

Figure 52. Location of surface-water and water-quality stations in the Lewis and Cowlitz River Basins and downstream to mouth of Columbia River.

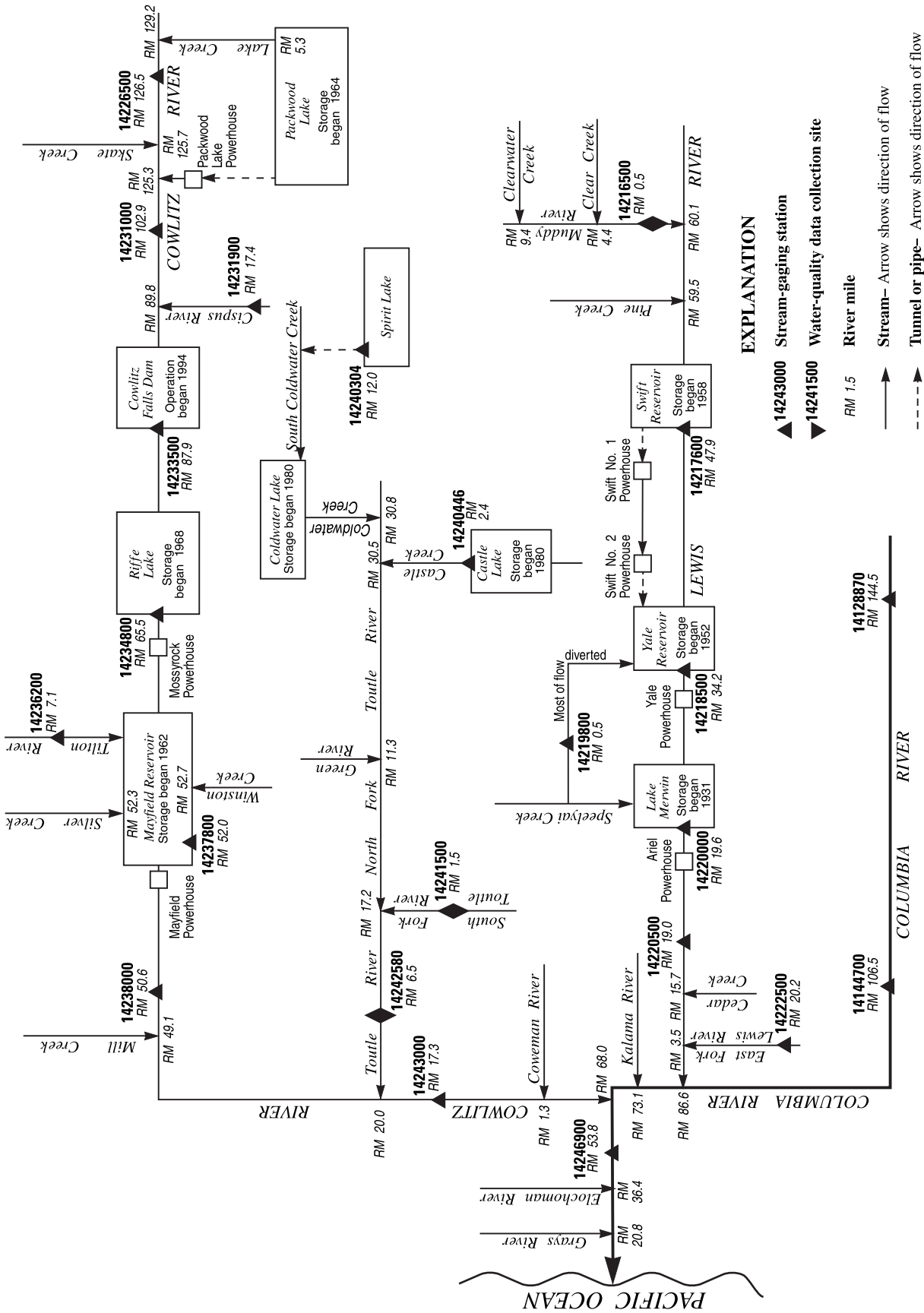


Figure 53. Schematic diagram showing surface-water and water-quality stations in the Lewis and Cowlitz River Basins and downstream to mouth of Columbia River.

COLUMBIA RIVER MAIN STEM

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR

LOCATION.--Lat 45°38'00", long 121°57'33", in sec.21, T.2 N., R.7 E., Multnomah County, Hydrologic Unit 17080001, on left bank 0.9 mi downstream from Bonneville Dam left bank powerhouse, 50 ft upstream from Tanner Creek, and at mile 144.5.

DRAINAGE AREA.--239,900 mi², approximately.

PERIOD OF RECORD.--May 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to August 15, 1990, at a site 0.5 mi upstream at the same datum.

REMARKS.--Flow regulated by many reservoirs upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 35.11 ft Feb. 9, 1996; minimum, 6.06 ft Sept. 21, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 25.36 ft May 31; minimum, 6.06 ft Sept. 21.

DAY	GAGE HEIGHT, FEET											
	WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003											
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	8.48	7.34	8.08	13.34	10.57	11.84	11.96	11.31	11.57	14.16	12.58	13.19
2	9.57	7.06	8.38	13.56	10.74	12.09	12.85	11.32	11.70	13.95	12.40	13.08
3	10.62	7.48	8.64	13.43	8.96	10.83	12.58	11.37	11.73	14.54	11.83	13.48
4	12.49	9.12	11.59	12.12	10.59	11.29	12.45	11.42	11.75	14.59	12.34	12.92
5	12.32	7.69	8.93	12.09	10.88	11.41	11.93	11.31	11.56	14.61	11.96	12.77
6	9.80	6.97	8.28	11.67	10.79	11.22	11.81	11.39	11.56	12.72	11.49	11.91
7	12.68	7.93	9.97	11.59	11.16	11.35	11.79	11.35	11.63	12.77	11.25	11.88
8	12.60	7.93	9.76	13.27	11.13	11.75	11.71	11.35	11.56	13.34	11.48	12.42
9	14.47	9.70	11.37	13.80	11.18	11.85	11.85	11.39	11.57	13.44	11.99	13.08
10	14.67	9.89	12.10	13.75	11.17	11.78	11.85	11.36	11.57	11.99	11.48	11.68
11	13.77	10.78	11.69	13.02	11.07	11.60	11.89	11.40	11.58	11.87	11.44	11.65
12	13.18	8.27	9.60	13.06	11.23	11.91	11.87	11.37	11.59	11.98	11.33	11.66
13	9.19	7.36	8.19	13.24	11.15	12.11	11.85	11.24	11.54	11.90	11.43	11.60
14	9.85	8.14	8.99	13.39	11.26	11.66	11.83	11.34	11.61	11.86	11.25	11.57
15	11.95	9.26	10.57	11.77	11.05	11.53	11.98	11.37	11.61	11.68	11.18	11.50
16	10.11	7.29	8.37	11.68	11.27	11.53	14.55	11.46	12.36	11.81	11.04	11.41
17	10.19	8.35	9.35	11.72	11.35	11.49	16.64	11.38	12.78	11.94	11.52	11.66
18	9.79	8.27	9.27	12.99	11.23	11.77	15.97	11.34	13.21	12.08	11.42	11.69
19	9.37	6.79	8.20	12.61	11.34	11.56	16.00	11.31	13.29	11.92	11.42	11.65
20	9.14	6.72	7.69	11.76	11.26	11.51	15.89	11.46	12.75	12.01	11.41	11.64
21	11.01	6.89	9.47	11.98	11.40	11.57	12.37	11.39	11.81	12.09	11.52	11.69
22	10.22	7.38	9.01	12.75	11.34	11.88	12.01	11.40	11.65	11.96	11.43	11.63
23	11.86	8.11	10.42	12.07	11.39	11.58	11.76	11.30	11.54	11.85	11.38	11.59
24	11.56	8.77	10.25	11.73	11.41	11.56	11.77	11.39	11.56	11.88	11.33	11.53
25	12.35	9.99	10.82	11.67	11.32	11.49	11.97	11.36	11.59	11.68	11.00	11.35
26	12.38	10.69	11.24	13.76	11.32	12.22	11.93	11.32	11.55	12.13	11.15	11.46
27	11.18	8.06	9.14	14.26	11.33	12.39	12.15	11.37	11.62	13.94	11.18	12.61
28	11.27	9.34	10.35	12.80	11.37	11.69	11.87	11.31	11.56	16.11	11.60	14.29
29	11.73	10.55	10.95	11.80	11.34	11.56	12.07	11.30	11.62	16.26	14.50	15.45
30	11.14	10.33	10.65	11.93	11.39	11.59	11.93	11.35	11.63	16.43	13.84	14.90
31	12.87	10.59	11.45	---	---	---	13.27	11.27	12.10	20.75	15.15	17.27
MONTH	14.67	6.72	9.77	14.26	8.96	11.65	16.64	11.24	11.83	20.75	11.00	12.46

COLUMBIA RIVER MAIN STEM

14144700 COLUMBIA RIVER AT VANCOUVER, WA

LOCATION.--Lat 45°37'15", long 122°40'20", in NE 1/4 NW 1/4 sec.34, T.2 N., R.1 E., Clark County, Hydrologic Unit 17080001, near right bank in control house of Interstate Highway 5 bridge at south edge of Vancouver, 5.0 mi upstream from Willamette River, and at mile 106.5.

DRAINAGE AREA.--241,000 mi², approximately.

PERIOD OF RECORD.--October 1963 to June 1970 (discharge), February 1998 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of the gage is Columbia River Datum, add 1.82 feet to correct to mean NGVD of 1929. Prior to February 1998, datum of gage was NGVD of 1929.

REMARKS.--Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant operations at Bonneville Dam and tides. Gage maintained by National Weather Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 27.60 ft Dec. 25, 1964, present datum, (backwater from Willamette River).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 7, 1894, reached a stage of 34.4 ft, present datum, from information provided by U.S. Army Corps of Engineers. Flood of June 13, 14, 1948, reached a stage of 31.0 ft, present datum, from Weather Bureau records.

EXTREMES FOR CURRENT YEAR.--Maximum recorded gage height, 13.77 ft Feb. 1; minimum, -0.84 ft Sept. 21.

DAY	GAGE HEIGHT, FEET											
	WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003											
	DAILY MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.18	1.97	3.15	6.80	13.13	3.70	6.76	7.18	10.11	4.08	3.13	2.85
2	1.26	2.76	3.38	7.34	12.94	3.68	6.83	6.91	9.40	4.02	3.50	2.29
3	1.63	3.01	3.61	7.37	11.38	3.72	6.97	6.34	8.56	3.35	3.06	1.94
4	2.56	3.13	3.58	7.16	10.01	4.02	6.35	6.23	8.09	2.55	2.48	1.99
5	2.62	3.43	3.53	6.85	7.85	4.40	5.89	5.87	7.93	---	2.63	2.04
6	2.04	3.66	3.52	5.96	5.93	4.70	6.20	6.15	7.46	---	2.48	2.09
7	2.30	4.00	3.37	5.39	5.23	5.00	5.87	6.88	7.37	2.19	2.59	2.26
8	2.66	4.33	3.00	4.74	4.64	6.40	5.98	6.21	7.24	2.50	2.90	2.19
9	2.86	4.10	2.81	4.62	3.77	7.48	5.81	5.80	7.04	2.83	2.98	2.32
10	3.26	3.66	2.98	3.88	3.06	7.06	5.90	5.59	7.00	4.14	3.40	2.52
11	2.74	2.89	2.84	3.46	3.10	6.15	5.81	5.10	7.76	4.23	3.15	2.11
12	1.98	3.00	3.22	3.67	3.13	5.44	5.90	4.84	8.37	4.25	3.69	1.87
13	1.14	3.00	3.48	3.75	3.54	5.92	6.24	5.06	8.32	4.11	3.96	1.66
14	1.19	2.88	4.17	4.01	3.67	6.45	6.66	5.99	7.74	3.99	3.47	1.67
15	1.67	2.70	4.49	3.94	4.03	6.67	7.10	7.05	7.86	4.40	3.15	1.46
16	1.58	3.15	5.57	3.92	4.22	6.70	7.67	7.23	6.64	3.81	2.66	1.63
17	2.00	3.27	5.69	3.85	4.34	6.76	7.70	7.25	6.73	3.80	2.62	1.66
18	2.08	3.18	5.61	3.94	4.68	6.83	8.38	6.90	6.84	3.52	2.25	1.10
19	1.86	3.47	5.40	3.98	4.98	6.94	8.04	6.55	6.65	2.49	2.56	1.13
20	1.65	3.35	5.59	3.87	5.27	6.85	7.45	6.05	5.47	1.83	2.13	0.72
21	2.02	3.43	5.09	3.90	4.96	6.44	6.64	5.47	3.84	2.39	2.54	0.71
22	2.16	3.36	4.48	3.93	4.73	7.29	6.32	5.79	3.44	2.51	2.49	1.32
23	2.28	3.22	4.06	4.06	4.01	7.60	6.60	6.10	3.57	2.45	2.42	2.18
24	2.48	2.91	3.74	3.86	3.64	6.76	7.00	6.51	3.45	3.04	2.35	2.43
25	2.51	2.46	3.80	3.80	3.28	6.30	6.63	6.46	3.20	2.93	2.93	2.32
26	---	2.28	3.77	4.42	3.62	6.69	7.21	6.48	4.32	2.54	3.27	2.74
27	1.81	2.44	4.22	5.00	3.71	7.52	7.65	6.87	4.87	2.62	3.92	3.09
28	1.67	2.41	4.58	5.50	3.49	8.51	6.93	8.68	4.52	2.64	3.89	3.37
29	1.77	2.53	4.83	6.30	---	8.30	7.19	8.35	4.46	3.53	3.09	2.73
30	1.51	2.88	5.32	7.02	---	7.47	7.24	8.66	4.45	3.71	2.73	2.47
31	1.51	---	6.27	9.38	---	7.26	---	9.78	---	3.38	3.01	---
MEAN	---	3.10	4.17	5.02	5.37	6.29	6.76	6.59	6.42	---	2.95	2.03
MAX	---	4.33	6.27	9.38	13.13	8.51	8.38	9.78	10.11	---	3.96	3.37
MIN	---	1.97	2.81	3.46	3.06	3.68	5.81	4.84	3.20	---	2.13	0.71

LEWIS RIVER BASIN

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA

LOCATION.-- Lat 46°04'33", long 121°59'51", in NE 1/4 SE 1/4 sec.24, T.7 N., R.6 E., Skamania County, Hydrologic Unit 17080002, Gifford Pinchot National Forest, on left bank 3.9 mi downstream from Clear Creek, approximately 14 mi northeast of Cougar, and 0.5 mi upstream from mouth.

DRAINAGE AREA.--135 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1927 to September 1934, October 1954 to December 1973 (destroyed by flood of January 1974), October 1983 to current year. Monthly discharge only for October, December 1933 and January 1934 published in WSP 1318. Published as "near Cougar" 1927-34. Records for August to October 1909, published in WSP 272 and 492, have been found to be unreliable and should not be used.

REVISED RECORDS.--WDR WA-99-1: 1991 (m), 1996-97 (M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,032.90 ft above NGVD of 1929. Aug. 1927 to Sept. 1934, at same site at different datum; Oct. 1954 to Dec. 1973 at site 3.7 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--46 years (water years 1928-34, 1955-73, 1984-2003), 873 ft³/s, 87.82 in/yr, 632,500 acre-ft/yr, includes monthly data published in WSP 1318.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,000 ft³/s, Feb. 8, 1996, gage height, 33.26 ft from high-water marks, from rating curve extended above 8,000 ft³/s; minimum, 94 ft³/s Dec. 5-7, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood occurred about 0900 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec 16	0845	3,730	20.77	Jan 31	1700	*9,100	*25.01
Jan 4	1330	4,610	21.56	Mar 13	1800	4,580	21.53
Jan 26	1215	5,510	22.34	Mar 22	1045	4,530	21.48

Minimum discharge, 104 ft³/s, on several days, gage height, 15.27 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	144	105	216	1,240	5,350	660	1,300	951	608	231	156	121
2	137	105	212	2,080	3,060	627	1,270	965	556	224	154	121
3	151	105	204	3,210	2,410	603	1,220	969	514	218	153	120
4	161	106	206	3,900	2,090	568	1,120	1,020	487	214	151	119
5	142	107	204	3,580	1,770	613	1,050	960	473	214	150	118
6	137	109	198	2,700	1,480	681	1,020	863	466	211	149	117
7	134	114	192	2,050	1,280	653	1,010	806	459	207	149	119
8	132	254	188	1,630	1,130	627	1,010	763	440	205	148	125
9	129	345	186	1,340	999	1,080	1,060	717	414	202	146	134
10	126	377	273	1,110	888	1,160	1,050	701	389	198	145	135
11	125	341	436	990	794	1,200	1,140	700	364	196	144	141
12	124	454	889	1,270	728	2,280	1,190	725	348	193	143	138
13	123	460	1,080	1,150	682	3,870	1,290	727	347	192	141	127
14	121	399	2,120	1,200	637	3,920	1,270	747	333	190	141	123
15	120	295	3,000	1,130	622	3,370	1,230	770	317	186	139	121
16	119	337	3,250	1,090	704	2,850	1,170	764	306	186	139	128
17	118	358	2,510	1,010	786	2,340	1,130	718	297	182	138	137
18	116	316	1,900	939	694	1,970	1,060	664	293	180	137	127
19	116	509	1,500	869	693	1,730	986	610	289	178	136	123
20	116	416	1,230	815	748	1,730	935	579	285	176	134	121
21	115	370	1,070	802	930	1,980	959	568	287	176	132	119
22	115	337	908	1,220	997	3,920	919	584	290	174	131	118
23	114	313	793	1,660	921	3,590	929	625	272	170	129	116
24	114	291	706	1,960	848	2,770	984	735	261	169	128	115
25	113	272	652	2,170	803	2,270	915	804	253	166	128	114
26	113	259	684	4,490	781	1,980	925	748	247	165	128	114
27	113	247	1,060	4,020	740	1,670	864	688	243	163	127	114
28	113	238	935	2,860	702	1,460	817	683	241	162	125	113
29	113	231	871	2,350	---	1,310	863	689	237	160	125	113
30	110	223	954	2,430	---	1,240	965	691	238	158	123	113
31	106	---	1,030	7,260	---	1,290	---	667	---	157	122	---
TOTAL	3,830	8,393	29,657	64,525	34,267	56,012	31,651	23,201	10,554	5,803	4,291	3,664
MEAN	124	280	957	2,081	1,224	1,807	1,055	748	352	187	138	122
MAX	161	509	3,250	7,260	5,350	3,920	1,300	1,020	608	231	156	141
MIN	106	105	186	802	622	568	817	568	237	157	122	113
AC-FT	7,600	16,650	58,820	128,000	67,970	111,100	62,780	46,020	20,930	11,510	8,510	7,270
CFSM	0.92	2.07	7.09	15.4	9.07	13.4	7.82	5.54	2.61	1.39	1.03	0.90
IN.	1.06	2.31	8.17	17.78	9.44	15.43	8.72	6.39	2.91	1.60	1.18	1.01

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2003, BY WATER YEAR (WY)

	MEAN	338	1,084	1,234	1,233	1,221	1,199	1,291	1,267	831	367	203	183
MAX (WY)	1,567	2,609	2,828	2,308	3,222	2,841	2,318	2,467	2,341	1,163	438	385	
MIN (WY)	107	102	313	365	254	386	620	425	194	143	116	122	
	(1988)	(1930)	(1931)	(1985)	(1929)	(1955)	(1973)	(1934)	(1992)	(1992)	(1992)	(2003)	

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1928 - 2003
ANNUAL TOTAL	315,147	275,848	
ANNUAL MEAN	863	756	869
HIGHEST ANNUAL MEAN			1,297
LOWEST ANNUAL MEAN			465
HIGHEST DAILY MEAN	7,650	7,260	21,000
LOWEST DAILY MEAN	105	105	94
ANNUAL SEVEN-DAY MINIMUM	106	106	95
ANNUAL RUNOFF (AC-FT)	625,100	547,100	629,700
ANNUAL RUNOFF (CFSM)	6.40	5.60	6.44
ANNUAL RUNOFF (INCHES)	86.84	76.01	87.48
10 PERCENT EXCEEDS	1,660	1,820	1,840
50 PERCENT EXCEEDS	800	436	630
90 PERCENT EXCEEDS	133	119	155

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1983 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: October 1983 to March 1995, October 1998 to current year. Water years 1995 and 1996, daily sediment discharge values for period October to March, monthly sediment discharge values only for the period April to September. Water years 1997 and 1998, annual sediment discharge estimates only (on file at the Cascades Volcano Observatory in Vancouver, WA). Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler August 1983 to September 1996, October 1998 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 37,800 mg/L Oct. 26, 1986; minimum, 1 mg/L on several days in water years 2001-2003.

SEDIMENT DISCHARGE: Maximum daily, 1,400,000 tons (estimated) Feb. 8, 1996; minimum, 0.34 tons Oct. 11, 30, 2003.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily 4,750 mg/L Jan. 31; minimum daily 1 mg/L on several days.

