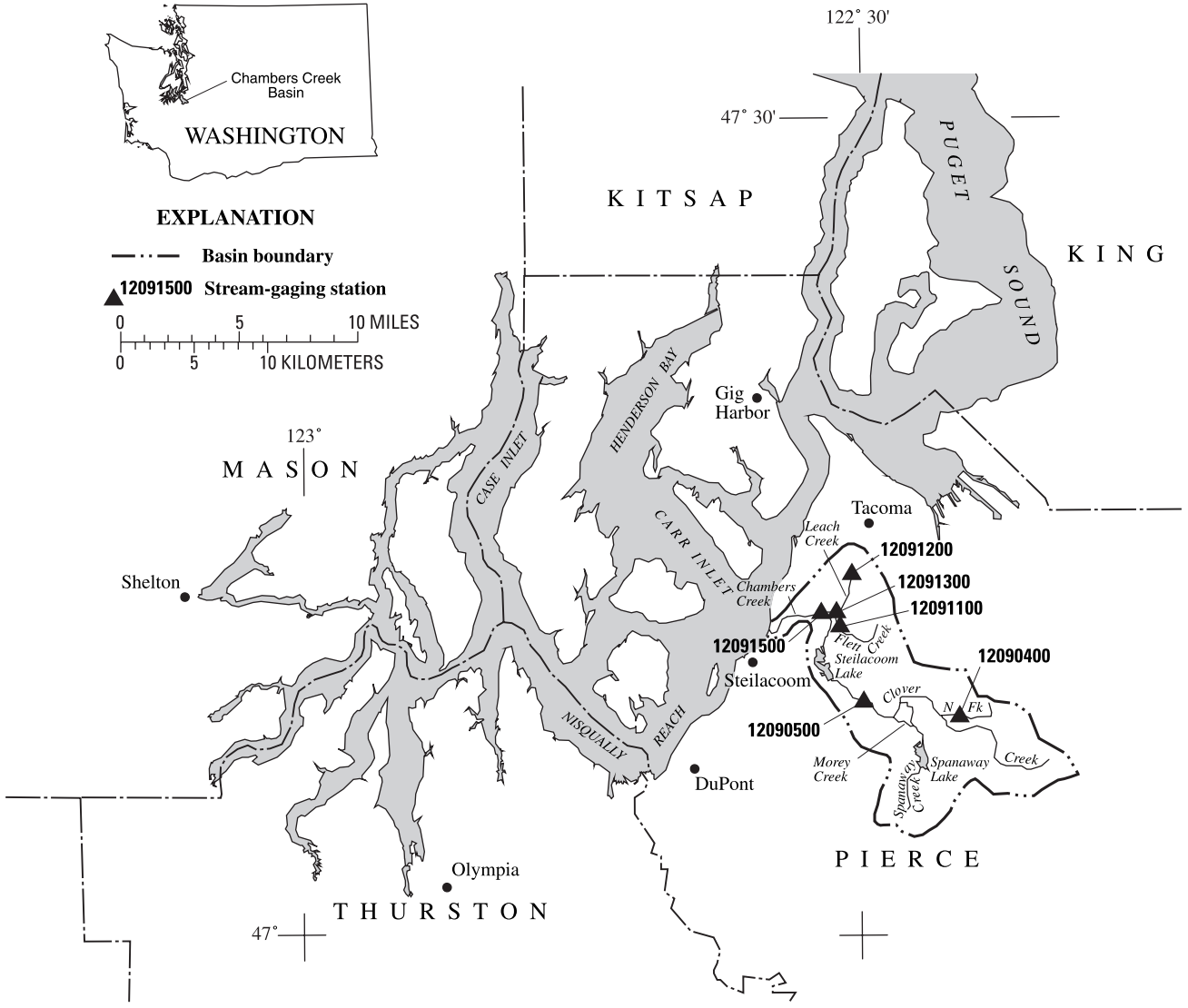

Figure 24. Location of surface-water stations in the Chambers Creek Basin.

