

Sand and gravel aquifers (glaciated regions)  
Glacial Surficial Sand and/or Gravel

Beltrami County, MN

LOCATION.--Lat 47°34'28.74", long 95°05'06.68" referenced to North American Datum of 1983, in NE ¼ SW ¼ SE ¼ sec.2, T.115 N., R.35 W., Beltrami County, MN, Hydrologic Unit 07010101.

### GROUNDWATER RECORDS

WELL CHARACTERISTICS.--Depth 18.63 ft. Upper casing diameter undefined; top of first opening undefined, bottom of last opening undefined. Well 501C was drilled on Feb. 28, 1985 by the U.S. Geological Survey and is used both as a water-table observation well and a water quality sampling well. Casing material: 2 inch diameter, galvanized steel. This casing has a stick-up of 5.67 feet above land surface. Hole depth: unknown. Total well depth: 18.97 feet. Screen length of 2.50 feet. Tailpipe length: 4.00 feet.

DATUM.--Land-surface datum is 1,385.17 ft above National Geodetic Vertical Datum of 1929. Measuring point: Undefined, 5.67 ft. above land-surface datum, Feb. 28, 1985, to present. Land-surface datum is 1,386.83 ft above North American Vertical Datum of 1988. Measuring point: MEASURINGPOINT. 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 0.01 feet, based on differential GPS Survey on Jun. 29, 2011. Water-level differences are accurate to plus-or-minus 0.001 feet.

PERIOD OF RECORD.--Water levels were recorded periodically from Feb. 27, 1984 to the present. Water levels were recorded hourly during May 12, 2011 at 10:00 CDT to Oct. 27, 2011 at 09:00 CDT.

GAGE.--Water level and water temperature were measured with an OTT Orpheus Mini 0-4m submersible pressure transducer accurate to 0.01 feet and 0.5°C respectively, but differences in temperature are accurate to 0.1°C. Data were recorded hourly by a built-in data logger that is part of the pressure transducer assembly. The data logger is housed inside the 2-inch, schedule-40, galvanized steel well casing. The gage is powered by 3 AA alkaline batteries that are inside of the communications rod. No telemetry or phone line is wired into the gage.

COOPERATION.--Well 501C is operated by the U.S. Geological Survey in cooperation with Enbridge Energy Limited Partnership, the Minnesota Pollution Control Agency, and Beltrami County.

REMARKS.--Local well ID number: 501C, at National Crude-Oil Spill Research Site near Bemidji, Minnesota. Owner: U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level: -2.73 feet below land surface datum (1389.56 feet NAVD88) on several hours during Jun. 02 - 07, 2011; lowest water level: -2.05 feet below land surface datum (1388.88 feet NAVD88) on Sept. 29, 2011 at 21:00 CDT and Sept. 20, 2011 at 00:00 CDT.

Highest daily-average water level: -2.73 feet below land surface datum (1389.56 feet NAVD88) on Jun. 03, 2011; lowest daily-average water level: -2.05 feet below land surface datum (1388.88 feet NAVD88) on Sept. 30, 2011.

EXTREMES FOR CURRENT YEAR.--Highest water level: -2.73 feet below land surface datum (1389.56 feet NAVD88) on several hours during Jun. 02 - 07, 2011; lowest water level: -2.05 feet below land surface datum (1388.88 feet NAVD88) on Sept. 29, 2011 at 21:00 CDT and Sept. 20, 2011 at 00:00 CDT.

Highest daily-average water level: -2.73 feet below land surface datum (1389.56 feet NAVD88) on Jun. 03, 2011; lowest daily-average water level: -2.05 feet below land surface datum (1388.88 feet NAVD88) on Sept. 30, 2011.

