Water-Data Report 2008

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND

Upper Red Basin
Upper Red Subbasin

LOCATION.--Lat 46°15′58″, long 96°35′54″ referenced to North American Datum of 1927, in NE ¼ sec.8, T.132 N., R.47 W., Richland County, ND, Hydrologic Unit 09020104, on left bank in Wahpeton, 800 ft downstream from confluence of Bois de Sioux and Otter Tail Rivers, and at mile 548.6.

DRAINAGE AREA.--4,010 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--May to October 1942, March 1943 to current year.

PERIOD OF RECORD.--DAILY GAGE HEIGHT--October 2000 to current year. Gage-height records collected in this vicinity since 1917 are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder and concrete and wooden dam. Datum of gage is 942.97 ft above National Geodetic Vertical Datum of 1929. Prior to August 6, 1943, National Weather Service nonrecording gage 800 ft upstream, converted to present datum. August 6, 1943, to October 27, 1950, nonrecording gage at present site and datum.

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

REGULATION.--Flow regulated by; Orwell Reservoir, flood storage capacity, 13,300 acre-ft at elevation 1,070 ft above mean sea level, adjustment of 1912; Mud Lake, flood storage capacity, 78,600 acre-ft at elevation 981 ft above mean sea level, adjustment of 1912; Lake Traverse, flood storage capacity, 75,100 acre-ft at elevation 981 ft above mean sea level, adjustment of 1912; and numerous other controlled lakes and ponds and several powerplants.

DIVERSION.--Since June 2005, Otter Tail River flows are partially diverted around Breckenridge. The diverted flows are measured at streamflow station Otter Tail River Diversion at Breckenridge, MN (station 05046475). Figures of daily discharge given here include flow through the diversion.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 17.0 ft, discharge, 10,500 ft^3/s, occurred in the spring of 1897.

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	278	342	e302	e347	e308	e353	e1,140	2,150	1,080	1,360	462	408
2	269	343	e309	e349	e312	e350	e992	2,520	1,060	1,170	485	943
3	270	345	e311	e359	e322	e352	859	2,580	1,060	1,010	521	931
4	270	346	e308	e394	e344	e348	876	2,230	1,040	959	525	595
5	280	345	e301	e426	e361	e343	916	1,930	1,000	910	549	470
6	255	346	e295	e452	e370	e340	1,080	1,820	1,760	904	584	432
7	183	343	e297	e448	e371	e341	1,020	1,810	3,010	906	543	421
8	179	341	e313	e398	e366	e345	1,110	1,780	3,280	906	513	410
9	177	336	e331	e388	e362	e350	1,320	1,750	2,790	903	527	404
10	204	287	e336	e378	e360	e390	1,270	1,730	2,330	937	513	398
11	280	271	e338	e370	e364	e529	1,250	1,730	2,140	1,300	637	414
12	311	271	e346	e369	e368	e565	1,170	1,760	2,520	1,440	1,680	404
13	316	270	e359	e380	e367	e584	1,140	1,770	2,830	1,190	1,590	373
14	314	281	e383	e405	e366	e594	1,150	1,750	2,730	1,050	1,050	365
15	320	321	e392	e411	e368	e623	1,190	1,720	2,570	971	820	364
16	343	321	e395	e407	e369	e673	1,340	1,720	2,440	937	720	360
17	336	317	e391	e401	e361	e739	1,240	1,650	2,350	896	637	363
18	354	316	e386	e398	e352	e806	1,110	1,580	2,300	855	612	375
19	437	314	e378	e392	e348	e853	1,240	1,560	2,240	814	569	382
20	458	e310	e369	e387	e348	e894	1,300	1,440	2,210	767	493	381
21	451	e286	e361	e384	e350	e923	1,280	1,280	2,170	754	449	376
22	446	e263	e358	e380	e355	e949	1,250	1,220	2,130	748	405	377
23	438	e262	e355	e378	e357	e966	1,210	1,130	2,110	744	373	375
24	546	e323	e351	e377	e358	e980	1,320	1,080	2,090	740	369	379
25	777	e332	e350	e376	e354	e1,010	1,410	1,040	2,090	720	364	529
26	798	e303	e360	e374	e350	e1,050	1,400	1,020	2,030	679	360	1,290
27	717	e252	e364	e366	e350	e1,100	1,320	1,020	1,900	661	400	974
28	472	e223	e365	e353	e352	e1,160	1,300	1,020	1,610	657	430	599
29	392	e236	e360	e343	e353	e1,230	1,390	1,020	1,430	634	411	449
30	359	e281	e355	e329	---	e1,260	1,650	1,030	1,380	580	395	425
31	330	---	e351	e313	---	e1,240	---	1,080	---	508	389	---
Total	11,560	9,127	10,770	11,832	10,266	22,240	36,243	48,920	61,680	27,610	18,375	14,966
Mean	373	304	347	382	354	717	1,208	1,578	2,056	891	593	499
Max	798	346	395	452	371	1,260	1,650	2,580	3,280	1,440	1,680	1,290
Min	177	223	295	313	308	340	859	1,020	1,000	508	360	360
Ac-ft	22,930	18,100	21,360	23,470	20,360	44,110	71,890	97,030	122,300	54,760	36,450	29,690