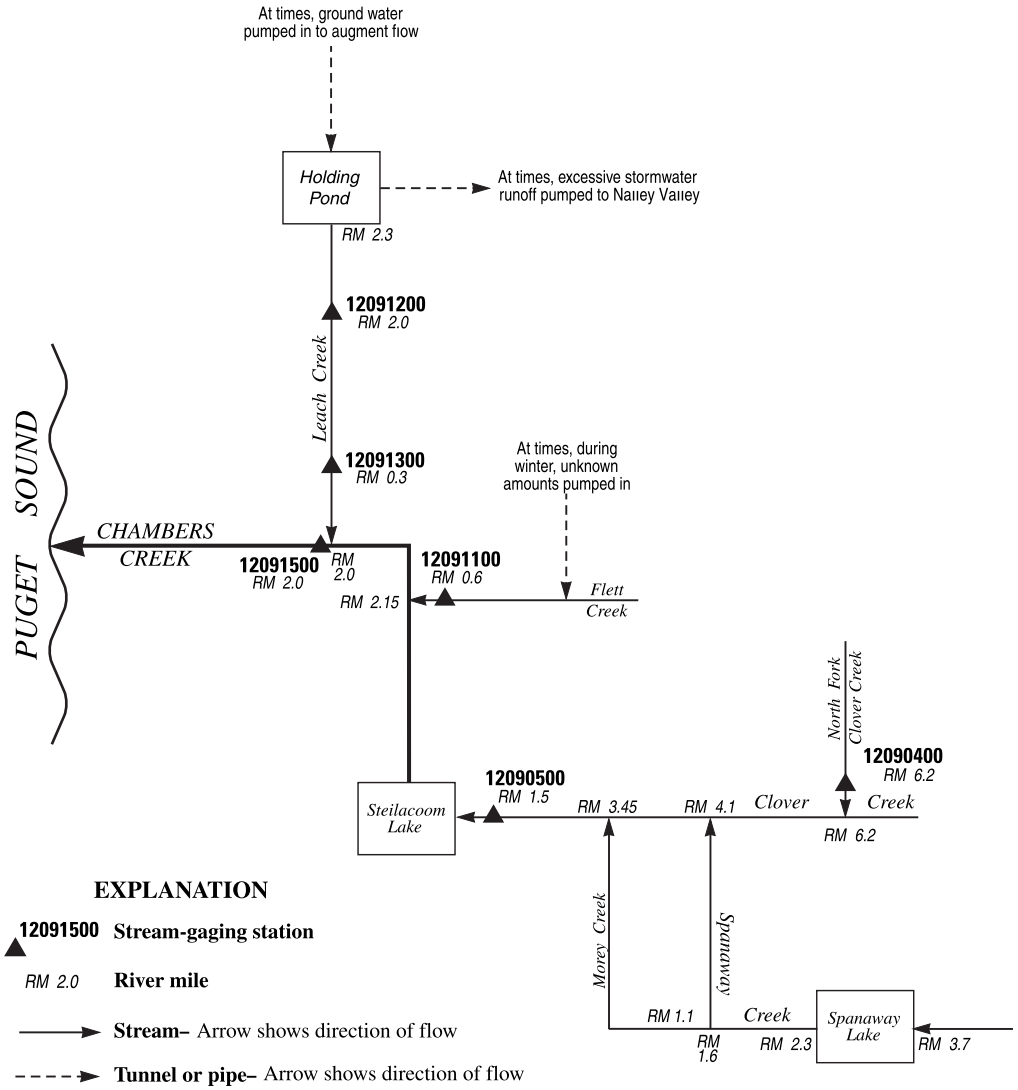

Figure 25. Schematic diagram showing surface-water stations in the Chambers Creek Basin.

12090400 NORTH FORK CLOVER CREEK NEAR PARKLAND, WA

LOCATION.--Lat 47°08'05", long 122°24'50", in SE ¼ NW ¼ sec.15, T.19 N., R.3 E., Pierce County, Hydrologic Unit 17110019, at Golden Given Avenue crossing, 1.5 mi southeast of Parkland.

DRAINAGE AREA.--6.25 mi^2.

PERIOD OF RECORD.--Water years 1960-1975 (annual maximum), November 1990 to September 1992, October 1994 to September 1997, October 1997 to April 1999 (seasonal records), October 1999 to current year.

REVISED RECORDS.--WDR WA-01-1: 1999(M).

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 315 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair except for discharges below 3 ft^3s, which are poor. Two flood control ponds (completed in 1999 and 2000, 228 acre-ft, total) upstream from station.

AVERAGE DISCHARGE.--8 years (water years 1992, 1995-97, 2000-03), 7.34 ft^3s, 15.96 in/yr, 5,320 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, not determined Feb. 8, 1996, gage height, 12.81 ft, from outside high-water mark, affected by backwater; minimum discharge, no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 118 ft^3/s Jan. 31, gage height, 7.11 ft, minimum discharge, no flow for many days during year.

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	0.00	0.00	0.00	17	55	1.0	4.9	e2.4	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	24	27	0.86	5.8	e1.9	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	23	15	2.2	6.3	e1.8	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	23	10	1.4	6.0	1.7	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	14	7.4	1.6	5.2	1.5	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	5.5	5.5	4.2	7.5	1.0	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	2.7	4.2	11	8.3	0.68	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	1.2	3.5	11	9.9	0.41	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.58	3.0	39	15	0.15	0.00	0.00	0.00	0.00
10	0.00	0.00	0.15	0.12	3.0	34	10	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	2.5	0.06	2.4	19	9.3	0.00	0.00	0.00	0.00	0.00
12	0.00	0.18	3.6	6.7	1.9	33	8.5	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	3.1	4.8	1.6	51	20	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	8.3	9.0	1.0	25	20	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	5.5	3.8	1.0	16	14	0.34	0.00	0.00	0.00	0.00
16	0.00	0.33	14	1.8	6.8	13	10	0.42	0.00	0.00	0.00	0.00
17	0.00	0.01	6.3	0.87	11	11	8.6	0.46	0.00	0.00	0.00	0.00
18	0.00	0.00	3.5	0.38	7.0	9.2	8.5	0.00	0.00	0.00	0.00	0.00
19	0.00	0.02	1.7	0.01	5.8	9.3	5.7	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.27	0.00	5.8	13	4.5	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	3.1	7.5	16	9.6	0.00	0.51	0.00	0.00	0.00
22	0.00	0.00	0.00	21	6.4	48	8.1	0.00	0.26	0.00	0.00	0.00
23	0.00	0.00	0.00	22	4.1	27	8.8	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	18	3.0	15	16	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.02	12	2.3	12	16	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	1.0	50	1.8	11	11	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	4.9	41	1.1	8.3	8.3	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	2.0	30	1.2	6.6	6.1	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	2.5	24	---	5.5	4.7	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	5.0	32	---	4.7	e3.3	0.00	0.00	0.00	0.00	0.00
31	0.00	---	8.8	95	---	5.4	---	0.00	---	0.00	0.00	---
TOTAL	0.00	0.54	73.14	486.62	205.3	465.26	279.9	12.76	0.77	0.00	0.00	0.00
MEAN	0.000	0.018	2.36	15.7	7.33	15.0	9.33	0.41	0.026	0.000	0.000	0.000
MAX	0.00	0.33	14	95	55	51	20	2.4	0.51	0.00	0.00	0.00
MIN	0.00	0.00	0.00	0.00	1.0	0.86	3.3	0.00	0.00	0.00	0.00	0.00
AC-FT	0.00	1.1	145	965	407	923	555	25	1.5	0.00	0.00	0.00
CFSM	0.00	0.00	0.38	2.51	1.17	2.40	1.49	0.07	0.00	0.00	0.00	0.00
IN.	0.00	0.00	0.44	2.90	1.22	2.77	1.67	0.08	0.00	0.00	0.00	0.00

