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

Lower Columbia Basin
Lower Cowlitz Subbasin

LOCATION.--Lat 46°20′02″, long 122°50′20″ referenced to North American Datum of 1927, in NW ¼ SW ¼ sec.20, T.10 N., R.1 W., Cowlitz County, WA, 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 to October 1981, the Coldwater Lake release, approximately 21 mi^2, was noncontributing. From October 1981 to November 1982, the Castle Lake release, approximately 19.7 mi^2, was noncontributing. Since November 1982, all areas, including the Spirit Lake release, are effectively contributing.

SURFACE-WATER 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 water-quality data available from USGS Washington Water Science Center for this station.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--25 years (water years 1982-2006), 2,060 ft^3/s, 56.44 in/yr, 1,493,000 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 (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 11	0300	*22,200	*13.69
Jan 14	0445	11,800	10.11
Jan 17	0715	11,100	9.87
Jan 30	0930	18,400	12.47

Minimum discharge, 342 ft^3/s, Sep 29, 30, gage height, 3.34 ft.

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

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

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	697	3,640	1,720	6,100	8,730	3,400	2,210	2,200	1,910	814	509	393
2	528	3,100	2,440	5,530	7,720	3,000	2,050	1,940	2,690	794	498	377
3	618	2,880	2,300	4,680	7,130	2,570	1,960	1,790	2,490	776	490	371
4	484	4,100	1,900	4,120	8,420	2,340	2,030	1,710	2,590	764	482	370
5	432	3,910	1,650	3,540	6,950	2,160	1,950	1,710	2,810	759	476	368
6	407	3,560	1,500	4,930	5,450	2,080	1,870	1,760	2,390	757	468	367
7	428	3,010	1,360	6,560	4,450	2,310	1,780	1,850	2,100	738	461	363
8	440	2,470	1,230	6,240	3,840	2,540	2,250	1,900	1,900	698	453	364
9	434	2,020	1,120	7,060	3,330	3,060	2,730	1,680	1,820	673	463	366
10	412	1,750	1,070	17,300	2,920	2,730	2,460	1,560	1,660	664	484	369
11	406	1,940	1,090	18,800	2,580	2,490	2,270	1,560	1,530	667	470	363
12	389	2,700	1,100	12,700	2,330	2,260	2,170	1,560	1,540	674	461	357
13	418	3,120	1,060	12,700	2,230	2,080	2,090	1,480	1,830	752	448	354
14	446	3,220	999	10,400	2,140	2,000	4,070	1,420	1,660	676	437	357
15	462	2,680	951	7,640	1,950	1,960	4,430	1,520	1,680	640	429	375
16	525	2,270	915	6,380	1,810	2,050	3,940	2,070	1,620	620	428	378
17	487	1,980	875	9,100	1,640	2,190	3,350	2,310	1,540	602	433	371
18	479	1,770	820	7,120	1,500	2,160	3,000	2,380	1,400	590	426	392
19	526	1,660	926	5,940	1,450	1,980	2,650	2,250	1,300	581	418	459
20	610	1,640	1,190	6,980	1,410	1,860	2,470	2,020	1,210	568	409	431
21	587	1,530	2,010	6,080	1,460	1,750	2,560	1,800	1,150	557	404	455
22	529	1,420	4,730	5,020	1,510	1,880	2,370	1,970	1,110	551	405	427
23	506	1,310	4,880	4,210	1,840	1,890	2,190	2,010	1,070	554	376	388
24	498	1,240	5,010	3,700	2,080	2,210	2,090	2,020	1,030	536	379	376
25	484	2,060	4,360	3,440	1,690	2,230	2,030	2,000	1,010	528	409	366
26	552	2,460	4,570	3,430	1,580	1,990	2,010	1,910	995	527	396	359
27	539	1,900	5,030	3,290	2,470	1,830	1,970	2,190	976	521	388	354
28	599	1,650	5,920	4,740	3,720	1,780	2,040	2,630	943	517	383	350
29	740	1,860	5,840	5,840	---	1,760	2,450	2,780	893	513	381	347
30	733	1,860	5,960	15,100	---	1,720	2,570	2,260	850	518	406	345
31	2,490	---	6,840	10,400	---	1,840	---	1,940	---	532	416	---
Total	17,885	70,710	81,366	229,070	94,330	68,100	74,010	60,180	47,697	19,661	13,486	11,312
Mean	577	2,357	2,625	7,389	3,369	2,197	2,467	1,941	1,590	634	435	377
Max	2,490	4,100	6,840	18,800	8,730	3,400	4,430	2,780	2,810	814	509	459
Min	389	1,240	820	3,290	1,410	1,720	1,780	1,420	850	513	376	345
Ac-ft	35,470	140,300	161,400	454,400	187,100	135,100	146,800	119,400	94,610	39,000	26,750	22,440
Cfsm	1.16	4.75	5.29	14.9	6.79	4.43	4.97	3.91	3.21	1.28	0.88	0.76
In.	1.34	5.30	6.10	17.18	7.07	5.11	5.55	4.51	3.58	1.47	1.01	0.85