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2008, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	377	349	321	306	324	748	1,502	1,198	1,203	883	469	377
Max	1,712	1,517	967	870	868	2,629	8,717	3,344	3,955	2,787	2,496	2,148
(WY)	(2005)	(2005)	(1999)	(2006)	(1998)	(1995)	(1997)	(1997)	(2007)	(1993)	(1993)	(1993)
Min	5.72	7.40	6.60	8.81	18.0	84.3	138	22.5	90.0	65.6	53.5	2.18
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1977)	(1976)

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND—Continued

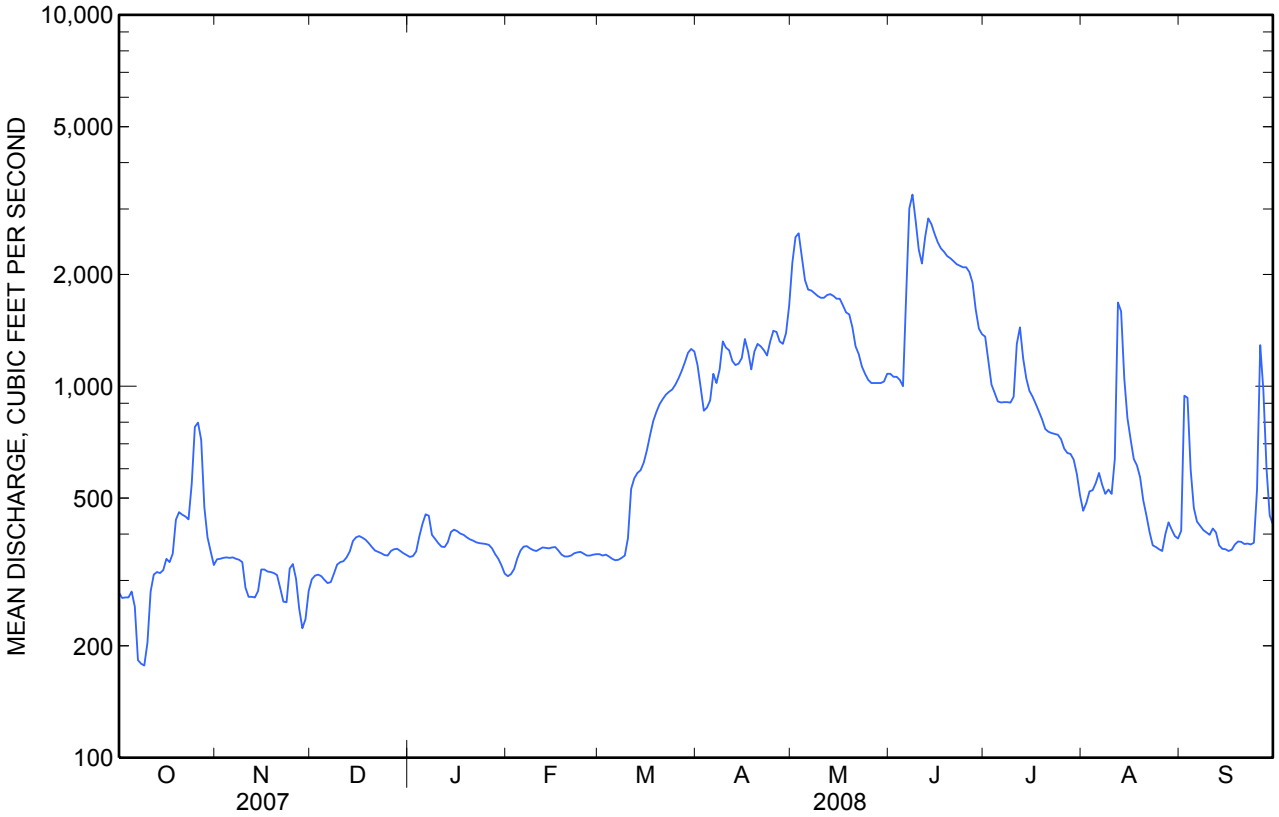
SUMMARY STATISTICS

	Calendar Year 2007		Water Year 2008		Water Years 1942 - 2008	
Annual total	[a]507,670		[a]283,589			
Annual mean	[a]1,391		[a]775		670	
Highest annual mean					1,600	1997
Lowest annual mean					54.0	1977
Highest daily mean	[a]9,950	Jun 3	[a]3,280	Jun 8	12,700	Apr 15, 1997
Lowest daily mean	[a]177	Oct 9	[a]177	Oct 9	1.7	Aug 28, 1976
Annual seven-day minimum	[a]221	Oct 4	[a]221	Oct 4	1.7	Aug 28, 1976
Maximum peak flow			[b]3,190	Jun 8	12,800	Apr 15, 1997
Maximum peak stage			9.93	Jun 8	[c]19.42	Apr 6, 1997
Annual runoff (ac-ft)	[a]1,007,000		[a]562,500		485,300	
10 percent exceeds	3,130		1,720		1,530	
50 percent exceeds	450		442		410	
90 percent exceeds	298		313		113	

[a] Combined daily flows from Red River of the North and Otter Tail River Diversion Channel.

[b] Red River of the North only, does not include peak flow from station 05046475.

[c] From floodmark, backwater from ice.