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

MEAN	1.03	10.2	18.9	20.3	18.6	13.1	9.48	2.22	0.76	0.094	0.071	0.11
MAX	4.24	20.6	40.3	42.2	41.9	23.2	27.8	5.41	3.01	0.23	0.42	0.40
(WY)	(1998)	(1996)	(1999)	(1997)	(1996)	(1997)	(1991)	(1996)	(2001)	(1995)	(2001)	(1997)
MIN	0.000	0.018	2.36	7.21	7.29	3.73	1.55	0.13	0.023	0.000	0.000	0.000
(WY)	(1995)	(2003)	(2003)	(2001)	(2001)	(1992)	(1999)	(1992)	(1995)	(1991)	(1996)	(2000)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1991 - 2003	
ANNUAL TOTAL	1,737.94		1,524.29			
ANNUAL MEAN	4.76		4.18		7.34	
HIGHEST ANNUAL MEAN					11.8	1997
LOWEST ANNUAL MEAN					4.18	2003
HIGHEST DAILY MEAN	101	Apr 14	95	Jan 31	400	Feb 8, 1996
LOWEST DAILY MEAN	0.00	Apr 7	0.00	Oct 1	0.00	May 23, 1991
ANNUAL SEVEN-DAY MINIMUM	0.00	Jun 6	0.00	Oct 1	0.00	Jun 2, 1991
ANNUAL RUNOFF (AC-FT)	3,450		3,020		5,320	
ANNUAL RUNOFF (CFSM)	0.76		0.67		1.17	
ANNUAL RUNOFF (INCHES)	10.34		9.07		15.96	
10 PERCENT EXCEEDS	14		13		20	
50 PERCENT EXCEEDS	0.00		0.00		0.95	
90 PERCENT EXCEEDS	0.00		0.00		0.00	

e Estimated

12090500 CLOVER CREEK NEAR TILLICUM, WA

LOCATION.--Lat 47°08'46", long 122°30'33", in NW ¼ SE ¼ sec.11, T.19 N., R.2 E., Pierce County, Hydrologic Unit 17110019, at Pacific Highway SW, Lakewood, Washington, 2.5 mi northeast of Tillicum.

DRAINAGE AREA.--73.8 mi^2.

PERIOD OF RECORD.--June 1949 to October 1954, October 1959 to September 1970 (annual maximums only), September 1990 to October 1992, October 1994 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 250 ft above NGVD of 1929, from topographic map. Prior to October 22, 1999, at Bridgeport Way, ¼ mi. upstream, at various datums.

REMARKS.--No estimated daily discharges. Records good except for flows below 5 ft^3/s, which are fair, and for flows below 1 ft^3/s, which are poor.

AVERAGE DISCHARGE.--16 years (water years 1950-54, 1991-92, 1995-2003), 43.1 ft^3/s, 7.94 in/yr, 31,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 568 ft^3/s Feb. 12, 1991, gage height, 5.71 ft (datum then in use); no flow for many days in 1949, 1952-53, 2001-03.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 84 ft^3/s Mar. 12, gage height, 15.74 ft; minimum discharge, no flow on many days in Oct., Nov., Aug., and Sept.

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	0.56	0.00	0.69	17	72	37	44	39	20	7.8	1.3	0.00
2	0.43	0.00	0.62	18	68	36	44	38	19	7.1	1.2	0.00
3	1.8	0.00	1.0	20	62	36	44	37	18	6.9	1.1	0.00
4	0.75	0.00	1.3	24	58	35	42	37	18	6.5	1.1	0.00
5	0.61	0.00	1.00	21	55	34	42	36	17	6.1	1.0	0.00
6	0.59	1.6	0.90	20	52	34	42	35	16	5.8	1.1	0.00
7	0.49	0.43	0.83	18	50	38	43	35	15	5.6	1.0	0.00
8	0.39	0.61	0.73	18	47	40	44	34	15	5.5	0.94	0.00
9	0.68	1.1	0.66	17	45	52	47	33	14	5.5	2.2	0.00
10	0.30	0.72	3.7	16	43	57	45	33	14	5.2	1.3	0.00
11	0.31	0.21	7.1	16	42	54	44	32	14	4.6	1.0	0.00
12	0.34	2.4	6.9	19	41	58	44	31	13	4.4	0.84	0.00
13	0.39	0.36	3.7	19	40	56	50	30	12	4.9	0.72	0.00
14	0.43	1.0	14	19	40	55	51	29	12	4.6	0.66	0.00
15	0.36	0.41	5.8	18	40	49	49	29	11	4.4	0.57	0.00
16	0.36	2.6	13	17	45	46	47	29	11	4.3	0.51	0.00
17	0.35	0.75	8.5	17	45	45	47	29	9.9	4.1	0.47	0.00
18	0.31	1.3	6.7	16	43	43	46	29	9.9	3.8	0.32	0.00
19	0.32	1.8	6.9	16	43	43	44	28	9.7	3.6	0.25	0.00
20	0.31	1.0	5.7	15	42	44	42	27	9.7	3.5	0.23	0.00
21	0.27	0.93	5.5	20	43	48	47	27	13	3.2	0.14	0.00
22	0.25	0.73	5.5	25	46	59	44	26	11	3.0	0.00	0.00
23	0.23	0.64	5.5	25	46	60	45	25	9.9	2.7	0.00	0.00
24	0.28	0.61	6.1	28	44	56	47	24	9.4	2.5	0.00	0.00
25	0.23	0.73	5.7	28	42	52	48	24	8.5	2.3	0.00	0.00
26	0.20	0.72	8.3	39	41	51	47	23	8.2	2.1	0.00	0.00
27	0.14	0.66	10	45	39	48	45	22	7.7	2.0	0.00	0.00
28	0.14	0.96	7.1	45	38	46	43	22	8.0	1.8	0.00	0.00
29	0.01	0.91	7.5	47	---	44	41	21	8.0	1.6	0.00	0.00
30	0.00	0.70	9.9	51	---	43	40	21	8.6	1.5	0.00	0.00
31	0.00	---	10	68	---	43	---	20	---	1.4	0.00	---
TOTAL	11.83	23.88	170.83	782	1,312	1,442	1,348	905	370.5	128.3	17.95	0.00
MEAN	0.38	0.80	5.51	25.2	46.9	46.5	44.9	29.2	12.3	4.14	0.58	0.000
MAX	1.8	2.6	14	68	72	60	51	39	20	7.8	2.2	0.00
MIN	0.00	0.00	0.62	15	38	34	40	20	7.7	1.4	0.00	0.00
AC-FT	23	47	339	1,550	2,600	2,860	2,670	1,800	735	254	36	0.00
CFSM	0.01	0.01	0.07	0.34	0.63	0.63	0.61	0.40	0.17	0.06	0.01	0.00
IN.	0.01	0.01	0.09	0.39	0.66	0.73	0.68	0.46	0.19	0.06	0.01	0.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2003, BY WATER YEAR (WY)

