14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA

Lower Columbia Basin
Lower Cowlitz Subbasin

LOCATION.--Lat 46°19′20″, long 122°41′45″ referenced to North American Datum of 1927, in SE ¼ NW ¼ sec.29, T.10 N., R.1 E., Cowlitz County, WA, 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, 1.3 mi southeast of Toutle, and approximately 1.0 mi upstream from mouth.

DRAINAGE AREA.--120 mi^2.

SURFACE-WATER 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 FOR PERIOD OF RECORD.--28 years (water years 1940-57, 1997-2006), 624 ft^3/s, 70.64 in/yr, 452,000 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 ft^3/s Feb. 8, 1996; minimum discharge, 61 ft^3/s Sept. 3-6, 2003.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 9, 1990, produced discharge of 19,200 ft^3/s as recorded at station 14241490, 2.2 mi upstream. A flood believed to be in excess of 100,000 ft^3/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 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 10	0730	*8,690	*27.22
Jan 13	0730	4,620	25.36
Jan 30	1030	7,130	26.58

Minimum discharge, 65 ft^3/s, Sep 12, 13, 30, gage height, 20.49 ft.

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	169	1,320	420	1,950	2,660	1,170	686	619	512	165	101	77
2	156	958	596	1,670	2,500	977	622	539	764	160	99	72
3	179	1,230	513	1,370	2,300	798	621	497	633	156	97	70
4	125	1,600	420	1,180	2,800	693	650	475	709	154	94	70
5	108	1,470	373	1,040	2,280	638	612	474	726	153	92	70
6	100	1,340	352	1,660	1,730	621	569	491	600	153	89	69
7	106	1,030	326	2,390	1,380	696	527	511	516	148	88	68
8	108	776	301	2,080	1,160	759	776	505	459	140	86	69
9	111	617	281	2,870	1,000	822	886	444	441	135	91	70
10	102	539	274	7,050	878	713	778	417	398	135	96	70
11	98	621	296	5,490	780	635	687	420	354	134	91	68
12	94	788	295	3,260	682	581	649	417	363	141	89	67
13	108	1,170	285	4,070	653	541	644	390	441	165	86	66
14	105	1,140	270	3,150	614	531	1,590	371	392	136	85	68
15	148	872	254	2,210	e560	521	1,600	411	413	129	83	74
16	169	704	245	1,810	e510	630	1,350	521	391	125	83	75
17	142	596	234	2,970	e460	712	1,110	551	359	121	86	73
18	125	529	232	e2,200	402	689	946	547	326	119	83	81
19	141	497	255	e1,700	384	621	840	514	301	116	80	103
20	167	475	357	2,140	373	568	781	458	279	113	78	86
21	144	433	790	1,790	384	533	802	406	262	111	78	113
22	126	391	2,340	1,420	393	665	730	501	249	110	78	89
23	118	360	1,810	1,150	512	697	671	492	235	110	79	79
24	115	340	1,520	1,020	518	840	635	510	223	105	81	75
25	111	647	1,200	952	434	793	612	459	212	104	81	71
26	156	648	1,440	946	411	684	601	521	202	104	77	69
27	136	495	1,730	935	932	613	577	642	193	103	74	e69
28	195	422	2,260	1,570	1,390	586	622	882	187	103	73	68
29	271	472	2,010	1,950	---	e570	765	840	181	102	73	67
30	250	451	2,050	5,610	---	e530	729	643	173	105	83	67
31	1,190	---	2,280	3,290	---	583	---	531	---	109	84	---
Total	5,373	22,931	26,009	72,893	29,080	21,010	23,668	15,999	11,494	3,964	2,638	2,233
Mean	173	764	839	2,351	1,039	678	789	516	383	128	85.1	74.4
Max	1,190	1,600	2,340	7,050	2,800	1,170	1,600	882	764	165	101	113
Min	94	340	232	935	373	521	527	371	173	102	73	66
Ac-ft	10,660	45,480	51,590	144,600	57,680	41,670	46,950	31,730	22,800	7,860	5,230	4,430
Cfsm	1.44	6.37	6.99	19.6	8.65	5.65	6.57	4.30	3.19	1.07	0.71	0.62
In.	1.67	7.11	8.06	22.60	9.01	6.51	7.34	4.96	3.56	1.23	0.82	0.69

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2006, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	361	858	1,151	1,081	1,053	830	753	635	405	189	119	136
Max	1,222	1,655	2,031	2,488	2,451	1,647	1,142	1,097	772	414	231	409
(WY)	(1998)	(1956)	(1997)	(1953)	(1996)	(1950)	(1996)	(1948)	(1955)	(1955)	(2004)	(1941)
Min	75.3	106	389	318	272	297	257	211	132	97.2	77.5	74.4
(WY)	(1953)	(1953)	(1945)	(2001)	(2005)	(1941)	(1941)	(1947)	(1940)	(1940)	(2003)	(2006)

