

RED RIVER OF THE NORTH BASIN

05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN

LOCATION.--Lat 46°22'10", long 96°01'02", in SW¹/₄SE¹/₄ sec. 31, T.134 N., R.42 W., Otter Tail County, Hydrologic Unit 09020103, on right bank at County Highway 10, 2.5 miles below Taplin Gorge Dam, 5.0 miles above the Diversion Dam, 5.7 miles east of Elizabeth and 6.6 miles northeast of Fergus Falls.

DRAINAGE AREA.--1,230 mi² (approximately).

PERIOD OF RECORD.--May 1904 to September 1917, monthly discharge only, published as "at German Church near Fergus Falls" in WSP 1308. July 1992 to current year.

REVISED RECORD.--WDR MN-03-1: Minimum discharge, 2000 and 2001 water years.

GAGE.--Water-stage recorder. Elevation of gage is 1,250 ft above sea level (from topographic map). Nonrecording gage at same site November 1913 to September 1917 at elevation 1,265 ft (from topographic map).

REMARKS.--Records good except those for estimated daily discharge, which are fair. Flow regulated by power plant upstream.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| 1 | 75 | 64 | 62 | 69 | e50 | 149 | 204 | 270 | 464 | 359 | 274 | 172 |
| 2 | 69 | 64 | 62 | 69 | e52 | 138 | 205 | 270 | 462 | 295 | 266 | 161 |
| 3 | 54 | 64 | 64 | e68 | e52 | 133 | 199 | 261 | 461 | 206 | 270 | 153 |
| 4 | 53 | 64 | 64 | e68 | e52 | 142 | 210 | 253 | 461 | 364 | 273 | 155 |
| 5 | 53 | 64 | 67 | e68 | e52 | 144 | 210 | 260 | 461 | 346 | 276 | 164 |
| 6 | 54 | 64 | 71 | e68 | e54 | 144 | 210 | 237 | 463 | 365 | 280 | 155 |
| 7 | 54 | 64 | 71 | e68 | e52 | 130 | 221 | 247 | 466 | 382 | 290 | 221 |
| 8 | 55 | 64 | 75 | e68 | e52 | 130 | 220 | 222 | 475 | 374 | 296 | 270 |
| 9 | 56 | 64 | 78 | e68 | e54 | 145 | 226 | 233 | 480 | 369 | 329 | 253 |
| 10 | 56 | 64 | 76 | 68 | e54 | e133 | 226 | 223 | 479 | 363 | 346 | 231 |
| 11 | 57 | 64 | 75 | 67 | e54 | e133 | 228 | 236 | 483 | 367 | 343 | 217 |
| 12 | 56 | 64 | 70 | 67 | e52 | e148 | 231 | 247 | 482 | 367 | 341 | 216 |
| 13 | 57 | 63 | 69 | 67 | e52 | 147 | 243 | 251 | 480 | 368 | 327 | 199 |
| 14 | 58 | 63 | 69 | 67 | e50 | 146 | 262 | 254 | 478 | 369 | 318 | 148 |
| 15 | 58 | 64 | 70 | 67 | e50 | 161 | 269 | 257 | 480 | 372 | 317 | 136 |
| 16 | 63 | 64 | 71 | 67 | e50 | 164 | 266 | 257 | 467 | 372 | 301 | 205 |
| 17 | 84 | 64 | 66 | e62 | e52 | 157 | 264 | 264 | 493 | 372 | 283 | 250 |
| 18 | 93 | 64 | 66 | e60 | e70 | 157 | 264 | 265 | 481 | 373 | 263 | 248 |
| 19 | 93 | 64 | 66 | e58 | e92 | 152 | 263 | 290 | 475 | 370 | 244 | 248 |
| 20 | 93 | 63 | 67 | e56 | e120 | 160 | 265 | 299 | 469 | 367 | 206 | 283 |
| 21 | 84 | 64 | 67 | e58 | 121 | 169 | 273 | 298 | 456 | 362 | 192 | 323 |
| 22 | 78 | 64 | 67 | e56 | 121 | 162 | 294 | 296 | 434 | 356 | 193 | 320 |
| 23 | 63 | 64 | 67 | e56 | 121 | 157 | 304 | 288 | 423 | 337 | 211 | 345 |
| 24 | 69 | e63 | 67 | e58 | 122 | 166 | 304 | 297 | 425 | 329 | 222 | 351 |
| 25 | 69 | 62 | 67 | e58 | 138 | 135 | 289 | 300 | 383 | 328 | 222 | 349 |
| 26 | 69 | 61 | 68 | e58 | 150 | 195 | 274 | 303 | 371 | 313 | 193 | 350 |
| 27 | 69 | 61 | 71 | e56 | 143 | 209 | 268 | 329 | 379 | 289 | 174 | 359 |
| 28 | 69 | 62 | 80 | e53 | 137 | 206 | 282 | 360 | 378 | 272 | 172 | 364 |
| 29 | 69 | 62 | 74 | e50 | 139 | 213 | 287 | 364 | 368 | 274 | 173 | 364 |
| 30 | 69 | 62 | 69 | e48 | --- | 206 | 277 | 473 | 365 | 276 | 174 | 363 |
| 31 | 66 | --- | e69 | e49 | --- | 200 | --- | 465 | --- | 276 | 173 | --- |
| TOTAL | 2,065 | 1,902 | 2,145 | 1,920 | 2,358 | 4,931 | 7,538 | 8,869 | 13,442 | 10,532 | 7,942 | 7,573 |
| MEAN | 66.6 | 63.4 | 69.2 | 61.9 | 81.3 | 159 | 251 | 286 | 448 | 340 | 256 | 252 |
| MAX | 93 | 64 | 80 | 69 | 150 | 213 | 304 | 473 | 493 | 382 | 346 | 364 |
| MIN | 53 | 61 | 62 | 48 | 50 | 130 | 199 | 222 | 365 | 206 | 172 | 136 |
| AC-FT | 4,100 | 3,770 | 4,250 | 3,810 | 4,680 | 9,780 | 14,950 | 17,590 | 26,660 | 20,890 | 15,750 | 15,020 |
| CFSM | 0.05 | 0.05 | 0.06 | 0.05 | 0.07 | 0.13 | 0.20 | 0.23 | 0.36 | 0.28 | 0.21 | 0.21 |
| IN. | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 | 0.15 | 0.23 | 0.27 | 0.41 | 0.32 | 0.24 | 0.23 |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 2004, BY WATER YEAR (WY)

| | | | | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 283 | 304 | 313 | 303 | 315 | 359 | 506 | 668 | 623 | 558 | 410 | 326 |
| MAX | 740 | 571 | 529 | 479 | 523 | 477 | 725 | 1,056 | 1,003 | 770 | 759 | 817 |
| (WY) | (1994) | (1994) | (1999) | (1999) | (1999) | (1999) | (1999) | (2001) | (2001) | (1998) | (1993) | (1993) |
| MIN | 66.6 | 63.4 | 69.2 | 61.9 | 81.3 | 159 | 251 | 286 | 429 | 340 | 218 | 97.8 |
| (WY) | (2004) | (2004) | (2004) | (2004) | (2004) | (2004) | (2004) | (2004) | (2002) | (2004) | (1996) | (2003) |

05030500 OTTER TAIL RIVER NEAR ELIZABETH, MN—Continued

| SUMMARY STATISTICS | FOR 2003 CALENDAR YEAR | | FOR 2004 WATER YEAR | | WATER YEARS 1992 - 2004 | |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL | 90,676 | | 71,217 | | 416 | |
| ANNUAL MEAN | 248 | | 195 | | 195 | |
| HIGHEST ANNUAL MEAN | | | | | 593 1999 | |
| LOWEST ANNUAL MEAN | | | | | 195 2004 | |
| HIGHEST DAILY MEAN | 601 | Jul 11 | a493 | Jun 17 | a1,110 | May 23, 2001 |
| LOWEST DAILY MEAN | 53 | Oct 4 | b48 | Jan 30 | 48 | Jan 30, 2004 |
| ANNUAL SEVEN-DAY MINIMUM | 54 | Oct 3 | 50 | Jan 29 | 50 | Jan 29, 2004 |
| MAXIMUM PEAK FLOW | | | a505 | Jun 16 | a1,170 | May 23, 2001 |
| MAXIMUM PEAK STAGE | | | 6.63 | Jun 16 | a9.37 | May 23, 2001 |
| INSTANTANEOUS LOW FLOW | | | c8.8 | Mar 25 | c8.8 | Mar 25, 2004 |
| ANNUAL RUNOFF (AC-FT) | 179,900 | | 141,300 | | 301,700 | |
| ANNUAL RUNOFF (CFSM) | 0.202 | | 0.158 | | 0.339 | |
| ANNUAL RUNOFF (INCHES) | 2.74 | | 2.15 | | 4.60 | |
| 10 PERCENT EXCEEDS | 475 | | 370 | | 722 | |
| 50 PERCENT EXCEEDS | 220 | | 168 | | 378 | |
| 90 PERCENT EXCEEDS | 64 | | 58 | | 174 | |

- a Due in part to regulation.
- b Estimated daily discharge, backwater from ice.
- c Result of regulation.
- e Estimated.