MEAN	4.24	13.9	53.0	86.0	110	96.8	69.3	41.9	24.1	12.9	5.49	3.37
MAX	13.8	37.0	119	232	279	196	133	78.5	42.1	26.9	12.5	11.5
(WY)	(1998)	(1991)	(1951)	(1997)	(1951)	(1997)	(1991)	(1996)	(1996)	(1996)	(1996)	(1997)
MIN	0.000	0.000	0.000	13.4	14.8	15.3	22.8	17.8	9.93	3.55	0.56	0.000
(WY)	(1953)	(1953)	(1953)	(2001)	(2001)	(2001)	(2001)	(2001)	(1992)	(2001)	(1952)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1949 - 2003	
ANNUAL TOTAL	11,732.28		6,512.29			
ANNUAL MEAN	32.1		17.8		43.1	
HIGHEST ANNUAL MEAN					81.9	1997
LOWEST ANNUAL MEAN					9.72	2001
HIGHEST DAILY MEAN	109	Mar 21	72	Feb 1	532	Feb 12, 1951
LOWEST DAILY MEAN	0.00	Oct 30	0.00	Oct 30	0.00	Oct 20, 1949
ANNUAL SEVEN-DAY MINIMUM	0.00	Oct 30	0.00	Oct 30	0.00	Oct 20, 1949
ANNUAL RUNOFF (AC-FT)	23,270		12,920		31,230	
ANNUAL RUNOFF (CFSM)	0.44		0.24		0.58	
ANNUAL RUNOFF (INCHES)	5.91		3.28		7.94	
10 PERCENT EXCEEDS	79		46		112	
50 PERCENT EXCEEDS	18		8.5		22	
90 PERCENT EXCEEDS	0.60		0.00		1.5	

12091100 FLETT CREEK AT TACOMA, WA

LOCATION.--Lat 47°11'23", long 122°31'08", in NE ¼ SW ¼ sec.26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank upstream of 75th Street bridge, 0.6 mi upstream from mouth and 0.7 mi west of city limits of Tacoma.

DRAINAGE AREA.--7.33 mi^2, excludes 0.68 mi^2 storm drainage diverted to Leach Creek basin but does not include some urban storm drainage diverted into the basin.

PERIOD OF RECORD.--June 1959 to September 1985, October 1985 to September 1996 (seasonal records). October 1996 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 189.32 ft above NGVD of 1929 (levels by USGS National Mapping Division). Prior to Oct. 11, 2000, at same site and at datum 5.74 ft higher.

REMARKS.--No estimated daily discharges. Records fair except for discharges below 5.0 ft^3/s, which are poor. Storm sewer drainage upstream from station. Several diversions for irrigation and industrial use. At times during winter months 1,000 gpm are pumped into creek for short intervals from Mountain View Memorial Park. Since October 1979, Flett Creek flood control retention ponds store and release flood water upstream from station. Chemical analyses October 1964 to September 1965.

AVERAGE DISCHARGE.--33 years (water years 1960-85, 1997-2003), 10.9 ft^3/s, 7,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 203 ft^3/s Feb. 8, 1996, gage height, 3.08 ft, site and datum then in use, from rating curve extended above 115 ft^3/s; minimum discharge, 0.09 ft^3/s Oct. 23-25, Nov. 11, 12, 1987, Sept. 5, 6, 9-15, 18, 2002.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 63 ft^3/s Dec. 16, gage height 10.92 ft; minimum discharge, 0.13 ft^3/s July 10-13.

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	0.28	0.80	0.44	19	47	8.3	13	8.2	1.4	0.20	0.25	0.24
2	0.22	0.64	0.41	35	39	8.2	16	8.2	0.81	0.20	0.24	0.24
3	0.78	0.48	0.34	43	37	8.5	18	8.2	0.65	0.19	0.24	0.25
4	0.56	0.49	0.52	38	32	8.9	18	8.2	1.6	0.18	0.24	0.25
5	0.56	0.53	0.34	40	19	8.4	16	7.7	0.89	0.19	0.24	0.43
6	0.51	2.4	0.23	26	17	8.1	15	8.3	0.58	0.18	0.24	0.21
7	0.49	2.1	0.19	13	14	8.7	15	11	0.53	0.18	0.24	0.26
8	0.50	2.2	0.16	11	13	9.6	17	8.0	0.53	0.17	0.24	0.24
9	0.53	2.4	0.16	11	11	18	21	7.4	0.51	0.16	0.46	0.24
10	0.53	1.4	1.0	9.3	11	32	20	6.9	0.44	0.16	0.24	0.28
11	0.47	1.4	2.7	6.4	10	28	17	6.3	0.39	0.16	0.21	0.24
12	0.38	2.7	16	11	12	36	15	6.1	0.35	0.15	0.21	0.24
13	0.39	2.5	22	13	10	47	17	6.3	0.35	0.60	0.21	0.24
14	0.40	2.4	31	16	9.3	36	19	5.7	0.33	0.38	0.22	0.24
15	0.41	1.6	40	13	7.5	33	18	6.6	0.28	0.31	0.23	0.24
16	0.33	2.5	46	11	13	27	18	9.0	0.28	0.30	0.24	0.24
17	0.30	1.8	49	11	15	16	17	6.0	0.25	0.28	0.22	0.24
18	0.31	2.0	38	8.6	15	16	17	4.9	0.27	0.29	0.22	0.24
19	0.40	1.6	20	6.1	15	16	16	4.0	0.28	0.28	0.23	0.25
20	0.42	1.3	12	5.2	15	17	12	3.8	0.28	0.28	0.24	0.24
21	0.42	1.1	10	6.9	16	18	16	3.7	0.34	0.28	0.22	0.24
22	0.44	1.0	8.1	14	15	39	18	3.1	0.29	0.27	0.23	0.24
23	0.51	0.98	5.5	26	14	46	15	2.9	0.25	0.26	0.24	0.24
24	0.58	0.92	3.5	21	13	29	18	2.6	0.24	0.26	0.23	0.24
25	0.53	0.84	4.9	23	12	19	16	2.9	0.24	0.27	0.23	0.24
26	0.53	0.85	6.7	34	11	25	15	1.8	0.22	0.26	0.24	0.24
27	0.68	0.81	9.3	48	10	25	14	2.2	0.23	0.28	0.24	0.24
28	0.71	0.70	10	44	8.7	17	12	2.0	0.20	0.26	0.24	0.27
29	0.76	0.62	9.5	39	---	14	11	1.6	0.20	0.26	0.24	0.28
30	0.82	0.54	11	43	---	12	9.5	1.5	0.22	0.25	0.24	0.28
31	0.85	---	15	54	---	13	---	0.83	---	0.26	0.24	---
TOTAL	15.60	41.60	373.99	699.5	461.5	647.7	479.5	165.93	13.43	7.75	7.45	7.56
MEAN	0.50	1.39	12.1	22.6	16.5	20.9	16.0	5.35	0.45	0.25	0.24	0.25
MAX	0.85	2.7	49	54	47	47	21	11	1.6	0.60	0.46	0.43
MIN	0.22	0.48	0.16	5.2	7.5	8.1	9.5	0.83	0.20	0.15	0.21	0.21
AC-FT	31	83	742	1,390	915	1,280	951	329	27	15	15	15

