

Figure 42. Location of surface-water stations in the Columbia River Basin from Coulee Dam to Wells Dam including Okanogan and Methow River Basins.

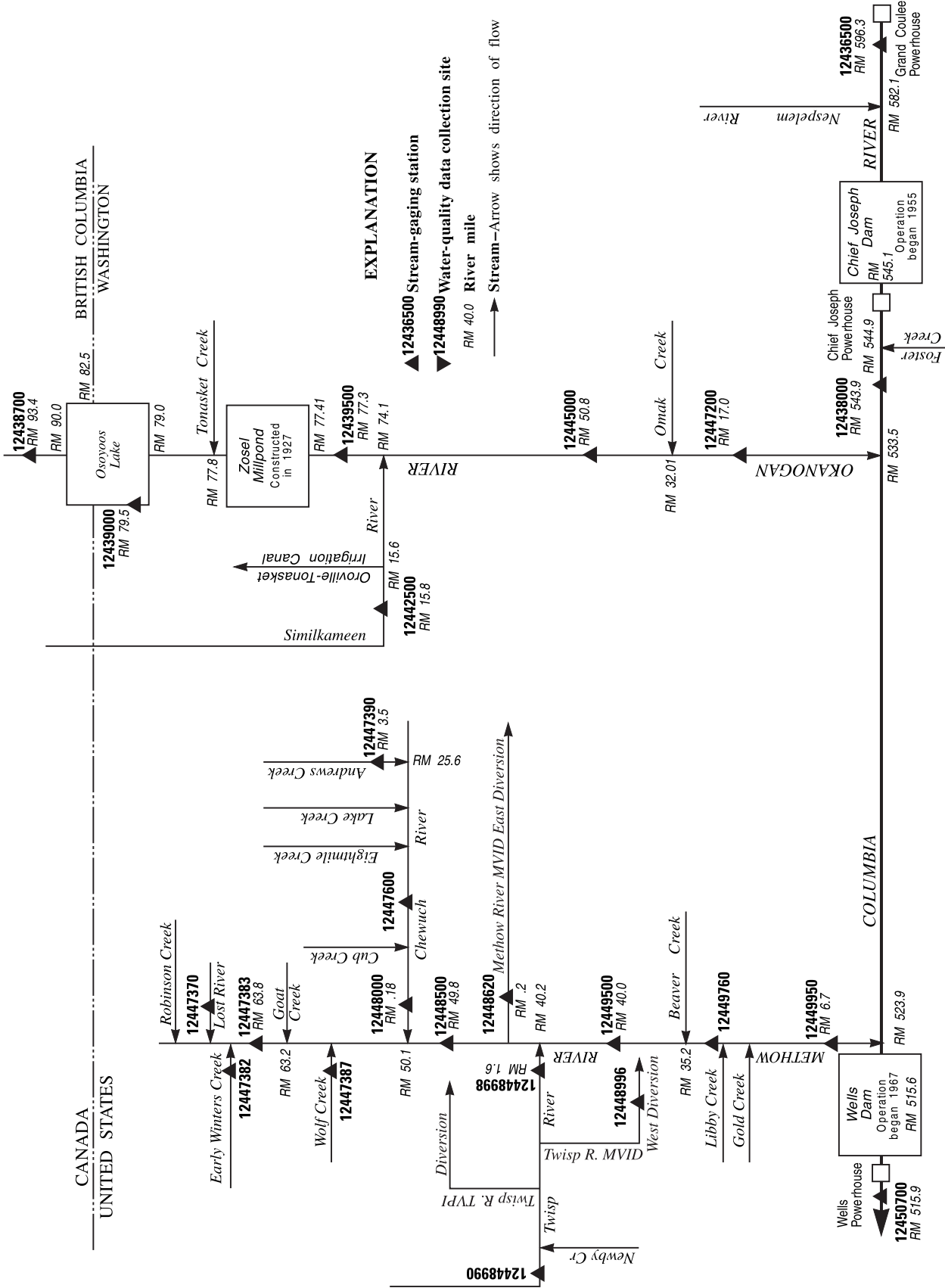


Figure 43. Schematic diagram showing surface-water stations in the Columbia River Basin from Coulee Dam to Wells Dam including Okanogan and Methow River Basins.

DIVERSION AT GRAND COULEE DAM

12435500 FEEDER CANAL AT GRAND COULEE, WA

LOCATION.--Lat 47°57'05", long 118°59'40", on line between secs.1 and 2, T.28 N., R.30 E., Grant County, Hydrologic Unit 17020001, on left bank at Grand Coulee, 0.2 mi downstream from headworks structure, and 0.5 mi southwest of Grand Coulee Dam.

PERIOD OF RECORD.--October 1951 to current year.

GAGE.--Daily discharge determined from flow through pumps or reverse flow through generators. Datum of gage is 1,500.00 ft above NGVD of 1929 (Bureau of Reclamation datum), adjustment of 1937. May 1, 1952, to Jan. 10, 1978, at datum 50.00 ft higher. Jan. 11, 1978, to Feb. 22, 1981, nonrecording gage at datum 1,500.00 ft lower. May 1, 1952, to Oct. 13, 1960, auxiliary gage 0.6 mi downstream from base gage at same datum.

REMARKS.--Since 1951, water has been pumped (lift about 280 ft) from Franklin D. Roosevelt Lake into the two-mile long Feeder Canal, which empties into Banks Lake. From Banks Lake, it is distributed through a system of canals to the Columbia Basin Project for irrigation. Between May 1951, and December 1974, six pumps were used. Since December 1974, six pump generators, which can also generate power during peak demand periods by returning water from Banks Lake, via the Feeder Canal, to Franklin D. Roosevelt Lake have been added; two in December 1974 and one each in April, June, and November 1983 and April 1984. Discharge is computed from relations between pump operation and head.

COOPERATION.--Discharge records furnished by Bureau of Reclamation; four discharge measurements made by U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 20,000 ft³/s July 5, 1997; minimum daily discharge, -7,900 ft³/s Nov. 16, 2001, reverse flow from Banks Lake.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 16,200 ft³/s July. 12; minimum daily discharge, -7,040 ft³/s Feb. 25, reverse flow from Banks Lake.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3,830	0.00	10,800	0.00	2,810	0.00	3,190	4,690	11,900	2,990	4,580	15,800
2	3,240	0.00	2,550	0.00	0.00	0.00	2,220	5,540	3,670	2,960	14,300	4,830
3	3,750	0.00	0.00	0.00	0.00	8.1	761	9,490	2,910	3,080	14,300	2,740
4	3,850	0.00	0.00	0.00	0.00	0.00	3,080	13,800	5,150	9,500	4,270	603
5	3,740	0.00	0.00	0.00	0.00	0.00	11,000	517	5,480	2,940	4,800	2,750
6	3,830	0.00	0.00	0.00	0.00	0.00	10,200	3,420	5,620	7,660	3,570	11,500
7	3,760	0.00	0.00	0.00	0.00	0.00	3,580	6,230	12,700	2,750	3,600	15,800
8	3,690	0.00	0.00	0.00	0.00	0.00	3,150	6,240	12,500	9,220	3,660	4,850
9	3,480	0.00	0.00	0.00	0.00	0.00	2,980	6,270	4,060	7,920	12,800	3,670
10	3,250	0.00	0.00	0.00	0.00	0.00	14	12,100	7,920	7,080	12,800	3,610
11	3,570	0.00	0.00	0.00	-6.080	0.00	4,340	10,800	7,040	9,290	3,960	3,590
12	3,750	0.00	0.00	0.00	-4.770	3,660	14,100	4,190	7,060	16,200	3,450	3,640
13	3,650	0.00	0.00	813	0.00	1,480	14,100	6,230	7,030	16,100	3,620	6,460
14	3,680	0.00	0.00	0.00	913	83	6,620	6,050	14,200	5,090	3,740	13,700
15	3,320	0.00	0.00	0.00	9,700	750	4,590	6,400	14,200	5,050	3,670	3,520
16	2,960	0.00	-2,640	0.00	7,930	7,610	6,080	6,060	-3,900	5,050	3,690	3,530
17	3,440	0.00	-5,230	0.00	0.00	3,860	4,080	11,900	3,850	5,130	11,200	3,540
18	3,500	0.00	-5,050	0.00	-4,050	1,530	3,010	11,900	7,870	4,930	3,630	3,610
19	3,770	-9.1	-4,660	0.00	-6,850	-2,690	8,990	5,970	7,770	12,300	3,750	3,560
20	3,690	-44	-2,630	0.00	0.00	3,160	8,990	6,290	14,200	15,400	3,710	3,610
21	2,620	-21	-4,400	-4,170	0.00	730	-304	4,100	14,500	5,060	2,780	11,000
22	0.00	-55	-563	0.00	0.00	867	3,160	4,100	14,500	5,000	3,610	3,470
23	5.0	0.00	-4.0	0.00	0.00	3,240	2,830	3,030	7,580	5,080	11,200	3,520
24	0.00	0.00	924	0.00	-6,980	3,190	5,830	11,400	9,660	5,030	11,200	3,520
25	0.00	0.00	10,900	0.00	-7,040	3,190	9,710	11,800	8,310	12,100	3,770	3,540
26	0.00	0.00	2,800	0.00	-3,080	3,120	13,900	13,400	5,760	15,800	4,990	3,570
27	0.00	971	0.00	904	-117	3,260	14,100	5,440	5,490	16,000	4,690	3,640
28	0.00	10,900	913	2,330	1,210	0.00	0.00	5,180	14,200	5,000	3,960	11,400
29	0.00	2,700	9,700	0.00	---	9,400	6,250	2,780	14,200	5,070	4,780	3,590
30	-371	1,070	2,430	0.00	---	9,380	5,290	2,990	4,150	4,650	11,100	3,560
31	0.00	---	0.00	0.00	---	3,280	---	11,900	---	4,700	11,700	---
TOTAL	74004	15,511.9	15,840	-123	-16,404	59,108.1	175,841	220,207	249,580	234,130	196,880	165,723
MEAN	2,387	517	511	-3.97	-586	1,907	5,861	7,103	8,319	7,553	6,351	5,524
MAX	3,850	10,900	10,900	2,330	9,700	9,400	14,100	13,800	14,500	16,200	14,300	15,800
MIN	-371	-55	-5,230	-4,170	-7,040	-2,690	-304	517	-3,900	2,750	2,780	603
AC-FT	146,800	30,770	31,420	-244	-32,540	117,200	348,800	436,800	495,000	464,400	390,500	328,700
CAL YR	2002	TOTAL 1,398,901.20	MEAN 3,833	MAX 16,100	MIN -5,230	AC-FT 2,775,000						
WTR YR	2003	TOTAL 1,390,298.00	MEAN 3,809	MAX 16,200	MIN -7,040	AC-FT 2,758,000						

12436000 FRANKLIN D. ROOSEVELT LAKE AT GRAND COULEE DAM, WA

LOCATION.--Lat 47°57'20", long 118°59'02", near center of sec.1, T.28 N., R.30 E., Grant County, Hydrologic Unit 17020001, in block 12 of Grand Coulee Dam on Columbia River, and at mile 596.6.

DRAINAGE AREA.--74,700 mi², approximately.

PERIOD OF RECORD.--April 1938 to current year. Prior to October 1943, published as Columbia River Reservoir at Grand Coulee Dam.

REVISED RECORDS.--WSP 1286: 1942, 1945(M). WSP 1316: 1942 (May monthend contents). WSP 1933: Drainage area. WDR WA-73-1: 1965, 1967. WDR WA-75-1: 1974 monthend contents.

GAGE.--U.S. Geological Survey water-stage recorder. Datum of gage is NGVD of 1929, adjustment of 1937 (Bureau of Reclamation datum), or 1.425 ft above NGVD of 1929 (levels by Bureau of Reclamation). Prior to Apr. 24, 1942, nonrecording gage at site 2,000 ft upstream at same datum.

REMARKS.--Reservoir is formed by concrete dam; construction of dam began in 1934; completed in 1941; storage began early in construction period. Capacity, 5,022,000 acre-ft between elevations 1,208 ft, proposed lower limit of operation, and 1,288 ft, top of gates. Capacity increased to 5,185,000 acre-ft by use of 2-ft flashboards installed after high-water period each year beginning August 1961. Storage below 1,208 ft, 4,209,000 acre-ft. Figures given herein represent total contents. Water is used for power generation and irrigation. Flow is regulated by nine major reservoirs and numerous smaller reservoirs and powerplants. Diversion by Feeder Canal (station 1243500) for irrigation of about 600,000 acres in the United States plus additional diversions in Canada for irrigation of about 66,500 acres. Maximum and minimum midnight contents were published as EXTREMES FOR CURRENT YEAR for 1997 to 2001.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents 9,586,000 acre-ft July. 17, 1942, June 3, 1945, elevation, 1,290.3 ft; maximum elevation, 1,290.36 ft Aug. 6, 1976; minimum contents observed, 16,200 acre-ft Aug. 29, 1938, elevation, 956.1 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 9,366,000 acre-ft Feb. 4, elevation, 1,289.65 ft; minimum contents, 7,504,000 acre-ft May 24, elevation, 1,264.93.

CAPACITY TABLE
(Prepared by U.S. Geological Survey from data furnished by Bureau of Reclamation, dated Oct. 24, 1975)

Elevation (feet)	Contents (acre-feet)	Elevation (feet)	Contents (acre-feet)
1,210.0	4,301,000	1,270.0	7,864,000
1,230.0	5,309,000	1,291.0	9,477,000
1,250.0	6,502,000		

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,287.75	1,286.46	1,284.12	1,286.88	1,288.36	1,286.61	1,283.73	1,278.79	1,273.71	1,285.70	1,281.41	1,278.97
2	1,287.53	1,286.18	1,283.62	1,287.25	1,288.88	1,286.25	1,283.81	1,277.82	1,275.41	1,286.09	1,282.13	1,278.72
3	1,287.73	1,286.71	1,283.31	1,287.49	1,289.53	1,285.60	1,283.61	1,277.65	1,276.96	1,286.18	1,282.81	1,278.51
4	1,288.09	1,286.38	1,282.80	1,287.94	1,289.16	1,284.82	1,283.99	1,277.59	1,278.35	1,287.22	1,282.55	1,278.37
5	1,288.33	1,286.10	1,282.94	1,288.55	1,288.93	1,284.12	1,284.31	1,276.78	1,279.36	1,288.35	1,282.30	1,278.55
6	1,288.42	1,285.62	1,282.38	1,288.25	1,288.60	1,283.70	1,284.83	1,276.47	1,279.84	1,289.16	1,282.61	1,278.67
7	1,287.93	1,285.32	1,282.69	1,287.96	1,288.45	1,283.24	1,284.63	1,275.67	1,280.68	1,288.72	1,282.54	1,279.50
8	1,287.10	1,285.19	1,283.02	1,287.76	1,288.81	1,283.02	1,284.50	1,275.11	1,282.30	1,288.44	1,282.57	1,279.45
9	1,286.88	1,285.03	1,282.70	1,287.54	1,289.35	1,283.82	1,283.96	1,274.87	1,282.83	1,287.91	1,282.58	1,279.71
10	1,286.69	1,285.59	1,282.78	1,287.53	1,288.67	1,283.65	1,283.54	1,274.59	1,283.27	1,287.42	1,282.87	1,280.08
11	1,286.67	1,285.67	1,282.92	1,287.88	1,288.88	1,283.62	1,283.12	1,274.72	1,283.14	1,286.82	1,282.41	1,280.12
12	1,286.93	1,285.75	1,283.30	1,288.66	1,288.86	1,283.26	1,283.08	1,273.86	1,283.00	1,286.48	1,282.65	1,280.09
13	1,287.21	1,285.87	1,283.38	1,288.65	1,288.36	1,283.03	1,283.55	1,272.85	1,283.10	1,286.80	1,282.63	1,280.74
14	1,286.71	1,285.69	1,284.44	1,288.30	1,288.64	1,282.88	1,283.53	1,272.33	1,283.23	1,286.06	1,282.26	1,281.34
15	1,286.48	1,285.39	1,285.68	1,287.73	1,288.62	1,283.28	1,283.16	1,271.54	1,283.71	1,285.29	1,281.71	1,281.50
16	1,286.43	1,285.55	1,285.97	1,287.14	1,288.56	1,284.04	1,282.44	1,270.63	1,283.29	1,284.95	1,281.88	1,281.80
17	1,286.62	1,286.40	1,285.97	1,286.68	1,288.22	1,284.04	1,282.22	1,270.59	1,283.31	1,284.60	1,282.51	1,282.51
18	1,286.69	1,286.21	1,286.25	1,286.65	1,287.97	1,283.93	1,282.26	1,270.84	1,283.87	1,284.13	1,282.23	1,282.94
19	1,287.29	1,285.99	1,286.55	1,286.84	1,287.92	1,284.21	1,281.79	1,270.08	1,284.52	1,283.82	1,282.07	1,283.39
20	1,288.15	1,285.89	1,286.37	1,286.19	1,287.38	1,284.58	1,282.77	1,269.00	1,284.84	1,284.39	1,281.48	1,283.92
21	1,288.05	1,285.14	1,286.72	1,285.58	1,287.51	1,284.53	1,281.70	1,267.57	1,286.17	1,283.91	1,280.58	1,284.00
22	1,288.04	1,284.69	1,287.45	1,285.29	1,287.73	1,285.38	1,281.60	1,266.40	1,287.59	1,283.69	1,280.53	1,284.03
23	1,287.89	1,284.30	1,287.11	1,285.45	1,288.19	1,286.38	1,280.55	1,265.43	1,287.71	1,283.60	1,280.28	1,284.31
24	1,287.42	1,284.56	1,286.98	1,285.47	1,287.86	1,286.72	1,279.68	1,265.30	1,287.43	1,283.85	1,280.26	1,284.33
25	1,286.71	1,284.02	1,287.04	1,285.95	1,287.86	1,286.68	1,278.74	1,265.67	1,286.95	1,283.60	1,279.37	1,284.08
26	1,286.80	1,283.98	1,286.41	1,287.21	1,287.64	1,286.14	1,278.86	1,266.65	1,286.56	1,283.27	1,278.83	1,283.92
27	1,287.58	1,283.70	1,286.07	1,287.11	1,287.34	1,285.66	1,279.27	1,267.51	1,285.64	1,284.01	1,279.23	1,284.57
28	1,287.54	1,284.25	1,285.90	1,287.79	1,286.66	1,285.26	1,279.13	1,267.33	1,284.79	1,283.60	1,278.78	1,284.81
29	1,287.17	1,284.42	1,286.38	1,287.52	---	1,284.46	1,278.68	1,268.00	1,285.77	1,282.91	1,278.23	1,284.86
30	1,286.79	1,284.31	1,285.98	1,287.64	---	1,284.29	1,278.53	1,269.70	1,285.11	1,281.94	1,278.21	1,284.55
31	1,286.65	---	1,286.08	1,287.79	---	1,283.84	---	1,271.44	---	1,281.52	1,278.41	---
MAX	1,288.42	1,286.71	1,287.45	1,288.66	1,289.53	1,286.72	1,284.83	1,278.79	1,287.71	1,289.16	1,282.87	1,284.86
MIN	1,286.43	1,283.70	1,282.38	1,285.29	1,286.66	1,282.88	1,278.53	1,265.30	1,273.71	1,281.52	1,278.21	1,278.37
†	9,123,000	8,937,000	9,077,000	9,214,000	9,123,000	8,900,000	8,492,000	7,968,000	9,000,000	8,720,000	8,483,000	8,956,000
‡	-95,000	-186,000	+140,000	+137,000	-91,000	-223,000	-408,000	-524,000	+1,032,000	-280,000	-237,000	+473,000

CAL YR 2002 MAX 1,289.45 MIN 1,239.93 AC-FT‡ +154,000
WTR YR 2003 MAX 1,289.53 MIN 1,265.30 AC-FT‡ -262,000

† Total Contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.

