49  | 1.82  | 2.08  | 2.36   | 2.65   | 3.04   | 3.36    |
| 1.8333               | 110            | 0.90          | 0.97 | 1.26 | 1.49  | 1.81  | 2.07  | 2.35   | 2.63   | 3.03   | 3.35    |
| 1.8500               | 111            | 0.90          | 0.96 | 1.25 | 1.48  | 1.80  | 2.06  | 2.33   | 2.62   | 3.01   | 3.34    |
| 1.8667               | 112            | 0.89          | 0.96 | 1.24 | 1.47  | 1.79  | 2.05  | 2.32   | 2.61   | 3.00   | 3.32    |
| 1.8833               | 113            | 0.89          | 0.95 | 1.24 | 1.46  | 1.78  | 2.04  | 2.31   | 2.60   | 2.99   | 3.31    |
| 1.9000               | 114            | 0.88          | 0.95 | 1.23 | 1.45  | 1.77  | 2.03  | 2.30   | 2.58   | 2.97   | 3.29    |
| 1.9167               | 115            | 0.88          | 0.94 | 1.22 | 1.44  | 1.76  | 2.02  | 2.29   | 2.57   | 2.96   | 3.28    |
| 1.9333               | 116            | 0.87          | 0.94 | 1.21 | 1.44  | 1.75  | 2.01  | 2.28   | 2.56   | 2.95   | 3.26    |
| 1.9500               | 117            | 0.87          | 0.93 | 1.21 | 1.43  | 1.74  | 2.00  | 2.27   | 2.55   | 2.93   | 3.25    |
| 1.9667               | 118            | 0.86          | 0.93 | 1.20 | 1.42  | 1.73  | 1.99  | 2.26   | 2.54   | 2.92   | 3.24    |
| 1.9833               | 119            | 0.86          | 0.92 | 1.19 | 1.41  | 1.72  | 1.98  | 2.25   | 2.52   | 2.91   | 3.22    |
| 2.0000               | 120            | 0.85          | 0.92 | 1.19 | 1.41  | 1.71  | 1.97  | 2.23   | 2.51   | 2.90   | 3.21    |

Constants for use in the General Rainfall Intensity Equation are based on regression analysis of data obtained from NOAA Atlas 14, Volume 8); Return Periods 1-yr through 10-yr based on Point Precipitation Frequency Estimates (Partial Duration Series); Return Periods 25-yr through 1000-yr based on Point Precipitation Frequency Estimates (Annual Maximum Series). Data values used in the regression analysis were obtained from the NOAA Precipitation Frequency Data Server for Wichita-Mid Continent weather station location.

|  |  |
|--|--|
| <b>General Rainfall Intensity Equation</b> |  |
| $i = \frac{a}{(D + b)^m}$                  | <i>i</i> = intensity in in/hr<br>D = Duration of rainfall in minutes<br>a, b, & m = constants shown in Table 2 below |

**Table 2 City of Wichita and Sedgwick County, General Rainfall Intensity Equation Constants (Durations from 5-min to 120 min)**

|   | Return Period |        |        |        |        |        |        |        |        |         |
|---|---------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|   | 1-yr          | 2-yr   | 5-yr   | 10-yr  | 25-yr  | 50-yr  | 100-yr | 200-yr | 500-yr | 1000-yr |
| a | 26.462        | 27.843 | 31.881 | 33.778 | 35.588 | 35.372 | 34.955 | 34.688 | 34.486 | 33.743  |
| b | 5.20          | 5.08   | 4.67   | 4.20   | 3.66   | 2.99   | 2.35   | 1.81   | 1.19   | 0.64    |
| m | 0.7113        | 0.7072 | 0.6817 | 0.6593 | 0.6298 | 0.6004 | 0.5721 | 0.5466 | 0.5164 | 0.4908  |



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