12324200 CLARK FORK AT DEER LODGE, MT

Pend Oreille Basin
Upper Clark Fork Subbasin

LOCATION.--Lat 46°23′52″, long 112°44′31″ referenced to North American Datum of 1927, in SW ¼ SW ¼ SW ¼ sec.33, T.8 N., R.9 W., Powell County, MT, Hydrologic Unit 17010201, on left bank 35 ft upstream from Milwaukee Avenue Bridge in Deer Lodge, 0.05 mi upstream from Taylor Creek, 0.24 mi downstream from Tin Cup Joe Creek, and at river mile 461.2.

DRAINAGE AREA.--995 mi^2. Area at site used prior to Oct. 1, 1994, 1,005 mi^2. Area used Octobert 1994 to September 2000, 916 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,502.24 ft, referenced to the National Geodetic Vertical Datum of 1929.

REMARKS.--Records are good except for estimated daily discharges, which are poor. Diversions occur upstream from station for irrigation of about 31,000 acres. Some regulation is imposed by settling ponds on Silver Bow Creek near Warm Springs. A U.S. Geological Survey satellite telemeter is locaed at the station.

12324200 CLARK FORK AT DEER LODGE, MT—Continued

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	178	205	237	234	192	215	187	348	248	170	45	61
2	194	216	231	228	191	194	205	348	232	161	45	71
3	204	228	224	224	191	191	226	336	252	152	43	78
4	225	233	237	217	193	191	208	321	299	150	47	73
5	223	230	208	209	191	180	230	316	297	150	55	69
6	215	229	e150	213	179	183	446	316	278	149	43	65
7	210	227	e100	213	187	185	465	312	240	147	40	66
8	208	242	e110	215	200	173	368	310	307	135	44	69
9	212	243	e120	194	194	171	352	297	433	118	42	70
10	211	234	e140	208	168	157	333	289	547	116	41	70
11	209	238	e150	216	169	158	321	287	578	125	37	70
12	202	236	e150	208	185	160	309	276	440	123	38	68
13	201	234	e150	200	201	165	314	270	385	126	38	70
14	196	239	e150	214	197	163	317	270	362	115	36	76
15	194	228	e170	210	e150	173	332	277	318	102	39	88
16	190	233	e160	192	e130	164	338	304	287	84	37	114
17	189	239	e140	198	e80	167	351	355	247	65	45	122
18	189	238	e120	207	e110	170	333	412	224	60	58	123
19	189	242	e110	197	e130	168	317	441	214	56	57	113
20	188	239	e150	186	e140	167	302	495	225	46	55	118
21	189	235	e170	197	150	169	297	518	209	41	54	129
22	193	231	e250	183	154	171	303	455	195	39	51	138
23	195	230	307	199	165	166	325	406	179	44	46	142
24	195	225	249	191	e170	169	326	385	158	43	44	139
25	198	226	249	190	e160	181	317	334	145	37	46	139
26	205	238	238	191	188	191	317	328	143	35	49	152
27	208	232	234	184	210	184	309	335	135	41	52	152
28	210	229	241	169	232	202	303	349	150	43	52	154
29	212	207	311	189	---	224	305	361	144	39	51	149
30	207	234	243	197	---	235	325	318	164	36	51	151
31	206	---	238	195	---	217	---	282	---	36	55	---
Total	6,245	6,940	5,937	6,268	4,807	5,604	9,381	10,651	8,035	2,784	1,436	3,099
Mean	201	231	192	202	172	181	313	344	268	89.8	46.3	103
Max	225	243	311	234	232	235	465	518	578	170	58	154
Min	178	205	100	169	80	157	187	270	135	35	36	61
Ac-ft	12,390	13,770	11,780	12,430	9,530	11,120	18,610	21,130	15,940	5,520	2,850	6,150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 2006, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	231	244	218	218	238	258	274	377	475	206	101	167
Max	421	384	353	342	481	387	422	971	1,450	593	337	315
(WY)	(1983)	(1981)	(1981)	(1983)	(1982)	(1979)	(1982)	(1981)	(1997)	(1982)	(1997)	(1993)
Min	115	156	122	140	137	147	144	80.2	57.8	29.9	27.8	57.8
(WY)	(1989)	(1989)	(1993)	(1992)	(1989)	(2005)	(2005)	(1992)	(1992)	(1985)	(1988)	(1988)