SEDIMENT DISCHARGE: Maximum daily 97,500 tons Jan. 31; minimum daily 0.34 tons Oct. 11, 30.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	144	2	0.66	105	1	0.40	216	11	6.5
2	137	4	1.6	105	2	0.44	212	11	6.3
3	151	9	3.9	105	2	0.48	204	11	6.1
4	161	7	3.3	106	2	0.53	206	11	6.1
5	142	2	0.77	107	3	0.73	204	11	6.1
6	137	2	0.73	109	6	1.9	198	11	5.9
7	134	2	0.61	114	8	2.6	192	11	5.7
8	132	1	0.48	254	30	21	188	11	5.6
9	129	1	0.49	345	21	20	186	11	5.5
10	126	1	0.39	377	10	10	273	e30	e24
11	125	1	0.34	341	6	5.3	436	e38	e46
12	124	1	0.40	454	203	329	889	e180	e540
13	123	3	0.97	460	49	64	1,080	272	867
14	121	4	1.4	399	21	24	2,120	1,690	11,000
15	120	2	0.75	295	11	9.2	3,000	1,310	10,700
16	119	1	0.43	337	66	82	3,250	975	8,680
17	118	3	0.89	358	34	34	2,510	529	3,640
18	116	4	1.3	316	10	9.0	1,900	230	1,210
19	116	5	1.7	509	41	59	1,500	156	636
20	116	4	1.2	416	9	9.9	1,230	98	328
21	115	6	1.9	370	5	5.0	1,070	72	207
22	115	4	1.1	337	4	3.6	908	50	124
23	114	3	1.1	313	4	3.4	793	39	85
24	114	7	2.0	291	9	7.0	706	31	59
25	113	7	2.2	272	13	9.9	652	25	43
26	113	4	1.1	259	13	8.9	684	e35	e66
27	113	2	0.53	247	12	8.3	1,060	e100	e310
28	113	4	1.2	238	12	7.8	935	54	136
29	113	2	0.46	231	12	7.3	871	35	84
30	110	1	0.34	223	11	6.8	954	50	131
31	106	1	0.37	---	---	---	1,030	48	135
TOTAL	3,830	---	34.61	8,393	---	751.48	29,657	---	39,104.8

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
	JANUARY			FEBRUARY			MARCH		
1	1,240	92	356	5,350	1,720	26,300	660	19	e35
2	2,080	415	2,850	3,060	975	8,170	627	17	e29
3	3,210	1,170	10,400	2,410	624	4,080	603	16	e26
4	3,900	1,510	16,500	2,090	379	2,160	568	15	e23
5	3,580	775	7,600	1,770	206	990	613	17	28
6	2,700	592	4,330	1,480	150	602	681	20	37
7	2,050	374	2,090	1,280	113	390	653	17	30
8	1,630	106	481	1,130	81	246	627	14	23
9	1,340	54	195	999	53	144	1,080	e73	e230
10	1,110	38	116	888	37	90	1,160	e74	e230
11	990	63	173	794	24	52	1,200	e64	e210
12	1,270	299	1,040	728	13	26	2,280	592	4,780
13	1,150	188	583	682	11	21	3,870	e1,400	e15,000
14	1,200	166	540	637	10	17	3,920	1,240	13,200
15	1,130	117	359	622	e9	e15	3,370	885	8,100
16	1,090	94	277	704	e22	e43	2,850	627	4,840
17	1,010	85	233	786	e35	e75	2,340	417	2,650
18	939	70	179	694	e21	e39	1,970	296	1,580
19	869	49	115	693	e19	e36	1,730	188	883
20	815	43	95	748	e24	e48	1,730	126	588
21	802	45	97	930	e52	e130	1,980	221	1,260
22	1,220	204	815	997	e74	e200	3,920	e1,100	e12,000
23	1,660	409	1,850	921	e50	e130	3,590	e830	e8,100
24	1,960	372	2,000	848	e36	e82	2,770	e540	e4,000
25	2,170	798	4,830	803	e29	e64	2,270	e400	e2,400
26	4,490	2,520	30,800	781	e26	e55	1,980	e300	e1,600
27	4,020	1,230	13,400	740	e24	e48	1,670	e220	e990
28	2,860	740	5,800	702	e22	e41	1,460	127	505
29	2,350	516	3,270	---	---	---	1,310	73	259
30	2,430	669	4,660	---	---	---	1,240	40	135
31	7,260	4,750	97,500	---	---	---	1,290	29	101
TOTAL	64,525	---	213,534	34,267	---	44,294	56,012	---	83,872
	APRIL			MAY			JUNE		
1	1,300	22	76	951	4	9.4	608	5	7.9
2	1,270	20	70	965	4	10	556	3	4.0
3	1,220	21	71	969	6	15	514	2	3.4
4	1,120	19	57	1,020	5	14	487	3	4.0
5	1,050	17	48	960	4	10	473	4	5.1
6	1,020	21	57	863	2	3.9	466	5	6.1
7	1,010	18	50	806	1	3.2	459	5	6.0
8	1,010	19	53	763	4	8.5	440	5	5.6
9	1,060	17	48	717	3	6.5	414	5	5.0
10	1,050	10	30	701	5	9.3	389	4	4.6
11	1,140	16	50	700	6	12	364	4	4.1
12	1,190	13	43	725	5	9.5	348	4	3.8
13	1,290	28	99	727	2	3.7	347	4	3.6
14	1,270	21	73	747	4	8.9	333	4	3.3
15	1,230	20	67	770	9	18	317	4	3.0
16	1,170	16	50	764	2	4.0	306	3	2.8
17	1,130	11	34	718	2	2.9	297	3	2.6
18	1,060	9	24	664	2	3.2	293	3	2.4
19	986	6	17	610	7	11	289	3	2.2
20	935	5	13	579	6	9.8	285	3	2.1
21	959	4	11	568	6	8.8	287	3	1.9
22	919	4	9.5	584	5	8.6	290	2	1.8
23	929	4	11	625	5	8.8	272	2	1.6
24	984	6	15	735	5	9.8	261	2	1.4
25	915	3	6.8	804	5	10	253	2	1.4
26	925	3	8.4	748	4	8.9	247	2	1.4
27	864	5	11	688	4	7.7	243	2	1.4
28	817	4	9.6	683	4	6.8	241	2	1.5
29	863	7	17	689	3	5.6	237	2	1.5
30	965	5	14	691	2	4.4	238	2	1.5
31	---	---	---	667	2	3.3	---	---	---
TOTAL	31,651	---	1,143.3	23,201	---	255.5	10,554	---	97.0

14216500 MUDDY RIVER BELOW CLEAR CREEK, NEAR COUGAR, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	231	2	1.5	156	4	1.9	121	6	2.0
2	224	3	1.5	154	5	1.9	121	6	2.0
3	218	3	1.5	153	5	1.9	120	6	1.9
4	214	3	1.5	151	5	1.9	119	6	1.9
5	214	3	1.6	150	5	1.9	118	6	1.9
6	211	3	1.6	149	5	1.9	117	6	1.9
7	207	3	1.6	149	5	1.9	119	6	1.9
8	205	3	1.6	148	5	2.0	125	7	2.2
9	202	3	1.6	146	5	2.0	134	8	2.8
10	198	3	1.6	145	5	2.0	135	8	3.1
11	196	3	1.6	144	5	2.0	141	6	2.2
12	193	3	1.6	143	5	2.0	138	6	2.2
13	192	3	1.7	141	5	2.0	127	2	0.73
14	190	3	1.7	141	5	2.0	123	4	1.2
15	186	3	1.7	139	5	2.0	121	6	1.8
16	186	3	1.7	139	5	2.0	128	9	3.1
17	182	3	1.7	138	5	2.0	137	7	2.5
18	180	4	1.7	137	6	2.1	127	4	1.2
19	178	4	1.7	136	6	2.1	123	4	1.3
20	176	4	1.7	134	6	2.0	121	5	1.7
21	176	4	1.8	132	6	2.0	119	13	4.3
22	174	4	1.8	131	6	2.0	118	17	5.3
23	170	4	1.8	129	6	2.0	116	11	3.4
24	169	4	1.8	128	6	2.1	115	4	1.2
25	166	4	1.8	128	6	2.1	114	6	2.0
26	165	4	1.8	128	6	2.1	114	9	2.7
27	163	4	1.8	127	6	2.1	114	17	5.1
28	162	4	1.8	125	6	2.0	113	8	2.4
29	160	4	1.8	125	6	2.0	113	2	0.64
30	158	4	1.8	123	6	2.0	113	3	0.51
31	157	4	1.9	122	6	2.0	---	---	---
TOTAL	5,803	---	52.3	4,291	---	61.9	3,664	---	67.08
YEAR	275,848	383,267.97							

e Estimated

14217600 SWIFT RESERVOIR AT COUGAR, WA

LOCATION.-- Lat 46°03'38", long 122°11'44", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.28, T.7 N., R.5 E., Skamania County, Hydrologic Unit 17080002, at the intake structure near left bank on Swift Dam on Lewis River, 5.0 mi east of Cougar, and at mile 47.9.

DRAINAGE AREA.--481 mi².

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began Sept. 29, 1958; dam completed in December 1958. Usable capacity, 446,600 acre-ft between elevations 878 ft, lower limit for economic operation, and 1,000.5 ft, maximum operating limit. Dead storage unknown. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 759,100 acre-ft, Nov. 15, 1973, elevation 1,000.77 ft; minimum contents since reservoir was first filled, 325,100 acre-ft, May 1, 1967, elevation 883.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 754,100 acre-ft, June 24, 30, elevation 999.68 ft; minimum contents 602,100 acre-ft, Mar. 7, elevation 964.31.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	999.39	752,800	--
October 31	982.24	676,600	-76,200
November 30	974.95	645,700	-30,900
December 31	978.73	661,600	+15,900
Calender Year 2002	--	--	+7,100
January 31	998.25	747,600	+86,000
February 28	966.32	610,100	-137,500
March 31	985.89	692,300	+82,200
April 30	988.28	702,900	+10,600
May 31	988.60	749,200	+46,300
June 30	999.31	752,400	+3,200
July 31	995.78	736,400	-16,000
August 31	990.96	714,800	-21,600
September 30	977.74	657,400	-57,400
Water Year 2003	--	--	-95,400

LEWIS RIVER BASIN

14218500 YALE RESERVOIR NEAR YALE, WA

LOCATION.-- Lat 45°57'50", long 122°19'53", in SE ¼ NE ¼ sec.32, T.6 N., R.4 E., Clark County, Hydrologic Unit 17080002, at left bank on Yale Dam on Lewis River just upstream from intake, 500 ft upstream from powerhouse, 1.0 mi upstream from Canyon Creek, 3.2 mi southeast of Yale, and at mile 34.2.

DRAINAGE AREA.--596 mi².

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

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp). Prior to Feb. 1, 1954, nonrecording indicator gage at same site and datum.

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by rock and earthfill dam; storage began July 31, 1952; dam completed in 1952. Usable capacity, 189,500 acre-ft between elevations 430 ft, lower limit for economic operation, and 490 ft, top of spillway gates. Dead storage below elevation 417 ft, 178,000 acre-ft. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 402,500 acre-ft, May 13, 1961, elevation 490.15 ft; minimum contents observed since reservoir was first filled, 227,600 acre-ft, Feb. 22, 1957, elevation 435.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 400,200 acre-ft, Jan. 31, elevation 489.58 ft; minimum contents 344,500 acre-ft, Dec. 10, elevation 474.09 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	479.95	364,900	--
October 31	481.87	371,700	+6,800
November 30	479.62	363,700	-8,000
December 31	484.13	379,900	+16,200
Calendar Year 2002	--	--	+53,300
January 31	489.05	398,200	+18,300
February 28	483.69	378,300	-19,900
March 31	482.15	372,800	-5,500
April 30	487.94	394,000	+21,200
May 31	486.07	387,100	-6,900
June 30	484.32	380,600	-6,500
July 31	486.10	387,200	+6,600
August 31	485.33	384,400	-2,800
September 30	483.26	376,800	-7,600
Water Year 2003	--	--	+11,900

14219800 SPEELYAI CREEK NEAR COUGAR, WA

LOCATION.--Lat 46°00'17", long 122°20'35", in SW ¼ NW ¼ sec.17, T.6 N., R.4 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 3.8 mi southwest of Cougar, and at mile 0.5.

DRAINAGE AREA.--12.6 mi².

PERIOD OF RECORD.--May 1959 to May 1978, October 1978 to current year.

REVISED RECORDS.--WSP 1718: 1959. WDR WA-81-1: 1978-80(P). WDR WA-84-1: 1983.

GAGE.--Water-stage recorder. Elevation of gage is 500 ft above NGVD of 1929, from topographic map. Prior to Nov. 21, 1959, at site 900 ft upstream at different datum; Nov. 22, 1959, to Sept. 30, 1996, at site 1,150 ft upstream at different datum.

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--43 years (water years 1960-77, 1979-2003), 102 ft³/s, 110.46 in/yr, 74,210 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft³/s probably Nov. 20, 1962 (by slope-area measurement, gage height not determined); maximum gage height, 8.12 ft Feb. 8, 1996, datum then in use; minimum discharge, no flow part of each day Sept. 6-7, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 26	1115	985	6.69	Mar 22	0845	1,050	7.14
Jan 31	1230	*2,090	*8.59				

Minimum discharge, no flow, part of each day Sept. 6, 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	4.4	0.78	18	290	692	60	79	70	16	6.2	1.2	0.13
2	2.2	0.79	17	382	339	54	73	63	15	5.4	1.3	0.13
3	7.6	0.81	16	453	225	51	77	58	15	5.2	1.3	0.09
4	5.5	0.83	15	448	166	46	71	152	14	5.0	1.2	0.06
5	3.1	0.85	14	346	130	67	76	170	13	4.9	1.2	e0.03
6	2.4	0.89	13	223	105	108	89	132	13	4.8	1.2	e0.01
7	2.0	1.4	12	157	88	138	134	106	12	4.5	1.1	e0.50
8	1.7	11	12	118	75	138	183	88	12	4.9	1.0	1.3
9	1.6	39	12	95	65	347	213	74	11	4.6	1.0	2.6
10	1.4	48	32	79	58	351	185	64	11	4.2	1.0	5.9
11	1.4	85	131	70	52	262	180	56	11	3.9	0.96	13
12	1.2	67	276	95	46	447	166	50	11	3.6	0.88	4.9
13	1.0	72	305	97	42	406	193	45	14	3.6	0.79	1.9
14	1.0	117	353	136	39	275	172	41	12	3.5	0.71	1.3
15	0.92	63	418	111	41	208	149	40	11	3.4	0.66	1.0
16	0.89	49	569	93	75	170	126	40	10	3.0	0.79	1.8
17	0.86	45	360	79	150	138	113	37	9.5	2.9	0.70	2.0
18	0.88	52	247	68	161	116	97	34	9.3	2.8	0.60	1.3
19	0.97	200	183	61	148	110	83	31	9.2	2.6	0.53	1.0
20	1.0	129	138	56	226	124	73	29	9.2	2.3	0.49	0.89
21	0.98	81	112	53	508	412	69	28	9.6	2.3	0.43	0.80
22	0.94	58	95	73	394	837	61	26	10	2.2	0.40	0.67
23	0.86	47	83	88	227	440	68	24	8.9	2.0	0.39	0.60
24	0.81	39	71	149	155	267	97	23	8.3	1.9	0.34	0.52
25	0.79	33	67	225	118	214	90	23	7.7	1.9	0.30	0.42
26	0.79	28	79	788	95	185	101	21	7.2	1.8	0.29	0.40
27	0.83	25	151	431	79	159	106	20	6.6	1.8	0.35	0.37
28	0.99	23	152	227	69	133	96	19	6.3	1.5	0.30	0.29
29	0.99	21	136	216	---	112	88	18	6.0	1.4	0.23	0.29
30	0.86	19	196	391	---	94	79	18	6.6	1.4	0.20	0.42
31	0.80	---	293	1,600	---	86	---	17	---	1.3	0.15	---
TOTAL	51.66	1,357.35	4,576	7,698	4,568	6,555	3,387	1,617	315.4	100.8	21.99	44.62
MEAN	1.67	45.2	148	248	163	211	113	52.2	10.5	3.25	0.71	1.49
MAX	7.6	200	569	1,600	692	837	213	170	16	6.2	1.3	13
MIN	0.79	0.78	12	53	39	46	61	17	6.0	1.3	0.15	0.01
AC-FT	102	2,690	9,080	15,270	9,060	13,000	6,720	3,210	626	200	44	89
CFSM	0.13	3.59	11.7	19.7	12.9	16.8	8.96	4.14	0.83	0.26	0.06	0.12
IN.	0.15	4.01	13.51	22.73	13.49	19.35	10.00	4.77	0.93	0.30	0.06	0.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2003, BY WATER YEAR (WY)

MEAN	49.9	171	205	197	182	152	126	77.6	39.6	15.5	8.60	13.5
MAX	174	371	393	350	374	357	238	151	106	71.2	49.0	55.9
(WY)	(1998)	(1996)	(1976)	(1974)	(1972)	(1972)	(1993)	(1960)	(1981)	(1983)	(1968)	(1977)
MIN	1.34	6.79	39.9	37.1	57.2	25.9	50.0	20.0	6.93	3.25	0.71	1.49
(WY)	(1988)	(1994)	(1977)	(1977)	(1973)	(1992)	(1998)	(1994)	(1992)	(2003)	(2003)	(2003)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1960 - 2003

ANNUAL TOTAL	33,881.81	30,292.82	
ANNUAL MEAN	92.8	83.0	102
HIGHEST ANNUAL MEAN			155
LOWEST ANNUAL MEAN			45.1
HIGHEST DAILY MEAN	1,500	1,600	2,410
LOWEST DAILY MEAN	0.78	0.01	0.01
ANNUAL SEVEN-DAY MINIMUM	0.82	0.09	0.09
ANNUAL RUNOFF (AC-FT)	67,200	60,090	74,210
ANNUAL RUNOFF (CFSM)	7.37	6.59	8.13
ANNUAL RUNOFF (INCHES)	100.03	89.44	110.46
10 PERCENT EXCEEDS	213	224	242
50 PERCENT EXCEEDS	52	25	56
90 PERCENT EXCEEDS	1.2	0.79	4.6

e Estimated

LEWIS RIVER BASIN

14220000 LAKE MERWIN NEAR ARIEL, WA

LOCATION.-- Lat 45°57'23", long 122°33'13", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.6 N., R.2 E., Clark County, Hydrologic Unit 17080002, on left bank on Merwin Dam on Lewis River at Ariel, and at mile 19.6.

DRAINAGE AREA.--730 mi².

PERIOD OF RECORD.--March 1931 to current year.

GAGE.--Water-stage recorder and long distance indicator in powerhouse. Datum of gage is NGVD of 1929 (levels by PacifiCorp).

REMARKS.--Hourly elevations for the year were furnished by PacifiCorp. Reservoir is formed by combination gravity-concrete-arch dam; some storage began March 1931; completed May 13, 1931. Usable capacity, 245,600 acre-ft between elevations 165 ft, lower limit of regulation set by Federal Energy Regulatory Commission, and 235 ft, top of spillway gates. Additional storage of 18,200 acre-ft is provided by flashboards to elevation 239.6 ft. Unused storage below elevation 165 ft, 159,000 acre-ft. Figures given herein represent total contents. Water is used by PacifiCorp for power generation. Capacity table furnished by PacifiCorp.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents during the period 1931-52 not determined; maximum since 1953, 424,000 acre-ft Jan. 24, 1959, elevation 239.86 ft; minimum contents observed since reservoir was first filled, 164,200 acre-ft, Dec. 5, 1936, elevation 166.7 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 422,000 acre-ft, April 11, elevation 239.39 ft; minimum contents 377,300 acre-ft, Feb. 2, elevation 227.92 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	234.57	402,900	--
October 31	235.89	408,100	+5,200
November 30	233.48	398,700	-9,400
December 31	236.58	410,800	+12,100
Calendar Year 2002	--	--	+15,400
January 31	229.68	384,000	-26,800
February 28	236.91	412,100	+28,100
March 31	233.91	400,300	-11,800
April 30	238.79	419,600	+19,300
May 31	238.63	418,900	-700
June 30	236.18	409,200	-9,700
July 31	234.82	403,900	-5,300
August 31	234.12	401,200	-2,700
September 30	236.93	412,200	+11,000
Water Year 2003	--	--	+9,300

14220500 LEWIS RIVER AT ARIEL, WA

LOCATION.--Lat 45°57'07", long 122°33'46", in NW ¼ NE ¼ sec.4, T.5 N., R.2 E., Cowlitz County, Hydrologic Unit 17080002, on right bank 0.4 mi southeast of Ariel, 0.5 mi downstream from Merwin Dam and powerplant, 3.3 mi upstream from Cedar Creek, and at mile 19.0.

DRAINAGE AREA.--731 mi².

PERIOD OF RECORD.--July to October 1909, November 1909 (gage heights only), July to October 1922, July 1923 to current year. Published as "near Ariel" water years 1922-29. Prior to October 1952, discharge measurements made at site 0.5 mi downstream; low discharges not equivalent due to local inflow.

REVISED RECORDS.--WSP 884: 1938. WSP 984: 1936-37, 1940-42. WSP 1318: 1924-30(M).

GAGE.--Water-stage recorder. Datum of gage is 44.0 ft above NGVD of 1929 (levels by Pacificorp). July to November 1909, nonrecording gage at site 4 mi upstream at different datum. July 27 to Oct. 29, 1922, and July 31, 1923, to Apr. 20, 1930, nonrecording gages at site 0.5 mi downstream at datums 3.90 ft and 0.90 ft higher respectively, than present datum.

