National water well Association
MEMBER

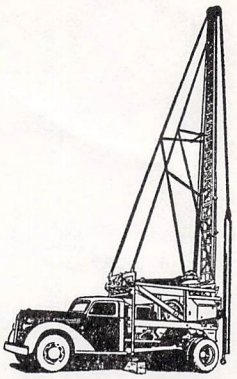
Phone GR 3-2707

HOEG & AMES, Inc.

WELL CONTRACTORS WELL SUPPLIES

☆ ★ ☆

LINCOLN, IOWA



"Old" well

RECORD OF WELL

Owner - Town of Union, Iowa.
Address - Union, Iowa.
Location - In the town of Union, Iowa. NW NE SE 21-86-19W
Started the Well - July 24, 1946.
Finished the Well - August 7, 1946.
Size of Well - 10".
Depth of Well - 190 feet.
Static Water Level - 23 feet.
Draw-down 5 ft., pumping 300 gallons per minute.
Pipe installed - 39 ft. of 16" pipe.
83'5" of 10" pipe.
20'6" of 8" pipe.

Driller - Homer Rhodes, for Hoeg & Ames, Inc.
Remarks: 8" bottom 102 ft. Rock broken from 51 ft. to100 ft. Rock from 100 feet to 190 feet.

FORMATION.

0' to 51' - Drift.
51' to 190' - Rock.

Total Depth - 190 feet.

PULLED PUMP MAY 1969
SWL SAME
D.D SAME
THIS WELL PROVIDES 75% OF CITY WATER
PUMPS CONTROLED BY PRES. SWITCH + THIS WELL GOES ON FIRST + NORTH WELL SECOND

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa

Well Log Record

Owner of well Town of Union County _____

Tenant _____ Town _____

Location _____ sec. ____, T. ____ N., R. ____ E. W. _____ Twp.

Curb elevation _____ ft. Present depth _____ ft. final depth 190 ft.

Static level: (Depth to water ~~above~~ below curb) 23 ft. Pumping level 28 ft. at 300 gpm.

Contractor (Howe Rhodes) Date drilled July 24 - Aug 7

Description*	FEET Thick	From	To	Description*	FEET Thick	From	To
Drift		0	51				
Rock		51	190				

*Abbreviate descriptions; use one line for each formation.

Remarks on water zones and casings

39' of 16" pipe (Pulled out and cemented with 65 sacks of cement)

83'5" 10" pipe

20' 6" 8 pipe to Horn 102'

Temperature: Air ____ °F., Water ____ °F. at ____ A.M. P.M. _____ 19__

Record obtained from _____ Recorded by _____

Hardin
6W
g.2

June 1, 1946

Mr. Sam Sorensen, Mayor
Union,
Iowa

Dear Mr. Sorensen:

In response to your request we have assembled our information concerning ground-water conditions in the vicinity of Union.

The town of Union is built on a terrace about 120 feet below the upland and 10 to 15 feet above the flood plain of the Iowa River. The town water supply is now derived from wells drilled into a sand and gravel bed beneath the terrace. These wells were put in about 25 years ago and are reported to have been very satisfactory. The water is of good mineralogical quality, and it is reported that 90 g.p.m. is pumped from them at the present time.

Bedrock is limestone of Mississippian age reported to occur at a depth of about 50 feet beneath the terrace and 30 to 35 feet beneath the flood plain. It is overlain by a mantle of blue clay, apparently thicker under the terrace than under the flood plain. The flood plain is reported to be composed mainly of sand. No large wells are known to be finished in this material, but many sand-point wells obtain a good supply of water.

There appear to be three rather good prospective sources for increasing the town water supply: 1) the sands and gravels under the terrace (the source of the present supply) 2) the sand and gravel beneath the flood plain and 3) the Mississippian limestones.

Before a final well can be decided upon from either of the sand and gravel sources it would be necessary to undertake a testing program. Since the terrace sands and gravels have yielded such a satisfactory supply and are still producing an adequate quantity of water, it would appear desirable to attempt to develop more water from them. Two test holes have already been drilled near the present wells. These showed excellent sands and gravels, but no water was reported by the driller. Nevertheless, water is being produced from this horizon, and it may be that further testing will encounter a satisfactory supply.

The sands underlying the floodplain is a second possibility. Marshalltown and many other towns in Iowa obtain abundant supplies from such a source. Relatively little is known about the water-bearing potentialities of these deposits at Union. It would be necessary to put down some test wells to determine the character of the sand and gravel, particularly its coarseness and its ability to yield water.

The Mississippian limestones are the third likely source for water. These rocks are expected to occur from 50 to 200 feet in depth. The entire section is

potentially water-bearing, but generally the lower portion yields large quantities. The mineral quality of water from the limestone is not expected to be very different from that of the water from the sands and gravels. It may be slightly harder and contain a small amount of iron. The quantity of water available cannot be forecast accurately, but it is probable that a sufficient amount for the needs of the town could be obtained from a well drilled through the limestones to the top of the Maple Mill shale.

As requested, the forecast of the geologic section is carried to a depth of 400 feet. The water in the limestone and dolomite which underlies a 100 foot bed of shale is likely to be much harder than the water in the Mississippian rocks. For this reason it would seem inadvisable to drill below the shale occurring at an approximate depth of 200 feet.