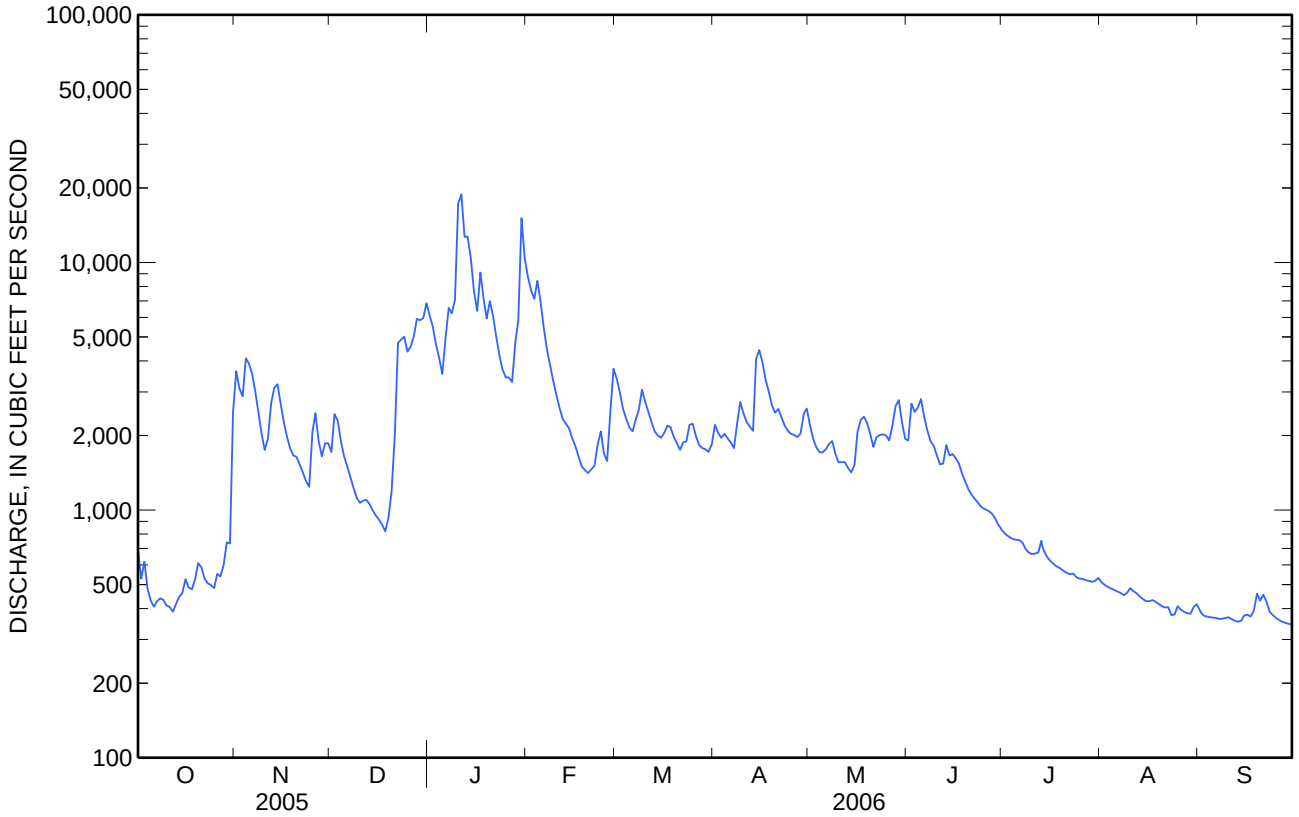
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 2006, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	930	2,739	3,363	3,557	3,326	2,873	2,644	2,078	1,547	793	491	470
Max	2,931	5,290	6,954	7,389	7,754	5,500	4,697	3,192	2,643	1,653	891	1,159
(WY)	(1998)	(1996)	(1997)	(2006)	(1996)	(1997)	(1991)	(1999)	(1990)	(1983)	(2004)	(2004)
Min	310	418	1,350	1,167	1,053	1,315	1,521	1,226	539	412	306	277
(WY)	(1988)	(1994)	(2001)	(2001)	(2005)	(1992)	(2004)	(1992)	(1992)	(1992)	(1992)	(1989)

