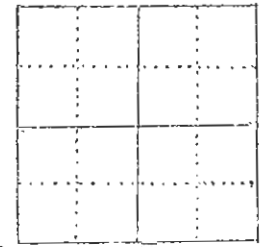


ICWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey
RECORD OF WELL



Location:

Town: LIDDENDALE (NE)
(SW) : County CARROLL
NWSEWSW sec ~~2~~ ³ ~~3~~ ³⁴⁻³⁵ ~~3~~ ⁸⁵ T. 84 N., R. 34 W. Twp.

Well name and number _____

Owner TOWN OF LIDDENDALE Address _____

Tenant MUNICIPAL WELL #2 Address _____

Contractor SUNBERG WELL CO. Address AUDUBON

Drillers _____

Drilling dates SEPT., 1956

Well data:

Altitudes: Drilling curb _____ feet; Land surface _____ feet

Determined by _____

Topographic position _____

Total depth: Reported ^{APP.} 240 feet, Measured _____ feet

Drilling method _____

Hole and casing data _____

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

Source of data _____

Sources of water: Principal _____

Others _____

Production Data

Date _____
 Static water level _____
 Measuring point _____
 Pumping water level _____
 Yield (g. p. m.) 30 GPM (BAILEY) - "VERY LITTLE DRAWDOWN" REPORTED
 Duration of pumping _____
 Specific capacity _____

Pump Data

Type pump _____ Column diameter and length _____
 Cylinder or bowls diameter and length _____
 Suction pipe _____ Airline _____
 Power _____ Production _____ g. p. m. for _____ hours per day
 Use of water _____

Dissolved constituents and properties (in parts per million except as indicated)

Date sampled _____
 Sampled by _____
 Silica (SiO₂) _____
 Iron (Fe) _____
 Manganese (Mn) _____
 Calcium (Ca) _____
 Magnesium (Mg) _____
 Potassium (K) _____
 Sodium (Na) _____
 Carbonate (CO₃) _____
 Bicarbonate (HCO₃) _____
 Sulfate (SO₄) _____
 Chloride (Cl) _____
 Fluoride (F) _____
 Nitrate (NO₃) _____
 Dissolved solids _____
 Hardness (as CaCO₃) _____
 Total _____
 Grains per gallon _____
 Noncarbonate _____
 Alkalinity (as CaCO₃) _____
 pH _____
 Specific conductance _____
 (micromhos at 25°C) _____
 Temperature (°F) _____
 Analysis No. _____

Laboratory Data

Well No. W 8006 Sample range 0-230 No. of samples 6
 No. of dupls. and cond. 46 Fair Washed range 170-230
 Samples prepared by Starland Date 9-25-56
 Logged by NORTHUP Date 10/15/56
 Correlations by _____ Date 10/15/56

UNITED STATES DEPARTMENT OF THE INTERIOR

Geological Survey
Water Resources Division

Local Well No. 085-34W-35000

Aquifer Code(s) K1D1

Water Quality
(ppm)

Owner's Name LIDDERDALE CITY #2 (1956)

W Number 08006

Card Q

State: Iowa 19 County: CARROLL 14 Town: LIDDERDALE, IOWA

Well No. Latitude 420733N Longitude 0944653 Seq. No. 1 Date 102159

Sampling Depth 240 Type 1 Kx10⁶ 670 pH 7.4 Temp. °F

SiO₂ 22 Ca 99 Mg 27 Na 9.5 K 3.4

HCO₃ 471 CO₃ 0 SO₄ 5.8 Cl 5 Source No. 3 Q

Card R

Duplicate Columns 1-25 from Card Q

F 4 NO₃ 9 PO₄ B Al Fe 10

Mn 37 Cu Pb Zn

Determined 338 Solids Calc. Ca, Mg 358 Hardness Non-Carb. 0

Color No. R

Card S

Duplicate Columns 1-25 from Card Q

Br I Alk. as CaCO₃ 386 Free CO₂ SAR

RSC ABS

Alpha (pc/l) Beta (pc/l) Ra (pc/l) U (ug/l)

No. S
80

Recorded by: D. AARONSON

Punched by: _____ Date: _____

Published: _____

UNITED STATES DEPARTMENT OF THE INTERIOR

Geological Survey
Water Resources Division

Local Well No. 085-34W-35CCC

Aquifer Code(s) K1D1

Water Quality
(ppm)

Owner's Name LIDDERDALE CITY #2 (1956)

W Number 08006

Card Q

State: Iowa 19 County: CARROLL 114 Town: LIDDERDALE, IOWA

Well No. 420733N 0944653 Seq. No. 1 Date 092756

Sampling Depth 240 Type 1 Kx10⁶ 680 pH 74 Temp. °F

SiO₂ 20. Ca 99. Mg 27. Na 11. K 40.

