

05345000 VERMILLION RIVER NEAR EMPIRE, MN

LOCATION.--Lat 44°40'00", long 93°03'17", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24, T.114 N., R.19 W., Dakota County, Hydrologic Unit 07040001, on right bank and just downstream from County Road 79, 2 mi west of Empire and 4 mi northeast of Farmington.

DRAINAGE AREA.--129 mi².

PERIOD OF RECORD.--May 1942 to June 1945 (no record during July, August, and September 1944), September 1969 to September 1973 (discharge measurements only), October 1973 to current year. Prior to October 1975 published as "near Empire City".

GAGE.--Water-stage recorder. Datum of gage is 851.99 ft above sea level (NGVD of 1929, levels by U.S. Army Corps of Engineers). April 12, 1942 to June 30, 1944, and October 1, 1944 to July 7, 1945, nonrecording gage at same site and present datum.

REMARKS.--Records good. Some regulation at lower flows by wastewater treatment plant upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft, from information by local resident; discharge 6,200 ft³/s, from rating extended above 2,100 ft³/s.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|
| 1 | 121 | 123 | 83 | 59 | 46 | 42 | 80 | 80 | 88 | 60 | 40 | 32 |
| 2 | 113 | 122 | 83 | 58 | 48 | 42 | 77 | 77 | 84 | 56 | 40 | 32 |
| 3 | 113 | 120 | 78 | 56 | 50 | 41 | 76 | 75 | 81 | 71 | 39 | e33 |
| 4 | 206 | 119 | 78 | 57 | 48 | 40 | 74 | 76 | 79 | 98 | 39 | 33 |
| 5 | 498 | 116 | 76 | 57 | 47 | 39 | 71 | 121 | 78 | 108 | 38 | 34 |
| 6 | 686 | 114 | 75 | 58 | 47 | 40 | 70 | 120 | 79 | 81 | 38 | 34 |
| 7 | 763 | 111 | 77 | 60 | 47 | 40 | 70 | 105 | 89 | 73 | 38 | 34 |
| 8 | 647 | 109 | 75 | 62 | 47 | 41 | 66 | 96 | 89 | 67 | 37 | 34 |
| 9 | 490 | 109 | 73 | 62 | 46 | 44 | 64 | 172 | 88 | 64 | 36 | 34 |
| 10 | 410 | 110 | 73 | 59 | 45 | 41 | 63 | 285 | 85 | 63 | 35 | e35 |
| 11 | 383 | 108 | 73 | 56 | 44 | 42 | 63 | 337 | 82 | 64 | 37 | 35 |
| 12 | 364 | 105 | 75 | 58 | e44 | 42 | 63 | 685 | 80 | 65 | 35 | 47 |
| 13 | 315 | 105 | 75 | 56 | 43 | 41 | 63 | 498 | 77 | 60 | 34 | 47 |
| 14 | 272 | 106 | 76 | 55 | 43 | 52 | 65 | 367 | 73 | 58 | 34 | 41 |
| 15 | 234 | 102 | 75 | 54 | 43 | 131 | 70 | 321 | 69 | 79 | 33 | e40 |
| 16 | 221 | 103 | 72 | 54 | 43 | 173 | 156 | 259 | 68 | 77 | 33 | 39 |
| 17 | 200 | 101 | 73 | 53 | 44 | 136 | 280 | 205 | 65 | 72 | 33 | 38 |
| 18 | 190 | 100 | 80 | 54 | 43 | 112 | 194 | 173 | 63 | 67 | 32 | 39 |
| 19 | 187 | 99 | 81 | 53 | 42 | 99 | 157 | 159 | 62 | 61 | 31 | 43 |
| 20 | 173 | 99 | 78 | 52 | 44 | 99 | 159 | 152 | 60 | 62 | 36 | 41 |
| 21 | 168 | 97 | 72 | 50 | 50 | 99 | 156 | 138 | 58 | 59 | 39 | 40 |
| 22 | 162 | 97 | 70 | 49 | 48 | 89 | 139 | 132 | 57 | 55 | 38 | 41 |
| 23 | 153 | 96 | 67 | e48 | 46 | 85 | 123 | 137 | 60 | 52 | 35 | 39 |
| 24 | 147 | 92 | 64 | 45 | 43 | 84 | 112 | 127 | 60 | 50 | 34 | 38 |
| 25 | 145 | 89 | 61 | 46 | 41 | 81 | 103 | 119 | 69 | 47 | 34 | 39 |
| 26 | 142 | 87 | 59 | 46 | 41 | 76 | 98 | 110 | 74 | 46 | 34 | 39 |
| 27 | 137 | 85 | 60 | 46 | 41 | 80 | 94 | 106 | 68 | 44 | 33 | 39 |
| 28 | 134 | 85 | 60 | 45 | 41 | 120 | 90 | 101 | 66 | 43 | 32 | 39 |
| 29 | 131 | 86 | 60 | 45 | --- | 105 | 88 | 96 | 71 | 42 | 31 | 39 |
| 30 | 127 | 85 | 62 | 45 | --- | 91 | 83 | 97 | 64 | 41 | 31 | 38 |
| 31 | 125 | --- | 60 | 46 | --- | 85 | --- | 92 | --- | 41 | 31 | --- |
| TOTAL | 8,157 | 3,080 | 2,224 | 1,644 | 1,255 | 2,332 | 3,067 | 5,618 | 2,186 | 1,926 | 1,090 | 1,136 |
| MEAN | 263 | 103 | 71.7 | 53.0 | 44.8 | 75.2 | 102 | 181 | 72.9 | 62.1 | 35.2 | 37.9 |
| MAX | 763 | 123 | 83 | 62 | 50 | 173 | 280 | 685 | 89 | 108 | 40 | 47 |
| MIN | 113 | 85 | 59 | 45 | 41 | 39 | 63 | 75 | 57 | 41 | 31 | 32 |
| AC-FT | 16,180 | 6,110 | 4,410 | 3,260 | 2,490 | 4,630 | 6,080 | 11,140 | 4,340 | 3,820 | 2,160 | 2,250 |
| CFSM | 2.04 | 0.80 | 0.56 | 0.41 | 0.35 | 0.58 | 0.79 | 1.40 | 0.56 | 0.48 | 0.27 | 0.29 |
| IN. | 2.35 | 0.89 | 0.64 | 0.47 | 0.36 | 0.67 | 0.88 | 1.62 | 0.63 | 0.56 | 0.31 | 0.33 |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2003, BY WATER YEAR (WY)

| | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 61.9 | 52.9 | 41.5 | 33.1 | 38.7 | 97.7 | 116 | 96.6 | 96.4 | 75.3 | 62.3 | 72.3 |
| MAX | 263 | 133 | 79.5 | 58.6 | 89.8 | 199 | 337 | 223 | 290 | 258 | 234 | 313 |
| (WY) | (2003) | (1993) | (1993) | (1998) | (1998) | (1983) | (2001) | (1986) | (1993) | (1997) | (1997) | (1992) |
| MIN | 14.9 | 15.6 | 12.4 | 11.0 | 13.1 | 25.4 | 35.2 | 29.3 | 23.0 | 16.0 | 14.3 | 14.6 |
| (WY) | (1977) | (1977) | (1977) | (1977) | (1977) | (1975) | (1977) | (1977) | (1988) | (1988) | (1976) | (1976) |

05345000 VERMILLION RIVER NEAR EMPIRE, MN—Continued

| SUMMARY STATISTICS | FOR 2002 CALENDAR YEAR | | FOR 2003 WATER YEAR | | WATER YEARS 1942 - 2003 | |
|--------------------------|------------------------|--------|---------------------|---------------|-------------------------|--------------|
| ANNUAL TOTAL | 42,031 | | 33,715 | | 70.7 | |
| ANNUAL MEAN | 115 | | 92.4 | | 23.6 | |
| HIGHEST ANNUAL MEAN | | | | | 147 | 1998 |
| LOWEST ANNUAL MEAN | | | | | 23.6 | 1977 |
| HIGHEST DAILY MEAN | 763 | Oct 7 | 763 | Oct 7 | 3,000 | Sep 16, 1992 |
| LOWEST DAILY MEAN | 36 | Jan 24 | 31 | Aug 19, 29-31 | 8.4 | Jan 15, 1975 |
| ANNUAL SEVEN-DAY MINIMUM | 36 | Jan 24 | 32 | Aug 27 | 9.0 | Jan 13, 1975 |
| MAXIMUM PEAK FLOW | | | 857 | Oct 7 | 6,570 | Sep 16, 1992 |
| MAXIMUM PEAK STAGE | | | 7.18 | Oct 7 | 10.00 | Sep 16, 1992 |
| INSTANTANEOUS LOW FLOW | | | 25 | Sep 3 | a6.8 | Aug 15, 1992 |
| ANNUAL RUNOFF (AC-FT) | 83,370 | | 66,870 | | 51,200 | |
| ANNUAL RUNOFF (CFSM) | 0.89 | | 0.72 | | 0.55 | |
| ANNUAL RUNOFF (INCHES) | 12.12 | | 9.72 | | 7.44 | |
| 10 PERCENT EXCEEDS | 207 | | 156 | | 134 | |
| 50 PERCENT EXCEEDS | 83 | | 67 | | 46 | |
| 90 PERCENT EXCEEDS | 39 | | 38 | | 22 | |

a Result of regulation.
 e Estimated.

