Water-Data Report 2013

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND

Lower Red Basin
Lower Red Subbasin

LOCATION.--Lat 48°58′25″, long 97°14′29″ referenced to North American Datum of 1927, in NE ¼ NE ¼ NE ¼ sec.4, T.163 N., R.51 W., Pembina County, ND, Hydrologic Unit 09020311, on left bank on bridge crossing the Red River of the North, 0.2 mi north of Pembina.

DRAINAGE AREA.--40,200 mi^2 of which 3,800 mi^2 probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--March 1985 to September 2002 (maximum discharge and gage height only), April to May 1997, October 2002 to current year (gage height and maximum discharge only).

GAGE.--Water stage recorder. Datum of gage is 739.45 ft above National Geodetic Vertical Datum of 1929 (levels by North Dakota State Water Commission).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 141,000 ft^3/s, April 26, 1997, gage height, 54.94 ft; minimum recorded gage height, 7.37 ft, September 15, 2003.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 45,900 ft^3/s, May 8, gage height, 46.11 ft; minimum daily gage height, 8.81 ft, October 3.

DISCHARGE MEASUREMENTS
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Date	Discharge, in ft^3/s
May 7, 2013	45,200

Suggested citation: U.S. Geological Survey, 2014, Water-resources data for the United States, Water Year 2013: U.S. Geological Survey Water-Data Report WDR-US-2013, site 05102490, accessed at http://wdr.water.usgs.gov/wy2013/pdfs/05102490.2013.pdf

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	8.85	9.66	9.95	9.45	9.39	9.99	13.53	42.80	36.15	29.66	15.15	11.49
2	8.83	9.62	9.97	9.40	9.32	9.98	13.55	43.76	36.68	30.35	14.97	11.44
3	8.81	9.58	10.12	9.36	9.29	9.97	13.56	44.43	---	30.91	14.78	11.47
4	8.83	9.52	10.24	9.34	9.28	10.00	13.57	44.93	37.40	31.31	14.57	11.54
5	8.91	9.48	10.34	9.31	9.32	10.07	13.58	---	37.32	31.53	14.42	11.51
6	9.02	9.44	10.37	9.29	9.36	10.13	13.61	45.62	37.01	31.51	14.24	11.39
7	9.02	9.47	10.39	9.31	9.41	10.19	13.67	45.91	36.42	31.18	14.02	11.26
8	8.97	9.49	10.42	9.36	9.47	10.26	13.73	45.97	---	30.37	13.81	11.18
9	8.91	9.52	10.43	9.42	9.53	10.34	13.77	45.91	34.64	29.00	13.59	11.17
10	8.90	9.55	10.42	9.45	9.58	10.41	13.83	45.78	33.69	26.99	13.46	11.16
11	8.97	9.61	10.31	9.49	9.65	10.48	13.91	45.58	32.69	24.64	13.37	11.16
12	9.10	9.69	10.19	9.58	9.72	10.52	13.98	45.38	31.59	22.48	13.28	11.19
13	9.15	9.89	10.06	9.61	9.78	10.57	14.02	45.14	30.45	20.83	13.18	11.24
14	9.11	9.96	9.89	9.58	9.84	10.63	14.08	44.71	29.22	19.70	13.10	11.32
15	9.11	10.09	9.71	9.55	9.88	10.73	14.19	44.15	27.92	18.96	13.07	11.37
16	9.10	10.23	9.56	9.52	9.90	10.90	14.28	43.22	26.58	18.47	13.05	11.40
17	9.13	10.16	9.49	9.51	9.90	11.10	14.35	42.07	25.23	18.10	13.02	11.36
18	9.23	10.20	9.48	9.54	9.94	11.37	14.47	40.70	23.97	18.01	13.07	11.30
19	9.31	10.21	9.48	9.56	9.98	11.67	14.72	39.13	22.85	18.13	13.14	11.43
20	9.48	10.18	9.47	9.61	10.0	11.97	15.14	37.57	21.95	18.81	13.12	11.74
21	9.65	10.27	9.44	9.65	9.96	12.22	15.69	36.83	21.22	18.69	12.99	12.06
22	9.80	10.26	9.43	9.64	9.93	12.39	16.58	36.73	20.59	18.31	12.75	12.18
23	9.95	10.10	9.46	9.60	9.91	12.51	18.16	37.11	20.17	18.14	12.51	12.13
24	10.07	10.29	9.51	9.55	9.89	12.63	20.56	37.65	20.08	17.98	12.36	11.97
25	10.11	10.29	9.56	9.50	9.89	12.81	23.47	38.31	20.78	17.62	12.38	11.83
26	10.09	10.39	9.59	9.49	9.90	13.05	26.92	38.71	22.70	17.19	12.23	11.68
27	10.07	10.58	9.59	9.50	9.92	13.27	32.16	38.75	24.64	16.73	---	11.52
28	9.99	10.51	9.58	9.48	9.96	13.41	36.97	38.42	26.30	16.27	11.89	11.51
29	9.89	10.32	9.58	9.46	---	13.47	39.39	37.79	27.62	15.86	11.72	11.61
30	9.84	10.10	9.55	9.45	---	13.51	41.35	36.95	28.73	15.55	11.57	11.72
31	9.77	---	9.51	9.45	---	13.52	---	36.20	---	15.32	11.52	---
Mean	9.35	9.96	9.84	9.48	9.71	11.42	18.36	---	---	22.21	---	11.51
Max	10.11	10.58	10.43	9.65	10.00	13.52	41.35	---	---	31.53	---	12.18
Min	8.81	9.44	9.43	9.29	9.28	9.97	13.53	---	---	15.32	---	11.16