HCO₃ 442 CO₃ 0 SO₄ 11. Cl 30. Source No. 3 Q

Card R

Duplicate Columns 1-25 from Card Q

F 3 NO₃ 40 PO₄ B Al Fe 11.

Mn 47 Cu Pb Zn

Determined 417 Solids Calc. Ca, Mg 358 Hardness Non-Carb. 0

Color No. R

Card S

Duplicate Columns 1-25 from Card Q

Br I Alk. as CaCO₃ 362 Free CO₂ SAR

RSC ABS

Alpha (pc/l) Beta (pc/l) Ra (pc/l) U (ug/l)

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. 085-34W-35CCC

Aquifer Code(s) K1D1

Water Quality
(ppm)

Owner's Name LIDDELDALE CITY #2 (1956)

W Number 08006

Card Q

State: Iowa 1 9 County: CARROLL 1 4 Town: LIDDELDALE, IOWA

Well No. 420733N 0944653 Seq. No. 1 Date 100769

Sampling Depth 240 Type 1 Kx10⁸ 690 pH 70 Temp. °F

SiO₂ 25 Ca 100 Mg 34 Na 96 K 40

HCO₃ 459 CO₃ 0 SO₄ 48 Cl 5 Source No. 3 Q

Card R

Duplicate Columns 1-25 from Card Q

F 4 NO₃ 18 PO₄ B Al Fe 29

Mn 46 Cu Pb Zn

Solids Hardness 390 Non-Carb. 12

Determined 388 Calc. Ca, Mg 390

Color No. R

Card S

Duplicate Columns 1-25 from Card Q

Br I Alk. as CaCO₃ 378 Free CO₂ SAR

RSC ABS

Alpha (pc/l) Beta (pc/l) Ra (pc/l) U (ug/l)

No. S
80

Recorded by: D. AARONSON

Punched by: Date:

Published:

UNITED STATES DEPARTMENT OF THE INTERIOR
 Geological Survey
 Water Resources Division

085-34W-35CCC
 KIDI
 LIDDERDALE CITY #2 (1956)
 08006

Water Quality
 (ppm)

Card Q

State: IOWA 1 6 County: CARROLL 1 4 Town: LIDDERDALE, IA

Well No. 4 2 0 7 3 3 N 0 9 4 4 6 5 3 Seq. No. 1 Date 0 8 1 9 6 5

Sampling Depth 2 4 0 Type 1 Kx10³ 7 0 2 pH 7 4 Temp. °F 5 4

SiO₂ 2 3 Ca 1 0 0 Mg 2 7 Na 1 0 K 2 9

HCO₃ 4 5 9 CO₃ 0 SO₄ 8 0 Cl 5 Source No. 3 Q

Card R

Duplicate Columns 1-25 from Card Q

F 3 NO₃ 1 PO₄ 1 B 1 Al 1 Fe 1 3

Mn 4 1 Cu 1 Pb 1 Zn 1

Determined 4 0 7 Solids Calc. 1 Ca, Mg 3 6 0 Hardness Non-Carb. 0

Color 1 No. R

Card S

Duplicate Columns 1-25 from Card Q

Br 1 I 1 Alk. as CaCO₃ 3 7 6 Free CO₂ 1 SAR 1

RSC 1 ABS 1 1 1

Alpha (pc/l) 1 Beta (pc/l) 1 Ra (pc/l) 1 U (ug/l) 1

Verified PMJ No. S
 80

Recorded by: D. HARRISON

Punched by: [Signature] Date: _____

Published: _____

085-344-35666

WD Exp. (GX)
Aug. 1964

verified (PMJ)