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

[- (minus sign), value is water level above land surface]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	---	---	---	---	---	---	---	---	-2.71	-2.69	-2.37	-2.26
2	---	---	---	---	---	---	---	---	-2.72	-2.67	-2.40	-2.26
3	---	---	---	---	---	---	---	---	-2.73	-2.65	-2.39	-2.25
4	---	---	---	---	---	---	---	---	-2.72	-2.65	-2.38	-2.24
5	---	---	---	---	---	---	---	---	-2.72	-2.64	-2.39	-2.23
6	---	---	---	---	---	---	---	---	-2.72	-2.62	-2.43	-2.22
7	---	---	---	---	---	---	---	---	-2.72	-2.61	-2.43	-2.21
8	---	---	---	---	---	---	---	---	-2.70	-2.59	-2.43	-2.20
9	---	---	---	---	---	---	---	---	-2.69	-2.59	-2.42	-2.19
10	---	---	---	---	---	---	---	---	-2.68	-2.58	-2.40	-2.18
11	---	---	---	---	---	---	---	---	-2.68	-2.56	-2.39	-2.18
12	---	---	---	---	---	---	---	---	-2.67	-2.54	-2.38	-2.17
13	---	---	---	---	---	---	---	-2.67	-2.67	-2.52	-2.37	-2.15
14	---	---	---	---	---	---	---	-2.67	-2.66	-2.51	-2.36	-2.14
15	---	---	---	---	---	---	---	-2.67	-2.66	-2.51	-2.35	-2.13
16	---	---	---	---	---	---	---	-2.67	-2.65	-2.50	-2.34	-2.12
17	---	---	---	---	---	---	---	-2.67	-2.64	-2.50	-2.32	-2.11
18	---	---	---	---	---	---	---	-2.66	-2.65	-2.50	-2.31	-2.11
19	---	---	---	---	---	---	---	-2.65	-2.64	-2.50	-2.34	-2.11
20	---	---	---	---	---	---	---	-2.65	-2.63	-2.49	-2.33	-2.11
21	---	---	---	---	---	---	---	-2.66	-2.64	-2.47	-2.33	-2.10
22	---	---	---	---	---	---	---	-2.68	-2.68	-2.45	-2.32	-2.10
23	---	---	---	---	---	---	---	-2.68	-2.68	-2.45	-2.32	-2.10
24	---	---	---	---	---	---	---	-2.67	-2.67	-2.45	-2.30	-2.09
25	---	---	---	---	---	---	---	-2.67	-2.67	-2.44	-2.29	-2.08
26	---	---	---	---	---	---	---	-2.66	-2.68	-2.43	-2.27	-2.08
27	---	---	---	---	---	---	---	-2.67	-2.70	-2.43	-2.26	-2.07
28	---	---	---	---	---	---	---	-2.68	-2.70	-2.42	-2.25	-2.07
29	---	---	---	---	---	---	---	-2.68	-2.70	-2.40	-2.24	-2.06
30	---	---	---	---	---	---	---	-2.68	-2.70	-2.39	-2.23	-2.05
31	---	---	---	---	---	---	---	-2.72	---	-2.37	-2.23	---
<b>Mean</b>	---	---	---	---	---	---	---	---	-2.68	-2.52	-2.34	-2.15
<b>Max</b>	---	---	---	---	---	---	---	---	-2.63	-2.37	-2.23	-2.05
<b>Min</b>	---	---	---	---	---	---	---	---	-2.73	-2.69	-2.43	-2.26
<b>Med</b>	---	---	---	---	---	---	---	---	-2.68	-2.50	-2.34	-2.12



**473429095050703 Local number 501C 147N35W02DCAB 03—Continued**

**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water temperatures were recorded hourly during May 12, 2011 at 10:00 CDT to Oct. 27, 2011 at 09:00 CDT.

INSTRUMENTATION.--Water temperature is measured with an OTT Orpheus Mini 0-4m pressure transducer internal thermistor. Water temperatures are accurate to plus-or-minus 0.5°C, but differences in temperature are accurate to 0.1°C. Water temperature measuring range capability of -25°C to 70°C, ice free. Record is currently uncalibrated while sufficient calibration data is being collected.

REMARKS.--Local well ID number: 501C, at National Crude-Oil Spill Research Site near Bemidji, Minnesota. Owner: U.S. Geological Survey.

