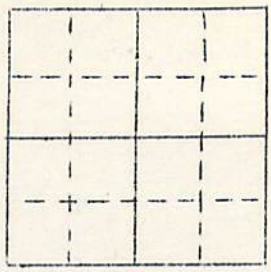
W-0817

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

RECORD OF WELL



Location:

1979 field located SE, SW, SW, NE, sec 32, T97N, R39W

Town: Hartley (N E / S W); County O'BRIEN

SW SW-NE sec. 32 T. 97 N., R. 39 W. Hartley Twp.

Well name and number HARTLEY Town #4 (?)

Owner _____ Address _____

Tenant _____ Address _____

Contractor Thorpe Well Co. Address _____

Drillers _____

Drilling dates deepened from 127' 6-28-38 to 4-1-39

Well data:

Elevations: Drilling curb 1456 feet; Land surface _____ feet

topo elev 1458'

Determined by H. G. Hershey

Topographic position Upland plain

Total depth: Reported 660 feet, Measured _____ feet

Drilling method cable tool

Hole and casing data 16" casing from surface to 411'
(Give amount, size, kind, and depth of all casing; type and
temporary 8" from surface to 578'
position of seals and packers; cementing; how finished--perforated pipe, screen,
gravel pack, open hole, etc.)

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

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

Sources of water: Principal _____; Others _____

Production data: Date _____

Static depth to water _____ Measuring point _____

Pumping level _____ at _____ 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 city supply

WATER ANALYSES (in parts per million)

Date sampled	Oct 1938 drlg depth 602'			
Sampled by	H.G. Hershey			
Total solids	2433			
Insoluble matter	17.0			
Alkalinity (Meo)	412.0			
Alkalinity (Phn)	0.0			
pH	7.0			
Fe_2O_3+ Mn_2O_3+Al_2O_3	8.0			
Alkali as sodium	140.1			
Calcium	390.2			
Magnesium	105.1			
Iron (unfiltered)	0.9			
Manganese	0.50			
Nitrate	0.00			
Fluoride	tr.			
Chloride	42.0			
Sulfate	1225.1			
Bicarbonate	502.6			
Hardness (ppm)	1409			
Hardness (gpg)	82.39			

Remarks _____

Laboratory data: Sample storage location _____

Sample range 225-660 No. spls. 57 No. dupls. & cond. 56 good

Spls. prepared by _____ Washed range _____ by _____

Driller's log and cond. Yes fair

Insoluble residues: Prepared by _____ Studied by _____ Strip log _____

Microscopic study Gulf strip log 1939 Carmody

Gen. log _____ Correl. by Carmody

Hartley Well W0817

O'Brien

Gen. Log.

	Thick	From	To
Shale, lt. gray, slightly micac	2'	478'	480'
SS, V. lt. br. to buff, med. to crse gr., fair sorting, V. ang., in parts slightly iron coated. Lime cem. frag 540-545 Becoming more silty, more crse. gr., & more poorly sorted from 572-595. Containing granules of Quartz and dark igneous material from 595-601	121'	480	-601
Sh., drk gray, micac., pyritic, Granules and small pebbles drk ig. material & Qz common. Non-calc.	2'	601	-603'

Generalized Log

Hartley City Well #4 #1 W-0817
Obrien County
Drilled by Thorpe Bros. Well Co. , Des Moines, Ia. Date - July 1938

Deepened from 197'