REMARKS.--No estimated daily discharges. Records good. No diversion upstream from station. Flow regulated by Swift and Yale Reservoirs, and Lake Merwin (stations 14217600, 14218500, 14220000). Chemical analyses July 1959 to June 1960, April 1979 to September 1986. Additional data from April to August 1980 are published in U.S. Geological Survey Open-File Report 81-1007. Water temperatures October 1950 to September 1963.

AVERAGE DISCHARGE.--80 years (water years 1924-2003), 4,809 ft³/s, 89.34 in/yr, 3,484,000 acre-ft/yr, adjusted for storage in Lake Merwin Reservoir since March 1931, Yale Reservoir since August 1952, and Swift Reservoir since October 1958.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 129,000 ft³/s Dec. 22, 1933, gage height, 35.0 ft, from floodmarks, from rating curve extended above 56,000 ft³/s on basis of computation of peak flow over dam; no flow at times June 30, July 1-3, 6-9, 1931 (caused by regulation during construction of Merwin Dam); minimum daily discharge, 1 ft³/s July 6, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 49,300 ft³/s Jan. 31, gage height, 18.98 ft, minimum discharge, 1,150 ft³/s July 31.

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	1,220	2,870	2,970	11,900	42,800	4,990	7,280	3,350	2,350	1,480	1,220	1,250
2	1,220	2,870	2,970	11,700	19,600	5,040	6,720	3,350	2,300	1,350	1,210	1,260
3	1,230	2,860	2,950	10,400	13,700	5,050	6,700	3,360	2,730	1,250	1,220	1,260
4	1,240	2,860	2,910	10,800	10,600	5,030	6,240	3,370	2,660	1,310	1,210	1,260
5	1,250	2,850	1,920	10,200	9,970	5,000	5,980	4,280	2,260	1,310	1,210	1,260
6	1,260	2,970	2,940	7,270	10,100	5,430	5,980	5,610	2,450	1,310	1,210	1,260
7	1,270	2,040	2,950	7,050	10,100	7,930	6,000	5,380	2,770	1,300	1,220	1,250
8	1,250	2,830	2,950	8,700	9,260	11,200	5,980	5,390	2,780	1,300	1,220	1,240
9	1,240	2,810	2,940	10,400	9,130	11,200	5,970	5,400	2,780	1,310	1,220	1,230
10	1,240	2,820	2,930	9,560	8,350	9,800	5,920	4,080	2,740	1,310	1,220	1,230
11	1,260	2,820	2,910	7,230	8,320	10,800	5,930	3,740	2,710	1,300	1,210	1,240
12	1,260	2,830	1,980	6,560	8,310	11,500	5,890	3,380	2,720	1,280	1,210	1,230
13	1,260	2,810	2,910	5,940	8,630	12,500	5,300	3,000	2,720	1,270	1,220	1,220
14	1,260	1,780	2,910	6,620	9,100	11,300	5,570	2,730	2,720	1,270	1,230	1,230
15	1,300	2,800	3,370	5,380	9,120	11,300	6,100	2,400	2,440	1,270	1,230	1,220
16	2,580	2,820	7,260	4,650	9,100	9,330	6,120	2,390	2,000	1,270	1,230	1,210
17	1,550	2,820	8,920	4,630	9,110	9,190	6,130	2,440	1,950	1,270	1,220	1,790
18	2,740	2,810	8,870	4,630	9,080	9,190	5,660	2,440	1,830	1,260	1,230	2,230
19	2,740	2,790	6,510	3,320	8,750	9,970	5,220	2,450	1,710	1,230	1,230	2,230
20	2,720	2,770	6,060	3,170	8,540	11,300	4,540	2,450	1,650	1,270	1,230	2,220
21	2,720	1,900	5,630	4,270	6,220	11,300	3,360	2,450	1,640	1,240	1,230	2,210
22	2,710	2,760	3,700	5,490	5,740	11,400	3,300	2,460	1,630	1,210	1,230	2,310
23	2,700	2,770	3,000	5,200	5,770	11,400	3,280	2,470	1,640	1,210	1,250	2,350
24	1,960	2,770	3,000	6,190	5,890	11,400	3,250	2,460	1,640	1,220	1,260	2,350
25	2,690	2,770	2,990	8,730	6,010	11,400	3,250	2,460	1,600	1,210	1,260	2,350
26	2,680	2,940	3,010	10,600	6,010	11,300	3,240	2,420	1,570	1,210	1,260	2,330
27	2,670	2,160	4,970	14,100	5,720	9,620	3,260	1,980	1,570	1,220	1,250	2,240
28	2,660	3,010	7,370	14,100	5,190	8,780	3,120	1,990	1,570	1,210	1,250	2,240
29	2,660	3,030	8,560	16,000	---	8,500	3,020	1,990	1,570	1,210	1,250	2,250
30	2,650	3,030	8,830	16,000	---	8,080	3,350	2,280	1,570	1,210	1,250	2,260
31	1,960	---	11,600	36,700	---	7,700	---	2,700	---	1,230	1,250	---
TOTAL	59,150	81,970	142,790	287,490	278,220	287,930	151,660	96,650	64,270	39,350	38,140	51,210
MEAN	1,908	2,732	4,606	9,274	9,936	9,288	5,055	3,118	2,142	1,269	1,230	1,707
MAX	2,740	3,030	11,600	36,700	42,800	12,500	7,280	5,610	2,780	1,480	1,260	2,350
MIN	1,220	1,780	1,920	3,170	5,190	4,990	3,020	1,980	1,570	1,210	1,210	1,210
AC-FT	117,300	162,600	283,200	570,200	551,800	571,100	300,800	191,700	127,500	78,050	75,650	101,600
MEAN†	864	1,921	5,325	10,530	7,607	10,340	5,914	3,747	1,924	1,030	790	800
CFSM†	1.18	2.63	7.28	14.40	10.41	14.14	8.09	5.13	2.63	1.41	1.08	1.09
IN.†	1.36	2.93	8.40	16.61	10.84	16.31	9.03	5.91	2.94	1.62	1.25	1.22
AC-FT†	53,100	114,300	327,400	647,700	422,500	636,000	351,900	230,400	114,500	63,350	48,550	47,600
CAL YR	2002	TOTAL 1,555,370	MEAN 4,261	MAX 11,800	MIN 1,150	AC-FT 3,085,000	MEAN† 4,366	CFSM† 5.97	IN.† 81.10	AC-FT† 3,161,000		
WTR YR	2003	TOTAL 1,578,830	MEAN 4,326	MAX 42,800	MIN 1,210	AC-FT 3,132,000	MEAN† 4,224	CFSM† 5.78	IN.† 78.46	AC-FT† 3,058,000		

† Adjusted for change in contents in Lake Merwin, Swift Reservoir and Yale Reservoir.

14222500 EAST FORK LEWIS RIVER NEAR HEISSON, WA

LOCATION.--Lat 45°50'13", long 122°27'54", in NE 1/4 NW 1/4 sec.17, T.4 N., R.3 E., Clark County, Hydrologic Unit 17080002, on right bank 60 ft downstream from Basket Creek, 1.5 mi northeast of Heisson, 3.4 mi southwest of Yacolt, and at mile 20.2.

DRAINAGE AREA.--125 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 356.8 ft above NGVD of 1929 (from river-profile survey). Prior to Oct. 1, 1987, at datum 10.00 ft higher.

REMARKS.--Records good, except for estimated daily discharges which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--74 years (water years 1930-2003), 739 ft³/s, 80.32 in/yr, 535,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,600 ft³/s Feb. 8, 1996, from indirect measurement, gage height, 25.26 ft; minimum discharge, 29 ft³/s Nov. 3, 1935, Sept. 27, 28, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 31	1715	*13,700	*21.08	No other peak greater than base discharge.			

Minimum discharge, 33 ft³/s, Sept. 3, 4, 5, 6, gage height, 10.00 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	98	47	104	1,750	5,630	571	956	706	233	93	48	37
2	68	48	101	1,820	3,160	522	887	648	221	89	48	37
3	87	49	96	2,440	2,260	533	967	609	210	86	51	35
4	101	50	96	2,130	1,690	471	947	1,030	199	84	49	34
5	76	50	93	1,770	1,320	797	951	1,150	187	83	47	34
6	74	50	89	1,270	1,070	1,900	1,310	957	178	84	48	34
7	69	51	86	983	892	2,980	1,340	820	169	81	47	37
8	64	112	84	804	767	2,360	1,340	726	164	87	46	52
9	60	231	83	678	664	3,040	1,480	639	163	86	47	65
10	58	272	175	586	592	2,740	1,370	575	164	76	47	62
11	57	292	536	525	530	2,060	1,340	525	157	73	45	96
12	55	287	965	666	480	2,300	1,220	491	152	71	44	93
13	52	356	1,310	726	443	2,670	1,300	453	184	e70	44	54
14	52	410	1,530	829	409	2,150	1,170	423	167	e69	43	45
15	50	254	1,830	728	399	1,860	1,040	415	145	68	41	43
16	48	202	2,770	636	539	1,650	928	490	135	66	44	58
17	48	301	1,850	570	1,010	1,360	906	484	128	65	42	75
18	49	264	1,250	516	1,420	1,140	852	474	124	64	41	53
19	50	e310	955	464	1,150	1,020	764	445	127	62	41	48
20	52	e290	757	426	1,350	1,030	701	426	130	60	43	50
21	52	e260	673	401	2,170	1,870	686	405	141	59	41	45
22	51	e220	574	481	2,160	4,540	639	385	166	58	40	43
23	49	e200	515	534	1,610	3,160	660	368	142	56	41	41
24	47	e180	467	624	1,220	2,130	871	356	128	55	40	41
25	47	e160	431	913	982	1,740	823	363	117	55	39	39
26	48	147	511	2,840	833	1,650	959	323	110	55	39	39
27	49	134	903	1,990	715	1,490	916	298	104	54	41	38
28	53	124	994	1,330	642	1,290	831	281	99	52	40	35
29	54	117	906	1,360	---	1,100	785	268	94	50	39	36
30	49	109	1,260	2,850	---	975	790	258	91	48	38	39
31	48	---	2,400	9,890	---	970	---	254	---	48	37	---
TOTAL	1,815	5,577	24,394	43,530	36,107	54,069	29,729	16,045	4,529	2,107	1,341	1,438
MEAN	58.5	186	787	1,404	1,290	1,744	991	518	151	68.0	43.3	47.9
MAX	101	410	2,770	9,890	5,630	4,540	1,480	1,150	233	93	51	96
MIN	47	47	83	401	399	471	639	254	91	48	37	34
AC-FT	3,600	11,060	48,390	86,340	71,620	107,200	58,970	31,830	8,980	4,180	2,660	2,850
CFSM	0.47	1.49	6.30	11.2	10.3	14.0	7.93	4.14	1.21	0.54	0.35	0.38
IN.	0.54	1.66	7.26	12.95	10.75	16.09	8.85	4.77	1.35	0.63	0.40	0.43

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)

	344	1,078	1,480	1,407	1,287	1,114	918	591	343	145	82.0	111
MEAN	344	1,078	1,480	1,407	1,287	1,114	918	591	343	145	82.0	111
MAX	1,318	2,502	3,957	3,460	2,636	2,432	1,818	1,254	914	561	278	555
(WY)	(1952)	(1996)	(1934)	(1953)	(1961)	(1932)	(1937)	(1933)	(1933)	(1983)	(1968)	(1941)
MIN	36.7	53.7	288	303	394	352	312	198	88.2	59.4	42.7	42.3
(WY)	(1988)	(1937)	(1977)	(1979)	(1977)	(1992)	(1941)	(1931)	(1992)	(1992)	(1992)	(1967)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1930 - 2003

ANNUAL TOTAL	220,594	220,681	
ANNUAL MEAN	604	605	739
HIGHEST ANNUAL MEAN			1,117
LOWEST ANNUAL MEAN			411
HIGHEST DAILY MEAN	4,860	Jan 25	9,890
LOWEST DAILY MEAN	47	Sep 27	34
ANNUAL SEVEN-DAY MINIMUM	48	Sep 22	35
ANNUAL RUNOFF (AC-FT)	437,500	437,700	535,300
ANNUAL RUNOFF (CFSM)	4.83	4.84	5.91
ANNUAL RUNOFF (INCHES)	65.65	65.67	80.32
10 PERCENT EXCEEDS	1,510	1,630	1,760
50 PERCENT EXCEEDS	338	254	447
90 PERCENT EXCEEDS	52	44	63

e Estimated

14226500 COWLITZ RIVER AT PACKWOOD, WA

LOCATION.--Lat 46°36'47", long 121°40'41", in SE ¼ SE ¼ sec.16, T.13 N., R.9 E., Lewis County, Hydrologic Unit 17080004, on right bank on upstream side of Forest Service bridge, 0.6 mi northwest of Packwood, 0.8 mi upstream from Skate Creek, and at mile 126.5.

DRAINAGE AREA.--287 mi².

PERIOD OF RECORD.--July 1911 to December 1919, September 1929 to current year. Published as "at Lewis" 1911-19.

REVISED RECORDS.--WSP 884: 1938. WSP 1348: 1916-18(M), 1934. WSP 1638: 1947(P).

GAGE.--Water-stage recorder. Datum of gage is 1,048.0 ft above NGVD of 1929 (Bureau of Public Roads benchmark). July 1, 1911, to Dec. 31, 1919, nonrecording gages at site about 1 mi upstream at different datums. Sept. 30, 1929, to Jan. 1, 1930, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good, except for those above 10,000 ft³/s, which are fair. Minor regulation by Packwood Lake beginning June 1964. Small diversions for domestic use. Water temperatures November 1970 to April 1971. U.S. Geological Survey satellite telemeter at station. Water is diverted from Packwood Lake for power generation and is discharged into Cowlitz River about 1 mi downstream from station. Monthly mean diversion in cubic feet per second for the current water year, as furnished by Energy Northwest is as follows:

October	0.3	January	58.6	April	75.4	July	92.2
November	22.4	February	109	May	105	August	37.6
December	59.0	March	98.7	June	164	September	79.9

AVERAGE DISCHARGE.--74 years (water years 1930-2003), 1,589 ft³/s, 1,151,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,600 ft³/s Dec. 21, 1933, gage height, 13.0 ft; maximum gage height, 13.73 ft Dec. 2, 1977; minimum discharge, 130 ft³/s Nov. 29, 1952.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 26	1245	13,800	8.81	Jan 31	0730	*20,700	*11.93

Minimum discharge, 156 ft³/s, Oct. 31, Nov. 1, 2, gage height, 1.17 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	268	164	321	669	8,260	892	3,150	1,640	3,830	1,810	885	460
2	255	167	299	1,130	4,960	842	2,500	1,960	3,490	1,470	820	459
3	289	173	288	2,330	3,620	786	2,060	2,040	3,390	1,380	750	524
4	311	180	289	2,850	2,700	732	1,710	1,890	3,350	1,350	639	586
5	284	182	281	3,270	2,080	800	1,450	1,750	3,760	1,360	640	562
6	306	188	266	2,140	1,610	871	1,330	1,500	4,330	1,290	695	498
7	336	191	256	1,640	1,310	886	1,230	1,350	4,740	1,330	660	464
8	317	242	246	1,390	1,170	863	1,230	1,240	4,570	1,300	603	379
9	314	272	237	1,230	1,070	981	1,400	1,180	3,990	1,180	573	304
10	301	253	284	1,090	1,010	1,150	1,480	1,200	3,330	1,190	601	298
11	267	237	374	998	1,030	1,580	1,790	1,300	2,770	1,350	515	457
12	249	482	738	1,250	992	3,950	1,930	1,400	2,930	1,410	495	497
13	250	661	1,050	1,250	959	6,650	2,310	1,580	3,070	1,340	503	381
14	255	506	1,710	1,280	940	5,580	2,280	2,060	2,750	1,130	523	378
15	260	380	2,350	1,180	903	4,380	2,020	2,310	2,250	1,140	584	355
16	274	348	1,980	1,060	902	3,570	1,780	1,940	2,380	1,150	557	324
17	282	508	1,490	970	918	2,820	1,650	1,580	2,870	1,070	588	308
18	282	409	1,150	944	858	2,240	1,450	1,340	3,120	1,030	609	257
19	276	1,520	939	965	826	1,830	1,310	1,250	2,510	1,040	646	304
20	275	1,160	806	930	909	1,690	1,250	1,230	1,960	1,040	532	291
21	251	869	719	950	1,410	1,810	1,330	1,340	1,770	1,040	501	296
22	255	708	645	1,740	2,030	4,010	1,460	1,740	1,530	1,030	481	323
23	244	576	585	3,380	1,470	3,740	1,470	2,930	1,390	1,040	425	348
24	229	487	539	2,600	1,140	2,870	1,610	4,650	1,420	1,030	400	365
25	222	420	522	2,550	1,030	2,340	1,450	4,780	1,610	988	448	414
26	215	382	513	9,610	1,030	2,130	1,420	3,950	1,980	938	538	506
27	209	355	542	5,590	1,020	1,880	1,310	3,640	2,420	921	458	515
28	201	343	537	3,410	977	1,670	1,280	4,500	2,380	901	418	472
29	191	339	515	2,570	---	1,500	1,330	4,560	2,320	896	449	454
30	176	334	535	3,790	---	1,760	1,460	4,680	2,250	897	454	410
31	166	---	626	15,800	---	3,200	---	4,430	---	895	468	---
TOTAL	8,010	13,036	21,632	80,556	47,134	70,003	49,430	72,940	84,460	35,936	17,458	12,189
MEAN	258	435	698	2,599	1,683	2,258	1,648	2,353	2,815	1,159	563	406
MAX	336	1,520	2,350	15,800	8,260	6,650	3,150	4,780	4,740	1,810	885	586
MIN	166	164	237	669	826	732	1,230	1,180	1,390	895	400	257
AC-FT	15,890	25,860	42,910	159,800	93,490	138,900	98,040	144,700	167,500	71,280	34,630	24,180

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)																																								
	804	2,683	(1956)	237	(1988)	1,594	5,023	(1996)	196	(1953)	1,746	6,025	(1934)	319	(1953)	1,530	4,104	(1974)	364	(1937)	1,415	4,690	(1996)	396	(1933)	1,229	3,478	(1972)	495	(1955)	1,708	2,833	(1991)	668	(1975)	2,810	5,209	(1949)	1,548	(1977)	3,055	6,085	(1974)	842	(1992)	1,782	4,265	(1933)	527	(1992)	821	1,824	(1999)	445	(1987)	575	1,527	(1959)	344	(1987)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003	
ANNUAL TOTAL	533,346		512,784			
ANNUAL MEAN	1,461		1,405		1,589	
HIGHEST ANNUAL MEAN					2,411	
LOWEST ANNUAL MEAN					923	
HIGHEST DAILY MEAN	11,500		15,800		27,700	
LOWEST DAILY MEAN	164		164		144	
ANNUAL SEVEN-DAY MINIMUM	173		173		156	
ANNUAL RUNOFF (AC-FT)	1,058,000		1,017,000		1,151,000	
10 PERCENT EXCEEDS	3,690		3,170		3,350	
50 PERCENT EXCEEDS	848		1,030		1,090	
90 PERCENT EXCEEDS	279		276		449	

14231000 COWLITZ RIVER AT RANDLE, WA

LOCATION.--Lat 46°31'57", long 121°57'20", in NW ¼ NE ¼ sec.17, T.12 N., R.7 E., Lewis County, Hydrologic Unit 17080004, on left bank on upstream side of Cispus Road bridge in the town of Randle, and at mile 102.9.

DRAINAGE AREA.--541 mi².

PERIOD OF RECORD.--October 1910 to December 1911, October 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above NGVD of 1929 from topographic map. October 1910 to December 1911, nonrecording gage at same site at different datum.

REMARKS.--Records good, except estimated daily discharges, which are fair. Small diversions for domestic use and irrigation upstream from station. Minor regulation by Packwood Lake for power production. U.S. Geological Survey satellite telemeter at station. Due to bank overflow, discharges above 19.00 ft gage height cannot be determined by direct methods.

AVERAGE DISCHARGE.--10 years (water years 1994-2003), 2,853 ft³/s, 71.66 in/yr, 2,067,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 24.90 ft Feb. 9, 1996, from outside high-water mark; minimum daily discharge, 278 ft³/s Nov. 3, 4, 2002.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base gage height of 18.00 ft (National Weather Service flood stage) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 31	2315	---	*22.49	No other peak greater than base discharge.			

Minimum daily discharge, 278 ft³/s, Nov. 3, 4.