12436500 COLUMBIA RIVER AT GRAND COULEE DAM, WA

LOCATION.--Lat 47°57'56", long 118°58'54", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.29 N., R.30 E., Douglas County, Hydrologic Unit 17020005, in pier 3 on west side of bridge on State Highway 155, 3,200 ft downstream from Grand Coulee Dam, 14.2 mi upstream from Nespelem River, and at mile 596.3.

DRAINAGE AREA.--74,700 mi², approximately.

PERIOD OF RECORD.--April 1913 to June 1923 (monthly discharge only), July to December 1923, January 1924 to May 1928 (monthly discharge only), June 1928 to current year. Published as "at Grand Coulee near Nespelem" prior to 1936 and as "at Grand Coulee" 1936-42.

REVISED RECORDS.--WSP 1286: 1942, 1947. WSP 1933: Drainage area.

GAGE.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is NGVD of 1929, adjustment of 1937 (Bureau of Reclamation datum). June 27 to Dec. 31, 1923, June 12, 1928, to Mar. 31, 1931, nonrecording gage at site 0.5 mi upstream at datum 2.4 ft lower. Apr. 1, 1931, to Dec. 31, 1935, water-stage recorder 850 ft downstream at present datum. Jan. 1, 1936, to June 11, 1955, water-stage recorder at present site and datum. June 12, 1955, to July 18, 1988, water-stage recorder at present site and datum with auxiliary water-stage recorder 5.3 mi downstream at datum 1.42 ft lower.

REMARKS.--Flow is regulated by numerous reservoirs. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Bureau of Reclamation at Grand Coulee Dam through the Corps of Engineers, Northwestern Division, Reservoir Control Center. The U.S. Geological Survey made 2 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--90 years (water years 1914-2003), 108,500 ft³/s, 78,610,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 637,800 ft³/s June 12, 1948, elevation, 987.90 ft; minimum discharge, 14,900 ft³/s Dec. 17, 1956, elevation, 934.37 ft; minimum daily discharge, 15,300 ft³/s Feb. 1, 1937.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a discharge of 725,000 ft³/s, estimated.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 161,000 ft³/s June 16; minimum daily discharge, 23,200 ft³/s Jan 26.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78,600	94,100	94,200	52,200	44,100	61,900	83,900	104,000	63,800	93,200	97,500	43,500
2	77,000	92,000	119,000	73,200	43,900	78,100	89,600	129,000	101,000	98,100	60,600	83,900
3	71,000	75,200	109,000	64,900	55,900	94,500	98,800	113,000	105,000	103,000	58,000	81,900
4	63,900	111,000	117,000	61,500	93,200	89,300	72,900	95,700	111,000	50,500	105,000	75,900
5	58,300	100,000	92,900	54,100	86,000	90,500	65,500	145,000	122,000	73,500	103,000	72,600
6	60,600	115,000	112,000	92,800	86,100	82,900	61,200	125,000	141,000	62,000	85,900	50,600
7	85,600	103,000	85,500	92,600	81,500	76,100	95,500	128,000	119,000	122,000	96,600	27,400
8	101,000	95,300	79,100	91,200	52,400	70,500	95,400	137,000	90,700	112,000	95,700	68,900
9	72,300	90,800	115,000	84,800	41,200	31,700	100,000	109,000	134,000	131,000	83,500	55,300
10	71,500	63,100	95,300	81,400	84,000	66,500	101,000	107,000	130,000	125,000	68,900	46,300
11	64,300	79,200	103,000	61,600	67,200	66,800	89,300	95,600	150,000	122,000	117,000	67,500
12	61,200	91,900	94,600	41,500	68,200	75,600	83,000	140,000	148,000	96,400	84,200	61,500
13	58,000	86,000	96,100	77,700	71,700	76,400	51,700	144,000	136,000	69,700	91,400	45,800
14	84,100	100,000	66,500	88,000	50,400	82,500	101,000	120,000	131,000	124,000	109,000	35,800
15	82,000	98,800	57,200	99,600	54,000	59,400	113,000	136,000	114,000	126,000	111,000	81,000
16	70,400	89,900	97,900	99,700	48,800	47,100	126,000	141,000	161,000	96,500	83,700	59,100
17	63,200	51,200	102,000	91,600	76,700	88,300	110,000	101,000	144,000	103,000	54,200	52,100
18	62,500	105,000	96,800	68,100	79,500	74,800	105,000	91,100	118,000	102,000	109,000	57,000
19	42,400	101,000	88,400	60,900	73,400	70,000	111,000	136,000	115,000	101,000	97,800	62,200
20	49,000	101,000	97,500	98,800	87,000	57,300	65,300	139,000	122,000	70,600	123,000	55,000
21	82,900	115,000	76,900	104,000	54,600	77,600	141,000	144,000	81,200	133,000	136,000	63,400
22	83,000	114,000	58,000	94,600	55,400	48,500	115,000	150,000	71,200	114,000	103,000	76,100
23	91,700	93,200	99,300	61,100	43,500	46,700	136,000	131,000	132,000	115,000	97,900	68,000
24	102,000	81,700	96,200	75,100	88,400	88,600	135,000	99,800	144,000	102,000	85,900	75,600
25	114,000	124,000	61,800	53,000	75,500	98,900	133,000	78,400	144,000	102,000	133,000	89,800
26	79,300	105,000	99,300	23,200	81,500	109,000	90,900	86,100	142,000	89,700	106,000	80,500
27	53,000	105,000	98,700	80,300	78,400	123,000	86,700	101,000	156,000	51,100	75,500	60,300
28	87,700	69,300	87,800	53,900	85,300	120,000	124,000	143,000	141,000	109,000	108,000	59,600
29	100,000	93,000	63,400	85,000	---	114,000	126,000	122,000	62,400	118,000	110,000	86,400
30	107,000	91,300	103,000	71,600	---	90,200	114,000	96,600	143,000	122,000	72,900	92,700
31	109,000	---	77,000	63,900	---	117,000	---	87,600	---	106,000	55,700	---
TOTAL	2,386,500	2,835,000	2,840,400	2,301,900	1,907,800	2,473,700	3,020,700	3,675,900	3,673,300	3,143,300	2,918,900	1,935,700
MEAN	76,980	94,500	91,630	74,250	68,140	79,800	100,700	118,600	122,400	101,400	94,160	64,520
MAX	114,000	124,000	119,000	104,000	93,200	123,000	141,000	150,000	161,000	133,000	136,000	92,700
MIN	42,400	51,200	57,200	23,200	41,200	31,700	51,700	78,400	62,400	50,500	54,200	27,400
AC-FT	4,734,000	5,623,000	5,634,000	4,566,000	3,784,000	4,907,000	5,992,000	7,291,000	7,286,000	6,235,000	5,790,000	3,839,000
CAL YR	2002	TOTAL 38,401,700	MEAN 105,200	MAX 238,000	MIN 24,000	AC-FT 76,170,000						
WTR YR	2003	TOTAL 33,113,100	MEAN 90,720	MAX 161,000	MIN 23,200	AC-FT 65,680,000						

12438000 COLUMBIA RIVER AT BRIDGEPORT, WA

LOCATION.--Lat 48°00'24", long 119°39'51", in SW 1/4 SW 1/4 sec.14, T.29 N., R.25 E., Douglas County, Hydrologic Unit 17020005, on left bank at Bridgeport, 1.0 mi downstream from Foster Creek, 1.6 mi downstream from Chief Joseph Dam, and at mile 543.9.

DRAINAGE AREA.--75,700 mi², approximately.

PERIOD OF RECORD.--April 1952 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is NGVD of 1929 (levels by Corps of Engineers). Apr. 4, 1952, to Aug. 4, 1988, water-stage recorder; May 26, 1967, to Aug. 4, 1988, auxiliary water-stage recorder 4,800 ft upstream from base gage at same datum.

REMARKS.--Flow regulated by numerous reservoirs. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Corps of Engineers at Chief Joseph Dam through the Corps of Engineers, Northwestern Division, Reservoir Control Center. The U.S. Geological Survey made 6 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--51 years (water years 1953-2003), 109,700 ft³/s, 79,480,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 495,800 ft³/s June 11, 1961; maximum elevation, 792.20 ft June 7, 1956; minimum observed discharge, 4,220 ft³/s Mar. 22, 1966, elevation, 746.91 ft; minimum daily discharge, 22,300 ft³/s Nov. 11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 154,000 ft³/s June 16; minimum daily discharge, 31,100 ft³/s Sept. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81,000	94,400	97,000	50,400	46,600	64,800	87,500	109,000	63,600	106,000	100,000	42,800
2	78,300	90,400	117,000	76,700	43,700	77,400	88,800	124,000	100,000	101,000	61,500	76,900
3	73,100	77,100	112,000	69,600	67,800	96,100	98,900	111,000	108,000	106,000	61,200	83,300
4	62,800	108,000	118,000	58,500	78,600	91,000	76,200	108,000	108,000	52,700	103,000	78,300
5	56,300	104,000	95,400	56,300	88,500	90,200	65,100	138,000	121,000	74,100	104,000	72,300
6	62,700	112,000	113,000	93,700	87,900	87,100	63,000	127,000	144,000	63,500	86,800	50,700
7	86,900	110,000	85,100	91,800	86,200	77,800	99,000	134,000	119,000	117,000	98,500	31,100
8	99,200	99,800	80,000	91,800	53,700	70,300	92,600	135,000	97,500	115,000	100,000	67,900
9	74,200	90,200	114,000	82,900	40,200	34,800	99,600	117,000	133,000	126,000	80,200	57,000
10	73,300	62,700	98,200	85,300	86,300	65,500	101,000	105,000	133,000	128,000	73,900	49,500
11	65,400	83,300	103,000	62,800	68,700	72,400	92,800	94,200	148,000	120,000	110,000	68,400
12	62,600	89,100	94,800	44,500	67,100	71,500	80,800	136,000	145,000	101,000	90,400	64,800
13	60,500	90,600	94,400	75,200	70,300	72,300	57,300	146,000	143,000	75,300	90,700	42,800
14	85,500	93,100	70,300	87,600	56,200	86,200	101,000	131,000	132,000	119,000	112,000	40,200
15	82,500	105,000	59,500	101,000	55,300	63,000	116,000	135,000	117,000	130,000	112,000	79,500
16	68,700	90,800	98,600	99,900	48,900	49,600	123,000	142,000	154,000	101,000	82,700	61,700
17	65,600	54,900	104,000	97,400	76,600	86,400	112,000	109,000	147,000	106,000	58,800	53,800
18	61,400	103,000	98,600	65,000	75,400	76,000	107,000	85,100	128,000	103,000	106,000	56,800
19	45,800	109,000	84,800	62,900	76,300	71,900	107,000	138,000	107,000	98,300	102,000	64,900
20	50,400	95,200	99,100	98,500	84,400	61,000	66,400	139,000	127,000	74,600	118,000	53,100
21	82,900	112,000	76,800	104,000	60,900	76,500	143,000	141,000	83,400	124,000	134,000	65,300
22	81,900	114,000	60,300	94,400	53,800	49,600	120,000	149,000	69,000	120,000	116,000	77,900
23	88,100	99,300	98,400	65,800	42,500	46,700	136,000	144,000	133,000	122,000	95,600	68,300
24	103,000	87,100	97,200	71,900	82,800	90,000	138,000	104,000	143,000	102,000	82,200	76,100
25	116,000	119,000	62,700	54,600	78,700	101,000	134,000	78,500	146,000	106,000	133,000	89,500
26	81,800	113,000	102,000	35,300	79,200	111,000	95,800	79,400	144,000	85,600	110,000	90,200
27	54,100	102,000	97,200	66,100	75,000	123,000	85,800	107,000	149,000	55,400	77,600	57,400
28	89,000	67,100	87,500	62,600	84,400	122,000	123,000	127,000	139,000	107,000	107,000	60,800
29	107,000	92,400	59,800	77,900	---	117,000	128,000	134,000	80,400	118,000	105,000	88,500
30	107,000	90,800	102,000	78,500	---	89,100	124,000	99,400	126,000	121,000	85,900	89,900
31	109,000	---	80,800	62,200	---	116,000	---	89,200	---	112,000	61,300	---
TOTAL	2,416,000	2,859,300	2,861,500	2,325,100	1,916,000	2,507,200	3,062,600	3,715,800	3,687,900	3,190,500	2,959,300	1,959,700
MEAN	77,940	95,310	92,310	75,000	68,430	80,880	102,100	119,900	122,900	102,900	95,460	65,320
MAX	116,000	119,000	118,000	104,000	88,500	123,000	143,000	149,000	154,000	130,000	134,000	90,200
MIN	45,800	54,900	59,500	35,300	40,200	34,800	57,300	78,500	63,600	52,700	58,800	31,100
AC-FT	4,792,000	5,671,000	5,676,000	4,612,000	3,800,000	4,973,000	6,075,000	7,370,000	7,315,000	6,328,000	5,870,000	3,887,000
CAL YR	2002	TOTAL 38,911,100	MEAN 106,600	MAX 229,000	MIN 28,400	AC-FT 77,180,000						
WTR YR	2003	TOTAL 33,460,900	MEAN 91,670	MAX 154,000	MIN 31,100	AC-FT 66,370,000						

12438700 OKANAGAN RIVER NEAR OLIVER, BRITISH COLUMBIA
(International gaging station)

LOCATION.--Lat 49°06'53", long 119°33'50", approximately 75 ft upstream from drop structure No. 3, 0.8 mi downstream from Testalinden Creek, 4.2 mi south of Oliver, and at mile 93.4.

DRAINAGE AREA.--2,930 mi².

PERIOD OF RECORD.--October 1961 to current year in reports of U.S. Geological Survey. March 1944 to December 1948 and April 1952 to current year in reports of Water Survey of Canada.

GAGE.--Water-stage recorder.

REMARKS.--Regulation by control dams at outlets of Okanagan and Skaha Lakes. Diversion for irrigation.

COOPERATION.--Discharge records furnished by Water Survey of Canada. This station is maintained by Canada under agreement with the United States subsequent to Feb. 14, 1965.

AVERAGE DISCHARGE.--53 years (water years 1945-47, 1953-56, 1958-2003), 664 ft³/s, 481,100 acre-ft/yr. 42 years (water years 1962-2003), 654 ft³/s, 474,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,740 ft³/s June 11, 1990, gage height, 7.52 ft; minimum, 55.9 ft³/s Jan. 30, 1963, gage height, 0.63 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge 667 ft³/s June 4; minimum daily discharge, 206 ft³/s several days Dec. - Mar.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	399	385	211	209	220	206	243	360	611	282	332	340
2	392	388	210	210	219	207	254	378	614	301	332	331
3	399	388	209	210	218	207	247	378	646	357	335	324
4	399	357	208	208	221	208	240	392	667	367	332	332
5	399	289	208	208	241	209	239	424	576	364	323	332
6	399	258	207	207	241	209	237	452	576	360	323	337
7	403	224	207	207	235	208	234	448	562	353	325	341
8	403	222	206	207	218	207	232	456	551	357	327	344
9	396	221	206	206	218	207	243	448	516	353	334	338
10	396	219	206	206	218	207	249	452	452	352	339	340
11	396	217	207	206	216	206	251	459	381	353	332	344
12	396	215	207	206	216	206	273	452	327	360	328	344
13	396	214	208	206	216	206	307	441	328	360	328	349
14	392	214	211	209	215	211	327	441	346	349	323	352
15	388	213	213	236	216	216	333	459	312	343	324	349
16	381	211	232	238	217	216	364	417	282	334	331	357
17	381	210	220	237	216	214	367	392	273	331	331	360
18	388	210	216	237	216	211	364	385	306	334	325	351
19	396	210	214	237	215	213	367	367	319	341	317	346
20	392	212	212	237	215	225	e381	360	322	340	321	341
21	388	213	211	236	214	223	e403	353	329	333	323	336
22	385	213	210	236	213	222	438	367	321	332	326	334
23	385	213	209	236	211	225	477	396	317	326	331	328
24	388	213	208	231	209	226	530	445	309	323	329	322
25	385	213	208	215	207	226	614	565	272	327	327	321
26	392	213	209	214	206	225	466	593	266	328	330	318
27	392	213	210	215	206	224	410	554	281	329	331	316
28	388	212	210	216	206	224	378	537	288	328	329	321
29	385	212	209	217	---	224	367	540	284	322	337	318
30	381	212	209	219	---	223	350	544	285	321	338	322
31	385	---	209	222	---	230	---	622	---	325	339	---
TOTAL	12,145	7,204	6,520	6,784	6,079	6,671	10,185	13,877	11,919	10,485	10,202	10,088
MEAN	392	240	210	219	217	215	340	448	397	338	329	336
MAX	403	388	232	238	241	230	614	622	667	367	339	360
MIN	381	210	206	206	206	206	232	353	266	282	317	316
AC-FT	24,090	14,290	12,930	13,460	12,060	13,230	20,200	27,530	23,640	20,800	20,240	20,010

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2003, BY WATER YEAR (WY)

MEAN	414	342	307	374	517	666	768	1,171	1,132	867	735	551
MAX	689	1,029	688	932	1,221	1,965	2,248	2,832	3,099	2,715	2,665	2,232
(WY)	(1998)	(1979)	(1977)	(1996)	(1997)	(1983)	(1983)	(1997)	(1990)	(1997)	(1997)	(1997)
MIN	160	122	112	107	85.6	124	142	267	228	209	187	205
(WY)	(1971)	(1971)	(1968)	(1971)	(1971)	(1968)	(1968)	(1992)	(1963)	(1963)	(1963)	(1988)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1962 - 2003

ANNUAL TOTAL	237,738	112,159	
ANNUAL MEAN	651	307	654
HIGHEST ANNUAL MEAN			1,714
LOWEST ANNUAL MEAN			235
HIGHEST DAILY MEAN	2,300	Jun 5	667
LOWEST DAILY MEAN	206	Dec 8	206
ANNUAL SEVEN-DAY MINIMUM	207	Dec 6	206
ANNUAL RUNOFF (AC-FT)	471,600		222,500
10 PERCENT EXCEEDS	1,520		406
50 PERCENT EXCEEDS	512		321
90 PERCENT EXCEEDS	213		208
			197

e Estimated

OKANOGAN RIVER BASIN

12439500 OKANOGAN RIVER AT OROVILLE, WA
(International gaging station)

LOCATION.--Lat 48°55'51", long 119°25'09", in SE 1/4 SW 1/4 sec.27, T.40 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on left bank in Oroville, 20 ft downstream from Burlington Northern trestle, 0.5 mi downstream from Tonasket Creek, 1.7 mi downstream from Osoyoos Lake, 3.2 mi upstream from Similkameen River, and at mile 77.3.

