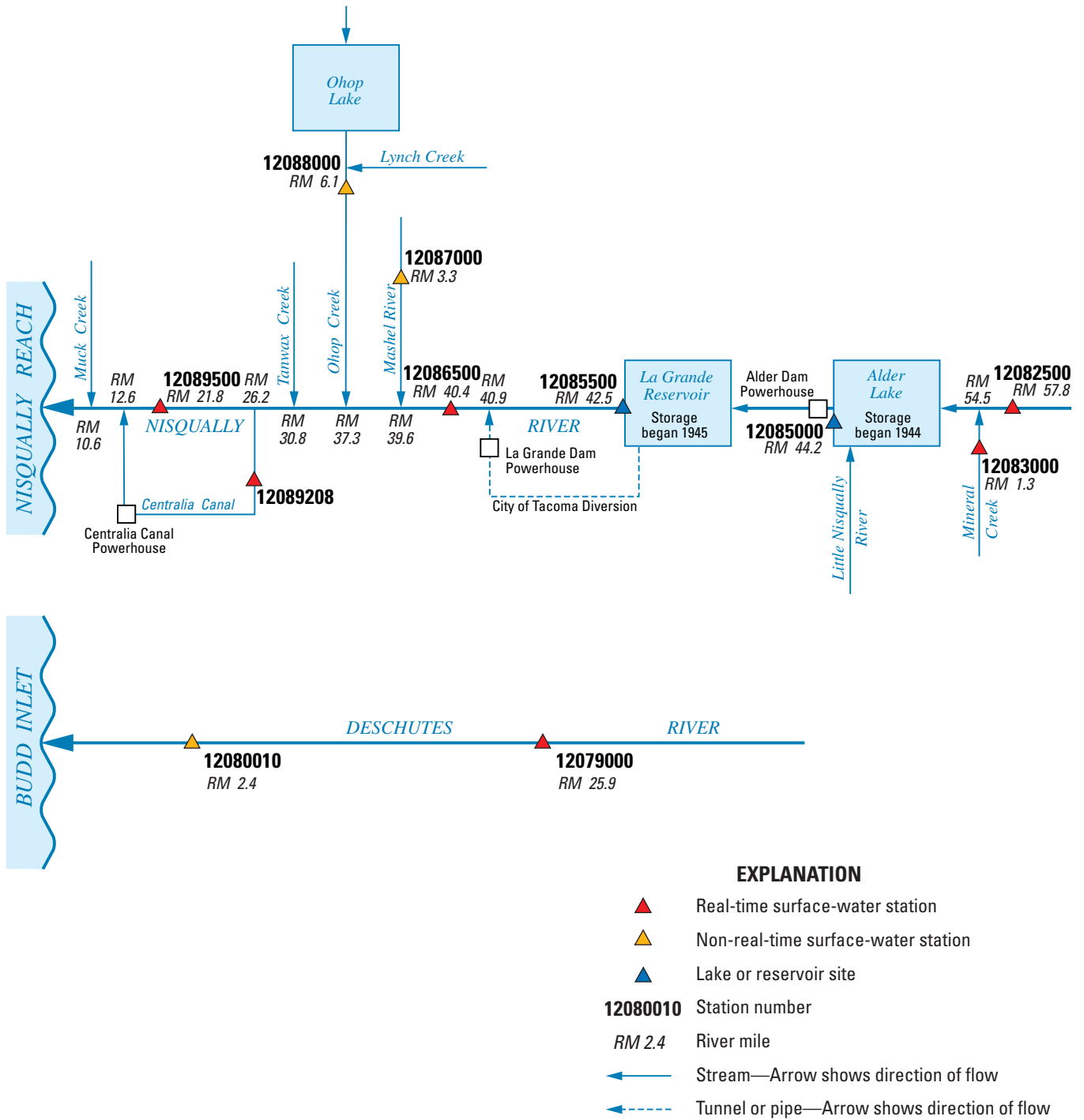


Figure 24. Location of surface-water stations in the Deschutes and Nisqually River Basins.



**Figure 25.** Schematic diagram showing surface-water stations in the Deschutes and Nisqually River Basins.

12079000 DESCHUTES RIVER NEAR RAINIER, WA

LOCATION.--Lat 46°51'08", long 122°40'03", in SE¼SW¼ sec.22, T.16 N., R.1 E., Thurston County, Hydrologic Unit 17110016, on right bank about 100 ft upstream from county road crossing, 0.4 mi downstream from outlet of Reichel Lake, 2.7 mi southeast of Rainier, and at mile 25.9.

DRAINAGE AREA.--89.8 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1949 to September 1975; water years 1976-79 (annual maximum); June 1980 to July 1982; June 1983 to October 1987 (seasonal records); October 1987 to September 1998; October 1998 to April 1999 (seasonal record); October 1999 to current year.

REVISED RECORDS.--WSP 1246: Drainage area. WDR WA-83-1: 1978(P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 348.77 ft above NGVD of 1929.

REMARKS.--Records good except for estimated daily discharges and flows above 700 ft<sup>3</sup>/s, which are fair. Probably some small diversions for irrigation and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Chemical analyses July 1959 to July 1960, October 1971 to September 1972. Water temperatures August 1968 to September 1970.

AVERAGE DISCHARGE.--44 years (water years 1950-75, 1981, 1988-98, 2000-05), 256 ft<sup>3</sup>/s, 38.77 in/yr, 185,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,600 ft<sup>3</sup>/s, Jan. 9, 1990, gage height, 17.01 ft, from outside high-water mark, from rating curve extended above 3,900 ft<sup>3</sup>/s; minimum discharge, 16 ft<sup>3</sup>/s, Sept. 7, 1963, gage height, 2.60 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) | Date                                       | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) |
|--------|------|--------------------------------|------------------|--|------|--------------------------------|------------------|
| Jan 18 | 1200 | *3,220                         | *9.99            | No other peak greater than base discharge. |      |                                |                  |

Minimum discharge, 25 ft<sup>3</sup>/s, Sept. 9, 21-29.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT   | NOV   | DEC    | JAN    | FEB   | MAR    | APR    | MAY    | JUN   | JUL   | AUG   | SEP   |
|-------|-------|-------|--------|--------|-------|--------|--------|--------|-------|-------|-------|-------|
| 1     | 57    | 123   | 135    | 124    | 124   | 84     | 446    | 145    | 118   | 68    | 40    | 28    |
| 2     | 54    | 280   | 133    | 119    | 117   | 82     | 503    | 153    | 111   | 65    | 40    | 27    |
| 3     | 51    | 426   | 124    | 110    | 111   | 78     | 446    | 163    | 104   | 63    | 39    | 27    |
| 4     | 49    | 275   | 118    | 105    | 114   | 75     | 462    | 151    | 97    | 60    | 38    | 27    |
| 5     | 48    | 213   | 121    | 100    | 124   | 72     | 379    | 141    | 94    | 60    | 37    | 27    |
| 6     | 49    | 175   | 125    | 98     | 118   | 70     | 311    | 133    | 92    | 67    | 36    | 27    |
| 7     | 52    | 149   | 136    | 106    | 134   | 68     | 280    | 123    | 91    | 66    | 37    | 27    |
| 8     | 54    | 130   | 675    | 105    | 123   | 67     | 303    | 116    | 89    | 63    | 36    | 26    |
| 9     | 157   | 117   | 673    | 100    | 115   | 65     | 263    | 130    | 84    | 108   | 36    | 26    |
| 10    | 136   | 107   | 657    | 95     | 109   | 64     | 227    | 286    | 81    | 96    | 35    | 27    |
| 11    | 111   | 99    | 1,330  | 91     | 106   | 62     | 339    | 256    | 81    | 85    | 34    | 31    |
| 12    | 94    | 92    | 749    | 91     | 105   | 61     | 416    | 207    | 80    | 79    | 35    | 29    |
| 13    | 82    | 87    | 458    | 97     | 107   | 59     | 343    | 174    | 76    | 72    | 35    | 27    |
| 14    | 75    | 83    | 418    | 92     | 103   | 59     | 276    | 158    | 74    | 67    | 33    | 27    |
| 15    | 70    | 82    | 433    | 90     | 97    | 59     | 241    | 152    | 73    | e69   | 32    | 27    |
| 16    | 69    | 85    | 348    | 138    | 93    | 60     | 670    | 209    | 71    | 61    | 31    | 27    |
| 17    | 420   | 81    | 279    | 399    | 90    | 73     | 814    | 216    | 108   | 60    | 33    | 27    |
| 18    | 465   | 114   | 234    | 2,490  | 88    | 64     | 509    | 229    | 96    | 58    | 35    | 27    |
| 19    | 369   | 145   | 207    | 1,100  | 86    | 62     | 362    | 299    | 93    | 55    | 32    | 27    |
| 20    | 331   | 128   | 182    | 605    | 83    | 101    | 287    | 352    | 84    | 53    | 31    | 27    |
| 21    | 239   | 114   | 164    | 436    | 81    | 198    | 242    | 318    | 77    | 51    | 30    | 26    |
| 22    | 188   | 106   | 157    | 341    | 79    | 157    | 213    | 294    | 78    | 52    | 30    | 26    |
| 23    | 160   | 99    | 142    | 284    | 77    | 130    | 196    | 254    | 91    | 56    | e30   | 26    |
| 24    | 143   | 97    | 133    | 240    | 76    | 113    | 205    | 220    | 79    | 49    | e30   | 26    |
| 25    | 128   | 201   | 130    | 213    | 74    | 113    | 208    | 192    | 73    | 47    | 29    | 26    |
| 26    | 123   | 228   | 157    | 194    | 72    | 161    | 202    | 170    | 70    | 45    | 28    | 25    |
| 27    | 114   | 184   | 145    | 178    | 71    | 1,480  | 188    | 153    | 78    | 44    | 28    | 25    |
| 28    | 106   | 155   | 134    | 164    | 72    | 1,010  | 171    | 138    | 87    | 42    | 27    | 25    |
| 29    | 101   | 135   | 132    | 152    | ---   | 817    | 162    | 129    | 78    | 42    | 28    | 26    |
| 30    | 112   | 128   | 129    | 139    | ---   | 681    | 157    | 121    | 72    | 42    | 30    | 43    |
| 31    | 130   | ---   | 122    | 132    | ---   | 450    | ---    | 115    | ---   | 41    | 29    | ---   |
| TOTAL | 4,337 | 4,438 | 9,080  | 8,728  | 2,749 | 6,695  | 9,821  | 5,897  | 2,580 | 1,886 | 1,024 | 819   |
| MEAN  | 140   | 148   | 293    | 282    | 98.2  | 216    | 327    | 190    | 86.0  | 60.8  | 33.0  | 27.3  |
| MAX   | 465   | 426   | 1,330  | 2,490  | 134   | 1,480  | 814    | 352    | 118   | 108   | 40    | 43    |
| MIN   | 48    | 81    | 118    | 90     | 71    | 59     | 157    | 115    | 70    | 41    | 27    | 25    |
| AC-FT | 8,600 | 8,800 | 18,010 | 17,310 | 5,450 | 13,280 | 19,480 | 11,700 | 5,120 | 3,740 | 2,030 | 1,620 |
| CFSM  | 1.56  | 1.65  | 3.26   | 3.14   | 1.09  | 2.40   | 3.65   | 2.12   | 0.96  | 0.68  | 0.37  | 0.30  |
| IN.   | 1.80  | 1.84  | 3.76   | 3.62   | 1.14  | 2.77   | 4.07   | 2.44   | 1.07  | 0.78  | 0.42  | 0.34  |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 102    | 334    | 513    | 569    | 513    | 408    | 303    | 161    | 101    | 54.5   | 39.7   | 42.3   |
| MAX  | 385    | 725    | 1,063  | 1,071  | 1,087  | 839    | 659    | 287    | 233    | 110    | 74.1   | 99.9   |
| (WY) | (1998) | (1961) | (1956) | (1953) | (1999) | (1972) | (1991) | (1960) | (1990) | (1974) | (1968) | (2004) |
| MIN  | 23.1   | 35.9   | 163    | 111    | 98.2   | 116    | 115    | 72.2   | 42.8   | 28.8   | 23.8   | 22.5   |
| (WY) | (1988) | (1953) | (2001) | (2001) | (2005) | (1992) | (2004) | (1994) | (1992) | (2003) | (2003) | (2002) |

## DESCHUTES RIVER BASIN

12079000 DESCHUTES RIVER NEAR RAINIER, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1949 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 61,461                 |        | 58,054              |        | 256                     |              |
| ANNUAL MEAN              | 168                    |        | 159                 |        | 407                     |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 1997                    |              |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 2001                    |              |
| HIGHEST DAILY MEAN       | 1,710                  | Jan 30 | 2,490               | Jan 18 | 6,000                   | Jan 9, 1990  |
| LOWEST DAILY MEAN        | 24                     | Aug 19 | 25                  | Sep 26 | 19                      | Oct 11, 1994 |
| ANNUAL SEVEN-DAY MINIMUM | 25                     | Aug 15 | 26                  | Sep 22 | 20                      | Sep 23, 2002 |
| ANNUAL RUNOFF (AC-FT)    | 121,900                |        | 115,200             |        | 185,600                 |              |
| ANNUAL RUNOFF (CFSM)     | 1.87                   |        | 1.77                |        | 2.85                    |              |
| ANNUAL RUNOFF (INCHES)   | 25.46                  |        | 24.05               |        | 38.77                   |              |
| 10 PERCENT EXCEEDS       | 349                    |        | 340                 |        | 604                     |              |
| 50 PERCENT EXCEEDS       | 116                    |        | 101                 |        | 136                     |              |
| 90 PERCENT EXCEEDS       | 39                     |        | 30                  |        | 34                      |              |

e Estimated

12080010 DESCHUTES RIVER AT E STREET BRIDGE, AT TUMWATER, WA

LOCATION.--Lat 47°00'43", long 122°54'07", in NW¼ Land Grant parcel 60, T.18 N., R.2 W., Thurston County, Hydrologic Unit 17110016, on left bank at "E" Street bridge, 0.2 mi upstream from Capitol Boulevard, and at mile 2.4.

