Water-Data Report 2008

05090000 PARK RIVER AT GRAFTON, ND

Lower Red Basin
Park Subbasin

LOCATION.--Lat 48°25′29″, long 97°24′42″ referenced to North American Datum of 1927, in NE ¼ sec.13, T.157 N., R.53 W., Walsh County, ND, Hydrologic Unit 09020310, on right bank just upstream of U.S. Highway 81 bridge in Grafton and 3.5 mi downstream from South Branch Park River.

DRAINAGE AREA.--695 mi^2, approximately.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--May 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

PERIOD OF RECORD.--DAILY GAGE HEIGHT--October 2000 to current year.

REVISED RECORDS.--WSP 955: 1941. WSP 1438: 1932, 1933(M), 1936-37(M), 1939(M), 1944. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 811.00 ft above National Geodetic Vertical Datum of 1929. Prior to October 1, 1984, gage located on right bank 30 ft upstream of Wakeman Avenue bridge. Datum of gage was 807.39 ft. Prior to September 30, 1940, nonrecording gage at site 30 ft downstream at same datum. October 1, 1940, to September 17, 1946, nonrecording gage at site 2 mi downstream above masonry dam at same datum. September 18, 1946, to July 25, 1952, nonrecording gage at site 30 ft downstream at same datum.

REMARKS.--Records good except for discharges below 10 ft^3/s and those for estimated daily discharges, which are poor.

05090000 PARK RIVER AT GRAFTON, 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	7.2	22	e15	7.4	e7.5	e5.0	e56	96	17	9.6	2.8	1.9
2	8.0	21	e16	6.9	e7.0	e5.0	e85	87	16	7.9	2.5	1.9
3	8.5	15	e17	6.9	e6.5	e5.0	e134	84	15	7.3	2.4	1.8
4	8.6	16	e19	6.9	e6.0	e5.0	e193	80	17	6.6	2.5	1.8
5	9.6	18	e20	6.7	e5.9	e5.0	e215	75	15	5.5	2.4	1.9
6	10	16	e20	6.9	e5.8	e5.0	e212	68	25	4.8	2.4	1.8
7	8.4	20	e20	6.8	e5.8	e5.0	e247	54	49	11	2.5	1.8
8	9.1	21	e20	6.7	e5.7	e5.0	e246	49	52	22	2.6	1.6
9	15	20	e20	6.6	e5.6	e5.0	e224	47	80	43	2.4	1.5
10	20	21	e20	e6.6	e5.4	e5.0	e302	47	125	37	2.4	3.7
11	14	22	e20	e6.5	e5.2	e5.0	e400	37	143	28	4.9	3.4
12	13	19	e19	e6.4	e5.2	e5.0	e400	32	174	20	4.5	2.6
13	17	21	e19	e6.2	e5.2	e5.0	335	32	256	26	5.6	2.3
14	11	18	e18	e6.1	e5.2	e5.4	297	32	391	16	12	2.2
15	9.0	20	e17	e6.0	e5.1	e6.0	306	38	416	9.0	22	2.1
16	9.6	19	e16	e5.8	e5.1	e7.1	308	37	397	6.7	6.3	2.1
17	9.7	17	e16	e5.8	e5.1	e9.0	333	34	323	4.7	4.2	2.0
18	12	17	16	e5.7	e5.1	e11	317	30	226	4.1	3.9	2.1
19	17	17	16	e5.6	e5.1	e13	303	31	160	3.8	3.4	2.1
20	28	18	16	e5.5	e5.1	e12	279	31	113	3.3	2.9	2.0
21	20	13	16	e5.4	e5.1	e11	261	26	82	3.1	2.5	1.8
22	19	e14	15	e5.3	e5.1	e9.6	181	25	49	2.8	2.7	2.1
23	18	e15	11	e5.1	e5.1	e9.2	138	24	32	2.8	2.6	2.6
24	17	e16	9.1	e4.9	e5.1	e9.2	126	25	23	2.9	8.0	3.1
25	22	e15	8.5	e4.8	e5.1	e9.2	119	25	19	2.7	9.1	2.5
26	16	e13	8.3	e4.8	e5.1	e9.2	120	23	14	2.8	6.6	2.9
27	15	e12	8.5	e4.8	e5.1	e9.0	119	22	13	2.9	3.0	8.5
28	13	e11	8.4	e4.8	e5.1	e9.0	116	21	15	2.8	2.5	95
29	13	e12	8.0	e5.5	e5.1	e9.6	115	19	14	2.9	2.2	125
30	15	e13	7.9	e7.0	---	e12	104	18	11	3.0	2.1	112
31	15	---	7.9	e8.0	---	e24	---	17	---	3.7	2.0	---
Total	427.7	512	468.6	188.4	158.5	249.5	6,591	1,266	3,282	308.7	137.9	398.1
Mean	13.8	17.1	15.1	6.08	5.47	8.05	220	40.8	109	9.96	4.45	13.3
Max	28	22	20	8.0	7.5	24	400	96	416	43	22	125
Min	7.2	11	7.9	4.8	5.1	5.0	56	17	11	2.7	2.0	1.5
Ac-ft	848	1,020	929	374	314	495	13,070	2,510	6,510	612	274	790