DRAINAGE AREA.--3,195 mi².

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

REVISED RECORDS.--WDR WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to Oct. 26, 1944, nonrecording gage at Zosel Mill dam 200 ft upstream, Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft upstream, both at same datum. Auxiliary water-stage recorder 0.5 mi downstream used during high-water periods; May 15, 1946, to Apr. 9, 1948, nonrecording gage at same site, both at datum 900.00 ft above NGVD of 1929. To convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

REMARKS.--No estimated daily discharges. Records good, except for the backwater period, May 25 to June 13, which are fair. Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States upstream from station. Natural regulation in several large lakes and artificial regulation in Okanogan Lake 46.7 mi upstream for flood control and irrigation; also regulated by Zosel dam at Oroville, 500 ft upstream from gage. Water temperature April 1986 to September 1987. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--61 years (water years 1943-2003), 691 ft³/s, 500,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,770 ft³/s June 7, 1997; maximum elevation, 916.89 ft June 2, 1972, at datum then in use, backwater from Similkameen River; minimum daily discharge, -2,270 ft³/s reverse flow May 29, 1948; minimum elevation, 903.98 ft Mar. 1, 1948, at datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,330 ft³/s May 5; maximum elevation, 908.13 ft May 29, result of backwater from Similkameen River and result of regulation at Zosel Dam; minimum discharge, 100 ft³/s July 6; minimum elevation, 905.75 ft, result of regulation at Zosel Dam.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	332	448	334	259	205	129	113	300	518	130	164	215
2	332	447	326	259	205	129	113	336	504	115	164	244
3	337	447	326	259	206	131	113	463	513	104	162	255
4	342	447	323	259	208	133	115	531	528	102	159	254
5	345	440	321	259	209	133	116	877	522	103	159	254
6	350	435	317	259	210	133	116	1,250	505	102	159	254
7	354	435	316	254	210	133	119	1,170	491	153	159	254
8	362	434	316	268	210	133	180	1,100	481	244	163	254
9	365	424	311	280	210	133	255	601	478	199	163	277
10	371	424	311	280	211	133	195	380	425	216	164	290
11	381	421	311	280	211	133	236	380	386	211	164	290
12	389	416	310	280	211	133	274	381	315	195	163	354
13	397	408	311	280	213	136	274	309	243	195	166	389
14	404	407	312	280	212	138	274	275	215	195	166	391
15	408	402	312	278	212	140	278	284	215	174	163	387
16	411	396	393	308	216	140	285	297	169	163	163	386
17	406	391	484	326	219	142	211	204	116	163	163	386
18	402	388	430	323	172	143	137	210	102	163	164	385
19	408	386	348	321	147	143	136	308	102	163	169	383
20	413	376	348	321	146	143	137	316	102	163	172	380
21	435	371	342	321	147	143	129	328	102	162	172	380
22	458	369	340	319	147	145	126	327	102	159	171	380
23	458	368	284	317	147	148	121	380	102	160	172	377
24	456	358	254	316	147	125	169	330	102	163	172	375
25	455	358	250	316	147	110	138	313	102	163	172	375
26	458	355	253	313	148	110	128	315	102	163	197	374
27	458	346	254	311	150	110	120	652	167	162	210	369
28	455	342	254	309	140	110	203	704	200	163	210	365
29	453	342	254	305	---	110	298	567	200	164	214	365
30	452	337	256	262	---	110	298	497	154	164	215	369
31	452	---	259	205	---	112	---	502	---	163	215	---
TOTAL	12,499	11,918	9,760	8,927	5,216	4,044	5,407	14,887	8,263	5,039	5,389	10,011
MEAN	403	397	315	288	186	130	180	480	275	163	174	334
MAX	458	448	484	326	219	148	298	1,250	528	244	215	391
MIN	332	337	250	205	140	110	113	204	102	102	159	215
AC-FT	24,790	23,640	19,360	17,710	10,350	8,020	10,720	29,530	16,390	9,990	10,690	19,860

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2003, BY WATER YEAR (WY)

	MEAN	508	478	465	484	573	647	769	1,161	1,156	817	658	568
MAX	1,430	1,551	1,404	1,190	1,214	1,918	2,475	2,870	3,165	2,598	2,570	2,279	2,279
(WY)	(1949)	(1949)	(1949)	(1949)	(1997)	(1983)	(1983)	(1983)	(1997)	(1997)	(1997)	(1997)	(1997)
MIN	179	148	149	162	140	74.1	115	180	111	126	150	81.7	81.7
(WY)	(1989)	(1971)	(1971)	(1968)	(1971)	(1977)	(1968)	(1992)	(1992)	(1947)	(1963)	(1944)	(1944)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1943 - 2003
ANNUAL TOTAL	220,527	101,360	
ANNUAL MEAN	604	278	691
HIGHEST ANNUAL MEAN			1,691
LOWEST ANNUAL MEAN			213
HIGHEST DAILY MEAN	2,520	1,250	3,680
LOWEST DAILY MEAN	188	102	-2,270
ANNUAL SEVEN-DAY MINIMUM	254	102	-1,080
ANNUAL RUNOFF (AC-FT)	437,400	201,000	500,400
10 PERCENT EXCEEDS	1,270	443	1,510
50 PERCENT EXCEEDS	381	259	500
90 PERCENT EXCEEDS	306	129	201

12442500 SIMILKAMEEN RIVER NEAR NIGHTHAWK, WA
(International gaging station)

LOCATION.--Lat 48°59'05", long 119°37'02", in NW 1/4 sec.7, T.40 N., R.26 E., Okanogan County, Hydrologic Unit 17020007, on left bank 1,000 ft upstream from Oroville-Tonasket Irrigation District canal intake, 1.6 mi northeast of Nighthawk, 3.8 mi downstream from Palmer Creek, and at mile 15.8.

DRAINAGE AREA.--3,550 mi², approximately.

PERIOD OF RECORD.--May 1911 to current year (prior to September 1928, mean monthly discharge included Oroville-Tonasket Irrigation District canal). Published as "near Oroville" 1911-28.

REVISED RECORDS.--WSP 1183: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,137.70 ft NGVD of 1929. Prior to Sept. 11, 1928, staff gages at sites 7 mi downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow at high stages regulated by natural diversion into and release from Palmer Lake of about 6,000 acre-feet. Several small diversions upstream from station for irrigation of about 2,900 acres in the United States in 1946 and approximately 10,500 acres in Canada in 1957. National Weather Service satellite telemeter at station. Water temperature April 1986 to September 1987.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--92 years (water years 1912-2003), 2,281 ft³/s, 1,653,000 acre-ft/yr. 75 years (water years 1929-2003), 2,306 ft³/s, 1,670,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,800 ft³/s June 1, 1972; maximum gage height, 18.78 ft May 31, 1972; minimum discharge, 65 ft³/s Jan. 3, 1974; minimum gage height, 1.55 ft Jan. 31, 1988, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,100 ft³/s May 31, gage height, 9.38 ft; minimum discharge, 136 ft³/s Sept. 11, gage height, 1.72 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	322	279	394	334	663	418	1,290	2,960	9,930	2,210	393	190
2	338	247	392	345	679	405	1,530	3,310	9,230	2,090	378	184
3	352	237	379	372	658	392	1,420	3,700	8,440	1,900	365	179
4	375	242	396	385	629	379	1,290	3,810	7,870	1,750	355	175
5	423	250	414	396	600	371	1,200	3,710	7,770	1,630	343	172
6	426	270	407	397	566	371	1,100	3,550	8,220	1,540	331	168
7	394	309	387	393	531	369	1,030	3,320	8,710	1,470	334	164
8	370	357	364	390	482	324	962	3,080	8,970	1,390	338	164
9	356	364	347	367	449	346	957	2,910	8,930	1,310	333	166
10	344	362	335	291	426	362	1,100	2,840	8,680	1,240	322	166
11	338	353	324	264	e395	371	1,180	2,980	7,740	1,160	332	169
12	341	346	325	260	e370	390	1,220	3,190	6,890	1,090	317	173
13	347	342	332	296	e380	407	1,360	3,420	6,320	1,040	311	173
14	350	359	368	326	421	412	1,580	3,550	5,950	989	303	182
15	349	418	384	359	442	515	1,650	3,780	5,370	951	291	208
16	349	408	444	338	474	710	1,640	3,860	4,800	903	277	213
17	348	386	436	335	460	769	1,620	3,560	4,410	844	268	209
18	349	371	424	331	442	765	1,610	3,320	4,180	795	259	213
19	351	373	408	324	424	734	1,540	3,120	4,130	753	248	215
20	348	368	375	324	414	699	1,490	2,950	3,900	707	240	222
21	344	481	349	320	418	677	1,500	2,870	3,740	664	236	227
22	341	668	333	328	416	667	1,680	2,920	3,630	635	228	237
23	340	616	333	329	410	667	2,030	3,370	3,510	601	222	229
24	336	620	316	329	373	678	2,430	4,220	3,250	563	216	212
25	331	538	278	336	337	649	2,780	7,010	3,010	533	211	203
26	323	423	299	350	333	624	2,930	8,530	2,790	512	208	196
27	315	361	308	360	358	610	2,810	7,690	2,680	488	202	187
28	311	339	315	536	407	590	2,720	7,910	2,650	463	198	180
29	330	372	317	666	---	572	2,710	9,110	2,520	442	198	177
30	336	406	314	702	---	563	2,810	9,510	2,340	425	196	175
31	316	---	327	684	---	615	---	9,610	---	408	195	---
TOTAL	10,793	11,465	11,124	11,767	12,957	16,421	51,169	139,670	170,560	31,496	8,648	5,728
MEAN	348	382	359	380	463	530	1,706	4,505	5,685	1,016	279	191
MAX	426	668	444	702	679	769	2,930	9,610	9,930	2,210	393	237
MIN	311	237	278	260	333	324	957	2,840	2,340	408	195	164
AC-FT	21,410	22,740	22,060	23,340	25,700	32,570	101,500	277,000	338,300	62,470	17,150	11,360

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

MEAN	684	929	788	641	669	732	2,060	7,876	8,719	3,002	927	595
MAX	2,265	4,531	3,480	2,067	2,235	2,206	13,510	15,360	24,910	8,495	2,625	1,614
(WY)	(1960)	(1991)	(1996)	(1981)	(1935)	(1934)	(1934)	(1972)	(1972)	(1972)	(1948)	(1954)
MIN	239	254	231	215	217	341	427	2,788	2,508	665	279	191
(WY)	(1988)	(1988)	(1988)	(1930)	(1929)	(1988)	(1929)	(1984)	(1992)	(1940)	(2003)	(2003)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003	
ANNUAL TOTAL	906,416		481,798			
ANNUAL MEAN	2,483		1,320		2,306	
HIGHEST ANNUAL MEAN					4,831	
LOWEST ANNUAL MEAN					1,038	
HIGHEST DAILY MEAN	17,600	May 31	9,930	Jun 1	44,800	Jun 1, 1972
LOWEST DAILY MEAN	237	Nov 3	164	Sep 7	120	Jan 4, 1988
ANNUAL SEVEN-DAY MINIMUM	262	Nov 1	167	Sep 5	141	Jan 5, 1974
ANNUAL RUNOFF (AC-FT)	1,798,000		955,600		1,670,000	
10 PERCENT EXCEEDS	9,650		3,550		6,750	
50 PERCENT EXCEEDS	585		407		788	
90 PERCENT EXCEEDS	333		225		367	

e Estimated

OKANOGAN RIVER BASIN

12445000 OKANOGAN RIVER NEAR TONASKET, WA

LOCATION.--Lat 48°37'57", long 119°27'38", in lot 3, sec.8, T.36 N., R.27 E., Okanogan County, Hydrologic Unit 17020006, on right bank 1,000 ft upstream from Chewiliken Creek, 5.2 mi south of Tonasket, and at mile 50.8.

DRAINAGE AREA.--7,260 mi², approximately.

PERIOD OF RECORD.--April 1929 to current year.

REVISED RECORDS.--WSP 862: 1937. WSP 1316: 1934(M), 1938(M). WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 860.78 ft above NGVD of 1929.

REMARKS.--No estimated daily discharges. Records good. Diversions upstream from station for irrigation of about 10,700 acres in the United States and 55,000 acres in Canada. Flow affected by regulation of Okanogan and Skaha Lakes and by natural storage in other lakes. U.S. Geological Survey satellite telemeter at station. Water temperature April 1986 to September 1987.

AVERAGE DISCHARGE.--74 years (water years 1930-2003), 2,945 ft³/s, 2,133,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft³/s June 2, 1972, gage height, 22.54 ft; minimum discharge recorded, 126 ft³/s Sept. 5, 1931, gage height, 3.43 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,000 ft³/s June 1, gage height, 11.22 ft; minimum discharge, 316 ft³/s Aug. 26, gage height 3.55 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	673	786	825	629	929	567	795	3,110	9,910	2,370	515	347
2	669	749	812	651	910	575	1,520	3,310	9,630	2,270	496	330
3	696	714	806	670	926	565	1,630	3,780	8,930	2,100	475	356
4	724	703	790	686	896	543	1,520	4,170	8,170	1,940	471	363
5	747	708	809	698	867	535	1,400	4,220	7,830	1,800	457	365
6	797	717	827	705	829	532	1,320	4,670	7,960	1,700	441	360
7	793	741	809	703	800	517	1,240	4,480	8,540	1,630	429	363
8	754	806	778	697	764	515	1,170	4,210	8,830	1,630	434	374
9	723	836	748	711	721	482	1,250	3,850	9,000	1,620	438	384
10	713	840	732	688	693	498	1,220	3,230	8,900	1,470	433	411
11	729	836	721	612	669	517	1,360	3,230	8,180	1,450	425	427
12	746	834	710	586	669	532	1,470	3,370	7,260	1,330	428	424
13	756	821	709	576	673	553	1,580	3,530	6,490	1,280	414	503
14	770	810	750	614	664	585	1,770	3,620	6,040	1,220	406	528
15	769	825	798	642	667	614	1,960	3,780	5,590	1,160	398	533
16	772	884	879	673	705	720	1,980	3,950	5,000	1,090	390	556
17	771	875	1,030	701	724	904	1,960	3,830	4,490	1,030	385	583
18	775	843	1,040	698	710	947	1,800	3,510	4,150	977	376	577
19	778	826	920	688	635	945	1,770	3,330	4,040	934	361	585
20	780	822	844	680	601	919	1,710	3,250	3,930	891	351	574
21	775	812	796	679	597	891	1,660	3,130	3,780	852	345	589
22	812	959	758	686	599	873	1,700	3,070	3,660	796	341	584
23	820	1,110	737	692	583	872	1,910	3,230	3,570	759	342	588
24	817	1,060	656	685	579	861	2,320	3,780	3,360	721	340	572
25	815	1,060	623	678	547	831	2,740	5,130	3,120	685	336	562
26	808	969	602	684	514	795	2,950	8,090	2,910	657	325	547
27	797	857	612	699	509	773	2,990	8,000	2,780	635	341	532
28	791	787	611	707	531	752	2,870	7,760	2,780	605	346	517
29	784	762	616	904	---	738	2,980	8,470	2,730	577	344	512
30	800	795	618	1,030	---	718	3,030	9,370	2,570	553	347	504
31	809	---	629	994	---	717	---	9,430	---	532	352	---
TOTAL	23,763	25,147	23,595	21,746	19,511	21,386	55,575	143,890	174,130	37,264	12,282	14,450
MEAN	767	838	761	701	697	690	1,852	4,642	5,804	1,202	396	482
MAX	820	1,110	1,040	1,030	929	947	3,030	9,430	9,910	2,370	515	589
MIN	669	703	602	576	509	482	795	3,070	2,570	532	325	330
AC-FT	47,130	49,880	46,800	43,130	38,700	42,420	110,200	285,400	345,400	73,910	24,360	28,660

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

	1,199	1,454	1,323	1,175	1,285	1,415	2,742	8,538	9,724	3,714	1,465	1,086
MEAN	1,199	1,454	1,323	1,175	1,285	1,415	2,742	8,538	9,724	3,714	1,465	1,086
MAX	2,849	4,618	4,252	2,564	2,964	3,131	13,220	16,190	27,720	10,210	4,095	3,039
(WY)	(1960)	(1991)	(1996)	(1981)	(1991)	(1991)	(1934)	(1972)	(1972)	(1972)	(1993)	(1948)
MIN	403	413	399	360	532	525	770	3,790	2,650	605	231	231
(WY)	(1932)	(1930)	(1930)	(1930)	(1937)	(1931)	(1931)	(1941)	(1992)	(1940)	(1931)	(1940)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1929 - 2003

ANNUAL TOTAL	1,140,636		572,739			
ANNUAL MEAN	3,125		1,569			2,945
HIGHEST ANNUAL MEAN						6,019
LOWEST ANNUAL MEAN						1,142
HIGHEST DAILY MEAN	18,900	Jun 1	9,910	Jun 1	44,200	Jun 2, 1972
LOWEST DAILY MEAN	529	Sep 18	325	Aug 26	132	Sep 5, 1931
ANNUAL SEVEN-DAY MINIMUM	616	Dec 25	339	Aug 21	146	Aug 31, 1931
ANNUAL RUNOFF (AC-FT)	2,262,000		1,136,000		2,133,000	
10 PERCENT EXCEEDS	11,300		3,780		7,600	
50 PERCENT EXCEEDS	1,070		780		1,450	
90 PERCENT EXCEEDS	727		436		648	

12447200 OKANOGAN RIVER AT MALOTT, WA

LOCATION.--Lat 48°16'53", long 119°42'12", in SW ¼ sec.9, T.32 N., R.25 E., Okanogan County, Hydrologic Unit 17020006, on right bank 75 ft upstream from highway bridge at Malott, 0.1 mi upstream from Loup Loup Creek, and at mile 17.0.