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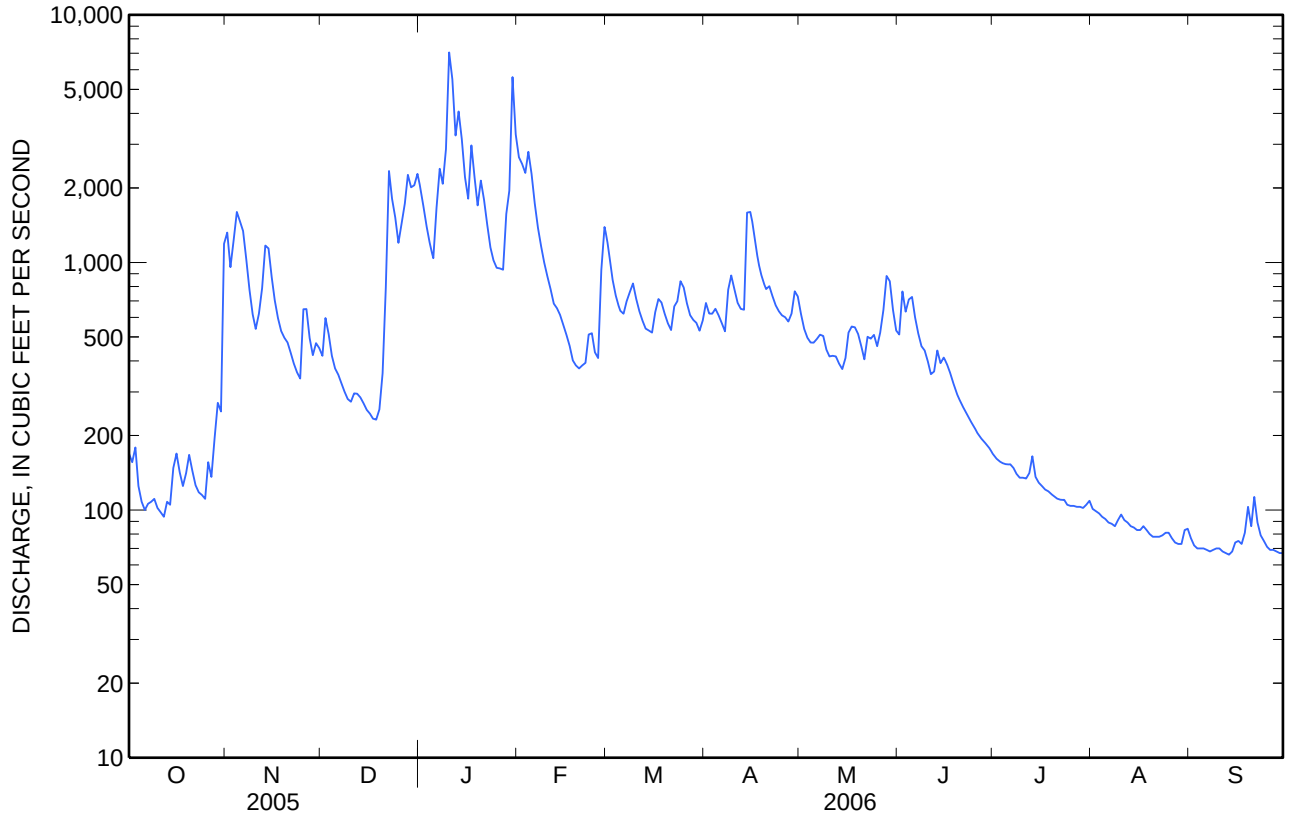
SUMMARY STATISTICS

	Calendar Year 2005		Water Year 2006		Water Years 1940 - 2006	
Annual total	171,128		237,292			
Annual mean	469		650		624	
Highest annual mean					928	1997
Lowest annual mean					317	2001
Highest daily mean	4,570	Mar 27	7,050	Jan 10	17,400	Feb 8, 1996
Lowest daily mean	76	Sep 29	66	Sep 13	62	Sep 4, 2003
Annual seven-day minimum	78	Sep 23	68	Sep 7	64	Aug 31, 2003
Annual runoff (ac-ft)	339,400		470,700		452,000	
Annual runoff (cfsm)	3.91		5.42		5.20	
Annual runoff (inches)	53.05		73.56		70.64	
10 percent exceeds	1,050		1,590		1,320	
50 percent exceeds	290		451		422	
90 percent exceeds	95		81		98	



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 September 2005. Water years 1999, 2006, 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 October 1999 to current year.

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 RECORD.--
SEDIMENT CONCENTRATION: Maximum daily, 18,000 mg/L (estimated), Oct. 4, 1997; minimum daily , 1 mg/L, on many days 1996, 1998-2005.
SEDIMENT DISCHARGE: Maximum daily, 356,000 tons, Jan. 1, 1997; minimum daily, 0.23 tons, Sept. 25-29, 2005.