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	543	e281	515	1,100	e25,000	1,950	5,050	2,650	4,500	2,200	1,090	695
2	478	e279	498	1,610	14,400	1,850	4,410	2,860	4,060	1,960	1,040	682
3	489	e278	510	3,270	8,840	1,800	3,910	2,970	3,900	1,850	960	683
4	536	e278	510	3,900	6,700	1,710	3,490	2,910	3,750	1,800	891	711
5	486	279	513	5,720	5,490	1,720	3,160	2,880	3,920	1,770	918	719
6	471	282	495	4,140	4,700	1,920	2,970	2,710	4,370	1,670	945	687
7	484	292	451	3,220	4,130	1,970	2,820	2,520	4,800	1,690	935	671
8	482	334	422	2,660	3,580	1,910	2,720	2,370	4,880	1,690	873	619
9	469	399	411	2,330	3,200	2,050	2,860	2,220	4,410	1,610	834	568
10	459	406	460	2,050	2,930	2,760	2,940	2,160	3,800	1,570	843	542
11	434	383	632	1,830	2,680	3,270	3,110	2,270	3,280	1,660	821	601
12	415	452	880	2,100	2,440	6,220	3,200	2,360	3,240	1,710	816	727
13	403	873	1,560	2,230	2,250	12,200	3,530	2,460	3,260	1,660	837	689
14	398	777	1,940	2,280	2,130	11,100	3,610	2,720	3,100	1,510	827	654
15	398	669	3,790	2,110	2,010	8,590	3,410	2,990	2,690	1,470	817	610
16	402	554	3,560	1,900	1,950	6,840	3,180	2,880	2,680	1,490	817	661
17	406	712	2,960	1,720	1,950	5,620	3,030	2,610	2,830	1,410	800	755
18	405	711	2,260	1,600	1,920	4,790	2,900	2,370	3,160	1,330	817	708
19	404	1,390	1,820	1,580	1,860	4,260	2,680	2,250	2,830	1,320	839	704
20	401	1,840	1,540	1,610	1,960	3,920	2,550	2,180	2,460	1,290	804	685
21	384	1,350	1,350	1,620	3,330	3,950	2,570	2,240	2,290	1,320	780	554
22	375	1,120	1,200	2,080	4,640	6,440	2,660	2,460	2,140	1,280	785	553
23	372	913	1,090	4,390	3,760	7,240	2,680	3,060	1,990	1,280	720	629
24	360	783	1,020	4,190	3,060	5,700	2,760	4,540	1,970	1,270	681	663
25	e349	697	949	4,010	2,640	4,880	2,710	5,470	1,980	1,220	674	694
26	e339	640	932	10,900	2,360	4,500	2,650	4,750	2,080	1,140	715	713
27	329	600	963	12,600	2,210	4,170	2,530	4,190	2,380	1,070	749	741
28	325	568	989	7,360	2,070	3,860	2,440	4,780	2,470	1,050	707	693
29	319	550	948	5,530	---	3,570	2,450	5,150	2,380	1,100	699	657
30	e307	534	940	6,530	---	3,570	2,550	5,150	2,400	1,090	700	627
31	e290	---	1,090	e21,000	---	4,610	---	5,090	---	1,090	697	---
TOTAL	12,712	19,224	37,198	129,170	124,190	138,940	91,530	98,220	94,000	45,570	25,431	19,895
MEAN	410	641	1,200	4,167	4,435	4,482	3,051	3,168	3,133	1,470	820	663
MAX	543	1,840	3,790	21,000	25,000	12,200	5,050	5,470	4,880	2,200	1,090	755
MIN	290	278	411	1,100	1,860	1,710	2,440	2,160	1,970	1,050	674	542
AC-FT	25,210	38,130	73,780	256,200	246,300	275,600	181,500	194,800	186,400	90,390	50,440	39,460
CFSM	0.76	1.18	2.22	7.70	8.20	8.28	5.64	5.86	5.79	2.72	1.52	1.23
IN.	0.87	1.32	2.56	8.88	8.54	9.55	6.29	6.75	6.46	3.13	1.75	1.37

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 2003, BY WATER YEAR (WY)

MEAN	1,326	3,215	3,654	3,711	3,602	3,035	3,251	4,267	4,086	2,273	1,092	790
MAX	3,690	9,466	6,632	5,981	8,136	4,912	4,737	6,748	6,662	4,822	2,382	1,493
(WY)	(1998)	(1996)	(1996)	(1997)	(1996)	(1997)	(2002)	(1997)	(1999)	(1999)	(1999)	(1997)
MIN	410	365	930	1,391	1,323	1,658	2,132	3,168	2,404	1,290	715	593
(WY)	(2003)	(1994)	(2001)	(2001)	(1994)	(2001)	(1998)	(2003)	(2001)	(2001)	(1994)	(1998)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1994 - 2003

ANNUAL TOTAL	990,165	836,080	
ANNUAL MEAN	2,713	2,291	2,853
HIGHEST ANNUAL MEAN			3,982
LOWEST ANNUAL MEAN			1,573
HIGHEST DAILY MEAN	22,000	25,000	35,000
LOWEST DAILY MEAN	278	278	278
ANNUAL SEVEN-DAY MINIMUM	281	281	281
ANNUAL RUNOFF (AC-FT)	1,964,000	1,658,000	2,067,000
ANNUAL RUNOFF (CFSM)	5.01	4.23	5.27
ANNUAL RUNOFF (INCHES)	68.09	57.49	71.66
10 PERCENT EXCEEDS	5,970	4,520	5,440
50 PERCENT EXCEEDS	1,990	1,800	2,240
90 PERCENT EXCEEDS	456	456	667

e Estimated

14231900 CISPUS RIVER ABOVE YELLOWJACKET CREEK, NEAR RANDLE, WA

LOCATION.--Lat 46°26'38", long 121°50'28", in NE 1/4 sec. 18, T.11 N., R.8 E., (unsurveyed), Lewis County, Hydrologic Unit 17080004, Gifford Pinchot National Forest, on right bank 600 ft downstream from Forest Service Road 28 bridge, 2.5 mi downstream from North Fork, 8.5 mi southeast of Randle, and at mile 17.4.

DRAINAGE AREA.--250 mi².

PERIOD OF RECORD.--August 1996 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,260 ft above NGVD of 1929.

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

AVERAGE DISCHARGE.--8 years (water years 1996-2003), 1,053 ft³/s, 57.21 in/yr, 762,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft³/s Jan. 31, 2003, gage height, 9.50 ft from floodmarks, result of slope area measurement; minimum daily discharge, 165 ft³/s Oct. 31, Nov. 1, 2, 2003.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 8, 1996, reached stage of 12.50 ft, discharge from floodmarks 24,600 ft³/s by slope-area measurement made about 7 mi downstream near Forest Service Road 25 bridge, adjusted for flow from intervening area.

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)
Jan 31	1515	*(a) 14,800	*(b) 9.50	Mar 14	0115	4,250	5.34

Minimum daily discharge, 165 ft³/s, Oct. 31, Nov. 1, 2.

(a) Peak discharge from indirect measurement.

(b) From floodmarks.

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	e260	e165	e245	605	7,800	746	1,740	1,210	1,690	761	e435	e305
2	e245	e165	e240	854	4,720	715	1,570	1,250	1,560	700	e425	e350
3	e270	e190	e235	1,690	3,130	691	1,440	1,270	1,460	673	e415	e350
4	e285	e250	e235	1,960	2,330	664	1,320	1,230	1,400	666	e380	e380
5	e265	e285	e230	2,240	1,870	696	1,230	1,220	1,420	667	e380	e340
6	e290	e290	e220	1,800	1,600	745	1,170	1,160	1,500	685	e390	e320
7	e315	e300	e215	1,410	1,440	732	1,110	1,110	1,570	661	e375	e305
8	e305	e340	e210	1,240	1,330	707	1,090	1,060	1,580	642	e350	e270
9	e295	e320	e200	1,120	1,240	818	1,130	1,010	1,470	618	e335	e235
10	e285	e340	e245	1,010	1,170	974	1,140	990	1,330	606	e350	e230
11	e255	e370	e300	941	1,100	1,050	1,210	1,020	1,210	626	e320	e320
12	e240	e400	e400	1,040	1,030	1,590	1,250	1,040	1,160	643	e310	e350
13	e240	e505	710	1,040	978	3,640	1,350	1,060	1,130	619	e330	e290
14	e245	e400	1,100	1,040	922	3,950	1,370	1,130	1,070	650	e340	e290
15	e250	e345	1,630	984	881	3,440	1,300	1,200	1,020	e565	e355	e285
16	e260	e320	1,690	928	884	2,810	1,240	1,170	987	e570	e345	e270
17	e265	e435	1,360	868	884	2,270	1,210	1,120	1,000	e530	e365	e260
18	e265	e370	1,070	827	840	1,900	1,160	1,050	1,050	e510	e390	e225
19	e260	e700	894	798	811	1,660	1,100	1,010	1,020	e515	e400	e255
20	e260	e600	777	771	823	1,610	1,070	984	922	e515	e350	e245
21	e240	e480	694	764	991	1,590	1,080	991	890	e515	e340	e250
22	e245	e400	624	974	1,160	3,090	1,100	1,070	848	e510	e325	e270
23	e235	e350	571	1,560	1,070	2,880	1,110	1,220	783	e515	e300	e290
24	e225	e320	536	1,510	954	2,210	1,160	1,610	743	e510	e280	e305
25	e215	e290	521	1,500	901	1,850	1,130	1,840	741	e490	e310	e335
26	e210	e270	517	2,840	875	1,680	1,130	1,670	770	e480	e350	e365
27	e205	e255	602	2,900	827	1,510	1,090	1,560	834	e470	e310	e370
28	e195	e250	612	2,240	790	1,390	1,040	1,750	851	e455	e280	e345
29	e185	e245	569	1,940	---	1,310	1,080	1,810	834	e450	e300	e335
30	e175	e245	560	2,130	---	1,350	1,180	1,890	851	e445	e305	e315
31	e165	---	616	9,800	---	1,660	---	1,900	---	e440	e310	---
TOTAL	7,650	10,195	18,628	51,324	43,351	51,928	36,300	39,605	33,694	17,612	10,750	9,010
MEAN	247	340	601	1,656	1,548	1,675	1,210	1,278	1,123	568	347	300
MAX	315	700	1,690	9,800	7,800	3,950	1,740	1,900	1,690	761	435	380
MIN	165	165	200	605	790	664	1,040	984	741	440	280	225
AC-FT	15,170	20,220	36,950	101,800	85,990	103,000	72,000	78,560	66,830	34,930	21,320	17,870
CFSM	0.99	1.36	2.40	6.62	6.19	6.70	4.84	5.11	4.49	2.27	1.39	1.20
IN.	1.14	1.52	2.77	7.64	6.45	7.73	5.40	5.89	5.01	2.62	1.60	1.34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2003, BY WATER YEAR (WY)

	1996	1997	1998	1999	2000	2001	2002	2003
MEAN	482	936	1,065	1,326	992	1,090	1,268	1,845
MAX	1,172	1,720	1,763	2,322	1,548	1,675	1,756	2,865
(WY)	(1998)	(2000)	(1999)	(1997)	(2003)	(2003)	(1997)	(1999)
MIN	247	340	369	426	414	574	785	1,278
(WY)	(2003)	(2003)	(2001)	(2001)	(2001)	(2001)	(2003)	(2001)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1996 - 2003

ANNUAL TOTAL	373,480	330,047	1,053
ANNUAL MEAN	1,023	904	1,381
HIGHEST ANNUAL MEAN			580
LOWEST ANNUAL MEAN			1997
HIGHEST DAILY MEAN	6,550	Jan 8	9,800
LOWEST DAILY MEAN	165	Oct 31	165
ANNUAL SEVEN-DAY MINIMUM	177	Oct 28	177
ANNUAL RUNOFF (AC-FT)	740,800	654,600	762,600
ANNUAL RUNOFF (CFSM)	4.09	3.62	4.21
ANNUAL RUNOFF (INCHES)	55.57	49.11	57.21
10 PERCENT EXCEEDS	2,150	1,660	1,980
50 PERCENT EXCEEDS	799	732	852
90 PERCENT EXCEEDS	260	250	337

e Estimated

COWLITZ RIVER BASIN

14233500 COWLITZ RIVER NEAR KOSMOS, WA

LOCATION.--Lat 46°27'59", long 122°06'28", in NE ¼ SW ¼ sec.6, T.11 N., R.6 E., Lewis County, Hydrologic Unit 17080005, at Cowlitz Falls Dam, 1.1 mi downstream from Cispus River, 8 mi southwest of Randle, 4.5 mi southeast of Kosmos.

DRAINAGE AREA.--1,040 mi².

PERIOD OF RECORD.--October 1947 to current year. October 1967 to March 1994, published as "14233400 Cowlitz River near Randle."

GAGE.--Discharge determined from flow through turbines and outlet structures of Cowlitz Falls Dam. Prior to December 1948, nonrecording gage at site 0.8 mi downstream. December 1948 to September 1967, water-stage recorder at site 0.3 mi downstream, at datum 760.96 ft above sea level. October 1967 to March 1994, water-stage recorder, at site 0.6 mi upstream, at datum 799.42 ft above NGVD of 1929.

REMARKS.--Flow regulated by Cowlitz Falls Dam since Mar. 8, 1994. Water temperatures November 1952 to August 1968, April 1969 to September 1982. Chemical analyses July 1959 to September 1970, December 1973 to September 1985.

COOPERATION.--Records provided by Lewis County Public Utility District since Mar. 8, 1994. U.S. Geological Survey made two discharge measurements at this site during the year.

AVERAGE DISCHARGE.--56 years (water years 1948-2003), 4,815 ft³/s, 62.90 in/yr, 3,488,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 103,000 ft³/s Feb. 9, 1996; no flow part or all of many days 1994-2003 water years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 61,800 ft³/s Feb. 1; no flow part of many days.

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	921	442	746	2,360	44,500	3,890	8,570	4,590	7,140	3,030	1,490	992
2	894	434	712	3,290	25,100	3,630	7,620	4,910	6,430	2,680	1,490	1,020
3	755	428	704	6,600	15,800	3,600	6,830	5,150	6,050	2,500	1,340	990
4	802	427	704	7,710	10,300	3,400	5,880	5,030	5,720	2,450	1,240	1,020
5	687	424	704	10,500	9,450	3,440	5,380	4,970	5,920	2,430	1,270	2,160
6	664	425	705	7,750	8,040	3,600	5,000	4,600	6,500	2,380	1,280	1,020
7	664	425	698	6,100	7,040	3,460	4,680	4,270	7,200	2,290	1,260	1,260
8	650	500	615	5,100	6,150	3,310	4,470	3,990	7,330	2,420	1,220	2,930
9	641	642	612	4,440	5,610	3,670	4,580	3,710	6,620	2,130	1,180	1,450
10	587	666	676	3,950	5,110	4,770	4,910	3,610	5,640	2,170	1,190	1,690
11	602	624	932	3,590	3,840	5,470	5,140	3,720	4,860	2,180	1,080	1,470
12	585	633	1,450	3,960	2,350	6,620	5,360	3,840	4,710	2,390	1,300	907
13	580	1,590	2,880	4,220	3,190	19,800	5,930	4,030	4,690	2,190	1,150	942
14	556	1,430	4,290	4,240	4,060	20,500	6,230	4,500	4,380	2,160	1,130	943
15	547	973	7,620	3,940	3,850	16,000	5,840	4,920	3,880	2,010	1,160	941
16	545	870	7,610	3,660	3,780	12,800	5,360	4,850	3,770	1,990	1,230	940
17	543	975	6,080	3,410	3,860	10,400	5,030	4,500	3,890	1,990	1,160	504
18	544	1,250	4,400	3,110	3,740	8,570	4,910	4,050	4,320	1,810	1,160	58
19	548	1,990	3,630	3,070	5,850	7,270	4,440	3,730	4,010	1,800	1,200	0.0
20	542	2,500	3,070	3,230	4,350	6,680	4,250	3,660	3,520	1,820	1,270	0.0
21	543	2,010	2,690	3,200	5,170	6,740	4,230	3,630	3,320	1,850	1,110	193
22	529	1,770	2,390	3,560	7,380	12,100	4,300	3,920	3,110	1,840	1,090	786
23	488	1,710	2,090	7,030	6,400	13,800	4,410	4,810	2,820	1,770	1,110	837
24	522	1,440	2,000	7,050	5,470	10,800	4,590	7,170	2,770	1,770	998	900
25	508	1,010	1,940	6,680	4,910	8,650	4,530	8,880	2,730	1,680	968	971
26	486	965	1,890	16,300	4,520	8,040	4,420	7,760	2,810	1,670	1,030	1,050
27	487	876	2,070	16,700	4,270	7,260	4,240	6,780	3,200	1,530	1,060	1,160
28	489	823	2,130	11,600	4,050	6,490	4,040	7,450	3,370	1,470	1,030	999
29	471	798	2,080	9,150	---	6,120	4,060	8,140	3,230	1,490	1,040	1,020
30	443	787	1,940	10,100	---	6,030	4,470	8,090	3,290	1,540	974	844
31	444	---	2,420	35,800	---	7,550	---	8,180	---	1,490	993	---
TOTAL	18,267	29,837	72,478	221,400	218,140	244,460	153,700	161,440	137,230	62,920	36,203	29,997.0
MEAN	589	995	2,338	7,142	7,791	7,886	5,123	5,208	4,574	2,030	1,168	1,000
MAX	921	2,500	7,620	35,800	44,500	20,500	8,570	8,880	7,330	3,030	1,490	2,930
MIN	443	424	612	2,360	2,350	3,310	4,040	3,610	2,730	1,470	968	0.00
AC-FT	36,230	59,180	143,800	439,100	432,700	484,900	304,900	320,200	272,200	124,800	71,810	59,500
CFSM	0.57	0.96	2.25	6.87	7.49	7.58	4.93	5.01	4.40	1.95	1.12	0.96
IN.	0.65	1.07	2.59	7.92	7.80	8.74	5.50	5.77	4.91	2.25	1.29	1.07

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2003, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)
1948	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1949	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1950	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1951	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1952	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1953	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1954	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1955	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1956	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1957	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1958	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1959	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1960	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1961	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1962	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1963	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1964	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1965	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1966	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1967	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1968	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1969	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1970	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1971	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1972	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1973	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1974	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1975	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1976	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1977	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1978	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1979	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1980	2,118	4,961	(1960)	6,209	(1978)	5,834	13,820	(1974)	1,640	(1979)	5,770	15,610	(1996)	1,815	(1977)
1981	6,302	14,650	(1996)	16,520	(1978)	13,820	15,610	(1974)	1,640	(1979)	5,770				

14234800 RIFFE LAKE NEAR MOSSYROCK, WA

LOCATION.--Lat 46°32'07", long 122°25'25", in SE ¼ SW ¼ sec. 10, T.12 N., R.3 E., Lewis County, Hydrologic Unit 17080005, in emergency generator room on top of Mossyrock Dam on Cowlitz River, 2.8 mi east of Mossyrock, and at mile 65.5.

DRAINAGE AREA.--1,154 mi².

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

REVISED RECORDS.--WDR WA-74-1: 1973.

GAGE.--Water-stage recorder; nonrecording gage prior to July 25, 1968. Datum of gage is NGVD of 1929 (levels by City of Tacoma).

REMARKS.--Reservoir is formed by concrete arch dam, completed in April 1968; storage began Apr. 3, 1968. Useable capacity, 1,297,400 acre-ft between elevations 600 ft, minimum operating level, and 770 ft, normal operating pool. Unused storage below elevation 600 ft, 288,900 acre-ft. Crest of spillway is at elevation 728.5 ft and top of taintor gates are at elevation 778.5 ft. Water used by City of Tacoma for power generation. Figures given herein represent total contents. Capacity table furnished by City of Tacoma. Chemical analyses December 1973 to September 1983 (samples were taken near the dam).

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,686,300 acre-ft July 31, 1972, elevation, 778.63 ft; minimum contents since normal low operating level was attained, 517,233 acre-ft Mar. 9, 2001, elevation, 644.93 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,625,751 acre-ft July 1, elevation, 773.45 ft; minimum contents, 1,108,154 acre-ft Dec. 11, elevation 722.58 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	751.68	1,389,138	---
October 31	733.92	1,213,717	-175,421
November 30	726.48	1,143,948	-69,769
December 31	730.09	1,177,563	+33,615
Calendar Year 2002	--	--	-107,716
January 31	753.73	1,410,284	+232,721
February 28	755.87	1,432,583	+22,299
March 31	766.41	1,546,113	+113,530
April 30	759.52	1,471,175	-74,938
May 31	766.38	1,545,781	+74,606
June 30	773.29	1,623,905	+78,124
July 31	768.29	1,567,051	-56,854
August 31	760.22	1,478,662	-88,389
September 30	751.44	1,386,676	-91,986
Water Year 2003	--	--	-2,462

14236200 TILTON RIVER ABOVE BEAR CANYON CREEK, NEAR CINEBAR, WA

LOCATION.--Lat 46°35'44", long 122°27'30", in NE ¼ SW ¼ sec.20, T.13 N., R.3 E., Lewis County, Hydrologic Unit 17080005, on right bank 0.9 mi upstream from Bear Canyon Creek, 3.5 mi southeast of Cinebar, and at mile 7.1.

DRAINAGE AREA.--141 mi².

PERIOD OF RECORD.--October 1956 to current year.

REVISED RECORDS.--WDR WA-72-1: 1957(M), 1959(P), 1960(P), 1961(M), 1963(P), 1964(M), 1965, 1967(P), 1971(P).

GAGE.--Water-stage recorder. Elevation of gage is 600 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Several small diversions for municipal and domestic use upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Water temperatures May 1965 to September 1982.

AVERAGE DISCHARGE.--47 years (water years 1957-2003), 824 ft³/s, 79.36 in/yr, 596,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,100 ft³/s Feb. 8, 1996, gage height, 17.90 ft, from rating curve extended above 10,500 ft³/s on basis of slope-area measurement at gage height of 14.79 ft; minimum discharge, 47 ft³/s Sept. 4-7, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 31	1030	*14,200	*12.62	No other peak greater than base discharge.			

