

05127000 KAWISHIWI RIVER NEAR WINTON, MN

LOCATION.--Lat 47°56'05", long 91°45'50", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 20, T.63 N., R.11 W., Lake County, Hydrologic Unit 09030001, Superior National Forest, at power plant of Minnesota Power Co., just upstream from Fall Lake, and 1.8 mi east of Winton.

DRAINAGE AREA.--1,230 mi².

PERIOD OF RECORD.--June 1905 to June 1907, October 1912 to September 1919 (fragmentary), September 1923 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WDR MN-77-1: Drainage area.

REMARKS.--No estimated daily discharges. Records fair. Daily discharge computed from power plant records. Flow regulated by power plant and by Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, South Farm, and Garden Lakes.

COOPERATION.--Records collected by Minnesota Power Co., under general supervision of the Geological Survey, in connection with a Federal Energy Regulatory Commission project.

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 | 554 | 287 | 451 | 381 | 370 | 673 | 634 | 2,640 | 2,250 | 625 | 253 | 149 |
| 2 | 555 | 252 | 451 | 381 | 373 | 861 | 550 | 2,660 | 2,220 | 559 | 253 | 178 |
| 3 | 555 | 379 | 434 | 380 | 357 | 866 | 499 | 2,660 | 2,250 | 556 | 254 | 185 |
| 4 | 555 | 379 | 406 | 376 | 360 | 819 | 514 | 2,670 | 2,240 | 555 | 236 | 169 |
| 5 | 555 | 379 | 406 | 378 | 346 | 721 | 582 | 2,670 | 2,240 | 555 | 191 | 275 |
| 6 | 555 | 379 | 406 | 379 | 335 | 624 | 740 | 2,650 | 2,230 | 555 | 127 | 419 |
| 7 | 556 | 379 | 406 | 379 | 334 | 578 | 849 | 2,340 | 2,230 | 556 | 117 | 262 |
| 8 | 519 | 379 | 406 | 379 | 332 | 536 | 883 | 2,160 | 2,240 | 557 | 117 | 205 |
| 9 | 491 | 330 | 406 | 380 | 330 | 492 | 1,020 | 2,140 | 2,240 | 531 | 204 | 205 |
| 10 | 491 | 330 | 357 | 382 | 353 | 490 | 1,320 | 2,030 | 2,240 | 437 | 440 | 182 |
| 11 | 491 | 330 | 357 | 383 | 417 | 480 | 1,320 | 1,950 | 2,240 | 588 | 402 | 161 |
| 12 | 490 | 333 | 361 | 383 | 432 | 409 | 1,320 | 1,890 | 2,240 | 676 | 272 | 161 |
| 13 | 406 | 356 | 361 | 383 | 446 | 378 | 1,330 | 1,770 | 2,210 | 493 | 230 | 158 |
| 14 | 442 | 356 | 361 | 383 | 445 | 379 | 1,450 | 1,770 | 1,930 | 495 | 201 | 139 |
| 15 | 442 | 370 | 361 | 383 | 445 | 588 | 1,530 | 1,760 | 1,770 | 509 | 184 | 148 |
| 16 | 442 | 379 | 361 | 383 | 447 | 702 | 1,540 | 1,660 | 1,760 | 508 | 184 | 309 |
| 17 | 442 | 387 | 361 | 382 | 447 | 661 | 1,540 | 1,570 | 1,500 | 509 | 184 | 398 |
| 18 | 442 | 402 | 361 | 382 | 449 | 588 | 1,540 | 1,570 | 1,060 | 509 | 177 | 307 |
| 19 | 442 | 401 | 383 | 383 | 452 | 588 | 1,550 | 1,570 | 847 | 509 | 163 | 230 |
| 20 | 442 | 397 | 385 | 395 | 449 | 589 | 1,770 | 1,570 | 847 | 509 | 163 | 230 |
| 21 | 442 | 353 | 385 | 380 | 447 | 589 | 2,010 | 1,670 | 767 | 502 | 163 | 230 |
| 22 | 442 | 354 | 385 | 378 | 447 | 588 | 2,310 | 1,780 | 599 | 460 | 163 | 229 |
| 23 | 442 | 372 | 385 | 372 | 446 | 574 | 2,690 | 1,770 | 603 | 460 | 151 | 230 |
| 24 | 442 | 402 | 385 | 361 | 446 | 543 | 2,850 | 1,780 | 602 | 460 | 139 | 230 |
| 25 | 441 | 450 | 385 | 342 | 446 | 589 | 2,990 | 1,890 | 675 | 460 | 132 | 230 |
| 26 | 422 | 451 | 377 | 299 | 446 | 695 | 3,100 | 1,960 | 754 | 460 | 117 | 230 |
| 27 | 422 | 451 | 381 | 295 | 446 | 639 | 3,160 | 2,070 | 755 | 439 | 117 | 230 |
| 28 | 422 | 451 | 381 | 295 | 446 | 703 | 3,180 | 2,130 | 725 | 358 | 117 | 230 |
| 29 | 422 | 451 | 381 | 336 | 446 | 679 | 2,840 | 2,130 | 697 | 354 | 117 | 230 |
| 30 | 422 | 451 | 381 | 362 | --- | 660 | 2,640 | 2,120 | 654 | 354 | 117 | 229 |
| 31 | 422 | --- | 381 | 365 | --- | 641 | --- | 2,200 | --- | 276 | 121 | --- |
| TOTAL | 14,608 | 11,370 | 11,988 | 11,420 | 11,935 | 18,922 | 50,251 | 63,200 | 45,615 | 15,374 | 5,806 | 6,768 |
| MEAN | 471 | 379 | 387 | 368 | 412 | 610 | 1,675 | 2,039 | 1,520 | 496 | 187 | 226 |
| MAX | 556 | 451 | 451 | 395 | 452 | 866 | 3,180 | 2,670 | 2,250 | 676 | 440 | 419 |
| MIN | 406 | 252 | 357 | 295 | 330 | 378 | 499 | 1,570 | 599 | 276 | 117 | 139 |
| AC-FT | 28,970 | 22,550 | 23,780 | 22,650 | 23,670 | 37,530 | 99,670 | 125,400 | 90,480 | 30,490 | 11,520 | 13,420 |
| CFSM | 0.38 | 0.31 | 0.31 | 0.30 | 0.33 | 0.50 | 1.36 | 1.66 | 1.24 | 0.40 | 0.15 | 0.18 |
| IN. | 0.44 | 0.34 | 0.36 | 0.35 | 0.36 | 0.57 | 1.52 | 1.91 | 1.38 | 0.46 | 0.18 | 0.20 |
| + | 0.00 | 20.4 | -42.3 | -98.7 | -204 | -184 | 496 | -36.0 | 43.0 | -105 | 271 | 116 |
| MEAN ‡ | 471 | 399 | 344 | 270 | 208 | 426 | 2171 | 2003 | 1564 | 391 | 190 | 342 |
| CFSM ‡ | 0.38 | 0.32 | 0.28 | 0.22 | 0.17 | 0.35 | 1.77 | 1.63 | 1.27 | 0.32 | 0.15 | 0.28 |
| IN ‡ | 0.44 | 0.36 | 0.32 | 0.25 | 0.18 | 0.40 | 1.97 | 1.88 | 1.42 | 0.37 | 0.17 | 0.31 |
| CAL YR 03 | TOTAL 177,622 | MEAN 487 | MAX 1490 | MIN 0.00 | MEAN ‡ 493 | CFSM ‡ 0.40 | IN ‡ 5.44 | | | | | |
| WTR YR 04 | TOTAL 267,257 | MEAN 730 | MAX 3180 | MIN 117 | MEAN ‡ 730 | CFSM ‡ 0.59 | IN ‡ 8.06 | | | | | |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 2004, BY WATER YEAR (WY)

