Water-Data Report 2013

05120000 SOURIS RIVER NEAR VERENDRYE, ND

Souris Basin
Lower Souris Subbasin

LOCATION.--Lat 48°09′35″, long 100°43′45″ referenced to North American Datum of 1927, in NW ¼ SW ¼ sec.17, T.154 N., R.78 W., McHenry County, ND, Hydrologic Unit 09010003, on left bank 2.7 mi north of Verendrye, 19 mi upstream from mouth of Wintering River, and at mile 302.0.

DRAINAGE AREA.--11,300 mi^2 of which 6,900 mi^2 probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--DAILY DISCHARGE--April 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

PERIOD OF RECORD.--DAILY GAGE HEIGHT--February to June 1933, October 2000 to current year.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,464.87 ft above National Geodetic Vertical Datum of 1929. February to June 1933, at site 4 mi upstream at datum 1.65 ft higher. April 1, 1937, to March 3, 1938, nonrecording gage at present site, at datum 1.97 ft higher.

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

REGULATION.--Flow regulated by reservoirs on Souris and Des Lacs Rivers, combined capacity about 700,000 acre-ft; some diversions for irrigation and municipal supply.

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 05120000, accessed at http://wdr.water.usgs.gov/wy2013/pdfs/05120000.2013.pdf

05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	13	29	e69	e69	e83	e84	e830	4,880	2,230	1,650	651	270
2	13	29	e69	e70	e83	e84	e860	4,300	3,120	1,620	495	188
3	17	38	e69	e70	e83	e84	e890	3,810	3,950	1,600	449	157
4	23	41	e69	e70	e83	e84	e920	3,340	4,170	1,560	465	145
5	26	40	e69	e69	e83	e82	e960	2,770	4,070	1,520	463	139
6	45	35	e69	e68	e82	e80	e1,000	2,160	5,800	1,530	436	139
7	57	34	e69	e68	e82	e76	e1,200	1,790	6,580	1,860	423	140
8	40	34	e69	e67	e82	e72	e1,350	1,550	5,620	1,900	427	144
9	29	e33	e69	e67	e82	e68	e1,600	1,260	4,700	1,690	447	146
10	25	e32	e68	e67	e83	e66	e1,900	940	4,040	1,580	446	164
11	22	e31	e68	e67	e83	e66	e2,200	700	3,490	1,550	460	187
12	20	e30	e68	e67	e84	e65	e2,400	515	3,150	1,380	476	191
13	20	e32	e67	e67	e85	e64	e2,580	405	2,980	1,090	474	169
14	20	e37	e69	e67	e85	e64	e2,650	341	2,840	859	443	154
15	20	e40	e76	e67	e85	e64	e2,690	294	2,630	732	333	146
16	20	e43	e86	e67	e85	e64	e2,700	261	2,380	672	231	143
17	24	e54	e103	e67	e85	e64	e2,690	224	2,170	668	183	141
18	61	e67	e111	e67	e87	e67	e2,690	213	2,050	814	157	138
19	80	e75	e113	e68	e88	e75	e2,650	251	1,970	774	139	140
20	83	e78	e115	e68	e88	e90	2,550	488	2,000	630	141	147
21	73	e77	e114	e67	e88	e120	2,470	1,210	1,970	572	149	141
22	60	e72	e113	e67	e88	e140	2,450	1,940	1,890	666	151	138
23	50	e68	e106	e70	e88	e180	2,470	2,100	1,900	770	150	138
24	43	e46	e96	e73	e88	e240	2,530	1,930	1,950	742	158	138
25	37	e46	e87	e76	e87	e300	2,580	1,700	2,010	755	174	143
26	32	e58	e79	e80	e86	e400	2,420	1,620	2,040	865	207	155
27	31	e66	e69	e83	e85	e500	2,250	1,610	1,930	926	226	151
28	31	e68	e67	e85	e84	e600	2,870	1,610	1,830	942	292	146
29	29	e69	e67	e84	---	e700	3,880	1,610	1,760	945	334	143
30	29	e69	e68	e84	---	e750	5,030	1,620	1,700	940	297	144
31	29	---	e69	e84	---	e810	---	1,730	---	853	310	---
Total	1,102	1,471	2,500	2,210	2,375	6,203	66,260	49,172	88,920	34,655	10,187	4,625
Mean	35.5	49.0	80.6	71.3	84.8	200	2,209	1,586	2,964	1,118	329	154
Max	83	78	115	85	88	810	5,030	4,880	6,580	1,900	651	270
Min	13	29	67	67	82	64	830	213	1,700	572	139	138
Ac-ft	2,190	2,920	4,960	4,380	4,710	12,300	131,400	97,530	176,400	68,740	20,210	9,170