DRAINAGE AREA.--162 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1945 to November 1954, water years 1955-57 (annual maximum), June 1957 to June 1964, published as "12080000 Deschutes River near Olympia". October 1990 to current year.

REVISED RECORDS.--WDR WA-96-1: 1991(P), 1992(P).

GAGE.--Water-stage recorder. Datum of gage is 62.01 ft above NGVD of 1929. April 1945 to Nov. 1954, water-stage recorder, Nov. 1954 to June 1957, crest-stage gage, June 1957 to June 1964, water-stage recorder, at site 1 mi upstream, at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. Some small diversions for irrigation and domestic use upstream from station. No regulation. Miscellaneous discharge measurement site 1971-72, 1975, 1977-90.

AVERAGE DISCHARGE.--30 years (water years 1946-54, 1958-63, 1991-2005), 396 ft<sup>3</sup>/s, 33.19 in/yr, 286,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft<sup>3</sup>/s, Feb. 9, 1996, gage height, 34.17 ft, on basis of slope-area measurement of peak flow; minimum discharge, 46 ft<sup>3</sup>/s, Sept. 29, 30, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,400 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) | Date                                       | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) |
|--------|------|--------------------------------|------------------|--|------|--------------------------------|------------------|
| Jan 19 | 0215 | *3,940                         | *30.34           | No other peak greater than base discharge. |      |                                |                  |

Minimum discharge, 52 ft<sup>3</sup>/s, Sept. 28, gage height, 24.52 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT    | NOV    | DEC    | JAN    | FEB    | MAR    | APR    | MAY    | JUN    | JUL   | AUG   | SEP   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| 1     | 99     | 178    | 213    | 200    | 266    | 144    | 718    | 283    | 238    | 144   | 89    | 65    |
| 2     | 94     | 225    | 217    | 198    | 253    | 159    | 797    | 280    | 233    | 142   | 88    | 63    |
| 3     | 90     | 568    | 202    | 182    | 241    | 151    | 721    | 295    | 218    | 139   | 87    | 62    |
| 4     | 87     | 441    | 199    | 171    | 237    | 144    | 720    | 290    | 209    | 134   | 88    | 61    |
| 5     | 89     | 336    | 195    | 163    | 243    | 139    | 653    | 275    | 204    | 130   | 86    | 62    |
| 6     | 92     | 278    | 201    | 157    | 244    | 136    | 562    | 261    | 204    | 140   | 85    | 62    |
| 7     | 88     | 243    | 218    | 169    | 251    | 133    | 503    | 248    | 196    | 142   | 85    | 61    |
| 8     | 107    | 211    | 472    | 172    | 245    | 130    | 512    | 237    | 190    | 141   | 87    | 60    |
| 9     | 161    | 186    | 1,040  | 170    | 230    | 128    | 478    | 245    | 183    | 163   | 84    | 60    |
| 10    | 221    | 170    | 865    | 157    | 218    | 125    | 427    | 373    | 177    | 190   | 84    | 61    |
| 11    | 188    | 158    | 1,550  | 151    | 213    | 123    | 469    | 448    | 177    | 176   | 83    | 62    |
| 12    | 162    | 146    | 1,370  | 150    | 208    | 122    | 635    | 374    | 177    | 160   | 83    | 63    |
| 13    | 148    | 136    | 773    | 151    | 205    | 119    | 584    | 325    | 171    | 155   | 84    | 61    |
| 14    | 134    | 129    | 600    | 149    | 201    | 117    | 494    | 297    | 163    | 143   | 82    | 61    |
| 15    | 124    | 128    | 633    | 148    | 190    | 115    | 447    | 296    | 159    | 135   | 80    | 60    |
| 16    | 121    | 132    | 547    | 167    | 182    | 123    | 601    | 322    | 157    | 130   | 78    | 61    |
| 17    | 240    | 131    | 455    | 311    | 177    | 133    | 1,310  | 363    | 184    | 126   | 79    | 61    |
| 18    | 671    | 142    | 390    | 2,340  | 174    | 135    | 870    | 379    | 212    | 120   | 80    | 59    |
| 19    | 483    | 200    | 342    | 2,660  | 171    | 135    | 644    | 457    | 181    | 117   | 80    | 59    |
| 20    | 474    | 199    | 304    | 1,140  | 165    | 156    | 527    | 525    | 180    | 113   | 78    | 59    |
| 21    | 374    | 181    | 275    | 795    | 159    | 255    | 453    | 534    | 166    | 112   | 76    | 57    |
| 22    | 300    | 166    | 260    | 644    | 152    | e286   | 401    | 502    | 159    | 110   | 75    | 57    |
| 23    | 248    | 155    | 238    | 554    | 148    | 236    | 369    | 457    | 169    | 114   | 89    | 56    |
| 24    | 221    | 159    | 219    | 481    | 144    | 213    | 370    | 404    | 168    | 111   | 96    | 56    |
| 25    | 196    | 234    | 212    | 431    | 143    | 204    | 365    | 360    | 154    | 105   | 81    | 57    |
| 26    | 187    | 378    | 220    | 390    | 140    | 261    | 366    | 328    | 149    | 102   | 74    | 55    |
| 27    | 174    | 321    | 228    | 362    | 138    | 1,310  | 343    | 300    | 158    | 99    | 74    | 54    |
| 28    | 159    | 276    | 214    | 337    | 139    | 1,840  | 322    | 280    | 172    | 97    | 75    | 53    |
| 29    | 147    | 239    | 203    | 314    | ---    | 1,220  | 306    | 262    | 165    | 94    | 77    | 69    |
| 30    | 151    | 217    | 198    | 299    | ---    | 1,120  | 298    | 251    | 156    | 92    | 72    | 92    |
| 31    | 169    | ---    | 192    | 284    | ---    | 804    | ---    | 242    | ---    | 90    | 67    | ---   |
| TOTAL | 6,199  | 6,663  | 13,245 | 13,997 | 5,477  | 10,416 | 16,265 | 10,493 | 5,429  | 3,966 | 2,526 | 1,829 |
| MEAN  | 200    | 222    | 427    | 452    | 196    | 336    | 542    | 338    | 181    | 128   | 81.5  | 61.0  |
| MAX   | 671    | 568    | 1,550  | 2,660  | 266    | 1,840  | 1,310  | 534    | 238    | 190   | 96    | 92    |
| MIN   | 87     | 128    | 192    | 148    | 138    | 115    | 298    | 237    | 149    | 90    | 67    | 53    |
| AC-FT | 12,300 | 13,220 | 26,270 | 27,760 | 10,860 | 20,660 | 32,260 | 20,810 | 10,770 | 7,870 | 5,010 | 3,630 |
| CFSM  | 1.23   | 1.37   | 2.64   | 2.79   | 1.21   | 2.07   | 3.35   | 2.09   | 1.12   | 0.79  | 0.50  | 0.38  |
| IN.   | 1.42   | 1.53   | 3.04   | 3.21   | 1.26   | 2.39   | 3.73   | 2.41   | 1.25   | 0.91  | 0.58  | 0.42  |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 162    | 481    | 711    | 748    | 800    | 593    | 464    | 299    | 191    | 129    | 105    | 98.8   |
| MAX  | 463    | 921    | 1,480  | 1,308  | 1,753  | 1,176  | 936    | 499    | 300    | 186    | 148    | 162    |
| (WY) | (1998) | (2000) | (1999) | (1953) | (1999) | (1950) | (1991) | (1948) | (1997) | (1997) | (1997) | (1997) |
| MIN  | 75.8   | 84.1   | 239    | 195    | 196    | 236    | 235    | 140    | 110    | 77.1   | 66.5   | 54.1   |
| (WY) | (2003) | (1994) | (2001) | (2001) | (2005) | (2001) | (2004) | (1994) | (1992) | (1992) | (2003) | (2003) |

## DESCHUTES RIVER BASIN

12080010 DESCHUTES RIVER AT E STREET BRIDGE, AT TUMWATER, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1945 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 101,680                |        | 96,505              |        |                         |              |
| ANNUAL MEAN              | 278                    |        | 264                 |        | 396                     |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 658                     |              |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 178                     |              |
| HIGHEST DAILY MEAN       | 2,210                  | Jan 30 | 2,660               | Jan 19 | 8,150                   | Feb 9, 1996  |
| LOWEST DAILY MEAN        | 60                     | Aug 20 | 53                  | Sep 28 | 48                      | Sep 29, 2003 |
| ANNUAL SEVEN-DAY MINIMUM | 63                     | Aug 15 | 55                  | Sep 22 | 49                      | Sep 27, 2003 |
| ANNUAL RUNOFF (AC-FT)    | 201,700                |        | 191,400             |        | 286,700                 |              |
| ANNUAL RUNOFF (CFSM)     | 1.71                   |        | 1.63                |        | 2.44                    |              |
| ANNUAL RUNOFF (INCHES)   | 23.35                  |        | 22.16               |        | 33.19                   |              |
| 10 PERCENT EXCEEDS       | 544                    |        | 517                 |        | 869                     |              |
| 50 PERCENT EXCEEDS       | 204                    |        | 177                 |        | 242                     |              |
| 90 PERCENT EXCEEDS       | 84                     |        | 77                  |        | 91                      |              |

e Estimated

12082500 NISQUALLY RIVER NEAR NATIONAL, WA

LOCATION.--Lat 46°45'10", long 122°04'57", in SW¼SW¼ sec.29, T.15 N., R.6 E., Pierce County, Hydrologic Unit 17110015, on right bank 100 ft downstream from old railroad bridge, 1.2 mi west of National, 3.3 mi upstream from Mineral Creek, and at mile 57.8.

DRAINAGE AREA.--133 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1942 to current year.

REVISED RECORDS.--WSP 1716: 1943(M), 1947(P), 1950-51, 1956(M). WDR WA-74-1: 1968(M), 1969(M), 1972(P).

GAGE.--Water-stage recorder. Elevation of gage is 1,450 ft above NGVD of 1929, from river-profile map.

REMARKS.--Records fair. Small diversions for domestic use. Water temperatures published October 1951 to September 1982. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--63 years (water years 1943-2005), 769 ft<sup>3</sup>/s, 78.54 in/yr, 557,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 12.18 ft; minimum discharge, 100 ft<sup>3</sup>/s, Nov. 10, 17, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) | Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) |
|--------|------|--------------------------------|------------------|--------|------|--------------------------------|------------------|
| Dec 11 | 0645 | 5,300                          | 7.13             | Sep 30 | 0330 | 3,400                          | (a) 6.20         |
| Jan 18 | 0900 | *8,140                         | *8.49            |        |      |                                |                  |

Minimum daily discharge, 178 ft<sup>3</sup>/s, Sept. 23.