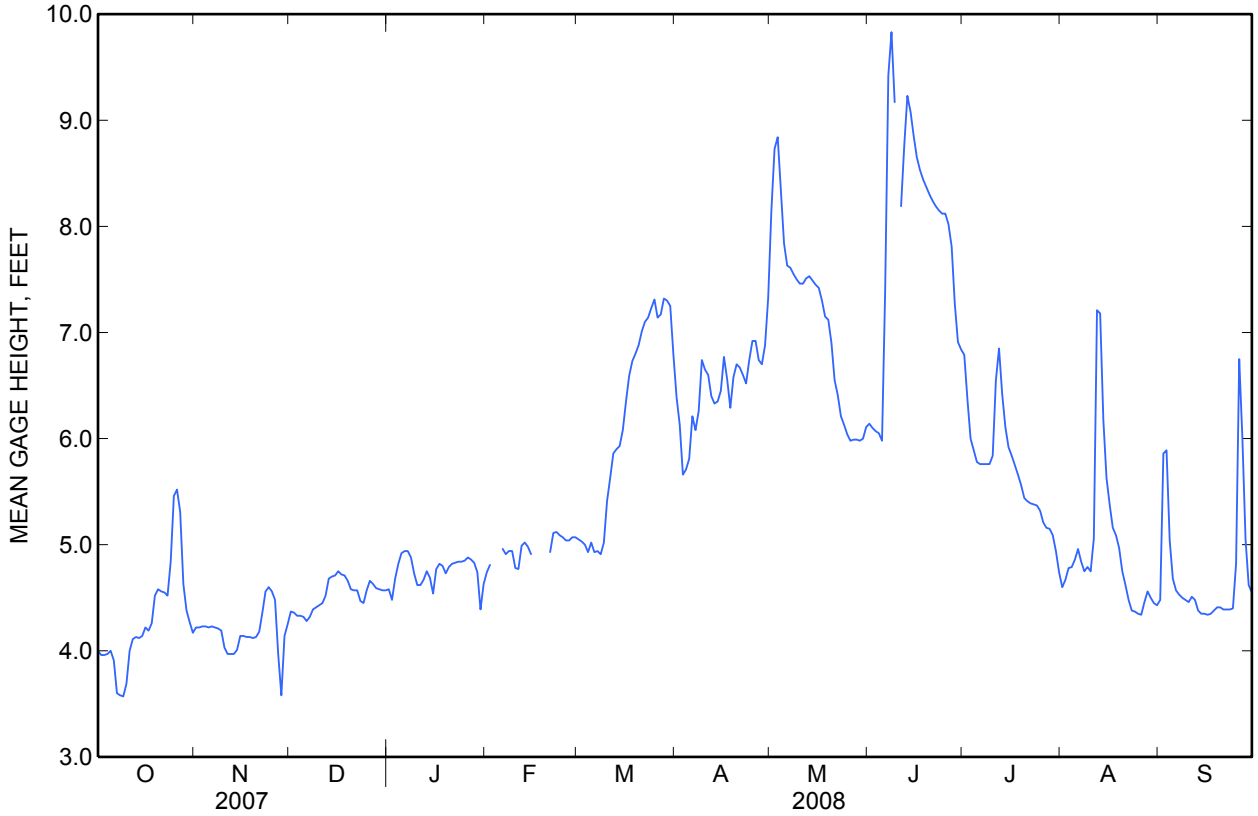


05051500 RED RIVER OF THE NORTH AT WAHPETON, ND—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4.00	4.22	4.37	4.58	4.74	5.05	6.39	8.15	6.14	6.79	4.60	4.48
2	3.96	4.22	4.36	4.48	4.81	5.03	6.13	8.73	6.10	6.37	4.67	5.86
3	3.96	4.23	4.33	4.68	---	5.00	5.66	8.84	6.07	6.00	4.78	5.89
4	3.97	4.23	4.33	4.82	---	4.93	5.71	8.34	6.05	5.89	4.79	5.04
5	4.00	4.22	4.32	4.92	---	5.02	5.81	7.84	5.98	5.78	4.86	4.68
6	3.91	4.23	4.28	4.94	4.96	4.93	6.21	7.63	7.40	5.76	4.96	4.57
7	3.60	4.22	4.32	4.94	4.91	4.94	6.08	7.61	9.42	5.76	4.84	4.53
8	3.58	4.21	4.39	4.88	4.94	4.91	6.26	7.55	9.83	5.76	4.75	4.50
9	3.57	4.19	4.41	4.73	4.94	5.02	6.74	7.50	9.17	5.76	4.79	4.48
10	3.69	4.03	4.43	4.62	4.78	5.41	6.65	7.46	---	5.84	4.75	4.46
11	4.00	3.97	4.45	4.62	4.77	5.63	6.60	7.46	8.19	6.55	5.06	4.51
12	4.11	3.97	4.52	4.67	4.99	5.86	6.40	7.51	8.76	6.85	7.21	4.48
13	4.13	3.97	4.68	4.75	5.02	5.90	6.33	7.53	9.23	6.42	7.18	4.38
14	4.12	4.01	4.70	4.69	4.98	5.93	6.35	7.49	9.08	6.11	6.18	4.35
15	4.14	4.14	4.71	4.54	4.91	6.08	6.45	7.45	8.85	5.92	5.63	4.35
16	4.22	4.14	4.75	4.77	---	6.35	6.77	7.42	8.65	5.84	5.38	4.34