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

SUMMARY STATISTICS

	Calendar Year 2005		Water Year 2006		Water Years 1981 - 2006	
Annual total	579,648		787,807			
Annual mean	1,588		2,158		2,060	
Highest annual mean					3,118	1997
Lowest annual mean					1,168	2001
Highest daily mean	10,200	Jan 18	18,800	Jan 11	48,300	Feb 8, 1996
Lowest daily mean	348	Sep 29	345	Sep 30	243	Oct 14, 1987
Annual seven-day minimum	364	Sep 23	357	Sep 24	248	Oct 10, 1987
Annual runoff (ac-ft)	1,150,000		1,563,000		1,493,000	
Annual runoff (cfsm)	3.20		4.35		4.15	
Annual runoff (inches)	43.47		59.09		56.44	
10 percent exceeds	3,280		4,730		4,090	
50 percent exceeds	1,100		1,720		1,600	
90 percent exceeds	420		406		400	



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 daily, 1 mg/L, Oct. 3, 1989.

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

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily, 6,430 mg/L, Jan. 30; minimum daily, 3 mg/L, Oct. 12.

SEDIMENT DISCHARGE: Maximum daily, 307,000 tons, Jan. 11; minimum daily, 3.5 tons, Oct. 12.

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, 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	697	e86	e168	3,640	1,100	11,600	1,720	63	291
2	528	e48	e69	3,100	587	5,240	2,440	166	1,150
3	618	e72	e124	2,880	490	4,490	2,300	92	578
4	484	e25	e33	4,100	873	9,810	1,900	61	316
5	432	e14	e17	3,910	591	6,290	1,650	33	147
6	407	e7	e7.5	3,560	381	3,710	1,500	28	114
7	428	e8	e9.3	3,010	239	1,950	1,360	26	95
8	440	e9	e10	2,470	157	1,060	1,230	20	67
9	434	e9	e10	2,020	104	570	1,120	16	49
10	412	e6	e6.9	1,750	84	400	1,070	17	49
11	406	e5	e5.4	1,940	120	645	1,090	26	75
12	389	e3	e3.5	2,700	304	2,250	1,100	24	73
13	418	e5	e6.2	3,120	340	2,920	1,060	14	41
14	446	6	7.7	3,220	302	2,640	999	13	34
15	462	7	8.9	2,680	174	1,270	951	13	32
16	525	22	31	2,270	106	649	915	12	30
17	487	30	39	1,980	e93	e498	875	10	25
18	479	17	22	1,770	e89	e425	820	13	29
19	526	16	24	1,660	e88	e395	926	56	143
20	610	31	52	1,640	e83	e368	1,190	127	413
21	587	24	38	1,530	e74	e305	2,010	246	1,420
22	529	12	18	1,420	e64	e246	4,730	1,630	21,500
23	506	8	11	1,310	e55	e194	4,880	1,030	14,100
24	498	7	8.9	1,240	e48	e161	5,010	941	12,800
25	484	5	7.0	2,060	e149	e977	4,360	672	7,930
26	552	10	15	2,460	e140	e957	4,570	627	7,950
27	539	13	19	1,900	e74	e381	5,030	535	7,260
28	599	15	27	1,650	55	245	5,920	1,470	26,000
29	740	35	71	1,860	75	381	5,840	1,410	22,400
30	733	32	65	1,860	79	396	5,960	1,270	20,400
31	2,490	1,320	13,500	---	---	---	6,840	1,410	26,100
Total	17,885	---	14,434.3	70,710	---	61,423	81,366	---	171,611