Unit	Rock Description	Thick	From	To 6
1.	Old well - no samples	197'	0	197'
2.	Deepened New well - no samples	28'	197'	225'
	Pleistocene System Kansan Drift			
3.	Till, glacial, medium gray, calcareous, fine silty texture, small pebbly with 15% of light buff, fine crystalline limestone fragments and 5% miscellaneous igneous pebbles.	32'	225'	257'
4.	Gravel, fine pebble to granule, clay coated, gray, dominantly light buff limestone, and with very little sand.	3'	257'	260'
5.	Till, glacial, olive gray, calcareous, very fine silty to clayey textured, pebbly with light buff limestone dominant.	30'	260'	290'
6.	Gravel, fine pebble and granule, dominantly igneous material and quartz, much light buff limestone. Very little sand.	5'?	290?	295'
7.	No sample.	5'	295'	300'
8.	Till, medium gray, calcareous, fine silty texture, pebbly with 10% light buff limestone and igneous pebbles. becomes non-calcareous in the lower 5'	35' 30'	300'	~~330'~~ 335'
9 10.	Sand, very coarse to granules, gray, clean, (Major Grade 1-1/2 mm, Principal Subsidiary Grade 2-1 mm)	5'	335'	340'
	Nebraskan (?)			
9.	Till, medium gray, slightly to non calcareous, silty texture, pebbly light buff limestone and igneous material.	5'	330'	335'
10.	Till, medium to dark gray, very slightly calcareous, micaceous, no pebbles.	8'	340'	348'
11.	Till, medium gray, silty textured, calcareous, slightly micaceous, pebbly 5% light buff limestone and igneous pebbles.	15'	355'	370'
12.	~~Sand-and-small-pebble-gravel,-gray,~~ Till, limonite yellow, silty textured, sandy, calcareous, oxidized, with 4% fine pebbles.	10'	370'	380'
13 14.	Sand and small pebble gravel, gray, medium grained (Major Grade 1/2-1/4 mm, Principal Subsidiary Grade 2-1 mm), dominantly subangular. Sand is 90% quartz and 10% miscellaneous. Granules are 30% igneous, 40% light buff ~~lime~~ dolomite, and 30% gray shale.	15'	380'	395'
15.	Sand, glacial, coarse, and granules. Sand (Major Grade 1-1/2 mm, Principal Subsidiary Grade 2-1 mm), subangular, granules dominantly igneous and light buff, fine crystalline dolomite fragments.	15'	395'	410'
16.	Cretaceous System Dakota Stage Middle Dakota sandstone and shale.			

W-0817

		Thick	From	To
		From---To-		
16.	Sandstone, light buff, medium grained (M.G. 1/2-1/4 mm, P.S. 1/4-1/8 mm), angular, with 30% coarse quartz, igneous material, and light buff dolomite (Believed to be cave from unit above since sand is of Dakota type).	5'	410'	415'
17.	Sandstone, very light buff, medium grained (M.G. 1/2-1/4 mm, P.S. mm., P.S. 1/4-1/8 mm), angular,	11'	415'	426'
18.	Shale, medium gray, silty textured, non-calcareous, slightly micaceous, wholly as well mud.	6'	426'	432'
19.	Sandstone, light buff, medium to fine grained (M.G. 1/4-1/8 mm, P.S. 1/2-1/4 mm) angular; trace pyrite; 2% dark brown iron oxide fragments.	9'	432'	441'
20.	Shale, medium gray, and very light gray, silty textured, both slightly micaceous; and wholly as well mud.	3'	441'	444'
21.	Sandstone, very light buff, medium grained (M.G. 1/2-1/4mm, P.S. 1-1/2 mm), angular, clean.	4'	444'	448'
22.	Sandstone, light buff, medium grained (M.G. 1/2-1/4 mm, P.S. 1/8-1/16 mm), silty, angular.	7'	448'	455'
23.	Sandstone, buff and light buff, medium grained (M.G. 1/2-1/4 mm, P.S. 1-1/2 mm), angular, clean, slightly iron coated in parts. Thin band of white shale between 467' and 471'.	23'	455'	478'
24.	Shale, light gray, very fine silty texture, micaceous, entirely as well mud, non-calcareous.	2'	478'	480'