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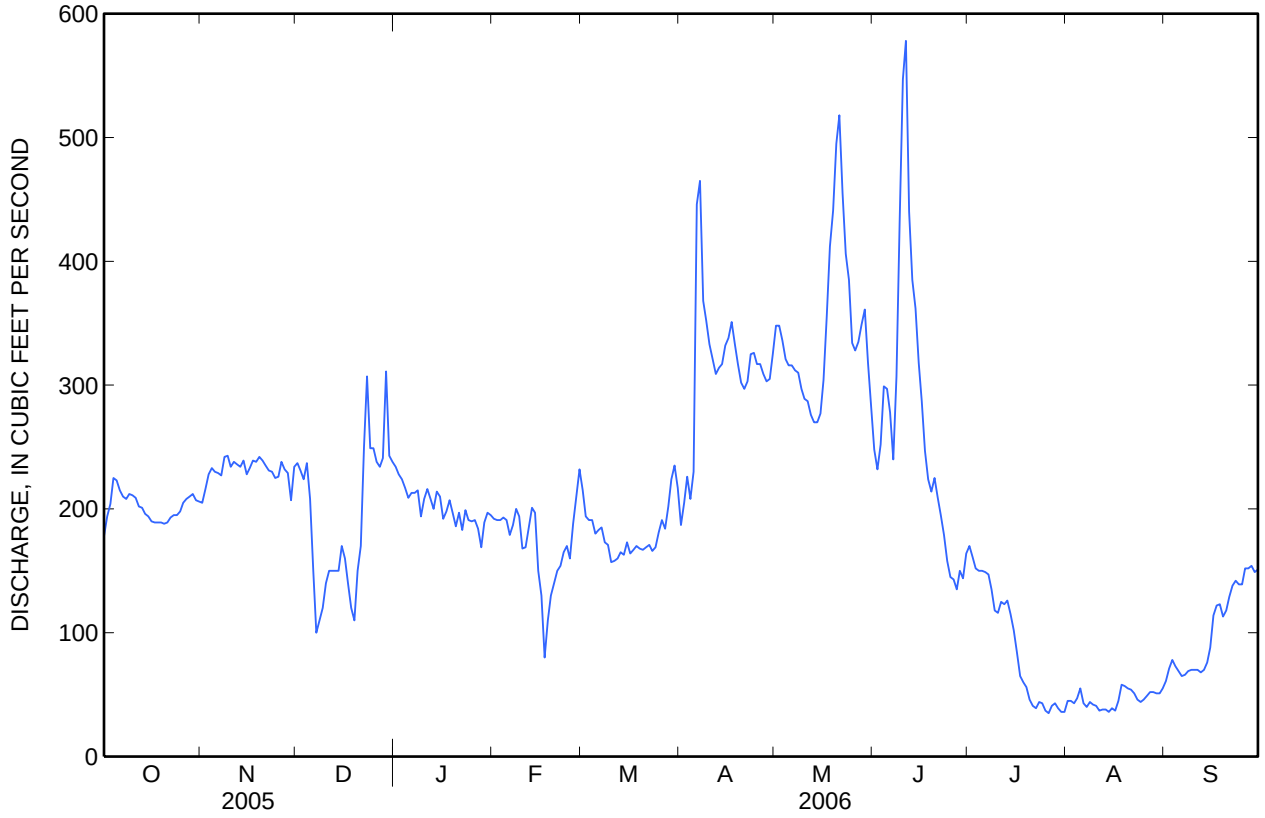
SUMMARY STATISTICS

	Calendar Year 2005		Water Year 2006		Water Years 1979 - 2006	
Annual total	75,523		71,187			
Annual mean	207		195		250	
Highest annual mean					465	1997
Lowest annual mean					130	1992
Highest daily mean	785	Jun 18	578	Jun 11	2,390	May 23, 1981
Lowest daily mean	73	Aug 8	35	Jul 26	22	Aug 18, 1988
Annual seven-day minimum	81	Aug 5	38	Aug 10	23	Aug 9, 1991
Maximum peak flow			654	Jun 10	[b]2,500	May 23, 1981
Maximum peak stage			3.66	Jun 10	[c]5.92	Nov 1, 1991
Instantaneous low flow			[a]35	Jul 25	[d]21	Aug 6, 1991
Annual runoff (ac-ft)	149,800		141,200		181,300	
10 percent exceeds	414		319		399	
50 percent exceeds	160		194		212	
90 percent exceeds	96		52		89	

[a] Gage height, 2.13 ft.
[b] Gage height, 5.35 ft.
[c] Backwater from ice.
[d] Gage height, 2.19 ft.



WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963, 1969-71, 1979-83, 1985 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1978 to September 1983, October 1991 to September 1998, seasonal records for May 2001 to September 2002.
SUSPENDED-SEDIMENT DISCHARGE: March 1985 through August 1986, April 1987 to March 2003, August 2003 to current year.

REMARKS.--Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF DAILY RECORD.--WATER TEMPERATURE : Maximum, 24.5°C, July 26, 1998, July 11-14, 2002; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 835 mg/L, Feb. 8, 1996; minimum daily mean, 1 mg/L, Aug. 19, 2002.
SEDIMENT LOAD: Maximum daily, 2,840 tons, Feb. 24, 1986; minimum daily, 0.18 ton, Aug. 19, 2002.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 328 mg/L, Apr. 6; minimum daily mean, 4 mg/L, June 29.
SEDIMENT LOAD: Maximum daily, 395 tons, Apr. 6; minimum daily, 0.59 ton, Aug. 24.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006

Part 1 of 2

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)
Oct													
18...	1150	189	8.5	540	21.0	10.0	240	69.0	16.4	10.6	12.4	.04	.12
Mar													
21...	1235	165	8.6	530	10.0	4.5	250	72.3	16.0	7.6	9.7	.06	.14
Apr													
18...	1315	331	8.4	521	7.0	6.5	230	67.3	15.3	12.5	19.2	.06	.26
May													
09...	1255	301	8.5	443	9.0	9.5	200	58.6	11.9	16.3	20.1	.04	.19
23...	1045	403	8.0	277	17.5	13.0	110	34.8	6.59	20.6	31.7	.04	.42
Jun													
13...	1400	381	8.2	347	30.0	19.0	140	42.5	8.73	19.8	27.1	.06	.28
Jul													
25...	0630	38	8.0	520	11.5	16.0	220	66.0	13.5	16.7	24.4	.06	.10
Aug													
24...	1055	44	8.3	530	21.0	14.0	220	66.9	13.7	12.4	--	.04	.06

12324200 CLARK FORK AT DEER LODGE, MT—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
Part 2 of 2
[Remark codes: <, less than; E, estimated.]

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover -able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi- ment, sieve diametr percent <.063mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment dis- charge, tons/d (80155)
Oct													
18...	5.5	17.8	E3	231	<.08	1.65	27.0	74.5	4.0	18	60	23	12
Mar													
21...	5.3	21.3	23	340	E.05	2.63	76.9	117	5.6	21	78	13	5.8
Apr													
18...	8.3	42.1	10	741	E.08	5.50	69.0	192	8.6	37	68	28	25
May													
09...	9.0	30.5	7	461	E.05	3.61	54.6	142	4.5	27	79	17	14
23...	11.1	92.1	26	1,450	.17	11.8	34.5	286	7.1	70	72	58	63
Jun													
13...	10.6	59.6	17	851	.13	7.12	23.3	135	5.0	42	67	35	36
Jul													
25...	8.6	15.3	E6	104	E.07	.96	52.1	73.1	8.1	14	88	7	.72
Aug													
24...	6.5	--	E6	67	E.04	.33	30.9	162	4.9	--	63	5	.59

