

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

Yellow Medicine County, MN

LOCATION.--Lat 44°44'23.48", long 95°31'22.69" referenced to North American Datum of 1983, in SW ¼ SW ¼ NW ¼ sec.11, T.115 N., R.39 W., Yellow Medicine County, MN, Hydrologic Unit 07020004, 4.6 miles south of Granite Falls, Minnesota.

### GROUNDWATER RECORDS

WELL CHARACTERISTICS.--Depth 100 ft. Upper casing diameter 2.04 in; top of first opening 85 ft, bottom of last opening 100 ft. The hole for well US-02 was drilled with a hydraulic rotary drill-rig to a depth of 120 feet. The well is constructed of a 15-foot-long, 2-inch-diameter, schedule-80 PVC screen glued to about 87 feet of 2-inch-diameter, schedule-80 PVC casing. This casing had a stick-up of 2.56 feet above land surface on 24 April 2007.

DATUM.--Land-surface datum is 1,038.4 ft above North American Vertical Datum of 1988. Measuring point: MP is top of casing, not protection post. 2.56 ft. above land-surface datum, April 24, 2007, 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 0.036 feet, based on differential GPS Survey on Oct. 06, 2010. Water-level differences are accurate to plus-or-minus 0.001 feet.

PERIOD OF RECORD.--Hourly water level measurements from Apr. 24, 2007 at 13:00 CDT to Nov. 22, 2007 at 22:00 CST. Hourly water level measurements from Nov. 23, 2007 at 11:00 CST to Dec. 13, 2007 at 21:00 CST. Hourly water level measurements (with intermittent gaps) from Dec. 13, 2007 at 21:00 CST to Mar. 01, 2008 at 23:00 CST. Hourly water level measurements from Mar. 10, 2008 at 00:00 CST to Mar. 15, 2008 at 23:00 CDT. Hourly water level measurements from Mar. 16, 2008 at 00:00 CDT to the present.

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

PERIOD OF DAILY RECORD.--Daily-average water level measurements from Apr. 25, 2007 to Nov. 21, 2007. Daily-average water level measurements from Nov. 24, 2007 to Dec. 12, 2007. Daily-average water level measurements from Dec. 18, 2007 to Dec. 21, 2007. Daily-average water level measurements from Jan. 05, 2008 to Jan. 15, 2008. Daily-average water level measurements from Jan. 27, 2008 to Jan. 28, 2008. Daily-average water level measurement on Feb. 17, 2008. Daily-average water level measurements from Feb. 24, 2008 to Mar. 02, 2008. Daily-average water level measurements from Mar. 05, 2008 to Mar. 06, 2008. Daily-average water level measurements from Mar. 10, 2008 to Mar. 14, 2008. Daily-average water level measurements from Mar. 16, 2008 to the present.

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

GAGE.--Water level and water temperature are measured with a Design Analysis H-310 submersible pressure transducer nominally accurate to 0.01 feet and 0.1°C, respectively. Water level, water temperature, shelter temperature, and battery voltage are all recorded by a Campbell Scientific, Inc. CR206 data logger, which records all data hourly. The data logger is housed in a 12-inch X 14-inch grey fiberglass shelter attached to an antenna mast. The gage is powered by a 10W solar panel and is telemetered by radio and telephone.

COOPERATION.--Well US-02 is operated by the U.S. Geological Survey in cooperation with the Upper Sioux Community.

REMARKS.--Measured groundwater levels are precise to two decimal places, not the 3 decimal places reported. Differences between subsequent groundwater levels are precise to 3 decimal places, however. Three-decimal place precision is useful at this site for hydrologic analyses such as estimation of groundwater recharge and evapotranspiration.

EXTREMES FOR PERIOD OF RECORD.--Highest water level: Highest water level: 83.705 feet below land surface datum (954.699 feet NAVD88) on Sept. 30, 2010 at 22:00 CDT; lowest water level: lowest water level: 85.267 feet below land surface datum (953.137 feet NAVD88) on Jan. 28, 2010 at 08:00 CST.

