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 D. AARONSON Source of data FILE Date 10/19/65 Map COUNTY HWY 1:63,360

State IOWA 16 County (or town) KOSSUTH 55

Latitude: 43 11 50 N Longitude: 094 13 06 Sequential number: 1

Lat-long accuracy: 2 T 97 N, R 29 W Sec 24, SESE ¼, SE ¼, SW ¼ 5 B & M

Local well number: 097 29W24 C DDD Other number: W-0616

Local use: 00616 37CITY 2 Owner or name: BURT CITY #2

Owner or name: BURT Address: BURT, IA.

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

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

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

DATA AVAILABLE: Well data 1 Freq. W/L meas.: INVENTORY Ø Field aquifer char.

Hyd. lab. data:

Qual. water data; type: COMPLETE C

Freq. sampling: ORIGINAL Ø Pumpage inventory: yes / no, period:

Aperture cards: yes

Log data: GEOLOGIST LOG G

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: 525.5 ft 526 Meas. 6

Depth cased: (first perf.) 296 ft 296 Casing type: STEEL; Diam. 10 in accuracy 10

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

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 C

Date Drilled: SEPT 1937 9 3 7 Pump intake setting: 75 ft 75

Driller: MC CUTCHEON WELL CO. DES MOINES, IA (name, address)

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

Power (type): diesel, (elec), nat gas, gasoline, hand, LPG gas, wind; H.P. 5 Trans. or meter no.

Descrip. MP LSD ft above/below lsd, Alt. MP 1178

Alt. LSD: 1178 1178 Accuracy: (source) ALTIMETER 7

Water Level 25 ft above/below MP; Ft above/below lsd 25 Accuracy: DRILLER'S LOG 3

Date meas: SEPT. 1937 9 3 7 Yield: 177 gpm 177 Method determined

Drawdown: 51 ft 51 Accuracy: 3 Pumping period hrs

QUALITY OF WATER DATA: Iron 0.9 ppm 4 Sulfate 122.0 ppm 4 Chloride 9.0 ppm 0 Hard. 382 ppm 7

Sp. Conduct K x 10⁶ Temp. 50 °F 50 Date sampled OCT. 28, 1937 Ø 3 7

Taste, color, etc.

97-29W-24 CDDD

Well Number 43 d 11 m 50 s N S 094 d 13 m 06 s

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD Physiographic Province: CENTRAL LOWLAND 12 Section: WESTERN

LAKE B Drainage Basin: DES MOINES 258 Subbasin:

Topo of well site: (D) local depression, flat surface, (F) hilltop, (H) hillside, (S) terrace, (T) valley flat, (V) UPLAND H

MAJOR AQUIFER: DEVONIAN, system; MIDDLE, series D2 CEDAR VALLEY LS., aquifer, formation, group MC

Lithology: FINE DOLOMITE 2D Origin: MARINE 6 Aquifer Thickness: 120 ft

120 Length of well open to: 64 ft 64 Depth to top of: 240 ft 240

MINOR AQUIFER: ORDOVICIAN, system; MIDDLE, series ØM GALENA FORMATION, aquifer, formation, group M6

Lithology: FINE DOLOMITE 2D Origin: MARINE 6 Aquifer Thickness: ft

Length of well open to: 105 ft 105 Depth to top of: 420 ft 420

Intervals Screened: NONE

Depth to consolidated rock: 120 ft 120 Source of data: WELL CUTTINGS C

Depth to basement: ft Source of data:

Surficial material: SANDY TILL BT Infiltration characteristics: POOR 4

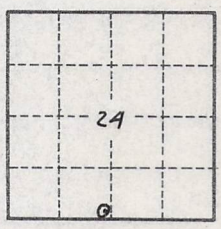
Coefficient Trans: gpd/ft Coefficient Storage:

Coefficient Perm: gpd/ft²; Spec cap: 3.4 gpm/ft; Number of geologic cards:

CASING

122' 4" OF 10" CASING SET AT 186'6"

127' 2" OF 8" CASING SET AT 296'



GPO 844-225

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Local Well No. 097-29W-24CDDD
Aquifer Code(s) D2MC Ø2MG
Owner's Name BURT TOWN #2 (1937)
W Number 0616

Card Q

State: IOWA (1 2) 19 County: KOSSUTH (3 4) 55 Town: BURT, IOWA

Well No. Latitude 43 11 50 N (5–11) Longitude 094 13 06 (12–18) Seq. No. 1 (19) Date M D Y 12 15 69 (20–25)

Sampling Depth 525 (26–29) Type 1 (30) Kx10⁶ 920 (31–35) pH 6.9 (36–38) Temp. °F (39–41)

SiO_2 8.4 (42–44) Ca 120. (45–49) Mg 32. (50–53) Na 45. (54–58) K 10. (59–61)

HCO_3 461 (62–65) CO_3 0 (66 67) SO_4 140. (68–72) Cl 3. (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F .6 (26–28) NO_3 .5 (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe .64 (42–45)

Mn .05 (46–49) Cu (50–52) Pb (53 54) Zn (55–57)

Solids Determined 557 (58–63) Calc. (64–69) Hardness Ca,Mg 430 (70–73) Non-Carb. 52 (74–77)

Color (78 79) No. R (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ 378 (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. S (80)

Recorded by: D. AARONSON

Punched by: T Date:

Published:

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Local Well No. 097-29W-24CDDD
Aquifer Code(s) D2MC O2MG
Owner's Name BURT TOWN #2 (1937)
W Number 0616

Water Quality
(ppm)

Card Q

State: IOWA (19) County: KOSSUTH (55) Town: BURT, IOWA

Well No. Latitude 43 11 50 N (5–11) Longitude 094 13 06 (12–18) Seq. No. 1 (19) Date M D Y 03 17 59 (20–25)

Sampling Depth 525 (26–29) Type 1 (30) Kx10^6 840 (31–35) pH 7.4 (36–38) Temp. °F 50 (39–41)

SiO_2 9.4 (42–44) Ca 103. (45–49) Mg 42. (50–53) Na 36. (54–58) K 1 0. (59–61)

HCO_3 461 (62–65) CO_3 0 (66 67) SO_4 141. (68–72) Cl 2. (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F .8 (26–28) NO_3 .9 (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe .92 (42–45)

Mn .05 (46–49) Cu (50–52) Pb (53 54) Zn (55–57)

Solids Determined 529 (58–63) Calc. (64–69) Hardness Ca,Mg 431 (70–73) Non-Carb. 53 (74–77)

Color (78 79) No. R (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ 378 (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. S (80)

Recorded by: D. AARONSON

Punched by: T Date:

Published:

Kossuth

Name of Well -- City Well, Burt, Iowa

Location --

Static Water Level --

Contractor -- McCutcheon Well Company

Description

	Feet	Total
Soil	3	3
Gray drift	109	112
Muddy sand	11	123
Sandy drift	43	166
Sand and broken lime	16	182
Firm limestone	21	203
Limestone- bands of shale	23	226
Shale	64	290
Limestone	12	302
Limestone and streaks of shale	4	306
Limestone various colors	219	525

Water at 360 to 390 and 480 to 525 feet
Static level 25 feet below curb
Test 175 g. p. m. at 76 feet
225 g. p. m. at 115 feet
10" casing set at 186 feet
8" casing set at 296-6 12 feet lap and lead seal from the 8" to 10" casing

IOWA GEOLOGICAL SURVEY
Well Log Record No. _____

County: Kossuth

Name of Well: Town Well No. 2 Town: Burt

Location: SE¼, SE¼, SW¼ Sec. 24 T. 97 N., R. 29 E. W. Burt Twp.

Curb Elevation: 1178 Ft. Present Depth 225 Ft. Final Depth - Ft.

Static Level: (Depth to Water (Above) (Below) Curb) _____ Ft. Pumping Level _____ Ft.

Contractor: McCutcheon Well Co., Des Moines Date Drilled: Aug. Sept. 1937

Description*	FEET Thick	FEET From	FEET To

Description*	FEET Thick	FEET From	FEET To

*Abbreviate descriptions; use one line for each formation.

Remarks on water zones and casing: 10" casing to 186'6" driven into rock. Water in sand below 135', static level 40', could not be bailed down. Water from this horizen said to be contaminated.

Temperature: Air ____ °F.; Water ____ °F., at ____ (A.M.) (P.M.) 193_

Record obtained from Carpenter, driller Recorded by H. G. Hershey
Sept. 5, 1937

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IOWA GEOLOGICAL SURVEY
Well Log Record

No. _____

County: Kossuth

Name of Well: Burt City Well No. 2 Town: Burt

Location: SW¼ Sec. 24 T. 97 N., R. 29 W. E. Burt Twp.

Curb Elevation: 1178 Ft. Present Depth 225 Ft. Final Depth — Ft.

Static Level: (Depth to Water (Above) (Below) Curb) _____ Ft. Pumping Level — Ft.

Contractor: McCutcheon Well Co, Des Moines Date Drilled: started Aug 1937

Description*	FEET Thick	FEET From	FEET To
Black topsoil	3	0	3
Yellow clay, silty, sandy, little grav. calc.	10	3	13
B. gray clay v. silty, calc., less sdy + grav. than usual.	37	13	50
Gray silt & clay calc similar to 13-50 but with more fine mat. less sd & grav.	20	50	70
Gray silt sd & clay Similar to 13-50 more coarse material.	15	70	95
Drab sd + little clay mxd. calc	25	95	120
Shale gray non-calc looks like clay cretac sh few grav & frags (?)	5'	120	125
Buff sand & clay mix, numerous calc frags fine with little clay	10	125	135
Gray sand + little clay med calc frags	5	135	140
Sand buff fine to coarse	5	140	145
" " coarse	5	145	150
Shale? gray non-calc, sand cave (clay?)	10	145	155
Sand-buff med. coarse no: calc	5	155	160
Shale? lt. gray, non-calc (clay?) sd. cave	bit	160	165
Sd. grav. shale variable in size + comp		160	165
Sd - similar to 145-150 (cave)			
Gravel chiefly gry chert ang to sub ang.		165	170
Sd & gravel ang to sub rd - (All light) pred.		170	180
Sd & fine gravel qtz rcht. (Rounded) light colored, gry to white coarse		180	190
Too much cave for determination			

Description*	FEET Thick	FEET From	FEET To
Unox. Unleach drift with more sd & silt than usual with less clay.			
Undoubtedly glacial			
Looks like dakota for most part			
Looks like Dakota ss (no calc)			
Would not stand up. Water flown. Drilled like Gravel. Little chance for cave because for cave			
Resembles cretaceous			
Numerous samples (5) show			
maybe Undoubtedly glacial			
Driller says rock at 185			

Surface Water @ < 25'

40' Static Level.

