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 mi^2. 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 mi^2 was noncontributing. From July 7, 1981 (Coldwater Lake, station 14240446, release) to October 1981, the noncontributing portion was approximately 21 mi^2. From October 1981 (Coldwater Lake release) to November 1982, the noncontributing portion was approximately 19.7 mi^2. 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 ft^3/s, 57.23 in/yr, 1,514,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,800 ft^3/s, Feb. 8, 1996, gage height, 24.91 ft; maximum gage height, 28.03 ft Dec. 3, 1982; minimum daily, 243 ft^3/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 ft^3/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 ft^3/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	1997
LOWEST ANNUAL MEAN					1,168	2001
HIGHEST DAILY MEAN	15,800	Jan 8	24,100	Jan 31	48,300	Feb 8, 1996
LOWEST DAILY MEAN	289	Nov 3	256	Sep 29	243	Oct 14, 1987
ANNUAL SEVEN-DAY MINIMUM	296	Oct 31	271	Sep 24	248	Oct 10, 1987
ANNUAL RUNOFF (AC-FT)	1,338,000		1,277,000		1,514,000	
ANNUAL RUNOFF (CFSM)	3.73		3.56		4.21	
ANNUAL RUNOFF (INCHES)	50.59		48.30		57.23	
10 PERCENT EXCEEDS	3,820		3,890		4,160	
50 PERCENT EXCEEDS	1,520		1,010		1,620	
90 PERCENT EXCEEDS	342		313		392	

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 concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)
		OCTOBER			NOVEMBER			DECEMBER	
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

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 concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)
		JANUARY			FEBRUARY			MARCH	
1	3,240	e960	e9,300	17,900	3,910	197,000	1,740	195	921
2	4,090	e1,200	e13,000	10,600	2,400	69,100	1,640	167	738
3	5,510	e2,300	e36,000	7,960	1,730	37,400	1,750	199	946
4	5,670	e2,400	e41,000	5,980	1,160	19,000	1,580	137	585
5	5,830	e1,400	e23,000	4,530	783	9,680	1,700	409	2,110
6	4,220	e770	e8,800	3,500	576	5,460	2,720	945	7,100
7	3,340	e490	e4,400	2,940	499	3,970	3,280	829	7,390
8	2,780	437	3,280	2,560	461	3,180	3,360	704	6,390
9	2,380	392	2,520	2,270	406	2,490	4,650	1,990	26,300
10	2,090	360	2,030	2,090	397	2,240	5,030	1,370	18,800
11	1,890	341	1,740	1,910	383	1,980	4,640	855	10,700
12	2,180	477	2,850	1,770	358	1,710	7,150	3,150	65,200
13	2,080	406	2,280	1,660	277	1,240	9,790	5,070	136,000
14	2,300	433	2,700	1,560	243	1,020	8,440	3,770	86,900
15	2,030	274	1,510	1,550	240	1,000	6,990	2,980	56,400
16	1,830	237	1,180	1,790	415	2,030	5,860	2,010	32,100
17	1,700	201	921	2,190	712	4,380	4,720	1,500	19,200
18	1,600	167	724	2,580	656	4,800	3,930	1,330	14,100
19	1,530	159	657	2,230	284	1,710	3,410	1,140	10,500
20	1,460	156	614	2,390	421	2,740	3,600	1,210	11,800
21	1,420	153	587	3,120	841	7,220	4,620	1,790	23,200
22	1,650	189	872	3,810	1,220	12,600	7,880	3,870	84,000
23	2,350	504	3,230	3,370	767	7,020	6,800	2,230	41,400
24	2,550	438	3,070	2,830	551	4,230	5,190	1,380	19,600
25	2,480	310	2,080	2,440	365	2,410	4,280	737	8,560
26	5,510	3,130	50,900	2,220	353	2,120	4,440	790	9,490
27	5,320	1,540	22,600	2,010	294	1,600	4,120	624	6,990
28	4,070	783	8,700	1,860	236	1,180	3,620	456	4,480
29	3,670	673	6,810	---	---	---	3,130	334	2,820
30	4,990	1,190	16,200	---	---	---	2,830	327	2,500
31	24,100	7,040	481,000	---	---	---	2,910	398	3,150
TOTAL	115,860	---	754,555	101,620	---	410,510	135,800	---	720,370
		APRIL			MAY			JUNE	
1	2,980	381	3,070	2,160	247	1,440	1,190	120	388
2	2,800	321	2,440	2,040	211	1,160	1,120	97	294
3	2,640	253	1,810	1,960	180	953	1,060	76	219
4	2,430	251	1,660	2,150	245	1,440	1,020	71	195
5	2,360	263	1,670	2,350	385	2,470	1,010	69	187
6	2,530	384	2,630	2,060	288	1,600	1,010	132	355
7	2,670	486	3,620	1,890	239	1,220	1,010	892	2,370
8	2,960	560	4,510	1,820	205	1,010	996	100	267
9	3,530	1,150	11,100	1,670	186	838	966	88	228
10	3,290	714	6,360	1,620	167	733	931	76	190
11	3,200	585	5,050	1,550	149	621	887	64	152
12	3,390	794	7,310	1,540	130	540	851	53	121
13	4,460	1,530	18,800	1,520	111	456	870	100	238
14	3,870	889	9,410	1,490	115	463	891	110	267
15	3,260	536	4,730	1,580	180	775	812	61	134
16	2,850	462	3,560	1,710	286	1,320	759	50	102
17	2,750	466	3,470	1,670	202	914	739	42	83
18	2,670	406	2,930	1,600	148	642	736	34	68
19	2,350	362	2,300	1,460	107	423	749	28	57
20	2,160	319	1,860	1,380	77	286	738	27	54
21	2,600	622	4,660	1,350	65	238	825	72	162
22	2,640	508	3,630	1,350	64	232	1,000	244	682
23	2,630	499	3,570	1,410	88	336	854	83	193
24	3,230	874	7,670	1,540	139	582	772	37	77
25	2,820	636	4,860	1,690	274	1,260	719	22	43
26	2,660	484	3,490	1,500	201	820	685	23	43
27	2,410	350	2,290	1,350	128	468	674	28	51
28	2,160	263	1,540	1,360	104	383	668	33	59
29	2,230	349	2,130	1,370	115	426	652	38	66
30	2,200	293	1,740	1,310	121	429	641	43	75
31	---	---	---	1,300	128	449	---	---	---
TOTAL	84,730	---	133,870	50,750	---	24,927	25,835	---	7,420

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 concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)	Mean discharge (cfs)	Mean concen-tration (mg/l)	Load (tons/day)
		JULY			AUGUST			SEPTEMBER	
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