DRAINAGE AREA.--8,080 mi², approximately.

PERIOD OF RECORD.--April 1958 to current year. April 1958 to September 1965, published as "near Malott." Records published for both sites December 1965 to July 1967.

REVISED RECORDS.--WDR WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 783.55 ft above NGVD of 1929. April 1958 to November 1965, water-stage recorder at site 3.9 mi downstream at NGVD of 1929.

REMARKS.--Records good except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation of about 22,000 acres in the United States and 55,000 acres in Canada. Flow regulated by Okanogan and Skaha Lakes and by natural storage in other lakes. U.S. Geological Survey satellite telemeter at station. Daily water temperature records November 1969 to June 1971. Chemical analyses 1959-62, 1963-70 (partial record station), 1972, 1975-94. Published as "near Brewster" prior to 1964 and as "near Malott" 1963-66 (station 12447300).

AVERAGE DISCHARGE.--45 years (water years 1959-2003), 3,067 ft³/s, 2,222,000 acre-ft/yr, includes records for "near Malott" site located 3.9 miles downstream, water years 1959-65. 38 years (water years 1966-2003), 3,077 ft³/s, 2,229,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,600 ft³/s June 3, 1972, gage height, 22.16 ft; minimum observed, 288 ft³/s Sept. 4, 1970, gage height, 2.03 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,500 ft³/s June 1, gage height, 9.15 ft; minimum discharge, 301 ft³/s Aug. 27,28, gage height, 2.24 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	658	808	800	677	1,030	625	915	3,190	10,200	2,410	533	329
2	672	788	818	705	975	661	1,110	3,340	10,400	2,250	532	324
3	672	757	809	715	967	665	1,720	3,660	9,790	2,150	492	310
4	696	729	801	738	978	653	1,710	4,200	9,040	1,990	469	330
5	720	716	789	762	947	642	1,610	4,450	8,470	1,850	462	340
6	745	723	809	759	915	631	1,520	4,710	8,380	1,740	448	340
7	784	737	819	754	878	616	1,430	4,840	8,810	1,650	430	334
8	769	791	808	749	852	598	1,360	4,580	9,250	1,610	424	359
9	736	814	786	743	821	603	1,310	4,290	9,480	1,630	423	377
10	713	836	773	748	791	583	1,400	3,650	9,490	1,590	427	381
11	704	837	762	728	763	594	1,390	3,360	9,060	1,500	419	401
12	720	841	754	685	744	617	1,520	3,440	8,160	1,470	411	412
13	736	832	742	654	745	636	1,720	3,600	7,270	1,390	409	414
14	745	819	785	651	749	689	1,850	3,720	6,610	1,340	395	475
15	760	810	835	678	746	752	2,050	3,830	6,160	1,290	390	504
16	764	829	928	703	775	850	2,110	4,030	5,520	1,240	380	507
17	763	869	959	725	801	934	2,100	4,140	4,870	1,170	383	536
18	766	854	1,060	752	807	1,070	2,030	3,810	4,410	1,110	378	564
19	767	835	1,030	749	789	1,080	1,910	3,550	4,150	1,050	359	569
20	768	819	902	742	724	1,080	1,870	3,450	4,090	999	349	566
21	770	819	849	741	702	1,050	1,830	3,300	3,910	957	340	557
22	771	812	811	752	691	1,040	1,810	3,210	3,780	901	331	555
23	798	987	784	757	682	1,080	1,890	3,200	3,640	853	326	553
24	801	1,060	761	750	662	1,040	2,190	3,600	3,490	802	331	554
25	801	1,040	694	744	656	1,010	2,780	4,410	3,230	756	328	545
26	801	1,020	683	745	e628	972	3,030	7,390	3,010	716	318	533
27	796	925	665	761	e610	932	3,150	8,610	2,790	691	309	511
28	795	839	655	767	600	909	3,060	8,290	2,720	666	312	494
29	799	788	656	786	---	882	3,040	8,640	2,710	624	321	483
30	787	773	667	989	---	879	3,110	9,620	2,610	589	326	475
31	804	---	682	1,100	---	894	---	9,940	---	560	329	---
TOTAL	23,381	25,107	24,676	23,309	22,028	25,267	58,525	148,050	185,500	39,544	12,084	13,632
MEAN	754	837	796	752	787	815	1,951	4,776	6,183	1,276	390	454
MAX	804	1,060	1,060	1,100	1,030	1,080	3,150	9,940	10,400	2,410	533	569
MIN	658	716	655	651	600	583	915	3,190	2,610	560	309	310
AC-FT	46,380	49,800	48,940	46,230	43,690	50,120	116,100	293,700	367,900	78,440	23,970	27,040

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2003, BY WATER YEAR (WY)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	1,135	1,447	1,288	1,229	1,399	1,687	2,845	8,542	10,110	4,082	1,647	1,150																										
MAX	1,847	4,747	4,402	2,970	2,979	3,946	7,015	16,420	29,290	10,990	4,150	2,963																										
(WY)	(1998)	(1991)	(1996)	(1984)	(1991)	(1983)	(1996)	(1972)	(1972)	(1972)	(1993)	(1997)																										
MIN	605	574	565	540	569	601	928	4,319	2,625	938	390	372																										
(WY)	(1988)	(1988)	(1971)	(1988)	(2001)	(1988)	(2001)	(1977)	(1992)	(1977)	(2003)	(1988)																										

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1966 - 2003	
ANNUAL TOTAL	1,142,365		601,103			
ANNUAL MEAN	3,130		1,647		3,077	
HIGHEST ANNUAL MEAN					6,312	
LOWEST ANNUAL MEAN					1,334	
HIGHEST DAILY MEAN	18,500	Jun 1	10,400	Jun 2	45,300	Jun 3, 1972
LOWEST DAILY MEAN	535	Sep 19	309	Aug 27	288	Sep 4, 1970
ANNUAL SEVEN-DAY MINIMUM	617	Sep 17	320	Aug 25	296	Aug 30, 1970
ANNUAL RUNOFF (AC-FT)	2,266,000		1,192,000		2,229,000	
10 PERCENT EXCEEDS	11,700		3,860		8,060	
50 PERCENT EXCEEDS	1,090		801		1,490	
90 PERCENT EXCEEDS	742		426		690	

e Estimated

12447370 LOST RIVER NEAR MAZAMA, WA

LOCATION.--Lat 48°39'19", long 120°30'18", in SE ¼ NW ¼ sec.5 T.36 N., R.19 E., Okanogan County, Hydrologic Unit 17020008, on right bank at Lost River Rd., 0.5 mi upstream from mouth, and 6.5 mi northwest of Mazama.

DRAINAGE AREA.--146 mi².

PERIOD OF RECORD.--Oct. 1, 2000 to current year. Miscellaneous discharge measurements 1926, 1970-71, 1990.

GAGE.--Water-stage recorder. Elevation of gage is 2,370 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good, except for estimated daily discharges, which are fair. No known diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--3 years (water years 2001-2003), 178 ft³/s, 16.54 in/yr, 128,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,040 ft³/s June 16, 2002, gage height 9.58 ft; minimum discharge 6.6 ft³/s Feb. 27, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,820 ft³/s May 25 and June 8, maximum gage height 9.64 ft June 8; minimum discharge, 10 ft³/s Jan. 26, gage height 5.33 ft, but may have been lower during period of ice effect Dec. 25-30.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	20	17	14	20	e20	e113	337	1,400	393	93	44
2	35	20	17	15	20	e20	e118	383	1,230	339	89	43
3	35	20	16	15	20	e20	e116	398	1,110	304	86	42
4	34	19	16	14	19	e20	e112	389	1,110	289	84	41
5	33	19	16	14	19	e20	e108	372	1,210	288	82	41
6	32	20	16	13	19	e20	e104	358	1,490	276	82	39
7	31	20	15	13	e18	e19	e102	340	1,550	261	80	39
8	31	20	15	14	e17	e19	e100	313	1,630	254	77	39
9	30	20	15	14	e19	e19	e104	294	1,550	228	75	38
10	30	19	15	13	e19	e19	e104	290	1,360	219	73	37
11	29	19	15	14	e23	e22	e106	308	1,140	216	72	37
12	29	21	15	14	e20	e26	e115	339	1,040	211	70	36
13	28	21	15	13	e20	e40	e145	366	952	201	67	35
14	28	19	16	13	e21	e55	e190	440	834	183	65	34
15	27	19	19	13	e21	e52	e185	511	725	173	63	33
16	27	19	21	13	e22	e51	168	489	687	161	63	33
17	26	19	18	13	e22	e50	156	447	714	155	62	33
18	26	19	16	13	e22	e50	144	405	756	145	60	32
19	25	19	16	13	e22	e50	138	371	703	140	58	32
20	25	20	15	13	e22	e52	136	343	649	135	57	31
21	24	21	15	13	e23	e52	154	320	539	133	55	30
22	24	20	15	14	e22	e70	204	341	466	127	54	29
23	24	20	15	13	e20	e68	272	449	420	122	54	28
24	23	19	14	13	e17	e65	390	987	393	117	52	28
25	23	e16	e14	13	e16	e65	526	1,580	408	111	51	27
26	22	e17	e14	15	e21	e64	417	1,290	454	107	50	26
27	22	18	e14	36	e23	e63	339	1,180	513	105	49	26
28	22	17	e13	29	e20	e62	290	1,430	495	103	49	25
29	22	17	e13	24	---	e63	280	1,560	464	100	47	25
30	21	17	e13	22	---	e70	298	1,450	447	99	46	26
31	20	---	14	22	---	e105	---	1,460	---	96	45	---
TOTAL	844	574	478	485	567	1,391	5,734	19,540	26,439	5,791	2,010	1,009
MEAN	27.2	19.1	15.4	15.6	20.2	44.9	191	630	881	187	64.8	33.6
MAX	36	21	21	36	23	105	526	1,580	1,630	393	93	44
MIN	20	16	13	13	16	19	100	290	393	96	45	25
AC-FT	1,670	1,140	948	962	1,120	2,760	11,370	38,760	52,440	11,490	3,990	2,000
CFSM	0.19	0.13	0.11	0.11	0.14	0.31	1.31	4.32	6.04	1.28	0.44	0.23
IN.	0.22	0.15	0.12	0.12	0.14	0.35	1.46	4.98	6.74	1.48	0.51	0.26

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

	2001	2002	2003	2001	2002	2003	2001	2002	2003	2001	2002	2003
MEAN	27.6	27.1	20.1	17.9	21.5	36.5	145	593	850	276	75.4	38.3
MAX	32.3	38.1	28.7	26.3	35.9	44.9	193	780	1,373	514	105	50.2
(WY)	(2001)	(2002)	(2002)	(2002)	(2002)	(2003)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	23.2	19.1	15.4	11.6	8.25	21.1	51.5	367	297	127	56.6	31.0
(WY)	(2002)	(2003)	(2003)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 2001 - 2003

ANNUAL TOTAL	96,902	64,862	
ANNUAL MEAN	265	178	178
HIGHEST ANNUAL MEAN			268
LOWEST ANNUAL MEAN			87.6
HIGHEST DAILY MEAN	1,820	Jun 16	1,820
LOWEST DAILY MEAN	13	Dec 28	7.2
ANNUAL SEVEN-DAY MINIMUM	14	Dec 24	7.4
ANNUAL RUNOFF (AC-FT)	192,200		128,700
ANNUAL RUNOFF (CFSM)	1.82		1.22
ANNUAL RUNOFF (INCHES)	24.69		16.53
10 PERCENT EXCEEDS	1,010		511
50 PERCENT EXCEEDS	48		37
90 PERCENT EXCEEDS	19		15

e Estimated

12447382 EARLY WINTERS CREEK NEAR MAZAMA, WA

LOCATION.--Lat 48°35'55", long 120°26'31", in NE ¼ NE ¼ sec.26, T.10 N., R.19 E., Okanogan County, Hydrologic Unit 17020008, on left bank 80 ft downstream from Hwy 20 bridge crossing, 0.3 mi upstream from mouth, and 1.7 mi northwest of Mazama.

DRAINAGE AREA.--80.15 mi².

PERIOD OF RECORD.--October 2000 to current year. Miscellaneous discharge measurements 1975-89, 1990.

GAGE.--Water-stage recorder. Elevation of gage is 2,180 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good, except for estimated daily discharges, which are fair. No regulation. Several diversions upstream for irrigation.

AVERAGE DISCHARGE.--3 years (water years 2001-2003), 121 ft³/s, 87,860 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,420 ft³/s May 28, 2002, gage height, 14.66 ft; maximum gage height, 14.82 ft May 28, 2002, from outside high water mark; minimum daily discharge 9.0 ft³/s Feb. 20-22, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,240 ft³/s June 8, gage height, 13.93 ft; maximum gage height, 14.36 ft June 8, from outside high water mark; minimum discharge 12 ft³/s Oct. 30, but may have been lower during period of ice effect.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	e13	17	e16	25	23	94	304	761	248	51	28
2	21	e13	17	e17	24	23	98	326	678	206	46	28
3	22	e13	16	e17	24	23	97	346	632	178	43	28
4	22	e12	17	e16	23	23	93	341	613	170	41	29
5	21	e12	17	e16	23	23	88	317	665	177	39	29
6	21	e14	16	e15	23	23	84	291	757	174	42	25
7	20	17	16	e15	e22	23	81	271	903	160	39	22
8	20	18	16	e16	e21	22	79	252	1,030	150	37	22
9	20	17	15	e16	e23	22	80	235	898	133	36	21
10	19	17	16	e15	e23	22	80	229	781	127	36	21
11	19	17	16	e16	e26	24	81	241	688	130	39	20
12	19	19	16	e16	e23	28	88	271	633	136	43	20
13	19	19	16	e15	e23	36	115	296	598	129	41	22
14	19	18	18	e15	24	45	130	340	531	113	39	23
15	19	17	19	e15	24	44	128	374	473	102	38	21
16	19	17	20	e15	25	43	126	346	449	94	38	21
17	18	18	17	e15	25	41	126	314	467	90	38	22
18	18	17	16	e15	25	41	123	281	526	82	39	22
19	18	18	16	15	25	41	121	256	516	78	40	22
20	18	20	16	15	25	42	122	236	434	76	38	22
21	18	20	16	16	26	42	132	224	341	76	37	21
22	17	20	15	21	25	50	159	241	281	74	37	21
23	17	20	15	20	e23	49	210	317	241	72	35	20
24	17	19	15	17	e20	46	308	559	221	68	33	19
25	17	e17	15	17	e19	46	377	793	244	59	32	19
26	17	e18	e15	25	e24	45	336	761	301	52	32	20
27	17	e19	e15	40	e26	44	303	743	382	52	32	20
28	17	e18	e14	30	e23	43	282	807	365	53	30	20
29	17	18	e14	27	---	44	275	820	318	52	29	20
30	14	18	e14	26	---	51	280	760	301	52	29	19
31	e13	---	e15	27	---	86	---	761	---	51	29	---
TOTAL	575	513	496	577	662	1,158	4,696	12,653	16,028	3,414	1,158	667
MEAN	18.5	17.1	16.0	18.6	23.6	37.4	157	408	534	110	37.4	22.2
MAX	22	20	20	40	26	86	377	820	1,030	248	51	29
MIN	13	12	14	15	19	22	79	224	221	51	29	19
AC-FT	1,140	1,020	984	1,140	1,310	2,300	9,310	25,100	31,790	6,770	2,300	1,320
CFSM	0.23	0.21	0.20	0.23	0.29	0.47	1.95	5.09	6.66	1.37	0.47	0.28
IN.	0.27	0.24	0.23	0.27	0.31	0.54	2.18	5.87	7.43	1.58	0.54	0.31

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

	2001	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
MEAN	20.0	22.2	18.0	18.4	24.2	33.7	124	426	534	166	41.5	23.8
MAX	23.4	30.1	23.7	24.2	37.8	45.8	167	560	846	317	53.9	27.7
(WY)	(2001)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	18.0	17.1	14.4	12.4	11.1	17.8	49.0	312	224	71.8	33.1	21.5
(WY)	(2002)	(2003)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 2001 - 2003

ANNUAL TOTAL	64,864	42,597	
ANNUAL MEAN	178	117	121
HIGHEST ANNUAL MEAN			179
LOWEST ANNUAL MEAN			67.8
HIGHEST DAILY MEAN	1,440	1,030	1,440
LOWEST DAILY MEAN	12	12	9.0
ANNUAL SEVEN-DAY MINIMUM	13	13	9.3
ANNUAL RUNOFF (AC-FT)	128,700	84,490	87,860
ANNUAL RUNOFF (CFSM)	2.22	1.46	1.51
ANNUAL RUNOFF (INCHES)	30.09	19.76	20.55
10 PERCENT EXCEEDS	614	340	360
50 PERCENT EXCEEDS	39	26	28
90 PERCENT EXCEEDS	17	16	15

e Estimated

12447383 METHOW RIVER ABOVE GOAT CREEK NEAR MAZAMA, WA

LOCATION.--Lat 48°34'32", long 120°23'05", in NE 1/4 SE 1/4 sec.31, T.36 N., R.20 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 0.6 mi upstream from Goat Creek, and 1.5 mi southeast of Mazama, and at mile 63.8.

DRAINAGE AREA.--373 mi².

PERIOD OF RECORD.--April 1991 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 2,040 ft above NGVD of 1929, from topographic map. Crest-stage gage since September 1992.