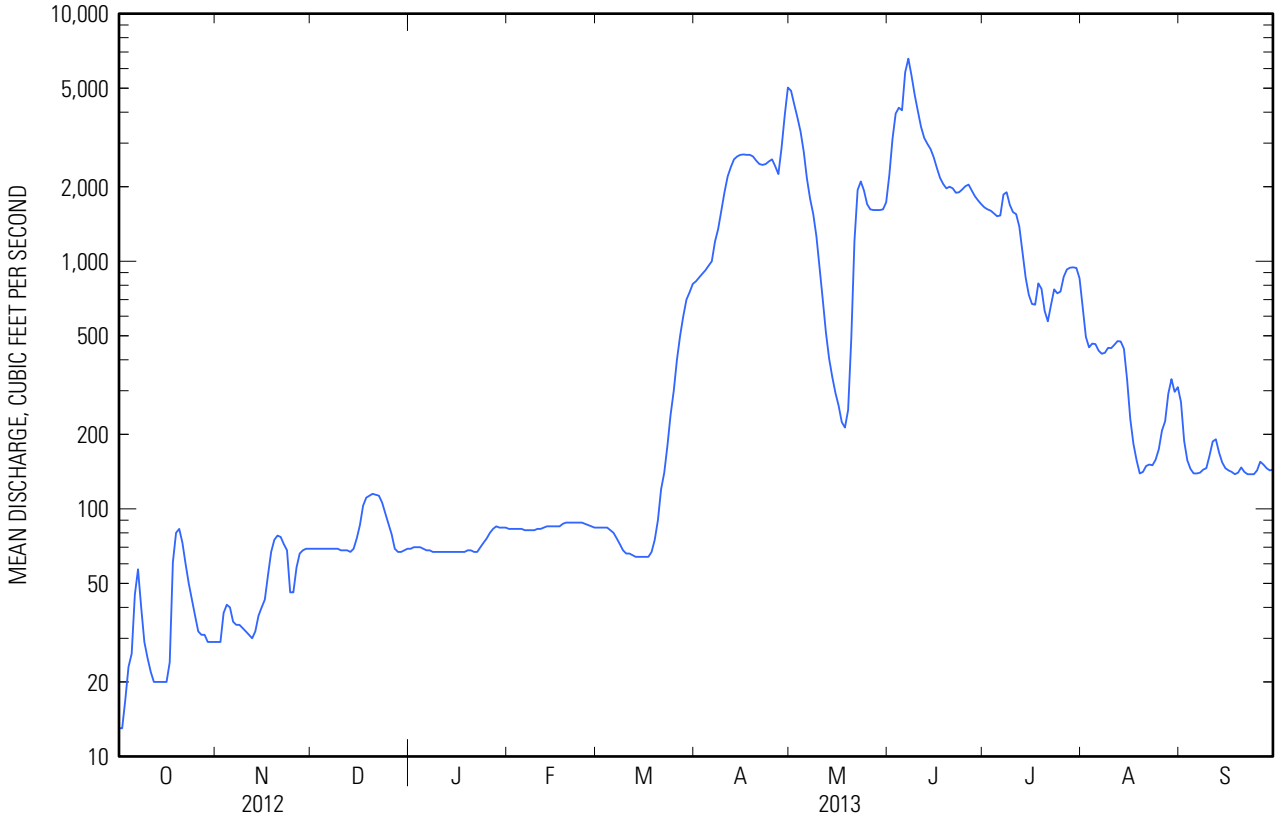
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2013, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	58.4	45.7	39.6	33.5	51.2	227	727	700	431	279	115	73.7
Max	376	200	392	209	470	1,209	6,280	5,694	10,910	8,229	2,112	977
(WY)	(2012)	(2012)	(2012)	(2011)	(2011)	(1976)	(1976)	(2011)	(2011)	(2011)	(2011)	(2011)
Min	1.50	1.00	1.00	0.50	0.50	2.25	11.7	6.80	2.33	0.67	0.42	0.10
(WY)	(1938)	(1938)	(1938)	(1938)	(1938)	(1940)	(1937)	(1938)	(1938)	(1937)	(1937)	(1937)

