IOWA GEOLOGICAL SURVEY
Generalized Log Based on Detailed
Description of Drill Cuttings

Name of Well Rake Town Well No. 1 Survey No. W-0967

Location Winnebago County

Drilled by Thorpe Bros. Well Co. March 4, 1939 (completed)

Total Depth 200 ft. Curb Elevation 1167 ft. Static Level 16 ft.

Pumping Test ____ Hours ____ Min; Gal. per min. 50 Drawdown 12 ft. in ___ min.

Casing Data 94' of 12" from +2' to 92'; 114' of 8" from +2' to 112'

Description of Formations

No.	Rock Unit	Thick.	From (feet)	To
	PLEISTOCENE SYSTEM			
1.	Clay, medium gray, soft, slightly calcareous, glacial sand 20%, coarse, angular, polished in part, granite and quartz. Shale or very fine siltstone 10%, noncalcareous medium-gray, hard, dense, micaceous, slightly fissile	13	0	13
2.	Shale 60%, as in 0 to 13 feet; gravel, large rounded pebbles of light brown, coarse-grained limestone	2	13	15
3.	No samples	2	15	17
4.	Clay, medium gray, slightly calcareous, soft, with shale 15% to 30%, and glacial sand 10% to 20%, as in 0 to 13 feet	58	17	75
5.	Glacial sand and gravel angular, slightly polished, consisting of granite, quartz, limestone and dolomite. Limestone 10% 90 to 95 feet, light grayish-drab, very fine grained, granular, with many fine brown dolomite rhombs embedded	20	75	95
	ORDOVICIAN SYSTEM Galena formation			
6.	Limestone, light grayish-drab to gray, very fine grained, granular, with coarsely crystalline crinoid fragments and abundant fine brown dolomite rhombs embedded. Chert, trace to 5% from 105 to 120 feet, light gray few black specks embedded, granular, subconchoidal, opaque	25	95	120

Notes:

Survey No. W0967

No.	Rock Unit	Description	Thick	From	To
7.	Limestone, light grayish-drab as in 95 to 120 feet, to light-buff, fine-grained, with few coarsely crystalline crinoid fragments and abundant light-medium brown dolomite rhombs embedded. Chert, trace 120 to 127 feet, as in 95 to 120 feet		22	120	142
8.	Limestone, pale to very light-buff, very fine-grained, granular, with few fossil fragments as in 120 to 142 feet and abundant very light tawny brown, medium-grained dolomite rhombs embedded		8	142	150
9.	Limestone, very light drab, very fine-grained, with dolomite rhombs embedded as in 142 to 150 feet, grading into dolomite 10% to 30%, light to medium tawny brown, medium-grained, subsaccharoidal, translucent		30	150	180
10.	Limestone, light-drab slightly buffish, very fine-grained, with abundant dolomite rhombs embedded as in 150 to 180 feet		20	180	200
Total Depth					200

Notes on Rake City Well - W-0967

Winnebago County

Pleistocene System - The upper 75 feet of this well consists of medium gray clay which is slightly calcareous. Embedded in the clay are minor percentages of glacial sand of heterogeneous composition, and rounded fragments of medium gray, fairly hard, non-calcareous, slightly fissile and silty shale. The shale was first believed to be indurated material, the fragments having been rounded possibly during drilling operations, and the non-fissile, soft, medium gray clay which accompanied it was considered to be drilled up shale of the same type. The glacial sand was thought to be mostly cave. However, the shale does not seem to be typical of any formation which might be encountered in this locality. It is neither typical Maquoketa nor Cretaceous.

Below the clay interval are 20 feet (75-95') of coarse glacial sand, gravel, and pebbles, which would appear to indicate a definite Pleistocene assignment to the questionable beds above. It is possible that samples in this interval are similar to those above and that the driller washed his samples very hard in the 75-95' interval so that he removed all the clay from the samples, but it appears unlikely that all four samples of this interval would have been entirely cleaned of till or clay.

It thus appears that there is included in the till at this locality some glacial borne masses of shale and siltstone.

