Water-Data Report 2011

473423095053301 Local number WLN04 147N35W02CDCBDD Bemidji 310D

Sand and gravel aquifers (glaciated regions)
Des Moines Outwash

Beltrami County, MN

LOCATION.--Lat 47°34'23.00", long 95°05'34.00" referenced to North American Datum of 1983, in SW ¼ SE ¼ SW ¼ sec.2, T.147 N., R.35 W., Beltrami County, MN, Hydrologic Unit 07010101, northwest of Bemidji.

GROUNDWATER RECORDS

WELL CHARACTERISTICS.--Depth 34.83 ft. Upper casing diameter 2 in; top of first opening 30.08 ft, bottom of last opening 33.08 ft. Well WLN04 was drilled on May 1, 1985 as a water-table observation well. Casing material: 2 inch diameter, schedule 40-PVC. This casing has a stick-up of 2.70 feet above land surface. Hole depth: 110 feet. Total well depth: 37.53 feet. Screen length of 3.00 feet. Tailpipe length: 1.75 feet.

DATUM.--Land-surface datum is 1,422.62 ft above North American Vertical Datum of 1988. Measuring point: Top of PVC casing that rising slightly above shelter floor, 2.70 ft. above land-surface datum, May 1, 1985, to present. Water levels are in depth below land surface and feet above sea level. Water levels are accurate to within 0.01 feet below land surface. Water-level elevations are accurate to plus-or-minus 0.056 feet, based on a 2nd-order vertical and horizontal reference point survey, which was completed on October 28, 2010 using a total station and four known NGS benchmarks installed at the site. Water-level differences are accurate to plus-or-minus 0.01 feet.

PERIOD OF RECORD.--Periodic water level measurements from August 13, 1985 to current year. Daily-average water level measurements (with intermittent gaps) from June 15, 1993 to June 30, 2003. Four-hourly water level measurements from Aug. 12, 2003 at 14:00 CDT to Aug. 18, 2003 at 22:00 CDT. Hourly water level measurements (with intermittent gaps) from Aug. 19, 2003 at 09:00 CDT to Dec. 15, 2009 at 15:00 CST; and Jan. 12, 2010 at 16:00 CST to present.

The break in daily-average and hourly level temperature measurements (above) were a result of station failure during those time periods.

PERIOD OF DAILY RECORD.--Daily-average water level measurements from June 15, 1993 to June 17, 1993. Daily-average water level measurements from Oct. 09, 1993 to Mar. 08, 1994. Daily-average water level measurements from May. 08, 1994 to Jul. 05, 1994. Daily-average water level measurements from Jul. 09, 1994 to Sept. 11, 1994. Daily-average water level measurements from Oct. 11, 1994 to Jan. 03, 1995. Daily-average water level measurements from Jan. 05, 1995 to Mar. 16, 1995. Daily-average water level measurements from Mar. 19, 1995 to Nov. 21, 1995. Daily-average water level measurements from Dec. 14, 1995 to Aug. 08, 1996. Daily-average water level measurements from Aug. 12, 1996 to Dec. 01, 1996. Daily-average water level measurements from Dec. 21, 1996 to Oct. 07, 1997. Daily-average water level measurements from Oct. 29, 1997 to Jul 15, 1999. Daily-average water level measurements from Aug. 25, 1999 to Feb. 28, 2001. Daily-average water level measurements from Mar. 02, 2001 to Sept. 24, 2001. Daily-average water level measurements from Oct. 09, 2001 to Jun. 29, 2003. Daily-average water level measurements from Aug. 13, 2003 to Nov. 26, 2003. Daily-average water level measurements from Dec. 01, 2003 to Dec. 23, 2003. Daily-average water level measurements from Dec. 29, 2003 to Jan. 22, 2004. Daily-average water level measurements from Jan. 27, 2004 to Jan. 23, 2006. Daily-average water level measurements from Jan. 30, 2006 to Dec. 14, 2009. Daily-average water level measurements from Jan. 13, 2010 to the present.

The break in daily-average level measurements (above) were a result of station failure during those time periods.

GAGE.--Continuous water level and water temperature data are measured with a KPSI 500 submersible pressure transducer; water level is measured monthly by USGS personal. Data are recorded hourly by a Campbell Scientific, Inc. CR10 data logger. The data logger is housed in a 2ft. x 2ft. aluminum shelter and is mounted on top of the well protection pipe. The gage is powered by a 10W solar panel, mounted approximately 15 feet above the shelter on a mast. Communication to data logger is via telephone line.

COOPERATION.--Well WLN04 is operated by the U.S. Geological Survey.

REMARKS.--Local well ID number: 310D, at National Crude-Oil Spill Research Site near Bemidji, Minnesota. Owner: U.S. Geological Survey.