Minimum discharge, 47 ft³/s, Sep. 4-7, gage height, 2.00 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	76	53	140	1,050	6,110	661	1,150	566	261	127	68	51
2	66	52	133	1,580	3,380	615	1,030	531	250	121	68	50
3	102	54	128	1,850	2,430	620	989	511	240	116	68	49
4	138	53	124	2,230	1,840	553	909	627	230	113	68	48
5	93	53	122	2,350	1,470	738	869	819	221	113	69	47
6	81	56	117	1,520	1,210	1,160	947	724	212	113	71	47
7	73	59	112	1,120	1,030	1,100	1,050	647	204	111	69	53
8	69	72	109	899	890	1,020	1,320	595	198	111	67	71
9	67	143	106	753	783	1,900	1,770	544	196	110	69	75
10	64	174	191	649	708	2,800	1,500	519	198	103	73	73
11	62	146	887	581	639	2,840	1,370	494	196	99	71	154
12	60	191	1,620	947	582	4,530	1,230	476	189	97	67	150
13	58	308	1,900	910	537	3,950	1,320	442	199	99	65	91
14	58	341	1,260	1,010	503	2,560	1,210	419	199	99	64	75
15	57	237	1,400	861	479	1,930	1,060	423	184	95	62	68
16	55	195	1,480	735	530	1,570	942	469	174	91	64	75
17	54	409	1,270	642	763	1,330	887	499	167	89	64	137
18	54	388	986	573	794	1,160	872	500	161	88	61	99
19	55	1,690	783	521	766	1,040	785	472	162	86	59	94
20	57	912	647	482	1,320	1,060	721	451	164	83	58	94
21	58	542	552	465	2,830	1,780	787	441	172	82	57	81
22	56	392	484	585	2,440	3,680	751	419	199	81	56	74
23	55	311	434	854	1,750	2,680	756	401	174	79	55	70
24	54	258	398	1,110	1,330	1,930	907	379	161	77	55	65
25	54	223	372	1,150	1,080	1,640	844	369	152	77	55	62
26	53	200	402	3,440	925	1,740	824	346	144	77	55	60
27	53	183	547	2,480	801	1,720	750	326	138	76	55	58
28	57	169	629	1,760	729	1,520	687	308	135	74	55	55
29	56	157	564	1,670	---	1,330	644	298	126	72	55	55
30	55	148	636	2,840	---	1,210	609	281	125	70	53	55
31	53	---	1,010	11,500	---	1,200	---	274	---	69	51	---
TOTAL	2,003	8,169	19,543	49,117	38,649	53,567	29,490	14,570	5,531	2,898	1,927	2,236
MEAN	64.6	272	630	1,584	1,380	1,728	983	470	184	93.5	62.2	74.5
MAX	138	1,690	1,900	11,500	6,110	4,530	1,770	819	261	127	73	154
MIN	53	52	106	465	479	553	609	274	125	69	51	47
AC-FT	3,970	16,200	38,760	97,420	76,660	106,300	58,490	28,900	10,970	5,750	3,820	4,440
CFSM	0.46	1.93	4.47	11.2	9.79	12.3	6.97	3.33	1.31	0.66	0.44	0.53
IN.	0.53	2.16	5.16	12.96	10.20	14.13	7.78	3.84	1.46	0.76	0.51	0.59

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)

MEAN	396	1,244	1,568	1,553	1,397	1,141	1,039	701	411	192	117	162
MAX	1,240	3,014	3,418	2,869	3,039	2,940	1,724	1,283	1,082	620	294	667
(WY)	(1960)	(1996)	(1976)	(1971)	(1982)	(1972)	(2002)	(1974)	(1981)	(1983)	(1968)	(1959)
MIN	52.0	185	401	415	377	374	520	304	134	93.4	62.2	60.5
(WY)	(1988)	(1994)	(1977)	(1977)	(1977)	(1992)	(1998)	(1980)	(1992)	(1970)	(2003)	(1967)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1957 - 2003
ANNUAL TOTAL	256,296	227,700	
ANNUAL MEAN	702	624	824
HIGHEST ANNUAL MEAN			1,228
LOWEST ANNUAL MEAN			464
HIGHEST DAILY MEAN	6,230	Apr 14	11,500
LOWEST DAILY MEAN	52	Nov 2	47
ANNUAL SEVEN-DAY MINIMUM	53	Oct 30	49
ANNUAL RUNOFF (AC-FT)	508,400	451,600	596,600
ANNUAL RUNOFF (CFSM)	4.98	4.42	5.84
ANNUAL RUNOFF (INCHES)	67.62	60.07	79.36
10 PERCENT EXCEEDS	1,470	1,540	1,770
50 PERCENT EXCEEDS	425	258	533
90 PERCENT EXCEEDS	64	56	93

14237800 MAYFIELD RESERVOIR NEAR SILVER CREEK, WA

LOCATION.--Lat 46°30'13", long 122°35'11", in SE ¼ SW ¼ sec.20, T.12 N., R.2 E., Lewis County, Hydrologic Unit 17080005, on right bank at Mayfield Dam on Cowlitz River, 0.3 mi downstream from Silver Creek, 4 mi south of town of Silver Creek, and at mile 52.0.

DRAINAGE AREA.--1,392 mi².

PERIOD OF RECORD.--April 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to Mar. 5, 1963, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete arch dam, completed April 1962; storage began Apr. 14, 1962. Usable capacity, 21,380 acre-ft between elevation 415 ft, lower limit of operation, and 425 ft, top of taintor gates. Dead storage below elevation 415 ft, 112,340 acre-ft. Crest of spillway is at elevation 385 ft. Water is used by City of Tacoma for power generation. Figures given herein represent total contents. Capacity table furnished by City of Tacoma. Chemical analyses December 1973 to September 1983 (samples were taken near the dam).

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 134,850 acre-ft Dec. 9, 1971, elevation, 425.50 ft; minimum contents since normal operating level was attained, 112,830 acre-ft June 4, 1969, elevation, 415.24 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 133,142 acre-ft June 27, elevation, 424.74 ft; minimum contents, 118,257 acre-ft Jan. 29, elevation, 417.87 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	432.82	131,084	---
October 31	423.96	131,392	+308
November 30	422.22	127,554	-3,838
December 31	423.16	129,618	+2,064
Calendar Year 2002	--	--	+678
January 31	422.11	127,312	-2,306
February 28	423.00	129,260	+1,948
March 31	422.18	127,466	-1,794
April 30	422.11	127,312	-154
May 31	423.57	130,524	+3,212
June 30	423.71	130,833	+309
July 31	424.19	131,907	+1,074
August 31	424.27	132,084	+177
September 30	422.89	129,028	-3,056
Water Year 2003	--	--	-2,056

14238000 COWLITZ RIVER BELOW MAYFIELD DAM, WA

LOCATION.--Lat 46°30'38", long 122°36'54", in SE ¼ NE ¼ sec.24, T.12 N., R.1 E., Lewis County, Hydrologic Unit 17080005, on right bank 1.1 mi upstream from fish barrier dam, 1.4 mi downstream from Mayfield Dam, 1.5 mi upstream from Mill Creek, 2.1 mi downstream from Winston Creek, and at mile 50.6.

DRAINAGE AREA.--1,400 mi².

PERIOD OF RECORD.--August to October 1910, December 1910 to September 1911, October to November 1911 (monthly discharge only), April 1934 to current year. Published as "at Mayfield" water years 1910-11 and "near Mayfield" water years 1934-61.

REVISED RECORDS.--WSP 1318: 1949(M). WSP 1348: Drainage area. WSP 1718: 1943, 1947.

GAGE.--Water-stage recorder. Datum of gage is 226.6 ft above NGVD of 1929. August 1910 to November 1911 nonrecording gage at site 2.5 mi upstream at different datum. Apr. 27 to July 2, 1934, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Riffe Lake (station 14234800) at mile 65.5 and Mayfield Reservoir (station 14237800) at mile 52.0. Minor diversions for domestic and farm use upstream from station. U.S. Geological Survey satellite telemeter at station. Sediment records October 1978 to September 1980. Water temperatures October 1950 to September 1980.

AVERAGE DISCHARGE.--69 years (water years 1935-2003), 6,249 ft³/s, 60.62 in/yr, 4,527,400 acre-ft/yr, adjusted for storage in Mayfield Reservoir since April 1962, and Riffe Lake since April 1968.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,400 ft³/s Nov. 28, 1995; gage height, 26.19 ft; minimum discharge, 37 ft³/s Apr. 16, 1962, gage height, 6.42 ft; minimum daily discharge, 451 ft³/s Apr. 16, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in December 1933 is known to have exceeded that of Nov. 28, 1995.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,300 ft³/s Jan. 31; gage height 17.08, minimum discharge 2,590 ft³/s July 27, 28 and many days in August.

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	4,620	3,920	2,950	2,940	19,500	5,290	8,720	5,710	4,020	3,390	2,670	2,610
2	4,620	3,120	2,940	2,940	17,800	5,220	9,790	5,260	4,000	3,380	2,600	2,920
3	4,610	3,100	2,930	3,530	15,400	5,240	10,200	5,210	4,000	3,370	2,590	3,170
4	4,600	3,210	2,940	3,790	14,500	5,240	10,100	5,200	4,010	3,370	2,590	3,370
5	4,040	3,170	2,940	3,780	13,800	5,230	8,590	5,200	4,000	3,370	2,590	3,340
6	3,950	2,920	2,940	4,600	13,500	5,210	7,140	5,190	4,000	3,380	2,590	2,700
7	4,450	2,930	2,940	5,590	10,300	5,200	8,840	5,180	4,020	3,370	2,590	2,620
8	4,590	2,930	2,940	5,570	8,130	5,210	10,100	5,200	4,020	3,370	2,590	2,920
9	4,040	2,930	2,930	5,580	8,110	5,210	10,100	5,210	4,000	3,380	2,600	3,030
10	3,940	2,940	2,920	5,560	9,920	7,060	10,100	5,210	4,560	3,380	2,600	3,030
11	3,930	2,940	2,980	4,120	10,600	10,100	8,280	5,240	4,050	3,350	3,130	3,030
12	3,240	2,950	3,110	3,980	11,000	12,600	7,440	5,250	3,980	3,360	3,380	3,030
13	3,100	2,940	3,120	5,430	11,000	13,600	6,880	5,200	3,970	3,360	3,400	2,700
14	3,710	2,940	3,140	5,580	10,000	13,600	8,670	5,220	3,970	3,360	3,370	2,610
15	3,930	2,940	3,160	5,590	6,090	13,600	9,060	5,210	3,980	3,370	3,170	3,200
16	3,930	2,930	3,060	5,000	5,980	13,600	9,090	5,190	3,980	3,370	2,600	3,070
17	3,940	2,930	3,040	4,650	5,970	13,500	9,030	5,200	4,730	3,370	2,600	3,030
18	3,630	2,930	3,510	4,010	5,960	10,500	7,510	5,210	4,050	3,360	3,140	3,040
19	3,100	2,930	3,950	3,970	6,460	11,600	6,900	5,220	3,970	3,350	3,360	3,050
20	3,110	2,930	3,940	4,830	7,450	11,600	6,890	5,230	3,940	3,360	3,200	2,660
21	3,740	2,930	3,140	6,720	6,890	11,500	8,210	5,240	3,540	3,370	3,030	2,620
22	3,940	2,940	3,150	8,240	6,890	11,500	9,060	5,240	3,480	3,200	2,940	3,260
23	3,930	2,940	3,490	8,430	5,540	10,600	9,030	5,220	3,480	3,030	2,610	3,060
24	3,930	2,940	3,130	7,540	7,880	11,000	9,020	5,040	3,450	3,030	2,610	3,030
25	3,940	2,940	2,940	7,550	9,070	11,500	7,620	5,060	3,440	2,980	3,070	3,060
26	3,320	2,930	2,960	9,550	9,040	11,500	6,950	5,060	3,450	2,610	3,350	3,020
27	3,100	2,930	2,960	11,600	8,970	11,400	6,130	5,050	3,410	2,600	3,360	2,640
28	3,870	2,920	2,950	10,700	7,610	9,840	7,150	5,040	3,370	2,930	3,220	2,630
29	3,930	2,940	2,950	10,100	---	8,510	7,450	5,040	3,390	3,380	2,830	3,000
30	3,940	2,940	2,950	10,300	---	6,940	7,490	5,020	3,400	3,550	2,610	3,280
31	3,940	---	2,950	16,900	---	8,090	---	4,130	---	3,280	2,620	---
TOTAL	120,660	89,880	95,950	198,670	273,360	290,790	251,540	159,880	115,660	101,330	89,610	88,730
MEAN	3,892	2,996	3,095	6,409	9,763	9,380	8,385	5,157	3,855	3,269	2,891	2,958
MAX	4,620	3,920	3,950	16,900	19,500	13,600	10,200	5,710	4,730	3,550	3,400	3,370
MIN	3,100	2,920	2,920	2,940	5,540	5,200	6,130	4,130	3,370	2,600	2,590	2,610
AC-FT	239,300	178,300	190,300	394,100	542,200	576,800	498,900	317,100	229,400	201,000	177,700	176,000
MEAN†	1,044	1,760	3,675	10,150	10,200	11,200	7,124	6,421	5,174	2,361	1,455	1,361
CFSM†	0.75	1.26	2.62	7.25	7.29	8.00	5.09	4.59	3.70	1.69	1.04	0.97
IN.†	0.86	1.40	3.03	8.36	7.59	9.22	5.68	5.29	4.12	1.94	1.20	1.08
AC-FT†	64,190	104,700	226,000	624,500	566,400	688,500	423,800	394,900	307,800	145,200	89,940	80,960

CAL YR 2002 TOTAL 2,189,150 MEAN 5,998 MAX 13,800 MIN 2,920 AC-FT 4,342,000 MEAN† 5,849 CFSM† 4.18 IN.† 56.72 AC-FT† 4,235,000
WTR YR 2003 TOTAL 1,876,060 MEAN 5,140 MAX 19,500 MIN 2,590 AC-FT 3,721,000 MEAN† 5,132 CFSM† 3.67 IN.† 49.77 AC-FT† 3,716,000

† Adjusted for change in contents in Riffe Lake and Mayfield Reservoir.

COWLITZ RIVER BASIN

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA

LOCATION.--Lat 46°19'26", long 122°42'28", in SE 1/4 NW 1/4 sec.29, T.10 N., R.1 E., Cowlitz County, Hydrologic Unit 17080005, on right bank at upstream side of bridge on South Toutle Road, 3.1 mi downstream from Johnson Creek, 0.8 mi upstream from Studebaker Creek, approximately 1.0 mi upstream from mouth, and 1.3 mi southeast of Toutle.

DRAINAGE AREA.--120 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to December 1957, February 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 460 ft above NGVD of 1929, from topographic map. Prior to Feb. 9, 1996, water-stage recorder at site 0.6 mi upstream, at datum at NGVD of 1929 (river-profile survey).

REMARKS.--Records good. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--25 years (water years 1940-57, 1997-2003), 632 ft³/s, 71.57 in/yr, 457,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, not determined Feb. 8, 1996, gage height, 28.81 ft, from high-water mark; maximum daily discharge, 17,400 ft³/s Feb. 8, 1996; minimum discharge, 61 ft³/s Sept. 3-6, 2003.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 9, 1990, produced discharge of 19,200 ft³/s as recorded at station 14241490, 2.2 mi upstream. A flood believed to be in excess of 100,000 ft³/s (from Ph.d. thesis by Fairchild, U. Wash., 1985) occurred at about 1000 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec 16	0845	4,720	25.35	Mar 22	1100	4,670	25.32
Jan 31	1500	*9,360	*27.47				

Minimum discharge, 61 ft³/s, Sept. 3, 4, 5, 6, gage height, 20.80 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	100	67	124	1,240	4,310	481	866	584	220	131	81	67
2	83	67	121	1,690	2,520	460	802	534	211	120	81	64
3	120	67	118	2,290	1,830	492	762	503	201	117	81	63
4	131	67	117	2,410	1,420	435	697	648	192	114	81	62
5	99	69	115	2,090	1,140	541	657	688	185	113	81	62
6	90	71	111	1,400	952	822	717	585	178	114	84	63
7	84	78	108	1,050	819	972	879	524	174	110	81	71
8	80	184	106	838	716	977	1,060	491	171	114	80	92
9	78	289	104	702	631	1,680	1,310	441	169	114	84	95
10	76	296	253	603	581	1,750	1,130	415	169	106	87	87
11	73	261	564	536	523	1,600	1,060	388	166	104	85	101
12	73	319	999	725	476	2,760	1,090	373	158	103	80	105
13	71	424	1,380	696	441	3,370	1,440	356	173	101	78	79
14	70	418	1,980	802	410	2,720	1,180	347	173	101	77	72
15	69	279	2,900	668	415	2,300	973	367	154	98	76	70
16	69	282	3,490	574	557	1,900	835	384	146	96	81	86
17	67	371	1,860	506	748	1,500	784	373	140	94	79	110
18	67	303	1,220	463	807	1,230	734	364	139	92	76	85
19	68	380	895	432	699	1,080	644	328	141	90	75	78
20	71	321	700	406	757	1,320	583	310	145	89	74	78
21	71	264	618	391	1,090	2,080	699	302	172	90	73	73
22	69	224	515	503	1,220	3,780	696	296	216	88	72	70
23	68	199	446	792	1,040	2,600	734	295	181	86	73	68
24	67	180	393	877	854	1,780	1,040	300	160	86	73	67
25	67	165	375	850	729	1,450	861	317	147	86	73	65
26	67	154	467	2,380	645	1,500	781	284	139	85	74	64
27	67	146	716	1,720	572	1,330	687	264	134	84	77	65
28	70	140	736	1,200	525	1,120	602	254	132	82	75	64
29	74	135	657	1,150	---	943	606	248	128	82	73	e65
30	71	129	736	1,630	---	836	604	239	130	81	71	67
31	68	---	1,160	7,420	---	865	---	236	---	81	68	---
TOTAL	2,398	6,349	24,084	39,034	27,427	46,674	25,513	12,038	4,944	3,052	2,404	2,258
MEAN	77.4	212	777	1,259	980	1,506	850	388	165	98.5	77.5	75.3
MAX	131	424	3,490	7,420	4,310	3,780	1,440	688	220	131	87	110
MIN	67	67	104	391	410	435	583	236	128	81	68	62
AC-FT	4,760	12,590	47,770	77,420	54,400	92,580	50,610	23,880	9,810	6,050	4,770	4,480
CFSM	0.64	1.76	6.47	10.5	8.16	12.5	7.09	3.24	1.37	0.82	0.65	0.63
IN.	0.74	1.97	7.47	12.10	8.50	14.47	7.91	3.73	1.53	0.95	0.75	0.70

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

	372	887	1,182	1,040	1,090	852	758	648	406	193	116	133
MAX	1,222	1,655	2,031	2,488	2,451	1,647	1,142	1,097	772	414	172	409
(WY)	(1998)	(1956)	(1997)	(1953)	(1996)	(1950)	(1996)	(1948)	(1955)	(1955)	(1954)	(1941)
MIN	75.3	106	389	318	381	297	257	211	132	97.2	77.5	75.3
(WY)	(1953)	(1953)	(1945)	(2001)	(1941)	(1941)	(1941)	(1947)	(1940)	(1940)	(2003)	(2003)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1940 - 2003
ANNUAL TOTAL	203,273	196,175	
ANNUAL MEAN	557	537	632
HIGHEST ANNUAL MEAN			928
LOWEST ANNUAL MEAN			317
HIGHEST DAILY MEAN	6,880	7,420	17,400
LOWEST DAILY MEAN	67	62	62
ANNUAL SEVEN-DAY MINIMUM	68	64	64
ANNUAL RUNOFF (AC-FT)	403,200	389,100	457,900
ANNUAL RUNOFF (CFSM)	4.64	4.48	5.27
ANNUAL RUNOFF (INCHES)	63.01	60.81	71.57
10 PERCENT EXCEEDS	1,200	1,310	1,350
50 PERCENT EXCEEDS	376	253	425
90 PERCENT EXCEEDS	74	71	98

e Estimated

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1996 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: February 1996 to March 1999, October 1999 to current year. Water year 1999, daily sediment discharge values for period October to March, monthly sediment discharge values only for the period April to September.

INSTRUMENTATION.--Samples obtained by observer, February 1996 to September 1999. Automatic pumping sampler since October 1999.

REMARKS.--Station was placed in operation after the station at South Fork Toutle River at Camp 12, near Toutle, WA (14241490) was destroyed by flood of February 1996. Current site is 2.2 miles downstream from destroyed station.

