

# ST. CROIX RIVER BASIN

## 05336700 KETTLE RIVER BELOW SANDSTONE, MN

LOCATION.--Lat 4606'20", long 9251'50", in NW 1 / 4 SW 1 / 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 mi<sup>2</sup> (revised).

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

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

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft, from flood marks, discharge, 13,400 ft<sup>3</sup> /s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft<sup>3</sup> /s and maximum (\*)

Date	Time	Discharge	Gage height (ft)	Date	Time	Discharge	Gage height (ft)
		(ft <sup>3</sup> /s)				(ft <sup>3</sup> /s)	
Apr. 09	0530	*2930	*7.15	(No peak greater than base discharge.)			

## DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

### DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	282	255	e170	e190	2400	1920	365	463	618	137	101
2	168	323	254	e180	e185	2280	2050	339	464	540	134	99
3	165	359	255	e200	e185	2200	2650	318	708	468	131	100
4	163	374	254	e190	e185	2010	2850	301	722	419	129	97
5	156	372	e240	e180	e185	1760	2610	281	684	394	125	96
6	165	367	e235	e175	e185	1550	2290	262	640	362	118	95

7	158	369	e230	e170	e185	e1200	2110	246	571	364	116	90
8	165	378	e230	e170	e185	e900	2520	237	491	400	116	88
9	172	378	e225	e165	e180	e750	2840	223	415	400	113	86
10	182	373	e220	e150	e180	e640	2580	212	356	356	108	86
11	187	366	e215	e140	e180	e550	2280	206	335	403	104	85
12	208	e315	e210	e130	e175	e480	2040	205	563	381	102	84
13	294	e310	e205	e140	175	e420	1920	208	1160	341	101	84
14	403	e310	e200	e150	175	e385	1910	216	1140	323	100	86
15	416	e300	e200	e160	174	e360	1760	220	953	523	96	85
16	410	e290	e195	e160	176	e340	1580	297	800	617	96	84
17	385	e280	e195	e165	193	e325	1410	387	687	530	104	85
18	370	e275	e195	e170	220	317	1260	352	623	442	100	85
19	376	e270	e195	e170	269	296	1150	309	1090	383	104	84
20	360	e265	e190	e170	339	280	1040	264	2020	335	115	85
21	329	e260	e190	e175	410	284	916	232	2040	297	112	80
22	313	e260	e190	e175	445	280	801	208	1690	269	122	78
23	296	e255	e190	e180	554	274	741	192	1410	234	141	79
24	280	e250	e190	e180	812	264	669	179	1170	212	138	82
25	267	e255	e190	e185	1010	279	610	169	996	195	127	83
26	252	e255	e190	e185	1180	314	550	158	1010	180	122	109
27	238	e255	e190	e190	1740	408	497	152	1040	169	122	99
28	228	e255	e190	e190	2440	689	455	148	1030	157	120	98
29	222	e255	e190	e190	---	1110	423	144	853	149	116	99
30	223	e255	e190	e190	---	1650	392	167	713	144	110	107
31	245	---	e180	e190	---	1980	---	320	---	135	104	---
TOTAL	7969	9111	6478	5335	12512	26975	46824	7517	26837	10740	3583	2699
MEAN	257	304	209	172	447	870	1561	242	895	346	116	90.0
MAX	416	378	255	200	2440	2400	2850	387	2040	618	141	109
MIN	156	250	180	130	174	264	392	144	335	135	96	78
AC-FT	15810	18070	12850	10580	24820	53500	92880	14910	53230	21300	7110	5350

CFSM	.30	.35	.24	.20	.52	1.01	1.81	.28	1.04	.40	.13	.10
IN.	.34	.39	.28	.23	.54	1.16	2.02	.32	1.16	.46	.15	.12

**e Estimated**

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	743	601	284	186	186	542	2375	1230	881	674	387	545
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 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1968 - 1998		
ANNUAL TOTAL	251844		166580				
ANNUAL MEAN	690		456		719		
HIGHEST ANNUAL MEAN					1390		1972
LOWEST ANNUAL MEAN					254		1977
HIGHEST DAILY MEAN	10300		Apr 6	2850	Apr 4	16400	Jul 23 1972
LOWEST DAILY MEAN	156		Oct 5	78	Sep 22	43	Nov 12 1976
ANNUAL SEVEN-DAY MINIMUM	163		Oct 2	82	Sep 19	62	Jan 14 1971
INSTANTANEOUS PEAK FLOW			2930		Apr 9	17200	Jul 23 1972
INSTANTANEOUS PEAK STAGE			7.15		Apr 9	15.38	Jul 23 1972
INSTANTANEOUS LOW FLOW			77		Sep 22	25a	Nov 11 1977
ANNUAL RUNOFF (AC-FT)	499500		330400		521100		

ANNUAL RUNOFF (CFSM)	.80		.53		.83		
ANNUAL RUNOFF (INCHES)	10.86		7.18		11.33		
10 PERCENT EXCEEDS	1240		1150		1770		
50 PERCENT EXCEEDS	302		250		295		
90 PERCENT EXCEEDS	190		104		130		

**a Result of freezeup.**