(a) From outside high water mark.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT    | NOV    | DEC    | JAN    | FEB    | MAR    | APR    | MAY    | JUN    | JUL    | AUG    | SEP    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1     | 412    | 500    | 585    | 484    | 552    | 277    | 944    | 794    | 868    | 516    | e419   | e373   |
| 2     | 390    | 1,550  | 523    | 455    | 520    | 259    | 873    | 776    | 715    | 470    | e368   | e389   |
| 3     | 378    | 1,320  | 486    | e425   | 495    | 250    | 803    | 742    | 683    | 433    | e371   | e326   |
| 4     | 373    | 989    | 465    | e415   | 502    | 240    | 757    | 744    | 637    | 464    | e392   | e268   |
| 5     | 366    | 829    | 451    | e389   | 512    | 234    | 675    | 747    | 604    | 494    | e425   | e231   |
| 6     | 542    | 724    | 425    | e385   | 470    | 230    | 647    | 711    | 573    | 635    | e461   | e226   |
| 7     | 359    | 652    | 450    | 383    | 454    | 239    | 765    | 669    | 551    | 577    | e473   | e286   |
| 8     | 422    | 597    | 743    | 371    | 423    | 251    | 842    | 604    | 526    | 588    | e458   | e331   |
| 9     | 518    | 548    | 786    | 354    | 401    | 266    | 748    | 726    | 494    | 724    | e467   | e325   |
| 10    | 426    | 498    | 2,170  | 340    | 382    | 267    | 672    | 1,050  | 480    | 495    | e440   | e267   |
| 11    | 351    | 462    | 4,150  | 327    | 367    | 288    | 766    | 906    | 524    | 473    | e413   | e241   |
| 12    | 362    | 435    | 2,290  | 333    | 370    | 303    | 699    | 851    | 534    | 474    | e422   | e198   |
| 13    | 373    | 407    | 1,530  | 321    | 368    | 288    | 622    | 785    | 515    | 451    | e430   | e190   |
| 14    | 402    | 387    | 1,500  | e301   | 345    | 268    | 572    | 870    | 501    | 456    | e429   | e209   |
| 15    | 369    | 413    | 1,360  | e304   | 322    | 256    | 554    | 976    | 478    | 516    | e425   | e191   |
| 16    | 516    | 386    | 1,180  | 369    | 311    | 271    | 1,020  | 1,040  | 479    | 534    | e430   | e188   |
| 17    | 902    | 350    | 1,070  | 753    | 305    | 265    | 1,120  | 880    | 685    | 479    | e422   | e191   |
| 18    | 842    | 463    | 1,000  | 5,540  | 299    | 243    | 959    | 931    | 582    | 538    | e384   | e188   |
| 19    | 766    | 402    | 1,010  | 3,130  | 293    | 256    | 835    | 1,200  | 590    | 556    | e365   | e205   |
| 20    | 686    | 357    | 950    | 1,900  | 283    | 358    | 775    | 1,160  | 555    | 543    | e377   | e199   |
| 21    | 649    | 336    | 880    | 1,880  | 271    | 332    | 753    | 1,050  | 595    | 533    | e441   | e190   |
| 22    | 665    | 343    | 810    | 1,590  | 265    | 288    | 828    | 1,050  | 633    | 614    | e498   | e200   |
| 23    | 646    | 350    | 741    | 1,470  | 260    | 270    | 1,020  | 930    | 570    | e569   | e420   | e178   |
| 24    | 604    | 888    | 691    | 1,260  | 259    | 251    | 1,290  | 837    | 526    | e502   | e378   | e186   |
| 25    | 550    | 1,580  | 674    | 1,060  | 260    | 239    | 1,330  | 778    | 506    | e473   | e383   | e193   |
| 26    | 506    | 1,040  | 654    | 930    | 260    | 510    | 1,250  | 765    | 501    | e470   | e410   | e219   |
| 27    | 460    | 841    | 593    | 866    | 259    | 2,030  | 1,200  | 784    | 516    | e485   | e404   | e237   |
| 28    | 435    | 716    | 556    | 779    | 278    | 1,860  | 1,140  | 823    | 515    | e503   | e446   | e230   |
| 29    | 405    | 643    | 592    | 703    | ---    | 1,380  | 954    | 823    | 519    | e500   | e394   | e1,030 |
| 30    | 486    | 623    | 557    | 645    | ---    | 1,050  | 861    | 792    | 522    | e479   | e305   | e2,400 |
| 31    | 445    | ---    | 514    | 598    | ---    | 851    | ---    | 773    | ---    | e476   | e320   | ---    |
| TOTAL | 15,606 | 19,629 | 30,386 | 29,060 | 10,086 | 14,370 | 26,274 | 26,567 | 16,977 | 16,020 | 12,770 | 10,085 |
| MEAN  | 503    | 654    | 980    | 937    | 360    | 464    | 876    | 857    | 566    | 517    | 412    | 336    |
| MAX   | 902    | 1,580  | 4,150  | 5,540  | 552    | 2,030  | 1,330  | 1,200  | 868    | 724    | 498    | 2,400  |
| MIN   | 351    | 336    | 425    | 301    | 259    | 230    | 554    | 604    | 478    | 433    | 305    | 178    |
| AC-FT | 30,950 | 38,930 | 60,270 | 57,640 | 20,010 | 28,500 | 52,110 | 52,700 | 33,670 | 31,780 | 25,330 | 20,000 |
| CFSM  | 3.79   | 4.92   | 7.37   | 7.05   | 2.71   | 3.49   | 6.58   | 6.44   | 4.25   | 3.89   | 3.10   | 2.53   |
| IN.   | 4.36   | 5.49   | 8.50   | 8.13   | 2.82   | 4.02   | 7.35   | 7.43   | 4.75   | 4.48   | 3.57   | 2.82   |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2005, BY WATER YEAR (WY)

|      | 464    | 822    | 947    | 877    | 814    | 654    | 786    | 1,027  | 1,045  | 798    | 561    | 433    |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 464    | 822    | 947    | 877    | 814    | 654    | 786    | 1,027  | 1,045  | 798    | 561    | 433    |
| MAX  | 1,333  | 2,696  | 2,344  | 1,805  | 2,330  | 1,784  | 1,276  | 1,681  | 2,010  | 1,334  | 952    | 739    |
| (WY) | (1948) | (1996) | (1976) | (1974) | (1996) | (1972) | (1990) | (1949) | (1974) | (1974) | (1999) | (1959) |
| MIN  | 205    | 140    | 246    | 285    | 318    | 296    | 362    | 596    | 490    | 433    | 333    | 275    |
| (WY) | (1990) | (1953) | (1953) | (1979) | (1966) | (1955) | (1975) | (1992) | (1992) | (1992) | (1994) | (1985) |

## NISQUALLY RIVER BASIN

12082500 NISQUALLY RIVER NEAR NATIONAL, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1942 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 280,878                |        | 227,830             |        |                         |              |
| ANNUAL MEAN              | 767                    |        | 624                 |        | 769                     |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 1,186                   | 1996         |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 496                     | 1944         |
| HIGHEST DAILY MEAN       | 4,150                  | Dec 11 | 5,540               | Jan 18 | 15,700                  | Feb 8, 1996  |
| LOWEST DAILY MEAN        | 300                    | Jan 5  | 178                 | Sep 23 | 105                     | Nov 10, 1987 |
| ANNUAL SEVEN-DAY MINIMUM | 367                    | Jan 1  | 192                 | Sep 18 | 116                     | Nov 26, 1952 |
| ANNUAL RUNOFF (AC-FT)    | 557,100                |        | 451,900             |        | 557,000                 |              |
| ANNUAL RUNOFF (CFSM)     | 5.77                   |        | 4.69                |        | 5.78                    |              |
| ANNUAL RUNOFF (INCHES)   | 78.56                  |        | 63.72               |        | 78.54                   |              |
| 10 PERCENT EXCEEDS       | 1,120                  |        | 1,040               |        | 1,330                   |              |
| 50 PERCENT EXCEEDS       | 669                    |        | 501                 |        | 627                     |              |
| 90 PERCENT EXCEEDS       | 435                    |        | 260                 |        | 319                     |              |

e Estimated



12083000 MINERAL CREEK NEAR MINERAL, WA

LOCATION.--Lat 46°44'40", long 122°08'36", in SE¼SW¼ sec.35, T.15 N., R.5 E., Lewis County, Hydrologic Unit 17110015, on right bank 0.3 mi downstream from railroad bridge, 2.3 mi northeast of Mineral, and at mile 1.3.

DRAINAGE AREA.--75.2 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1942 to current year.

REVISED RECORDS.--WSP 1932: Drainage area. WRD WA-74: 1971(P).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,340 ft above NGVD of 1929, from topographic map. Prior to May 14, 1987, at site 0.25 mi downstream at datum 1.90 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--63 years (water years 1943-2005), 359 ft<sup>3</sup>/s, 64.83 in/yr, 260,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 12.89 ft, from rating curve extended above 560 ft<sup>3</sup>/s, based on runoff comparisons with nearby stations; minimum discharge, 13 ft<sup>3</sup>/s, Sept. 23-25, 1989, gage height, 6.93 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) | Date   | Time | Discharge (ft <sup>3</sup> /s) | Gage height (ft) |
|--------|------|--------------------------------|------------------|--------|------|--------------------------------|------------------|
| Dec 11 | 0715 | 4,000                          | 12.22            | Jan 18 | 0330 | *4,750                         | *12.56           |

Minimum discharge, 30 ft<sup>3</sup>/s, Sept. 7-9, 22-28, gage height, 8.20 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT    | NOV    | DEC    | JAN    | FEB   | MAR    | APR    | MAY    | JUN   | JUL   | AUG   | SEP   |
|-------|--------|--------|--------|--------|-------|--------|--------|--------|-------|-------|-------|-------|
| 1     | 107    | 239    | 254    | 186    | 204   | 118    | 733    | 258    | 241   | 110   | 49    | 34    |
| 2     | 102    | 801    | 227    | 174    | 190   | 105    | 697    | 244    | 222   | 105   | 48    | 33    |
| 3     | 97     | 816    | 210    | 163    | 178   | 102    | 640    | 229    | 202   | 102   | 47    | 33    |
| 4     | 92     | 571    | 201    | e145   | 196   | 96     | 588    | 211    | 185   | 97    | 45    | 32    |
| 5     | 90     | 445    | 211    | e141   | 196   | 93     | 509    | 197    | 178   | 93    | 44    | 33    |
| 6     | 103    | 363    | 202    | e138   | 184   | 91     | 468    | 186    | 172   | 107   | 43    | 32    |
| 7     | 95     | 309    | 246    | 150    | 177   | 89     | 504    | 171    | 166   | 94    | 42    | 31    |
| 8     | 148    | 268    | 784    | 142    | 163   | 85     | 554    | 165    | 172   | 122   | 42    | 31    |
| 9     | 256    | 237    | 844    | 134    | 154   | 84     | 481    | 219    | 153   | 214   | 41    | 33    |
| 10    | 187    | 213    | 2,000  | 128    | 147   | 82     | 419    | 355    | 143   | 142   | 40    | 51    |
| 11    | 151    | 194    | 3,230  | 123    | 143   | 80     | 546    | 325    | 158   | 123   | 40    | 44    |
| 12    | 133    | 179    | 1,710  | 126    | 144   | 78     | 509    | 291    | 155   | 110   | 40    | 38    |
| 13    | 121    | 166    | 1,060  | 125    | 149   | 76     | 447    | 262    | 147   | 102   | 39    | 35    |
| 14    | 113    | 157    | 907    | 116    | 138   | 75     | 399    | 264    | 140   | 95    | 38    | 35    |
| 15    | 108    | 172    | 791    | 115    | 130   | 73     | 387    | 254    | 132   | 89    | 37    | 34    |
| 16    | 124    | 171    | 656    | 173    | 125   | 80     | 950    | 330    | 128   | 86    | 37    | 34    |
| 17    | 428    | 158    | 548    | 1,010  | 121   | 89     | 927    | 362    | 230   | 81    | 41    | 34    |
| 18    | 486    | 249    | 474    | 3,840  | 118   | 81     | 706    | 444    | 186   | 77    | 45    | 34    |
| 19    | 453    | 236    | 421    | 1,780  | 114   | 86     | 566    | 618    | 225   | 73    | 40    | 33    |
| 20    | 362    | 200    | 375    | 1,070  | 111   | 115    | 490    | 594    | 186   | 71    | 37    | 32    |
| 21    | 308    | 183    | 344    | 836    | 106   | 120    | 439    | 533    | 168   | 68    | 36    | 32    |
| 22    | 273    | 176    | 311    | 651    | 104   | 106    | 409    | 527    | 168   | 79    | 36    | 32    |
| 23    | 255    | 171    | 280    | 530    | 101   | 100    | 414    | 466    | 158   | 73    | 36    | 31    |
| 24    | 244    | 260    | 258    | 444    | 99    | 100    | 495    | 405    | 142   | 67    | 35    | 31    |
| 25    | 224    | 613    | 261    | 381    | 97    | 95     | 484    | 356    | 132   | 63    | 34    | 31    |
| 26    | 207    | 496    | 281    | 344    | 96    | 467    | 419    | 313    | 125   | 61    | 33    | 31    |
| 27    | 188    | 394    | 236    | 320    | 94    | 2,030  | 374    | 277    | 136   | 58    | 32    | 32    |
| 28    | 176    | 325    | 215    | 284    | 102   | 1,430  | 340    | 247    | 135   | 56    | 32    | 32    |
| 29    | 168    | 283    | 224    | 262    | ---   | 1,180  | 312    | 225    | 124   | 54    | 34    | 32    |
| 30    | 264    | 269    | 214    | 239    | ---   | 850    | 287    | 210    | 115   | 53    | 35    | 129   |
| 31    | 247    | ---    | 198    | 222    | ---   | 622    | ---    | 208    | ---   | 50    | 34    | ---   |
| TOTAL | 6,310  | 9,314  | 18,173 | 14,492 | 3,881 | 8,878  | 15,493 | 9,746  | 4,924 | 2,775 | 1,212 | 1,109 |
| MEAN  | 204    | 310    | 586    | 467    | 139   | 286    | 516    | 314    | 164   | 89.5  | 39.1  | 37.0  |
| MAX   | 486    | 816    | 3,230  | 3,840  | 204   | 2,030  | 950    | 618    | 241   | 214   | 49    | 129   |
| MIN   | 90     | 157    | 198    | 115    | 94    | 73     | 287    | 165    | 115   | 50    | 32    | 31    |
| AC-FT | 12,520 | 18,470 | 36,050 | 28,740 | 7,700 | 17,610 | 30,730 | 19,330 | 9,770 | 5,500 | 2,400 | 2,200 |
| CFSM  | 2.71   | 4.13   | 7.80   | 6.22   | 1.84  | 3.81   | 6.87   | 4.18   | 2.18  | 1.19  | 0.52  | 0.49  |
| IN.   | 3.12   | 4.61   | 8.99   | 7.17   | 1.92  | 4.39   | 7.66   | 4.82   | 2.44  | 1.37  | 0.60  | 0.55  |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 151    | 500    | 674    | 656    | 604    | 483    | 487    | 378    | 206    | 81.8   | 47.1   | 56.1   |
| MAX  | 527    | 1,219  | 1,463  | 1,568  | 1,443  | 1,358  | 873    | 745    | 552    | 195    | 109    | 192    |
| (WY) | (1956) | (1956) | (1976) | (1953) | (1982) | (1972) | (1991) | (1949) | (1955) | (1983) | (2004) | (1959) |
| MIN  | 23.1   | 35.9   | 128    | 138    | 139    | 155    | 213    | 141    | 50.9   | 32.9   | 20.4   | 18.3   |
| (WY) | (1953) | (1953) | (1977) | (1977) | (2005) | (1992) | (2004) | (1994) | (1992) | (2003) | (2003) | (1989) |