05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1937 - 2013	
Annual total	40,571		269,680			
Annual mean	111		739		235	
Highest annual mean					2,917	2011
Lowest annual mean					18.8	1991
Highest daily mean	522	Jun 11	6,580	Jun 7	25,700	Jun 27, 2011
Lowest daily mean	11	Sep 21	13	Oct 1	0.10	Sep 1, 1937
Annual seven-day minimum	12	Sep 15	21	Oct 11	0.10	Sep 1, 1937
Maximum peak flow			6,840	Jun 7	26,900	Jun 26, 2011
Maximum peak stage			16.99	Jun 7	18.53	Jun 26, 2011
Annual runoff (ac-ft)	80,470		534,900		170,000	
10 percent exceeds	217		2,410		452	
50 percent exceeds	80		141		40	
90 percent exceeds	20		41		4.6	

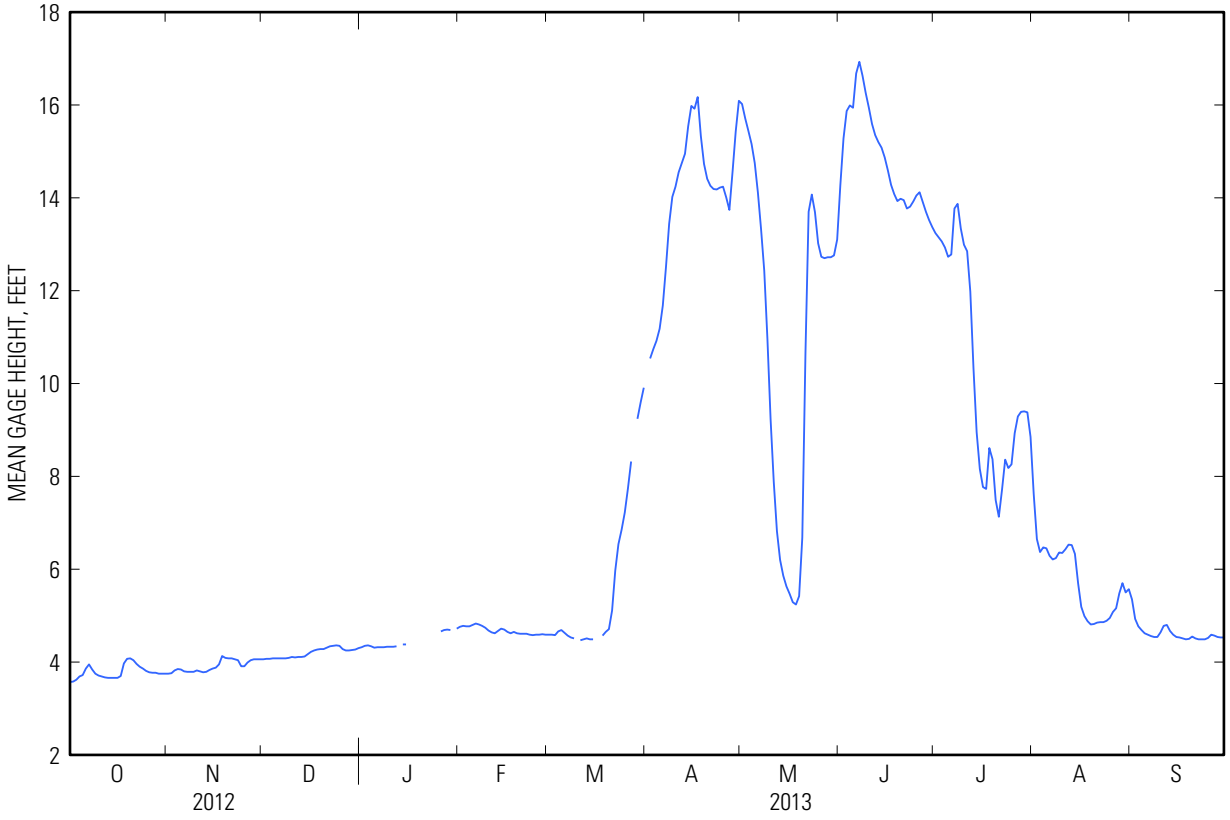


05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

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	3.57	3.75	4.06	4.32	4.76	4.59	---	16.02	14.27	13.24	7.62	5.35
2	3.58	3.76	4.07	4.35	4.78	4.59	10.54	15.71	15.28	13.15	6.65	4.93
3	3.62	3.82	4.07	4.36	4.77	4.58	10.74	15.44	15.87	13.06	6.37	4.77
4	3.69	3.85	4.08	4.34	4.77	4.66	10.92	15.16	15.99	12.93	6.47	4.69
5	3.72	3.84	4.08	4.31	4.80	4.69	11.18	14.75	15.94	12.73	6.45	4.62
6	3.86	3.80	4.08	4.32	4.83	4.63	11.68	14.11	16.68	12.78	6.29	4.59
7	3.95	3.79	4.08	4.32	4.81	4.57	12.51	13.32	16.93	13.77	6.21	4.56
8	3.84	3.79	4.08	4.32	4.78	4.53	13.44	12.43	16.63	13.87	6.24	4.54
9	3.75	3.79	4.09	4.33	4.74	4.51	14.02	10.96	16.26	13.34	6.36	4.54
10	3.71	3.82	4.11	4.33	4.68	---	14.24	9.23	15.94	12.99	6.35	4.64
11	3.69	3.80	4.10	4.33	4.64	4.47	14.55	7.88	15.59	12.85	6.43	4.78