REMARKS.--Records fair except for estimated daily discharges which are poor. No known regulation. Several diversions for irrigation upstream from station. U. S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--12 years (water years 1992-2003), 500 ft³/s, 362,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,440 ft³/s June 17, 1999, gage height, 20.56 ft; minimum discharge, no flow for all or part of many days during most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 25	0700	3,720	17.38	Jun 8	0230	*4,560	17.83
May 29	0500	4,020	17.55	Jun 8	---	---	(a) *18.00

Minimum discharge, no flow, Oct. 7 to Mar. 27 and Sept. 20-30.
(a) From outside high water mark.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	0.00	0.00	0.00	0.00	0.00	285	878	3,400	841	108	e14
2	3.4	0.00	0.00	0.00	0.00	0.00	291	970	2,950	725	98	e13
3	2.3	0.00	0.00	0.00	0.00	0.00	272	1,020	2,660	641	89	e12
4	2.3	0.00	0.00	0.00	0.00	0.00	250	997	2,610	598	e78	e11
5	0.76	0.00	0.00	0.00	0.00	0.00	228	937	2,850	592	e70	e10
6	0.01	0.00	0.00	0.00	0.00	0.00	209	884	3,450	577	e70	e9.0
7	0.00	0.00	0.00	0.00	0.00	0.00	193	829	3,900	544	e83	e8.0
8	0.00	0.00	0.00	0.00	0.00	0.00	187	769	4,180	525	e76	e7.0
9	0.00	0.00	0.00	0.00	0.00	0.00	199	718	4,000	479	e78	e6.0
10	0.00	0.00	0.00	0.00	0.00	0.00	209	705	3,340	450	e75	e5.0
11	0.00	0.00	0.00	0.00	0.00	0.00	213	732	2,800	440	e72	e4.0
12	0.00	0.00	0.00	0.00	0.00	0.00	248	802	2,560	440	e67	e4.0
13	0.00	0.00	0.00	0.00	0.00	0.00	352	859	2,340	420	e62	e3.0
14	0.00	0.00	0.00	0.00	0.00	0.00	445	992	2,050	375	e57	e3.0
15	0.00	0.00	0.00	0.00	0.00	0.00	433	1,130	1,760	339	e52	e2.0
16	0.00	0.00	0.00	0.00	0.00	0.00	418	1,080	1,630	304	e48	e2.0
17	0.00	0.00	0.00	0.00	0.00	0.00	403	988	1,660	284	e45	e1.0
18	0.00	0.00	0.00	0.00	0.00	0.00	377	894	1,850	257	e43	e1.0
19	0.00	0.00	0.00	0.00	0.00	0.00	364	818	1,760	238	e41	e1.0
20	0.00	0.00	0.00	0.00	0.00	0.00	361	760	1,550	223	36	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	402	715	1,250	218	33	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	e480	744	1,040	205	32	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	e609	917	909	192	29	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	913	1,830	826	181	27	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	1,230	3,490	845	163	24	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	1,040	3,040	944	146	22	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	912	2,750	1,130	136	20	0.00
28	0.00	0.00	0.00	0.00	0.00	5.6	826	3,220	1,130	132	e19	0.00
29	0.00	0.00	0.00	0.00	---	16	795	3,770	1,020	125	e18	0.00
30	0.00	0.00	0.00	0.00	---	55	803	3,410	968	120	e17	0.00
31	0.00	---	0.00	0.00	---	220	---	3,400	---	114	e16	---
TOTAL	12.87	0.00	0.00	0.00	0.00	296.60	13,947	45,048	63,362	11,024	1,605	116.00
MEAN	0.42	0.000	0.000	0.000	0.000	9.57	465	1,453	2,112	356	51.8	3.87
MAX	4.1	0.00	0.00	0.00	0.00	220	1,230	3,770	4,180	841	108	14
MIN	0.00	0.00	0.00	0.00	0.00	0.00	187	705	826	114	16	0.00
AC-FT	26	0.00	0.00	0.00	0.00	588	27,660	89,350	125,700	21,870	3,180	230

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2003, BY WATER YEAR (WY)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	25.6	89.2	65.9	20.6	13.3	94.6	569	1,984	2,185	910	189	37.1	
MAX	214	452	523	124	93.3	405	1,080	3,297	3,907	2,527	610	102	
(WY)	(1998)	(2000)	(1996)	(1996)	(1996)	(1992)	(1996)	(1998)	(1999)	(1999)	(1999)	(1999)	
MIN	0.000	0.000	0.000	0.000	0.000	0.000	10.0	937	642	191	29.0	0.65	
(WY)	(1995)	(1993)	(1993)	(1992)	(1993)	(1993)	(2001)	(2001)	(2001)	(2001)	(2001)	(1994)	

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1991 - 2003
ANNUAL TOTAL	211,934.67	135,411.47	
ANNUAL MEAN	581	371	500
HIGHEST ANNUAL MEAN			798
LOWEST ANNUAL MEAN			153
HIGHEST DAILY MEAN	5,350	4,180	8,460
LOWEST DAILY MEAN	0.00	0.00	0.00
ANNUAL SEVEN-DAY MINIMUM	0.00	0.00	0.00
ANNUAL RUNOFF (AC-FT)	420,400	268,600	362,200
10 PERCENT EXCEEDS	2,160	1,030	1,660
50 PERCENT EXCEEDS	30	0.00	53
90 PERCENT EXCEEDS	0.00	0.00	0.00

e Estimated

12447387 WOLF CREEK BELOW DIVERSION NEAR WINTHROP, WA

LOCATION.--Lat 48°29'00", long 120°18'24", in NE ¼ NW ¼ sec.2 T.34 N., R.20 E., Okanogan County, Hydrologic Unit 17020008, on left bank approximately 400 ft downstream from Wolf Creek diversion, 6.0 mi northwest of Winthrop, and at mi 4.2.

DRAINAGE AREA.--32.5 mi².

PERIOD OF RECORD.--Oct. 1, 2000 to current year. Miscellaneous discharge measurements made at location 250 ft upstream 1972-73 and 1976.

GAGE.--Water-stage recorder. Elevation of gage is 2,660 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good except for estimated daily discharges and those discharges above 100 ft³/s which are fair. No known regulation. Wolf Creek Reclamation District irrigation diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--3 years (water years 2001-2003), 27.3 ft³/s, 19,790 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 454 ft³/s May 29, 2002, gage height 8.15 ft; maximum gage height, 8.45 ft May 29, 2002, from outside high water mark; minimum discharge, .54 ft³/s Oct. 30, 2002, but may have been lower during period of ice effect Oct. 31 to Nov. 7, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 404 ft³/s May 28, gage height, 8.06 ft; maximum gage height, 8.30 ft from outside high-water mark; minimum discharge, .54 ft³/s Oct. 30, but may have been lower during period of ice effect Oct. 31 to Nov. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	e1.0	4.1	3.6	5.3	5.3	38	87	236	34	9.6	4.1
2	4.2	e3.5	3.8	4.1	5.1	5.3	27	95	201	29	9.5	4.0
3	4.3	e3.5	3.9	4.5	5.0	5.4	19	100	188	24	9.2	4.1
4	4.5	e3.0	3.6	3.1	5.0	5.3	14	94	184	22	9.2	4.1
5	4.5	e3.0	3.3	2.9	4.8	5.4	12	88	192	21	8.8	4.0
6	5.1	e3.5	3.1	e2.8	e4.2	5.4	11	85	221	20	9.0	3.9
7	4.2	e4.0	2.9	e2.7	e3.9	5.4	9.4	83	247	18	8.6	3.9
8	4.0	4.7	2.9	e2.5	e3.5	5.2	9.2	77	258	17	8.3	4.3
9	4.0	4.1	2.8	e2.3	e4.0	5.2	10	72	217	14	7.8	4.3
10	4.0	3.8	3.0	e2.0	e4.0	5.1	11	73	176	13	7.5	4.4
11	4.0	4.0	3.0	e2.8	e7.0	5.6	12	78	151	12	7.3	4.4
12	3.9	4.8	3.1	3.2	e6.5	6.1	16	90	138	11	7.0	4.2
13	4.1	4.2	3.1	3.1	6.5	10	27	105	125	10	6.8	4.0
14	4.1	4.0	3.5	3.1	6.5	15	34	115	110	9.8	6.4	4.0
15	4.1	3.8	4.0	2.9	6.1	15	32	115	95	9.2	6.3	4.0
16	4.1	3.9	3.9	2.9	6.3	14	29	100	86	9.8	6.3	4.0
17	4.0	3.6	3.5	2.9	6.1	12	27	86	83	9.7	6.2	4.0
18	3.9	3.6	3.2	2.9	6.0	11	25	75	88	9.2	6.0	4.1
19	3.8	4.0	3.1	2.9	6.0	11	24	68	88	9.3	5.8	4.6
20	3.9	5.1	3.2	3.1	6.1	10	25	61	75	9.0	5.6	4.1
21	3.8	4.9	3.1	3.1	6.1	10	31	61	61	13	5.5	4.0
22	3.8	4.8	3.2	3.3	6.0	12	44	72	51	15	5.3	4.1
23	3.8	4.5	3.1	3.3	e5.0	12	62	106	45	15	5.2	4.0
24	3.6	3.4	3.1	3.3	e4.6	12	120	203	40	14	5.1	3.9
25	3.4	e2.0	3.1	3.3	e4.2	12	178	302	38	13	5.0	3.8
26	3.4	e3.0	e3.0	6.0	e5.8	12	128	251	40	13	4.8	3.8
27	4.0	3.9	e3.0	28	e6.6	11	102	224	46	12	4.7	3.6
28	3.9	4.2	e2.8	19	5.8	11	84	276	47	11	4.8	3.6
29	3.8	4.1	e2.8	6.9	---	11	79	268	42	11	4.6	3.5
30	1.4	4.1	e2.8	6.0	---	19	81	239	39	10	4.4	3.5
31	e1.0	---	3.7	5.9	---	42	---	223	---	9.9	4.3	---
TOTAL	118.7	114.0	100.7	148.4	152.0	326.7	1,320.6	3,972	3,608	447.9	204.9	120.3
MEAN	3.83	3.80	3.25	4.79	5.43	10.5	44.0	128	120	14.4	6.61	4.01
MAX	5.1	5.1	4.1	28	7.0	42	178	302	258	34	9.6	4.6
MIN	1.0	1.0	2.8	2.0	3.5	5.1	9.2	61	38	9.0	4.3	3.5
AC-FT	235	226	200	294	301	648	2,620	7,880	7,160	888	406	239
CFSM	0.12	0.12	0.10	0.15	0.17	0.32	1.35	3.94	3.70	0.44	0.20	0.12
IN.	0.14	0.13	0.12	0.17	0.17	0.37	1.51	4.55	4.13	0.51	0.23	0.14

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

MEAN	4.29	4.65	4.17	4.86	9.78	10.7	35.5	117	105	20.8	7.28	4.04
MAX	5.16	6.12	5.77	6.36	20.5	14.4	49.5	156	165	37.7	10.1	4.91
(WY)	(2001)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	3.83	3.80	3.25	3.43	3.41	7.22	13.0	65.4	29.3	10.3	5.15	3.19
(WY)	(2003)	(2003)	(2003)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 2001 - 2003

ANNUAL TOTAL	14,448.6	10,634.2		
ANNUAL MEAN	39.6	29.1		
HIGHEST ANNUAL MEAN			27.3	
LOWEST ANNUAL MEAN			40.0	2002
HIGHEST DAILY MEAN	338	302	12.8	2001
LOWEST DAILY MEAN	1.0	1.0	338	May 29, 2002
ANNUAL SEVEN-DAY MINIMUM	2.3	2.3	1.0	Oct 31, 2002
ANNUAL RUNOFF (AC-FT)	28,660	21,090	2.3	Oct 30, 2002
ANNUAL RUNOFF (CFSM)	1.22	0.90	19,790	
ANNUAL RUNOFF (INCHES)	16.54	12.17	0.84	
10 PERCENT EXCEEDS	136	89	11.42	
50 PERCENT EXCEEDS	8.2	5.6	86	
90 PERCENT EXCEEDS	3.5	3.1	6.1	
			3.3	

e Estimated

12447390 ANDREWS CREEK NEAR MAZAMA, WA
(Hydrologic benchmark station)

LOCATION.--Lat 48°49'23", long 120°08'41", in NE ¼ sec.1, T.38 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, Okanogan National Forest, on left bank 50 ft upstream from Blizzard Creek, 3.5 mi upstream from mouth, and 20 mi northeast of Mazama.

DRAINAGE AREA.--22.1 mi².

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR WA-76-2: 1975. WDR WA-77-2: 1976.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 4,300 ft above NGVD of 1929, from topographic map.

REMARKS.--Records poor. No regulation or diversion. Chemical analyses water years 1972-96.

AVERAGE DISCHARGE.--35 years (water years 1969-2003), 31.1 ft³/s, 19.15 in/yr, 22,560 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft³/s June 10, 1972, gage height, 4.00 ft, from rating curve extended above 440 ft³/s; minimum discharge .97 ft³/s, Oct. 30, 2002.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 29	2300	301	2.69	Jun 8	---	*428	*3.04
May 31	1730	324	2.76				

Minimum discharge, 0.97 ft³/s, Oct. 30, gage height, -0.08 ft, result of freeze-up.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	2.5	3.1	2.6	2.2	1.9	5.0	23	244	e67	e15	6.0
2	3.9	2.6	3.0	2.6	2.2	1.9	4.6	28	e216	e58	e14	5.9
3	4.8	2.4	3.0	2.6	2.2	1.9	4.5	29	e195	e52	e14	5.8
4	4.9	2.5	2.9	2.6	2.2	1.9	4.4	29	e195	e49	e13	5.7
5	4.3	2.8	2.9	2.5	2.2	1.9	4.4	27	e213	e49	e13	5.9
6	4.0	3.0	2.5	2.5	2.1	1.9	4.4	25	e262	e46	e13	5.8
7	3.8	3.3	2.6	2.5	2.1	1.9	4.3	24	e273	e44	e12	5.6
8	3.7	3.4	2.5	2.5	2.1	1.9	4.4	22	e287	e43	e12	5.9
9	3.7	3.3	2.4	2.5	2.1	1.9	4.7	22	e273	e38	e12	6.4
10	3.7	3.2	2.4	2.5	2.1	1.9	4.7	22	e239	e37	e11	5.9
11	3.9	3.2	2.4	2.5	2.1	1.9	4.7	23	e201	e36	e11	5.8
12	3.8	3.5	2.5	2.4	2.1	2.0	5.2	24	185	e35	e11	6.1
13	4.1	3.5	2.5	2.4	2.1	3.4	6.2	28	180	e33	e10	6.6
14	4.1	3.4	2.8	2.4	2.1	3.6	6.6	37	150	e30	e9.8	6.2
15	4.1	3.2	3.9	2.3	2.1	5.0	6.5	42	134	e29	e9.4	6.1
16	4.1	3.2	4.6	2.3	2.1	4.9	6.6	37	124	e26	e9.4	6.0
17	4.0	3.1	4.2	2.2	2.1	4.2	6.7	34	126	e25	e9.1	6.5
18	3.8	3.1	3.4	2.2	2.0	3.6	6.7	31	e133	e24	e8.8	6.8
19	3.8	3.2	3.2	2.2	2.0	3.4	6.8	29	e124	e23	e8.4	6.8
20	3.8	3.6	3.1	2.2	2.0	3.3	7.1	27	e114	e22	e8.2	6.4
21	3.7	3.6	3.0	2.2	2.0	3.3	7.9	27	e94	e22	e7.7	6.0
22	3.6	3.7	2.8	2.2	2.0	4.0	10	32	e81	e21	e7.3	5.8
23	3.5	3.7	2.8	2.2	2.0	3.6	13	49	e73	e20	e7.3	5.7
24	3.2	e2.7	2.7	2.2	1.9	3.4	20	94	e68	e19	e6.9	5.6
25	3.2	e2.2	2.7	2.1	1.9	3.3	24	152	e71	e18	e6.7	5.5
26	3.2	e3.3	2.7	2.6	1.9	3.2	22	155	e78	e17	e6.5	5.4
27	3.3	3.2	2.7	3.1	1.9	3.1	20	164	e88	e17	6.4	5.4
28	3.4	3.1	2.7	2.4	1.9	3.1	20	208	e85	e16	6.4	5.3
29	3.1	3.1	2.7	2.3	---	3.2	20	227	e80	e16	6.4	5.2
30	2.0	3.1	2.6	2.3	---	3.7	21	223	e76	e15	6.2	5.1
31	2.6	---	2.6	2.3	---	5.3	---	249	---	e15	6.1	---
TOTAL	115.0	93.7	89.9	74.4	57.7	93.5	286.4	2,143	4,662	962	298.0	177.2
MEAN	3.71	3.12	2.90	2.40	2.06	3.02	9.55	69.1	155	31.0	9.61	5.91
MAX	4.9	3.7	4.6	3.1	2.2	5.3	24	249	287	67	15	6.8
MIN	2.0	2.2	2.4	2.1	1.9	1.9	4.3	22	68	15	6.1	5.1
AC-FT	228	186	178	148	114	185	568	4,250	9,250	1,910	591	351
CFSM	0.17	0.14	0.13	0.11	0.09	0.14	0.43	3.13	7.03	1.40	0.43	0.27
IN.	0.19	0.16	0.15	0.13	0.10	0.16	0.48	3.61	7.85	1.62	0.50	0.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2003, BY WATER YEAR (WY)

MEAN	6.52	6.38	4.91	4.05	3.57	3.79	14.8	109	152	45.7	13.6	8.31
MAX	19.1	22.1	13.4	10.3	6.53	6.85	49.9	205	419	125	34.7	40.8
(WY)	(1979)	(2000)	(2000)	(1984)	(1982)	(1992)	(1994)	(1998)	(1974)	(1999)	(1976)	(1978)
MIN	2.58	2.72	2.17	1.69	1.71	1.81	2.95	36.4	34.9	13.6	5.36	3.28
(WY)	(1971)	(1971)	(1971)	(1971)	(2001)	(2001)	(1975)	(1984)	(2001)	(2001)	(1973)	(1970)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1968 - 2003

ANNUAL TOTAL	10,747.0	9,052.8	
ANNUAL MEAN	29.4	24.8	31.1
HIGHEST ANNUAL MEAN			59.1
LOWEST ANNUAL MEAN			10.7
HIGHEST DAILY MEAN	320	287	874
LOWEST DAILY MEAN	2.0	1.9	1.2
ANNUAL SEVEN-DAY MINIMUM	2.5	1.9	1.4
ANNUAL RUNOFF (AC-FT)	21,320	17,960	22,560
ANNUAL RUNOFF (CFSM)	1.33	1.12	1.41
ANNUAL RUNOFF (INCHES)	18.09	15.24	19.15
10 PERCENT EXCEEDS	123	72	97
50 PERCENT EXCEEDS	4.0	4.6	6.4
90 PERCENT EXCEEDS	3.1	2.1	2.9

e Estimated

12447600 CHEWUCH RIVER ABOVE CUB CREEK NEAR WINTHROP, WA

LOCATION.--Lat 48°33'53", long 120°10'35", in SE ¼ NW ¼ sec.2 T.35 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on left bank at Frank MacPherson bridge at junction of East and West Chewack Rd., 0.9 mi below Boulder Creek, at mile 7.6 and 7.2 mi northeast of Winthrop.

DRAINAGE AREA.--466 mi².

PERIOD OF RECORD.--October 2000 to current year. Miscellaneous discharge measurements 1978-84.

REVISED RECORDS.--Miscellaneous discharge measurements 1978-84 incorrectly published as at station 12447500 Chewack River below Boulder Creek near Winthrop, WA.