## NISQUALLY RIVER BASIN

12083000 MINERAL CREEK NEAR MINERAL, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1942 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 107,069                |        | 96,307              |        |                         |              |
| ANNUAL MEAN              | 293                    |        | 264                 |        | 359                     |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 527                     |              |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 173                     |              |
| HIGHEST DAILY MEAN       | 3,230                  | Dec 11 | 3,840               | Jan 18 | 9,260                   | Feb 8, 1996  |
| LOWEST DAILY MEAN        | 27                     | Aug 20 | 31                  | Sep 7  | 13                      | Sep 24, 1989 |
| ANNUAL SEVEN-DAY MINIMUM | 29                     | Aug 15 | 31                  | Sep 20 | 15                      | Sep 19, 1989 |
| ANNUAL RUNOFF (AC-FT)    | 212,400                |        | 191,000             |        | 260,000                 |              |
| ANNUAL RUNOFF (CFSM)     | 3.89                   |        | 3.51                |        | 4.77                    |              |
| ANNUAL RUNOFF (INCHES)   | 52.96                  |        | 47.64               |        | 64.83                   |              |
| 10 PERCENT EXCEEDS       | 565                    |        | 547                 |        | 778                     |              |
| 50 PERCENT EXCEEDS       | 222                    |        | 165                 |        | 230                     |              |
| 90 PERCENT EXCEEDS       | 50                     |        | 36                  |        | 37                      |              |

e Estimated

12085000 ALDER RESERVOIR AT ALDER, WA

LOCATION.--Lat 46°48'09", long 122°18'37", in SE 1/4 NW 1/4 sec.9, T.15 N., R.4 E., Thurston County, Hydrologic Unit 17110015, near left end of Alder Dam on Nisqually River, 1.0 mi west of Alder, 1.7 mi upstream from La Grande Dam, 4.6 mi upstream from Mashel River, and at mile 44.2.

DRAINAGE AREA.--286 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1944 to current year.

GAGE.--Water-stage recorder. Datum of gage is 7.61 ft above NGVD of 1929 (levels by Tacoma Public Utilities). Prior to July 8, 1946, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete-arch dam; storage began Nov. 7, 1944; dam completed in 1945. Usable capacity, 161,457 acre-ft (based on 1985 survey) between gage heights 1,114 ft, lower limit of operating range, and 1,207 ft, top of spillway gates. Unused storage below gage height 1,114 ft, 52,110 acre-ft. Crest of spillway is at gage height 1,177 ft. Figures given herein represent total contents. Water is used by City of Tacoma for power generation. Chemical analyses December 1973 to September 1983 (samples were taken near the dam).

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 233,848 acre-ft, Dec. 4, 1975, gage height, 1,207.68 ft; minimum contents since reservoir first filled, 74,200 acre-ft, Nov. 26, 2000, gage height, 1,137.36 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 209,100 acre-ft, May 24; gage height, 1,205.55 ft; minimum contents 118,800 acre-ft Mar. 26, gage height, 1,169.03 ft.

CAPACITY TABLE

(Based on project resurvey and maps provided by Tacoma Public Utilities in 1985)

| Gage height (feet) | Contents (acre-feet) | Gage height (feet) | Contents (acre-feet) | Gage height (feet) | Contents (acre-feet) |
|--------------------|----------------------|--------------------|----------------------|--------------------|----------------------|
| 1,143              | 80,474               | 1,170              | 120,736              | 1,200              | 192,544              |
| 1,150              | 89,003               | 1,180              | 141,570              | 1,207              | 213,570              |
| 1,160              | 103,084              | 1,190              | 164,970              |                    |                      |

RESERVOIR STORAGE, ACRE FEET  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY OBSERVATION AT 2400 HOURS

| DAY    | OCT      | NOV         | DEC         | JAN            | FEB      | MAR      | APR      | MAY      | JUN      | JUL      | AUG      | SEP      |
|--------|----------|-------------|-------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1      | 181,500  | 163,900     | 140,200     | 150,000        | 163,600  | 139,100  | 152,400  | 201,600  | 203,200  | 196,900  | 179,500  | 165,700  |
| 2      | 180,500  | 166,800     | 138,700     | 148,700        | 162,900  | 138,100  | 155,300  | 200,900  | 202,400  | 196,500  | 178,600  | 165,300  |
| 3      | 179,500  | 169,100     | 137,400     | 147,400        | 162,300  | 137,000  | 157,600  | 200,100  | 201,900  | 195,600  | 178,000  | 164,700  |
| 4      | 178,400  | 169,800     | 136,200     | 146,000        | 161,700  | 136,000  | 159,600  | 199,700  | 201,600  | 195,000  | 177,500  | 164,000  |
| 5      | 177,400  | 169,700     | 135,100     | 144,500        | 161,200  | 134,800  | 161,200  | 199,800  | 201,300  | 194,300  | 177,000  | 163,400  |
| 6      | 176,700  | 169,300     | 133,700     | 143,000        | 160,900  | 133,900  | 162,100  | 199,800  | 201,000  | 194,200  | 176,600  | 162,700  |
| 7      | 175,500  | 168,400     | 132,600     | 141,900        | 160,100  | 132,900  | 163,800  | 199,700  | 200,900  | 193,700  | 176,200  | 162,200  |
| 8      | 175,300  | 167,200     | 133,800     | 140,500        | 159,500  | 132,000  | 165,600  | 199,600  | 200,600  | 193,300  | 175,900  | 161,700  |
| 9      | 175,300  | 165,800     | 134,400     | 139,200        | 158,800  | 131,200  | 167,000  | 200,000  | 200,200  | 193,500  | 175,400  | 161,300  |
| 10     | 174,900  | 164,400     | 140,700     | 138,000        | 157,900  | 130,200  | 168,100  | 201,400  | 199,800  | 193,500  | 175,000  | 160,800  |
| 11     | 174,200  | 162,900     | 154,100     | 136,600        | 157,000  | 129,500  | 170,300  | 202,200  | 199,700  | 192,600  | 174,600  | 160,100  |
| 12     | 173,500  | 161,400     | 159,200     | 135,300        | 156,100  | 128,500  | 172,200  | 202,800  | 199,400  | 192,100  | 173,900  | 159,300  |
| 13     | 172,400  | 159,600     | 161,200     | 134,000        | 155,200  | 127,700  | 173,400  | 203,000  | 199,000  | 191,500  | 173,600  | 158,500  |
| 14     | 171,600  | 157,800     | 163,000     | 132,700        | 154,300  | 126,700  | 174,500  | 203,600  | 198,600  | 190,800  | 173,200  | 157,800  |
| 15     | 170,700  | 156,100     | 164,200     | 131,500        | 153,500  | 125,900  | 175,500  | 204,400  | 198,300  | 190,100  | 173,100  | 156,700  |
| 16     | 170,200  | 154,300     | 164,800     | 130,400        | 152,500  | 125,200  | 180,400  | 204,600  | 198,100  | 189,500  | 173,400  | 155,800  |
| 17     | 172,700  | 152,300     | 165,000     | 133,000        | 151,400  | 124,300  | 184,500  | 204,000  | 198,500  | 188,900  | 172,700  | 155,000  |
| 18     | 174,700  | 151,100     | 164,600     | 152,800        | 150,400  | 123,400  | 187,100  | 204,100  | 198,800  | 188,300  | 172,200  | 154,200  |
| 19     | 175,600  | 149,500     | 164,100     | 160,900        | 149,400  | 122,700  | 189,000  | 205,500  | 199,000  | 187,700  | 171,800  | 153,400  |
| 20     | 175,800  | 147,800     | 163,400     | 164,100        | 148,400  | 122,300  | 190,500  | 206,600  | 199,000  | 187,100  | 171,200  | 152,400  |
| 21     | 175,700  | 146,200     | 162,400     | 166,100        | 147,400  | 122,100  | 191,700  | 207,500  | 199,100  | 186,300  | 170,700  | 151,300  |
| 22     | 175,200  | 144,400     | 161,300     | 166,900        | 146,300  | 121,500  | 193,100  | 208,300  | 199,200  | 186,000  | 170,500  | 149,300  |
| 23     | 174,700  | 142,700     | 160,300     | 167,100        | 145,300  | 120,600  | 194,500  | 208,600  | 199,300  | 185,300  | 170,200  | 148,000  |
| 24     | 174,100  | 142,200     | 159,200     | 166,800        | 144,300  | 119,900  | 196,900  | 208,500  | 199,100  | 184,400  | 169,600  | 147,300  |
| 25     | 173,400  | 144,000     | 158,100     | 166,300        | 143,200  | 119,100  | 199,100  | 208,300  | 198,900  | 183,600  | 169,100  | 146,600  |
| 26     | 172,700  | 144,500     | 157,100     | 165,900        | 142,200  | 120,700  | 200,800  | 207,600  | 198,400  | 183,000  | 168,600  | 145,800  |
| 27     | 171,100  | 144,200     | 155,800     | 165,300        | 141,100  | 131,900  | 202,000  | 206,800  | 198,300  | 182,300  | 168,200  | 145,300  |
| 28     | 169,600  | 143,500     | 154,400     | 165,100        | 140,000  | 139,000  | 202,700  | 206,000  | 198,100  | 181,700  | 167,900  | 144,700  |
| 29     | 168,100  | 142,500     | 153,300     | 164,900        | ---      | 144,300  | 202,800  | 205,100  | 197,700  | 181,100  | 167,400  | 145,000  |
| 30     | 166,700  | 141,500     | 152,300     | 164,700        | ---      | 147,200  | 202,200  | 204,400  | 197,500  | 180,500  | 166,800  | 148,200  |
| 31     | 165,200  | ---         | 151,300     | 164,000        | ---      | 149,400  | ---      | 203,600  | ---      | 180,100  | 166,300  | ---      |
| MAX    | 181,500  | 169,800     | 165,000     | 167,100        | 163,600  | 149,400  | 202,800  | 208,600  | 203,200  | 196,900  | 179,500  | 165,700  |
| MIN    | 165,200  | 141,500     | 132,600     | 130,400        | 140,000  | 119,100  | 152,400  | 199,600  | 197,500  | 180,100  | 166,300  | 144,700  |
| †      | 1,190.07 | 1,179.98    | 1,184.34    | 1,189.60       | 1,179.35 | 1,183.55 | 1,203.26 | 1,203.72 | 1,201.65 | 1,195.60 | 1,190.50 | 1,183.02 |
| ‡      | -17,300  | -23,700     | +9,800      | +12,700        | -24,000  | +9,400   | +52,800  | +1,400   | -6,100   | -17,400  | -13,800  | 18,100   |
| CAL YR | 2004     | MAX 190,900 | MIN 123,700 | AC-FT‡ +10,000 |          |          |          |          |          |          |          |          |
| WTR YR | 2005     | MAX 208,600 | MIN 119,100 | AC-FT‡ +34,300 |          |          |          |          |          |          |          |          |

† Gage Height, in feet, at end of month.