Highest daily-average water level: 83.738 feet below land surface datum (954.666 NAVD88) on Sept. 30, 2010; lowest daily-average water level: 85.235 feet below land surface datum (953.169 NAVD88) on Jan. 1 and 28, 2010.

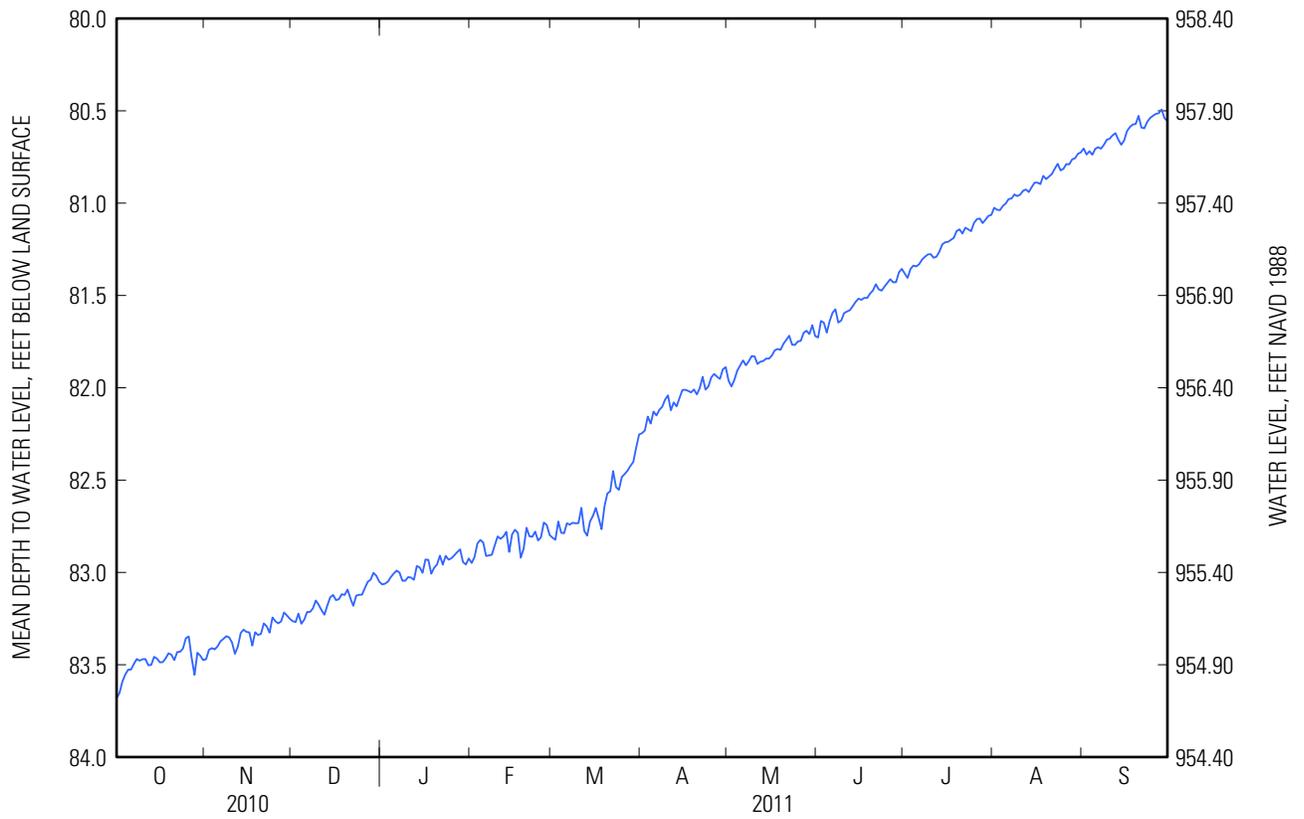
EXTREMES FOR CURRENT YEAR.--Highest water level: Highest water level: 80.476 feet below land surface datum (957.928 feet NAVD88) on Sept. 28, 2011 at 15:00 CDT; lowest water level: lowest water level: 83.704 feet below land surface datum (954.700 feet NAVD88) on Oct. 01, 2010 at 00:00 CST.