A generalized section based on a starting elevation of 936 feet is given below:

Formation and Description	Thickness	From	To
1. Pleistocene (loess and till, sand and gravel at base	~~75~~ 50	0	50
2. Mississippian system			
Burlington formation (dolomite and chert)	10	50	60
Hampton formation (dolomite and chert)	~~135~~ 140	60	~~195~~ 200
Maple Mill and Sheffield formations (shale with some dolomite)	~~100~~ 95	~~195~~ 200	295
3. Devonian system			
Lime Creek formation			
(dolomite and limestone)	50	295	345
(shale with some dolomite)	80	345	425

Very truly yours,

H. G. Hershey
Associate State Geologist

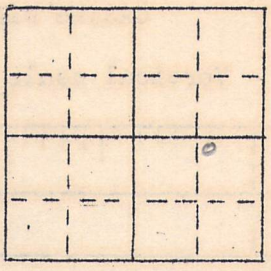
HGH:SEH:BH

7½' Union Quad
421443N-0930347-01
86-19W-21 DABA,
1975 field located
Elev. 937' CI=10'

W-2419

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

RECORD OF WELL



Location:

Town: UNION (N E / S W): County Hardin

NW NE SE sec. 21 T 86 N., R. 19 W. Union Twp.

Well name and number Town of Union (1946)

Owner Town of Union Address

Tenant Address

Contractor Hoeg and Ames Address Lincoln

Drillers Homer Rhodes

Drilling dates Started July 24, 1946 Finished August 7, 1946

Well data:

Elevations: Drilling curb 938.5 feet; Land surface feet

Determined by Hale & T. Parker

Topographic position High terrace in Valley of Iowa River

Total depth: Reported 190 feet, Measured feet

Drilling method Cable tool

Hole and casing data 83'5" of 10-inch pipe from 0 to 83'5". 20'6" of 8-inch pipe from 81.5 to 102 feet. (Cemented after pulling 29' of 6" pipe with 65 sacks of cement.)

Original depth to water 23 ft. ~~above~~ below Date Aug 7, 1946

Original elevation of water level ft.; Source of data

Sources of water: Principal ; Others

Production data: Date Aug 7, 1946

Static depth to water 23 Measuring point

Pumping level 28 at 300 g.p.m.

Specific capacity g.p.m. per ft. drawdown; Temperature °F.

Pump data: Type pump Column Dia. Length

Cylinder or bowls: Dia. Length Suction pipe

Power Airline

Estimated rate of production: g.p.m. for hrs. a day

Use of water

WATER ANALYSES (in parts per million)

Date samples				
Sampled by				
Total solids				
Insoluble matter				
Alkalinity (Meo)				
Alkalinity (Phn)				
pH				
$Fe_2O_3 + Mn_2O_3 + Al_2O_3$				
Alkali as sodium				
Calcium				
Magnesium				
Iron (unfiltered)				
Manganese				
Nitrate				
Fluoride				
Chloride				
Sulfate				
Bicarbonate				
Hardness (ppm)				
Hardness (gpg)				

Remarks

Laboratory data: Sample storage location

Sample range 0-185 No. spls. 34 No. dupls. & cond. 34 fair

Spls. prepared by TCP Washed range 51-185 by T.C.P.

Driller's log and cond. poor

Insoluble residues: Prepared by Studied by Strip log

Microscopic study 0-185 strip log Aug 22, 1946

Gen. log Correl. by T.C.P.

2419

Name: Union town well (1946) pop. 534 (1960)

Loc. NW NE SE 21-86N-19W, Hardin Co.

T.D. 190'

Drilled: Hoeg & Ames July-Aug, 1946

Log: W-2419 Parker

Casing: 83'5" of 10" pipe from 0-83'5"; 20'6" of 8" pipe from 81'5" to 102'

220 meters averaging 4000+ g/qtr. or 1500-2000 gp month = approx 5000 gp qtr.

Prod. data:

SWL 23'

PWL 28'

Yield 300 gpm

$5\overline{)300.}$ 60. sp. cap

$\frac{60.}{83} = 72.3 \times 10^{-2}$

piezometric $\begin{array}{r} 938 \\ 23 \\ \hline 915 \end{array}$

Analysis. No. J-1770 Nov. or Dec., 1946; No. 2331(2128) 5/9/60

$$83\overline{)60.000} = .723$$

581

190

166

240

249

Elevation 938.5

Formations	Depth	Top	Base	Thick.
Gilmore City	50	888.5	848.5	40
Hampton	90	848.5	793.5	55
Maynes Crk.	145	793.5	763.5	30
Chapin	175	763.5		
Pros. Hill ?	?			

5000
4
20000 gpyr/meter
220
400000
40000
4400,000 gpyr.

12222 gpd
360 | 4400000
360
800
720
800

locker plant = 312000 gpyr.

23 gpd/per
534 | 12222
1068
1542
1602

175
50
125

16630
15800
32430

4400000
1275000
5675000
312000

360 | 5987000 | 16630 gpd
360
2387
2160
2270
2160
1100

add school approx. 575000 gpyr.
and laundromat " 700000 "
= 5,675,000 gpyr.
= 15800 gpd domestic
= 30 gpd/per. domestic