| MEAN | 877 | 756 | 594 | 453 | 349 | 379 | 1,216 | 3,069 | 1,882 | 1,156 | 686 | 723 |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MAX | 4,277 | 3,572 | 1,422 | 862 | 770 | 844 | 5,020 | 9,278 | 5,661 | 3,382 | 3,775 | 3,149 |
| (WY) | (1947) | (1971) | (1983) | (1978) | (1927) | (1945) | (1945) | (1950) | (1968) | (1999) | (1988) | (1928) |
| MIN | 66.5 | 8.97 | 76.1 | 80.3 | 74.5 | 103 | 19.3 | 111 | 519 | 217 | 51.7 | 38.1 |
| (WY) | (1924) | (1924) | (1977) | (1977) | (1977) | (1924) | (1924) | (1924) | (1980) | (1961) | (1919) | (1919) |

05127000 KAWISHIWI RIVER NEAR WINTON, MN—Continued

| SUMMARY STATISTICS | FOR 2003 CALENDAR YEAR | | FOR 2004 WATER YEAR | | WATER YEARS 1905 - 2004 | |
|--------------------------|------------------------|--------|---------------------|---------------|-------------------------|--------------|
| ANNUAL TOTAL | 177,622.00 | | 267,257 | | 1,021 | |
| ANNUAL MEAN | 487 | | 730 | | 240 | |
| HIGHEST ANNUAL MEAN | | | | | 1,967 | 1950 |
| LOWEST ANNUAL MEAN | | | | | 240 | 1924 |
| HIGHEST DAILY MEAN | 1,490 | Jul 11 | 3,180 | Apr 28 | 16,000 | May 18, 1950 |
| LOWEST DAILY MEAN | 0.00 | Aug 19 | 117 | Aug 7,8,26-30 | a0.00 | Aug 24, 1905 |
| ANNUAL SEVEN-DAY MINIMUM | 45 | Sep 1 | 120 | Aug 25 | 0.00 | Oct 13, 1923 |
| ANNUAL RUNOFF (AC-FT) | 352,300 | | 530,100 | | 739,900 | |
| ANNUAL RUNOFF (CFSM) | 0.396 | | 0.594 | | 0.830 | |
| ANNUAL RUNOFF (INCHES) | 5.37 | | 8.08 | | 11.28 | |
| 10 PERCENT EXCEEDS | 897 | | 2,040 | | 2,400 | |
| 50 PERCENT EXCEEDS | 401 | | 442 | | 597 | |
| 90 PERCENT EXCEEDS | 127 | | 229 | | 200 | |

+ Change in contents, equivalent in cubic feet per second, in Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, Farm, South Farm, and Garden Lakes.

‡ Adjusted for change in reservoir contents.

a Many days, several years.