EXTREMES FOR PERIOD OF DAILY RECORDS.--

SEDIMENT CONCENTRATION: Maximum daily, 18,000 mg/L (estimated) Oct. 4, 1997; minimum, 1 mg/L on many days 1996, 1998-2003,

SEDIMENT DISCHARGE: Maximum daily, 356,000 tons Jan. 1, 1997; minimum, 0.25 tons Aug. 29, and Oct. 25, 2002.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 2,890 mg/L Jan. 31; minimum, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 62,800 tons Jan. 31; minimum, 0.25 tons Oct. 25.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	OCTOBER			NOVEMBER			DECEMBER		
				Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	100	7	0.64	67	3	0.55	124	3	0.89			
2	83	3	0.75	67	4	0.67	121	1	0.46			
3	120	6	2.0	67	3	0.59	118	2	0.56			
4	131	7	2.7	67	4	0.66	117	1	0.36			
5	99	2	0.57	69	2	0.45	115	1	0.34			
6	90	2	0.60	71	3	0.63	111	2	0.56			
7	84	2	0.35	78	6	1.3	108	2	0.58			
8	80	2	0.53	184	24	13	106	2	0.54			
9	78	2	0.32	289	27	21	104	1	0.38			
10	76	3	0.53	296	19	16	253	6	6.6			
11	73	3	0.59	261	7	5.1	564	52	106			
12	73	3	0.59	319	25	29	999	209	772			
13	71	3	0.57	424	30	35	1,380	203	836			
14	70	3	0.56	418	e44	e52	1,980	548	3,640			
15	69	3	0.56	279	e22	e17	2,900	841	6,700			
16	69	3	0.55	282	e24	e21	3,490	1,210	12,100			
17	67	3	0.54	371	e41	e41	1,860	354	1,860			
18	67	3	0.54	303	e25	e20	1,220	198	663			
19	68	3	0.58	380	e41	e42	895	117	287			
20	71	5	0.89	321	e30	e27	700	36	70			
21	71	6	1.2	264	22	16	618	21	36			
22	69	7	1.3	224	17	10	515	15	21			
23	68	6	1.0	199	14	7.4	446	13	16			
24	67	3	0.56	180	11	5.5	393	13	14			
25	67	1	0.25	165	10	4.3	375	8	8.4			
26	67	2	0.32	154	5	1.9	467	19	24			
27	67	2	0.45	146	2	0.69	716	55	120			
28	70	5	0.91	140	3	1.3	736	48	96			
29	74	5	1.0	135	2	0.83	657	27	49			
30	71	3	0.54	129	2	0.74	736	35	74			
31	68	3	0.53	---	---	---	1,160	82	262			
TOTAL	2,398	---	23.02	6,349	---	392.61	24,084	---	27,765.67			

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	FEBRUARY			MARCH		
				Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
	JANUARY			FEBRUARY			MARCH		
1	1,240	104	387	4,310	1,400	17,900	481	3	4.1
2	1,690	172	835	2,520	434	3,050	460	2	2.5
3	2,290	380	2,500	1,830	210	1,040	492	2	2.3
4	2,410	319	2,320	1,420	194	744	435	3	3.7
5	2,090	189	1,120	1,140	187	579	541	6	11
6	1,400	72	279	952	136	354	822	14	32
7	1,050	40	113	819	55	121	972	72	191
8	838	29	67	716	24	47	977	11	30
9	702	12	23	631	8	13	1,680	122	595
10	603	7	11	581	5	7.8	1,750	75	357
11	536	6	9.0	523	5	7.2	1,600	50	219
12	725	17	35	476	6	7.4	2,760	440	3,820
13	696	13	25	441	5	6.2	3,370	734	6,720
14	802	12	27	410	5	5.0	2,720	369	2,780
15	668	7	13	415	7	8.0	2,300	121	759
16	574	3	4.9	557	51	79	1,900	45	234
17	506	1	1.7	748	85	177	1,500	9	40
18	463	1	1.4	807	81	180	1,230	16	52
19	432	3	3.1	699	65	123	1,080	14	41
20	406	4	4.0	757	87	180	1,320	28	102
21	391	2	2.2	1,090	136	405	2,080	110	704
22	503	14	24	1,220	120	395	3,780	637	6,760
23	792	26	57	1,040	75	213	2,600	263	1,950
24	877	29	71	854	45	105	1,780	85	414
25	850	23	53	729	29	58	1,450	55	217
26	2,380	325	2,250	645	15	26	1,500	62	252
27	1,720	121	592	572	5	7.7	1,330	47	169
28	1,200	38	127	525	2	2.3	1,120	23	70
29	1,150	25	81	---	---	---	943	15	37
30	1,630	90	432	---	---	---	836	9	20
31	7,420	2,890	62,800	---	---	---	865	10	23
TOTAL	39,034	---	74,268.3	27,427	---	25,840.6	46,674	---	26,611.6
	APRIL			MAY			JUNE		
1	866	13	30	584	1	1.7	220	1	0.72
2	802	6	13	534	2	2.5	211	1	0.62
3	762	6	12	503	1	1.6	201	10	5.2
4	697	12	22	648	3	5.3	192	11	5.9
5	657	7	13	688	3	5.0	185	12	5.8
6	717	7	14	585	1	1.6	178	12	5.8
7	879	13	33	524	1	1.4	174	12	5.8
8	1,060	10	28	491	1	1.3	171	13	5.9
9	1,310	15	54	441	1	1.2	169	12	5.6
10	1,130	14	44	415	1	1.1	169	11	4.9
11	1,060	9	27	388	1	1.1	166	9	4.0
12	1,090	e13	e39	373	1	1.0	158	7	3.1
13	1,440	e37	e150	356	1	1.0	173	6	2.7
14	1,180	e20	e64	347	1	1.1	173	9	4.3
15	973	21	56	367	2	2.0	154	6	2.5
16	835	12	27	384	2	2.1	146	5	1.8
17	784	8	18	373	2	2.0	140	5	1.7
18	734	10	20	364	2	1.7	139	4	1.6
19	644	5	8.3	328	1	1.1	141	4	1.6
20	583	5	7.5	310	1	0.97	145	5	2.1
21	699	5	9.1	302	1	1.1	172	12	5.5
22	696	11	21	296	10	7.6	216	14	8.3
23	734	15	31	295	25	20	181	7	3.7
24	1,040	13	37	300	10	7.9	160	4	1.8
25	861	6	14	317	7	6.3	147	3	1.0
26	781	9	19	284	2	1.6	139	3	0.95
27	687	6	11	264	2	1.3	134	2	0.89
28	602	3	4.2	254	2	1.2	132	2	0.84
29	606	1	1.7	248	2	1.1	128	2	0.78
30	604	1	1.6	239	1	0.94	130	2	0.76
31	---	---	---	236	1	0.85	---	---	---
TOTAL	25,513	---	829.4	12,038	---	86.66	4,944	---	96.16

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	131	2	0.74	81	2	0.39	67	2	0.37
2	120	2	0.65	81	2	0.38	64	2	0.41
3	117	2	0.63	81	2	0.37	63	3	0.49
4	114	2	0.62	81	2	0.36	62	2	0.42
5	113	2	0.61	81	2	0.35	62	2	0.34
6	114	2	0.62	84	2	0.36	63	2	0.35
7	110	2	0.60	81	2	0.33	71	3	0.66
8	114	2	0.62	80	1	0.32	92	6	1.6
9	114	2	0.62	84	1	0.33	95	8	2.0
10	106	2	0.58	87	5	1.1	87	7	1.7
11	104	2	0.57	85	18	4.0	101	9	2.5
12	103	2	0.56	80	28	6.1	105	11	3.2
13	101	2	0.55	78	20	4.3	79	6	1.3
14	101	2	0.55	77	10	2.2	72	4	0.83
15	98	2	0.53	76	2	0.50	70	3	0.65
16	96	2	0.52	81	3	0.61	86	8	1.9
17	94	2	0.52	79	2	0.39	110	12	3.6
18	92	2	0.50	76	3	0.69	85	8	1.9
19	90	2	0.50	75	5	0.98	78	6	1.3
20	89	2	0.49	74	6	1.3	78	5	1.1
21	90	2	0.49	73	7	1.3	73	5	0.91
22	88	2	0.48	72	6	1.3	70	4	0.76
23	86	2	0.47	73	6	1.2	68	4	0.70
24	86	2	0.47	73	4	0.84	67	4	0.65
25	86	2	0.47	73	5	0.94	65	3	0.60
26	85	2	0.46	74	4	0.89	64	3	0.56
27	84	2	0.44	77	4	0.79	65	3	0.53
28	82	2	0.42	75	3	0.69	64	3	0.49
29	82	2	0.42	73	3	0.60	e65	e3	e0.53
30	81	2	0.40	71	3	0.52	67	3	0.44
31	81	2	0.39	68	2	0.43	---	---	---
TOTAL	3,052	---	16.49	2,404	---	34.86	2,258	---	32.79
YEAR	196,175	155,998.16							

e Estimated

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA

LOCATION.--Lat 46°20'05", long 122°50'27", in NW ¼ SW ¼ sec.20, T.10 N., R.1 W., Cowlitz County, Hydrologic Unit 17080005, on right bank 10.7 mi downstream from confluence of North and South Forks, 2.9 mi northwest of Silver Lake, and at mile 6.5.

DRAINAGE AREA.--496 mi². A large debris avalanche generated by the eruption of Mount St. Helens on May 18, 1980 blocked tributaries in the upper North Fork Toutle River valley. As a result, from May 19, 1980 to July 7, 1981, approximately 40 mi² was noncontributing. From July 7, 1981 (Coldwater Lake, station 14240446, release) to October 1981, the noncontributing portion was approximately 21 mi². From October 1981 (Coldwater Lake release) to November 1982, the noncontributing portion was approximately 19.7 mi². Since November 1982 (Spirit Lake, station 14240304, release), effectively all areas are contributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1981 to current year.

REVISED RECORDS.--WDR WA-86-1: 1982 (M)(P), 1983 (M)(P), 1984 (M)(P), 1985 (M).

GAGE.--Water-stage recorder. Elevation of gage is 160 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No regulation or diversion upstream from station. Some quality of water data available from Washington Office for this station.

AVERAGE DISCHARGE.--22 years (water years 1982-2003), 2,089 ft³/s, 57.23 in/yr, 1,514,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,800 ft³/s, Feb. 8, 1996, gage height, 24.91 ft; maximum gage height, 28.03 ft Dec. 3, 1982; minimum daily, 243 ft³/s Oct. 14, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 18, 1980, from mudflows caused by the eruption of Mount St. Helens. A flood about 1200 hours was due to mudflow from South Fork Toutle River and a larger flood about 2100 hours was due to mudflow from North Fork Toutle River.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan 31	1745	*32,200	*15.60	Mar 13	0100	11,500	10.17

Minimum discharge, 247 ft³/s, Sept. 29, gage height, 3.26 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	476	297	504	3,240	17,900	1,740	2,980	2,160	1,190	647	374	281
2	387	294	493	4,090	10,600	1,640	2,800	2,040	1,120	612	373	280
3	471	289	482	5,510	7,960	1,750	2,640	1,960	1,060	585	376	279
4	646	290	476	5,670	5,980	1,580	2,430	2,150	1,020	572	375	277
5	492	295	472	5,830	4,530	1,700	2,360	2,350	1,010	563	369	272
6	440	302	460	4,220	3,500	2,720	2,530	2,060	1,010	568	387	269
7	406	323	447	3,340	2,940	3,280	2,670	1,890	1,010	554	371	297
8	388	504	439	2,780	2,560	3,360	2,960	1,820	996	555	367	392
9	380	754	430	2,380	2,270	4,650	3,530	1,670	966	564	378	419
10	366	778	637	2,090	2,090	5,030	3,290	1,620	931	529	382	393
11	354	701	1,260	1,890	1,910	4,640	3,200	1,550	887	510	383	395
12	344	766	1,810	2,180	1,770	7,150	3,390	1,540	851	504	363	419
13	337	1,060	2,960	2,080	1,660	9,790	4,460	1,520	870	503	328	355
14	331	1,010	3,470	2,300	1,560	8,440	3,870	1,490	891	503	326	330
15	326	818	5,880	2,030	1,550	6,990	3,260	1,580	812	487	341	323
16	319	747	7,380	1,830	1,790	5,860	2,850	1,710	759	476	357	357
17	314	1,050	4,990	1,700	2,190	4,720	2,750	1,670	739	469	352	501
18	309	915	3,620	1,600	2,580	3,930	2,670	1,600	736	459	339	420
19	313	1,090	2,790	1,530	2,230	3,410	2,350	1,460	749	447	331	373
20	324	1,090	2,280	1,460	2,390	3,600	2,160	1,380	738	435	327	361
21	325	921	2,100	1,420	3,120	4,620	2,600	1,350	825	435	324	334
22	317	822	1,860	1,650	3,810	7,880	2,640	1,350	1,000	426	318	316
23	312	749	1,660	2,350	3,370	6,800	2,630	1,410	854	417	313	303
24	307	689	1,500	2,550	2,830	5,190	3,230	1,540	772	413	310	291
25	302	640	1,420	2,480	2,440	4,280	2,820	1,690	719	413	306	279
26	303	608	1,560	5,510	2,220	4,440	2,660	1,500	685	409	300	271
27	304	581	2,000	5,320	2,010	4,120	2,410	1,350	674	404	308	267
28	321	558	2,110	4,070	1,860	3,620	2,160	1,360	668	398	304	260
29	338	540	1,990	3,670	---	3,130	2,230	1,370	652	390	295	256
30	318	523	2,040	4,990	---	2,830	2,200	1,310	641	384	291	270
31	302	---	3,290	24,100	---	2,910	---	1,300	---	375	283	---
TOTAL	11,172	20,004	62,810	115,860	101,620	135,800	84,730	50,750	25,835	15,006	10,551	9,840
MEAN	360	667	2,026	3,737	3,629	4,381	2,824	1,637	861	484	340	328
MAX	646	1,090	7,380	24,100	17,900	9,790	4,460	2,350	1,190	647	387	501
MIN	302	289	430	1,420	1,550	1,580	2,160	1,300	641	375	283	256
AC-FT	22,160	39,680	124,600	229,800	201,600	269,400	168,100	100,700	51,240	29,760	20,930	19,520
CFSM	0.73	1.34	4.08	7.54	7.32	8.83	5.69	3.30	1.74	0.98	0.69	0.66
IN.	0.84	1.50	4.71	8.69	7.62	10.19	6.35	3.81	1.94	1.13	0.79	0.74

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 2003, BY WATER YEAR (WY)

MEAN	932	2,859	3,448	3,443	3,453	2,988	2,682	2,088	1,543	805	477	447
MAX	2,931	5,290	6,954	5,939	7,754	5,500	4,697	3,192	2,643	1,653	771	925
(WY)	(1998)	(1996)	(1997)	(1997)	(1996)	(1997)	(1991)	(1999)	(1990)	(1983)	(1999)	(1997)
MIN	310	418	1,350	1,167	1,185	1,315	1,707	1,226	539	412	306	277
(WY)	(1988)	(1994)	(2001)	(2001)	(1993)	(1992)	(1998)	(1992)	(1992)	(1992)	(1992)	(1989)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1981 - 2003

ANNUAL TOTAL	674,545	643,978	
ANNUAL MEAN	1,848	1,764	2,089
HIGHEST ANNUAL MEAN			3,118
LOWEST ANNUAL MEAN			1,168
HIGHEST DAILY MEAN	15,800	Jan 8	24,100
LOWEST DAILY MEAN	289	Nov 3	256
ANNUAL SEVEN-DAY MINIMUM	296	Oct 31	271
ANNUAL RUNOFF (AC-FT)	1,338,000		1,277,000
ANNUAL RUNOFF (CFSM)	3.73		3.56
ANNUAL RUNOFF (INCHES)	50.59		48.30
10 PERCENT EXCEEDS	3,820		3,890
50 PERCENT EXCEEDS	1,520		1,010
90 PERCENT EXCEEDS	342		313
			4,160
			1,620
			392
			48,300
			243
			248
			1,514,000
			4.21
			57.23
			Feb 8, 1996
			Oct 14, 1987
			Oct 10, 1987

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA—Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to October 1990, May to September 1991.

WATER TEMPERATURE: May to October 1990, May to September 1991.

SUSPENDED SEDIMENT DISCHARGE: February 1981 to current year. Records prior to October 1985 are published in U.S. Geological Survey Open-File Report 85-632; records for 1984-87 are published in U.S. Geological Survey Open-File Report 91-219.

INSTRUMENTATION.--Water-quality monitor May 1990 to September 1991. Automatic pumping sediment sampler since February 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily, 232,000 mg/L Mar. 20, 1982; minimum, 1 mg/L Oct. 3, 1989.

SEDIMENT DISCHARGE: Maximum daily, 5,930,000 tons Feb. 20, 1982; minimum, 0.71 tons Oct. 3, 1989.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 7,040 mg/L Jan. 31; minimum, 2 mg/L on Oct. 22.

SEDIMENT DISCHARGE: Maximum daily, 481,000 tons Jan. 31; minimum, 2.1 tons Oct. 22.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	476	23	29	297	15	12	504	42	58
2	387	12	12	294	22	17	493	40	54
3	471	22	34	289	19	15	482	38	50
4	646	102	182	290	12	9.7	476	36	46
5	492	46	63	295	7	5.3	472	34	43
6	440	19	22	302	8	6.4	460	32	40
7	406	14	15	323	6	5.3	447	30	36
8	388	9	10	504	28	43	439	28	33
9	380	10	10	754	133	274	430	28	32
10	366	10	9.4	778	108	231	637	200	432
11	354	13	12	701	51	96	1,260	592	2,240
12	344	10	9.2	766	129	324	1,810	1,510	8,220
13	337	5	4.8	1,060	591	1,710	2,960	4,280	37,100
14	331	6	5.1	1,010	288	796	3,470	3,420	39,400
15	326	5	4.4	818	96	217	5,880	5,230	86,200
16	319	6	4.8	747	75	158	7,380	4,130	86,300
17	314	5	4.0	1,050	325	928	4,990	1,430	19,600
18	309	5	4.5	915	122	304	3,620	763	7,570
19	313	4	3.4	1,090	501	1,600	2,790	473	3,590
20	324	6	5.2	1,090	534	1,610	2,280	378	2,330
21	325	5	4.0	921	169	422	2,100	363	2,060
22	317	2	2.1	822	116	259	1,860	290	1,460
23	312	5	4.3	749	84	169	1,660	264	1,180
24	307	8	6.8	689	60	111	1,500	241	979
25	302	4	3.4	640	55	95	1,420	219	836
26	303	4	3.0	608	53	87	1,560	300	1,270
27	304	7	5.4	581	51	80	2,000	475	2,730
28	321	7	6.2	558	49	73	2,110	398	2,290
29	338	18	16	540	47	68	1,990	301	1,620
30	318	9	8.1	523	44	63	2,040	342	1,910
31	302	13	11	---	---	---	3,290	e1,300	e12,000
TOTAL	11,172	---	514.1	20,004	---	9,788.7	62,810	---	321,709

COWLITZ RIVER BASIN

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Day	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concentration (mg/l)	Load (tons/day)
1	647	49	85	374	4	4.3	281	10	7.2
2	612	31	52	373	4	4.1	280	9	6.5
3	585	21	32	376	4	4.2	279	8	5.9
4	572	17	26	375	4	4.3	277	8	5.6
5	563	14	21	369	4	4.4	272	7	5.3
6	568	14	21	387	4	4.7	269	7	5.4
7	554	14	22	371	5	4.6	297	15	13
8	555	15	23	367	5	4.7	392	20	22
9	564	16	25	378	5	4.9	419	13	15
10	529	17	24	382	5	5.1	393	13	14
11	510	15	21	383	6	6.2	395	10	10
12	504	13	18	363	10	10	419	10	12
13	503	13	17	328	12	10	355	11	11
14	503	13	17	326	11	9.3	330	10	8.7
15	487	12	16	341	8	7.0	323	9	8.1
16	476	12	16	357	7	6.6	357	8	8.1
17	469	14	17	352	6	5.7	501	27	38
18	459	15	19	339	5	4.8	420	16	18
19	447	17	20	331	4	4.0	373	12	12
20	435	18	22	327	4	3.7	361	10	9.4
21	435	17	19	324	5	4.0	334	8	7.6
22	426	13	15	318	5	4.2	316	8	6.5
23	417	10	12	313	5	4.5	303	7	5.6
24	413	9	10	310	6	4.7	291	6	4.8
25	413	9	9.8	306	8	7.0	279	5	4.0
26	409	8	9.0	300	9	7.2	271	5	3.7
27	404	8	8.2	308	6	4.8	267	5	3.6
28	398	7	7.3	304	5	4.2	260	5	3.5
29	390	6	6.4	295	7	5.9	256	5	3.6
30	384	5	5.6	291	10	7.7	270	6	4.1
31	375	5	4.9	283	11	8.0	---	---	---
TOTAL	15,006	---	621.2	10,551	---	174.8	9,840	---	282.2
YEAR	643,978	2,384,742.0							

e Estimated

14243000 COWLITZ RIVER AT CASTLE ROCK, WA

LOCATION.--Lat 46°16'28", long 122°54'45", in SW ¼ SE ¼ sec.10, T.9 N., R.2 W., Cowlitz County, Hydrologic Unit 17080005, on left bank 40 ft downstream from Arkansas Valley Road bridge in Castle Rock, 2.7 mi downstream from Toutle River, and at mile 17.3.

DRAINAGE AREA.--2,238 mi². A large debris avalanche generated by the eruption of Mount St. Helens on May 18, 1980 blocked tributaries in the upper North Fork Toutle River valley. As a result, from May 19, 1980 to July 7, 1981, approximately 40 mi² was noncontributing. From July 7, 1981 (Coldwater Lake, station 14240446, release) to October 1981, the noncontributing portion was approximately 21 mi². From October 1981 (Coldwater Lake release) to November 1982, the noncontributing portion was approximately 19.7 mi². Since November 1982 (Spirit Lake, station 14240304, release), effectively all areas are contributing.