Highest daily-average water level: 80.493 feet below land surface datum (957.911 NAVD88) on Sept. 28, 2011; lowest daily-average water level: 83.681 feet below land surface datum (954.723 NAVD88) on Oct. 01, 2010.

**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	83.681	83.470	83.264	83.065	82.949	82.812	82.246	81.962	81.728	81.381	81.025	80.704
2	83.653	83.419	83.269	83.061	82.916	82.823	82.231	81.993	81.638	81.405	81.036	80.737
3	83.592	83.410	83.223	83.050	82.843	82.724	82.156	81.957	81.648	81.357	81.038	80.719
4	83.553	83.417	83.278	83.025	82.824	82.785	82.194	81.907	81.701	81.338	81.015	80.738
5	83.527	83.400	83.256	83.006	82.838	82.788	82.129	81.879	81.639	81.343	81.002	80.706
6	83.526	83.373	83.214	82.990	82.911	82.734	82.150	81.852	81.594	81.331	80.978	80.697
7	83.495	83.360	83.214	83.001	82.908	82.741	82.120	81.878	81.575	81.306	80.975	80.705
8	83.469	83.345	83.195	83.045	82.904	82.731	82.103	81.856	81.647	81.291	80.953	80.684
9	83.478	83.352	83.152	83.045	82.853	82.734	82.064	81.828	81.636	81.278	80.962	80.657
10	83.470	83.380	83.175	83.025	82.805	82.733	82.041	81.830	81.596	81.276	80.954	80.651
11	83.469	83.441	83.205	83.028	82.818	82.650	82.122	81.871	81.587	81.296	80.933	80.633
12	83.503	83.402	83.229	83.040	82.805	82.775	82.079	81.859	81.580	81.290	80.926	80.621
13	83.501	83.328	83.179	82.965	82.780	82.801	82.101	81.855	81.558	81.263	80.940	80.656
14	83.457	83.310	83.135	82.973	82.889	82.724	82.055	81.842	81.535	81.224	80.913	80.684
15	83.467	83.322	83.122	83.002	82.794	82.694	82.012	81.842	81.517	81.212	80.889	80.661
16	83.487	83.325	83.150	82.930	82.769	82.651	82.011	81.825	81.524	81.210	80.889	80.610
17	83.486	83.396	83.145	82.932	82.786	82.706	82.017	81.797	81.513	81.199	80.897	80.588
18	83.465	83.324	83.118	83.007	82.920	82.766	82.025	81.790	81.514	81.188	80.852	80.574
19	83.438	83.339	83.122	82.975	82.872	82.643	82.009	81.794	81.490	81.151	80.870	80.572
20	83.446	83.333	83.093	82.957	82.758	82.573	82.036	81.762	81.473	81.142	80.856	80.527
21	83.475	83.276	83.140	82.909	82.804	82.560	82.002	81.740	81.439	81.165	80.842	80.591
22	83.431	83.292	83.181	82.958	82.807	82.451	81.941	81.718	81.467	81.133	80.813	80.595
23	83.430	83.326	83.126	82.910	82.779	82.538	82.010	81.767	81.474	81.142	80.787	80.560
24	83.412	83.244	83.121	82.931	82.827	82.553	81.993	81.768	81.452	81.152	80.823	80.539
25	83.356	83.264	83.121	82.923	82.810	82.484	81.944	81.749	81.432	81.107	80.814	80.527
26	83.347	83.276	83.085	82.907	82.730	82.467	81.925	81.746	81.412	81.087	80.788	80.517
27	83.463	83.265	83.051	82.890	82.743	82.449	81.940	81.702	81.429	81.083	80.790	80.513
28	83.555	83.217	83.039	82.875	82.797	82.423	81.952	81.691	81.428	81.108	80.763	80.493
29	83.435	83.233	83.002	82.944	---	82.401	81.900	81.709	81.375	81.089	80.757	80.540
30	83.451	83.251	83.019	82.957	---	82.323	81.888	81.661	81.356	81.069	80.733	80.555
31	83.475	---	83.050	82.924	---	82.253	---	81.720	---	81.064	80.725	---
<b>Mean</b>	83.484	83.336	83.151	82.976	82.830	82.629	82.047	81.811	81.532	81.215	80.888	80.618
<b>Max</b>	83.681	83.470	83.278	83.065	82.949	82.823	82.246	81.993	81.728	81.405	81.038	80.738
<b>Min</b>	83.347	83.217	83.002	82.875	82.730	82.253	81.888	81.661	81.356	81.064	80.725	80.493
<b>Med</b>	83.470	83.331	83.145	82.973	82.814	82.694	82.030	81.825	81.520	81.210	80.889	80.616