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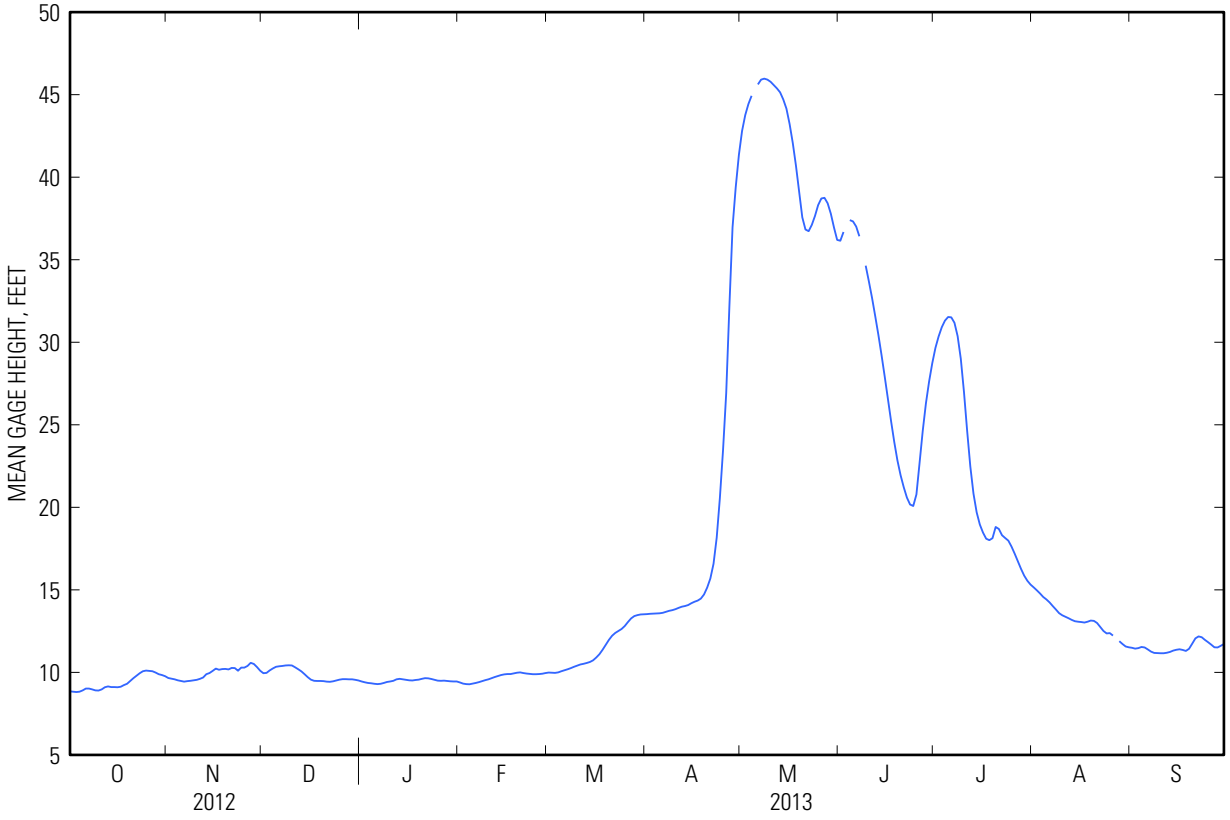