PERIOD OF RECORD.--December 1926 to current year; October 1985 to April 2000 (seasonal records).

REVISED RECORDS.--WSP 1218: Drainage area. WSP 1638: 1947(P), 1951.

GAGE.--Water-stage recorder. Datum of gage is NAVD of 1988. Prior to Dec. 18, 1933, nonrecording gage at site 2 mi upstream at datum 38.58 ft higher. Dec. 18, 1933, to June 13, 1934, nonrecording gage, and June 14 to Sept. 30, 1934, water-stage recorder, at present site at datum 28.65 ft higher. Oct. 1, 1934, to May 21, 1980, water-stage recorder, on right bank at datum 23.65 ft higher. May 23, 1980, to July 29, 1997, water-stage recorder at present site at datum 23.65 ft higher.

REMARKS.--Records good. Flow regulated by Riffe Lake (station 14234800) at mile 65.5, and Mayfield Reservoir (station 14237800) at mile 52.0. Minor diversions for domestic and farm use upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--61 years (water years 1928-85, 2001-03), 9,185 ft³/s, 55.73 in/yr, 6,655,000 acre-ft/yr, adjusted for storage in Mayfield Reservoir since April 1962, and Riffe Lake since April 1968.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 139,000 ft³/s Dec. 23, 1933, gage height, 55.25 ft present datum, from rating curve extended above 80,000 ft³/s; maximum gage height, 55.76 ft Feb. 8, 1996; minimum discharge, 998 ft³/s Nov. 7, 8, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 69,000 ft³/s Jan. 31, gage height, 47.58 ft; minimum discharge, 2,760 ft³/s Sept 2.

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	4,880	4,400	3,610	8,080	46,800	8,380	12,800	9,200	5,330	3,990	3,180	2,820
2	5,160	3,890	3,600	9,650	30,600	7,450	13,500	7,920	5,220	3,940	2,930	2,960
3	5,220	3,560	3,580	11,000	24,900	7,600	14,100	7,670	5,140	3,900	2,930	3,240
4	5,410	3,570	3,580	11,600	22,600	7,390	14,000	7,880	5,080	3,880	2,930	3,540
5	4,950	3,790	3,570	12,100	20,100	7,390	12,800	8,220	5,040	3,870	2,920	3,550
6	4,580	3,420	3,550	9,710	18,800	8,680	11,800	7,850	5,020	3,880	2,940	3,140
7	4,800	3,430	3,540	9,850	16,100	10,000	12,100	7,560	5,000	3,870	2,920	2,880
8	5,150	3,570	3,530	9,010	13,300	10,600	14,500	7,470	5,020	3,870	2,930	3,090
9	e4,800	3,860	3,520	8,460	12,200	12,200	14,900	7,310	4,960	3,890	2,930	3,410
10	e4,600	3,920	3,760	8,100	12,700	13,400	14,700	7,210	5,130	3,850	2,930	3,370
11	e4,500	3,820	4,740	6,910	13,100	15,700	13,400	7,140	5,270	3,820	3,170	3,360
12	4,060	3,920	5,720	6,610	13,500	20,400	12,900	7,130	4,810	3,810	3,660	3,370
13	3,610	4,350	6,930	7,490	13,300	27,200	15,100	7,040	4,830	3,810	3,660	3,140
14	3,900	4,260	7,570	8,460	13,100	25,400	14,900	6,980	4,850	3,820	3,650	2,880
15	4,430	3,990	10,800	8,200	9,250	23,200	14,400	7,050	4,760	3,800	3,620	3,150
16	4,430	3,890	12,400	7,490	8,680	21,900	13,600	7,190	4,700	3,780	3,050	3,450
17	4,430	4,320	9,540	6,810	10,100	20,400	13,300	7,170	5,150	3,770	2,920	3,450
18	4,360	4,170	7,860	6,130	11,500	17,300	12,000	7,150	5,010	3,760	3,130	3,390
19	3,650	4,330	7,320	5,730	10,300	16,800	10,700	6,980	4,690	3,740	3,600	3,340
20	3,590	4,370	6,660	5,940	11,700	17,100	10,100	6,860	4,650	3,740	3,560	3,120
21	3,910	4,120	5,780	7,720	11,800	18,600	11,200	6,840	4,490	3,740	3,290	2,900
22	4,420	3,990	5,360	9,750	12,200	24,200	12,800	6,800	4,520	3,680	3,270	3,220
23	4,430	3,900	5,430	11,800	10,700	21,500	12,700	6,820	4,340	3,390	2,950	3,380
24	4,420	3,820	4,950	11,100	10,700	18,600	13,700	6,760	4,240	3,380	2,860	3,270
25	4,410	3,760	4,660	11,100	12,600	17,800	12,400	6,890	4,110	3,390	3,030	3,270
26	4,110	3,700	4,800	15,600	12,300	17,900	11,100	6,710	4,150	3,090	3,550	3,260
27	3,580	3,670	5,500	18,700	12,000	17,600	9,940	6,540	4,050	2,970	3,570	2,980
28	4,040	3,650	5,710	16,000	10,900	15,900	9,860	6,510	4,000	3,090	3,540	2,850
29	4,430	3,640	5,420	14,900	---	14,000	10,700	6,510	3,980	3,530	3,210	3,010
30	4,420	3,630	5,680	16,300	---	12,000	10,600	6,430	3,990	3,870	2,850	3,360
31	4,410	---	8,130	47,800	---	12,100	---	5,840	---	3,740	2,830	---
TOTAL	137,090	116,710	176,800	348,100	425,830	488,690	380,600	221,630	141,530	114,660	98,510	96,150
MEAN	4,422	3,890	5,703	11,230	15,210	15,760	12,690	7,149	4,718	3,699	3,178	3,205
MAX	5,410	4,400	12,400	47,800	46,800	27,200	15,100	9,200	5,330	3,990	3,660	3,550
MIN	3,580	3,420	3,520	5,730	8,680	7,390	9,860	5,840	3,980	2,970	2,830	2,820
AC-FT	271,900	231,500	350,700	690,500	844,600	969,300	754,900	439,600	280,700	227,400	195,400	190,700
MEAN†	1,574	2,654	6,284	14,980	15,640	17,580	11,420	8,415	6,035	2,791	1,743	1,607
CFSM†	0.70	1.19	2.81	6.69	6.99	7.86	5.10	3.76	2.70	1.25	0.78	0.72
IN.†	0.81	1.32	3.24	7.72	7.28	9.06	5.69	4.34	3.01	1.44	0.90	0.80
AC-FT†	96,810	157,900	386,400	920,900	868,800	1,081,000	679,800	517,400	359,100	171,600	107,200	95,650
CAL YR	2002	TOTAL 3,151,750	MEAN 8,635	MAX 33,800	MIN 3,420	AC-FT 6,251,000	MEAN† 8,488	CFSM† 3.79	IN.† 51.50	AC-FT† 6,145,000		
WTR YR	2003	TOTAL 2,746,300	MEAN 7,524	MAX 47,800	MIN 2,820	AC-FT 5,447,000	MEAN† 7,517	CFSM† 3.36	IN.† 45.61	AC-FT† 5,442,000		

† Adjusted for change in contents in Riffe Lake and Mayfield Reservoir.

e Estimated

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued
(National stream quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--August 1967 to September 1970, October 1993 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1993 to current year.
WATER TEMPERATURE: August 1967 to September 1970. October 1993 to current year.
TURBIDITY: February 2001 to current year.

INSTRUMENTATION.--Temperature recorder August 1967 to September 1970. Water-quality monitor.

REMARKS.--Specific conductance, water temperature and turbidity records good. The probe was checked using a formazin standard. Since February, 1994, specific conductance and temperature sensors located near right bank. Prior to that time, sensors were located near left bank. It was determined that daily record collected prior to February 1994 is not representative of the cross section due to a seasonal influence from several upstream sloughs. Additional specific conductance and temperature data for the period October 1992 to September 1993 available in the files of the Portland field office. Boron values less than 16 UG/L have been designated as estimated due to a change in the minimum reporting level effective December 22, 1997.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded, 188 microsiemens Feb. 5, 1994, but may have been higher during periods of missing record; minimum recorded, 73 microsiemens Feb. 9, 1996, but may have been lower during periods of missing record.
WATER TEMPERATURE: Maximum, 24.0°C July 28, 1998; minimum, 0.0°C Jan. 31, Feb. 1, 1969.
TURBIDITY: Maximum, 221 NTU Feb. 1, 2003; minimum, <1 NTU Mar. 2, 2001.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 174 microsiemens Dec. 2, 6; minimum recorded, 85 microsiemens Feb. 1.
WATER TEMPERATURE: Maximum, 23.1°C July 30; minimum, 5.8°C Jan. 13, 14, Feb. 27.
TURBIDITY: Maximum, 221 NTU Feb. 1; minimum, 1 NTU Sept. 27, 28, 30.

WATER-QUALITY DATA

Date	Time	Dis-charge, cfs (00060)	Turbidity, wat unfltrd, Hach 2100AN NTU (99872)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specific conductance, wat unfltrd, uS/cm 25 degC (00095)	Temperature, water, deg C (00010)	Hardness, water, unfltrd, mg/L as CaCO3 (00900)	Calcium, water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	
OCT 2002														
16...	1210	126000	6.2	1.0	763	9.8	96	7.8	141	14.8	54	14.5	4.26	
NOV														
14...	1140	172000	--	2.7	772	10.6	94	7.6	146	10.9	--	--	--	
DEC														
09...	1150	147000	3.6	3.7	762	11.6	97	7.8	158	7.6	63	17.1	5.01	
JAN 2003														
02...	0920	279000	--	19	--	12.4	--	7.4	107	7.2	--	--	--	
16...	1300	209000	4.5	9.1	773	--	--	7.6	128	6.3	48	12.8	3.84	
FEB														
03...	1350	456000	--	58	772	12.0	99	7.3	97	7.5	--	--	--	
10...	1200	204000	E9.6	14	769	13.2	105	7.6	129	6.0	44	11.6	3.54	
MAR														
10...	1330	340000	--	27	765	12.0	99	7.4	113	7.3	42	11.3	3.35	
APR														
07...	1300	302000	--	9.5	765	11.7	100	7.6	142	8.8	--	--	--	
MAY														
12...	1230	262000	--	4.4	766	--	--	8.1	129	12.2	--	--	--	
JUN														
10...	1220	282000	4.5	10	761	10.0	103	7.5	102	16.7	40	11.2	2.92	
JUL														
14...	1240	147000	6.3	8.3	764	9.7	107	7.7	124	20.5	49	13.5	3.68	
AUG														
11...	1150	125000	--	7.1	766	8.8	100	7.5	127	22.3	--	--	--	
SEP														
08...	1230	E96000	3.8	5.2	762	8.3	94	7.6	133	21.5	49	13.3	3.82	
Date	Time	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Sodium, percent (00932)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate, water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents, mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)
OCT 2002														
16...	1.11	.4	6.12	19	52	63	0	3.66	<.17	8.88	9.4	80	.12	
NOV														
14...	--	--	--	--	53	65	0	--	--	--	--	--	--	--
DEC														
09...	1.12	.4	6.89	19	61	74	0	3.98	<.17	8.44	11.4	92	.13	
JAN 2003														
02...	--	--	--	--	39	47	--	--	--	--	--	--	--	--
16...	1.00	.4	6.05	21	46	56	--	4.30	<.17	11.1	8.4	77	.12	
FEB														
03...	--	--	--	--	36	44	--	--	--	--	--	--	--	--
10...	.86	.3	5.19	20	47	57	--	3.26	.11	10.7	8.5	74	.12	
MAR														
10...	.98	.4	5.88	23	40	49	--	2.72	.09	12.2	7.9	71	.11	
APR														
07...	--	--	--	--	53	64	0	--	--	--	--	--	--	--
MAY														
12...	--	--	--	--	50	60	0	--	--	--	--	--	--	--
JUN														
10...	.98	.4	5.18	21	38	46	0	3.36	<.2	11.5	6.6	65	.09	
JUL														
14...	.91	.3	4.58	17	48	58	0	3.11	<.2	8.35	7.7	71	.09	
AUG														
11...	--	--	--	--	49	60	--	--	--	--	--	--	--	--
SEP														
08...	1.09	.4	6.00	21	51	62	0	3.83	<.2	8.88	8.7	77	.10	

< -- Less than
E -- Estimated value

WATER-QUALITY DATA

Date	Residue on evap. at 180degC wat flt (70300)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd, mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water, fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, fltrd, mg/L (00666)	Phos-phorus, water, unfltrd, mg/L (00665)	Phos-phorus, suspdn sedimnt total, percent (30292)	Total carbon, suspdn sedimnt total, percent (30244)	Total carbon, suspdn sedimnt total, mg/L (00694)	Inor-ganic carbon, suspdn sedimnt total, mg/L (00688)
OCT 2002 16...	90	.10	.15	.033	.149	.005	.017	.022	.021	--	--	.3	<.1
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	.6	<.1
DEC 09...	99	E.08	.14	.026	.259	.006	.018	.025	.024	--	--	.2	<.1
JAN 2003 02...	--	--	--	--	--	--	--	--	--	--	--	.4	<.1
16...	86	E.10	.16	.033	.485	.004	.020	.023	.022	.160	3.3	<.1	<.1
FEB 03...	--	--	--	--	--	--	--	--	--	--	--	1.0	<.1
10...	85	E.07	.20	.017	.410	.003	.015	.021	.027	--	--	.3	<.1
MAR 10...	84	.10	.24	.021	.527	.005	.016	.021	.045	.130	2.1	.6	<.1
APR 07...	--	--	--	--	--	--	--	--	--	--	--	.3	<.1
MAY 12...	--	--	--	--	--	--	--	--	--	--	--	.6	<.1
JUN 10...	70	.11	.18	<.015	.134	.003	.009	.014	.037	.030	--	.3	<.1
JUL 14...	69	E.08	.16	<.015	.060	.003	.008	.013	.043	--	--	.5	<.1
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	.4	<.1
SEP 08...	76	E.10	.17	<.015	.104	.003	.012	.019	.036	.150	6.1	.3	<.1
Date	Organic carbon, suspdn sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Organic carbon, suspdn sedimnt percent (50465)	Alum-inum, water, fltrd, ug/L (01106)	Anti-mony, water, fltrd, ug/L (01095)	Arsenic water, fltrd, ug/L (01000)	Barium, water, fltrd, ug/L (01005)	Beryll-ium, water, fltrd, ug/L (01010)	Boron, water, fltrd, ug/L (01020)	Cadmium water, fltrd, ug/L (01025)	Chrom-ium, water, fltrd, ug/L (01030)	Cobalt water, fltrd, ug/L (01035)	Copper, water, fltrd, ug/L (01040)
OCT 2002 16...	.2	1.9	--	--	--	.9	--	--	10	--	--	--	--
NOV 14...	.6	1.8	--	--	--	--	--	--	--	--	--	--	--
DEC 09...	.2	1.6	--	--	--	.9	--	--	12	--	--	--	--
JAN 2003 02...	.4	2.2	--	--	--	--	--	--	--	--	--	--	--
16...	<.1	2.2	3.5	5	E.19	.6	17	<.06	12	<.04	<.8	.050	.9
FEB 03...	1.0	2.8	--	--	--	--	--	--	--	--	--	--	--
10...	.3	1.8	--	--	--	.3	--	--	10	--	--	--	--
MAR 10...	.6	2.1	2.2	7	<.30	.5	14	<.06	16	<.04	<.8	.055	1.0
APR 07...	.3	1.8	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	.6	1.9	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	.3	2.4	3.5	6	<.30	.8	15	<.06	E6	<.04	<.8	.053	1.1
JUL 14...	.5	2.5	--	--	--	.8	--	--	11	--	--	--	--
AUG 11...	.4	1.9	--	--	--	--	--	--	--	--	--	--	--
SEP 08...	.3	2.2	6.1	3	<.30	.9	19	<.06	8	<.04	<.8	.058	1.1
Date	Iron, water, fltrd, ug/L (01046)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Mangan-ese, water, fltrd, ug/L (01056)	Molyb-denum, water, fltrd, ug/L (01060)	Nickel, water, fltrd, ug/L (01065)	Selen-ium, water, fltrd, ug/L (01145)	Silver, water, fltrd, ug/L (01075)	Stront-ium, water, fltrd, ug/L (01080)	Vanad-ium, water, fltrd, ug/L (01085)	Zinc, water, fltrd, ug/L (01090)	Alum-inum, suspdn sedimnt total, percent (30221)	Anti-mony, suspdn sedimnt total, ug/g (29816)
OCT 2002 16...	<10	--	2.4	--	--	--	<.5	--	83.6	1.8	--	--	--
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC 09...	E6	--	2.7	--	--	--	<.5	--	96.9	1.6	--	--	--
JAN 2003 02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	13	.18	2.3	2.8	.7	.93	<.5	<.2	73.3	1.5	4	8.4	1.0
FEB 03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	11	--	2.2	--	--	--	<.5	--	69.6	1.4	--	--	--
MAR 10...	16	.12	2.2	3.0	.6	1.81	<.5	<.2	68.3	1.7	4	8.6	.8
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	12	<.08	1.9	.9	.6	1.20	<.5	<.2	55.3	1.8	2	--	.7
JUL 14...	E4	--	2.2	--	--	--	<.5	--	72.0	1.6	--	--	--
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP 08...	<8	<.08	2.1	.3	.7	.46	<.5	<.2	75.1	1.8	3	6.7	1.1

< -- Less than
E -- Estimated value

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

WATER-QUALITY DATA

Date	Arsenic suspnd sedimnt total, ug/g (29818)	Barium, suspnd sedimnt total, ug/g (29820)	Beryll- ium, suspnd sedimnt total, ug/g (29822)	Cadmium suspnd sedimnt total, ug/g (29826)	Chrom- ium, suspnd sedimnt total, ug/g (29829)	Cobalt, suspnd sedimnt total, ug/g (35031)	Copper, suspnd sedimnt total, ug/g (29832)	Iron, suspnd sedimnt total, percent (30269)	Lead, suspnd sedimnt total, ug/g (29836)	Lithium suspnd sedimnt total, ug/g (35050)	Mangan- ese, suspnd sedimnt total, ug/g (29839)	Mercury suspnd sedimnt total, ug/g (29841)	Molyb- denum, suspnd sedimnt total, ug/g (29843)
OCT 2002													
16...	--	--	--	--	--	--	--	--	--	--	--	--	--
NOV													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
09...	--	--	--	--	--	--	--	--	--	--	--	--	--
JAN 2003													
02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	8.0	470	2	.7	83	20	54	4.6	22	28	1600	--	3
FEB													
03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR													
10...	6.3	470	2	.5	54	20	48	4.5	15	26	900	--	2
APR													
07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
10...	1.8	120	3	--	--	--	--	--	--	--	--	--	--
JUL													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
08...	9.3	540	1	.8	85	16	61	3.8	26	23	1600	.15	3
Date	Nickel, suspnd sedimnt total, ug/g (29845)	Selen- ium, suspnd sedimnt total, ug/g (29847)	Silver, suspnd sedimnt total, ug/g (29850)	Stront- ium, suspnd sedimnt total, ug/g (35040)	Titan- ium, suspnd sedimnt total, percent (30317)	Vanad- ium, suspnd sedimnt total, ug/g (29853)	Zinc, suspnd sedimnt total, ug/g (29855)	2,6-Di- ethyl- aniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Aceto- chlor, water, fltrd, ug/L (49260)	Ala- chlor, water, fltrd, ug/L (46342)	alpha- HCH, water, fltrd, ug/L (34253)	Atra- zine, water, fltrd, ug/L (39632)
OCT 2002													
16...	--	--	--	--	--	--	<.006	<.006	<.006	<.004	<.005	E.004	
NOV													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
09...	--	--	--	--	--	--	<.006	<.006	<.006	<.004	<.005	<.007	
JAN 2003													
02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	43	1	<1	310	.530	130	150	<.006	<.006	<.006	<.004	<.005	.016
FEB													
03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	<.006	E.003	<.006	<.004	<.005	.011	
MAR													
10...	32	M	<.5	350	.530	120	200	<.006	<.006	<.006	<.004	<.005	<.010
APR													
07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
10...	--	M	--	--	--	--	<.006	<.006	<.006	<.004	<.005	<.007	
JUL													
14...	--	--	--	--	--	--	<.006	<.006	<.006	<.004	<.005	<.007	
AUG													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
08...	44	M	<.5	290	.470	110	190	<.006	<.006	<.006	<.004	<.005	E.004
Date	Azin- phos- methyl, water, fltrd 0.7u GF ug/L (82686)	Ben- flur- alin, water, fltrd 0.7u GF ug/L (82673)	Butyl- ate, water, fltrd, ug/L (04028)	Car- baryl, water, fltrd 0.7u GF ug/L (82680)	Carbo- furan, water, fltrd 0.7u GF ug/L (82674)	Chlor- pyrifos water, fltrd, ug/L (38933)	cis- Per- methrin water, fltrd 0.7u GF ug/L (82687)	Cyana- zine, water, fltrd, ug/L (04041)	DCPA, water, fltrd 0.7u GF ug/L (82682)	Diazi- non, water, fltrd, ug/L (39572)	Diel- drin, water, fltrd, ug/L (39381)	Disul- foton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)
OCT 2002													
16...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002
NOV													
14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC													
09...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002
JAN 2003													
02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002
FEB													
03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002
MAR													
10...	<.050	<.010	<.002	<.041	<.020	.013	<.006	<.018	<.003	<.005	<.005	<.02	<.002
APR													
07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY													
12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN													
10...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	.003
JUL													
14...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002
AUG													
11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP													
08...	<.050	<.010	<.002	<.041	<.020	<.005	<.006	<.018	<.003	<.005	<.005	<.02	<.002