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, 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	6,100	941	15,600	8,730	2,600	61,500	3,400	e1,080	e9,920
2	5,530	702	10,500	7,720	2,110	43,900	3,000	e889	e7,210
3	4,680	486	6,180	7,130	1,770	34,300	2,570	e712	e4,950
4	4,120	351	3,950	8,420	3,010	70,400	2,340	e561	e3,550
5	3,540	257	2,470	6,950	2,090	39,700	2,160	e456	e2,660
6	4,930	609	8,520	5,450	1,500	22,300	2,080	498	2,810
7	6,560	869	15,700	4,450	1,060	12,900	2,310	e736	e4,600
8	6,240	728	12,400	3,840	847	8,780	2,540	e901	e6,770
9	7,060	984	20,600	3,330	721	6,500	3,060	882	7,410
10	17,300	5,040	245,000	2,920	610	4,810	2,730	e582	e4,300
11	18,800	5,950	307,000	2,580	531	3,700	2,490	e381	e2,570
12	12,700	3,630	126,000	2,330	454	2,860	2,260	e301	e1,840
13	12,700	3,650	125,000	2,230	377	2,270	2,080	e260	e1,460
14	10,400	2,770	78,700	2,140	305	1,760	2,000	e219	e1,180
15	7,640	2,120	44,000	1,950	265	1,400	1,960	e179	e944
16	6,380	e1,460	e25,100	1,810	230	1,120	2,050	e394	e2,270
17	9,100	e2,030	e51,200	1,640	196	872	2,190	e296	e1,750
18	7,120	e1,360	e26,200	1,500	187	760	2,160	e193	e1,120
19	5,940	e1,100	e17,700	1,450	183	719	1,980	e189	e1,010
20	6,980	e1,730	e33,700	1,410	166	632	1,860	e186	e932
21	6,080	e1,180	e19,500	1,460	154	607	1,750	e184	e870
22	5,020	e930	e12,600	1,510	183	749	1,880	e391	e2,000
23	4,210	798	9,100	1,840	479	2,560	1,890	e366	e1,870
24	3,700	735	7,340	2,080	705	4,110	2,210	e904	e5,480
25	3,440	738	6,860	1,690	316	1,450	2,230	e720	e4,370
26	3,430	978	9,070	1,580	174	746	1,990	e398	e2,140
27	3,290	791	7,020	2,470	762	6,010	1,830	e276	e1,360
28	4,740	1,990	27,300	3,720	1,280	13,200	1,780	175	843
29	5,840	2,000	34,300	---	---	---	1,760	135	643
30	15,100	6,430	270,000	---	---	---	1,720	111	515
31	10,400	3,280	92,900	---	---	---	1,840	e347	e1,730
Total	229,070	---	1,671,510	94,330	---	350,615	68,100	---	91,077