*Abbreviate descriptions; use one line for each formation.

Remarks on water zones and casing: 10" casing to 186'6" driven 18" into rock.

Temperature: Air ____ °F.; Water ____ °F., at ____ (A.M.) (P.M.) 193_

Record obtained from _____ Recorded by _____

IOWA GEOLOGICAL SURVEY
Well Log Record

John Bison No.

E. of Algona on Rd to Wesley
1 mi N side of Road big white Building — evergreens.

County:

Name of Well: Town:

Location: Sec. T. N. R. E. W. Twp.

Curb Elevation: Ft. Present Depth Ft. Final Depth Ft.

Static level: (Depth to Water (Above / Below) Curb) Ft. Pumping Level Ft.

Contractor: Date Drilled:

Description*	Thick	From	To
Probably cherty, chiefly cave.	185	190	
chiefly cave with some siltstone? lithic powder	190	195	
siltstone, drab. much cave Much powder.	195	200	
ligt gry + yw sh + siltstone mixed Much powder. some sh + sh	200	205	
chiefly white + gry chert much powder	205	210	
chiefly white + brown chert lagg powder	210	215	
chiefly white & brown chert lithic powder	215	220	
Chiefly white & brown chert lithic powder	220	225	

Cut hard as well.

(223 ft cut easier

No. 1.

James Lee, of Burt original, Dec 1915

514.

Static 20'

80 gpm. (1' dd)

35' bottom pump no tail.

Single acting Meyers (6" dia cylinder

8" casing at surface.

*Abbreviate descriptions; use one line for each formation.

Remarks on water zones and casing:

Temperature: Air °F.; Water °F., at (P.M.) (A.M.) 193

Record obtained from Recorded by

IOWA GEOLOGICAL SURVEY
Well Log Record No. _____

County: Kossuth

Name of Well: Town Well No 2 Town: Burt

Location: SE¼ SE¼ SW¼ Sec. 24 T. 97 N., R. 29 ~~E.~~ W. Burt Twp.

Curb Elevation: 1178 Ft. Present Depth 365 Ft. Final Depth — Ft.

Static Level: (Depth to Water (Above) (Below) Curb) 35 Ft. Pumping Level — Ft.

Contractor: McCutcheon Well Co, Des Moines Date Drilled: Aug.-Sept. 1937

Description*	FEET Thick	FEET From	FEET To	Description*	FEET Thick	FEET From	FEET To
Orange, blue, red & y/lw. shale, rk. bds.	70	226	296				
Mixed broken rock	6	296	302				
Blue shale & rock bands	3	302	305				
Blue-gray ls. harder at 325	27	305	332				
Lt. blue gray sh. & ls. bands	2	332	334				
Blue limestone & shale bands	10	334	344				
Gray & white ls.	14	344	358				
Gray ls. & shale bands	3	358	361				
Light & dark gray limestone		361					

*Abbreviate descriptions; use one line for each formation.

Remarks on water zones and casing: 192'4" of 10" extra heavy black casing +3½' to 186'6" 187'2" of 8" extra heavy black casing from 168'10" to 296'. Water level appears to be a little higher each day.

Temperature: Air ____ °F.; Water ____ °F., at ____ (A.M.) (P.M.) 193_

Record obtained from E.E. Koster, driller Recorded by H.G. Hershey
Sept. 23, 1937

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

Name of Well Burt City Well No. 2 Survey No. W-0616

Location SE/c SE SW sec. 24, T. 97 N., R. 29 W. Kossuth County

Drilled by McCutcheon, 1937

Total Depth 525 ft. Curb Elevation 1178 ft. Static Level 35 ft.

Pumping Test ____Hours____Min; Gal. per min. _____Drawdown_____ft. in___min.

Casing Data 192'4" of 10" extra heavy black casing +3½ to 186'6"

127'2" of 8" extra heavy black casing from 168'10" to 296'

Description of Formations

No.	Rock Unit	Thick.	From (feet)	To
	PLEISTOCENE SYSTEM			
1.	Soil, black silty, slightly calcareous, with much included medium to coarse angular quartz	3	0	3
2.	Clay, light olive drab, slightly calcareous, grading downward to very calcareous at base, few coarse to medium sand grains, dark igneous, quartz, and dolomite pebbles included	10	3	13
3.	Clay, light yellowish gray, calcareous, soft, with igneous, chert and dolomite pebbles, and trace hard rounded silty shale grains included	7	13	20
4.	Clay, light brownish gray, calcareous, silty, with traces of igneous, chert, and dolomite pebbles and few traces shale as in 7 to 13 feet	75	20	95
5.	Clay as in 20 to 95 feet, with 20% sand, coarse to medium, angular to subangular, polished and frosted in part, igneous, limestone and dolomite grains	15	95	110
6.	Sand, major grade coarse, with much medium and minor amount granules and pebbles, angular to subangular, slightly frosted, well polished in part, silty, dirty	10	110	120

Notes:

Survey No. W-0616

No.	Rock Unit	Description	Thick	From	To
	CRETACEOUS SYSTEM Dakota formation				
7.		Shale, light medium gray streaked red in part, very silty with large mica flakes, noncalcareous. Sandstone 20%, medium reddish brown (siderite cemented), very fine-grained, mostly quartz	5	120	125
8.		Sandstone, fine- to medium-grained with trace very coarse-grained at the base, angular to subangular, very little frosting or polishing, loose, dirty, mostly quartz	15	125	140
9.		Sandstone, clear to light yellow, orange, and pink, very coarse-grained to granules, angular to subangular, polished, loose, clean. Siderite trace, massive	12	140	152
10.		Shale, light medium gray, noncalcareous, nonfissile, abundant large mica flakes	3	152	155
11.		Sandstone, transparent slightly tinted yellow and pink, major grade coarse, well sorted, angular, polished, clean, quartz	5	155	160
12.		Sandstone, varicolored, very coarse-grained, largely pebbles, angular, polished, mostly free, with trace cemented by siderite consisting of quartz, igneous, and chert granules and pebbles	20	160	180
13.		Chert 70% grading downward to 30%, varicolored, dull to chalcedonic, dense, in broken pieces (pebble fragments ?). Quartz sand, very coarse with few pebbles, as in 160-to 180 feet	35	180	215
14.		Sandstone 55%, granules, angular, polished, quartz with chert 40%, light creamy drab, subvitreous, conchoidal, slightly translucent. Siderite, 5% massive	5	215	220
15.		Chert 60%, powdered and in broken fragments. Sandstone 40%, free, very coarse to granules, angular, as in 215 to 220 feet, mostly medium-grained sandstone cemented by siderite	10	220	230
16.		Sandstone, light yellow, very fine-grained, silty, soft, friable	1	230	231
17.		Shale, light brownish red streaked and mottled with small amount light bluish green, lavender and maroon, noncalcareous, nonfissile. Trace iron concretions; trace of sand and chert	24	231	255
18.		Shale, light yellowish brown mottled olive green and blue green, ferruginous, noncalcareous, nonfissile, with traces chert, sand, and iron concretion fragments. Dolomite 10% 285 to 295 feet, light greenish gray, few black fossil specks, fine-grained, soft, porous	40	255	295

Survey No. W-0616

No.	Rock Unit	Description	Thick	From	To
	DEVONIAN SYSTEM				
		Wapsipinicon (?) formation			
19.		Dolomite, light medium gray, fine-grained, granular, very argillaceous and silty, with 10% shale 310 to 315 feet, light greenish gray, slightly dolomitic, massive, soft	25	295	320
20.		Limestone 70% to 40%, light-medium brown mottled gray, medium- to coarse-grained, dense, translucent. Dolomite 30% to 60%, light gray and cream, fine-grained granular, dense, slightly argillaceous and silty	10	320	330
	ORDOVICIAN SYSTEM				
		Maquoketa (?) formation			
21.		Shale, light gray, dolomitic, soft, grading into 15% dolomite, light gray, very fine-grained, soft, dense, slightly argillaceous	5	330	335
22.		Dolomite 80%, light drabish gray, fine-grained, dense, very argillaceous and silty. Dolomite 20%, dark gray, coarse-grained, dense, translucent	5	335	340
23.		Limestone 60%, very light drabish gray, very fine- to coarse-grained, dense, subtranslucent. Dolomite 40%, light drab, very fine-grained, dense	5	340	345
24.		Dolomite, pale drab, fine- to trace coarse-grained, subtranslucent, medium hard, dense	10	345	355
25.		Limestone, very light drab mottled dark gray, medium- to coarse-grained, dense, medium hard, subtranslucent	10	355	365
26.		Dolomite 60% to 85%, very light brownish drab and gray, medium-grained, dense, hard with 10% to 35% limestone as in 355 to 365 feet, and 5% to 15% chert, very light to light gray, vitreous, conchoidal, subtranslucent	20	365	385
27.		Dolomite, very light creamy drab, fine- to medium-grained, granular, hard, slightly weathered in part. Chert 30% 395 to 400 feet, 5% in remainder, light gray, vitreous, conchoidal, subtranslucent	20	385	405
		Galena formation			
28.		Dolomite, pale to very light creamy drab, fine- to mostly medium-grained, porous, granular, crinoid stems embedded and free. Chert trace, as in 385 to 405 feet	35	405	440
29.		Dolomite, light brownish drab, medium-grained, slightly porous, hard, subtranslucent, granular	55	440	495
30.		Dolomite, light to light medium drab, slightly mottled brown in part, medium-grained, dense to porous, granular, subsaccharoidal	20	495	515

Survey No. W-0616

No.	Rock Unit	Description	Thick	From	To
31.		Dolomite, very light to light cream and brown, fine- to mostly medium-grained, porous, subsaccharoidal	10	515	525
Total Depth					525

Notes on Burt City Well No. 2
Kossuth Co.
Survey No. W-0616

Sample intervals are maximum 5 feet, with numerous double samples for certain intervals. In all such instances, the most compatible sample was plotted.

The Pleistocene samples of this well correspond closely with those of the Rake City Well, Winnebago County. The samples show rounded fragments of the same type of silty shale, and there is a bed of rounded glacial gravel and sand, 20 feet thick, underlying it.