Sheet No. 3 Name of Well Hartley City Well #2 Survey No. W-0517

Location ..... Date Drilled ..... Analyst Schuldt

200

205

210

215

220

225 Till, med. gray, calc., fine silty text., pebbly, with 15 % lt. buff fine xline. ls.; 5% miscellaneous (Ig mat.)

230 Till, sim. to spls. 225-230'. ls. pebbles, dom., some ig.

235 Till, " " " " " "

240 Till, " " " " " " Pebbles 30%

245 Till, " " " " " " 50 %

250 Till, " " " " " " 40 %

255

257 Gravel, fine pebble to granule, clay coated, gray, dom. lt. buff ls, v. little sd

260 Till, olive gray, calc., v.fine silty to clayey text., pebbly, lt. buff ls. dom., Pebbles 30%

265 Till, " " " " " " " " Pebbles 20%

270 Till, " " " " " " " " 20 %

275 Till, " " " " " " " " 20 %

280 Till " " " " " " " " 20 %

285 Till, " " " " " " " " 15 %

290 Gravel, fine pebble & granule; dom. ig mat. & Qz, much lt. buff ls, v. little sd

295

300

NS

Sheet No. 4 Name of Well Hartley City Well #1 Survey No. W-0817

Location ..... Date Drilled ..... Analyst Schuldt

300
305
310
315
320
325
330
335
340
345
348
350
355
360
370
380
390
400

Till, med. gray, calc., fine silty text., pebbly, lt. buff ls. & ig pebbles 10%

Till, med. gray, calc., fine silty text., pebbly, lt. buff, ls. & ig pebbles 15%

Till, " " " " " " " " " " " " 15%

Till, " " " " " " , lt. buff, ls & ig pebbles 10%

Till, med. gray, slightly to gracalc., silty text., pebbly, lt. buff ls. & Ig mat. 10%

sd, V. crse. to granules, gray, clean, sd. (ME. 1-½ mm, RS. 2-1 mm) 75% Qz, 25% ig. & misc.

Till or Sh, med. to drk gray, V. slightly calc., micac., no pebbles, as well mud.

Gravel, gray, Small pebble & granule, 10% crse sd., dom. ig with much lt. buff, fass., fine text. dol.; <2% pyrite.

Till, med. gr., silty text., calc, slightly micac., pebbly (lt. buff ls & Ig, 5%)

Till, med. gr., silty text, " " " (" " " " ", 2%)

Till, limonite yellow, silty text, sandy, calc., oxidized, 4% fine pebbles (Ig & ls).

Sand & Small pebble gravel, Gray. sd, med. (ME ½-¼ mm, PS 2-1 mm), dom. subang. sd. 90% Qz, 10% misc. Granules 30% Ig., 40% lt. buff dol., 30% gray sh.

sd & granules, sd. crse. (ME 1-½ mm, RS. 2-1 mm), subang., finer portion dom. Qz sd, crser. portion dom. ig frag. & lt. buff, fine gr. dol.

To 405

Sheet No. 5 Name of Well Hartley City Well #1 Survey No. W-0817

Location ..... Date Drilled ..... Analyst Schuldt

00

caving from above

10

SS, lt. buff, ang. med. gr. (M.G. ½-¼ mm, P.S ¼-⅛ mm), with 30% crse qz, lg., & lt. buff dol. (believed to be cave from unit above since sd is of Dakota type)

415

SS, v. lt. buff, med. gr. (M.G. ½-¼ mm, P.S. ¼-⅛), ang., with 5% lg frag. (cave) <1% Pyrite

20

423

SS, buff, sim. in gr. size & mica. comp. to unit 415-423.

426

Sh. or clay (?) med. gray, silty text., non-calc., slightly micac. Wholly Well mud

30

432

SS, or sd, lt. buff, med. to fine gr. (M.G. ¼-⅛ mm, P.S. ½-¼ mm) ang., <2% red-brn. Fe. oxide; <1% pyrite.

40

441

Sh, med. gray, & v. lt. gray, silty text., both wholly as well mud, both micac.

444

SS, v. lt. buff, med. gr. (M.G. ½-¼ mm, PS 1-½ mm), ang., clean; 1% casing scale

448

SS, lt. buff, med. gr. (M.G. ½-¼ " , P.S. ½-¼ mm " silty ;

50

455

SS, buff, med. gr. (M.G. ½-¼ mm, PS 1-½ mm), ang, clean, slightly iron coated, 5% Fe cem. ss frag. ; 1/g frag. med. gray silty text. sh, slightly micac.

60

SS, lt. buff, sim to unit 455-460 in gr. size & char. No Fe coating or cem.

467

SS buff, " " " " " " " " " " " ; 3 or 4 frag Fe_2O_3 3% v. crse. sd. (Ang); 10% Wh., non calc. sh (as mud.

70

471

SS, lt. buff, sim. to unit 465-460 in gr. size & char. No Fe coating or cem.; 2% br. Fe_2O_3 frag.

478

Sh, lt. gray, v. fine silty text., micac., entirely as well mud., non calc.