Galena formation - The geologic map of Iowa shows Cedar Valley limestone underlying the drift at this locality. These samples contain buff and drab limestone which has abundant brown to reddish brown dolomite rhombs and coarsely crystalline crinoid fragments embedded. There are abundant loose crinoid stem plates which are relatively thick, small, and rounded, the "doughnut" crinoids which are typical of Galena in many wells of this general area. There is little doubt that this limestone is Galena, though no cinnamon specks were found.

This is a good set of samples. The intervals are 5' or less, except for one of 18' (17-35').

It might be added that Carmody of Gulf considers the shale in the upper part of the hole to be Cretaceous (Fuson ?), the gravel directly underlying it to be "very poor samples", and the limestone below to be Galena.

W-0967

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

RECORD OF WELL

Location:

Town: Rake (N E / S W): County WINNEBAGO

NE/4 SW sec. 16 T. 100 N., R. 26 W. LINCOLN Twp.

Well name and number Town Well #1

Owner _____ Address _____

Tenant _____ Address _____

Contractor THORPE WELL CO. Address Des Moines

Drillers _____

Drilling dates completed March 4, 1939

Well data:

Elevations: Drilling curb 1167 feet; Land surface 1166 feet

Determined by T.W. Robinson

Topographic position Upland plain

Total depth: Reported 200 feet, Measured _____ feet

Drilling method _____

Hole and casing data 94' of 12-inch casing from +2' to 92'

114' of 8-inch casing from +2' to 112'

15" to 8" hole

Original depth to water _____ ft. above / below _____ Date _____

Original elevation of water level _____ ft.; Source of data _____

Sources of water: Principal Galena ; Others _____

Production data: Date

Static depth to water 16 Measuring point

Pumping level 28 at 50 g.p.m.

Specific capacity 4.1 g.p.m. per ft. drawdown; Temperature °F.

Pump data: Type pump Turbine Column Dia. Length

Cylinder or bowls: Dia. Length Suction pipe

Power Electric (5h.p.) Airline

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

Use of water

WATER ANALYSES (in parts per million)

Date samples	March 6, 1939			
Sampled by	C.S. Mullinex			
Total solids	685			
Insoluble matter	18.0			
Alkalinity (Meo)	434.0			
Alkalinity (Phn)	0.0			
pH	7.1			
$Fe_2O_3 + Mn_2O_3 + Al_2O_3$	12.0			
Alkali as sodium	167.2			
Calcium	66.5			
Magnesium	17.5			
Iron (unfiltered)	0.8			
Manganese	trace			
Nitrate	0.00			
Fluoride	trace			
Chloride	4.0			
Sulfate	156.3			
Bicarbonate	529.5			
Hardness (ppm)	239			
Hardness (gpg)	14.0			

Remarks

Laboratory data: Sample storage location

Sample range 0-200 No. spls. 37 No. dupls. & cond. 37 good

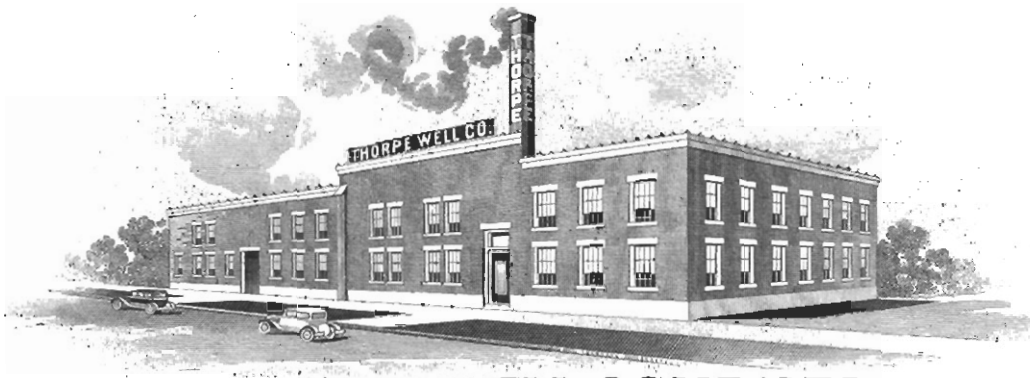
Spls. prepared by Unklesbay Washed range by