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2008, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	5.45	4.55	2.99	1.74	3.05	83.2	427	120	59.6	39.7	15.4	9.41
Max	69.9	31.3	17.4	13.9	45.7	654	2,051	2,071	576	441	569	185
(WY)	(1983)	(1981)	(1983)	(1983)	(1981)	(1995)	(1950)	(1950)	(1964)	(1997)	(1993)	(2002)
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.00	0.00	0.00	0.00
(WY)	(1934)	(1934)	(1933)	(1932)	(1933)	(1936)	(1991)	(1939)	(1961)	(1990)	(1932)	(1932)

05090000 PARK RIVER AT GRAFTON, ND—Continued

SUMMARY STATISTICS

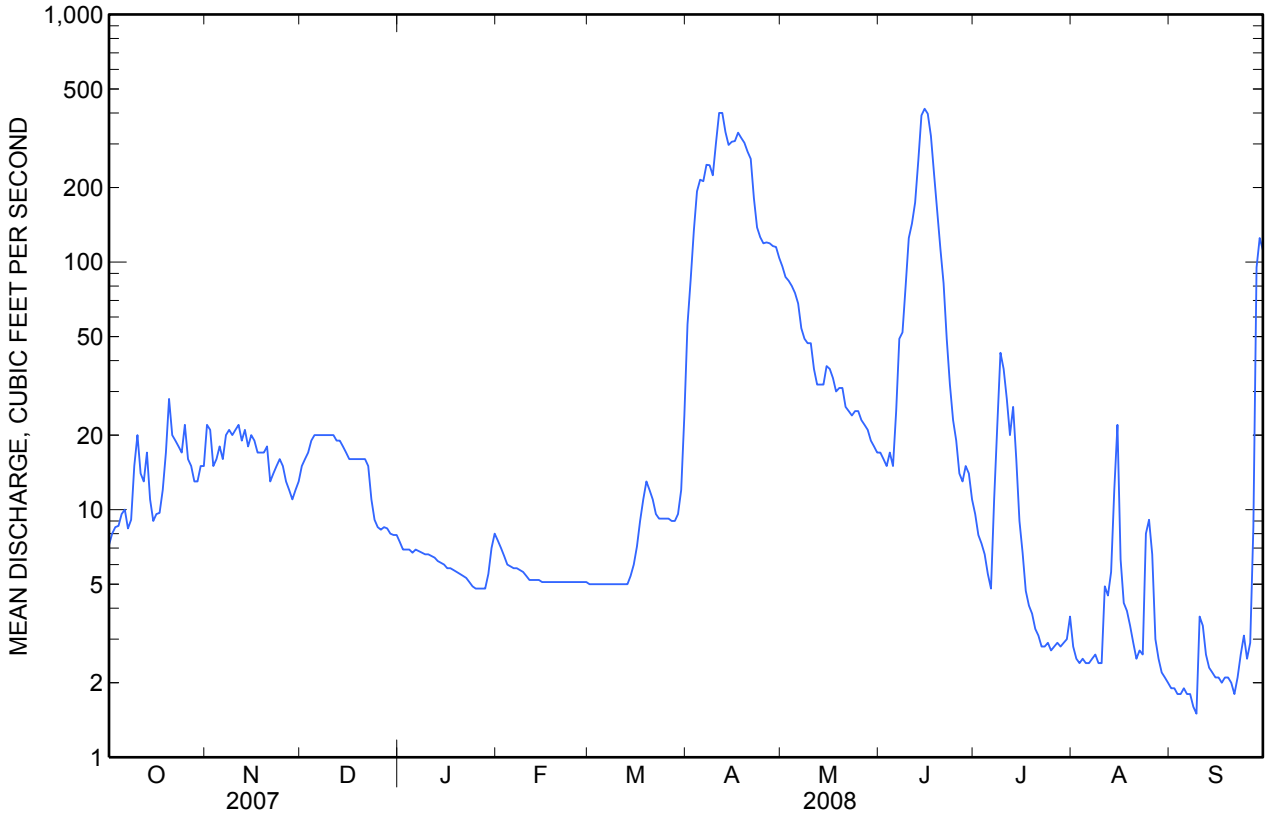
	Calendar Year 2007		Water Year 2008		Water Years 1931 - 2008	
Annual total	43,900.76		13,988.4			
Annual mean	120		38.2		64.3	
Highest annual mean					353	1950
Lowest annual mean					1.38	1990
Highest daily mean	2,100	Apr 2	416	Jun 15	11,700	Apr 19, 1950
Lowest daily mean	0.03	Feb 3	1.5	Sep 9	0.00	Aug 10, 1931
Annual seven-day minimum	0.09	Jan 29	1.7	Sep 3	0.00	Aug 21, 1931
Maximum peak flow			[a]420	Jun 15	[b]12,600	Apr 19, 1950
Maximum peak stage			[c]8.72	Apr 12	[d]20.13	Apr 19, 1950
Annual runoff (ac-ft)	87,080		27,750		46,600	
10 percent exceeds	269		117		94	
50 percent exceeds	17		10		2.4	
90 percent exceeds	6.7		2.6		0.00	

