

ST. CROIX RIVER BASIN--Continued

05336700 KETTLE RIVER BELOW SANDSTONE, MN

LOCATION.--Lat 46°06'20", long 92°51'50", in NW¹/₄SW¹/₄ sec. 22, T.42 N., R.20 W., Pine County, Hydrologic Unit 07030003, on Sandstone Federal Correctional Institution property, on left bank, about 1.8 mi south of Sandstone.

DRAINAGE AREA.--868 mi².

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 931.50 ft above sea level. (Minnesota Department of Transportation bench mark).

REMARKS.--Records good except those for estimated daily discharge, which are fair.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft, from flood marks, discharge, 13,400 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,200 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr 8	2230	*3,950	*7.90	No other peak greater than base discharge.			

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103	207	527	e185	e148	e144	2050	551	347	542	1430	956
2	99	199	501	e186	e149	e148	1930	503	334	500	1290	816
3	98	192	479	e190	e149	e155	1750	466	318	547	1440	714
4	96	187	456	e190	e150	e161	1930	434	290	611	1830	681
5	102	182	503	e188	e150	e168	2950	436	452	623	1690	676
6	114	178	800	e186	e150	e165	3080	524	821	685	1470	645
7	126	175	839	e183	e150	e159	3200	752	1050	638	1280	602
8	128	174	737	e178	e151	e153	3780	1140	1230	604	1110	663
9	125	171	675	e172	e152	e170	3740	1190	1050	646	995	711
10	127	235	651	e167	e154	e168	3330	1120	908	826	943	656
11	124	395	554	e164	e157	e165	2960	1420	773	877	894	600
12	122	484	513	e160	e160	e158	2710	2090	660	863	856	608
13	117	452	472	e157	e165	152	2430	2420	571	823	1500	723
14	116	476	421	e153	e167	148	2130	2370	489	758	2110	721
15	118	455	416	e150	e160	149	1990	2080	430	659	1910	666
16	133	451	361	e150	e159	159	2100	1820	371	688	1680	591
17	226	435	331	e152	e155	185	2120	1620	323	894	1550	535
18	285	436	e310	e151	e153	209	1920	1440	285	851	1410	491
19	292	489	e280	e150	e150	244	1730	1260	260	788	1800	465
20	269	566	e265	e150	e148	299	1570	1110	247	701	1800	476
21	258	483	e250	e150	e146	311	1440	1000	241	617	1530	462
22	233	554	e240	e150	e143	317	1320	907	279	561	1350	432
23	217	556	e230	e150	e141	332	1190	849	432	523	1480	405
24	211	656	e220	e150	e139	349	1070	824	660	563	2700	380
25	208	692	e211	e148	e139	361	971	752	695	517	2930	361
26	208	675	e203	e145	e139	365	878	671	696	904	2450	433
27	203	631	e200	e149	e140	412	795	591	646	1360	2000	1210
28	197	593	e198	e149	e140	966	725	527	582	1310	1680	1220
29	198	562	e197	e148	---	2100	657	469	530	1220	1420	1020
30	202	540	e190	e148	---	2280	601	417	479	1270	1230	856
31	201	---	e188	e148	---	2170	---	376	---	1490	1070	---
TOTAL	5256	12481	12418	4997	4204	13422	59047	32129	16449	24459	48828	19775
MEAN	170	416	401	161	150	433	1968	1036	548	789	1575	659
MAX	292	692	839	190	167	2280	3780	2420	1230	1490	2930	1220
MIN	96	171	188	145	139	144	601	376	241	500	856	361
AC-FT	10430	24760	24630	9910	8340	26620	117100	63730	32630	48510	96850	39220
CFSM	.20	.48	.46	.19	.17	.50	2.28	1.20	.64	.91	1.83	.76
IN.	.23	.54	.54	.22	.18	.58	2.55	1.38	.71	1.05	2.10	.85

e Estimated

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STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	725	595	288	185	185	539	2363	1224	870	678	425	548
MAX	2652	2414	652	411	447	1742	4653	3168	2799	2869	2094	3065
(WY)	1969	1972	1984	1984	1998	1973	1969	1986	1993	1972	1972	1986
MIN	80.6	85.8	98.3	77.3	98.5	141	435	222	131	110	86.4	71.3
(WY)	1977	1977	1977	1971	1977	1980	1977	1980	1988	1988	1976	1976

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR	FOR 1999 WATER YEAR	FOR 1998 CALENDAR YEAR	FOR 1999 WATER YEAR	FOR 1998 CALENDAR YEAR	FOR 1999 WATER YEAR
ANNUAL TOTAL	173177	253465	173177	253465	173177	253465
ANNUAL MEAN	474	694	474	694	474	694
HIGHEST ANNUAL MEAN					1390	1972
LOWEST ANNUAL MEAN					254	1977
HIGHEST DAILY MEAN	2850	Apr 4	3780	Apr 8	16400	Jul 23 1972
LOWEST DAILY MEAN	78	Sep 22	96	Oct 4	43	Nov 12 1976
ANNUAL SEVEN-DAY MINIMUM	82	Sep 19	105	Oct 1	62	Jan 14 1971
INSTANTANEOUS PEAK FLOW			3950	Apr 8	17200	Jul 23 1972
INSTANTANEOUS PEAK STAGE			7.90	Apr 8	15.38	Jul 23 1972
INSTANTANEOUS LOW FLOW			92	Oct 4	25a	Nov 11 1977
ANNUAL RUNOFF (AC-FT)	343500	502700	343500	502700	343500	502700
ANNUAL RUNOFF (CFSM)	.55	.80	.55	.80	.55	.80
ANNUAL RUNOFF (INCHES)	7.46	10.93	7.46	10.93	7.46	10.93
10 PERCENT EXCEEDS	1150	1710	1150	1710	1150	1710
50 PERCENT EXCEEDS	237	479	237	479	237	479
90 PERCENT EXCEEDS	102	149	102	149	102	149

a Result of freezeup.