‡ Change in contents, in acre-feet.

## NISQUALLY RIVER BASIN

## 12085500 LA GRANDE RESERVOIR AT LA GRANDE, WA

LOCATION.--Lat 46°49'23", long 122°18'13", in SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.33, T.16 N., R.4 E., Thurston County, Hydrologic Unit 17110015, at left end of gate control structure, 1.1 mi southeast of La Grande, 1.7 mi downstream from Alder Dam, and at mile 42.5.

DRAINAGE AREA.--289 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1945 to current year. January 1945 to September 1951 included in combined adjustment to monthly flow of Nisqually River at La Grande. Month-end contents January 1945 to September 1950, published in WSP 1316.

GAGE.--Water-stage recorder. Datum of gage is 7.61 ft below NGVD of 1929 (levels by City of Tacoma). Prior to June 12, 1947, month-end gage heights furnished by City of Tacoma from temporary gages in pool upstream from dam.

REMARKS.--Reservoir is formed by concrete gravity dam completed in 1944; storage began in February 1945. Useable storage, 1,053 acre-ft between gage heights 910 ft, minimum practical head, and 935 ft, normal reservoir level. Dead storage below gage height 910 ft, 1,629 acre-ft. Figures given herein represent total contents. Water used by Tacoma Public Utilities for power generation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,760 acre-ft, May 14, 1950, gage height, 936.4 ft; minimum contents observed since reservoir first filled, 1,370 acre-ft, Aug. 24, 1956, gage height, 900.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,652 acre-ft, Feb. 15, gage height, 934.45 ft; minimum contents, 1,650 acre-ft, Aug. 17, gage height, 910.73 ft.

MONTH-END GAGE HEIGHT AND CONTENTS AT 2400  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005

| Date               | Gage height<br>(feet) | Contents<br>(acre-feet) | Change in contents<br>(acre-feet) |
|--------------------|-----------------------|-------------------------|-----------------------------------|
| September 30       | 932.28                | 2,535                   | --                                |
| October 31         | 932.10                | 2,525                   | -10                               |
| November 30        | 932.23                | 2,532                   | +7                                |
| December 31        | 931.81                | 2,510                   | -22                               |
| Calendar Year 2004 | --                    | --                      | +30                               |
| January 31         | 932.66                | 2,555                   | +45                               |
| February 28        | 930.14                | 2,424                   | -131                              |
| March 31           | 931.83                | 2,511                   | +87                               |
| April 30           | 931.88                | 2,514                   | +3                                |
| May 31             | 931.74                | 2,506                   | -8                                |
| June 30            | 930.56                | 2,446                   | -60                               |
| July 31            | 927.66                | 2,302                   | -144                              |
| August 31          | 929.83                | 2,408                   | +106                              |
| September 30       | 931.36                | 2,487                   | +79                               |
| Water Year 2005    | --                    | --                      | -48                               |

12086500 NISQUALLY RIVER AT LA GRANDE, WA

LOCATION.--Lat 46°50'37", long 122°19'46", in NW<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub> sec.29, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on right bank 0.4 mi downstream from Tacoma Public Utilities powerplant, 0.6 mi northwest of La Grande, 0.8 mi upstream from Mashel River, and at mile 40.4.

DRAINAGE AREA.--292 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1906 to October 1911, November to December 1911 (gage heights only), October 1919 to September 1931, October 1943 to current year. Monthly discharge only for some periods, published in WSP 1316. Published as "below Little Nisqually River, near La Grande" September 1906 to October 1911, and as "near La Grande" November to December 1911 and October 1919 to September 1931.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1316: 1927-28(M), 1949-50. WRD WA-74: 1956(M), 1959-61(M), 1965.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 490 ft above NGVD of 1929, from river-profile map. See WSP 1932 for history of changes prior to Feb. 8, 1945.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Tacoma Public Utilities powerplant at La Grande since December 1943, by Alder Reservoir (station 12085000) since November 1944, and by La Grande Reservoir (station 12085500) since February 1945. All diversions returned to river upstream from gage. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1972 to September 1985. Water temperatures October 1965 to September 1982.

AVERAGE DISCHARGE.--79 years (water years 1907-11, 1920-31, 1944-2005), 1,428 ft<sup>3</sup>/s, 66.41 in/yr, 1,035,000 acre-ft/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,500 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 15.30 ft, from rating curve extended above 5,300 ft<sup>3</sup>/s, and computed flow over dam as provided by Tacoma Public Utilities; practically no flow on many days at site "near La Grande" (which excluded diversion between 1920 and 1930) as a result of regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,440 ft<sup>3</sup>/s, Jan. 18, gage height, 5.51 ft; minimum discharge, 539 ft<sup>3</sup>/s, Aug. 24, gage height, 3.21 ft; minimum daily discharge, 634 ft<sup>3</sup>/s, Aug. 15.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY         | OCT           | NOV        | DEC       | JAN     | FEB           | MAR         | APR        | MAY        | JUN            | JUL    | AUG    | SEP    |
|-------------|---------------|------------|-----------|---------|---------------|-------------|------------|------------|----------------|--------|--------|--------|
| 1           | 1,110         | 1,640      | 1,650     | 1,430   | 1,190         | 1,050       | 892        | 1,590      | 1,620          | 992    | 846    | 665    |
| 2           | 1,120         | 1,650      | 1,650     | 1,430   | 1,190         | 1,040       | 894        | 1,590      | 1,470          | 1,020  | 852    | 664    |
| 3           | 1,120         | 1,650      | 1,590     | 1,430   | 1,190         | 993         | 892        | 1,600      | 1,350          | 1,020  | 855    | 664    |
| 4           | 1,120         | 1,640      | 1,450     | 1,440   | 1,160         | 996         | 891        | 1,400      | 1,140          | 1,010  | 810    | 663    |
| 5           | 1,120         | 1,640      | 1,450     | 1,440   | 1,130         | 994         | 891        | 1,170      | 1,130          | 989    | 772    | 664    |
| 6           | 1,120         | 1,640      | 1,520     | 1,430   | 1,130         | 994         | 890        | 1,020      | 1,130          | 976    | 770    | 664    |
| 7           | 1,120         | 1,640      | 1,650     | 1,340   | 1,130         | 989         | 894        | 1,060      | 1,010          | 1,050  | 765    | 663    |
| 8           | 1,130         | 1,640      | 1,910     | 1,250   | 1,120         | 939         | 894        | 1,070      | 1,000          | 1,070  | 766    | 663    |
| 9           | 1,130         | 1,640      | 2,160     | 1,260   | 1,120         | 916         | 891        | 1,070      | 1,000          | 1,020  | 764    | 660    |
| 10          | 1,130         | 1,650      | 2,170     | 1,250   | 1,140         | 889         | 896        | 1,080      | 1,010          | 1,020  | 730    | 662    |
| 11          | 1,130         | 1,650      | 2,170     | 1,230   | 1,130         | 887         | 902        | 1,080      | 977            | 1,040  | 707    | 660    |
| 12          | 1,120         | 1,650      | 2,160     | 1,220   | 1,130         | 887         | 897        | 1,090      | 976            | 1,040  | 846    | 665    |
| 13          | 1,130         | 1,650      | 2,140     | 1,220   | 1,130         | 887         | 894        | 1,090      | 982            | 1,050  | 675    | 665    |
| 14          | 1,120         | 1,650      | 2,160     | 1,220   | 1,110         | 887         | 891        | 1,090      | 985            | 1,070  | 674    | 668    |
| 15          | 1,120         | 1,650      | 2,040     | 1,220   | 1,110         | 887         | 891        | 1,090      | 957            | 1,040  | 634    | 800    |
| 16          | 1,130         | 1,650      | 1,870     | 1,220   | 1,100         | 887         | 908        | 1,460      | 957            | 1,010  | 663    | 820    |
| 17          | 1,150         | 1,650      | 1,860     | 1,390   | 1,090         | 887         | 902        | 1,840      | 951            | 1,010  | 704    | 665    |
| 18          | 1,140         | 1,650      | 1,860     | 2,030   | 1,090         | 887         | 895        | 1,830      | 951            | 1,010  | 718    | 660    |
| 19          | 1,270         | 1,650      | 1,860     | 2,250   | 1,070         | 887         | 896        | 1,590      | 952            | 1,010  | 724    | 657    |
| 20          | 1,420         | 1,650      | 1,860     | 2,110   | 1,070         | 889         | 900        | 1,580      | 950            | 1,050  | 715    | 812    |
| 21          | 1,420         | 1,650      | 1,860     | 2,080   | 1,070         | 890         | 905        | 1,580      | 947            | 1,060  | 716    | 869    |
| 22          | 1,420         | 1,650      | 1,820     | 2,070   | 1,070         | 887         | 904        | 1,580      | 952            | 1,060  | 670    | 1,250  |
| 23          | 1,420         | 1,650      | 1,720     | 2,060   | 1,050         | 887         | 923        | 1,580      | 952            | 1,050  | 658    | 886    |
| 24          | 1,410         | 1,650      | 1,640     | 1,980   | 1,050         | 888         | 934        | 1,580      | 951            | 1,050  | 653    | 650    |
| 25          | 1,410         | 1,650      | 1,640     | 1,800   | 1,050         | 887         | 936        | 1,580      | 949            | 1,040  | 662    | 647    |
| 26          | 1,410         | 1,650      | 1,650     | 1,650   | 1,050         | 892         | 1,040      | 1,700      | 948            | 984    | 666    | 648    |
| 27          | 1,420         | 1,650      | 1,640     | 1,590   | 1,050         | 918         | 1,170      | 1,680      | 951            | 958    | 664    | 647    |
| 28          | 1,530         | 1,650      | 1,630     | 1,350   | 1,050         | 903         | 1,250      | 1,620      | 949            | 958    | 665    | 648    |
| 29          | 1,630         | 1,650      | 1,510     | 1,220   | ---           | 899         | 1,460      | 1,620      | 958            | 944    | 665    | 762    |
| 30          | 1,640         | 1,650      | 1,430     | 1,220   | ---           | 897         | 1,610      | 1,520      | 972            | 930    | 666    | 1,000  |
| 31          | 1,640         | ---        | 1,420     | 1,220   | ---           | 896         | ---        | 1,670      | ---            | 887    | 665    | ---    |
| TOTAL       | 39,300        | 49,430     | 55,140    | 47,050  | 30,970        | 28,516      | 29,033     | 44,100     | 31,027         | 31,418 | 22,340 | 21,711 |
| MEAN        | 1,268         | 1,648      | 1,779     | 1,518   | 1,106         | 920         | 968        | 1,423      | 1,034          | 1,013  | 721    | 724    |
| MAX         | 1,640         | 1,650      | 2,170     | 2,250   | 1,190         | 1,050       | 1,610      | 1,840      | 1,620          | 1,070  | 855    | 1,250  |
| MIN         | 1,110         | 1,640      | 1,420     | 1,220   | 1,050         | 887         | 890        | 1,020      | 947            | 887    | 634    | 647    |
| AC-FT       | 77,950        | 98,040     | 109,400   | 93,320  | 61,430        | 56,560      | 57,590     | 87,470     | 61,540         | 62,320 | 44,310 | 43,060 |
| MEAN†       | 986           | 1,250      | 1,938     | 1,725   | 672           | 1,074       | 1,856      | 1,445      | 931            | 728    | 498    | 421    |
| CFSM†       | 3.38          | 4.28       | 6.64      | 5.91    | 2.30          | 3.68        | 6.36       | 4.95       | 3.19           | 2.49   | 1.71   | 1.44   |
| IN.†        | 3.89          | 4.77       | 7.65      | 6.81    | 2.39          | 4.24        | 7.09       | 5.70       | 3.56           | 2.88   | 1.97   | 1.61   |
| AC-FT†      | 60,640        | 74,350     | 119,200   | 106,100 | 37,300        | 66,050      | 110,400    | 88,860     | 55,380         | 44,780 | 30,620 | 25,040 |
| CAL YR 2004 | TOTAL 481,373 | MEAN 1,315 | MAX 2,430 | MIN 704 | AC-FT 954,800 | MEAN† 1,329 | CFSM† 4.55 | IN.† 61.95 | AC-FT† 964,800 |        |        |        |
| WTR YR 2005 | TOTAL 430,035 | MEAN 1,178 | MAX 2,250 | MIN 634 | AC-FT 853,000 | MEAN† 1,131 | CFSM† 3.87 | IN.† 52.57 | AC-FT† 818,700 |        |        |        |

† Adjusted for change in contents in Alder and La Grande Reservoirs.