COOPERATION.--Well 501C is operated by the U.S. Geological Survey in cooperation with Enbridge Energy Limited Partnership, the Minnesota Pollution Control Agency, and Beltrami County.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: maximum hourly: 12.8°C on several hours during Sept. 15 - 17, 2011; minimum hourly: 8.2°C on several hours during May 12 - 14, 2011.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: maximum daily-average: 12.8°C on Sept. 15 & 16, 2011; minimum daily-average: 8.2°C on May 13 & 14, 2011.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum hourly, 12.8°C on several hours during Sept. 15 - 17, 2011; minimum hourly, 8.2°C on several hours during May 12 - 14, 2011.

Maximum daily-average, 12.8°C on Sept. 15 & 16, 2011; minimum daily-average, 8.2°C on May 13 & 14, 2011.

**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	---	---	---	---	---	---	---	---	8.9	10.0	11.5	12.5
2	---	---	---	---	---	---	---	---	8.9	10.1	11.6	12.5
3	---	---	---	---	---	---	---	---	9.0	10.1	11.6	12.6
4	---	---	---	---	---	---	---	---	9.0	10.1	11.7	12.6
5	---	---	---	---	---	---	---	---	9.1	10.2	11.7	12.6
6	---	---	---	---	---	---	---	---	9.1	10.2	11.7	12.6
7	---	---	---	---	---	---	---	---	9.1	10.3	11.8	12.6
8	---	---	---	---	---	---	---	---	9.2	10.3	11.8	12.7
9	---	---	---	---	---	---	---	---	9.2	10.3	11.9	12.7
10	---	---	---	---	---	---	---	---	9.2	10.4	11.9	12.7
11	---	---	---	---	---	---	---	---	9.3	10.5	12.0	12.7
12	---	---	---	---	---	---	---	---	9.3	10.5	12.0	12.7
13	---	---	---	---	---	---	---	8.2	9.4	10.6	12.0	12.7
14	---	---	---	---	---	---	---	8.2	9.4	10.6	12.1	12.7
15	---	---	---	---	---	---	---	8.3	9.4	10.7	12.1	12.8
16	---	---	---	---	---	---	---	8.3	9.5	10.7	12.1	12.8
17	---	---	---	---	---	---	---	8.3	9.5	10.8	12.2	12.7
18	---	---	---	---	---	---	---	8.4	9.6	10.8	12.2	12.7
19	---	---	---	---	---	---	---	8.4	9.6	10.9	12.2	12.7
20	---	---	---	---	---	---	---	8.4	9.6	11.0	12.2	12.7
21	---	---	---	---	---	---	---	8.5	9.7	11.0	12.3	12.7
22	---	---	---	---	---	---	---	8.5	9.7	11.1	12.3	12.7
23	---	---	---	---	---	---	---	8.5	9.7	11.1	12.3	12.7
24	---	---	---	---	---	---	---	8.6	9.8	11.2	12.3	12.7
25	---	---	---	---	---	---	---	8.6	9.8	11.2	12.4	12.7
26	---	---	---	---	---	---	---	8.6	9.8	11.3	12.4	12.6
27	---	---	---	---	---	---	---	8.7	9.9	11.3	12.4	12.6
28	---	---	---	---	---	---	---	8.7	9.9	11.4	12.4	12.6
29	---	---	---	---	---	---	---	8.8	9.9	11.4	12.5	12.6
30	---	---	---	---	---	---	---	8.8	10.0	11.4	12.5	12.6
31	---	---	---	---	---	---	---	8.8	---	11.5	12.5	---
<b>Mean</b>	---	---	---	---	---	---	---	---	9.4	10.7	12.1	12.7
<b>Max</b>	---	---	---	---	---	---	---	---	10.0	11.5	12.5	12.8
<b>Min</b>	---	---	---	---	---	---	---	---	8.9	10.0	11.5	12.5
<b>Med</b>	---	---	---	---	---	---	---	---	9.5	10.7	12.1	12.7

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