Driller's log and cond. Yes good

Insoluble residues: Prepared by Studied by Strip log

Microscopic study 0-200 IBC, Gulf strip log 1939 Gulf 5/29/42 IBC

Gen. log Yes ✓ IBC Correl. by IBCarrico, Carmody



THORPE WELL COMPANY

CONTRACTORS

LATEST ROTARY AND CABLE TOOL EQUIPMENT
THORPE PATENT GRAVEL PACKED WELLS

2340 SIXTH AVENUE
TELEPHONE 3-6107

PLEASE ADDRESS ALL REPLIES DIRECT TO THE COMPANY

DES MOINES, IOWA May 19th 1939

H.G.Hershey,
Iowa Geological Survey,
Iowa City, Ia.,

Dear Sir:

As per your request we are enclosing herewith log of the new well at Rake, Iowa.

Mr. Ralph Gearhart of Cedar Rapids, Ia., was the engineer on this job and Andrew E. Schumann , of Forest City, Iowa was the R.E.I. engineer.

Trust that this will give you the information desired.

Very trulyyours,

Thorpe Well Company

R-1-B

THORPE BROTHERS WELL COMPANY

2340 Sixth Avenue

DES MOINES, IOWA

Drilled for Town of Rake *at* Rake, Ia

Drilling started _____ *19* ____ *Completed* March 4th 1939 *19* ____

Well No. 1 *Kind of Well* Drilled *Depth* 200' *Size hole started* 15" *in.*

Finish 8" *G. P. M.* 50 *Static head* 16' *Drawdown* 28'

Water was first encountered at _____ *in* _____ *Approximate Amount* _____

Remarks _____

RECORD OF PERMANENT PIPE					TEMPORARY PIPE	
SIZE PIPE	AMOUNT OF PIPE	DEPTH TO BOTTOM OF PIPE	DEPTH TO TOP OF PIPE	MAKE OF PIPE	SIZE PIPE	AMOUNT
12"	94'	92'	2' above surface			
8"	114'	112'	2' above surface			

Driller _____ *From Surface to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

Driller _____ *From* _____ *feet to* _____ *feet*

AMOUNT IN FEET	KIND OF SOIL OR FORMATION	TOTAL DEPTH FEET
2	Yellow clay	2
11	Blue clay	13
2	Sand & gravel	15
45	Blue clay	60
5	Dark shale	65
5	Gray shale	70
5	Sandy gray shale	75
10	Sand & gravel	85
5	Sandy blue shale(top of lime)	90
30	Lime rock-hard	120
7	Gray lime	127
23	Hard lime rock- water head 19'	150
35	Hard lime- brown	185
5	Lime rock- not very hard	190
10	Hard gray lime	200

water file.

November 1, 1938

Mr. H. W. Poston
State Department of Health
Des Moines, Iowa

Dear Mr. Poston:

We have just received copies of Department of Health reports on the towns of Rake and Thornton, Iowa, by J. A. Sampson, Assistant Engineer of ~~this~~ the Division. I presume that you are responsible for sending these to us and I wish to thank you for your cooperation in doing so.

Very truly yours,

HGH:LM

H. G. Hershey

Winnebago

IOWA STATE
DEPARTMENT OF HEALTH

October 28, 1938.

Mr. W. C. Sundermeyer,
Town Clerk,
Rake, Iowa.

For the attention of the Hon. Mayor and Council

Gentlemen:

We are enclosing a report of a recent investigation conducted by Mr. J. A. Sampson, Assistant Engineer of this Division, of a well development location for the Town of Rake, Iowa.

COPY

We believe you will find Mr. Sampson's report self-explanatory, and wish to call your particular attention to the provisions under which the location in question was approved, namely, the provision of adequate drainage immediately surrounding the well, and also water-tight construction for privies, septic tanks and sanitary sewers within a radius of 250 feet of the well.