EXTREMES FOR PERIOD OCTOBER TO MARCH.--
SEDIMENT CONCENTRATION: Maximum daily, 3,120 mg/L, Jan. 10; minimum daily, 1 mg/L, Oct. 24, 25.
SEDIMENT DISCHARGE: Maximum daily, 60,500 tons, Jan. 10; minimum daily, .41 tons, Oct. 24.

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
[e, estimated]

Day	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)
		October			November			December	
1	169	16	7.9	1,320	219	872	420	10	11
2	156	16	7.8	958	81	217	596	18	29
3	179	21	11	1,230	220	946	513	14	19
4	125	9	3.1	1,600	207	916	420	11	12
5	108	6	1.9	1,470	99	396	373	9	9.4
6	100	5	1.3	1,340	66	245	352	8	7.5
7	106	5	1.5	1,030	30	85	326	7	6.3
8	108	5	1.5	776	17	36	301	7	5.3
9	111	6	1.8	617	10	17	281	6	4.5
10	102	5	1.5	539	9	13	274	6	4.2
11	98	4	1.2	621	17	33	296	7	5.4
12	94	3	0.88	788	22	49	295	6	5.1
13	108	7	2.2	1,170	83	271	285	6	4.5
14	105	7	2.0	1,140	63	197	270	5	3.8
15	148	13	5.9	872	31	74	254	5	3.2
16	169	19	8.8	704	23	44	245	4	2.7
17	142	14	5.3	596	17	27	234	4	2.2
18	125	12	4.0	529	10	15	232	9	5.5
19	141	12	4.7	497	7	9.0	255	18	13
20	167	13	5.7	475	6	7.9	357	37	38
21	144	8	3.2	433	6	6.6	790	198	549
22	126	5	1.7	391	5	5.5	2,340	933	6,200
23	118	3	0.84	360	5	4.5	1,810	322	1,660
24	115	1	0.41	340	5	4.2	1,520	140	595
25	111	1	0.45	647	19	38	1,200	56	185
26	156	9	3.7	648	16	29	1,440	102	426
27	136	3	1.1	495	11	15	1,730	123	585
28	195	18	11	422	9	10	2,260	244	1,730
29	271	50	39	472	11	14	2,010	147	813
30	250	36	24	451	11	14	2,050	225	1,250
31	1,190	250	1,170	---	---	---	2,280	152	933
Total	5,373	---	1,335.38	22,931	---	4,610.7	26,009	---	15,117.6

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
[e, estimated]

Day	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)
		January			February			March	
1	1,950	82	434	2,660	385	2,770	1,170	68	219
2	1,670	51	231	2,500	397	2,680	977	43	115
3	1,370	32	121	2,300	214	1,360	798	30	65
4	1,180	24	77	2,800	232	1,780	693	18	35
5	1,040	23	67	2,280	115	729	638	11	19
6	1,660	111	532	1,730	55	259	621	12	20
7	2,390	142	930	1,380	26	99	696	17	32
8	2,080	112	631	1,160	19	59	759	32	75
9	2,870	626	5,590	1,000	16	44	822	36	81
10	7,050	3,120	60,500	878	14	33	713	23	44
11	5,490	2,370	35,700	780	11	24	635	16	28
12	3,260	1,620	14,400	682	9	17	581	11	17
13	4,070	1,820	20,100	653	7	13	541	7	9.9
14	3,150	1,120	9,710	614	7	11	531	6	8.1
15	2,210	505	3,060	e560	e6	e9.1	521	5	6.4
16	1,810	208	1,020	e510	e6	e8.3	630	13	23
17	2,970	487	4,040	e460	e5	e6.2	712	9	17
18	e2,200	e196	e1,160	402	5	5.1	689	9	16
19	e1,700	e82	e376	384	4	4.3	621	7	11
20	2,140	92	539	373	4	3.7	568	5	8.1
21	1,790	69	338	384	4	3.8	533	5	6.8
22	1,420	37	142	393	4	3.9	665	13	24
23	1,150	14	44	512	15	24	697	9	18
24	1,020	3	7.8	518	26	37	840	33	76
25	952	13	35	434	17	19	793	18	40
26	946	14	35	411	13	14	684	10	19
27	935	11	27	932	59	188	613	8	13
28	1,570	50	224	1,390	121	473	586	6	9.5
29	1,950	126	897	---	---	---	e570	4	6.8
30	5,610	1,430	22,700	---	---	---	e530	4	5.6
31	3,290	688	6,310	---	---	---	583	8	12
Total	72,893	---	189,977.8	29,080	---	10,677.4	21,010	---	1,080.2

Month	Total Mean Discharge (ft³/s)	Total Sediment Discharge (tons/day)
April	23,700	3,000
May	16,000	450
June	11,500	400
July	3,960	37
August	2,640	20
September	2,230	21