GAGE.--Water-stage recorder. Elevation of gage is 1,980 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good, except for estimated daily discharges, which are fair. Several diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--3 years (water years 2001-2003) 199 ft³/s, 144,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 2,930 ft³/s May 30, 2002, gage height 12.86 ft; maximum gage height 13.17 ft, May 30, 2002, from outside high water mark; minimum discharge, 20 ft³/s Sept. 18, 2001.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,510 ft³/s June 8, gage height 12.75 ft; maximum gage height 13.04 ft, June 8, from outside high-water mark; minimum discharge, 21 ft³/s Feb. 24, but may have been lower during periods of ice effect.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	e40	e50	e47	48	44	110	399	2,030	356	72	30
2	54	e44	51	e49	46	43	110	447	1,830	331	69	29
3	55	e46	50	e52	46	42	106	477	1,710	311	70	28
4	58	e45	51	53	46	42	102	479	1,700	294	71	27
5	58	e46	50	51	45	43	99	454	1,760	280	70	27
6	57	48	48	49	e43	43	96	419	2,010	268	70	25
7	55	49	48	e40	e41	43	95	396	2,130	255	67	24
8	53	52	47	e38	e40	41	96	371	2,170	242	66	27
9	53	49	e45	e37	e41	43	105	356	2,200	231	63	29
10	52	48	e45	e36	e40	43	109	360	1,960	218	61	28
11	52	48	e43	e41	e46	43	110	369	1,620	208	63	28
12	52	52	e45	e49	e44	44	118	385	1,450	197	61	27
13	52	52	48	e45	e44	51	148	422	1,370	187	57	27
14	53	50	54	e47	e46	65	175	496	1,260	178	53	28
15	52	50	60	e43	47	73	171	569	1,090	170	50	27
16	52	50	71	e45	48	74	167	526	975	162	48	27
17	52	50	63	e43	47	71	153	492	912	149	47	27
18	52	50	57	e44	45	67	145	455	880	144	45	28
19	52	50	54	e46	44	64	144	426	823	134	44	28
20	52	50	53	e45	45	64	141	406	755	126	42	27
21	52	51	53	e43	45	67	149	392	689	121	41	27
22	51	52	51	e49	45	75	178	406	624	114	40	26
23	51	53	51	e47	e40	82	222	485	576	109	39	25
24	50	52	50	e47	e34	75	330	748	535	104	38	25
25	49	e43	50	46	e33	74	544	1,300	500	97	38	25
26	49	e45	50	48	e40	73	486	1,440	467	93	37	24
27	49	e47	e47	54	e46	71	425	1,450	449	89	36	24
28	49	e47	e45	50	45	71	383	1,660	428	85	35	24
29	49	e49	e43	48	---	73	376	1,850	405	82	33	23
30	46	e50	e43	e45	---	79	384	1,910	383	78	32	23
31	e42	---	e45	e47	---	99	---	2,020	---	76	31	---
TOTAL	1,600	1,458	1,561	1,424	1,220	1,882	5,977	22,365	35,691	5,489	1,589	794
MEAN	51.6	48.6	50.4	45.9	43.6	60.7	199	721	1,190	177	51.3	26.5
MAX	58	53	71	54	48	99	544	2,020	2,200	356	72	30
MIN	42	40	43	36	33	41	95	356	383	76	31	23
AC-FT	3,170	2,890	3,100	2,820	2,420	3,730	11,860	44,360	70,790	10,890	3,150	1,570
CFSM	0.11	0.10	0.11	0.10	0.09	0.13	0.43	1.55	2.55	0.38	0.11	0.06
IN.	0.13	0.12	0.12	0.11	0.10	0.15	0.48	1.79	2.85	0.44	0.13	0.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

	2001	2002	2002	2002	2002	2003	2003	2002	2002	2002	2002	2002
MEAN	52.7	54.9	49.7	47.0	45.0	52.3	141	686	975	194	55.9	32.2
MAX	60.9	59.1	50.7	48.7	46.4	60.7	199	1,008	1,474	289	73.2	43.8
(WY)	(2001)	(2002)	(2002)	(2002)	(2002)	(2003)	(2003)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	45.5	48.6	48.0	45.9	43.6	46.5	49.6	328	263	115	43.2	26.4
(WY)	(2002)	(2003)	(2001)	(2003)	(2003)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2001 - 2003	
ANNUAL TOTAL	102,227		81,050			
ANNUAL MEAN	280		222		199	
HIGHEST ANNUAL MEAN					280	
LOWEST ANNUAL MEAN					94.4	
HIGHEST DAILY MEAN	2,570	May 30	2,200	Jun 9	2,570	May 30, 2002
LOWEST DAILY MEAN	37	Sep 30	23	Sep 29	21	Sep 18, 2001
ANNUAL SEVEN-DAY MINIMUM	39	Sep 24	24	Sep 24	22	Sep 15, 2001
ANNUAL RUNOFF (AC-FT)	202,800		160,800		144,100	
ANNUAL RUNOFF (CFSM)	0.60		0.48		0.43	
ANNUAL RUNOFF (INCHES)	8.16		6.47		5.80	
10 PERCENT EXCEEDS	972		498		454	
50 PERCENT EXCEEDS	53		52		52	
90 PERCENT EXCEEDS	44		36		39	

e Estimated

12448000 CHEWUCH RIVER AT WINTHROP, WA

LOCATION.--Lat 48°28'38", long 120°11'07", SW 1/4 NW 1/4 sec.2, T.34 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on right bank, 80 ft downstream from State Road 20 bridge crossing, at northwest end of Winthrop, WA, and at mile 0.18.

DRAINAGE AREA.--525 mi².

PERIOD OF RECORD.--1912 to 1913, seasonal records only. October 1991 to current year. Prior to October 1991 published as "Chewack River at Winthrop, WA".

GAGE.--Water-stage recorder. Datum of gage is 1,736.26 ft above NGVD of 1929 (Okanogan County Public Works benchmark). Prior to November 1991, nonrecording gage 10 ft upstream from bridge, and at datum 8.74 ft higher.

REMARKS.--Records fair. No known regulation. Several diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station. Water temperature records April to September 2002.

AVERAGE DISCHARGE.--12 years (water years 1992-2003), 380 ft³/s, 275,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,480 ft³/s June 16, 1999, gage height, 8.92 ft; maximum gage height, 9.79 ft June 16, 1999, from outside high-water mark; minimum discharge, 20 ft³/s Sept. 18 and 19, 2001, gage height, 2.24 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jun 1	0630	2,710	6.67	Jun 10	---	---	(a) *7.11
Jun 10	0030	*2,770	6.82				

Minimum discharge, 29 ft³/s, Feb. 24, but may have been less during periods of ice effect.

(a) From crest-stage gage.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	e44	e50	e53	e54	48	125	516	2,430	365	82	40
2	63	e48	51	e55	53	48	125	571	2,190	340	78	40
3	65	e50	50	59	52	47	121	605	2,010	318	78	39
4	67	e48	51	60	52	46	116	607	1,950	297	78	38
5	68	e49	49	57	52	47	113	581	2,040	280	76	38
6	65	e51	48	55	e49	48	109	536	2,290	267	75	37
7	63	52	47	e45	e47	47	107	511	2,420	254	72	35
8	61	55	46	e43	e46	45	108	470	2,460	244	71	39
9	60	52	45	e42	e47	48	124	444	2,400	234	68	42
10	59	51	45	e41	e46	46	127	446	2,240	224	65	43
11	59	50	45	e46	e52	46	125	460	1,790	213	66	43
12	59	54	47	e54	e50	48	135	477	1,590	206	67	41
13	59	55	50	e50	e50	53	177	516	1,470	195	63	40
14	60	53	59	e52	e52	68	226	600	1,360	188	61	41
15	59	51	63	e48	53	79	217	699	1,150	180	57	41
16	59	51	83	e50	54	84	207	656	1,020	176	55	43
17	59	51	72	e48	53	80	192	606	937	164	54	43
18	58	51	64	e49	51	76	180	558	901	157	54	43
19	58	51	60	e51	51	73	177	521	857	147	52	43
20	57	51	59	e49	51	72	176	494	783	139	49	43
21	57	52	58	e48	50	76	184	472	710	136	47	42
22	56	53	56	e54	49	82	221	479	638	128	47	41
23	56	54	56	52	e45	96	275	554	585	120	47	41
24	56	53	55	53	e38	88	433	846	539	118	46	41
25	55	e45	55	52	e37	87	778	1,550	508	113	45	41
26	54	e46	55	53	e46	83	685	1,760	467	108	45	40
27	54	e47	e52	58	e51	82	589	1,750	455	104	44	39
28	54	e47	e50	57	50	81	528	1,990	438	100	43	39
29	54	e49	e48	e53	---	82	503	2,300	414	98	43	39
30	51	e50	e48	e50	---	86	504	2,330	393	92	41	39
31	46	---	e50	e52	---	108	---	2,390	---	89	41	---
TOTAL	1,801	1,514	1,667	1,589	1,381	2,100	7,687	27,295	39,435	5,794	1,810	1,214
MEAN	58.1	50.5	53.8	51.3	49.3	67.7	256	880	1,314	187	58.4	40.5
MAX	68	55	83	60	54	108	778	2,390	2,460	365	82	43
MIN	46	44	45	41	37	45	107	444	393	89	41	35
AC-FT	3,570	3,000	3,310	3,150	2,740	4,170	15,250	54,140	78,220	11,490	3,590	2,410

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 2003, BY WATER YEAR (WY)

MEAN	89.5	94.3	79.7	68.8	70.3	101	377	1,407	1,547	502	149	70.3
MAX	176	210	148	111	102	169	761	2,671	3,348	1,414	349	130
(WY)	(1998)	(2000)	(2000)	(2000)	(2000)	(1996)	(1996)	(1998)	(1999)	(1999)	(1999)	(1999)
MIN	52.6	50.5	44.1	40.2	48.9	48.5	59.9	348	278	115	40.2	26.2
(WY)	(2002)	(2003)	(1993)	(1993)	(2002)	(1993)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1992 - 2003
ANNUAL TOTAL	114,661	93,287	
ANNUAL MEAN	314	256	380
HIGHEST ANNUAL MEAN			630
LOWEST ANNUAL MEAN			101
HIGHEST DAILY MEAN	2,760	2,460	6,010
LOWEST DAILY MEAN	41	35	20
ANNUAL SEVEN-DAY MINIMUM	42	38	22
ANNUAL RUNOFF (AC-FT)	227,400	185,000	275,500
10 PERCENT EXCEEDS	1,120	605	1,040
50 PERCENT EXCEEDS	59	58	99
90 PERCENT EXCEEDS	47	43	49

e Estimated

12448500 METHOW RIVER AT WINTHROP, WA

LOCATION.--Lat 48°28'25", long 120°10'34", in NE ¼ SW ¼ sec.2, T.34 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on left bank at Winthrop, 0.3 mi downstream from Chewuch River, and at mile 49.8.

DRAINAGE AREA.--1,007 mi².

PERIOD OF RECORD.--January to October 1912, August 1971 to June 1972 (destroyed by flood of May 31, 1972), November 1989 to current year. Published as "near Winthrop" January to October 1912.

GAGE.--Water-stage recorder. Datum of gage is 1,718.09 ft above NGVD of 1929. January to August 1912, nonrecording gage at site 0.6 mi downstream at different datum. August 1971 to June 1972, water-stage recorder at same site at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Diversions for irrigation of about 1,170 acres upstream from station. U.S. Geological Survey satellite telemeter at station. Water temperatures records April to September 2002.

AVERAGE DISCHARGE.--13 years (water years 1991-2003), 1,170 ft³/s, 847,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,400 ft³/s May 31, 1972, gage height, 20.90 ft, from outside high-water mark; minimum discharge, 115 ft³/s Nov. 28, 2000, gage height, 9.44 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 29	0700	7,320	15.45	Jun 8	---	---	(a) *16.37
Jun 8	0445	*8,120	15.81				

Minimum daily discharge, 155 ft³/s Feb. 24 and Sept. 29.

(a) From crest-stage gage.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e187	182	185	181	182	171	689	1,810	6,690	1,540	343	167
2	e190	184	184	185	179	170	700	1,980	5,880	1,370	331	166
3	e200	184	184	188	179	169	671	2,060	5,300	1,250	322	166
4	e206	181	185	190	177	169	630	2,040	5,130	1,160	319	166
5	e207	187	184	186	177	170	595	1,940	5,480	1,120	305	166
6	e209	187	181	183	175	172	569	1,840	6,490	1,090	302	165
7	e206	189	179	173	169	172	543	1,750	7,150	1,030	299	163
8	e207	198	178	166	167	167	533	1,650	7,510	995	292	167
9	e208	190	177	e164	169	171	559	1,560	7,370	935	281	170
10	206	187	178	162	172	168	584	1,540	6,530	883	272	172
11	205	186	179	180	175	169	592	1,580	5,260	849	269	174
12	206	195	180	186	171	173	651	1,680	4,740	830	267	170
13	207	193	184	178	172	186	817	1,790	4,360	803	255	168
14	207	190	204	179	177	216	1,000	2,000	3,910	760	244	169
15	206	188	203	169	177	238	989	2,230	3,370	715	233	169
16	205	187	251	179	183	244	945	2,140	3,080	671	223	169
17	204	188	222	173	179	237	909	2,000	3,000	634	218	170
18	202	186	204	175	176	233	863	1,850	3,160	602	214	169
19	200	187	194	176	176	227	842	1,720	3,060	564	206	170
20	201	187	192	174	172	225	831	1,630	2,780	537	200	167
21	200	187	190	172	172	231	885	1,550	2,410	525	196	165
22	198	188	186	180	174	246	1,030	1,580	2,110	509	193	164
23	196	188	185	178	171	266	1,260	1,800	1,900	481	192	162
24	195	187	184	177	155	256	1,770	2,870	1,740	464	189	163
25	194	180	184	177	159	251	2,650	5,410	1,690	441	187	161
26	193	182	185	181	170	248	2,280	5,440	1,720	419	184	159
27	193	183	184	188	174	244	2,000	5,000	1,870	398	180	157
28	193	181	180	189	172	246	1,810	5,760	1,910	387	180	156
29	192	184	180	184	---	247	1,730	6,850	1,780	375	177	155
30	189	185	179	182	---	289	1,730	6,610	1,690	364	173	156
31	182	---	184	187	---	525	---	6,580	---	353	171	---
TOTAL	6,194	5,601	5,849	5,542	4,851	6,896	31,657	86,240	119,070	23,054	7,417	4,961
MEAN	200	187	189	179	173	222	1,055	2,782	3,969	744	239	165
MAX	209	198	251	190	183	525	2,650	6,850	7,510	1,540	343	174
MIN	182	180	177	162	155	167	533	1,540	1,690	353	171	155
AC-FT	12,290	11,110	11,600	10,990	9,620	13,680	62,790	171,100	236,200	45,730	14,710	9,840

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2003, BY WATER YEAR (WY)

MEAN	275	393	324	250	246	410	1,355	4,151	4,530	1,600	522	268
MAX	575	915	957	459	452	878	2,475	7,125	10,110	3,832	1,208	418
(WY)	(1998)	(1991)	(1996)	(1996)	(1996)	(1992)	(1996)	(1998)	(1972)	(1999)	(1999)	(1999)
MIN	181	187	189	179	173	177	194	1,629	1,257	501	204	150
(WY)	(1995)	(2003)	(2003)	(2003)	(1912)	(1912)	(2001)	(2001)	(2001)	(2001)	(2001)	(1994)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1912 - 2003
ANNUAL TOTAL	416,839	307,332	
ANNUAL MEAN	1,142	842	1,170
HIGHEST ANNUAL MEAN			1,729
LOWEST ANNUAL MEAN			430
HIGHEST DAILY MEAN	8,430	7,510	21,400
LOWEST DAILY MEAN	160	155	134
ANNUAL SEVEN-DAY MINIMUM	179	158	136
ANNUAL RUNOFF (AC-FT)	826,800	609,600	847,300
10 PERCENT EXCEEDS	4,120	2,020	3,250
50 PERCENT EXCEEDS	250	200	340
90 PERCENT EXCEEDS	184	169	186

e Estimated

METHOW RIVER BASIN

12448620 METHOW RIVER/MVID EAST DIVERSION NEAR WINTHROP, WA

LOCATION.--Lat 48°25'08", long 120°08'24", in SW ¼ NW ¼ sec.30, T.34 N., R.22 E., Okanogan County, Hydrologic Unit 17020008, at diversion structure 3.8 mi southeast of Winthrop city limits.

PERIOD OF RECORD.--May 5, 2001, to October 1, 2003 (irrigation season only) (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,640 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Methow Valley Irrigation District personnel via diversion and headgate. Canal diverts water from the Methow River at river mile 44.8 in SW ¼ NW ¼ sec.30, T.34 N., R.22 E., for irrigation and water supply in the Methow River Basin. Figures herein represent water diverted from the main stem, some of which may return to the Methow River directly or through seepage.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 30 ft³/s May 13, 2001; minimum discharge, no flow preceding and succeeding irrigation periods.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 28 ft³/s May 25, gage height, 2.41 ft; minimum discharge, no flow preceding and succeeding irrigation period.

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

DAY	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	---	8.3	17	12	19	14	0.88
2	---	8.9	13	10	18	14	---
3	---	9.0	14	13	18	14	---
4	---	9.3	17	13	18	13	---
5	---	9.6	18	15	17	12	---
6	---	9.1	20	14	16	9.1	---
7	---	8.6	18	13	15	9.1	---
8	---	8.0	18	12	15	11	---
9	---	7.6	15	13	13	12	---
10	---	7.5	13	17	14	12	---
11	---	7.4	13	16	16	11	---
12	---	7.7	15	15	16	10	---
13	---	12	16	14	15	9.6	---
14	0.00	14	16	13	14	9.4	---
15	3.8	15	16	12	11	9.4	---
16	5.4	14	15	9.4	8.3	11	---
17	2.4	13	16	6.1	8.9	11	---
18	0.00	13	17	5.0	13	10	---
19	2.4	13	17	3.5	20	9.9	---
20	3.9	13	15	13	19	9.8	---
21	2.7	14	13	19	19	9.4	---
22	6.4	16	13	19	18	9.3	---
23	11	17	15	18	18	9.1	---
24	13	21	14	17	18	9.1	---
25	10	18	13	16	17	9.1	---
26	9.5	16	13	15	17	9.0	---
27	8.7	15	15	15	16	8.7	---
28	8.0	17	15	14	16	8.6	---
29	7.8	17	14	13	16	5.4	---
30	7.9	14	14	10	15	2.0	---
31	---	14	---	15	15	---	---
TOTAL	---	387.0	458	410.0	489.2	301.0	---
MEAN	---	12.5	15.3	13.2	15.8	10.0	---
MAX	---	21	20	19	20	14	---
MIN	---	7.4	13	3.5	8.3	2.0	---

12448990 TWISP RIVER ABOVE NEWBY CREEK NEAR TWISP, WA

LOCATION.--Lat 48°22'51", long 120°15'38", in NW ¼ NE ¼ sec.7, T.33 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on right bank at county road bridge 6.0 mi west of Twisp city limits and at mile 8.1.