Very truly yours,

A. H. Wieters, Director,
Division of Public Health Engineering.

By_____
Assistant Engineer.

CDM:MO'L
Enc.
Copy to Dr. H. G. Hershey
" " R. W. Gearhart.

IOWA
STATE DEPARTMENT OF HEALTH
DIVISION OF PUBLIC HEALTH ENGINEERING
DES MOINES

Town Rake, Iowa. Date October 17, 1938

Report on Well Location - New Development

By J. A. Sampson Approved A. H. Wieters Director
Division of Public Health Engineering

At the request of Mr. W. C. Sundermeyer, Town Clerk, the writer visited Rake, and contacted Mr. O. A. Hove, Mayor, in regard to location on new well development.

On September 16, 1938, a representative of this Division made a location survey, and at that time investigated a number of sites that could be approved by this Department for a ground water development. In considering these locations, the Town Council met with considerable opposition, and deemed it advisable to have another survey made by this Division with the object of securing a more satisfactory site to all concerned.

At this time the writer investigated a possible well site, located in the west end of Rake, known as the Stuckslager Subdivision of the Town of Rake. This plot of ground, which has been in pasture for a number of years, is approximately 100 feet wide by 300 feet long. It is bounded on the north by the Legion Baseball Diamond; on the west by the railroad right-of-way; on the east by Fourth Street, and on the south by privately owned property. The topography of this site is flat, however, a good drainage outlet is accessible in the county or town tile drain, located at the southeast corner of this site. It is the writer's opinion that a well located along the north line and within the west one-third of this area will be of sufficient distance from contaminating influences to meet the requirementsof this Department. As pointed out to Mayor Hove at this time that this site can be approved, providing that the area within a 50 foot radius of the well be graded above any possible flooding, and that any privies, septic tanks, or sewers within a radius of 250 feet of the well be of water-tight construction.

Plans and specifications for a complete water works system, including the development of a well, construction of a pump house, distribution system, and elevated steel tank has been approved by this Department.

Respectfully submitted,

J. A. Sampson,
Assistant Engineer,

JAS:MO'L

Sheet No. 1 Name of Well Town Well No. 1 Survey No. W0967

Location Rake Winnebago Co. Date Drilled .... Analyst Carrier 5/29/42

Depth	Description
0	After seeing sples from 75' to 95' it would seem that sples from 0 to 75' should be considered till with minor amount sh. emb. – gaa
0–5	Sh. or v.fn. siltstone, med. gr., hard dense sltly fissile, non-calc. few micas. few blk. spks. – 10%
5–10	Glacial sand, heterog. igs. qtz + seds – A – polished in pt 20% Till medium gr. soft, sltly calc. – 70%.
10–15	(silty) Sh. lt. med gr. fn grained med. hard conch to sltly fissile non. dolom. mica – 60% Ls. in lg. rded pebs – glacial (?), lt. brn. crse xln with veinlets of clear xln. calcite 40
15–17	GAP
17–20	
20–30	Till, medium gr. soft sltly calc – 70% Sh. lt. med gr. soft v. sltly dolom. – sltly fissile, few micas: silty in pt. 20% Glacial gravel. A to a grains igs, qtz + ls, (lt. orange – yello, fn. xln. dense) – 10% polished in pt
30–35	
35–40	Till as above – 60% Sh. as above – few blk. spks – 30% Glacial gravel as above – tr. – rded. lt. crm ls. pebs as above – 10%
40–45	Sple ditto 35'–40 Sh. aa – 15%
45–50	Sple " 35-40
50–55	" " 35-40
55–60	Sh. med gr. non-calc. sltly silty + fissile, med. hd. – 20% Inoceramus shell fragment. Glacial sd – qtz, igs + ls. grains – cave – 15%
60–65	Sple ditto 55-60 but 5% only, glacial sand, + 10% sh.
65–70	Sple " 60-65
70–75	Till as above. Shale ditto 60-65. sltly calc. or dolm. – 10% Glacial gravel 15%.
75–80	Glacial sand. coarse to pebbles (mainly) qtz, igs + ls + dol as above – A, sltly pol. in pt. Tr. sh as above in rded frags. Inoceramus shell frag – tr.
80–85	Sple ditto 75-80 – mostly ls + dol. in crse sltly rded. pebs. as above (75-80)
85–90	" " 80-85
90–100	" " 85-90. but sltly smaller fragments + more qtz + igs in sple. Ls. lt. gryish drb with many fn brn dol rhombs emb + v.fn. xln granular – 10% Ls. " " " " " " " " " " etc – sltly phenoclast – 60% Glacial sd. ... %