Cretaceous. In addition to the quartz gravel and sand of typical Dakota there is a large percentage of chert, which generally occurs in angular pieces, but some grains show rounding and weathering. Apparently, the gravels of this range consist largely of chert pebbles and granules which were crushed and broken by the drill. In the varicolored shale underlying these gravels are fragments of what appears to be iron concretions, but which might as readily be cinders or other extraneous material.

Devonian. Below the shale is a dolomite sequence which is undoubtedly Devonian, and which has the appearance of the samples directly overlying the limestone marker at approximately 300 feet in most Mason City Wells. It is a silty, argillaceous dolomite of relatively uniform texture and color, and is underlain by a thin limestone which is believed to be equivalent to the above mentioned limestone in Cerro Gordo County.

Maquoketa. The material directly underlying the limestone appears, in the first sample, to be largely dolomitic shale underlain by a series of dolomite with limestone partings and minor amounts of chert which does not particularly resemble the Ft. Atkinson chert of Cerro Gordo County.

Galena. The top of the Galena is drawn in the middle of an indivisible lithologic unit on the basis of crinoid stems ("doughnut type"), which are believed to characterize the Galena.

IOWA GEOLOGICAL SURVEY coded 5/4/76 mundt

Well or Water Sample Date Bottle No. G-4

TOWN: Burt COUNTY Kossuth

LOCATION: SE¼ SE¼ SW¼ Sec. 24 T. 97 N., R. 29 W. (E.) Burt Twp.

OWNER OF WELL: Town of Burt Well. No. 2

USE OF WATER: City Supply (×); Private-Domestic ( ); Public Drinking ( ) Livestock ( ); Industrial ( ); School Supply ( ); Cooling or Air Conditioning ( ); _____ ( ).

CONSTRUCTION OF WELL: Drilled (×); Gravel-Pack type ( ); Driven ( ); Dug ( ); Bored ( ); _____ ( ).

CONTRACTOR: McCutcheon Well Co, Des Moines DATE DRILLED: 1937

CASING OR CURBING DATA: (Show by diagram on opposite side of sheet the length and depth of top and bottom of each size of pipe, the amount of overlaps, position of seals or packers, pipe perforation and screens, etc.) 192'4" of 10" extra heavy black casing from surface to 192'4" 127'2" of 8" extra heavy black casing from 168'10" to 296' (?)

WELL DATA:

Curb Elevation 1178 Ft. Present Depth — Ft. Final Depth 525½ Ft.

Topographic Position of Well: Upland.

Static Level (Depth to Water (~~Above~~ Below) Curb) -25 Ft. Pumping Level 76 Ft.

Amount of Drawdown 51 ft. pumping at 177 g.p.m. in 3 hours 0 minutes. Calculated gals. per ft. drawdown 3½ g.p.m.

Capacity of well ____ g.p.m. at ____ ft. drawdown.

Type of Pump Turbine. Power Electricity.

Depth of Bottom of Pump 75' ft. with 0 ft. of suction pipe.

TEMPERATURE: Air 49¾°F.; Water 50 °F., measured at end of 4" discharge 12' from pump Time 11:45 (A.M.) (~~P.M.~~)

SOURCE OF WATER: Recent (Type and Depth) _____

Glacial Formations (Type) _____ at ____ ft. to ____ ft.

Limestone or Dolomite (Age) ~~Devonian~~ Maquoketa - Galena at ____ ft. to 525½ ft.

Sandstone (Age) _____ at ____ ft. to ____ ft.

Principal Producing Formation Cedar Valley Limestone

REMARKS: _____

Sample taken for: Mineral Analysis (×); Sanitary Analysis ( ).

Data Collected by H. G. Hershey; Date Oct. 28, 1937.

Report Analysis to A. C. Tester, Iowa Geological Survey, Iowa City.

Abbreviated Driller's Log

Supplied by E. F. Kester, Driller for McCutcheon,
City Well at Burt, Kossouth County

	Thickness	From	To	
Black top soil	3	0	3	
Blue clay	2	3	5	
Blue clay and sandy drift	5	5	10	
Yellow clay and sandy drift	3	10	13	
Gray sandy drift	12	13	25	
Gray drift (with sand and gravel), soft	87	25	112	
Sand, soft	11	112	123	
Sand, harder than above, with broken rock and shale bands	3	123	126	
White, sugary sand	18	126	144	
Gray, coarse sand (petrified wood at 151')	9	144	153	
Sandy, gray shale	7	153	160	
Gray shale and broken rock	6	160	166	
Sand and rock (coarse sand at 170')	8	166	174	
Pea gravel and coarse sand	8	174	182	
Fine gravel with sand and broken rock (hard at 186')(?)	3	182	185	
Rock cutting and fine sand	18	185	203	
White, soapy shale and limestone	6	203	209	
Brown limestone; hard, broken rock	14	209	223	
Oolitic limestone	3	223	226	
Orange shale	24	226	250	P.D.

Hotel Hanford
Mason City, Iowa
September 28, 1937

MEMORANDUM

TO: Dr. A. C. Tester

FROM: H. G. Hershey

SUBJECT: New town well at Burt, Kossuth County.

Your memorandum of September 27, regarding casing in the above well, was received today. If the opportunity presents itself, I will recommend to the water superintendent at Burt that the well be cased below the present bottom of the 8-inch casing at 296 feet to a solid limestone formation.