17	4.19	4.13	4.72	4.82	---	6.59	6.56	7.30	8.53	5.75	5.16	4.35
18	4.26	4.13	4.71	4.80	---	6.73	6.29	7.15	8.44	5.66	5.09	4.38
19	4.52	4.12	4.66	4.73	---	6.80	6.58	7.12	8.37	5.56	4.97	4.41
20	4.58	4.13	4.58	4.79	---	6.88	6.70	6.90	8.30	5.44	4.75	4.41
21	4.56	4.18	4.57	4.82	4.93	7.01	6.67	6.55	8.24	5.41	4.62	4.39
22	4.55	4.36	4.57	4.83	5.11	7.10	6.60	6.41	8.19	5.39	4.48	4.39
23	4.52	4.56	4.47	4.84	5.12	7.14	6.52	6.21	8.15	5.38	4.38	4.39
24	4.84	4.60	4.45	4.84	5.09	7.23	6.74	6.13	8.12	5.37	4.37	4.40
25	5.46	4.56	4.57	4.85	5.07	7.31	6.92	6.04	8.12	5.32	4.35	4.82
26	5.52	4.48	4.66	4.88	5.04	7.14	6.92	5.98	8.02	5.21	4.34	6.75
27	5.31	3.97	4.63	4.86	5.04	7.17	6.74	5.99	7.81	5.16	4.46	6.01
28	4.63	3.58	4.59	4.83	5.07	7.32	6.70	5.99	7.27	5.15	4.56	5.05
29	4.38	4.14	4.58	4.74	5.07	7.30	6.88	5.98	6.91	5.09	4.50	4.62
30	4.27	4.25	4.57	4.39	---	7.25	7.33	6.00	6.84	4.94	4.45	4.55
31	4.17	---	4.57	4.63	---	6.79	---	6.11	---	4.74	4.43	---
Mean	4.28	4.18	4.52	4.75	---	6.19	6.49	7.11	---	5.71	4.95	4.73
Max	5.52	4.60	4.75	4.94	---	7.32	7.33	8.84	---	6.85	7.21	6.75
Min	3.57	3.58	4.28	4.39	---	4.91	5.66	5.98	---	4.74	4.34	4.34