Galena (driller) — at 90

Galena — at 95

Sheet No. 2 Name of Well Town Well No. 1 Survey No. W. 0967

Location Rake Winnebago Co. Date Drilled Analyst Carrier 5/29/42

Depth	Description
100–105	Ls. as above – more phenoclastic, cri frags fairly abund't. – s'tly mott. dk. gr. with blk. spks. Glacial sd. & pebs as above – 50%. – cave
105–110	Cht. lt. gr. gran. sub-conch., tr blk. spks emb. – opaque – 5%. Ls. as above – 50%. Glacial sd – cave – as above – 45%.
110–115	Cht. as above – s'tly bf. – drb in pt. – 5%. – Ls. " " – 50% – cri stems ("do-nut"), brach shells etc. s'tly cherty. Glacial cave as ab. – 45%.
115–120	Sple ditto 110-115. – trace only of chert
120–125	Cht. a.a. – tr. Ls. lt. grsh drb, dol. rh. emb, etc. as above to small amount v. lt. bf. with few dol. rhombs. fn. xln. gr. – both s'tly phenoclastic 60%. Glacial cave – 40%.
125–127	Cht. as above – tr. Ls. as above – 70%. Glacial cave 30%.
127–130	Smple ditto 125-127. no chert.
132–137	Ls. as above – phenoclast. – cri "donuts" & other fos. frags. (Cse) Sd. mostly qtz – some igs; A, non-frst or polished. – glacial cave – 15%.
137–142	Ls. lt. bf. mottled heavily by lt. med. brn dol. rhombs in about 50% of sple. s'tly phenoclastic – 90%. Glacial sd. as above – cave. – 10%.
142–147	Ls. pale to v. lt. bf. with abund't (fn) lt. tawny transl dol. rhombs emb. – s'tly phenoclastic – cri frags – tr. Sd. loose crse to mostly med. A to a few a grains well frsted, most not. – 15% cave.
147–150	Sple ditto 142-147 – some igs sd. cave.
150–155	Dol. lt. tawny brn, transl, med. xln. dense – 10%. Ls v. lt. drb & fn. xln mott by emb. v. lt. tawny brn. dol. rhombs as above – Glacial sd a.a. – 20%. Strong tr. brick red material loose not calc – extraneous? – pcs of brick?
155–160	Dol. calc, lt tawny brn, med xln. 20% ± grading into Ls. as above. Glacial sd. 15% – cave. Tr. red – brick (?) material as above.
160–165	(5%) Dol. med. brn, transl, fn-med. xln. subsac ±10% grading into Ls. as above. – s'tly phenoclastic, cri stem frags. Glacial sd. 20% – cave
165–170	Sple ditto 160-165.
170–175	Dol. as above – 30% grading into Ls. lt. drb., v. fn. xln with abund't dol. rh. fn-med, med brn. emb. s'tly phenoclastic. not abundantly foss.
175–180	Sple ditto 170-175 plus tr. dk. brn, arg, fn. xln, soft, dolom.
180–185	Ls. lt. drb. s'tly bf-ish. v. fn. xln etc. as above.
185–190	Ls. as above with abund't dol. rhombs in large part.
190–195	Sple ditto 185-190.
195–200	Ls. as above but moderate amt. dol. rhombs emb. some coarse xls. semi transl. not phenoclastic.