	Calendar Year 2010	Water Year 2011
<b>Mean</b>	84.226	82.208
<b>High</b>	83.002	80.493
<b>Low</b>	85.235	83.681
<b>Med</b>	84.360	82.246



### WATER-QUALITY RECORDS

PERIOD OF RECORD.--Hourly water temperature measurements from Apr. 24, 2007 at 13:00 CDT to Nov. 22, 2007 at 22:00 CST. Hourly water temperature measurements from Nov. 23, 2007 at 11:00 CST to Dec. 13, 2007 at 21:00 CST. Hourly water temperature measurements (with intermittent gaps) from Dec. 13, 2007 at 21:00 CST to Mar. 01, 2008 at 23:00 CST. Hourly water temperature measurements from Mar. 10, 2008 at 00:00 CST to Mar. 15, 2008 at 23:00 CDT. Hourly water temperature measurements from Mar. 16, 2008 at 00:00 CDT to the present.

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PERIOD OF DAILY RECORD.--Daily-average water temperature measurements from Apr. 25, 2007 to Nov. 21, 2007. Daily-average water temperature measurements from Nov. 24, 2007 to Dec. 12, 2007. Daily-average water temperature measurements from Dec. 18, 2007 to Dec. 21, 2007. Daily-average water temperature measurements from Jan. 05, 2008 to Jan. 15, 2008. Daily-average water temperature measurements from Jan. 27, 2008 to Jan. 28, 2008. Daily-average water temperature measurement on Feb. 17, 2008. Daily-average water temperature measurements from Feb. 24, 2008 to Mar. 02, 2008. Daily-average water temperature measurements from Mar. 05, 2008 to Mar. 06, 2008. Daily-average water temperature measurements from Mar. 10, 2008 to Mar. 14, 2008. Daily-average water temperature measurements from Mar. 16, 2008 to the present.

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

INSTRUMENTATION.--Water temperature was measured with a Design Analysis H-310 submersible pressure transducer accurate to 0.1°C. Record is currently uncalibrated while sufficient calibration data is being collected.

COOPERATION.--Well US-02 is operated by the U.S. Geological Survey in cooperation with the Upper Sioux Community.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum hourly, 8.3°C on many hours; minimum hourly: 8.1°C on many hours.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum daily-average, 8.3°C on many days; minimum: 8.1°C on many days.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum hourly, 8.3°C on many hours; minimum hourly, 8.2°C on many hours.

Maximum daily-average, 8.3°C on many days; minimum daily-average, 8.2°C on many days.

**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	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
2	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
3	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
4	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
5	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
6	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
7	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
8	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
9	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
10	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
11	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3	8.2
12	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
13	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
14	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
15	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
16	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
17	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
18	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
19	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
20	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
21	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
22	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
23	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
24	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
25	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
26	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
27	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
28	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
29	8.3	8.3	8.3	8.3	---	8.3	8.3	8.3	8.3	8.3	8.2	8.2
30	8.3	8.3	8.3	8.3	---	8.3	8.3	8.3	8.3	8.3	8.2	8.2
31	8.3	---	8.3	8.3	---	8.3	---	8.3	---	8.3	8.2	---
<b>Mean</b>	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2
<b>Max</b>	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2
<b>Min</b>	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.2	8.2
<b>Med</b>	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2

	Calendar Year 2010	Water Year 2011
<b>Mean</b>	8.2	8.3
<b>Max</b>	8.3	8.3
<b>Min</b>	8.2	8.2
<b>Med</b>	8.2	8.3