12324200 CLARK FORK AT DEER LODGE, MT—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006

Day	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)
	October		November		December		January		February		March	
1	19	9.1	12	6.6	24	15	19	12	20	10	27	16
2	17	8.9	12	7.0	24	15	22	14	19	9.8	23	12
3	17	9.4	12	7.4	31	19	21	13	19	9.8	31	16
4	17	10	12	7.5	64	41	20	12	21	11	30	15
5	17	10	11	6.8	106	60	19	11	27	14	30	15
6	16	9.3	10	6.2	77	31	18	10	34	16	24	12
7	16	9.1	10	6.1	42	11	18	10	37	19	26	13
8	16	9.0	10	6.5	36	11	17	9.9	37	20	25	12
9	15	8.6	11	7.2	35	11	17	8.9	35	18	26	12
10	15	8.5	12	7.6	34	13	17	9.5	34	15	31	13
11	15	8.5	16	10	33	13	17	9.9	34	16	28	12
12	15	8.2	14	8.9	33	13	18	10	33	16	35	15
13	15	8.1	12	7.6	32	13	18	9.7	33	18	34	15
14	15	7.9	10	6.5	32	13	19	11	32	17	30	13
15	16	8.4	10	6.2	32	15	19	11	31	13	37	17
16	17	8.7	10	6.3	31	13	20	10	30	11	30	13
17	18	9.2	11	7.1	31	12	21	11	28	6.0	28	13
18	19	9.7	11	7.1	32	10	22	12	26	7.7	28	13
19	19	9.7	12	7.8	37	11	21	11	25	8.8	27	12
20	18	9.1	12	7.7	40	16	21	11	26	9.8	23	10
21	17	8.7	11	7.0	42	19	20	11	26	11	20	9.1
22	17	8.9	10	6.2	44	30	20	9.9	27	11	28	13
23	17	9.0	10	6.2	47	39	19	10	27	12	23	10
24	16	8.4	11	6.7	70	47	18	9.3	28	13	23	10
25	16	8.6	12	7.3	94	63	18	9.2	31	13	25	12
26	15	8.3	12	7.7	40	26	18	9.3	34	17	28	14
27	14	7.9	13	8.1	25	16	19	9.4	36	20	30	15
28	14	7.9	15	9.3	21	14	21	9.6	33	21	36	20
29	13	7.4	18	10	10	8.4	22	11	---	---	26	16
30	13	7.3	21	13	7	4.6	22	12	---	---	20	13
31	13	7.2	---	---	12	7.7	21	11	---	---	18	11
Total	---	269.0	---	225.6	---	630.7	---	328.6	---	383.9	---	412.1

12324200 CLARK FORK AT DEER LODGE, MT—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006

Day	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)	Mean concen-tration (mg/l)	Sediment discharge (tons/day)
	April		May		June		July		August		September	
1	20	10	30	28	23	15	7	3.2	30	3.6	24	4.0
2	22	12	26	24	23	14	7	3.0	32	3.9	20	3.8
3	20	12	21	19	27	18	7	2.9	33	3.8	19	4.0
4	51	29	22	19	27	22	9	3.6	34	4.3	22	4.3
5	145	90	17	15	17	14	10	4.0	36	5.3	27	5.0
6	328	395	18	15	17	13	10	4.0	38	4.4	33	5.8
7	133	167	17	14	27	17	17	6.7	39	4.2	33	5.9
8	58	58	14	12	168	139	37	13	39	4.6	29	5.4
9	49	47	15	12	214	250	23	7.3	38	4.3	22	4.2
10	43	39	18	14	132	195	15	4.7	37	4.1	16	3.0
11	37	32	18	14	51	80	14	4.7	36	3.6	14	2.6
12	39	33	18	13	36	43	12	4.0	35	3.6	14	2.6
13	38	32	17	12	34	35	11	3.7	34	3.5	15	2.8
14	44	38	19	14	29	28	9	2.8	32	3.1	17	3.5
15	41	37	22	16	23	20	9	2.5	30	3.2	18	4.3
16	39	36	28	23	15	12	8	1.8	28	2.8	18	5.5
17	37	35	49	47	10	6.7	9	1.6	26	3.2	18	5.9
18	28	25	80	89	9	5.4	12	1.9	26	4.1	18	6.0
19	24	21	92	110	9	5.2	18	2.7	29	4.5	17	5.2
20	22	18	116	155	8	4.9	21	2.6	32	4.8	16	5.1
21	25	20	116	162	8	4.5	22	2.4	34	5.0	16	5.6
22	30	25	78	96	8	4.2	22	2.3	23	3.2	15	5.6
23	28	25	56	61	7	3.4	24	2.9	11	1.4	15	5.8
24	23	20	48	50	7	3.0	29	3.4	5	0.59	16	6.0
25	22	19	41	37	7	2.7	12	1.2	16	2.0	16	6.0
26	22	19	37	33	8	3.1	9	0.85	23	3.0	17	7.0
27	22	18	28	25	7	2.6	13	1.4	26	3.7	16	6.6
28	21	17	29	27	5	2.0	18	2.1	26	3.7	16	6.7
29	20	16	28	27	4	1.6	23	2.4	26	3.6	16	6.4
30	26	23	24	21	6	2.7	27	2.6	26	3.6	14	5.7
31	---	---	25	19	---	---	29	2.8	25	3.7	---	---
Total	---	1,368	---	1,223	---	967.0	---	105.05	---	112.39	---	150.3
Year	---	6,175.64										