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1994 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 1 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)	pH, water, unfiltered, laboratory, standard units (00403)	Specific conduc-tance, water, unfiltered, laboratory, µS/cm at 25°C (90095)	Specific conduc-tance, water, unfiltered, µS/cm at 25°C (00095)	Tempera-ture, water, °C (00010)	Turbidity, water, unfiltered, broad band light source (400-680 nm), detection angle 90 +/- 30 degrees to incident light, NTU (63675)
10-29-2012	**1115**	742	12.9	100	8.7	8.4	1,700	1,680	3.2	--
01-28-2013	**1015**	--	11.6	--	7.4	8.0	1,520	1,560	-.1	--
05-07-2013	**1535**	--	8.1	--	7.3	7.8	361	358	10.2	--
05-22-2013	**1330**	--	8.1	--	7.5	7.7	625	614	14.0	--
05-28-2013	**1115**	--	7.3	--	7.4	7.8	631	638	15.1	--
06-19-2013	**1410**	--	6.7	--	7.9	8.0	947	946	21.8	--
07-10-2013	**1100**	--	5.6	--	7.8	7.9	775	802	24.6	66
07-31-2013	**1140**	740	7.4	88	8.1	7.9	937	997	22.3	--

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 2 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Turbidity, water, unfiltered, monochrome near infrared LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, FNU (63680)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)	Hardness, water, mg/L as $CaCO_3$ (00900)	Suspended solids, water, unfiltered, mg/L (00530)	Calcium, water, filtered, mg/L (00915)	Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)
10-29-2012	1115	31	--	--	33	--	--	--	--
01-28-2013	1015	5.9	982	510	8	100	63.2	18.7	2.78
05-07-2013	1535	200	223	150	344	37.5	13.6	6.70	.51
05-22-2013	1330	480	407	272	781	63.1	27.9	8.60	.88
05-28-2013	1115	89	424	301	215	71.0	30.1	8.16	.81
06-19-2013	1410	120	608	407	274	87.4	45.8	7.57	1.12
07-10-2013	1100	--	529	352	109	73.5	41.0	8.50	.94
07-31-2013	1140	200	627	408	334	82.2	49.1	9.11	1.19

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 3 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Sodium fraction of cations, water, percent in equivalents of major cations (00932)	Sodium, water, filtered, mg/L (00930)	ANC, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, mg/L as $CaCO_3$ (90410)	Chloride, water, filtered, mg/L (00940)	Silica, water, filtered, mg/L as SiO_2 (00955)	Sulfate, water, filtered, mg/L (00945)	Ammonia, water, filtered, mg/L as N (00608)	Ammonia, water, unfiltered, mg/L as N (00610)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)
10-29-2012	1115	--	--	305	139	--	414	0.087	0.08	0.315
01-28-2013	1015	37	144	343	110	19.1	315	.140	.18	1.16
05-07-2013	1535	16	14.2	111	8.25	15.0	56.4	.126	.12	.771
05-22-2013	1330	20	33.4	158	21.1	18.5	136	.141	.15	.786
05-28-2013	1115	18	32.5	150	20.6	20.9	147	.068	.07	.831
06-19-2013	1410	21	52.1	222	38.6	19.0	222	< .030	.03	.509
07-10-2013	1100	20	40.7	213	23.5	25.0	187	.043	.04	.487
07-31-2013	1140	22	55.4	238	30.7	23.9	231	< .030	< .03	.720