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

MEAN	4.16	10.6	19.5	23.8	23.4	20.4	14.5	8.63	5.40	3.01	1.72	2.36
MAX	18.7	32.4	40.2	54.9	53.9	52.1	32.4	29.9	15.6	10.9	5.24	9.81
(WY)	(1998)	(1991)	(1999)	(1997)	(1999)	(1972)	(1991)	(1996)	(1997)	(1983)	(1983)	(1997)
MIN	0.13	1.39	3.14	1.93	1.69	5.81	2.96	2.39	0.45	0.25	0.18	0.14
(WY)	(1988)	(2003)	(1977)	(1977)	(1977)	(1962)	(1977)	(1977)	(2003)	(2003)	(2002)	(2002)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003	
ANNUAL TOTAL	3,467.70		2,921.51			
ANNUAL MEAN	9.50		8.00		10.9	
HIGHEST ANNUAL MEAN					21.7	1997
LOWEST ANNUAL MEAN					2.87	1977
HIGHEST DAILY MEAN	54	Jan 8	54	Jan 31	138	Nov 15, 2001
LOWEST DAILY MEAN	0.10	Aug 29	0.15	Jul 12	0.09	Oct 24, 1987
ANNUAL SEVEN-DAY MINIMUM	0.10	Aug 29	0.17	Jul 6	0.10	Aug 29, 2002
ANNUAL RUNOFF (AC-FT)	6,880		5,790		7,910	
10 PERCENT EXCEEDS	29		21		27	
50 PERCENT EXCEEDS	2.7		1.6		6.5	
90 PERCENT EXCEEDS	0.16		0.24		1.0	

12091200 LEACH CREEK NEAR FIRCREST, WA

LOCATION.--Lat 47°13'18", long 122°30'29", in lot 24, block 14, SE ¼ NE ¼ sec.14, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on left bank 1.0 mi south of Fircrest, and 2 mi upstream from mouth.

DRAINAGE AREA.--4.73 mi^2 includes 0.68 mi^2 storm drainage from Flett Creek basin.

PERIOD OF RECORD.--March 1957 to September 1985, October 1985 to April 1988 (seasonal records), October 1988 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder, metal weir control, and crest-stage gage. Prior to Oct. 19, 1979, at site 20 ft downstream at same datum. Datum of gage is 222.98 ft above NGVD of 1929 (levels by U.S. Geological Survey National Mapping Division).

REMARKS.--No estimated daily discharges.Records fair except for flows below 3 ft^3/s, which are poor. Since Oct. 1, 1961, flow may be regulated at dam upstream from station. Storage is not retained. Since early 1992 excess stormwater runoff pumped into Nalley Valley. Since June 30, 1993, low flows supplemented from well in basin. Drainage in basin influenced by urbanization. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1958-85, 1989-2003), 4.79 ft^3/s, 13.75 in/yr, 3,470 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 309 ft^3/s Nov. 24, 1990, gage height, 5.76 ft, from rating curve extended above 200 ft^3/s; minimum discharge, 0.1 ft^3/s Sept. 22, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 66 ft^3/s Dec. 11, gage height, 2.15 ft; miimum recorded discharge 1.1 ft^3/s July 22, 23.