Punched ERG

U. S. DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

Record by DAARONSON Source of data FILE Date 5/2/66 County MY
 State INDIANA County (or town) CARROLL Map 1:63,360
 Latitude: 420733N Longitude: 0944653W
 Sectional number: 7
 Township: 28S Range: 34E Sec: 5
 Well number: 08534W35CCC Other number: W-8006
 Local name: 0806 Name of owner: OWN OF LIDDERDALE 2
 Address of name: LIDDERDALE IQWA
 Name of county: CLAY (S) (M)
 Ownership: County, Fed Gov't, (P) (S) (M) State Agency, Water Dist.
 Use of well: (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V)
 (A) Air cond., (B) Comb., (C) Dewatering, (D) Fire, (E) Ind., (F) Stock, (G) Instif., (H) Unused
 Use of well: (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V)
 (A) Anode, (B) Drin., (C) Seismic, (D) Oil-gas, (E) Recharge, (F) Spring, (G) Test, (H) Unused, (I) Withflow, (N) Waste, (S) Destroyed
 DATA AVAILABLE: Well data: 4 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50)
 Hyd. data: COMPLETE (M) Field aquifer char. N
 Qual. water data: COMPLETE (M) (U) (S) (T) (U) (V) (W) (X) (Y) (Z)
 Freq. sampling: INTERMITTENT (9/27/56) Pumpage inventory: yes (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50)
 Aperture card: 6
 Log data: 08060157 106

SAME AS ON MASTER CARD
 Well number: 420733 Section: WESTERN
 PHYSIOGRAPHIC PROVINCE: CENTRAL LOWLAND
 DEATHLINE: 1.2 Subbasin: 25A
 LAKE: RACCOON (S) (T) (V) Top of well base: LEVEL AND
 MAJOR AQUIFER: CRESTALPOW COOR K1 (B) (S) (T) (V) Local base: flat surface, hilltop, hillside, terrace, valley flat,
 MINOR AQUIFER: FINE SANDSTONE 2Y ORIGIN: MARINE 6 JAKOTA SANDSTONE 81
 Lithology: 167 Depth to top of: 167 Aquifer thickness: 30
 MINOR AQUIFER: 167 Depth to top of: 167 Aquifer thickness: 30
 Lithology: SCREENED AT BOTTOM aquifer, formation, group: WELL CURTINGS
 Consolidated rock: 167 Depth to top of: 167 Thickness: 30
 Depth to basement: 167 Source of data: WELL CURTINGS
 Surface material: SANDY TILL Infiltration characteristics: POOR
 Coefficient of storage: 167 Coefficient of storage: 4
 Trans: 167 Trans: 4
 Form: 167 Spec cap: 4 Number of geologic cards: 30

WELL-DESCRIPTION CARD
 Same as on Master Card: 240 ft Depth well: 240 ft Accuracy: 6
 Casing type: JT 60 L Dia.: 6 In. Accuracy: 6
 Finish: CONCRETE, (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V)
 Method: AIR (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V)
 Drilled: PERCUSSION, (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V)
 Date drilled: 5/5/6 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50)
 Driller: SUNDELL WELL CO. Address: AUDUBON, IA.
 Well type: (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V) (W) (X) (Y) (Z)
 (A) Air, (B) bucket, (C) jet, (D) (cent.), (E) (turk.), (F) (mud), (G) (piston), (H) (rot.), (I) (sump), (N) (torb), (S) (other), (T) (shallow), (U) (deep), (V) (meter no.)
 Power: gasoline, (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V) (W) (X) (Y) (Z)
 (A) gas, (B) gasoline, (C) hand, (D) gas, (E) wind, (F) H.P., (G) L.S.D.
 Description: 1230 ft above/below MP: 1230 Accuracy: HAND LEVEL
 Alt. L.S.D.: 1230 Accuracy: HAND LEVEL
 Water level: 30 ft above/below MP: 30 Accuracy: 30
 Date measured: 5/4 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50)
 Brand: APPLE, (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V) (W) (X) (Y) (Z)
 (A) Apple, (B) B.P., (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V) (W) (X) (Y) (Z)
 Quality of water data: Iron 5, (A) (B) (C) (D) (E) (F) (G) (H) (I) (N) (S) (T) (U) (V) (W) (X) (Y) (Z)
 (A) Iron, (B) Manganese, (C) Chloride, (D) Sulfate, (E) Hardness, (F) Temperature, (G) Specific Conductivity, (H) Colored Solids, (I) Chloride, (N) Hardness, (S) Manganese, (T) Sulfate, (U) Temperature, (V) Specific Conductivity, (W) Colored Solids, (X) Chloride, (Y) Sulfate, (Z) Hardness
 Sp. Conduct.: 702 at 54 °F. Temp. 54 °F. Hard. 360 ppm. Sampled 8/10/65
 Date, color, etc. 8/10/65

CASING: 35
 CAGED ALL THE WAY WITH SCREEN ON BOTTOM.