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND—Continued



05051500 RED RIVER OF THE NORTH AT WAHPETON, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1972 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 1 of 3

[Remark codes: <, less than. Null value qualifier codes: x, result failed quality assurance review.]

Date	Time	Instantaneous discharge, ft3/s (00061)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conductance, wat unf lab, µS/cm 25 degC (90095)	Specific conductance, wat unf µS/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)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)
Apr													
09...	0945	1,360	8.5	--x	717	709	7.0	5.8	350	69.5	44.0	5.28	.4
Jul													
31...	1030	524	8.3	7.9	440	442	23.5	25.6	210	39.1	27.6	3.69	.3

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 2 of 3

[Remark codes: <, less than. Null value qualifier codes: x, result failed quality assurance review.]

Date	Sodium fraction of cations percent (00932)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L as SiO2 (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, dissolved, tons/d (70302)	Aluminum, water, fltrd, µg/L (01106)	Antimony, water, fltrd, µg/L (01095)	Arsenic water, fltrd, µg/L (01000)	Barium, water, fltrd, µg/L (01005)
Apr													
09...	10	18.4	201	13.4	.17	15.4	162	445	1,650	<50	<1.00	3.1	64
Jul													
31...	9	9.40	193	10.5	.12	17.3	29.6	273	358	<50	<1.00	2.8	70

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 3 of 3

[Remark codes: <, less than. Null value qualifier codes: x, result failed quality assurance review.]

Date	Beryllium, water, fltrd, µg/L (01010)	Boron, water, fltrd, µg/L (01020)	Cadmium water, fltrd, µg/L (01025)	Chromium, water, fltrd, µg/L (01030)	Copper, water, fltrd, µg/L (01040)	Iron, water, fltrd, µg/L (01046)	Lead, water, fltrd, µg/L (01049)	Manganese, water, fltrd, µg/L (01056)	Nickel, water, fltrd, µg/L (01065)	Selenium, water, fltrd, µg/L (01145)	Silver, water, fltrd, µg/L (01075)	Thallium, water, fltrd, µg/L (01057)	Zinc, water, fltrd, µg/L (01090)
Apr													
09...	<1.00	65	<1.00	2.6	<1.0	<50	<1.00	35.0	2.0	<1.0	<1.0	<1.00	1.6
Jul													
31...	<1.00	60	<1.00	<1.0	<1.0	<50	<1.00	21.0	2.1	<1.0	<1.0	<1.00	1.4