80

90

00

Thorpe Well Company
Hartley (City Well No. 1 OWDD)
SW NE 32-97N-39W

Obrien County
Elevation 1456 feet (Hershey)
Comm. 6-28-38
Comp. 4- 1-39

45 feet	Clay
193 feet	Shale
197 feet	Sand and gravel
392 feet	Clay and stone
406 feet	Sand
410 feet	Shale
418 feet	Sand hard
478 feet	Sand soft
480 feet	Shale
601 feet	Sand soft
605 feet	Shale
618 feet	Sand
626 feet	Shale
638 feet	Sand
660 feet	Shale blue

Total Depth - 660 feet

WRD Exp. (GW)
Aug. 1964

Verified ERC

Punched FCH

U. S. DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

Record by P.J. Horick Source of data Files Date 6/7/65 Map H. & T.

State Iowa (16) County (or town) O'Brien (71)

Latitude: 43 deg 10 min 35 sec N (1) Longitude: 095 28 32 (12 degrees 15 min sec 18) Sequential number: 1 (19)

Lat-long accuracy: 2 (20) T. 97 N, R 39 W Sec 32, SW ¼, SW ¼, NE ¼ SPM

Local well number: 097 39 W 32 a c c (21–34) Other number: B & M W-0817

Local use: 008 17 39 c 1 T N 4 (35–41) Owner or name: HARTLEY

Owner or name: HARTLEY IOWA (52–66) Address: Hartley, Iowa

Ownership: (C) County, (F) Fed Gov't, (M) City, (N) Corp or Co, (P) Private, (S) State Agency, (W) Water Dist — M (67)

Use of water: (A) Air cond, (C) Comm, (D) Dewatering, (F) Fire, (H) Dom, (I) Irr, (N) Ind, (P) P S, (S) Stock, (T) Instit, (U) Unused — P (68)

Use of well: (A) Anode, (D) Drain, (G) Seismic, (O) Obs, (P) Oil-gas, (R) Recharge, (S) Spring, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed — W (69)

DATA AVAILABLE: Well data 5 (70) Freq. W/L meas.: NONE N (71) Field aquifer char. (72)

Hyd. lab. data: (73)

Qual. water data; type: COMPLETE C (74)

Freq. sampling: INTERMITTENT I (75) Pumpage inventory: yes / no, period: (76)

Aperture cards: yes (77)

Log data: GEOLOGIST LOG G (78 79)

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD (19) Depth well: 602 ft (20–23) Meas. / Rept 6 (24)

Depth cased: (first perf.) ft (25–28) Casing type: STEEL; Diam. 8 in accuracy 8 (29–30)

Finish: (C) porous concrete, (F) gravel w. (perf.), (G) gravel w. (screen), (H) horiz. gallery, (O) open end, (P) perf., screen, sd. pt., (S) shored, (T) open hole, (W) other, (X) other, (Z) other — (31)

Method Drilled: (A) air rot, (B) bored, (C) cable, (D) dug, (H) hyd rot., (J) jetted, (P) air percussion, (R) reverse rotary, (T) trenching, (V) driven, (W) drive wash, (Z) other — (32)

Date Drilled: 1939 9 3 7 (33–35) Pump intake setting: ft (36–38)

Driller: Thorpe Well Co. (name), DesMoines, Iowa (address)

Lift (type): (A) air, (B) bucket, (C) cent, (J) jet, (L) multiple (cent.), (M) multiple, (N) none, (P) piston, (R) rot., (S) submerg, (T) turb, (Z) other — (39) Deep / Shallow D (40)

Power (type): diesel, elec, gas, gasoline, hand, gas, wind; nat, LPG; H.P. (41) Trans. or meter no.

Descrip. MP LSD ft above / below lsd, Alt. MP 1456

Alt. LSD: 1456 (42–45) Accuracy: (source) ALTIMETER 7 (47)

Water Level 260 ft above / below MP; Ft above / below lsd 260 (48–51) Accuracy: DRILLER'S LOG D (52)

Date meas: 1939 3 9 (53–55) Yield: gpm (56–60) Method determined (61)

Drawdown: ft (62–64) Accuracy: (65) Pumping period hrs (66–68)

QUALITY OF WATER DATA: Iron 0.72 ppm 4 (69) Sulfate 1140 ppm 9 (70) Chloride 35 ppm 2 (71) Hard. 1340 ppm 9 (72)

Sp. Conduct 2620 K x 10^6 6 (73) Temp. 48 °F (74–76) Date sampled MARCH 1965 3 6 5 (77–79)

Taste, color, etc.