## NISQUALLY RIVER BASIN

12087000 MASHEL RIVER NEAR LA GRANDE, WA

LOCATION.--Lat 46°51'25", long 122°18'05", in NW¼SE¼ sec.21, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on left bank, 50 ft downstream from State Highway 7 bridge, 1.8 mi northeast of La Grande, and at mile 3.3.

DRAINAGE AREA.--80.7 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1940 to September 1957, October 1991 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 619.53 ft above NGVD of 1929. Prior to Oct. 1, 1957, on right bank at same datum.

REMARKS.--Records good except for estimated discharges, which are poor. Small diversion for municipal supply for Eatonville. Some regulation at low water by millpond in Eatonville.

AVERAGE DISCHARGE.--31 years (1940-56, 1992-2005), 221 ft<sup>3</sup>/s, 37.20 in/yr, 160,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,980 ft<sup>3</sup>/s, Dec. 11, 1946, gage height, 9.30 ft, from rating curve extended above 3,200 ft<sup>3</sup>/s, present datum; minimum discharge, 2.3 ft<sup>3</sup>/s, Aug. 27, 1992.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge<br>(ft <sup>3</sup> /s) | Gage height<br>(ft) | Date   | Time | Discharge<br>(ft <sup>3</sup> /s) | Gage height<br>(ft) |
|--------|------|-----------------------------------|---------------------|--------|------|-----------------------------------|---------------------|
| Oct 17 | 1130 | 1,520                             | 5.59                | Mar 27 | 0900 | 1,560                             | 5.63                |
| Jan 18 | 0845 | *3,080                            | *6.74               |        |      |                                   |                     |

Minimum discharge, 7.4 ft<sup>3</sup>/s, Sept. 9, gage height, 2.83 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT    | NOV    | DEC    | JAN    | FEB   | MAR    | APR    | MAY    | JUN    | JUL   | AUG   | SEP   |
|-------|--------|--------|--------|--------|-------|--------|--------|--------|--------|-------|-------|-------|
| 1     | 48     | 118    | 244    | 128    | 96    | 63     | 444    | e170   | 218    | 93    | 20    | 11    |
| 2     | 42     | 554    | 202    | 113    | 90    | 56     | 475    | e160   | 180    | 85    | 20    | 10    |
| 3     | 38     | 628    | 176    | 101    | 86    | 55     | 381    | e190   | 179    | 79    | 19    | 9.9   |
| 4     | 35     | 378    | 165    | 94     | 93    | 48     | e320   | 152    | 162    | 71    | 18    | 9.8   |
| 5     | 33     | 277    | 158    | e84    | 100   | 45     | e260   | 136    | 146    | 64    | 16    | 9.8   |
| 6     | 47     | 216    | 151    | 87     | 92    | 42     | 248    | 122    | 152    | 69    | 15    | 9.6   |
| 7     | 44     | 175    | 163    | 93     | 96    | 42     | e260   | 106    | 167    | 66    | 15    | 9.1   |
| 8     | 147    | 146    | 695    | 89     | 84    | 41     | e330   | 101    | 172    | 65    | 15    | 8.6   |
| 9     | 354    | 125    | 572    | 81     | 78    | 39     | e255   | 167    | 137    | 126   | 14    | 11    |
| 10    | 222    | 111    | 668    | 76     | 74    | 37     | e195   | 564    | 117    | 84    | 14    | 27    |
| 11    | 146    | 100    | 1,090  | 73     | 72    | 36     | e270   | 394    | 135    | 74    | 15    | 25    |
| 12    | 109    | 91     | 670    | 75     | 73    | 34     | e245   | 296    | 177    | 63    | 14    | 18    |
| 13    | 89     | 85     | 448    | 80     | 81    | 33     | e210   | 232    | 155    | 59    | 14    | 14    |
| 14    | 77     | 80     | 455    | 69     | 74    | 31     | e190   | 220    | 145    | 55    | 12    | 12    |
| 15    | 69     | 88     | 402    | 70     | 66    | 30     | e182   | 255    | 168    | 50    | 11    | 11    |
| 16    | 206    | 106    | 322    | 154    | 62    | 34     | e650   | 486    | 135    | 48    | 11    | 12    |
| 17    | 1,160  | 92     | 265    | 220    | 61    | 59     | e600   | 423    | 472    | 46    | 20    | 12    |
| 18    | 723    | 198    | 224    | 2,130  | 60    | 58     | e420   | 395    | 319    | 42    | 33    | 12    |
| 19    | 450    | 192    | 200    | 946    | 59    | 50     | e355   | 564    | 306    | 37    | 20    | 11    |
| 20    | 300    | 142    | 177    | 534    | 57    | 123    | e295   | 544    | 208    | 34    | 15    | 10    |
| 21    | 229    | 120    | 161    | 372    | 54    | 150    | e250   | 404    | 171    | 32    | 13    | 9.3   |
| 22    | 201    | 117    | 150    | 287    | 52    | 105    | e235   | 358    | 196    | 48    | 12    | 8.9   |
| 23    | 194    | 121    | 134    | 243    | 50    | 84     | e240   | 298    | 205    | 55    | 12    | 8.9   |
| 24    | 212    | 324    | 123    | 202    | 49    | 76     | e280   | 237    | 150    | 39    | 12    | 8.9   |
| 25    | 178    | 641    | 126    | 175    | 48    | 65     | e275   | 194    | 128    | 33    | 11    | 8.7   |
| 26    | 153    | 437    | 160    | 158    | 47    | 143    | e245   | 160    | 118    | 30    | 10    | 8.4   |
| 27    | 132    | 311    | 125    | 153    | 46    | 1,330  | e225   | 133    | 143    | 28    | 9.3   | 8.3   |
| 28    | 117    | 241    | 112    | 135    | 54    | 911    | e210   | 114    | 142    | 25    | 9.0   | 8.2   |
| 29    | 115    | 195    | 141    | 120    | ---   | 640    | e195   | 102    | 123    | 24    | 13    | 8.8   |
| 30    | 127    | 210    | 171    | 111    | ---   | 454    | e185   | 100    | 105    | 23    | 17    | 242   |
| 31    | 128    | ---    | 145    | 104    | ---   | 323    | ---    | 106    | ---    | 21    | 13    | ---   |
| TOTAL | 6,125  | 6,619  | 8,995  | 7,357  | 1,954 | 5,237  | 8,925  | 7,883  | 5,331  | 1,668 | 462.3 | 573.2 |
| MEAN  | 198    | 221    | 290    | 237    | 69.8  | 169    | 298    | 254    | 178    | 53.8  | 14.9  | 19.1  |
| MAX   | 1,160  | 641    | 1,090  | 2,130  | 100   | 1,330  | 650    | 564    | 472    | 126   | 33    | 242   |
| MIN   | 33     | 80     | 112    | 69     | 46    | 30     | 182    | 100    | 105    | 21    | 9.0   | 8.2   |
| AC-FT | 12,150 | 13,130 | 17,840 | 14,590 | 3,880 | 10,390 | 17,700 | 15,640 | 10,570 | 3,310 | 917   | 1,140 |
| CFSM  | 2.45   | 2.73   | 3.60   | 2.94   | 0.86  | 2.09   | 3.69   | 3.15   | 2.20   | 0.67  | 0.18  | 0.24  |
| IN.   | 2.82   | 3.05   | 4.15   | 3.39   | 0.90  | 2.41   | 4.11   | 3.63   | 2.46   | 0.77  | 0.21  | 0.26  |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 110    | 313    | 429    | 362    | 378    | 308    | 281    | 214    | 148    | 56.4   | 25.7   | 36.3   |
| MAX  | 307    | 688    | 890    | 694    | 786    | 567    | 475    | 441    | 329    | 178    | 88.3   | 126    |
| (WY) | (1956) | (1956) | (1947) | (1953) | (1996) | (1950) | (1955) | (1945) | (1946) | (1993) | (2004) | (2004) |
| MIN  | 10.0   | 12.9   | 83.2   | 113    | 69.8   | 88.2   | 103    | 67.2   | 25.2   | 12.6   | 7.05   | 10.4   |
| (WY) | (1953) | (1953) | (1953) | (2001) | (2005) | (1941) | (2004) | (1947) | (1992) | (2003) | (2003) | (2003) |

12087000 MASHIEL RIVER NEAR LA GRANDE, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1941 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 72,654.4               |        | 61,129.5            |        | 221                     |              |
| ANNUAL MEAN              | 199                    |        | 167                 |        | 337                     |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 125                     |              |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 1956                    |              |
| HIGHEST DAILY MEAN       | 1,780                  | Jan 29 | 2,130               | Jan 18 | 5,570                   | Dec 11, 1946 |
| LOWEST DAILY MEAN        | 6.3                    | Aug 20 | 8.2                 | Sep 28 | 4.1                     | Sep 5, 2003  |
| ANNUAL SEVEN-DAY MINIMUM | 7.2                    | Aug 15 | 8.6                 | Sep 23 | 4.6                     | Sep 1, 2003  |
| ANNUAL RUNOFF (AC-FT)    | 144,100                |        | 121,300             |        | 160,100                 |              |
| ANNUAL RUNOFF (CFSM)     | 2.46                   |        | 2.08                |        | 2.74                    |              |
| ANNUAL RUNOFF (INCHES)   | 33.49                  |        | 28.18               |        | 37.20                   |              |
| 10 PERCENT EXCEEDS       | 437                    |        | 386                 |        | 502                     |              |
| 50 PERCENT EXCEEDS       | 133                    |        | 113                 |        | 138                     |              |
| 90 PERCENT EXCEEDS       | 20                     |        | 13                  |        | 16                      |              |

e Estimated

## 12088000 OHOP CREEK NEAR EATONVILLE, WA

LOCATION.--Lat 46°52'52", long 122°16'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.10, T.16 N., R.4 E., Pierce County, Hydrologic Unit 17110015, on left bank, 150 ft downstream from Lynch Creek, 0.2 mi downstream from outlet of Ohop Lake, 0.8 mi northwest of Eatonville, and at mile 6.1.

DRAINAGE AREA.--34.5 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1927 to September 1932, September 1941 to September 1971, June 1993 to current year.

REVISED RECORDS.--WSP 1286: 1946. WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 517.76 ft above NGVD of 1929 (stadia traverse). June 1, 1927, to Sept. 30, 1932, water-stage recorder at datum 4.83 ft higher; Sept. 6, 1941, to Mar. 17, 1942, nonrecording gage and Mar. 18, 1942, to June 15, 1964, water-stage recorder at datum 2.04 ft higher; all at site 250 ft downstream. June 15, 1964, to Aug. 26, 1966, water-stage recorder at site on left bank across stream at datum 2.04 ft higher. Aug. 27, 1966, to Sept. 30, 1971, water-stage recorder at site on right bank at same datum.

REMARKS.--Records fair except for estimated daily discharges and Jan. 18 to Sept. 30, which are poor. Flow affected by natural storage in Ohop Lake.

