

## STREAMS TRIBUTARY TO LAKE SUPERIOR

## 04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN

LOCATION.--Lat 48°00'44", long 89°36'58", in SW<sup>1</sup>/<sub>4</sub>NE<sup>1</sup>/<sub>4</sub> sec. 24, T.64 N., R.6 E., Cook County, Hydrologic Unit 04010101, on the Grand Portage Indian Reservation, on right bank 400 ft upstream from Middle Falls, 2.5 mi upstream from Grand Portage Port of Entry, 3.5 mi upstream from mouth, and 4.7 mi northeast of city of Grand Portage.

DRAINAGE AREA.--609 mi<sup>2</sup>.

PERIOD OF RECORD.--June to October 1921, April to November 1922, March 1923 to current year. Published as "at International Bridge" April 1924 to September 1940; as "below International Bridge" October 1940 to September 1965. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 744:1927-28. WSP 804: 1934(M). WSP 974: Drainage area. WSP 1337:1924(M), 1925, 1926-28(M), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level (NGVD of 1929). Prior to Sept. 30, 1940, nonrecording gage at International Bridge, 5.8 mi upstream at datum 102.24 ft higher. Oct. 1, 1940 to Dec. 31, 1975, at present site at datum 2.00 ft higher.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr 22	0400	*3,550	*8.65	No other peak greater than base discharge.			

Minimum discharge, 25 ft<sup>3</sup>/s, estimated daily-mean.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	e99	e40	e31	e27	e29	e100	642	956	368	273	172
2	47	e97	e38	e30	e27	e29	e88	528	807	359	286	158
3	45	e95	e35	e30	e27	e29	e80	482	701	383	281	149
4	156	e91	e33	e30	e26	e28	e70	450	618	384	271	140
5	318	87	e31	e30	e26	e28	e64	429	560	343	257	134
6	321	81	e31	e29	e26	e28	e60	398	511	316	252	127
7	284	82	e30	e29	e26	e28	e57	385	471	316	252	118
8	241	84	e30	e29	e26	e28	e77	376	434	318	245	110
9	212	80	e30	e28	e26	e28	e110	549	416	317	235	105
10	188	78	e30	e28	e25	e28	e145	1,970	409	314	236	99
11	168	e73	e31	e28	e25	e29	e210	1,770	391	362	241	93
12	151	e60	e31	e27	e25	e29	e290	2,570	368	422	241	96
13	139	e50	e31	e27	e25	e30	e400	1,880	348	393	228	97
14	129	e47	e31	e26	e26	e31	e555	1,350	330	352	209	96
15	123	e45	e31	e26	e26	e33	e755	1,100	324	377	193	94
16	116	e48	e31	e26	e26	e35	e960	954	301	414	181	94
17	109	e51	e31	e26	e27	e37	e1,170	842	309	388	172	90
18	108	e55	e32	e26	e27	e44	e1,350	769	766	341	161	87
19	136	e58	e33	e26	e28	e52	e1,550	738	831	306	154	88
20	144	e57	e35	e26	e29	e65	e2,300	1,020	618	295	147	97
21	134	e56	e35	e25	e30	e95	e3,000	1,020	490	429	193	134
22	126	e54	e35	e25	e29	e155	3,390	875	421	543	245	167
23	119	e54	e34	e25	e29	e220	2,220	790	386	477	288	157
24	114	e53	e34	e25	e28	e290	1,360	698	375	411	259	148
25	110	e50	e33	e25	e28	e270	1,080	627	488	365	224	143
26	108	e46	e32	e25	e28	e248	927	575	578	331	198	142
27	106	e42	e32	e26	e28	e232	838	528	566	308	177	144
28	102	e43	e32	e26	e29	e205	791	513	518	290	171	143
29	100	e45	e31	e26	---	e180	745	529	446	274	176	141
30	103	e44	e31	e27	---	e150	683	661	404	273	187	140
31	e102	---	e31	e27	---	e125	---	1,030	---	269	189	---
TOTAL	4,407	1,905	1,005	840	755	2,838	25,425	27,048	15,141	11,038	6,822	3,703
MEAN	142	63.5	32.4	27.1	27.0	91.5	848	873	505	356	220	123
MAX	321	99	40	31	30	290	3,390	2,570	956	543	288	172
MIN	45	42	30	25	25	28	57	376	301	269	147	87
AC-FT	8,740	3,780	1,990	1,670	1,500	5,630	50,430	53,650	30,030	21,890	13,530	7,340
CFSM	0.23	0.10	0.05	0.04	0.04	0.15	1.39	1.43	0.83	0.58	0.36	0.20
IN.	0.27	0.12	0.06	0.05	0.05	0.17	1.55	1.65	0.92	0.67	0.42	0.23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2003, BY WATER YEAR (WY)

MEAN	357	352	207	150	125	175	1,198	1,593	832	416	241	284
MAX	2,095	1,461	720	431	300	1,169	2,724	4,016	2,801	1,127	1,029	2,985
(WY)	(1978)	(1971)	(1978)	(1975)	(1969)	(1945)	(2001)	(1950)	(1947)	(1968)	(1950)	(1977)
MIN	17.4	11.4	2.85	2.18	8.02	60.0	290	138	125	78.0	46.5	40.2
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1941)	(1977)	(1977)	(1977)	(1958)	(1998)	(1976)

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SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1921 - 2003	
ANNUAL TOTAL	82,433		100,927		497	
ANNUAL MEAN	226		277		158	
HIGHEST ANNUAL MEAN					840 1971	
LOWEST ANNUAL MEAN					158 1958	
HIGHEST DAILY MEAN	2,180	Apr 17	3,390	Apr 22	10,700	May 5, 1934
LOWEST DAILY MEAN	30	Dec 7	25	aJan 21	b1.0	Jan15-21,1977
ANNUAL SEVEN-DAY MINIMUM	30	Dec 5	25	Jan 20	1.0	Jan 15, 1977
MAXIMUM PEAK FLOW			3,550	Apr 22	c11,000	May 5, 1934
MAXIMUM PEAK STAGE			8.65	Apr 22	d12.37	Sep 24, 1977
INSTANTANEOUS LOW FLOW					b1.0	Jan 15, 1977
ANNUAL RUNOFF (AC-FT)	163,500		200,200		359,800	
ANNUAL RUNOFF (CFSM)	0.37		0.45		0.82	
ANNUAL RUNOFF (INCHES)	5.04		6.16		11.08	
10 PERCENT EXCEEDS	570		689		1,270	
50 PERCENT EXCEEDS	125		127		222	
90 PERCENT EXCEEDS	45		27		83	

- a Also occurred Jan. 22-26 and Feb. 10-13.
- b Minimum observed.
- c Gage height 7.60 ft, site and datum then in use.
- d At present site and datum, discharge 10,500 ft<sup>3</sup>/s.
- e Estimated.

