

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN

LOCATION.--Lat 44° 40'00", long 93° 03'17", in SW¼NW¼ sec. 24, T.114 N., R.19 W., Dakota County, Hydrologic Unit 07040001, on right bank and just downstream from County Road 79, 2 mi west of Empire and 4 mi northeast of Farmington.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--May 1942 to June 1945 (no record during July, August, and September 1944), September 1969 to September 1973 (discharge measurements only), October 1973 to current year. Prior to October 1975 published as "near Empire City".

GAGE.--Water-stage recorder. Datum of gage is 851.99 ft above mean sea level (levels by U.S. Army Corps of Engineers). April 12, 1942 to June 30, 1944, and October 1, 1944 to July 7, 1945, nonrecording gage at same site and present datum.

REMARKS.--Records good. Some regulation at low-flow by sewage plant upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft, from information by local resident, discharge 6,200 ft³/s, from rating extended above 2,100 ft³/s.

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

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP							
1	43	77	e99	55	51	51	238	86	66
138	238	208							
2	43	68	e94	56	50	53	214	84	63
104	227	189							
3	42	65	e90	56	50	54	194	87	61
203	218	173							
4	44	65	e84	68	49	53	178	84	60
251	194	156							
5	45	70	e80	73	49	51	173	84	62
129	183	146							
6	47	65	77	69	49	50	199	81	64
99	167	137							
7	47	63	74	70	49	51	199	79	64
89	166	131							

8	48	59	71	68	49	51	157	91	64
88	159	124							
9	47	56	70	67	48	54	146	87	61
96	147	126							
10	47	53	69	66	49	62	141	82	60
88	136	163							
11	47	52	68	e67	48	74	135	79	62
80	130	160							
12	47	49	68	e63	47	85	130	78	80
78	122	133							
13	47	48	69	60	47	83	126	75	67
81	123	124							
14	47	46	67	58	47	72	123	75	61
85	119	116							
15	47	51	66	58	46	78	118	74	62
106	121	113							
16	71	117	65	e59	46	68	113	73	64
91	163	108							
17	149	278	64	e57	46	71	108	71	61
79	244	172							
18	117	289	63	e55	48	69	108	77	59
126	285	340							
19	81	164	61	54	49	72	118	78	62
149	207	341							
20	69	125	61	53	50	85	114	72	63
131	220	218							
21	65	106	61	54	52	120	109	69	62
196	495	177							
22	65	100	60	55	52	203	105	70	59
249	769	153							
23	86	93	61	e53	50	338	100	69	58
491	494	140							
24	85	86	e62	e52	48	358	96	80	58
978	387	139							
25	73	80	e59	e51	49	307	93	84	65
611	323	134							
26	70	76	e58	e50	50	263	90	76	64
510	263	128							
27	64	e74	56	e49	49	341	89	72	58
997	226	120							
28	62	e78	57	e48	49	496	92	69	55
611	203	117							
29	70	e86	56	48	---	453	89	71	63
436	181	116							
30	110	e96	56	50	---	350	88	72	135
342	166	111							
31	93	---	55	52	---	280	---	69	---
277	182	---							
TOTAL	2018	2735	2101	1794	1366	4796	3983	2398	1943
7989	7258	4713							

MEAN	65.1	91.2	67.8	57.9	48.8	155	133	77.4	64.8
258	234	157							
MAX	149	289	99	73	52	496	238	91	135
997	769	341							
MIN	42	46	55	48	46	50	88	69	55
78	119	108							
AC-FT	4000	5420	4170	3560	2710	9510	7900	4760	3850
15850	14400	9350							
CFSM	.15	.21	.15	.13	.11	.35	.30	.18	.15
.58	.53	.36							
IN.	.17	.23	.18	.15	.11	.40	.34	.20	.16
.67	.61	.40							

o e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1997, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP							
MEAN	53.1	48.8	38.6	30.6	34.5	100	101	87.0	85.2
65.4	55.5	72.0							
MAX	160	133	79.5	57.9	85.2	199	244	223	290
258	234	313							
(WY)	1995	1993	1993	1997	1984	1983	1983	1986	1993
1997	1997	1992							
MIN	14.9	15.6	12.4	11.0	13.1	25.4	35.2	29.3	23.0
16.0	14.3	14.6							
(WY)	1977	1977	1977	1977	1977	1975	1977	1977	1988
1988	1976	1976							

<i>SUMMARY STATISTICS</i>	<i>FOR 1996 CALENDAR YEAR</i>	<i>FOR 1997 WATER YEAR</i>	<i>WATER YEARS 1942 - 1997</i>						
ANNUAL TOTAL		26633			43094				
ANNUAL MEAN		72.8			118				64.2
HIGHEST ANNUAL MEAN									
142		1993							
LOWEST ANNUAL MEAN									
23.6		1977							
HIGHEST DAILY MEAN			319	Mar 14	997	Jul 27		3000	Sep
16		1992							
LOWEST DAILY MEAN			28	Feb 2	42	Oct 3		8.4	Jan
15		1975							
ANNUAL SEVEN-DAY MINIMUM			30	Jan 29	44	Oct 1		9.0	Jan
13		1975							
INSTANTANEOUS PEAK FLOW					1290	Jul 24		6570	Sep
16		1992							
INSTANTANEOUS PEAK STAGE					7.90	Jul 24		10.00	Sep
16		1992							
INSTANTANEOUS LOW FLOW					35	Feb 15		6.8	Aug
15		1992							
ANNUAL RUNOFF (AC-FT)			52830		85480			46500	
ANNUAL RUNOFF (CFSM)			.16		.27			.15	
ANNUAL RUNOFF (INCHES)			2.24		3.63			125	

50 PERCENT EXCEEDS	61	76	42
90 PERCENT EXCEEDS	35	49	20

(National Water Quality Assessment Station),

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

BICAR- BONATE WATER IT FIELD DATE MG/L AS HCO3 (00453)	DIS- CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) WATER (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, (PER- CENT SOLVED SATUR- ATION) (MG/L) (00300)	ALKA- LITY WAT DIS TOT IT DIS FIELD MG/L AS CACO3 (00301)	(39086)		
MAR 21...	1340	120	696	7.7	4.5	734	11.2	91	225	274
SED. SUSP. SIEVE DIAM. FINER DATE THAN .062 MM (70331)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS PHOS- TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	%
MAR 21...	<0.015	<0.010	<0.20	0.60	<0.050	0.470	<0.010	<0.010	32	81