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 473423095053301, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/473423095053301.2011.pdf

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EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level: 27.54 feet below land surface (1395.08 feet NGVD88) during Jun. 15-16, 2001; Lowest recorded water level: 30.60 feet below land surface (1392.02 feet NGVD88) several times during Mar. 9-13, 2007.

Highest daily-average water level: 27.54 feet below land surface (1395.08 feet NGVD88) during Jun. 15-16, 2001; lowest daily-average water level: 30.60 feet below land surface (1392.03 feet NAVD88) during Mar. 9-13, 2007.

EXTREMES FOR CURRENT YEAR.--Highest recorded water level: 28.44 feet below land surface (1394.18 feet NGVD88) on Oct. 26, 2010 at 04:00 CDT; lowest recorded water level: 29.29 feet below land surface (1393.33 feet NGVD88) on March. 18, 2011 at 06:00 CDT.

Highest daily-average water level: 28.45 feet below land surface (1394.18 feet NGVD88) on Oct. 19 & 26, 2010; lowest daily-average water level: 29.28 feet below land surface (1393.35 feet NAVD88) on March. 17, 18. 19 & 21, 2011.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	28.68	28.51	28.64	28.85	29.06	29.22	29.27	28.80	28.63	28.57	28.82	29.03
2	28.66	28.49	28.65	28.87	29.06	29.23	29.27	28.80	28.61	28.59	28.83	29.04
3	28.63	28.49	28.65	28.87	29.05	29.22	29.26	28.78	28.60	28.58	28.84	29.05
4	28.61	28.50	28.67	28.88	29.05	29.23	29.27	28.77	28.61	28.58	28.85	29.06
5	28.58	28.49	28.67	28.88	29.07	29.23	29.26	28.76	28.60	28.59	28.86	29.06
6	28.57	28.48	28.68	28.88	29.08	29.24	29.27	28.74	28.59	28.60	28.86	29.07
7	28.54	28.49	28.68	28.89	29.09	29.24	29.27	28.73	28.58	28.60	28.86	29.08
8	28.52	28.48	28.68	28.91	29.09	29.24	29.26	28.73	28.60	28.60	28.85	29.08
9	28.51	28.49	28.66	28.92	29.10	29.24	29.25	28.72	28.59	28.61	28.86	29.09
10	28.49	28.50	28.69	28.92	29.09	29.25	29.23	28.71	28.58	28.62	28.88	29.10
11	28.48	28.53	28.71	28.93	29.10	29.23	29.23	28.71	28.58	28.64	28.88	29.10
12	28.48	28.54	28.72	28.94	29.11	29.26	29.20	28.70	28.57	28.65	28.89	29.11
13	28.47	28.52	28.72	28.93	29.11	29.27	29.17	28.70	28.57	28.66	28.90	29.12
14	28.46	28.50	28.72	28.94	29.13	29.26	29.14	28.69	28.56	28.66	28.91	29.13
15	28.46	28.52	28.72	28.96	29.12	29.26	29.09	28.68	28.56	28.66	28.91	29.14
16	28.46	28.53	28.73	28.94	29.13	29.26	29.06	28.67	28.57	28.68	28.92	29.14
17	28.46	28.56	28.74	28.95	29.13	29.27	29.03	28.66	28.57	28.69	28.92	29.15
18	28.46	28.55	28.75	28.97	29.16	29.28	29.01	28.66	28.57	28.70	28.93	29.15
19	28.45	28.55	28.76	28.97	29.16	29.27	28.98	28.65	28.57	28.70	28.94	29.16
20	28.46	28.57	28.76	28.98	29.15	29.26	28.96	28.64	28.57	28.70	28.95	29.16
21	28.48	28.55	28.78	28.98	29.16	29.28	28.94	28.63	28.57	28.72	28.95	29.18
22	28.47	28.56	28.80	28.99	29.17	29.27	28.91	28.62	28.57	28.73	28.95	29.19
23	28.48	28.59	28.80	28.98	29.17	29.27	28.91	28.63	28.58	28.74	28.95	29.19
24	28.48	28.57	28.82	29.00	29.18	29.26	28.89	28.64	28.57	28.76	28.97	29.20
25	28.46	28.57	28.82	29.01	29.19	29.26	28.87	28.64	28.57	28.76	28.98	29.20
26	28.45	28.60	28.82	29.01	29.19	29.27	28.86	28.63	28.57	28.76	28.99	29.21
27	28.51	28.60	28.81	29.02	29.20	29.27	28.84	28.62	28.58	28.77	29.00	29.21
28	28.55	28.60	28.82	29.02	29.21	29.27	28.83	28.62	28.58	28.79	29.00	29.22
29	28.51	28.61	28.82	29.04	---	29.27	28.82	28.63	28.57	28.80	29.01	29.23
30	28.51	28.62	28.84	29.05	---	29.26	28.80	28.62	28.56	28.81	29.02	29.24
31	28.51	---	28.84	29.06	---	29.26	---	28.62	---	28.82	29.03	---
Mean	28.51	28.54	28.74	28.95	29.13	29.25	29.07	28.68	28.58	28.68	28.92	29.14
Max	28.68	28.62	28.84	29.06	29.21	29.28	29.27	28.80	28.63	28.82	29.03	29.24
Min	28.45	28.48	28.64	28.85	29.05	29.22	28.80	28.62	28.56	28.57	28.82	29.03