DRAINAGE AREA.--207 mi².

PERIOD OF RECORD.--October 2000 to September 2003 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 2,040 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good, except for estimated daily discharges and discharges above 1,000 ft³/s, which are fair. Several small diversions for irrigation upstream from station. Water temperature records October 2001 to September 2002.

AVERAGE DISCHARGE.--3 year (water years 2001-2003), 191 ft³/s, 138,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,690 ft³/s June 16, 2002, gage height, 10.77 ft; maximum gage height, 10.94 ft June 16, 2002, from outside high water mark; minimum daily discharge, 21 ft³/s Jan. 10, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,120 ft³/s June 7, gage height, 10.54 ft; maximum gage height 10.77 ft June 7, from outside high-water mark; minimum daily discharge, 21 ft³/s Jan. 10.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	e27	31	e30	37	41	197	430	1,400	403	79	32
2	36	e31	31	e33	37	41	184	459	1,280	353	76	32
3	37	e32	31	34	36	41	168	465	1,180	317	72	31
4	38	e30	32	34	37	41	156	458	1,160	298	71	30
5	36	e31	31	32	37	42	148	438	1,270	297	69	30
6	35	32	31	31	e35	42	142	420	1,610	293	69	29
7	34	34	30	e25	e33	42	135	398	1,660	277	66	29
8	34	37	29	e23	e31	42	136	375	1,590	264	64	30
9	34	34	29	e22	e33	42	145	357	1,450	244	61	31
10	e32	32	30	e21	e32	42	149	355	1,240	229	57	31
11	e32	32	31	e26	e34	44	150	364	1,080	222	55	31
12	e33	36	31	e32	e32	50	166	399	1,030	221	53	29
13	e34	35	31	e30	e33	57	220	432	970	213	52	29
14	e36	33	35	e30	e36	74	250	481	871	198	48	29
15	e36	32	37	e28	40	85	237	529	770	182	46	29
16	e35	32	45	e30	41	87	228	492	723	167	44	29
17	e35	34	38	e28	40	80	222	460	736	158	44	29
18	e34	32	35	e29	40	77	213	426	810	148	43	29
19	e34	33	33	e30	40	75	208	399	813	139	42	31
20	e34	35	33	e30	41	75	207	378	698	131	41	29
21	e33	35	32	e28	43	78	222	364	568	129	41	28
22	e33	35	32	e32	43	86	251	382	486	123	40	28
23	e33	34	31	e32	42	93	309	458	438	116	39	28
24	e33	33	31	e33	e40	89	435	761	404	112	38	28
25	e33	30	31	30	e38	86	546	1,200	411	106	37	27
26	e33	31	31	35	e44	85	485	1,150	451	100	37	26
27	e33	31	e27	45	e47	84	446	1,050	522	95	36	26
28	e33	e28	e26	44	42	83	417	1,110	522	92	36	26
29	e32	e29	e26	41	---	85	408	1,350	479	88	35	26
30	e31	e30	e25	40	---	102	411	1,280	455	86	34	26
31	e27	---	e29	39	---	174	---	1,330	---	82	33	---
TOTAL	1,049	970	975	977	1,064	2,165	7,591	18,950	27,077	5,883	1,558	868
MEAN	33.8	32.3	31.5	31.5	38.0	69.8	253	611	903	190	50.3	28.9
MAX	38	37	45	45	47	174	546	1,350	1,660	403	79	32
MIN	27	27	25	21	31	41	135	355	404	82	33	26
AC-FT	2,080	1,920	1,930	1,940	2,110	4,290	15,060	37,590	53,710	11,670	3,090	1,720
CFSM	0.16	0.16	0.15	0.15	0.18	0.34	1.22	2.95	4.36	0.92	0.24	0.14
IN.	0.19	0.17	0.18	0.18	0.19	0.39	1.36	3.41	4.87	1.06	0.28	0.16

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2001 - 2003, BY WATER YEAR (WY)

MEAN	36.3	38.9	35.3	35.1	39.2	59.7	208	630	846	270	61.0	33.2
MAX	46.0	42.6	39.6	43.1	51.1	74.1	290	811	1,322	479	88.1	43.3
(WY)	(2001)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	29.2	32.3	31.5	30.8	28.4	35.3	80.3	467	313	141	44.6	27.2
(WY)	(2002)	(2003)	(2003)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 2001 - 2003

ANNUAL TOTAL	100,457	69,127		
ANNUAL MEAN	275	189		191
HIGHEST ANNUAL MEAN				276
LOWEST ANNUAL MEAN				108
HIGHEST DAILY MEAN	2,060	1,660	2,060	2,060
LOWEST DAILY MEAN	25	21	21	21
ANNUAL SEVEN-DAY MINIMUM	28	26	25	25
ANNUAL RUNOFF (AC-FT)	199,300	137,100	138,600	
ANNUAL RUNOFF (CFSM)	1.33	0.91	0.92	
ANNUAL RUNOFF (INCHES)	18.05	12.42	12.55	
10 PERCENT EXCEEDS	995	483	529	
50 PERCENT EXCEEDS	64	41	45	
90 PERCENT EXCEEDS	32	29	29	

e Estimated

METHOW RIVER BASIN

12448996 TWISP RIVER/MVID WEST DIVERSION NEAR TWISP, WA

LOCATION.--Lat 48°22'12", long 120°11'31", in SE 1/4 SE 1/4 sec.10, T.33 N., R.21 E., Okanogan County Hydrologic Unit 17020008, at diversion structure 3.1 mi west of Twisp.

PERIOD OF RECORD.--May 2001 to October 2003 (irrigation season only) (discontinued).

GAGE.--Water stage recorder. Elevation of gage is 1,780 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Methow Valley Irrigation District personnel via diversion and head gate. Canal diverts water from the Twisp River in SW 1/4 SE 1/4 sec.10, T.33 N., R.21 E. for irrigation and water supply in the Methow River Basin. Figures herein represent water diverted from the Twisp River, some of which may return to the Twisp River and Methow River directly or through seepage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52 ft³/s June 9, 2003, gage height 2.16 ft; minimum discharge, no flow when diversion shut off.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52 ft³/s June 9, gage height, 2.16 ft; minimum discharge, no flow when diversion shut off.

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

DAY	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	---	14	21	25	22	16	8.7
2	---	13	22	23	23	16	2.7
3	---	13	20	23	23	16	0.00
4	---	14	18	23	23	16	---
5	---	17	18	24	22	15	---
6	---	19	18	24	23	15	---
7	---	18	16	24	23	15	---
8	---	17	18	21	23	16	---
9	---	18	23	22	22	16	---
10	---	18	21	23	21	18	---
11	---	18	20	23	21	19	---
12	---	19	21	24	22	18	---
13	---	19	21	24	21	18	---
14	0.08	21	21	23	21	18	---
15	0.09	21	21	22	20	18	---
16	8.9	21	22	22	19	18	---
17	14	20	22	22	18	18	---
18	12	19	23	22	21	18	---
19	12	19	23	22	24	19	---
20	13	19	22	21	24	18	---
21	13	21	20	21	24	18	---
22	13	23	20	20	23	17	---
23	13	22	21	20	22	17	---
24	7.3	7.3	21	19	21	14	---
25	11	0.00	21	21	21	12	---
26	20	0.18	23	21	21	11	---
27	17	9.9	25	20	20	11	---
28	12	16	27	20	21	11	---
29	12	9.3	26	20	20	11	---
30	13	17	26	21	20	9.4	---
31	---	20	---	22	18	---	---
TOTAL	---	502.68	641	682	667	472.4	---
MEAN	---	16.2	21.4	22.0	21.5	15.7	---
MAX	---	23	27	25	24	19	---
MIN	---	0.00	16	19	18	9.4	---

12448998 TWISP RIVER NEAR TWISP, WA

LOCATION.--Lat 48°22'12", long 120°08'51", in SE ¼ SE ¼ sec.12, T.33 N., R.21 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 20 ft downstream from county road bridge, 0.8 mi west of the Twisp city limits, and at mile 1.6.

DRAINAGE AREA.--245 mi².

PERIOD OF RECORD.--May 1975 to September 1979, October 1989 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,640 ft above NGVD of 1929, from topographic map, May 1975 to September 1979, water-stage recorder at same site. Crest-stage gage since September 1992.

REMARKS.--Records good except for estimated daily discharges which are fair. No known regulation. Several diversions upstream from station for irrigation. U.S. Geological Survey satellite telemeter at station. Water temperature records October 2001 to September 2002.

AVERAGE DISCHARGE.--18 years (water years 1976-79, 1990-2003), 258 ft³/s, 186,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,540 ft³/s June 17, 1999, gage height, 11.83 ft; maximum gage height, 12.42 ft June 17, 1999, from crest-stage gage; minimum daily discharge, 15 ft³/s Oct. 2-4, 1989, Sept. 28-30, Oct. 1-3, 1994, Sept. 19-20 and 22-24, 2001.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 29, 1948, had a discharge of 9,440 ft³/s, by slope-area measurement made about 1,000 ft upstream from mouth.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 25	0915	1,460	10.09	Jun 7	2315	*1,910	10.55
May 29	0415	1,620	10.26	Jun 7	----	---	*10.70

Minimum discharge, 19 ft³/s, Sept. 12, 13, 18, 22, gage height, 6.86 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	e29	32	e32	41	43	188	394	1,410	357	60	24
2	29	e32	32	e34	40	42	178	430	1,220	311	56	24
3	29	e34	32	e37	40	43	165	438	1,120	280	54	23
4	34	e32	33	38	40	43	153	429	1,080	263	54	22
5	37	e33	32	35	40	43	144	402	1,170	261	52	23
6	35	34	32	34	e38	45	139	378	1,410	258	52	23
7	35	35	31	28	e36	44	133	355	1,620	245	50	22
8	34	39	31	e26	e34	44	131	332	1,730	237	49	23
9	34	35	31	e25	e36	45	138	312	1,620	215	47	23
10	34	34	32	e24	e35	44	142	306	1,390	196	44	22
11	34	34	32	e29	e37	45	143	314	1,140	188	41	21
12	35	37	33	e35	e35	52	156	346	1,040	183	38	20
13	36	37	33	e33	e36	59	202	378	973	177	37	20
14	38	35	38	e33	e39	76	233	436	853	168	36	20
15	38	34	38	e31	e43	89	221	494	743	158	34	20
16	37	34	51	e33	44	92	203	460	691	148	33	20
17	37	35	42	e31	43	85	192	420	691	140	33	20
18	36	34	38	e32	43	81	185	378	768	130	30	20
19	36	34	36	33	43	79	180	348	783	122	25	21
20	36	35	37	33	43	79	178	328	671	114	24	20
21	35	36	36	e31	43	81	187	309	539	111	24	20
22	35	35	34	e36	45	89	211	319	458	106	25	20
23	35	35	34	36	43	97	262	398	400	97	24	20
24	35	34	34	38	e42	92	402	752	362	94	24	22
25	35	32	34	37	e40	89	560	1,310	365	89	23	24
26	35	32	34	39	e46	88	468	1,180	404	81	24	24
27	35	33	31	46	49	86	421	1,070	475	76	23	24
28	35	e30	e30	47	44	86	389	1,230	481	73	23	24
29	34	e31	e30	44	---	87	376	1,470	435	69	23	24
30	33	32	e29	e43	---	99	376	1,340	411	66	22	24
31	e29	---	e32	43	---	161	---	1,310	---	62	23	---
TOTAL	1,069	1,016	1,054	1,076	1,138	2,228	7,056	18,366	26,453	5,075	1,107	657
MEAN	34.5	33.9	34.0	34.7	40.6	71.9	235	592	882	164	35.7	21.9
MAX	38	39	51	47	49	161	560	1,470	1,730	357	60	24
MIN	29	29	29	24	34	42	131	306	362	62	22	20
AC-FT	2,120	2,020	2,090	2,130	2,260	4,420	14,000	36,430	52,470	10,070	2,200	1,300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2003, BY WATER YEAR (WY)

MEAN	61.4	104	93.7	65.6	69.6	112	332	826	930	399	99.8	46.4
MAX	144	350	323	152	168	270	723	1,455	1,517	859	302	110
(WY)	(1998)	(1991)	(1996)	(1976)	(1996)	(1996)	(1996)	(1997)	(1999)	(1991)	(1976)	(1978)
MIN	34.2	33.9	34.0	31.6	29.2	39.6	80.1	201	282	56.9	23.7	16.4
(WY)	(1990)	(2003)	(2003)	(1993)	(1994)	(1977)	(2001)	(1977)	(1977)	(1977)	(1977)	(1994)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1975 - 2003	
ANNUAL TOTAL	95,542		66,295			
ANNUAL MEAN	262		182		258	
HIGHEST ANNUAL MEAN					413	
LOWEST ANNUAL MEAN					82.9	
HIGHEST DAILY MEAN	1,970	Jun 15	1,730	Jun 8	3,200	May 19, 1991
LOWEST DAILY MEAN	27	Sep 30	20	Sep 12	15	Sep 28, 1994
ANNUAL SEVEN-DAY MINIMUM	29	Sep 25	20	Sep 12	15	Sep 26, 1994
ANNUAL RUNOFF (AC-FT)	189,500		131,500		186,600	
10 PERCENT EXCEEDS	887		446		770	
50 PERCENT EXCEEDS	53		42		85	
90 PERCENT EXCEEDS	32		24		34	

e Estimated

12449500 METHOW RIVER AT TWISP, WA

LOCATION.--Lat 48°21'55", long 120°06'54", in NE 1/4 NW 1/4 sec.17, T.33 N., R.22 E., Okanogan County, Hydrologic Unit 17020008, on left bank, 0.25 mi downstream from Twisp River, 0.3 mi east of center of Twisp, and at mile 40.

DRAINAGE AREA.--1,301 mi².

PERIOD OF RECORD.--June 1919 to September 1962, April 1991 to current year. Monthly discharge only for some periods, published in WSP 1316. Miscellaneous measurements in 1967, 1970, 1976, 1978-90. For 1976, 1978-80 published as "at site 2.7 mi downstream", in error.

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above NGVD of 1929, from topographic map. Prior to Oct. 3, 1919, several staff gages in the immediate vicinity at different datum. Oct. 3, 1919 to Sept. 30, 1929, and Oct. 31 to Nov. 6, 1933, chain gage on road bridge 40 ft upstream at same datum as staff gages. Nov. 7 to Dec. 18, 1933, staff gage at present site at different datum.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation. Numerous diversions for irrigation upstream from station. Water temperature records April to September 2002.

AVERAGE DISCHARGE.--55 years (water years 1920-62, 1992-2003), 1,334 ft³/s, 966,500 acre-ft/yr. Includes discharge for water years 1930-34, which were estimated for WSP 1316.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,800 ft³/s May 29, 1948, gage height, 12.94 ft, in gage well, from rating curve extended above 18,000 ft³/s on basis of slope-area measurement of peak flow; minimum observed, 134 ft³/s Sept. 4, 5, 1926, Sept. 9, 10, 1929, but may have been less during period of ice effect Jan. 6 to Mar. 4, 1937.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 29	0830	8,250	4.75	Jun 8	0600	*9,180	*5.10

Minimum discharge, 188 ft³/s, Jan. 8, gage height, -0.22 ft, but may have been less during period of ice effect.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227	232	228	222	227	224	839	2,170	7,790	1,890	411	208
2	242	234	228	228	222	223	852	2,380	6,990	1,680	396	207
3	246	235	226	234	220	222	820	2,510	6,390	1,520	389	206
4	256	232	228	236	219	220	773	2,480	6,210	1,410	385	205
5	260	239	228	231	220	223	733	2,350	6,540	1,360	374	207
6	255	237	226	225	216	228	702	2,220	7,530	1,320	367	208
7	267	240	224	211	206	227	670	2,110	8,270	1,260	361	206
8	272	260	221	195	203	224	655	1,980	8,680	1,210	353	207
9	270	245	220	e190	206	229	678	1,860	8,510	1,140	340	210
10	266	239	222	e188	211	225	709	1,820	7,690	1,060	330	211
11	265	237	224	211	217	226	721	1,870	6,390	1,020	320	212
12	265	247	224	225	214	238	775	1,990	5,810	999	315	210
13	266	248	228	216	218	255	959	2,130	5,370	967	307	207
14	271	240	260	218	229	305	1,180	2,400	4,880	918	295	207
15	268	237	255	203	228	344	1,170	2,730	4,230	862	282	207
16	265	237	321	213	233	360	1,120	2,640	3,860	810	272	207
17	265	237	288	208	229	347	1,080	2,450	3,750	767	267	207
18	263	236	259	212	225	339	1,030	2,250	3,990	728	256	207
19	259	234	245	213	224	331	1,000	2,080	3,930	684	239	207
20	259	235	241	210	222	327	991	1,960	3,530	641	235	206
21	258	237	236	207	223	335	1,040	1,860	3,020	620	234	202
22	254	237	231	218	228	353	1,180	1,880	2,610	607	233	201
23	254	237	228	217	226	385	1,450	2,140	2,320	577	232	200
24	254	237	228	219	205	375	2,000	3,470	2,110	554	228	201
25	253	229	225	218	204	366	3,230	6,600	2,040	532	226	202
26	248	225	227	220	224	360	2,790	6,600	2,080	506	222	199
27	248	227	225	233	231	354	2,430	6,070	2,300	484	216	198
28	248	225	221	239	226	355	2,190	6,780	2,370	471	216	198
29	248	227	221	230	---	355	2,090	7,860	2,190	459	214	200
30	246	228	221	227	---	389	2,070	7,610	2,080	449	211	204
31	234	---	225	232	---	617	---	7,520	---	428	211	---
TOTAL	7,952	7,090	7,284	6,749	6,156	9,561	37,927	102,770	143,460	27,933	8,937	6,157
MEAN	257	236	235	218	220	308	1,264	3,315	4,782	901	288	205
MAX	272	260	321	239	233	617	3,230	7,860	8,680	1,890	411	212
MIN	227	225	220	188	203	220	655	1,820	2,040	428	211	198
AC-FT	15,770	14,060	14,450	13,390	12,210	18,960	75,230	203,800	284,600	55,410	17,730	12,210

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 2003, BY WATER YEAR (WY)

MEAN	412	467	399	312	316	431	1,583	4,920	4,943	1,750	498	306
MAX	1,383	1,183	1,205	578	958	1,773	7,692	9,515	11,030	4,392	1,280	727
(WY)	(1960)	(1934)	(1996)	(1935)	(1935)	(1934)	(1934)	(1957)	(1950)	(1954)	(1999)	(1959)
MIN	189	234	222	178	183	204	180	1,546	846	289	162	148
(WY)	(1937)	(1940)	(1926)	(1937)	(1929)	(1936)	(1929)	(1920)	(1926)	(1926)	(1926)	(1929)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1919 - 2003

ANNUAL TOTAL	493,527	371,976		
ANNUAL MEAN	1,352	1,019		
HIGHEST ANNUAL MEAN			1,354	
LOWEST ANNUAL MEAN			2,231	1951
HIGHEST DAILY MEAN	9,590	Jun 16	8,680	Jun 8
LOWEST DAILY MEAN	205	Jan 29	188	Jan 10
ANNUAL SEVEN-DAY MINIMUM	218	Feb 12	200	Sep 23
ANNUAL RUNOFF (AC-FT)	978,900		737,800	980,600
10 PERCENT EXCEEDS	4,840		2,460	3,930
50 PERCENT EXCEEDS	313		255	416
90 PERCENT EXCEEDS	225		208	223

e Estimated

12449760 METHOW RIVER AT CARLTON, WA

LOCATION.--Lat 48°14'11", long 120°06'43", in NE ¼ NW ¼ sec.32, T.32 N., R.22 E., Okanogan County, Hydrologic Unit 17020008, on left bank approximately 0.5 mile downstream from Methow Valley Irrigation District diversion return, and 1.0 mile south of Carlton.