< -- Less than
E -- Estimated value
M -- Presence verified, not quantified

WATER-QUALITY DATA

Date	Ethal-flur-alin, water, fltrd, ug/L (82663)	Etho-prop, water, fltrd, ug/L (82672)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water, fltrd, ug/L (82666)	Mala-thion, water, fltrd, ug/L (39532)	Methyl para-thion, water, fltrd, ug/L (82667)	Metola-chlor, water, fltrd, ug/L (39415)	Metri-buzin, water, fltrd, ug/L (82630)	Moli-nate, water, fltrd, ug/L (82671)	Naprop-amide, water, fltrd, ug/L (82684)	p,p'-DDE, water, fltrd, ug/L (34653)	Para-thion, water, fltrd, ug/L (39542)
OCT 2002 16...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	E.004	<.006	<.002	<.007	<.003	<.010
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC 09...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	<.013	<.006	<.002	<.007	<.003	<.010
JAN 2003 02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	E.008	.010	<.002	<.007	<.003	<.010
FEB 03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	E.004	.006	<.002	<.007	<.003	<.010
MAR 10...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	E.010	<.006	<.002	<.007	<.003	<.010
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	<.013	<.006	<.002	<.007	<.003	<.010
JUL 14...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	<.013	<.006	<.002	<.007	<.003	<.010
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP 08...	<.009	<.005	<.003	<.004	<.035	<.027	<.006	E.004	<.006	<.002	<.007	<.003	<.010

Date	Peb-ulate, water, fltrd, ug/L (82669)	Pendi-meth-alin, water, fltrd, ug/L (82683)	Phorate water, fltrd, ug/L (82664)	Prome-ton, water, fltrd, ug/L (04037)	Pron-amide, water, fltrd, ug/L (82676)	Propa-chlor, water, fltrd, ug/L (04024)	Pro-panil, water, fltrd, ug/L (82679)	Propar-gite, water, fltrd, ug/L (82685)	Sima-zine, water, fltrd, ug/L (04035)	Tebu-thiuron, water, fltrd, ug/L (82670)	Terba-cil, water, fltrd, ug/L (82665)	Terbu-fos, water, fltrd, ug/L (82675)	Thio-bencarb, water, fltrd, ug/L (82681)
OCT 2002 16...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	--	--
DEC 09...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005
JAN 2003 02...	--	--	--	--	--	--	--	--	--	--	--	--	--
16...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005
FEB 03...	--	--	--	--	--	--	--	--	--	--	--	--	--
10...	<.004	E.008	<.011	<.01	<.004	<.01	<.011	<.02	E.004	<.02	<.034	<.02	<.005
MAR 10...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	.038	<.02	<.034	<.02	<.005
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 10...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005
JUL 14...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005
AUG 11...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP 08...	<.004	<.022	<.011	<.01	<.004	<.01	<.011	<.02	<.005	<.02	<.034	<.02	<.005

Date	Tri-allate, water, fltrd, ug/L (82678)	Tri-flur-alin, water, fltrd, ug/L (82661)	Uranium natural, fltrd, ug/L (22703)	Uranium suspndt total, ug/g (35046)	Suspnd. sedi-ment, sieve diametr <.063mm percent (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT 2002 16...	<.002	<.009	--	--	92	5	1700
NOV 14...	--	--	--	--	91	3	1390
DEC 09...	<.002	<.009	--	--	95	5	1980
JAN 2003 02...	--	--	--	--	83	21	15800
16...	<.002	<.009	.53	<100	98	6	3390
FEB 03...	--	--	--	--	78	678	835000
10...	<.002	<.009	--	--	93	15	8260
MAR 10...	<.002	<.009	.48	<50	64	41	37600
APR 07...	--	--	--	--	58	17	13900
MAY 12...	--	--	--	--	94	9	6370
JUN 10...	<.002	<.009	.30	4	88	12	9140
JUL 14...	<.002	<.009	--	--	82	15	5950
AUG 11...	--	--	--	--	80	12	4050
SEP 08...	<.002	<.009	.44	<50	94	8	E2070

< -- Less than
E -- Estimated value

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	138	135	136	153	142	145	169	155	159	120	106	114
2	138	133	135	152	144	148	174	159	164	111	105	108
3	140	133	136	150	142	147	166	157	161	109	103	106
4	142	134	138	148	143	145	164	159	161	106	102	104
5	138	134	136	149	144	146	170	159	163	107	103	105
6	136	133	135	152	146	149	174	161	165	107	104	105
7	140	135	137	152	144	148	168	160	163	108	104	106
8	138	132	135	150	142	146	167	156	159	112	106	109
9	134	131	133	157	145	149	166	158	160	119	110	115
10	139	133	135	160	147	153	162	157	159	126	119	123
11	147	139	143	151	145	147	163	152	158	131	124	127
12	147	137	142	149	146	148	158	151	154	129	124	128
13	146	137	141	149	145	148	152	147	150	136	128	131
14	149	137	144	151	145	148	149	143	146	136	130	134
15	145	137	142	151	144	147	146	131	141	132	126	130
16	144	137	140	146	141	143	142	133	139	131	126	129
17	143	137	140	146	143	144	135	123	130	133	126	129
18	144	138	140	150	143	147	126	118	123	139	128	132
19	145	138	142	151	135	145	127	119	123	139	132	135
20	147	139	142	147	138	145	139	118	125	145	133	140
21	145	140	143	150	143	145	138	129	134	145	139	142
22	151	140	145	150	141	146	138	129	133	144	138	141
23	145	141	143	159	148	152	143	130	134	145	137	142
24	145	141	143	154	147	150	135	129	132	145	135	141
25	147	140	143	155	149	151	135	127	133	146	136	141
26	148	143	145	156	151	153	139	130	134	143	131	138
27	148	141	143	155	149	153	143	133	139	134	120	129
28	154	142	148	160	148	152	139	133	137	124	112	118
29	145	139	142	160	151	154	134	128	131	115	110	112
30	146	140	143	159	154	156	134	126	131	117	109	114
31	151	143	147	---	---	---	127	115	123	111	94	102
MONTH	154	131	141	160	135	148	174	115	144	146	94	124
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	98	85	89	151	144	148	153	145	149	136	129	131
2	98	86	92	155	148	151	147	143	145	138	129	134
3	104	95	99	158	150	153	149	142	145	137	131	134
4	105	99	101	164	155	159	153	141	146	138	129	133
5	114	104	111	160	154	158	147	140	143	133	126	129
6	117	111	113	160	154	157	146	141	144	128	122	125
7	118	114	116	161	149	155	147	139	143	126	121	123
8	127	117	122	150	133	142	145	133	139	125	123	123
9	132	126	129	133	117	125	144	130	135	127	123	125
10	132	127	130	118	114	116	133	126	130	128	124	126
11	138	130	133	117	110	113	135	126	130	126	123	124
12	139	132	135	111	102	106	128	120	124	131	123	126
13	138	133	136	105	99	102	124	112	118	130	124	127
14	141	135	138	107	97	102	116	110	113	130	123	127
15	152	140	143	108	102	105	115	110	112	131	125	128
16	154	148	151	109	100	104	120	111	115	133	127	130
17	157	150	154	110	101	105	123	118	120	132	125	129
18	156	148	152	121	105	114	126	122	123	129	123	126
19	156	145	150	127	117	122	131	125	129	127	123	125
20	149	141	145	128	120	123	131	124	129	127	122	125
21	148	143	146	128	118	122	129	120	125	126	122	124
22	154	142	148	122	112	117	123	119	122	129	124	126
23	149	137	144	117	109	112	125	122	123	128	124	127
24	145	139	141	110	103	107	130	125	127	129	126	127
25	145	135	141	110	105	107	132	127	130	131	126	128
26	142	135	138	116	108	111	130	124	128	127	123	125
27	144	138	140	125	114	119	133	129	131	127	123	125
28	149	141	144	137	125	132	133	127	129	130	124	126
29	---	---	---	145	137	141	133	127	130	126	123	125
30	---	---	---	148	145	146	137	129	132	131	126	129
31	---	---	---	154	147	150	---	---	---	131	130	131
MONTH	157	85	131	164	97	127	153	110	130	138	121	127

COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	130	128	129	120	115	118	123	120	121	134	132	133
2	131	128	130	122	115	119	126	120	124	137	131	135
3	132	128	129	118	116	117	126	120	123	137	132	134
4	135	125	130	119	116	118	122	119	121	140	131	136
5	129	122	126	122	117	119	124	119	121	140	135	137
6	122	119	121	121	117	120	124	118	120	142	136	139
7	123	118	120	121	116	119	125	119	121	140	133	137
8	118	112	115	124	118	122	128	123	125	140	133	137
9	112	103	109	124	120	122	125	121	123	143	137	140
10	104	101	102	124	121	123	135	123	127	145	133	140
11	102	98	99	126	121	124	131	122	125	141	133	137
12	105	96	100	124	119	121	123	120	121	142	135	140
13	105	101	102	125	119	122	128	120	122	137	133	135
14	103	100	101	123	119	121	129	121	125	136	133	135
15	104	102	103	125	121	122	127	123	125	137	133	135
16	105	103	104	124	120	122	128	124	126	138	133	135
17	107	105	106	124	120	122	127	123	125	138	133	137
18	113	105	109	124	120	122	130	125	127	144	135	138
19	113	106	109	126	121	124	136	126	131	142	135	138
20	114	107	111	124	120	123	130	124	126	139	132	135
21	114	108	110	125	119	122	132	124	126	139	132	135
22	111	108	109	125	120	121	128	124	126	138	133	135
23	110	108	109	127	120	123	129	126	127	139	132	134
24	110	108	109	123	117	120	133	126	130	140	131	134
25	117	108	112	120	118	119	133	127	130	142	137	140
26	116	110	112	120	117	118	132	127	130	140	135	137
27	117	111	113	124	117	120	133	128	131	142	135	139
28	121	113	117	125	118	121	137	128	131	143	136	139
29	116	113	115	124	119	121	133	128	130	139	136	137
30	119	113	116	122	118	120	137	133	135	140	138	139
31	---	---	---	122	119	120	135	132	134	---	---	---
MONTH	135	96	113	127	115	121	137	118	126	145	131	137
YEAR	174	85	131									

Temperature, water, degrees Celsius
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	18.4	18.4	18.4	12.7	11.6	12.1	8.5	8.2	8.3	7.2	7.2	7.2
2	18.4	17.8	18.0	11.6	10.9	11.2	8.2	8.0	8.2	7.6	7.2	7.3
3	17.8	17.2	17.5	10.9	10.3	10.6	8.0	7.8	7.9	7.8	7.4	7.6
4	17.2	17.2	17.2	10.3	10.0	10.2	8.3	8.0	8.0	7.8	7.6	7.7
5	17.2	17.2	17.2	10.3	10.1	10.3	8.4	8.3	8.3	7.8	7.6	7.8
6	17.5	16.9	17.2	10.3	10.3	10.3	8.3	8.0	8.2	7.7	7.3	7.5
7	17.2	16.9	16.9	10.5	10.3	10.4	8.0	7.8	7.9	7.5	7.1	7.2
8	16.9	16.9	16.9	10.7	10.5	10.6	8.0	7.6	7.8	7.1	6.8	7.0
9	16.9	16.6	16.6	10.7	10.5	10.7	7.6	7.6	7.6	6.8	6.2	6.5
10	16.6	16.3	16.5	10.5	10.5	10.5	7.6	7.6	7.6	6.2	6.1	6.1
11	16.6	16.3	16.5	10.9	10.5	10.7	7.8	7.6	7.6	6.1	5.9	5.9
12	16.6	16.0	16.3	11.1	10.9	10.9	8.0	7.8	7.9	5.9	5.9	5.9
13	16.1	15.8	15.9	11.1	10.9	11.0	8.2	8.0	8.1	6.0	5.8	5.8
14	15.8	15.5	15.7	10.9	10.9	10.9	8.3	8.2	8.2	6.1	5.8	6.0
15	15.5	15.0	15.3	10.9	10.7	10.7	8.4	8.2	8.3	6.3	6.1	6.2
16	15.2	14.7	14.9	10.7	10.5	10.6	8.3	8.1	8.2	6.3	6.1	6.3
17	15.0	14.7	14.7	10.5	10.5	10.5	8.1	7.9	8.0	6.3	6.3	6.3
18	14.7	14.5	14.6	10.5	10.1	10.4	7.9	7.9	7.9	6.3	6.3	6.3
19	14.5	14.5	14.5	10.3	10.1	10.1	7.9	7.7	7.8	6.3	6.1	6.1
20	14.7	14.5	14.6	10.3	10.1	10.3	7.7	7.5	7.6	6.1	6.0	6.0
21	15.0	14.7	14.7	10.5	10.1	10.3	7.5	7.3	7.5	6.0	6.0	6.0
22	15.0	14.7	14.9	10.5	10.3	10.4	7.3	7.3	7.3	6.1	6.0	6.1
23	15.3	15.0	15.0	10.7	10.5	10.6	7.3	7.1	7.1	6.3	6.1	6.1
24	15.3	15.0	15.2	10.7	10.5	10.7	7.1	6.9	7.0	6.3	6.1	6.3
25	15.0	15.0	15.0	10.5	10.3	10.5	7.0	6.8	7.0	6.6	6.1	6.4
26	15.0	14.2	14.6	10.3	9.7	10.2	6.8	6.8	6.8	7.3	6.6	6.8
27	14.2	13.7	13.9	9.7	9.3	9.6	6.9	6.8	6.9	7.3	7.1	7.2
28	13.7	13.4	13.7	9.3	8.9	9.2	7.0	6.9	6.9	7.5	7.1	7.2
29	13.7	13.4	13.5	8.9	8.7	8.8	7.0	7.0	7.0	7.3	7.1	7.3
30	13.5	13.2	13.3	8.7	8.5	8.5	7.2	7.0	7.0	7.5	7.1	7.2
31	13.4	12.7	13.0	---	---	---	7.2	7.0	7.2	7.9	7.3	7.7
MONTH	18.4	12.7	15.6	12.7	8.5	10.4	8.5	6.8	7.6	7.9	5.8	6.7

COLUMBIA RIVER MAIN STEM

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

Turbidity, water, unfiltered, nephelometric turbidity units
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
1	8	2	4	6	3	5	6	2	5	27	9	18
2	6	2	4	7	3	5	7	1	5	30	9	17
3	6	2	4	9	4	5	9	3	5	50	12	25
4	7	3	4	8	4	6	7	3	5	62	19	42
5	6	3	4	9	4	6	6	3	5	60	23	34
6	6	2	4	8	4	6	10	2	5	58	16	31
7	10	2	4	7	4	5	6	2	4	42	12	22
8	7	3	4	7	2	5	6	2	4	30	12	19
9	6	2	4	7	3	5	6	2	4	22	9	15
10	9	2	4	6	3	5	5	2	3	18	6	11
11	8	2	4	7	3	5	8	2	4	16	5	9
12	7	2	4	7	3	5	6	2	4	14	5	8
13	6	2	4	7	3	5	7	2	4	11	4	8
14	6	2	4	13	2	6	16	4	8	12	4	8
15	10	2	4	14	3	6	58	4	8	14	3	7
16	9	2	5	7	3	5	88	22	46	10	4	7
17	7	4	5	6	2	5	58	20	42	11	4	8
18	7	4	5	7	3	5	31	10	21	16	5	8
19	8	4	5	9	3	5	25	8	18	8	4	7
20	8	3	5	8	3	5	32	8	16	9	4	7
21	9	4	5	6	3	5	22	10	16	10	3	7
22	7	4	5	6	3	5	20	9	15	8	4	6
23	9	4	5	9	3	5	21	8	14	7	3	5
24	7	3	5	6	3	5	16	6	11	10	4	7
25	6	3	5	6	2	4	14	4	9	9	3	7
26	7	3	5	6	2	4	16	5	8	10	3	7
27	7	3	5	6	2	4	18	5	8	45	8	19
28	9	3	4	7	2	4	12	4	8	28	8	19
29	7	3	5	6	2	4	26	6	10	22	7	15
30	12	3	5	8	3	5	10	4	8	27	9	14
31	6	2	5	---	---	---	21	5	9	201	17	44
MAX	12	4	5	14	4	6	88	22	46	201	23	44
MIN	6	2	4	6	2	4	5	1	3	7	3	5
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
1	221	126	171	15	7	11	16	8	13	13	6	10
2	139	77	101	13	6	10	15	7	11	11	6	9
3	90	59	71	12	6	10	14	8	11	12	4	9
4	82	52	64	14	6	9	14	7	10	12	5	8
5	63	33	43	12	5	9	13	6	10	11	4	8
6	45	24	30	11	5	8	13	6	10	13	4	8
7	30	16	24	16	5	11	14	8	11	11	5	8
8	25	14	21	17	6	13	17	5	12	11	5	8
9	24	11	18	19	9	16	17	10	14	12	6	8
10	32	9	18	38	15	28	22	12	16	11	4	8
11	31	9	16	33	20	28	20	12	16	12	4	8
12	23	7	15	35	19	25	20	9	16	11	3	8
13	22	8	14	106	24	37	27	10	16	10	3	8
14	---	---	---	106	41	69	32	14	22	13	3	7
15	---	---	---	82	30	61	23	11	17	11	2	8
16	15	8	12	74	28	53	19	9	15	10	2	8
17	17	7	12	56	22	42	21	9	14	11	3	8
18	21	7	13	47	19	32	18	8	14	11	3	8
19	24	9	15	36	17	26	17	8	13	12	3	9
20	17	8	14	33	14	22	20	8	12	16	4	9
21	24	10	16	38	16	24	15	7	11	16	5	8
22	31	15	25	50	16	32	15	8	11	13	4	7
23	45	17	29	79	34	52	14	8	11	14	4	8
24	32	14	22	52	25	39	14	7	11	9	3	8
25	35	11	18	42	24	33	14	8	12	9	4	7
26	22	10	15	41	21	27	14	8	11	9	3	7
27	20	9	14	28	17	23	13	7	11	10	3	8
28	20	8	12	23	14	18	14	6	11	12	4	8
29	---	---	---	21	12	16	19	6	10	16	6	10
30	---	---	---	18	10	15	16	6	10	16	5	10
31	---	---	---	18	9	13	---	---	---	17	7	10
MAX	---	---	---	106	41	69	32	14	22	17	7	10
MIN	---	---	---	11	5	8	13	5	10	9	2	7

14246900 COLUMBIA RIVER AT BEAVER ARMY TERMINAL, NEAR QUINCY, OR--Continued

Turbidity, water, unfiltered, nephelometric turbidity units
 WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN	MAX	MIN	MEDIAN
1	18	8	13	9	3	7	9	2	5	10	2	4
2	18	9	14	13	3	7	9	2	6	7	2	4
3	18	6	12	14	4	8	10	3	6	6	2	4
4	17	8	11	14	4	8	9	3	6	7	1	4
5	27	8	16	17	5	8	15	3	7	12	2	4
6	22	6	12	14	5	8	16	3	7	8	2	4
7	22	3	7	14	4	7	11	3	6	6	2	4
8	15	3	6	17	4	7	11	3	6	9	2	4
9	14	2	6	12	4	8	13	2	6	12	2	4
10	12	3	6	15	4	8	11	3	6	8	2	4
11	12	3	7	20	3	7	10	3	6	10	2	4
12	10	3	8	13	3	6	10	3	6	6	2	4
13	16	3	8	19	4	8	10	3	6	10	2	4
14	13	4	8	11	4	8	10	3	6	7	2	4
15	11	4	8	12	4	8	8	2	5	6	2	4
16	12	3	8	20	5	10	8	2	5	7	2	3
17	20	3	8	13	4	9	7	2	4	12	2	4
18	15	4	8	12	4	8	6	2	4	8	1	4
19	11	5	8	12	3	7	10	2	5	6	2	4
20	10	3	8	13	3	6	9	3	6	6	2	4
21	13	3	7	12	3	6	10	4	7	8	2	4
22	16	2	6	10	3	6	12	4	8	7	2	4
23	10	3	6	10	2	6	12	4	9	8	2	4
24	10	2	6	10	2	6	14	6	9	8	2	4
25	8	2	6	9	3	6	13	6	9	7	2	3
26	26	2	7	10	2	6	14	6	9	8	2	4
27	17	3	7	10	2	6	13	5	9	6	1	3
28	10	3	6	10	2	6	11	5	8	5	1	3
29	12	3	6	10	2	6	19	6	8	5	2	3
30	14	3	7	10	3	6	11	5	8	6	1	3
31	---	---	---	10	2	5	10	2	6	---	---	---
MAX	27	9	16	20	5	10	19	6	9	12	2	4
MIN	8	2	6	9	2	5	6	2	4	5	1	3