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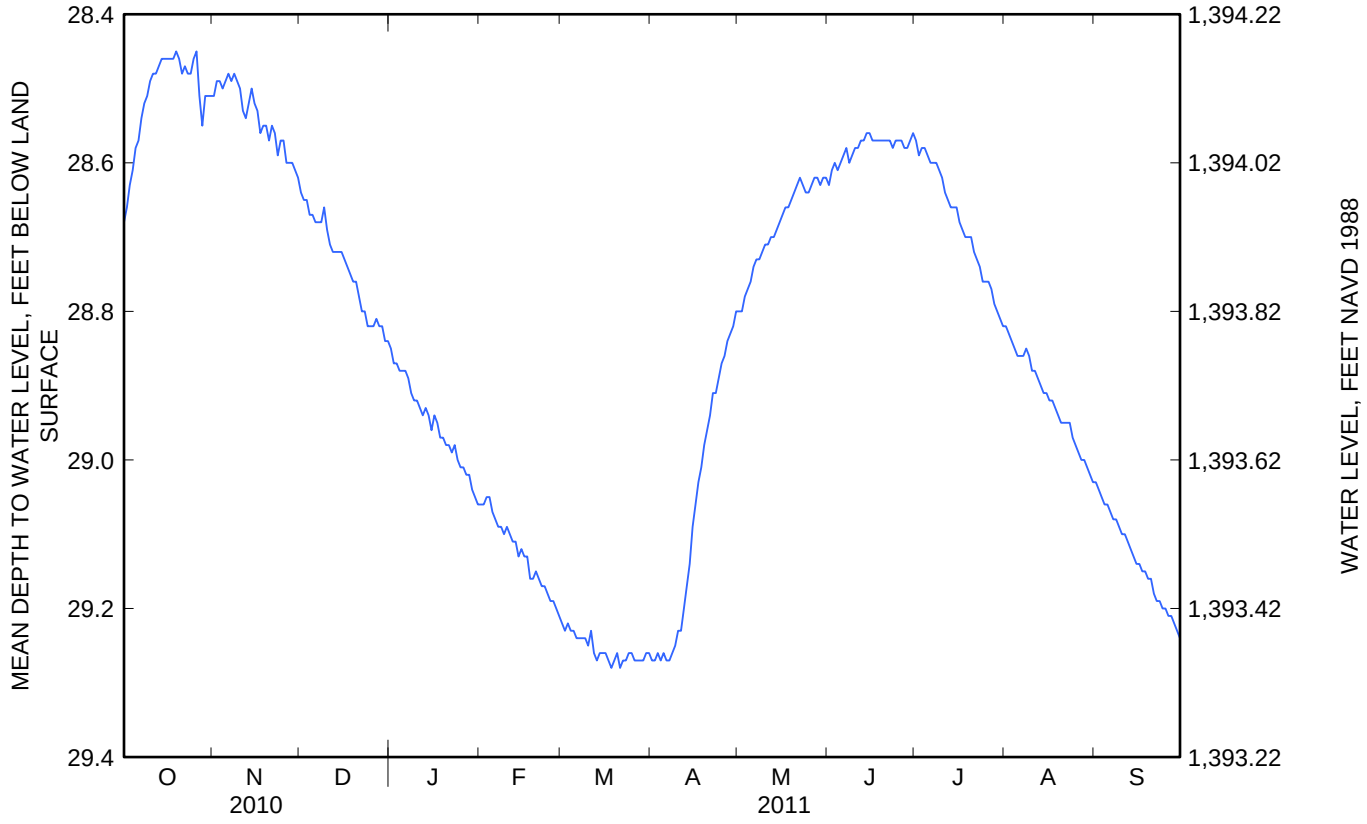
	Water Year 2011
Mean	28.85
High	28.45
Low	29.28



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--

WATER TEMPERATURE: Hourly water temperature measurements from Mar. 20, 2007 at 16:00 CDT to Dec. 18, 2008 at 04:00 CST. Hourly water temperature measurement from Dec. 19, 2008 at 04:00 CST to Dec. 15, 2009 at 15:00 CST. Hourly water temperature measurements from Jan. 13, 2010 at 11:00 CST to the present.