[a] Gage height, 8.43 ft.

[b] From rating curve extended above 9,000 ft³/s.

[c] Backwater from ice.

[d] Site and datum then in use.

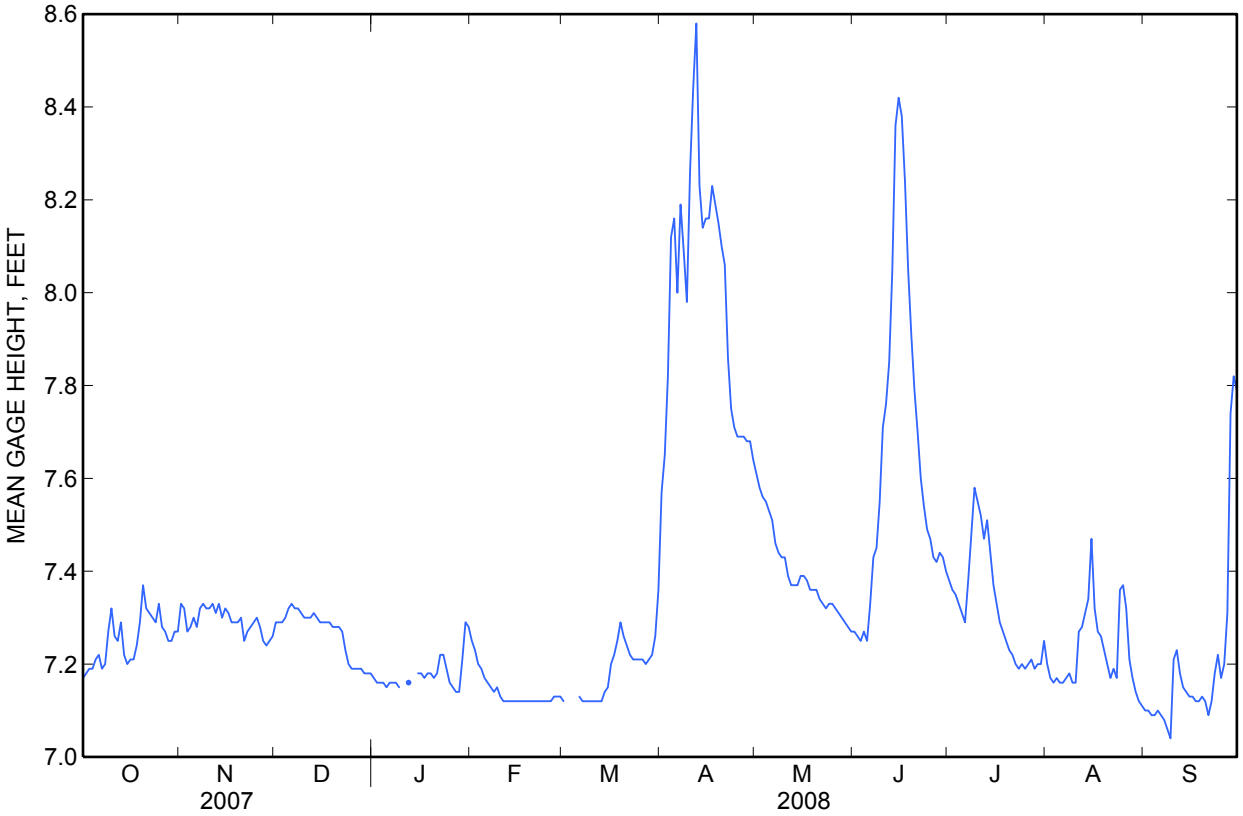


05090000 PARK RIVER AT GRAFTON, ND—Continued

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	7.17	7.33	7.29	7.17	7.25	7.12	7.57	7.61	7.27	7.38	7.20	7.10
2	7.18	7.32	7.29	7.16	7.23	---	7.65	7.58	7.26	7.36	7.17	7.10
3	7.19	7.27	7.29	7.16	7.20	---	7.82	7.56	7.25	7.35	7.16	7.09
4	7.19	7.28	7.30	7.16	7.19	---	8.12	7.55	7.27	7.33	7.17	7.09
5	7.21	7.30	7.32	7.15	7.17	---	8.16	7.53	7.25	7.31	7.16	7.10
6	7.22	7.28	7.33	7.16	7.16	7.13	8.00	7.51	7.33	7.29	7.16	7.09
7	7.19	7.32	7.32	7.16	7.15	7.12	8.19	7.46	7.43	7.38	7.17	7.08
8	7.20	7.33	7.32	7.16	7.14	7.12	8.09	7.44	7.45	7.48	7.18	7.06
9	7.27	7.32	7.31	7.15	7.15	7.12	7.98	7.43	7.55	7.58	7.16	7.04
10	7.32	7.32	7.30	---	7.13	7.12	8.26	7.43	7.71	7.55	7.16	7.21
11	7.26	7.33	7.30	---	7.12	7.12	8.44	7.39	7.76	7.52	7.27	7.23
12	7.25	7.31	7.30	7.16	7.12	7.12	8.58	7.37	7.85	7.47	7.28	7.18
13	7.29	7.33	7.31	---	7.12	7.12	8.23	7.37	8.05	7.51	7.31	7.15
14	7.22	7.30	7.30	---	7.12	7.14	8.14	7.37	8.36	7.44	7.34	7.14
15	7.20	7.32	7.29	7.18	7.12	7.15	8.16	7.39	8.42	7.37	7.47	7.13