AVERAGE DISCHARGE.--47 years (water years 1928-32, 1942-71, 1994-2005), 65.4 ft<sup>3</sup>/s, 25.77 in/yr, 47,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,620 ft<sup>3</sup>/s, Feb. 8, 1996, gage height, 8.76 ft; minimum discharge, 2.2 ft<sup>3</sup>/s, Sept. 2, 1994, Sept. 1, 2, 2002, and Aug. 25, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft<sup>3</sup>/s and maximum (\*):

| Date   | Time | Discharge<br>(ft <sup>3</sup> /s) | Gage height<br>(ft) | Date   | Time | Discharge<br>(ft <sup>3</sup> /s) | Gage height<br>(ft) |
|--------|------|-----------------------------------|---------------------|--------|------|-----------------------------------|---------------------|
| Jan 18 | 1000 | *1,030                            | *5.69               | Apr 16 | 1430 | 529                               | 4.26                |

Minimum discharge, 2.9 ft<sup>3</sup>/s, Aug. 3, gage height, 1.17 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT   | NOV   | DEC   | JAN   | FEB   | MAR   | APR   | MAY   | JUN   | JUL   | AUG   | SEP   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1     | 24    | 32    | 94    | e53   | 49    | e34   | 134   | 86    | 59    | 23    | 4.9   | 9.2   |
| 2     | 23    | 99    | 89    | e45   | 47    | e28   | 142   | 89    | 49    | 20    | 4.3   | 8.4   |
| 3     | 21    | 211   | 76    | e37   | 45    | e26   | 130   | 123   | 41    | 18    | 4.1   | 8.0   |
| 4     | 20    | 141   | 66    | e32   | 47    | e24   | 126   | 83    | 33    | 16    | 4.6   | 7.7   |
| 5     | 21    | 103   | 59    | e29   | 46    | e21   | 115   | 66    | 29    | 15    | 5.2   | 7.6   |
| 6     | 25    | 77    | 53    | 30    | 44    | e19   | 101   | 54    | 33    | 17    | 5.1   | 6.7   |
| 7     | 27    | 60    | 49    | 31    | 40    | e18   | 103   | 44    | 47    | 16    | 5.1   | 7.6   |
| 8     | 26    | 49    | 74    | 30    | 36    | e17   | 130   | 39    | 52    | 19    | 5.2   | 6.8   |
| 9     | 119   | 42    | 91    | 29    | 34    | e16   | 107   | 49    | 40    | 69    | 5.0   | 7.5   |
| 10    | 102   | 37    | 104   | 27    | 31    | e16   | 89    | 162   | 31    | 54    | 5.1   | 12    |
| 11    | 81    | 34    | 147   | 26    | 30    | e15   | 103   | 118   | 28    | 47    | 5.0   | 11    |
| 12    | 62    | 32    | 146   | 26    | 29    | e15   | 110   | 89    | 28    | 41    | 5.2   | 10    |
| 13    | 49    | 30    | 117   | 28    | 34    | e14   | 97    | 72    | 24    | 37    | 5.4   | 13    |
| 14    | 41    | 28    | 102   | 26    | 29    | e14   | 88    | 69    | 21    | 34    | 5.5   | 11    |
| 15    | 35    | 27    | 117   | 27    | 29    | e14   | 90    | 93    | 20    | 32    | 7.1   | 9.7   |
| 16    | 36    | 31    | 100   | 49    | 28    | e15   | 269   | 197   | 17    | 30    | 9.8   | 9.6   |
| 17    | 247   | 33    | 82    | 78    | 27    | e26   | 232   | 158   | 72    | 27    | 13    | 9.2   |
| 18    | 220   | 55    | 69    | 777   | 27    | e25   | 185   | 123   | 50    | 24    | 14    | 9.1   |
| 19    | 158   | 78    | 60    | 454   | 26    | e20   | 146   | 120   | 49    | 20    | 11    | 8.9   |
| 20    | 116   | 63    | 55    | 289   | e25   | 35    | 119   | 133   | 36    | 18    | 11    | 8.8   |
| 21    | 86    | 51    | 49    | 205   | e23   | 51    | 101   | 108   | 26    | 14    | 9.8   | 8.0   |
| 22    | 67    | 44    | 46    | 156   | e22   | 43    | 96    | 90    | 35    | 15    | 9.2   | 7.1   |
| 23    | 55    | 40    | 42    | 129   | e21   | 37    | 91    | 84    | 51    | 14    | 9.0   | 7.0   |
| 24    | 50    | 64    | 39    | 109   | e20   | 34    | 99    | 69    | 40    | 10    | 9.0   | 7.3   |
| 25    | 43    | 158   | e43   | 92    | e19   | 32    | 102   | 54    | 36    | 8.9   | 8.3   | 6.8   |
| 26    | 39    | 164   | e73   | 78    | e19   | 45    | 97    | 45    | 32    | 7.6   | 7.2   | 6.3   |
| 27    | 36    | 123   | e49   | 72    | e17   | 301   | 93    | 37    | 36    | 7.2   | 6.6   | 6.3   |
| 28    | 32    | 104   | e39   | 64    | e24   | 296   | 85    | 33    | 36    | 6.8   | 6.1   | 6.5   |
| 29    | 31    | 84    | e64   | 58    | ---   | 227   | 85    | 28    | 32    | 6.5   | 6.5   | 6.5   |
| 30    | 32    | 77    | e95   | 53    | ---   | 198   | 91    | 27    | 28    | 6.5   | 6.9   | 122   |
| 31    | 35    | ---   | e70   | 50    | ---   | 152   | ---   | 29    | ---   | 6.2   | 8.1   | ---   |
| TOTAL | 1,959 | 2,171 | 2,359 | 3,189 | 868   | 1,828 | 3,556 | 2,571 | 1,111 | 679.7 | 222.3 | 365.6 |
| MEAN  | 63.2  | 72.4  | 76.1  | 103   | 31.0  | 59.0  | 119   | 82.9  | 37.0  | 21.9  | 7.17  | 12.2  |
| MAX   | 247   | 211   | 147   | 777   | 49    | 301   | 269   | 197   | 72    | 69    | 14    | 122   |
| MIN   | 20    | 27    | 39    | 26    | 17    | 14    | 85    | 27    | 17    | 6.2   | 4.1   | 6.3   |
| AC-FT | 3,890 | 4,310 | 4,680 | 6,330 | 1,720 | 3,630 | 7,050 | 5,100 | 2,200 | 1,350 | 441   | 725   |
| CFSM  | 1.83  | 2.10  | 2.21  | 2.98  | 0.90  | 1.71  | 3.44  | 2.40  | 1.07  | 0.64  | 0.21  | 0.35  |
| IN.   | 2.11  | 2.34  | 2.54  | 3.44  | 0.94  | 1.97  | 3.83  | 2.77  | 1.20  | 0.73  | 0.24  | 0.39  |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 34.9   | 83.7   | 118    | 120    | 112    | 94.9   | 83.0   | 55.2   | 40.2   | 19.7   | 11.6   | 15.5   |
| MAX  | 90.8   | 235    | 268    | 258    | 305    | 191    | 141    | 138    | 114    | 64.5   | 59.6   | 70.9   |
| (WY) | (1928) | (1961) | (1947) | (1971) | (1996) | (1932) | (1928) | (1960) | (1942) | (1993) | (1968) | (1968) |
| MIN  | 7.69   | 8.76   | 24.6   | 32.8   | 31.0   | 46.4   | 28.4   | 19.2   | 12.2   | 6.04   | 4.93   | 4.44   |
| (WY) | (1930) | (1953) | (1953) | (2001) | (2005) | (2001) | (2004) | (1947) | (1932) | (1944) | (2003) | (1952) |



12088000 OHOP CREEK NEAR EATONVILLE, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1927 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 20,717.2               |        | 20,879.6            |        |                         |              |
| ANNUAL MEAN              | 56.6                   |        | 57.2                |        | 65.4                    |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 98.4 1956               |              |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 32.4 1994               |              |
| HIGHEST DAILY MEAN       | 407                    | Jan 29 | 777                 | Jan 18 | 2,090                   | Feb 8, 1996  |
| LOWEST DAILY MEAN        | 2.8                    | Jul 26 | 4.1                 | Aug 3  | 2.5                     | Aug 23, 1944 |
| ANNUAL SEVEN-DAY MINIMUM | 3.6                    | Aug 12 | 4.8                 | Aug 1  | 3.0                     | Aug 26, 2002 |
| ANNUAL RUNOFF (AC-FT)    | 41,090                 |        | 41,410              |        | 47,400                  |              |
| ANNUAL RUNOFF (CFSM)     | 1.64                   |        | 1.66                |        | 1.90                    |              |
| ANNUAL RUNOFF (INCHES)   | 22.34                  |        | 22.51               |        | 25.77                   |              |
| 10 PERCENT EXCEEDS       | 117                    |        | 122                 |        | 149                     |              |
| 50 PERCENT EXCEEDS       | 41                     |        | 36                  |        | 42                      |              |
| 90 PERCENT EXCEEDS       | 9.6                    |        | 7.6                 |        | 8.2                     |              |

e Estimated

## 12089208 CENTRALIA POWER CANAL NEAR MCKENNA, WA

LOCATION.--Lat 46°54'01", long 122°29'50", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.1, T.16 N., R.2 E., Thurston County, Hydrologic Unit 17110015, on left bank 1,000 ft downstream from headworks at dam, and 3.7 mi southeast of McKenna.

PERIOD OF RECORD.--March 1979 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 330 ft above NGVD of 1929, from topographic map. Prior to Oct. 20, 1999, at site 500 ft upstream at datum 10.00 ft lower.

REMARKS.--Records good, except for estimated daily discharges, which are fair. Flow regulated by headworks 1,000 ft upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft<sup>3</sup>/s, Nov. 11, 1990, gage height, 7.72 ft at datum then in use; minimum discharge, no flow on many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 801 ft<sup>3</sup>/s, Oct. 25, gage height, 16.31 ft; minimum daily discharge, 14 ft<sup>3</sup>/s, Sept. 2-15.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY    | OCT    | NOV           | DEC      | JAN     | FEB    | MAR           | APR    | MAY    | JUN    | JUL    | AUG    | SEP   |
|--------|--------|---------------|----------|---------|--------|---------------|--------|--------|--------|--------|--------|-------|
| 1      | 566    | 772           | 763      | 764     | 716    | 514           | 730    | 756    | 757    | 578    | 449    | e70   |
| 2      | 575    | 766           | 764      | 765     | 694    | 500           | 742    | 759    | 766    | 586    | 529    | e14   |
| 3      | 579    | 770           | 761      | 764     | 679    | 462           | 742    | 761    | 757    | 589    | 546    | e14   |
| 4      | 575    | 769           | 760      | 764     | 661    | 448           | 746    | 760    | 762    | 543    | 528    | e14   |
| 5      | 578    | 754           | 763      | 766     | 638    | 441           | 724    | 748    | 766    | 513    | 483    | e14   |
| 6      | 590    | 746           | 762      | 766     | 622    | 435           | 656    | 615    | 765    | 507    | 479    | e14   |
| 7      | 600    | 749           | 755      | 753     | 626    | 433           | 637    | 603    | 730    | 577    | 478    | e14   |
| 8      | 613    | 754           | 756      | 687     | 606    | 409           | 746    | 585    | 710    | 606    | 479    | e14   |
| 9      | 713    | 755           | 755      | 678     | 603    | 397           | 675    | 603    | 678    | 641    | 476    | e14   |
| 10     | 720    | 757           | 755      | 670     | 605    | 372           | 615    | 758    | 650    | 598    | 463    | e14   |
| 11     | 722    | 755           | 755      | 674     | 605    | 362           | 690    | 761    | 627    | 608    | 433    | e14   |
| 12     | 691    | 758           | 758      | 668     | 607    | 353           | 752    | 761    | 649    | 588    | 497    | e14   |
| 13     | 667    | 751           | 760      | 674     | 617    | 345           | 678    | 754    | 640    | 592    | 426    | e14   |
| 14     | 656    | 749           | 762      | 664     | 601    | 340           | 611    | 737    | 635    | 596    | 417    | e14   |
| 15     | 641    | 747           | 753      | 660     | 555    | 337           | 591    | 728    | 625    | 582    | 392    | e14   |
| 16     | 653    | 760           | 762      | 732     | 550    | 333           | 699    | 762    | 600    | 551    | 379    | e120  |
| 17     | 734    | 764           | 764      | 758     | 536    | 352           | 746    | 754    | 720    | 545    | 430    | 270   |
| 18     | 740    | 763           | 761      | 667     | 534    | 352           | 742    | 761    | 760    | 538    | 452    | 325   |
| 19     | 739    | 762           | 766      | 749     | 521    | 351           | 755    | 758    | 751    | 531    | 447    | 337   |
| 20     | 746    | 762           | 767      | 755     | 517    | 387           | 730    | 758    | 687    | 543    | 440    | 320   |
| 21     | 742    | 759           | 765      | 760     | 514    | 442           | 660    | 760    | 640    | 575    | 439    | 290   |
| 22     | 733    | 756           | 763      | 763     | 513    | 415           | 615    | 760    | 651    | 589    | 413    | 401   |
| 23     | 749    | 763           | 762      | 756     | 499    | 390           | 595    | 763    | 700    | 603    | 396    | 379   |
| 24     | 763    | 757           | 765      | 759     | 496    | 378           | 680    | 757    | 636    | 579    | 354    | 258   |
| 25     | 779    | 754           | 765      | 746     | 494    | 370           | 680    | 765    | 602    | 569    | 336    | 246   |
| 26     | 778    | 760           | 765      | 760     | 492    | 392           | 683    | 764    | 585    | 539    | 345    | 251   |
| 27     | 766    | 762           | 763      | 761     | 491    | 692           | 751    | 762    | 603    | 502    | 341    | 249   |
| 28     | 762    | 764           | 755      | 757     | 496    | 751           | 750    | 752    | 611    | 495    | 339    | 242   |
| 29     | 764    | 761           | 755      | 759     | ---    | 352           | 754    | 756    | 591    | 491    | 335    | 283   |
| 30     | 754    | 763           | 765      | 763     | ---    | 643           | 754    | 763    | 584    | 476    | 305    | 385   |
| 31     | 761    | ---           | 763      | 758     | ---    | 713           | ---    | 764    | ---    | 460    | 243    | ---   |
| TOTAL  | 21,449 | 22,762        | 23,588   | 22,720  | 16,088 | 13,461        | 20,929 | 22,848 | 20,238 | 17,290 | 13,069 | 4,622 |
| MEAN   | 692    | 759           | 761      | 733     | 575    | 434           | 698    | 737    | 675    | 558    | 422    | 154   |
| MAX    | 779    | 772           | 767      | 766     | 716    | 751           | 755    | 765    | 766    | 641    | 546    | 401   |
| MIN    | 566    | 746           | 753      | 660     | 491    | 333           | 591    | 585    | 584    | 460    | 243    | 14    |
| AC-FT  | 42,540 | 45,150        | 46,790   | 45,070  | 31,910 | 26,700        | 41,510 | 45,320 | 40,140 | 34,290 | 25,920 | 9,170 |
| CAL YR | 2004   | TOTAL 241,129 | MEAN 659 | MAX 781 | MIN 18 | AC-FT 478,300 |        |        |        |        |        |       |
| WTR YR | 2005   | TOTAL 219,064 | MEAN 600 | MAX 779 | MIN 14 | AC-FT 434,500 |        |        |        |        |        |       |