Until now I have neglected to acknowledge receiving your memorandum of September 20 which concerned the drillers notes on the Burt well. I will return the notes to Mr. Kester at the first opportunity.

Word reached me through Mr. Carpenter, who is now working for Mr. Sharff, that the drill stem had broken off in the Burt well. No further details were available.

September 27, 1937

MEMORANDUM

TO: H. G. Hershey, Hotel Hanford, Mason City.

FROM: A. C. Tester

SUBJECT: New well at Burt, Kossuth County

Thank you for the information relating to this project. If the opportunity presents itself, I suggest that you recommend to the water superintendent at Burt that the well be cased below the present bottom of the 8-inch casing at 296 feet to a solid limestone formation. The exact depth at which the bottom of the casing should be set may not be predictable at this time, although I believe the rock below 361 feet is the Cedar Valley and should not contain shale of caving qualities.

Dictated September 25.

Hotel Hanford
Mason City, Iowa
September 23, 1937

MEMORANDUM

TO: Dr. A. C. Tester

FROM: H. G. Hershey

SUBJECT: New town well at Burt, Kossuth County.

The above well was visited today and the results obtained appear on the attached well log record. I also have a complete set of samples for each 5-foot interval between 225-365 feet.

Under the present plans, no additional casing is to be placed in the hole and the water superintendant voiced his concern that the shales below the bottom of the 8-inch casing were not to be cased off. He believes that caving of these shales caused trouble in the old well several years ago. The driller, however, is of the opinion that the shales in question will not cave.

Mr. Kester, the driller in charge at Burt, informed me that the McCutcheon Well Company is drilling a new well at the State park near Hampton and that the same company has been awarded the contract for a new town well at Pocahontas, Pocahontas County. He reported further that contracts had been let for wells at Cherokee and Aurelia, Cherokee County.

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September 20, 1937

MEMORANDUM

TO: H. G. Hershey, Hotel Hanford, Mason City.

FROM: A. C. Tester

SUBJECT: New well at Burt, Kossuth County.

Enclosed find the notebook memorandum sheets sent you by Mr. Kester, the driller for McCutcheon at the new well at Burt. These can be returned to Mr. Kester at your convenience. Copies have been made for our record in this office.

AT

Kester does not want this material

Data supplied by
E. F. Kester, driller for the Cutchon
of City well at Burt -

10" Casing (top length first in hole)
1 drive shoe

First joint (at bottom of string)	21' 6"
	21' 8"
	21' 1"
	21'
	20' 11"
	20' 3"
	19' 1"
	18' 1"
	11'
	10' 8"
	7' 1"
	(40" = 3' 4")
Total 10" casing in hole	189' 40" = 192' 4" + drive shoe and threads of 1' 5" (6" + 11" = 17")
	193' 9" = bottom of 10" casing.

8" casing

Top	19' 4"
	19' 9"
	19' 3"
	19' 1"
	19' 3"
	95' 20" = 96' 8" + 4" (threads) = 97' 0"

Drillers log
See attached sheet.

Butt Casing 10"

(5)

21' 6"	1 Drive Shoe	
21' 8"		43' 2"
21' 1		64' 3"
21'		85' 2"
20' 11"		106' 2"
20' 3		126' 5"
19' 1		145' 6"
18' 1		163' 7"
11		174' 7"
10' 8		185' 3"
7' 1		192' 4"

Set at 186.6 ft

Bent 8" Casing

19' 4"	
19' 9	39' 1"
19' 3	58' 4"
19' 1	77' 5"
19' 3	96' 8"

(270) Set.

Burt Log.

0-3 Blacktop Soil

3-5 Blue Clay

5-10 Blue Gray Sandy Drift

10-13 yellow Sandy Drift

13-25 Gray Sandy Drift

25-112 Gray Drift (Sand Gravel Soft

112-123 Sand (Soft)

123-126 Sand (Hard Hard and Broken Rock & Shale Bands)

126-144 White Sugar Sand 151 Petrified wood

144-153 Gray Course Sand

153-160 Sandy Gray Shale

160-166 Gray Shale & Broken Rock

166-174 Sand & Rock. 170 Course Sand.

174-182 Pea Gravel & Course Sand

182-185 Fine Gravel Hard at 186 Sand & Broken Rock

185-203 Rock Cutting & Lime Sand

203-209 White Soapy Shale Lime Stone

209 - 223 Brown Limestone / Hard Broken Rock

223 - 226 Oolitic Limestone

226 - Orange Cretaceous Shale.

250 at present.

Bent Iowa
Sept. 8 1937

Dr. H. L. Hershey
Mason City, Ia.

Dear Sir:- I understand you were here Saturday just after I left. We were having a shakedown in which Mac. left Owen go. I am mailing you this log as far as we are at present, (250 ft) would like to see you. I will be here until Sat. noon and then again Monday. We have 187 ft 10" casing in set at 186'.6". Have 96'8" 8" Casing will set at approx. 270' with Lead packer on it. See you this week hope. Regt.

E H Kester
Bent Iowa.

(6)

Brut Iowa
Sept 19, 1937

Mr. H. G. Hughey
Mason City Ia.