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, 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)
		April			May			June	
1	2,210	1,480	8,910	2,200	e638	e3,800	1,910	e181	e936
2	2,050	e748	e4,180	1,940	e545	e2,860	2,690	588	4,390
3	1,960	e349	e1,840	1,790	e468	e2,260	2,490	540	3,670
4	2,030	e238	e1,310	1,710	e414	e1,910	2,590	665	4,800
5	1,950	e184	e974	1,710	e407	e1,880	2,810	e768	e5,880
6	1,870	e131	e660	1,760	e423	e2,010	2,390	e349	e2,260
7	1,780	e77	e370	1,850	e505	e2,520	2,100	e288	e1,630
8	2,250	e1,210	e8,490	1,900	455	2,350	1,900	e254	e1,300
9	2,730	1,310	9,830	1,680	361	1,640	1,820	e220	e1,080
10	2,460	e520	e3,460	1,560	320	1,350	1,660	e186	e836
11	2,270	e292	e1,800	1,560	315	1,320	1,530	e152	e631
12	2,170	e166	e975	1,560	317	1,330	1,540	e142	e592
13	2,090	e154	e873	1,480	303	1,220	1,830	e407	e2,020
14	4,070	e2,160	e26,100	1,420	262	1,010	1,660	286	1,280
15	4,430	e2,900	e34,700	1,520	323	1,330	1,680	194	874
16	3,940	e1,700	e18,400	2,070	1,080	6,160	1,620	112	494
17	3,350	1,090	9,900	2,310	1,260	7,890	1,540	91	378
18	3,000	1,130	9,170	2,380	1,590	10,400	1,400	83	313
19	2,650	800	5,750	2,250	967	5,870	1,300	75	262
20	2,470	652	4,360	2,020	1,020	5,620	1,210	67	218
21	2,560	e1,020	e7,110	1,800	496	2,420	1,150	59	182
22	2,370	e935	e6,000	1,970	496	2,730	1,110	52	154
23	2,190	e694	e4,120	2,010	292	1,590	1,070	52	151
24	2,090	468	2,650	2,020	335	1,830	1,030	54	151
25	2,030	314	1,720	2,000	437	2,270	1,010	90	246
26	2,010	257	1,390	1,910	259	1,340	995	196	525
27	1,970	267	1,410	2,190	363	2,150	976	144	380
28	2,040	633	3,510	2,630	991	7,070	943	123	314
29	2,450	1,260	8,280	2,780	e526	e3,990	893	152	366
30	2,570	1,080	7,560	2,260	e314	e1,930	850	187	430
31	---	---	---	1,940	e214	e1,130	---	---	---
Total	74,010	---	195,802	60,180	---	93,180	47,697	---	36,743

14242580 TOUTLE RIVER AT TOWER ROAD, NEAR SILVER LAKE, 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)
		July			August			September	
1	814	203	447	509	25	34	393	e25	e27
2	794	212	455	498	21	28	377	e19	e20
3	776	202	423	490	15	20	371	e18	e18
4	764	187	386	482	16	21	370	e17	e17
5	759	173	354	476	22	28	368	e17	e17
6	757	158	323	468	28	35	367	e17	e17
7	738	86	172	461	33	41	363	e16	e16
8	698	59	110	453	38	46	364	e16	e16
9	673	73	132	463	40	49	366	e16	e15
10	664	75	135	484	22	28	369	e15	e15
11	667	65	117	470	17	21	363	e15	e15
12	674	68	125	461	16	19	357	e15	e14
13	752	154	313	448	14	17	354	e14	e14
14	676	166	303	437	13	16	357	e14	e14
15	640	160	276	429	13	15	375	e16	e16
16	620	149	250	428	13	15	378	e16	e16
17	602	108	175	433	13	15	371	e15	e15
18	590	65	103	426	15	17	392	e22	e23
19	581	57	90	418	16	18	459	e36	e45
20	568	56	86	409	18	20	431	e31	e36
21	557	54	82	404	18	19	455	e34	e42
22	551	49	73	405	17	19	427	e26	e31
23	554	43	64	376	17	17	388	e21	e22
24	536	37	53	379	21	22	376	e18	e19
25	528	32	46	409	29	32	366	e17	e17
26	527	29	41	396	36	39	359	e17	e16
27	521	25	35	388	e33	e34	354	e16	e15
28	517	22	30	383	e27	e28	350	e15	e15
29	513	19	27	381	e26	e26	347	e15	e14
30	518	25	35	406	e32	e35	345	e14	e13
31	532	29	41	416	e31	e35	---	---	---
Total	19,661	---	5,302	13,486	---	809	11,312	---	590
Year	787,807	---	2,693,096.3						