The break in hourly water temperature measurements (above) were a result of station failure during those time periods.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: WATER TEMPERATURE: Daily-average water temperature measurements from Mar. 21, 2007 Dec. 17, 2008. Daily-average water temperature measurement from Dec. 20, 2008 to Dec. 14, 2009. Daily-average water temperature measurements from Jan. 13, 2010 to the present.

The break in hourly water temperature measurements (above) were a result of station failure during those time periods.

INSTRUMENTATION.--Water temperature was measured with a KPSI 500 submersible pressure transducer accurate to 0.1°C. Record is currently uncalibrated while sufficient calibration data is being collected.

COOPERATION.--Well WLN04 is operated by the U.S. Geological Survey.

REMARKS.--All previously published water temperature data between Oct. 01, 2009 and September 30, 2010 were changed slightly due the discovery of an inaccurate water thermistor. This thermistor was used to calibrate the water temperature record against, but after further analysis/comparison, the thermistor was determined to be a poor piece of calibration equipment. This thermistor has since been discontinued and the Minnesota Water-Science Center is currently testing a more accurate water thermistor to calibrate the water temperature record against. These have been corrected in the USGS data base, but will not be republished in this report series. Contact the USGS Minnesota Water-Science Center for all corrected data.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum hourly, 6.4°C many times during Sept. 2010; minimum hourly, 5.3°C, many days in Aug. 2009 and on Sep. 25 2009.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum daily-average, 6.4°C on many days during Sept. 2010; minimum daily-average, 5.3°C on many days in Aug. 2009 and on Sep. 25, 2009.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum hourly, 6.2°C on many days; minimum hourly, 5.4°C on many days.

Maximum daily-average, 6.1°C on many days; minimum daily-average, 5.5°C on many days.

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TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.5	5.6	5.8	6.0	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7
2	5.5	5.6	5.8	6.0	6.1	6.1	6.1	6.0	5.9	5.8	5.7	5.7
3	5.5	5.7	5.9	6.0	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7
4	5.5	5.7	5.8	6.0	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7
5	5.5	5.7	5.8	6.0	6.1	6.1	6.0	5.9	5.9	5.8	5.7	5.7
6	5.5	5.7	5.8	6.0	6.0	6.1	6.1	5.9	5.9	5.7	5.7	5.6
7	5.5	5.7	5.9	6.0	6.1	6.1	6.0	6.0	5.9	5.7	5.7	5.7
8	5.5	5.7	5.9	6.0	6.1	6.1	6.0	6.0	5.9	5.7	5.7	5.7
9	5.5	5.7	5.9	6.0	6.1	6.1	6.0	6.0	5.9	5.7	5.7	5.6
10	5.5	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
11	5.5	5.7	5.9	6.0	6.1	6.1	6.0	6.0	5.8	5.7	5.6	5.7
12	5.5	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
13	5.5	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.6
14	5.5	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.6	5.7
15	5.6	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
16	5.6	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.6	5.7
17	5.6	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.6	5.6
18	5.6	5.8	5.9	6.0	6.1	6.0	6.0	5.9	5.8	5.7	5.6	5.7
19	5.6	5.8	5.9	6.1	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
20	5.6	5.7	6.0	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.6	5.7
21	5.6	5.8	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.6	5.7
22	5.6	5.8	5.9	6.0	6.1	6.0	6.0	5.9	5.8	5.7	5.7	5.7
23	5.6	5.8	5.9	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7	5.7
24	5.6	5.8	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
25	5.6	5.8	5.9	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7	5.7
26	5.6	5.8	5.9	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.6	5.7
27	5.6	5.8	6.0	6.1	6.1	6.0	6.0	5.9	5.8	5.7	5.7	5.7
28	5.6	5.8	6.0	6.0	6.1	6.0	6.0	5.9	5.8	5.7	5.6	5.7
29	5.6	5.8	6.0	6.1	---	6.1	6.0	5.9	5.8	5.7	5.7	5.7
30	5.6	5.8	6.0	6.1	---	6.1	6.0	5.9	5.8	5.7	5.6	5.7
31	5.6	---	6.0	6.1	---	6.1	---	5.9	---	5.7	5.6	---
Mean	5.6	5.7	5.9	6.0	6.1	6.1	6.0	5.9	5.8	5.7	5.7	5.7
Max	5.6	5.8	6.0	6.1	6.1	6.1	6.1	6.0	5.9	5.8	5.7	5.7
Min	5.5	5.6	5.8	6.0	6.0	6.0	6.0	5.9	5.8	5.7	5.6	5.6

	Water Year 2011
Mean	5.9
High	6.1
Low	5.5

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