Dear Mr Hughey; I am sending you a revised log of the well here. 192'4 of 10" casing set at 186'6" with 10" Drive Shoe on same and 127'2" of 8" casing set at 296 ft with 17'6" Lap. This 8" previous was sent you at 96'8" The change on this came as we had Shale to 296 ft which kept coming in. We were all week getting things in shape here The Hole is 305 ft at present. Mr carpenter failed to give me this log that you gave him. See you Soon.

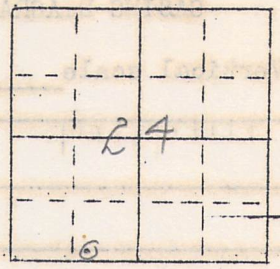
Respt.
C H Kester.

7½' Burt Quad
431152 0941315-01
097-29W-24 CDCC
1980 field located by D. Karsten

IOWA GEOLOGICAL SURVEY W-0616

In Cooperation with U. S. Geological Survey

RECORD OF WELL



Location:

Town: BURT (N E / S W): County Kossuth ~~E~~

SW-SE-SW sec. 21 T 97 N., R. 29 W. Burt Twp.

Well name and number BURT TOWN Well #2

Owner _____ Address _____

Tenant _____ Address _____

Contractor McCutcheon Well Co Address Des Moines

Drillers C. F. Kester

Drilling dates August - Sept 1937

Well data:

Elevations: Drilling curb 1178 feet; Land surface 1178 feet

Determined by _____

Topographic position Upland

Total depth: Reported 525½ feet, Measured _____ feet

Drilling method cable tool

Hole and casing data 192'4" of 10" casing set at 186.6'

127'2" of 8" casing set at 296

Original depth to water 25 ft. above / below _____ Date _____

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

Sources of water: Principal Devonian (Cedar Valley); Others _____

Production data: Date

Static depth to water 25 Measuring point

Pumping level 76 at 177 g.p.m.

115 225

Specific capacity 3½ g.p.m. per ft. drawdown; Temperature 50 °F.

Pump data: Type pump TURBINE Column Dia. Length 75'

Cylinder or bowls: Dia. Length Suction pipe 0

Power Electricity Airline

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

Use of water City supply

WATER ANALYSES (in parts per million)

Date samples	Oct. 28, 1937			
Sampled by	H. G. Hershey			
Total solids	552.0			
Insoluble matter	12.5			
Alkalinity (Meo)	356.0			
Alkalinity (Phn)	0.0			
pH	6.9			
$Fe_2O_3 + Mn_2O_3 + Al_2O_3$	3.0			
Alkali as sodium	47.2			
Calcium	96.1			
Magnesium	34.2			
Iron (unfiltered)	0.9			
Manganese	0.04			
Nitrate	0.89			
Fluoride	trace			
Chloride	9.0			
Sulfate	122.0			
Bicarbonate	434.3			
Hardness (ppm)	382.0			
Hardness (gpg)	22.3			

Remarks

Laboratory data: Sample storage location

Sample range 0-525 No. spls. 105 No. dupls. & cond. 119 grs

Spls. prepared by Washed range by

Driller's log and cond.

Insoluble residues: Prepared by Studied by Strip log

Microscopic study Gulf + JBC strip log 6-10-42 JBC

Gen. log yes Correl. by J. B. CARRIER

Burt - Kossuth Co.

12

Sept. 11, 1925

Hon. John Martin, Mayor,
Burt, Iowa

My dear Sir:

As Dean Kay is out of the city at time of receipt of your letter, I am forwarding a copy of same to Dr. W. H. Norton, Mount Vernon, Iowa, who has charge of the division of Underground Waters for the Iowa Geological Survey. I am sure he will give you the advice you seek.

Yours sincerely,

LCA

Secretary

JOHN MARTIN, MAYOR
H. A. THOMPSON, CLERK

COUNCIL
B. W. BROOKE
LLOYD ELSTON
THOMAS HAWCOTT
W. A. PETERS
G. J. F. VOGEL

13

Town Of Burt

Kossuth County

BURT, IOWA

Sept. 9th 1925.

Mr. George F. Kay, State Geologist,

Iowa City,

Iowa.

Dear Sir;-

I wish to intrude upon your time for a few minutes to get your ppinion on the following proposition. We have a city well here which is 514 ft. deep. It is cased with 8 in. pipe for 185 ft. down from the surface. At this point it is reduced to a 6 in. hole to the bottom in which is about 60 or 70 ft. of 6 in. pipe. From the 185 ft. level down it is supposed to be rock.

The well was dug in 1916. The water level is 24 ft. from the surface. We think the pumping level is 15 or 20 ft. lower. We have a 5 3/4 inch cylinder and run our pump from 34 to 38 strokes to the minute. About a year ago the well began to pump a very fine quantity of mud or sand. We have lined 185 ft. from the surface without any results. When the pump is started the water is clear for 2 minutes and 30 sec. then the mud or sand appears. And it does this invariably. The column of water in the well is about 480 ft. at all times. The pump throws 2 1/2 gal. per stroke. The question is could the mud or shale raise from the bottom of the well in 2 min. and 30 sec? I figure the upward pressure is about 200 lbs. to the square inch at the bottom. We are not agreed as to what point the shale comes in. With your probable experience you could give us an opinion as to whether it could raise from the bottom in the two and one half minutes as stated.

Thanking you. We would appreciate an early reply,

Respectfully,

John Martin

Mayor.