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	2.4	2.5	3.0	26	6.8	4.0	12	3.9	3.4	3.4	3.3	3.2
2	2.4	2.6	3.0	31	5.8	5.2	8.7	3.9	3.4	3.4	3.2	3.1
3	11	2.0	3.0	19	5.2	4.4	11	4.1	3.4	3.4	3.1	3.3
4	3.1	2.5	5.6	28	4.7	4.1	5.4	5.6	3.4	3.3	3.1	3.3
5	2.6	3.5	3.1	7.0	4.5	4.3	6.0	3.9	3.4	3.3	3.5	3.2
6	2.6	21	3.0	5.7	4.2	5.1	6.0	4.7	3.3	3.3	3.2	3.1
7	2.6	8.7	3.0	3.8	4.3	5.4	13	3.8	3.3	3.3	3.2	4.8
8	2.8	6.5	2.9	2.5	4.1	9.2	8.3	3.7	3.3	3.3	3.2	3.6
9	3.5	15	3.0	2.5	4.3	22	11	3.7	3.3	3.3	6.8	3.6
10	2.6	5.7	16	2.4	4.2	7.2	4.8	3.7	3.3	3.2	3.6	6.3
11	2.5	7.5	34	5.9	4.1	17	5.2	3.7	3.2	3.2	3.4	5.4
12	2.5	21	19	17	4.0	24	5.8	3.6	3.4	3.2	3.4	4.1
13	2.5	9.6	13	9.7	4.2	17	22	3.6	4.0	3.5	3.5	3.2
14	2.5	10	29	6.6	4.0	5.5	5.3	3.6	3.3	3.3	3.3	3.2
15	2.5	3.8	22	2.4	5.8	7.3	4.6	5.2	3.3	3.2	3.2	3.2
16	2.5	14	31	2.1	24	12	4.4	3.9	3.3	3.2	3.3	6.2
17	2.5	4.2	19	1.9	6.9	5.8	4.3	3.5	3.4	3.2	3.3	4.1
18	2.6	12	14	1.9	4.8	6.4	4.1	3.5	3.3	3.1	3.3	3.5
19	2.6	10	10	1.8	6.5	11	4.2	3.6	3.4	3.1	3.4	4.9
20	2.6	3.9	5.5	1.8	6.1	7.5	4.3	3.7	3.3	3.1	3.3	3.1
21	2.5	3.4	5.3	15	14	22	16	3.9	5.8	3.0	3.4	3.0
22	2.5	3.3	5.2	29	5.2	29	4.4	3.7	3.4	2.7	3.4	2.8
23	2.5	3.2	5.0	11	4.5	6.2	11	3.8	3.3	2.6	3.3	2.8
24	2.5	3.1	12	18	4.2	5.2	10	3.6	2.6	3.0	3.4	2.8
25	2.6	3.1	8.9	15	4.0	4.9	4.4	4.1	2.5	3.2	3.3	2.8
26	2.5	3.1	15	38	3.9	10	5.5	3.5	3.4	3.2	3.3	2.8
27	2.5	3.1	21	16	3.7	4.8	4.1	3.5	3.4	3.0	3.3	2.9
28	2.5	3.0	7.9	5.9	5.8	4.4	4.0	3.5	3.3	3.2	3.3	2.8
29	2.5	3.0	9.6	23	---	4.4	3.9	3.5	3.3	3.2	3.3	3.2
30	2.5	3.0	16	21	---	4.9	3.9	3.5	4.8	3.2	3.4	3.2
31	2.5	---	12	26	---	9.1	---	3.4	---	3.3	3.3	---
TOTAL	88.5	197.3	360.0	396.9	163.8	289.3	217.6	118.9	103.2	98.9	106.3	107.5
MEAN	2.85	6.58	11.6	12.8	5.85	9.33	7.25	3.84	3.44	3.19	3.43	3.58
MAX	11	21	34	38	24	29	22	5.6	5.8	3.5	6.8	6.3
MIN	2.4	2.0	2.9	1.8	3.7	4.0	3.9	3.4	2.5	2.6	3.1	2.8
AC-FT	176	391	714	787	325	574	432	236	205	196	211	213
CFSM	0.60	1.39	2.46	2.71	1.24	1.97	1.53	0.81	0.73	0.67	0.72	0.76
IN.	0.70	1.55	2.83	3.12	1.29	2.28	1.71	0.94	0.81	0.78	0.84	0.85

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

MEAN	4.18	7.28	7.79	7.96	6.73	5.62	4.35	3.15	2.98	2.38	2.52	2.93
MAX	8.60	16.8	15.5	16.3	15.1	12.4	10.3	5.73	5.30	4.58	5.17	6.92
(WY)	(1998)	(1991)	(1997)	(1990)	(1999)	(1972)	(1991)	(1997)	(1997)	(1983)	(2001)	(1978)
MIN	1.57	2.53	3.54	2.80	1.72	2.22	2.09	1.72	1.40	1.33	1.12	1.24
(WY)	(1973)	(1977)	(1977)	(1962)	(1993)	(1992)	(1977)	(1965)	(1969)	(1969)	(1969)	(1989)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	2,111.1		2,248.2			
ANNUAL MEAN	5.78		6.16		4.79	
HIGHEST ANNUAL MEAN					8.15	1997
LOWEST ANNUAL MEAN					2.61	1962
HIGHEST DAILY MEAN	42	Jan 7	38	Jan 26	166	Jan 9, 1990
LOWEST DAILY MEAN	1.9	Aug 19	1.8	Jan 19	0.50	Sep 1, 1972
ANNUAL SEVEN-DAY MINIMUM	2.0	Aug 13	2.4	Oct 28	0.71	Aug 30, 1972
ANNUAL RUNOFF (AC-FT)	4,190		4,460		3,470	
ANNUAL RUNOFF (CFSM)	1.22		1.30		1.01	
ANNUAL RUNOFF (INCHES)	16.60		17.68		13.75	
10 PERCENT EXCEEDS	14		14		10	
50 PERCENT EXCEEDS	3.3		3.6		2.7	
90 PERCENT EXCEEDS	2.2		2.6		1.5	

12091300 LEACH CREEK NEAR STEILACOOM, WA

LOCATION.--Lat 47°11'54", long 122°31'17", in NW ¼ NW ¼ sec.26, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank 0.3 mi upstream from mouth, and 4.1 mi northeast of Steilacoom.

DRAINAGE AREA.--6.56 mi^2, includes 0.68 mi^2 storm drainage from Flett Creek basin. Area used prior to July 1967, 5.88 mi^2.

PERIOD OF RECORD.--February 1957 to September 1985, October 1985 to September 1992 (seasonal records), October 1992 to current year.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 140 ft above NGVD of 1929 (levels by U.S. Geological Survey National Mapping Division). Prior to June 27, 1973, water-stage recorder at site 150 ft upstream at different datum. Supplementary water-stage recorder at site 50 ft downstream at different datum used Feb. 4, 1963, to Feb. 27, 1964. June 27, 1973, to Mar. 14, 1975, nonrecording gage at site 350 ft upstream at different datum.

REMARKS.--Records fair. Some pumping for community use upstream from gage. Since Oct. 1, 1961, flow may be regulated at flood control dam upstream from gage. Since early 1992 excess stormwater runoff pumped into Nalley Valley. Since June 30, 1993, low flows supplemented from well in basin. Drainage in basin influenced by urbanization. Chemical analyses October 1962 to September 1965, October 1975 to September 1976.