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 4 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Nitrate plus nitrite, water, unfiltered, mg/L as N (00630)	Organic nitrogen, water, filtered, mg/L (00607)	Organic nitrogen, water, unfiltered, mg/L (00605)	Phos-phorus, water, filtered, mg/L as P (00666)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, filtered, analytically determined, mg/L (62854)	Total nitrogen, water, unfiltered, analytically determined, mg/L (62855)	Aluminum, water, filtered, µg/L (01106)
10-29-2012	**1115**	0.320	0.89	0.85	0.216	0.252	1.29	1.25	< 50
01-28-2013	**1015**	1.31	.96	.91	.208	.246	2.26	2.40	< 50
05-07-2013	**1535**	.750	.66	.45	.208	.420	1.56	1.32	130
05-22-2013	**1330**	.750	.76	.62	.182	.738	1.69	1.52	50
05-28-2013	**1115**	.810	.78	.65	.187	.341	1.68	1.53	60
06-19-2013	**1410**	.480	< .76	.62	.164	.339	1.27	1.13	< 50
07-10-2013	**1100**	.460	.76	.69	.287	.361	1.29	1.19	< 50
07-31-2013	**1140**	.670	< .74	< .62	.253	.449	1.46	1.29	< 50

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 5 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Barium, water, filtered, µg/L (01005)	Beryllium, water, filtered, µg/L (01010)	Cadmium, water, filtered, µg/L (01025)	Chromium, water, filtered, µg/L (01030)	Copper, water, filtered, µg/L (01040)	Iron, water, filtered, µg/L (01046)	Lead, water, filtered, µg/L (01049)	Manga-nese, water, filtered, µg/L (01056)	Nickel, water, filtered, µg/L (01065)
10-29-2012	**1115**	70.0	< 5.00	< 5.00	< 5.0	< 5.0	129	< 5.00	< 10.0	8.3
01-28-2013	**1015**	90.5	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0	< 5.00	30.0	6.4
05-07-2013	**1535**	33.8	< 5.00	< 5.00	< 5.0	< 5.0	168	< 5.00	33.0	5.2
05-22-2013	**1330**	39.3	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0	< 5.00	22.0	5.4
05-28-2013	**1115**	43.8	< 5.00	< 5.00	< 5.0	< 5.0	51.0	< 5.00	11.0	5.6
06-19-2013	**1410**	58.5	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0	< 5.00	13.0	9.2
07-10-2013	**1100**	66.8	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0	< 5.00	< 10.0	8.1
07-31-2013	**1140**	67.6	< 5.00	< 5.00	< 5.0	< 5.0	< 50.0	< 5.00	< 10.0	7.6

05102490 RED RIVER OF THE NORTH AT PEMBINA, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

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[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Silver, water, filtered, µg/L (01075)	Thallium, water, filtered, µg/L (01057)	Zinc, water, filtered, µg/L (01090)	Antimony, water, filtered, µg/L (01095)	Arsenic, water, filtered, µg/L (01000)	Boron, water, filtered, µg/L (01020)	Selenium, water, filtered, µg/L (01145)	Organic carbon, water, filtered, mg/L (00681)	Organic carbon, water, unfiltered, mg/L (00680)
10-29-2012	**1115**	< 5.00	< 5.00	< 5.0	< 5.00	5.7	140	< 5.0	12.4	12.9
01-28-2013	**1015**	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	206	< 5.0	11.4	11.6
05-07-2013	**1535**	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	68	< 5.0	7.77	7.1
05-22-2013	**1330**	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	83	< 5.0	8.85	7.7
05-28-2013	**1115**	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	127	< 5.0	10.2	9.6
06-19-2013	**1410**	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	< 500	< 5.0	11.9	11.5
07-10-2013	**1100**	< 5.00	< 5.00	< 5.0	< 5.00	7.6	148	< 5.0	11.5	10.7
07-31-2013	**1140**	< 5.00	< 5.00	< 5.0	< 5.00	7.3	175	< 5.0	12.1	11.4

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 7 of 7

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; NTU, nephelometric turbidity unit; P, phosphorus; SiO_2, silicon dioxide; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Suspended sediment, sieve diameter, percent smaller than 0.0625 mm (70331)	Suspended sediment concen-tration, mg/L (80154)
10-29-2012	**1115**	98	40
01-28-2013	**1015**	73	20
05-07-2013	**1535**	98	385
05-22-2013	**1330**	91	937
05-28-2013	**1115**	90	275
06-19-2013	**1410**	94	310
07-10-2013	**1100**	99	110
07-31-2013	**1140**	100	378