e Estimated

12089500 NISQUALLY RIVER AT MCKENNA, WA

LOCATION.--Lat 46°56'01", long 122°33'35", in SE¼NW¼ sec.28, T.17 N., R.2 E., Thurston County, Hydrologic Unit 17110015, on left bank at downstream side of State Highway 507 bridge at McKenna, and at mile 21.8.

DRAINAGE AREA.--517 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1947 to September 1968, May 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 285.47 ft above NGVD of 1929. Oct. 1, 1947, to Sept. 30, 1968, water-stage recorder at site 80 ft downstream at present datum, and Oct. 1, 1968, to Oct. 11, 1985, water-stage recorder at site 20 ft upstream at present datum.

REMARKS.--Records fair. Flow regulated by Alder Reservoir (station 12085000) at mile 44.2 and La Grande Reservoir (station 12085500) at mile 42.5. Centralia Power Canal (station 12089208) diverts water 4.4 mi upstream from station, which is returned to river at powerplant 9.2 mi downstream from station. Centralia Power Canal was built in 1929 and put into operation in 1930. Minor diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--49 years (water years 1948-68, 1978-2005), 1,286 ft<sup>3</sup>/s, 931,600 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s, Feb. 8 or 9, 1996, gage height, 17.13 ft, estimated based on comparison with upstream gaging stations; minimum discharge, 20 ft<sup>3</sup>/s, Sept. 10, 11, 1965, Aug. 31, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,040 ft<sup>3</sup>/s, Jan. 18, gage height, 5.41 ft; minimum discharge, 344 ft<sup>3</sup>/s, Aug. 23, 24, gage height, 0.96 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005  
DAILY MEAN VALUES

| DAY   | OCT    | NOV    | DEC    | JAN    | FEB    | MAR    | APR    | MAY    | JUN    | JUL    | AUG    | SEP    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1     | 576    | 1,080  | 1,240  | 796    | 633    | e620   | 707    | 1,050  | 1,190  | 529    | 480    | 591    |
| 2     | 574    | 1,480  | 1,210  | 782    | 629    | e620   | 805    | 1,020  | 982    | 529    | 396    | 640    |
| 3     | 562    | 1,970  | 1,130  | 781    | 635    | e620   | 689    | 1,200  | 831    | e529   | 380    | 639    |
| 4     | 564    | 1,590  | 907    | 765    | 631    | e620   | 652    | 940    | 632    | e548   | 374    | 638    |
| 5     | 564    | 1,420  | 871    | 733    | 626    | e622   | 623    | 688    | 551    | e562   | 374    | 636    |
| 6     | 561    | 1,320  | 887    | 724    | 632    | e625   | 614    | 621    | 542    | e546   | 376    | 634    |
| 7     | 564    | 1,250  | 1,090  | 703    | 637    | e624   | 618    | 618    | 542    | 527    | 375    | 633    |
| 8     | 563    | 1,190  | 1,730  | 647    | 634    | 618    | 661    | 621    | 521    | 528    | 375    | 633    |
| 9     | 847    | 1,150  | 2,150  | 643    | e627   | 621    | 627    | 626    | 522    | 531    | 373    | 632    |
| 10    | 705    | 1,110  | 2,180  | 642    | e621   | 622    | 631    | 1,030  | 522    | 523    | 373    | 653    |
| 11    | 605    | 1,080  | 2,690  | 623    | e618   | 619    | 649    | 928    | 522    | 522    | 374    | 655    |
| 12    | 574    | 1,050  | 2,360  | 613    | e601   | 621    | 642    | 770    | 527    | 520    | 400    | 645    |
| 13    | 573    | 1,060  | 2,050  | 616    | e606   | 622    | 618    | 679    | 521    | 522    | 375    | 644    |
| 14    | 575    | 1,050  | 2,020  | 613    | e619   | 624    | 620    | 659    | 519    | 523    | 371    | 642    |
| 15    | 579    | 1,060  | 1,950  | 611    | 619    | 627    | 625    | 660    | 521    | 521    | 372    | 719    |
| 16    | 584    | 1,090  | 1,670  | 630    | 618    | 630    | 1,100  | 1,270  | 522    | 519    | 373    | 728    |
| 17    | 1,750  | 1,060  | 1,580  | 785    | 614    | 624    | 1,470  | 1,850  | 671    | 521    | 373    | 476    |
| 18    | 1,560  | 1,180  | 1,520  | 3,940  | 612    | 622    | 971    | 1,740  | 588    | 518    | 371    | 425    |
| 19    | 1,210  | 1,260  | 1,460  | 3,640  | 617    | 626    | 731    | 1,630  | 557    | 517    | 369    | 409    |
| 20    | 1,170  | 1,150  | 1,430  | 2,600  | 607    | 638    | 631    | 1,650  | 527    | 522    | 364    | 499    |
| 21    | 1,040  | 1,080  | 1,400  | 2,230  | 605    | 643    | 623    | 1,490  | 522    | 527    | 358    | 622    |
| 22    | 970    | 1,040  | 1,370  | 1,990  | e609   | 629    | 620    | 1,400  | 527    | 539    | 355    | 772    |
| 23    | 947    | 1,010  | 1,250  | 1,900  | e612   | 625    | 621    | 1,330  | 535    | 534    | 348    | 669    |
| 24    | 921    | 1,200  | 1,090  | 1,730  | 616    | 629    | 627    | 1,230  | 523    | 533    | 382    | 490    |
| 25    | 871    | 1,630  | 1,060  | 1,500  | 615    | 626    | 625    | 1,130  | 521    | 530    | 407    | 484    |
| 26    | 850    | 1,590  | 1,110  | 1,260  | 617    | 631    | 639    | 1,160  | 523    | 520    | 402    | 481    |
| 27    | 838    | 1,370  | 1,050  | 1,180  | 615    | 1,610  | 700    | 1,180  | 525    | 517    | 404    | 481    |
| 28    | 926    | 1,270  | 1,020  | 901    | 612    | 1,690  | 702    | 1,060  | 523    | 521    | 405    | 484    |
| 29    | 1,090  | 1,180  | 952    | 683    | ---    | 1,630  | 854    | 1,020  | 523    | 519    | 410    | 497    |
| 30    | 1,110  | 1,170  | 853    | 659    | ---    | 1,040  | 1,130  | 913    | 529    | 517    | 439    | 870    |
| 31    | 1,120  | ---    | 816    | 648    | ---    | 722    | ---    | e1,000 | ---    | 517    | 473    | ---    |
| TOTAL | 25,943 | 37,140 | 44,096 | 36,568 | 17,337 | 22,940 | 21,825 | 33,163 | 17,561 | 16,331 | 12,001 | 18,021 |
| MEAN  | 837    | 1,238  | 1,422  | 1,180  | 619    | 740    | 728    | 1,070  | 585    | 527    | 387    | 601    |
| MAX   | 1,750  | 1,970  | 2,690  | 3,940  | 637    | 1,690  | 1,470  | 1,850  | 1,190  | 562    | 480    | 870    |
| MIN   | 561    | 1,010  | 816    | 611    | 601    | 618    | 614    | 618    | 519    | 517    | 348    | 409    |
| AC-FT | 51,460 | 73,670 | 87,460 | 72,530 | 34,390 | 45,500 | 43,290 | 65,780 | 34,830 | 32,390 | 23,800 | 35,740 |
| CFSM  | 1.62   | 2.39   | 2.75   | 2.28   | 1.20   | 1.43   | 1.41   | 2.07   | 1.13   | 1.02   | 0.75   | 1.16   |
| IN.   | 1.87   | 2.67   | 3.17   | 2.63   | 1.25   | 1.65   | 1.57   | 2.39   | 1.26   | 1.18   | 0.86   | 1.30   |

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2005, BY WATER YEAR (WY)

|      |        |        |        |        |        |        |        |        |        |        |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| MEAN | 825    | 1,609  | 2,295  | 2,121  | 2,169  | 1,582  | 1,332  | 1,145  | 884    | 570    | 435    | 523    |
| MAX  | 1,693  | 4,071  | 5,516  | 4,397  | 6,198  | 3,398  | 2,714  | 2,659  | 1,894  | 1,419  | 1,104  | 1,167  |
| (WY) | (1956) | (1956) | (1978) | (1997) | (1996) | (1950) | (1991) | (1949) | (1950) | (1999) | (1999) | (1977) |
| MIN  | 298    | 272    | 595    | 620    | 593    | 405    | 553    | 499    | 254    | 85.5   | 137    | 148    |
| (WY) | (1962) | (1953) | (2001) | (2001) | (2001) | (1962) | (1978) | (1978) | (1965) | (1965) | (1963) | (1965) |

## NISQUALLY RIVER BASIN

12089500 NISQUALLY RIVER AT MCKENNA, WA—Continued

| SUMMARY STATISTICS       | FOR 2004 CALENDAR YEAR |        | FOR 2005 WATER YEAR |        | WATER YEARS 1948 - 2005 |              |
|--------------------------|------------------------|--------|---------------------|--------|-------------------------|--------------|
| ANNUAL TOTAL             | 341,216                |        | 302,926             |        |                         |              |
| ANNUAL MEAN              | 932                    |        | 830                 |        | 1,286                   |              |
| HIGHEST ANNUAL MEAN      |                        |        |                     |        | 2,238                   | 1996         |
| LOWEST ANNUAL MEAN       |                        |        |                     |        | 590                     | 2001         |
| HIGHEST DAILY MEAN       | 4,420                  | Jan 30 | 3,940               | Jan 18 | 27,300                  | Feb 9, 1996  |
| LOWEST DAILY MEAN        | 378                    | Aug 18 | 348                 | Aug 23 | 22                      | Sep 11, 1965 |
| ANNUAL SEVEN-DAY MINIMUM | 392                    | Aug 5  | 363                 | Aug 17 | 27                      | Sep 1, 1965  |
| ANNUAL RUNOFF (AC-FT)    | 676,800                |        | 600,900             |        | 931,600                 |              |
| ANNUAL RUNOFF (CFSM)     | 1.80                   |        | 1.61                |        | 2.49                    |              |
| ANNUAL RUNOFF (INCHES)   | 24.55                  |        | 21.80               |        | 33.80                   |              |
| 10 PERCENT EXCEEDS       | 1,660                  |        | 1,440               |        | 2,300                   |              |
| 50 PERCENT EXCEEDS       | 676                    |        | 631                 |        | 896                     |              |
| 90 PERCENT EXCEEDS       | 511                    |        | 483                 |        | 387                     |              |

e Estimated