AVERAGE DISCHARGE.--39 years (water years 1958-85, 1993-2003), 10.9 ft^3/s, 7,870 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 378 ft^3/s, Jan. 18, 1986, by culvert computation of peak flow through culvert, gage height, 5.21 ft, from outside high-water mark; minimum discharge, 2.0 ft^3/s, July 3, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 81 ft^3/s, Dec. 14, Jan. 2, 26 gage height, 3.28 ft; minimum discharge, 6.0 ft^3/s, July 23.

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	6.5	7.1	7.6	34	16	8.8	12	8.4	7.4	7.8	7.2	7.2
2	6.5	7.2	7.6	46	12	8.9	16	8.4	7.4	7.7	7.2	7.1
3	12	6.9	7.6	35	11	10	19	8.7	7.4	7.6	7.1	7.2
4	7.5	6.7	9.2	39	9.9	8.8	11	10	7.4	7.6	7.1	7.2
5	6.7	7.6	7.6	14	9.4	9.2	9.6	8.6	7.4	7.6	7.3	7.2
6	6.6	18	7.6	10	8.9	9.8	12	9.0	7.4	7.7	7.3	7.2
7	6.6	10	7.6	9.1	8.9	10	19	8.2	7.4	7.6	7.2	8.0
8	6.7	11	7.6	7.8	8.8	15	11	8.1	7.4	7.6	7.2	7.4
9	7.2	13	7.6	7.6	8.8	33	21	8.0	7.4	7.6	9.5	7.3
10	6.6	11	17	7.6	9.1	13	9.5	8.0	7.4	7.5	7.6	8.2
11	6.6	8.0	36	9.4	8.7	23	9.9	8.0	7.3	7.5	7.3	11
12	6.6	22	26	27	8.6	33	10	8.0	7.3	7.5	7.3	9.5
13	6.6	10	23	11	8.7	30	32	8.0	7.8	7.9	7.4	7.8
14	6.6	16	42	19	8.6	12	11	8.0	7.5	7.6	7.3	7.7
15	6.7	8.0	35	8.0	10	11	9.3	9.8	7.6	7.6	7.5	7.7
16	6.7	15	42	7.5	27	19	9.0	8.2	7.6	7.5	7.5	8.8
17	6.7	9.2	27	7.5	18	11	8.9	7.9	7.7	7.5	7.2	9.1
18	6.7	10	19	7.4	10	11	8.7	7.7	7.7	7.4	7.3	7.2
19	6.8	17	14	7.4	11	16	8.7	7.7	7.7	7.5	7.5	8.9
20	6.8	8.6	9.7	7.4	12	14	8.7	7.8	7.6	7.4	7.6	7.2
21	6.9	7.9	9.1	23	23	26	24	8.0	9.3	7.3	7.6	7.0
22	6.9	7.7	9.1	41	11	48	9.4	7.7	8.2	7.1	7.2	7.1
23	6.9	7.6	8.8	24	9.5	12	17	7.8	7.7	7.0	7.1	7.0
24	7.0	7.6	14	29	9.1	9.6	19	7.7	7.4	7.4	7.2	6.9
25	7.0	7.6	12	19	8.8	9.3	9.3	8.1	6.9	7.4	7.3	6.8
26	6.9	7.6	22	62	8.6	16	11	7.6	7.6	7.3	7.3	6.9
27	6.9	7.6	27	32	8.5	9.3	8.8	7.6	7.7	7.2	7.3	7.1
28	7.0	7.6	12	12	11	8.8	8.7	7.6	7.8	7.2	7.3	7.2
29	7.0	7.6	14	33	---	8.8	8.6	7.5	7.7	7.2	7.3	7.2
30	6.9	7.6	22	30	---	8.8	8.4	7.5	9.0	7.2	7.2	7.1
31	6.9	---	19	49	---	15	---	7.4	---	7.3	7.2	---
TOTAL	216.0	298.7	529.7	675.7	314.9	478.1	380.5	251.0	229.1	231.3	228.6	229.2
MEAN	6.97	9.96	17.1	21.8	11.2	15.4	12.7	8.10	7.64	7.46	7.37	7.64
MAX	12	22	42	62	27	48	32	10	9.3	7.9	9.5	11
MIN	6.5	6.7	7.6	7.4	8.5	8.8	8.4	7.4	6.9	7.0	7.1	6.8
AC-FT	428	592	1,050	1,340	625	948	755	498	454	459	453	455

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

MEAN	9.78	14.2	15.1	16.4	14.8	12.7	11.0	9.00	8.15	7.11	7.15	7.89
MAX	17.4	28.9	28.7	34.4	28.1	25.2	23.0	18.3	14.5	10.6	9.91	13.7
(WY)	(1986)	(1991)	(1997)	(1990)	(1974)	(1972)	(1991)	(1984)	(1984)	(1983)	(2001)	(1997)
MIN	5.96	7.30	8.64	6.87	6.66	5.12	6.36	5.78	5.23	5.04	4.40	5.19
(WY)	(1988)	(1970)	(1977)	(1985)	(1973)	(1973)	(1973)	(1971)	(1969)	(1973)	(1969)	(1974)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	3,864.3		4,062.8			
ANNUAL MEAN	10.6		11.1		10.9	
HIGHEST ANNUAL MEAN					15.2	1997
LOWEST ANNUAL MEAN					7.50	1962
HIGHEST DAILY MEAN	54	Jan 25	62	Jan 26	250	Nov 24, 1990
LOWEST DAILY MEAN	6.5	Sep 30	6.5	Oct 1	3.6	Aug 25, 1971
ANNUAL SEVEN-DAY MINIMUM	6.6	Oct 10	6.6	Oct 10	3.8	Aug 24, 1971
ANNUAL RUNOFF (AC-FT)	7,660		8,060		7,870	
10 PERCENT EXCEEDS	18		20		18	
50 PERCENT EXCEEDS	8.0		7.9		8.2	
90 PERCENT EXCEEDS	7.1		7.0		5.8	

12091500 CHAMBERS CREEK BELOW LEACH CREEK, NEAR STEILACOOM, WA

LOCATION.--Lat 47°11'52", long 122°31'39", in NE ¼ NE ¼ sec.27, T.20 N., R.2 E., Pierce County, Hydrologic Unit 17110019, on right bank 200 ft downstream from Leach Creek, 1.5 mi downstream from outlet of Steilacoom Lake, and 4 mi northeast of Steilacoom.