12	3.67	3.78	4.11	4.34	4.62	4.49	14.75	6.82	15.35	11.98	6.53	4.80
13	3.66	3.79	4.11	---	4.67	4.51	14.95	6.20	15.20	10.33	6.52	4.67
14	3.66	3.83	4.12	4.38	4.72	4.49	15.54	5.86	15.08	8.95	6.33	4.59
15	3.66	3.86	4.17	4.38	4.70	4.49	15.98	5.63	14.87	8.16	5.70	4.54
16	3.66	3.88	4.22	---	4.65	---	15.92	5.47	14.59	7.77	5.19	4.53
17	3.70	3.95	4.25	---	4.62	---	16.17	5.29	14.28	7.73	4.99	4.51
18	3.97	4.13	4.27	---	4.65	4.57	15.33	5.24	14.08	8.61	4.88	4.49
19	4.07	4.09	4.28	---	4.62	4.65	14.73	5.42	13.93	8.37	4.81	4.50
20	4.08	4.08	4.28	---	4.61	4.71	14.41	6.68	13.98	7.49	4.82	4.55
21	4.04	4.08	4.31	---	4.61	5.11	14.26	10.66	13.95	7.13	4.85	4.51
22	3.96	4.06	4.34	---	4.61	5.97	14.19	13.70	13.77	7.71	4.86	4.49
23	3.90	4.04	4.35	---	4.59	6.54	14.18	14.07	13.81	8.36	4.86	4.49
24	3.86	3.91	4.36	---	4.58	6.85	14.22	13.69	13.92	8.18	4.89	4.49
25	3.81	3.91	4.35	---	4.59	7.22	14.24	13.02	14.05	8.26	4.95	4.52
26	3.78	3.99	4.28	4.66	4.59	7.74	14.01	12.73	14.12	8.93	5.08	4.59
27	3.77	4.04	4.25	4.69	4.60	8.32	13.74	12.70	13.91	9.29	5.16	4.57
28	3.77	4.06	4.25	4.70	4.59	---	14.56	12.72	13.70	9.39	5.48	4.54
29	3.75	4.06	4.26	4.69	---	9.24	15.43	12.72	13.52	9.40	5.70	4.53
30	3.75	4.06	4.27	---	---	9.59	16.09	12.76	13.37	9.38	5.50	4.53
31	3.75	---	4.30	4.72	---	9.91	---	13.10	---	8.85	5.57	---
Mean	3.78	3.91	4.19	---	4.68	---	---	10.95	14.83	10.29	5.75	4.62
Max	4.08	4.13	4.36	---	4.83	---	---	16.02	16.93	13.87	7.62	5.35
Min	3.57	3.75	4.06	---	4.58	---	---	5.24	13.37	7.13	4.81	4.49