GPO 184229

IOWA STATE DEPARTMENT OF HEALTH
DIVISION OF PUBLIC HEALTH ENGINEERING AND INDUSTRIAL HYGIENE

GROUND WATER

Town Lidderdale County CATFOLL Date February 12 19 57

WELL NO. ? Active Yes Standby _____ Abandoned _____ Replaced by No. _____

LOCATION: Street 25' N of the S line of Lot 12 Blk 17 & 43' E of E. line of Main St. E. of Sec. 34 T. 85 N.R. 34 BLK West

Lot 12 Block _____ Township _____
OWNERSHIP Municipal Date Installed Started Sept. 13 1956 Finished 17 1956

CONTRACTOR Sunberg Well Co. Address Audubon, Iowa

DATE RECONDITIONED None 19 _____ Contractor _____ Address _____

CONSTRUCTION EMPLOYED: 6" casing drilled to the 230' level. Lower 6' of casing perforated - gravel packed from 230' to approximately 160' - grouted from 6' to approx. 25' level. Top 6' of casing replaced with a 6" section having underground discharge for submersible pump.

CURB ELEVATION 1235 REFERENCE Sea level

TYPE OF CONSTRUCTION Deep well - drilled - gravel packed Depth 230 ft. Diameter 6 in.

CASING: Material New - black Condition New

SCREEN: Material Perforated casing Length 6 ft. Diameter 6 in. Slot Opening 1/4 in.

WELL SEALED Yes How Underground discharge section Approved Yes

WELL VENTED No How May later install one if necessary Approved Yes

TYPE OF PUMP Submersible Make Reda-underground discharge Capacity 25 GPM Lubricated Water

DEPTH TO Top of Pump 100 ft. 5' long Pump & motor sec. 5' long _____ ft.

PUMP CONTROL: Manual _____ Automatic Yes - soon Semi-Automatic _____

STATIC LEVEL 77 ft. Pumping Level 85 ft. Drawdown 8 ft.

OPTIMUM SPECIFIC YIELD 40 GPM Drawdown 13 ft. Time _____ hrs.

RATE OF DRAWDOWN slow Rate of Recovery fast

TEMPERATURE OF WATER ? °F Where Measured _____ Temp. of Atmosphere _____ °F

DRAWDOWN GAUGE INSTALLED No

TOPOGRAPHICAL POSITION OF WELL Flat

WELL SITE INVESTIGATED Yes Approved Yes Why not _____

WELL CONSTRUCTION REVIEWED Yes Approved Yes Why not _____

PER CONSTRUCTION: Purpose None Size and Description _____

CONDITION: _____ Drainage Facilities _____

PUMP INSTALLATION: Approved Yes Why Not _____

CUTTINGS FROM WELL PRESERVED: Yes Where Iowa Geological Survey

DEPTH TO BED ROCK 168 Depth to Water-bearing Stratum 160

SOURCE OF WATER: Principal Formation Sandstone 168-230 Other Sand & gravel 160 - 168

Mineral Analysis #491 Collected 9/27/56

Total Hardness 21.2-363 ppm. Total Iron 1.1 ppm. Sulfates 10.9 ppm. Fluorine 0.3 ppm.

Manganese 0.47 ppm. pH 7.1 CO₂ _____ ppm.

REMARKS: Well & connected piping disinfected Feb. 7, 1957 - 2 lbs. chlorine in well - 24 hrs. -

Top 6' of casing to be grouted when weather permits.

Lower 70' of casing gravel packed.

Sept. 25 to 28 pump test at 15 g/m - well cleared and remained clear even with surging.

Links pit toilet has conc. vault - others to be equipped with concrete vaults or removed.

GEOLOGICAL DATA			CASING DATA	WELL DATA	
Formation	Material and distance from surface in ft.	Strata	Position, kind and extent of casing, liners, shoes, etc.	Scale: Horizontal Vertical	Position of seals, screens, static level, etc.

FROM	TO	FORMATION
0	75	Drift
75	110	Sand & gravel
110	160	Drift
160	168	Sand & gravel
168	230	Sandstone

Removable piped lift inserting in top of discharge tee.

Taper in bottom part of adapter