14

Burt

(Copy)

TOWN OF BURT

Kossuth County

Burt, Iowa

Sept. 9th, 1925

Mr. George F. Kay,
State Geologist
Iowa City

5-14 22 49

Dear Sir:

I wish to intrude upon your time for a few minutes to get your opinion on the following proposition. We have a city well here which is 514 ft. deep. It is cased with 8 in. pipe for 185 ft. down from the surface. At this point it is reduced to a 6 in. hole to the bottom in which is about 60 or 70 ft. of 6 in. pipe. From the 185 ft. level down it is supposed to be rock.

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Respectfully,

John Martin, Mayor.

Mr bison reports that he placed a seal between the 8 and 6" casing to stop a sand ~~leak~~ but it was ~~th~~ ineffective. He then put in a 7" I.J liner which rests on the seal and 4½" ~~tie~~ liner which hangs on the seal. However, he could not remember how much casing was put in the hole.

The ~~town of Burt~~ new Clerk at Burt says that Mr Bison has all the records of the well. Mr. Bison says the town has them

He reports that ~~each~~ he put two cup shaped leather collars on each length of 4½ in pipe which fitted the 6" pipe snugly. This was done to prevent sand ~~being drawn~~ passing down between the 6" and 4" and then being carried up the 4".

G-54

Burt Kossuth

SE¼, SE¼, SW¼ 24 97 29 Burt

Town of Burt Well # 1

James Lee, Burt Dec. 1985

8" casing

1178 — 514

Upland plain

SWL 20 PWL 21

Drawdown → 1 @ 80 GPM

Meyers single acting (6" dia. Diesel engine

depth to bottom of pump 35 suction pipe 0

temp. air, 83 water 50¼ °F pump after water had

passed through 4½' of 3" pipe & 26" of ½" pipe after well had pumped 4 hrs. at 80 gpm. 12:01

Devonian (?)

[*Information from C.H. Schrader) Water Supt.]

[John Bison, Algo

H. G. Hershey Sept. 5

7

Hotel Hanford
Mason City, Iowa
September 16, 1937

MEMORANDUM

TO: Dr. A. C. Tester

FROM: H. G. Hershey

SUBJECT: Well being drilled at Burt, Kossuth County.

Information has reached me through Mr. Sharff that they have a flat hole at Burt. Mr. McCutcheon borrowed some equipment from Mr. Sharff yesterday to overcome the difficulty.

As suggested in your memorandum of September 15, I will write to Mr. Kester, the driller at Burt, requesting information on current developments and visit the well at the most advantageous time.

I will appreciate your sending the material pertaining to casing and drillers log on the Burt well. I presume that Mr. Kester wants his notes returned, although as you know, he did not say so in his letter.

8

September 15, 1937

MEMORANDUM

TO: H. G. Hershey, Hotel Hanford, Mason City

FROM: A. C. Tester

SUBJECT: Well being drilled at Burt, Kossuth County.

With reference to your memorandum of September 12, will say that it appears desirable for you to write to Kester, the driller, at Burt asking for current information on the project at Burt. If the well has reached an important stage, you might find it desirable to visit the sight, examine the samples, and collect the sample material that is available. In other words, if the project is at a stage where you feel the travel will benefit the Geological Survey in information and prestige, then I would work the trip into your Mason City program to the best advantage.

Do you want the notes relating to casing and driller's log returned? If so, I will make copies and return the original material to you or to Mr. Kester, as the needs may be.

9

Hotel Hanford
Mason City, Iowa
September 12, 1937

MEMORANDUM

TO: Dr. A. C. Tester

FROM: H. G. Hershey

SUBJECT: New town well at Burt, Kossuth County

The attached letter and notes were received on September 10. I answered the letter saying that it would be impossible for me to leave Mason City at the present time. I also thanked Mr. Kester for the notes and log. Would you suggest that I ~~that I~~ go to Burt? It would mean about 130 miles of travel.

The "Owen" referred to in the letter is, I believe, Owen Carpenter, who was in charge at Burt at the time of my last visit.

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Algona, Iowa
September 5, 1937

MEMORANDUM

TO: Dr. A. C. Tester

FROM: H. G. Hershey

SUBJECT: New town well at Burt, Kossuth County

Attached is a well log record sheet on the above well, which is now under construction. One of the drillers had gone to Des Moines and taken the log with him. I have all samples collected to date.

Mr. Carpenter, the driller in charge, reports that hard rock was first encountered at 185 feet, and that the casing was driven 1.5 feet into it. He adds that the material above the rock would not stand up and, in drilling, reacted exactly like sand and gravel. However, the samples below 125 feet are not characteristically glacial material. I went over all of the samples, but feel that before any final decision is made they should be studied under microscope.

I stopped at Burt last night on the way to Algona, but it was too dark to do any work, so I returned and spent this morning going over the samlpes, talking to the driller and water superintenadat, and taking a sample from the old well for mineral analysis.

This afternoon almost two hours were spent talking to Mr. John Bison. The little information obtained from him appears on the data sheet.

In addition to the above work and the conference with Mr. Kelley at Algona, I visited the new Wesley town well. At the time I was there it was impossible to pump for more than about 20 minutes. Arrangements were made to pump for a longer period tomorrow, at which time a sample for mineral analysis will be obtained.