05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued



05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1957 to current year.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 1 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Discharge, ft^3/s (00060)	Discharge, instantaneous, ft^3/s (00061)	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 conductance, water, unfiltered, laboratory, µS/cm at 25°C (90095)	Specific conductance, water, unfiltered, µS/cm at 25°C (00095)
10-30-2012	**1000**	725	--	29	10.2	84	8.5	8.3	1,640	1,580
01-03-2013	**1500**	723	E 70	--	9.5	69	7.4	8.0	1,650	1,650
04-23-2013	**0840**	726	--	2,460	11.5	92	7.8	8.2	974	988
05-07-2013	**1110**	720	--	1,810	9.6	92	7.9	7.9	785	793
05-21-2013	**1310**	720	--	1,290	8.3	82	8.0	8.1	1,310	1,340
05-28-2013	**1530**	713	--	--	8.4	89	7.9	--	--	1,080
06-11-2013	**1500**	721	--	3,420	6.4	75	7.7	8.0	778	789
07-09-2013	**0830**	721	--	1,720	6.2	78	7.8	8.2	995	1,020
08-27-2013	**1400**	720	--	228	7.8	98	8.3	8.3	1,250	1,280

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 2 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Temperature, water, °C (00010)	Turbidity, water, unfiltered, monochrome near infrared LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, FNU (63680)	Dissolved solids dried at 180°C, water, filtered, mg/L (70300)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)	Dissolved solids, water, tons per day (70302)	Hardness, water, mg/L as $CaCO_3$ (00900)	Suspended solids, water, unfiltered, mg/L (00530)	Calcium, water, filtered, mg/L (00915)
10-30-2012	**1000**	5.0	--	1,170	1,150	91.5	572	< 30 d	108
01-03-2013	**1500**	-.1	--	1,140	1,080	--	535	< 15	100
04-23-2013	**0840**	3.8	--	667	654	4,430	362	132	63.1
05-07-2013	**1110**	10.9	--	555	509	2,710	276	120	57.2
05-21-2013	**1310**	12.3	--	962	964	3,350	472	282 d	98.4
05-28-2013	**1530**	14.9	470	--	--	--	--	--	--
06-11-2013	**1500**	20.1	--	533	506	4,920	289	52 d	55.5
07-09-2013	**0830**	24.2	--	698	655	3,240	347	93	67.8
08-27-2013	**1400**	23.8	--	894 d	863	550	408	90 d	77.3

05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 3 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Magne-sium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium adsorption ratio, water, number (00931)	Sodium fraction of cations, water, percent in equiva-lents 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)	Fluoride, water, filtered, mg/L (00950)	Sulfate, water, filtered, mg/L (00945)
10-30-2012	1000	73.3	14.9	3.42	41	188	365 @c	50.1 d	0.17	492 d
01-03-2013	1500	69.4	17.6	3.22	40	171	370 @c	63.7 d	.23	433 d
04-23-2013	0840	49.6	16.0	1.91	32	83.6	278 @c	19.1 d	--	255 d
05-07-2013	1110	32.4	13.3	1.55	31	59.3	172 @c	12.2 d	.14 dc	229 d
05-21-2013	1310	55.0	13.9	2.66	37	133	246 @c	22.5 d	--	492 d
05-28-2013	1530	--	--	--	--	--	--	--	--	--
06-11-2013	1500	36.5	14.1	1.32	27	51.6	169 @c	9.51 d	.15 dc	235 d
07-09-2013	0830	43.1	14.1	1.96	33	84.1	212 @c	13.9 d	.18 dc	302 d
08-27-2013	1400	52.3	13.8	2.67	39	124	282 @c	28.9 d	.21 d	397 d