16	7.21	7.31	7.29	7.18	7.12	7.20	8.16	7.39	8.38	7.33	7.32	7.13
17	7.21	7.29	7.29	7.17	7.12	7.22	8.23	7.38	8.24	7.29	7.27	7.12
18	7.24	7.29	7.29	7.18	7.12	7.25	8.19	7.36	8.05	7.27	7.26	7.12
19	7.29	7.29	7.28	7.18	7.12	7.29	8.15	7.36	7.91	7.25	7.23	7.13
20	7.37	7.30	7.28	7.17	7.12	7.26	8.10	7.36	7.79	7.23	7.20	7.12
21	7.32	7.25	7.28	7.18	7.12	7.24	8.06	7.34	7.70	7.22	7.17	7.09
22	7.31	7.27	7.27	7.22	7.12	7.22	7.86	7.33	7.60	7.20	7.19	7.12
23	7.30	7.28	7.23	7.22	7.12	7.21	7.75	7.32	7.54	7.19	7.17	7.18
24	7.29	7.29	7.20	7.19	7.12	7.21	7.71	7.33	7.49	7.20	7.36	7.22
25	7.33	7.30	7.19	7.16	7.12	7.21	7.69	7.33	7.47	7.19	7.37	7.17
26	7.28	7.28	7.19	7.15	7.12	7.21	7.69	7.32	7.43	7.20	7.32	7.20
27	7.27	7.25	7.19	7.14	7.13	7.20	7.69	7.31	7.42	7.21	7.21	7.31
28	7.25	7.24	7.19	7.14	7.13	7.21	7.68	7.30	7.44	7.19	7.17	7.74
29	7.25	7.25	7.18	7.21	7.13	7.22	7.68	7.29	7.43	7.20	7.14	7.82
30	7.27	7.26	7.18	7.29	---	7.26	7.64	7.28	7.40	7.20	7.12	7.79
31	7.27	---	7.18	7.28	---	7.36	---	7.27	---	7.25	7.11	---
Mean	7.25	7.29	7.27	---	7.14	---	7.99	7.40	7.65	7.32	7.22	7.20
Max	7.37	7.33	7.33	---	7.25	---	8.58	7.61	8.42	7.58	7.47	7.82
Min	7.17	7.24	7.18	---	7.12	---	7.57	7.27	7.25	7.19	7.11	7.04