097-39W-32acc

Well Number 43.10.35(N)09.28.32.1
d m s d m s

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD (1-19) Physiographic Province: CENTRAL LOWLAND [12] (20-21) Section: WESTERN

LAKE [B] (22) Drainage Basin: LITTLE SIOUX [36C] (23-25) Subbasin: [ ] (26)

Topo of well site: (D) (F) flat surface, (H) hilltop, (S) hillside, (T) terrace, (V) valley flat, [F] (27)

MAJOR AQUIFER: Cretaceous system, LOWER series [K1] (28-29) Dakota Sandstone aquifer, formation, group [D1] (30-31)

Lithology: FINE SANDSTONE [2V] (32-33) Origin: MARINE [C] (34) Aquifer Thickness: 193 ft

[193] (35-37) Length of well open to: ft (38-40) Depth to top of: 410 ft [410] (41-43)

MINOR AQUIFER: system, series (44-45) aquifer, formation, group (46-47)

Lithology: (48-49) Origin: (50) Aquifer Thickness: ft

(51-53) Length of well open to: ft (54-56) Depth to top of: ft (57-59)

Intervals Screened:

Depth to consolidated rock: 340 ft [340] (60-63) Source of data: WELL CUTTINGS [C] (64)

Depth to basement: ft (65-68) Source of data: (69)

Surficial material: [ST] (70-71) Infiltration characteristics: POOR [4] (72)

Coefficient Trans: gpd/ft (73-75) Coefficient Storage: (76-78)

Coefficient Perm: gpd/ft²; Spec cap: gpm/ft; Number of geologic cards: [ ] (79)

Casing:

16" csg from 0-411'

8" from 0-578' (This was reported as temporary csg.)



John C. Moore Corporation, Rochester, N. Y. Binder and holes in leaves, each Patented 1906. 390345

Hartley, O'Brien Co
Deepening old 200' well
Field info. from driller Guy Elam Aug 3, 1938

Old well Thorpe gravel pack put in by Stoner
No. 1 originally drilled 5 years ago
T.D = 197' checked by present driller
Elev. of ground = top rail. ±
Point of ref. 2' above top rail at top of platform
Side holes = 4
Casing = 16"
Screen = Thorpe 5/16 ± openings 10'
S.W.L = 80' ±
Old casing pulled, shoe & most of screen drilled out
Reason for deepening - Well would not produce.

New well - deepening No 1.
Using elect. driven motor.
Dia: 20" as far as possible then 16"
Present depth: 230 ± open hole except for ft. of curbing
To go about 500'
Keeping water 6' from top to prevent caving
Blue clay so far

Aug 19, 1938
Down 295' in blue clay (Sand streak 257'-260'

Nov. 10 1938 NE SW SW NE, Sec 32, T. 97 N. R 39 W. Hartley

Well No 2.

About 300' E. of No 1
470' in sand (Base or near base of drift ??)
Gravel pack

O'BRIEN

...ster, N. Y. Binder and holes in leaves, each Patented 1906. 390345

MOORE'S MODERN METHODS

Hartley No. 1, O'Brien Co

Oct. 12, 1938.

Mr. T. W. Thorpe called on the phone this morning and gave the following information, on well at time of pumping test

T. D = 602
SWL = 260

16" casing from surface to 411'
8" " temp. " " 578'

No screen used in pumping test.

Pumped 30 gpm. Sandstone broke down on boiling

2' of shale 478-480 ? or 578-580 ?
Solid sandstone below is 578'-602'
Loose sandstone 418-578

Rochester, N. Y. Binder and holes in leaves. Patented 1906. 0687

Hartley, O'Brien Co

Jan. 25, 1939

T.D 660.

Shale	608	605
Sand	65	618
Shale	618	624 (?)
Sand	624	628
Shale	628	660

Gravel poured between 10" & 16" came in below 10" at 601 then screen set bailed. Fine sand came in. More gravel poured in. Bailing fine sand now (Jan. 25

Bottom of screen @ 601 Thorpe screen
60' long 10" dia
one joint 8" on top of screen 22' long

20" casing pulled
410' of 16" - 6' below rig floor
10" to 540; top 5' below floor
below floor
below floor.

S.W.L. = 268

Salty well S. of D.M. (Earl Allen)
School well 500± by Charlie Cooper.