

IOWA GEOLOGICAL SURVEY  
Iowa City, Iowa

Results of Pumping Test

Grinnell City Wells, Grinnell, Iowa

June 15-16, 1942

WELL DATA:

City Well No. 4:

Location - NW $\frac{1}{4}$  SW $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 16, T. 80 N., R. 16 W., Grant Township.  
Elevation - 1020.62 (top of circular concrete base, 1 foot above ground)  
1022.13 (top of 2" pipe at base of air gage)

City Well No. 5:

Location - (same as well No. 4)  
Elevation - 1020.09 (top of 20-inch casing)  
Total depth - 2260' (deepened from 2006 feet in 1942)  
Pump - Johnson turbine, single pulley. Bowls at 400', no tailpipe.  
Power - Caterpillar diesel engine.

City Well No. 6:

Location - (same as well No. 4)  
Elevation - 1019.88 (top of pump base at breather hole by air gage)  
Total depth - 2498'  
Pump - Sterling turbine, 1800 R.P.M. 15 stage 10" bowls at 420' with 6' tailpipe  
Power - 100 H.P. electric motor

Well No. 4 is 93' east of Well No. 5.

Well No. 6 is 42.5' east and north of Well No. 5.

Productions on Well No. 5 measured with 1 foot weir.

Measuring point of Well No. 4 is top of 2" pipe below air gage; elevation = 1022.13.

Measuring point of Well No. 5 is top of wooden clamp blocks 0.49' above top of 20" casing; elevation = 1020.57.

Measuring point of Well No. 6 is top of pump base at breather hole; elevation = 1019.88.

Depth to Water in Feet Below Measuring Point

<u>Time</u>	<u>Well No. 4</u>	<u>Well No. 5</u>	<u>Well No. 6</u>	<u>Remarks</u>
6-13-42				
11:36 a.m.		271.98		Static level.
11:52			270.79	Static level.
2:00 p.m.		271.54	270.49	Static level.
6-15-42				
1:55 p.m.		271.33		
2:02			270.16	
2:07				Start Well No. 5, water muddy.

<u>Time</u>	<u>Well No. 4</u>	<u>Well No. 5</u>	<u>Well No. 6</u>	<u>Remarks</u>
2:25				200 g.p.m.
2:27		293.89		200 g.p.m.
2:45			274.02	
2:53			274.25	
2:54		294.10		Water clearing up.
3:00				Temp. water - 74 3/4° F. air - 66° F. Measured after passing through 35' of 6" pipe.
3:13		294.37		200 g.p.m.
3:15			274.63	
3:37				200 g.p.m.
3:38		294.42	274.77	
3:55		294.43		
3:56			274.88	200 g.p.m.
4:05				Pumping rate increased.
4:06		below 300'		330 g.p.m.
4:12		below 300'		357 g.p.m.
4:21			277.14	
4:49			277.85	
4:54		317 (by city)		
4:58				357 g.p.m. Temp. water - 74 3/4° F. air - 66° F. Pumping fine sand.
5:13			278.18	
5:43			278.37	
7:00			278.79	
7:03				357 g.p.m. Temp. water - 74 3/4° F. air - 65° F.
7:26	282.06			
7:38				357 g.p.m.
7:39		317' 2 1/2" (by city)		
8:20		317.36		#5 water level fluctuating badly. Very difficult to measure.
8:27			279.16	
8:29				357 g.p.m. Temp. water = 74 3/4° F. No. 5 pump stopped.
8:36:45		300.00		
8:37:15		286.62		
8:38:15		279.33		
8:39		274.38		
8:40		273.99		
8:41		273.84		
8:42		273.72		
8:43		273.57		
8:44		273.42		
8:45		273.33		
8:46				

<u>Time</u>	<u>Well No. 4</u>	<u>Well No. 5</u>	<u>Well No. 6</u>	<u>Remarks</u>
8:47		273.23		
8:48		273.14		
8:49		273.04		
8:50		272.97		
8:52		272.82		
8:54		272.70		
8:56		272.58		
8:58		272.50		
9:00		272.41		
9:02		272.33		
9:04		272.25		
9:06		272.18		
9:08		272.10		
9:10		272.06		
9:15		271.95		
9:20		271.85		
9:30		271.71		
9:32			272.21	
9:40		271.56		
9:50		271.46		
9:56			271.90	
10:00		271.35		
10:15		271.23		
10:28			271.62	
10:30		271.16		
10:45		271.10		
10:55			271.48	
11:15		270.99		
11:18	271.22			
11:30		270.94	271.32	
6-16-42				
12:15 a.m.		270.85		
12:20			271.17	
12:30		270.80		
7:27			270.81	
7:30		270.08		Water entering well by hose.
7:41	273.72			
7:45		270.10		Water entering well by hose.
7:54			270.64	
7:56	273.53			
8:00			270.67	
8:01				No. 6 pump started.
9:48			340.00	800g g.p.m.
9:50			335.84	
10:03	320.21			
10:06			336.08	
10:25			336.32	
10:40		284.61		
10:48			336.55	
10:50				No. 5 pump started.

<u>Time</u>	<u>Well No. 4</u>	<u>Well No. 5</u>	<u>Well No. 6</u>	<u>Remarks</u>
10:53				No. 5 - 237 g.p.m.
10:55				No. 5 - 397 g.p.m.
11:00			342.23	
11:05				No. 5 - 350 g.p.m.
11:10				No. 5 - 350 g.p.m.
11:15			343.70	
11:20	329.42			
11:30			344.33	No. 5 - 350 g.p.m.
11:45			344.72	No. 5 - 397 g.p.m.
12:55 p.m.			341.23	No. 6 - pumping rate lowered.
1:00	328.21			Sample taken for chemical analysis, Temp. water - 74 3/4°F. air - 67°F.
1:05	328.28			
1:09			341.43	

Elevations in Grinnell Well Field

(All elevations from U.S.C. & G.S. Bench Mark at Railroad Depot)

1. X chiseled in curb at telephone pole W. of No. 5 well, E. side of street = 1017.54.
2. Copper bolt and washer set vertically in NW side of telephone pole, 40' W. of Well No. 5 and 60' NW of NW corner of waterworks plant, 2' above ground, stamped U.S.C. & G.S. - B.M. - 1020. = 1020.00.
3. Well No. 4, top of circular concrete base, 1' above ground = 1020.62.
4. Well No. 4, top of 2" pipe at base of air gage = 1022.13.
5. Well No. 5, E. edge of top of 20" casing = 1020.09.
6. Well No. 6, top of pump base at breather hole by air gage = 1019.88.

Dr. M. A. Stainbrook's Notes

W-0151  
Grinnell (Poweshiek)  
Grinnell City Well #6

550-60 dolomite, gray, saccharoidal, some gray shale  
560-70 dolomite, gray and shale  
570-80 as above  
580-90 dolomite, gray, saccharoidal Conodont  
590-600 shale  
600-10 shale (not well washed)  
610-20 dolomite and shale  
620-30 shale Charophytes common, Tentaculites, crinoid segments, pyrite  
gastropod, brach fragments  
630-40 shale and dolomite (not well washed)  
640-50 shale (not well washed)  
650-60 " "  
670-80 shale  
680-90 dolomite, shale (not well washed)  
690-700 limestone. Dolomite fossils (Cedar Valley?)  
700-10 limestone (some shale, cave?)  
710-20 limestone, fossiliferous (Cedar Valley)

550-90 Lime Creek dolomite Owen member  
590-690 Shale (Cerro Gordo certainly at 630)  
Cerro Gordo and Juniper Hill  
690 below Cedar Valley