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 4 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Ammonia plus organic nitrogen, water, unfiltered, mg/L as N (00625)	Ammonia, water, filtered, mg/L as N (00608)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Organic nitrogen, water, unfiltered, mg/L (00605)	Phosphorus, water, unfiltered, mg/L as P (00665)	Aluminum, water, unfiltered, recover-able, µg/L (01105)	Barium, water, unfiltered, recover-able, µg/L (01007)	Beryllium, water, unfiltered, recover-able, µg/L (01012)	Cadmium, water, unfiltered, µg/L (01027)
10-30-2012	1000	1.5	0.018 n	0.064 n	1.5	0.19	203	71.8	< .02	0.019 n
01-03-2013	1500	2.8	1.26 d	.569	1.5	.25	166	84.2	.02 n	.037
04-23-2013	0840	1.6	.047	.266	1.5	.32	1,510	104	.11	.083
05-07-2013	1110	2.0	.211	.624	1.8	.30	1,480	99.6	.11	.079
05-21-2013	1310	2.0	.225	.231	1.8	.38	1,920	143	.14	.114
05-28-2013	1530	--	--	--	--	--	--	--	--	--
06-11-2013	1500	1.3	.094	.450	1.2	.22	752	88.1	.06	.050
07-09-2013	0830	1.4	.062	.522	1.4	.32	903	94.4	.07	.052
08-27-2013	1400	2.4	.016 n	< .040	2.4	.38	994	103	.10	.074

05120000 SOURIS RIVER NEAR VERENDRYE, ND—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 5 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Chromium, water, unfiltered, recoverable, µg/L (01034)	Cobalt, water, unfiltered, recoverable, µg/L (01037)	Copper, water, unfiltered, recoverable, µg/L (01042)	Iron, water, unfiltered, recoverable, µg/L (01045)	Lead, water, unfiltered, recoverable, µg/L (01051)	Mercury, water, unfiltered, recoverable, µg/L (71900)	Molybdenum, water, unfiltered, recoverable, µg/L (01062)	Nickel, water, unfiltered, recoverable, µg/L (01067)	Zinc, water, unfiltered, recoverable, µg/L (01092)
10-30-2012	1000	0.55 n	0.59	1.7	588	0.46	< .005	3.66	4.0	3.1 n
01-03-2013	1500	1.5	.41	1.9	576	.33	< .005	5.22	4.5	< 3.0
04-23-2013	0840	2.7	1.9	4.4	3,250 d	2.05	.007 +nc	4.48	7.1	11.3
05-07-2013	1110	2.0	1.9	4.6	3,400	2.23	.011	3.16	6.7	10.6
05-21-2013	1310	3.9	2.9	6.3	4,910	3.29	.013	2.85	9.9	15.8
05-28-2013	1530	--	--	--	--	--	--	--	--	--
06-11-2013	1500	1.3	.94	3.0	1,640	1.07	< .005	2.83	5.3	6.6
07-09-2013	0830	1.8	1.3	3.5	2,180	1.50	.006 n	4.29	6.4	7.4
08-27-2013	1400	2.1	1.7	4.2	2,140	1.78	.007 n	5.50	6.8	10.6

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
Part 6 of 6

[%, percent; ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated; +, improper preservation; @, holding time exceeded; c, see result laboratory comment; d, diluted sample: method hi range exceeded; n, below the LRL and above the LT-MDL]

Date	Sample start time	Arsenic, water, unfiltered, µg/L (01002)	Boron, water, unfiltered, recoverable, micrograms per liter (01022)	Selenium, water, unfiltered, µg/L (01147)	Organic carbon, water, filtered, mg/L (00681)	Organic carbon, water, unfiltered, mg/L (00680)
10-30-2012	1000	4.8	170	0.506	13.3	14.6
01-03-2013	1500	4.7	172	.529	14.1	16.2
04-23-2013	0840	5.3	134	.595	14.5	18.7
05-07-2013	1110	3.7	90	.831	11.8	22.5
05-21-2013	1310	4.7	93	.989	12.6	25.2
05-28-2013	1530	--	--	--	--	--
06-11-2013	1500	4.1	74	.756	11.8	12.5
07-09-2013	0830	5.8	116	.920	13.5	16.3
08-27-2013	1400	9.3	192	.654 d	13.8	20.1