DRAINAGE AREA.--104 mi^2.

PERIOD OF RECORD.--December 1937 to September 1940, July 1943 to September 1965, October 1997 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 100 ft above NGVD of 1929, from topographic map. Prior to October 1997, at several sites within 0.10 mi downstream from present site at various datums.

REMARKS.--Records fair, except estimated daily discharges, which are poor. Some diversions from tributaries for domestic use. Flow partially regulated at Steilacoom Lake and in Leach Creek Basin, see remarks for station 12091300.

AVERAGE DISCHARGE.--30 years (water years 1939-40, 1944-65, 1998-2003), 111 ft^3/s, 80,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 792 ft^3/s, Jan. 5, 1956, gage height, 3.58 ft, site and datum then in use; minimum discharge, 14 ft^3/s Aug. 15-17, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 219 ft^3/s, Jan. 31, gage height, 3.00 ft from peak stage indicator; minimum daily discharge, 29 ft^3/s, Sept. 6 & 25.

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	33	40	34	94	e170	e102	e92	e107	65	e46	e31	e30
2	33	39	34	122	e160	e94	e100	107	62	e41	e31	e30
3	40	37	34	123	e148	e96	e109	105	53	e41	e30	e30
4	40	36	35	126	e143	e97	e99	106	49	e39	e30	e30
5	35	36	35	111	e136	e94	e91	103	50	e39	e30	e30
6	34	48	34	97	e128	e98	e98	102	47	e39	e31	e29
7	34	42	34	82	e120	e104	e92	103	38	e39	e31	e34
8	34	39	34	74	e113	e115	e100	99	37	e39	e30	e31
9	34	36	33	73	e109	e123	e114	97	39	e38	e40	e30
10	34	40	42	72	e103	e120	e96	94	42	e38	e35	e34
11	34	33	65	72	e100	e130	e93	93	47	e36	e32	e40
12	33	46	59	97	e104	e140	e90	92	58	e36	e31	e36
13	33	39	60	81	e105	e150	e120	91	63	e39	e30	e32
14	35	43	87	97	e99	e138	e110	89	59	e38	e30	e31
15	42	35	93	85	e105	e116	e105	91	57	e38	e30	e31
16	45	40	113	82	e135	e114	104	92	56	e38	e31	e34
17	46	38	118	81	e125	e100	101	88	55	e38	e31	e37
18	45	35	102	e81	e115	e96	107	85	53	e37	e30	e33
19	45	46	79	e77	e110	e99	110	83	52	e37	e31	e38
20	44	36	66	e72	e115	e100	109	82	47	e37	e31	e32
21	43	34	63	e96	e130	e144	129	74	44	e34	e31	e30
22	43	34	60	e115	e125	e170	e114	69	46	e34	e30	e31
23	42	34	57	e110	e120	e148	e118	71	e49	e33	e30	e30
24	46	33	59	e115	e120	e110	e126	71	e45	e33	e30	e30
25	57	34	60	e88	e114	e108	e120	72	e45	e34	e30	e29
26	52	34	71	e150	e110	e121	121	70	e43	e33	e30	e30
27	50	34	80	e140	e105	e114	e116	70	e43	e32	e30	e30
28	47	34	67	e130	e100	e105	e114	70	e43	e31	e30	e31
29	45	34	68	e145	---	e100	e110	68	e46	e31	e30	e31
30	43	34	77	e158	---	e92	e109	67	e50	e31	e30	e32
31	41	---	78	e180	---	e100	---	66	---	e31	e30	---
TOTAL	1,262	1,123	1,931	3,226	3,367	3,538	3,217	2,677	1,483	1,130	957	956
MEAN	40.7	37.4	62.3	104	120	114	107	86.4	49.4	36.5	30.9	31.9
MAX	57	48	118	180	170	170	129	107	65	46	40	40
MIN	33	33	33	72	99	92	90	66	37	31	30	29
AC-FT	2,500	2,230	3,830	6,400	6,680	7,020	6,380	5,310	2,940	2,240	1,900	1,900
CFSM	0.39	0.36	0.60	1.00	1.16	1.10	1.03	0.83	0.48	0.35	0.30	0.31
IN.	0.45	0.40	0.69	1.15	1.20	1.27	1.15	0.96	0.53	0.40	0.34	0.34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2003, BY WATER YEAR (WY)

MEAN	54.2	70.6	127	183	210	198	152	116	83.8	60.4	48.5	46.4
MAX	96.9	111	357	496	499	448	270	201	126	101	94.6	79.7
(WY)	(1998)	(1998)	(1956)	(1956)	(1951)	(1950)	(1950)	(1948)	(1948)	(1948)	(1948)	(1948)
MIN	36.0	37.4	40.5	43.7	72.1	73.2	63.1	60.4	49.4	36.5	30.9	31.9
(WY)	(1953)	(2003)	(1945)	(1945)	(2001)	(2001)	(1944)	(1944)	(2003)	(2003)	(2003)	(2003)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1938 - 2003	
ANNUAL TOTAL	37,670		24,867			
ANNUAL MEAN	103		68.1		111	
HIGHEST ANNUAL MEAN					184	1951
LOWEST ANNUAL MEAN					59.3	1944
HIGHEST DAILY MEAN	288	Mar 20	180	Jan 31	650	Feb 13, 1951
LOWEST DAILY MEAN	33	Oct 1	29	Sep 6	14	Aug 16, 1965
ANNUAL SEVEN-DAY MINIMUM	34	Sep 26	30	Aug 31	26	Aug 13, 1965
ANNUAL RUNOFF (AC-FT)	74,720		49,320		80,200	
ANNUAL RUNOFF (CFSM)	0.99		0.66		1.06	
ANNUAL RUNOFF (INCHES)	13.47		8.89		14.46	
10 PERCENT EXCEEDS	210		120		218	
50 PERCENT EXCEEDS	75		53		83	
90 PERCENT EXCEEDS	35		31		41	

e Estimated