DRAINAGE AREA.--1,531 mi².

PERIOD OF RECORD.--October 2001 to current year.

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

REMARKS.--Records good, except for estimated daily discharges, which are fair. Several small diversions for irrigation upstream from station. Water temperature records April to September 2002.

AVERAGE DISCHARGE.--2 years (water years 2002-2003), 1,224 ft³/s, 887,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 10,400 ft³/s, June 16, 2002, gage height 9.08 ft; maximum gage height 9.48 ft June 16, 2002, from outside high-water mark; minimum discharge 221 ft³/s Feb. 25 and Aug. 31, 2003, but may have been lower during period of ice effect Jan. 9-11, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,350 ft³/s June 8, 2003 gage height, 8.73 ft; minimum discharge, 221 ft³/s Feb. 25 and Aug. 31, but may have been lower during period of ice effect Jan. 9-11.

REVISIONS.--The maximum discharge for the water year 2002 has been revised to 10,400 ft³/s, June 16, 2002, gage height 9.08 ft. The minimum discharge for water year 2002 has been revised to 242 ft³/s measured Feb. 13, 2002.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	274	262	260	260	265	260	822	2,170	7,850	1,840	434	232
2	290	263	260	269	258	257	868	2,360	7,160	1,660	419	229
3	299	265	259	271	256	255	848	2,490	6,610	1,500	411	228
4	301	263	259	278	254	256	804	2,480	6,300	1,390	408	227
5	305	269	259	273	255	258	766	2,380	6,520	1,330	399	228
6	298	269	258	265	251	263	741	2,260	7,390	1,300	391	229
7	300	272	255	255	243	263	709	2,140	8,220	1,250	386	228
8	308	293	253	231	240	260	691	2,020	8,700	1,200	380	230
9	306	278	252	e226	242	263	705	1,890	8,580	1,140	370	233
10	301	270	254	e222	248	263	734	1,850	7,870	1,080	357	236
11	299	267	257	e242	252	262	749	1,880	6,510	1,030	349	242
12	298	273	257	263	250	273	788	1,990	5,830	1,000	344	238
13	299	279	262	254	249	285	940	2,120	5,260	983	338	234
14	302	272	295	256	263	324	1,170	2,350	4,860	949	326	236
15	301	268	300	241	263	369	1,180	2,680	4,220	889	311	238
16	299	266	356	247	271	390	1,140	2,640	3,820	843	299	239
17	298	268	335	246	265	382	1,110	2,460	3,670	794	294	241
18	296	266	305	246	263	374	1,070	2,270	3,860	759	287	240
19	291	265	289	248	260	367	1,030	2,110	3,810	718	273	241
20	289	264	284	246	259	362	1,020	1,990	3,450	676	268	239
21	289	268	277	243	257	367	1,060	1,890	2,970	650	265	235
22	287	268	270	255	264	379	1,170	1,880	2,570	633	260	233
23	285	268	268	254	261	407	1,400	2,100	2,280	604	259	230
24	284	266	264	252	e238	404	1,850	3,210	2,070	578	256	232
25	282	261	264	252	234	396	3,170	6,350	1,990	557	254	234
26	281	255	267	253	253	393	2,810	6,740	2,010	533	249	229
27	280	258	267	266	266	386	2,480	6,250	2,180	508	240	228
28	280	257	258	275	263	384	2,230	6,820	2,280	492	239	228
29	277	260	e257	269	---	386	2,110	7,850	2,120	477	239	226
30	275	261	257	266	---	402	2,090	7,700	2,010	463	235	228
31	265	---	266	270	---	564	---	7,520	---	447	232	---
TOTAL	9,039	8,014	8,424	7,894	7,143	10,454	38,255	102,840	142,970	28,273	9,772	6,991
MEAN	292	267	272	255	255	337	1,275	3,317	4,766	912	315	233
MAX	308	293	356	278	271	564	3,170	7,850	8,700	1,840	434	242
MIN	265	255	252	222	234	255	691	1,850	1,990	447	232	226
AC-FT	17,930	15,900	16,710	15,660	14,170	20,740	75,880	204,000	283,600	56,080	19,380	13,870

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2002 - 2003, BY WATER YEAR (WY)

MEAN	280	276	276	268	274	363	1,309	3,742	5,708	1,508	417	267
MAX	292	284	281	281	293	388	1,342	4,167	6,650	2,104	518	301
(WY)	(2003)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)
MIN	267	267	272	255	255	337	1,275	3,317	4,766	912	315	233
(WY)	(2002)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)	(2003)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2002 - 2003	
ANNUAL TOTAL	513,694		380,069			
ANNUAL MEAN	1,407		1,041		1,224	
HIGHEST ANNUAL MEAN					1,407	
LOWEST ANNUAL MEAN					1,041	
HIGHEST DAILY MEAN	9,620	Jun 16	8,700	Jun 8	9,620	Jun 16, 2002
LOWEST DAILY MEAN	250	Jan 29	222	Jan 10	222	Jan 10, 2003
ANNUAL SEVEN-DAY MINIMUM	255	Dec 6	228	Sep 2	228	Sep 2, 2003
ANNUAL RUNOFF (AC-FT)	1,019,000		753,900		887,000	
10 PERCENT EXCEEDS	5,080		2,480		3,410	
50 PERCENT EXCEEDS	361		289		310	
90 PERCENT EXCEEDS	266		240		253	

e Estimated

12449950 METHOW RIVER NEAR PATEROS, WA

LOCATION.--Lat 48°04'39", long 119°59'02", in SE 1/4 SW 1/4 sec.20, T.30 N., R.23 E., Okanogan County, Hydrologic Unit 17020008, on right bank 1.4 mi downstream from Black Canyon Creek, 4.3 mi northwest of Pateros, and at mile 6.7.

DRAINAGE AREA.--1,772 mi².

PERIOD OF RECORD.--April 1959 to current year.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above NGVD of 1929, from topographic map. Prior to Dec. 17, 1964, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Diversions for irrigation of about 11,000 acres upstream from station (1959 Bureau of Reclamation land classification). U.S. Geological Survey satellite telemeter at station. Water temperature October 1968 to October 1970.

AVERAGE DISCHARGE.--44 years (water years 1960-2003), 1,540 ft³/s, 1,116,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,800 ft³/s May 31, 1972, gage height, 12.25 ft; minimum daily discharge, 150 ft³/s Jan. 8-10, 1974, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1894, 46,700 ft³/s May 29, 1948, determined by slope-area measurement of peak flow at site 1 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jun 1	1115	8,360	7.16	Jun 8	1015	*9,350	*7.52

Minimum discharge, 238 ft³/s, part or all of each day Sept 2-8, gage height, 1.34 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	287	269	267	276	286	271	754	2,280	8,010	2,110	468	244
2	288	267	267	280	282	274	851	2,460	7,340	1,900	455	241
3	302	267	267	284	277	274	864	2,600	6,720	1,720	443	238
4	309	267	267	291	273	272	850	2,620	6,400	1,590	437	238
5	310	267	267	297	270	271	825	2,530	6,610	1,510	431	238
6	309	270	267	296	267	272	799	2,400	7,450	1,470	420	238
7	302	273	266	289	263	274	772	2,290	8,310	1,410	412	238
8	301	287	263	276	256	274	739	2,170	8,900	1,340	409	240
9	301	294	260	258	251	277	724	2,050	8,860	1,280	399	246
10	300	285	260	253	252	278	729	1,990	8,160	1,190	387	252
11	297	280	263	295	255	278	750	2,000	6,850	1,140	374	260
12	297	277	266	289	257	279	775	2,100	6,190	1,100	366	262
13	297	280	267	283	259	286	907	2,240	5,730	1,070	359	256
14	297	282	286	276	261	314	1,170	2,450	5,300	1,030	349	255
15	297	278	312	269	267	370	1,220	2,780	4,650	976	336	256
16	297	274	375	261	275	400	1,190	2,830	4,220	927	323	257
17	297	272	398	259	278	410	1,160	2,650	4,030	880	311	259
18	297	271	372	257	278	410	1,110	2,470	4,180	836	306	259
19	294	271	343	256	276	405	1,070	2,290	4,240	801	295	261
20	291	271	327	256	274	399	1,060	2,160	3,870	760	283	259
21	290	271	315	256	272	396	1,080	2,050	3,400	702	278	258
22	289	271	305	258	273	397	1,170	2,020	2,950	688	274	253
23	286	271	296	267	274	410	1,390	2,190	2,620	664	274	251
24	285	271	289	267	272	427	1,820	3,100	2,380	631	271	251
25	282	271	284	267	260	428	3,150	5,980	2,250	605	269	255
26	282	267	282	267	253	422	3,000	6,770	2,250	584	263	254
27	282	267	282	269	262	419	2,650	6,240	2,400	561	258	250
28	282	267	281	278	270	414	2,410	6,700	2,560	540	255	249
29	282	263	277	282	---	410	2,260	7,850	2,400	523	252	248
30	279	266	274	282	---	410	2,220	7,840	2,270	508	251	249
31	276	---	276	285	---	482	---	7,580	---	489	247	---
TOTAL	9,085	8,187	9,021	8,479	7,493	10,903	39,469	105,680	151,500	31,535	10,455	7,515
MEAN	293	273	291	274	268	352	1,316	3,409	5,050	1,017	337	250
MAX	310	294	398	297	286	482	3,150	7,850	8,900	2,110	468	262
MIN	276	263	260	253	251	271	724	1,990	2,250	489	247	238
AC-FT	18,020	16,240	17,890	16,820	14,860	21,630	78,290	209,600	300,500	62,550	20,740	14,910

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	474	532	477	419	417	595	1,577	4,898	5,895	2,141	695	440
MAX	1,458	1,327	1,361	938	803	1,407	3,364	9,768	13,150	4,960	1,860	1,196
(WY)	(1960)	(1991)	(1996)	(1981)	(1968)	(1968)	(1996)	(1972)	(1999)	(1972)	(1976)	(1978)
MIN	293	273	270	248	262	237	309	1,415	1,583	471	284	238
(WY)	(2003)	(2003)	(1995)	(1995)	(2001)	(1977)	(2001)	(1977)	(2001)	(1977)	(1977)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1959 - 2003

ANNUAL TOTAL	516,077	399,322		
ANNUAL MEAN	1,414	1,094	1,540	
HIGHEST ANNUAL MEAN			2,963	1972
LOWEST ANNUAL MEAN			565	1977
HIGHEST DAILY MEAN	9,780	Jun 16	8,900	Jun 8
LOWEST DAILY MEAN	260	Dec 9	238	Sep 3
ANNUAL SEVEN-DAY MINIMUM	264	Dec 6	239	Sep 2
ANNUAL RUNOFF (AC-FT)	1,024,000		792,100	
10 PERCENT EXCEEDS	4,970		2,630	4,290
50 PERCENT EXCEEDS	378		297	537
90 PERCENT EXCEEDS	275		257	300

12450700 COLUMBIA RIVER BELOW WELLS DAM, WA

LOCATION.--Lat 47°56'48", long 119°51'56", in SW ¼ SE ¼ sec.6, T.28 N., R.24 E., Chelan County, Hydrologic Unit 17020005, at powerhouse of Wells Dam, 0.7 mi northeast of Azwell, and at mile 515.9.

DRAINAGE AREA.--86,100 mi², approximately.

PERIOD OF RECORD.--October 1967 to current year. October 1953 to September 1967 (monthly discharge only) in the files of the U.S. Geological Survey.

GAGE.--Daily discharge determined from flow through turbines plus spillway flow when present. Datum of gage is NGVD of 1929 (levels by Bechtel Corporation). Prior to Oct. 1, 1970, at site 0.8 mi downstream at same datum. Oct. 1, 1970, to July 20, 1988, water-stage recorder at present site and datum with auxiliary water-stage recorder 6.8 mi downstream from base gage at same datum.

REMARKS.--Flow regulated by numerous reservoirs. Feeder Canal diversion (station 12435500) for Columbia Basin project is used to irrigate approximately 600,000 acres in the United States. An additional 66,500 acres in Canada are irrigated by other diversions.

COOPERATION.--Discharge records provided by Public Utility District No. 1 of Douglas County at Wells Dam through the Corps of Engineers, North Pacific Division, Reservoir Control Center. The U.S. Geological Survey made 7 discharge measurements at this site during the year.

AVERAGE DISCHARGE.--50 years (water years 1954-2003), 114,900 ft³/s, 83,250,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 402,000 ft³/s June 15, 1972; maximum elevation, 731.92 ft June 16, 1972; minimum discharge, 17,900 ft³/s Oct. 5, 1970 (from powerplant records); minimum elevation, 703.55 ft Sept. 28, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 166,000 ft³/s May 22, June 11, 16; minimum daily discharge, 31,100 ft³/s Sept. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80,900	94,500	96,500	47,100	48,600	64,700	93,300	116,000	85,900	122,000	105,000	48,200
2	79,500	89,500	115,000	80,200	44,800	76,500	90,200	133,000	119,000	101,000	63,300	71,300
3	73,900	80,900	113,000	70,300	67,600	99,800	99,300	116,000	124,000	110,000	58,700	82,900
4	61,900	109,000	119,000	57,700	83,400	90,600	81,300	118,000	129,000	59,200	103,000	77,600
5	58,700	105,000	99,100	59,700	86,300	91,400	67,700	146,000	136,000	74,500	108,000	70,500
6	63,400	114,000	113,000	91,200	93,900	89,300	62,200	137,000	159,000	66,600	85,200	48,300
7	87,600	110,000	89,000	94,300	88,600	79,800	105,000	140,000	146,000	122,000	100,000	31,100
8	104,000	102,000	82,700	95,000	54,500	70,800	95,400	146,000	122,000	120,000	101,000	64,000
9	75,900	88,400	113,000	81,400	43,500	37,800	102,000	129,000	153,000	124,000	83,000	57,100
10	75,700	65,700	98,900	86,800	86,300	67,500	104,000	111,000	160,000	133,000	72,800	52,000
11	67,500	82,000	105,000	61,600	69,800	73,200	96,800	102,000	166,000	121,000	111,000	67,100
12	63,600	89,900	93,700	44,700	66,200	69,600	84,300	139,000	160,000	107,000	90,500	69,500
13	58,900	91,500	93,600	74,300	72,500	72,400	67,700	159,000	165,000	80,700	93,100	35,600
14	88,300	94,400	71,900	88,200	60,300	89,200	101,000	143,000	145,000	122,000	111,000	38,900
15	83,600	107,000	59,100	102,000	57,600	66,700	116,000	142,000	131,000	132,000	118,000	71,700
16	71,600	93,900	102,000	100,000	50,400	61,100	127,000	150,000	166,000	107,000	81,300	63,600
17	68,900	55,700	107,000	98,900	73,200	77,100	120,000	124,000	164,000	107,000	64,100	53,600
18	63,700	102,000	99,600	67,300	72,900	78,200	110,000	87,700	146,000	106,000	105,000	57,300
19	46,700	111,000	84,700	63,700	77,800	72,600	109,000	146,000	113,000	99,900	102,000	61,900
20	52,700	98,300	99,700	99,900	82,500	62,500	68,700	148,000	139,000	77,700	115,000	53,600
21	83,500	110,000	77,700	104,000	64,800	78,500	146,000	148,000	94,800	124,000	134,000	63,300
22	84,400	115,000	61,500	94,900	56,700	52,100	134,000	166,000	79,500	123,000	122,000	78,300
23	86,800	103,000	98,400	68,300	43,900	45,800	136,000	148,000	136,000	124,000	94,500	66,800
24	103,000	89,600	98,500	73,400	82,700	89,200	144,000	116,000	154,000	106,000	83,500	74,200
25	116,000	121,000	62,200	56,800	81,200	104,000	142,000	88,200	155,000	109,000	134,000	86,500
26	86,000	114,000	104,000	35,900	81,300	115,000	103,000	95,800	154,000	89,600	112,000	88,800
27	55,200	106,000	96,800	64,200	76,200	124,000	93,200	125,000	158,000	58,800	78,300	58,000
28	90,100	68,800	90,400	69,100	89,000	124,000	128,000	140,000	149,000	110,000	106,000	56,200
29	107,000	92,900	59,000	74,500	---	119,000	140,000	158,000	90,800	122,000	102,000	86,000
30	112,000	93,500	102,000	82,000	---	89,500	132,000	127,000	130,000	118,000	87,200	86,400
31	109,000	---	85,400	60,200	---	117,000	---	110,000	---	115,000	61,800	---
TOTAL	2,460,000	2,898,500	2,891,400	2,347,600	1,956,500	2,548,900	3,199,100	4,054,700	4,130,000	3,292,000	2,986,300	1,920,300
MEAN	79,350	96,620	93,270	75,730	69,880	82,220	106,600	130,800	137,700	106,200	96,330	64,010
MAX	116,000	121,000	119,000	104,000	93,900	124,000	146,000	166,000	166,000	133,000	134,000	88,800
MIN	46,700	55,700	59,000	35,900	43,500	37,800	62,200	87,700	79,500	58,800	58,700	31,100
AC-FT	4,879,000	5,749,000	5,735,000	4,656,000	3,881,000	5,056,000	6,345,000	8,042,000	8,192,000	6,530,000	5,923,000	3,809,000
CAL YR	2002	TOTAL 40,801,600	MEAN 111,800	MAX 251,000	MIN 28,500	AC-FT 80,930,000						
WTR YR	2003	TOTAL 34,685,300	MEAN 95,030	MAX 166,000	MIN 31,100	AC-FT 68,800,000						