05090000 PARK RIVER AT GRAFTON, ND—Continued



05090000 PARK RIVER AT GRAFTON, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1969 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 1 of 5

[Remark codes: <, less than. Null value qualifier codes: c, sample lost in lab; x, result failed quality assurance review.]

Date	Time	Instantaneous discharge, ft3/s (00061)	Turbidity, IR LED light, det ang 90 deg, FNU (63680)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	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)
Oct													
16...	0920	9.7	7.3	736	9.2	82	7.8	8.1	1,390	1,380	6.0	8.5	450
Jan													
08...	1000	6.7	--	736	7.4	55	7.6	7.4	1,640	1,740	-8.0	1.3	580
Apr													
28...	1010	114	--	743	13.5	105	8.3	7.6	929	922	3.0	3.6	380
May													
13...	1330	32	--	732	12.2	113	8.8	8.2	1,140	1,120	8.0	9.9	420
Jun													
04...	1305	18	--	727	8.2	88	8.3	--x	1,450	1,440	20.0	16.0	530
Jul													
15...	1130	9.0	--	737	8.0	91	8.3	8.1	1,270	1,240	24.5	19.5	520
Aug													
05...	1315	2.4	--	746	6.0	70	8.3	8.3	1,560	1,560	25.0	21.5	550
Sep													
03...	0910	1.7	--	749	7.2	79	8.3	8.3	1,230	1,230	8.5	18.5	430

05090000 PARK RIVER AT GRAFTON, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 2 of 5
[Remark codes: <, less than. Null value qualifier codes: c, sample lost in lab; x, result failed quality assurance review.]

Date	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium frac-tion of cations percent (00932)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L as SiO2 (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, dis-solved, tons/d (70302)
Oct													
16...	100	47.6	9.33	2.3	35	113	263	102	.34	11.4	321	862	22.7
Jan													
08...	134	59.8	10.3	2.2	32	124	356	109	.39	15.2	388	1,020	19.2
Apr													
28...	90.2	37.0	7.44	1.4	26	61.0	213	39.6	.32	18.1	214	576	185
May													
13...	95.9	44.1	7.65	1.8	31	86.6	242	69.1	.32	5.78	271	707	62.7
Jun													
04...	117	58.2	9.07	2.3	33	120	266	103	.36	3.75	353	899	44.9
Jul													
15...	116	56.5	8.52	1.5	24	76.9	236	50.6	.32	17.0	372	787	20.5
Aug													
05...	121	60.7	9.72	2.2	32	118	286	117	.38	18.7	412	967	6.67
Sep													
03...	94.7	46.3	10.3	2.0	33	95.4	241	59.4	.30	19.4	330	763	3.68

05090000 PARK RIVER AT GRAFTON, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 3 of 5
[Remark codes: <, less than. Null value qualifier codes: c, sample lost in lab; x, result failed quality assurance review.]

Date	Residue total non-filter-able, mg/L (00530)	Ammonia + org-N, water, fltrd, mg/L as N (00623)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia water, unfltrd mg/L as N (00610)	Nitrate + nitrite water fltrd, mg/L as N (00631)	Nitrate + nitrite water unfltrd mg/L as N (00630)	Organic nitro-gen, water, fltrd, mg/L (00607)	Organic nitro-gen, water, unfltrd mg/L (00605)	Total nitro-gen, wat flt by anal ysis, mg/L (62854)	Total nitro-gen, wat unf by anal ysis, mg/L (62855)	Total nitro-gen, water, fltrd, mg/L (00602)	Phos-phorus, water, fltrd, mg/L as P (00666)
Oct													
16...	14	.61	.72	.010	.01	.931	.930	.60	.71	1.54	1.65	1.5	.077
Jan													
08...	<5	.82	.86	.240	.23	1.30	1.28	.58	.63	2.12	2.14	2.1	.109
Apr													
28...	24	.55	.56	<.030	<.03	1.17	1.18	--	--	1.72	1.74	1.7	.131
May													
13...	23	.54	.60	<.030	<.03	<.030	<.030	--	--	.57	.63	--	.006
Jun													
04...	33	.52	.55	<.030	<.03	<.030	<.030	--	--	.55	.58	--	.019
Jul													
15...	21	.76	.70	<.030	<.03	.588	.580	--	--	1.35	1.28	1.4	.170
Aug													
05...	11	.63	.71	<.030	<.03	<.030	<.030	--	--	.66	.74	--	.131
Sep													
03...	<5	--	.85	--c	.10	--c	.330	--	.75	--c	1.18	--	--c

05090000 PARK RIVER AT GRAFTON, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 4 of 5
[Remark codes: <, less than. Null value qualifier codes: c, sample lost in lab; x, result failed quality assurance review.]

Date	Phos-phorus, water, unfltrd mg/L as P (00665)	Organic carbon, water, fltrd, mg/L (00681)	Organic carbon, water, unfltrd mg/L (00680)	E coli, m-TEC MF, water, col/ 100 mL (31633)	Fecal coli-form, M-FC 0.7u MF col/ 100 mL (31625)	Fecal strep-tococci KF MF, col/ 100 mL (31673)	Alum-inum, water, fltrd, µg/L (01106)	Anti-mony, water, fltrd, µg/L (01095)	Arsenic water, fltrd, µg/L (01000)	Barium, water, fltrd, µg/L (01005)	Beryll-ium, water, fltrd, µg/L (01010)	Boron, water, fltrd, µg/L (01020)	Cadmium water, fltrd, µg/L (01025)
Oct													
16...	.103	6.7	6.9	10	10	270	<50	<1.00	3.6	38	<1.00	243	<1.00
Jan													
08...	.120	7.5	7.4	20	20	20	<50	<1.00	3.0	40	<1.00	274	<1.00
Apr													
28...	.164	7.0	6.7	<10	<10	--	<50	<1.00	2.8	28	<1.00	109	<1.00
May													
13...	.048	6.8	6.8	40	40	--	<50	<1.00	2.5	36	<1.00	162	<1.00
Jun													
04...	.061	7.6	7.5	<10	<10	--	<50	<1.00	3.2	52	<1.00	234	<1.00
Jul													
15...	.200	9.1	8.8	150	150	--	<50	<1.00	5.9	38	<1.00	163	<1.00
Aug													
05...	.156	8.4	8.3	30	40	--	<50	<1.00	10.3	45	<1.00	284	<1.00
Sep													
03...	.252	7.8	7.8	<10	<10	--	60	<1.00	7.7	33	<1.00	200	<1.00

05090000 PARK RIVER AT GRAFTON, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 5 of 5
[Remark codes: <, less than. Null value qualifier codes: c, sample lost in lab; x, result failed quality assurance review.]

Date	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)	Suspnd. sediment, sieve diametr percent <62.5um (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment discharge, tons/d (80155)
Oct													
16...	<1.0	3.1	<50	<1.00	40.0	6.1	5.0	<1.0	<1.00	4.7	94	14	.37
Jan													
08...	9.5	2.5	<50	<1.00	172	6.9	4.3	<1.0	<1.00	10.9	100	4	.07
Apr													
28...	<1.0	1.6	<50	<1.00	70.0	4.7	2.3	<1.0	<1.00	2.3	98	22	6.8
May													
13...	<1.0	2.1	<50	<1.00	<10.0	5.2	2.3	<1.0	<1.00	1.5	64	31	2.7
Jun													
04...	<1.0	2.7	<50	<1.00	197	7.6	3.4	<1.0	<1.00	<1.0	91	20	.97
Jul													
15...	<1.0	<1.0	<50	<1.00	112	8.6	2.6	<1.0	<1.00	3.7	90	13	.32
Aug													
05...	<1.0	<1.0	<50	<1.00	253	8.2	3.1	<1.0	<1.00	3.0	54	11	.07
Sep													
03...	<1.0	<1.0	<50	<1.00	336	7.9	2.8	<1.0	<1.00	4.0	60	9	.04