20388

MASTER CARD - A

9-26-69
RP 11-22-70

STATE	COUNTY	LATITUDE DEG	LATITUDE MIN	LATITUDE SEC	LAT N or S	LONGITUDE DEG	LONGITUDE MIN	LONGITUDE SEC	SEQ NO
1 2	3 4	5 6	7 8	9 10	11	12 13 14	15 16	17 18	19
19	01	41	30	15	N	094	39	13	2

WELL SCHEDULE

US GEOLOGICAL SURVEY

IOWA DISTRICT WRD

WELL NO 20388 CO ADAIR

OWNER ADAIR TOWN WELL (1968) ADDRESS ADAIR

DRILLER THORPE WELL CO DATE DRLD 10-1968

MAP

SOURCE OF DATA FILE

DESCRIPTION M.P LSD FEET (ABOVE) BELOW LSD

CONTINUED FROM ABOVE	ACCURACY	LOCAL WELL NUMBER T	R	E/W	SEC	QUARTERS	LOCAL USE W-NUMBER	LOCAL USE OPTIONAL	OWNER OR NAME	OWNERSHIP	WATER USE	WELL USE	WELL DATA	IF REQ. W/L	FIELD CHKR	I LAB	QW - DATA	QW - FREQ	PUMPAGE	APPURTENANCE	LOG DATA	CARD DESIG.
	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 51	52 53 54 55 56 57 58 59 60 61 62 63 64 65 66	67	68	69	70	71	72	73	74	75	76	77	78 79	80
		077	33	W	04	ABB	20388	1/68 TOWN	ADAIR	MP	W	I	Ø			C	I				G	A

WELL-DESCRIPTION CARD - B

DUPLICATE CARD A CC 1-19	DEPTH OF WELL	ACCURACY	DEPTH CASED OR FIRST PERF.	DIAM. INCHES	WELL FINISH METH DRILLED	YEAR DRILLED	PUMP SETTING	METH. LIFT	DEEP SHALLOW	POWER	ALTITUDE OF LSD (FEET)	ACCURACY	WATER LEVEL (FEET)	ACCURACY	DATE MONTH	DATE YEAR	YIELD OF WELL (GPM)	METH. DET	DRAW-DOWN (FEET)	ACCURACY	PUMPING PERIOD (HOURS)	QUALITY OF WATER IRON	SULF	CHLOR	HARD	SP. CONC	TEMP	DATE SAMPLED	CARD DESIG.
	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 51	52	53 54 55		56 57 58 59 60	61	62 63 64	65	66 67 68	69	70	71	72	73	74 75 76	77 78 79	80
	0720	3	2475	12	X	C 96	8				1391	7	590	D	0	68	240	3	45	3									B

HYDROGEOLOGIC CARD - C

DUPLICATE CARD A CC 1-19	PHYS-IOG-RAPHY PROV.	SEC.	DRAINAGE BASIN	SUBBASIN	TOPO SETTING	MAJOR AQUIFER SYSTEM	SERIES USGS	SERIES IGS	UNIT	LITH-OLOGY	ORIG	THICK-NESS	LENGTH WELL OPEN TO	DEPTH TO TOP OF	MINOR AQUIFER SYSTEM	SERIES USGS	SERIES IGS	UNIT	LITH-OLOGY	ORIG	THICK-NESS	LENGTH WELL OPEN TO	DEPTH TO TOP OF	DEPTH TO CONSOL-DATED ROCK	SOURCE	DEPTH TO BASEMENT	SOURCE	SURF MAT LITH-OLOGY	SURF MAT INF IL	CODE TRAN SIG FIG	CODE TRAN X10	CODE STOR SIG FIG	CODE STOR X10	GEOL CARD CARD DESIG.
	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	51 52 53		54 55 56	57 58 59	60 61 62 63	64	65 66 67 68	69	70 71	72	73 74	75	76 77	78 79	80
	12	E	35	D		C	3S	X	V	6	56		87	B26	Ø	1	LP	8	D6	20	812		B24	250	D				Q	2					C

CASING AND SCREEN (SIZE, TYPE, INTERVALS):

469' of 12" csg 0 - 469'
501' of 10" csg 440' - 941'
126' of 8" csg 1204' - 1330'
287' of 7" csg 1566' - 1853'
1182' of 8" csg 0 - 1182'
1295' of 5" csg 1180' - 2475'

8" AND 5" STRINGS CONNECTED WITH SWEDGE NIPPLE AND CEMENTED FROM TOP TO BOTTOM, USING 680 SACKS OF CEMENT.

CODED BY MACGOWAN DATE 7-13-72

PUNCHED BY MACGOWAN DATE 7-14-72

VERIFIED BY DATE

SKETCH ON REVERSE: YES NO

04

WELL ON 20388

Drilled for Town of Adair Adair, Iowa 50002

Well is located ½ miles N-E-S-W and 650Ft. ~~miles~~ N-E-S-W from North East Corner

in the ¼ ¼ Section 4 Township 77 Range 33, Adair County, Iowa

Drilling started April 11 19 68 Completed October 26 19 68

Well No. Kind of Well Water Well Depth 2723 Size hole started 24" in

Finish 5" G. P. M. 250 Static Head 590' Pumping level from surface 630

Water was first encountered at 2605' in Jordan Sand Approx. Amt. Temp. 78

Remarks Jordan from 2605' to 2660'

(GIVE DETAILS OF PERFORATED PIPE AND SEALS)

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
26"	7'	7'	0		20"	44'
12"	469'	469'	0		18"	93'
10"	501'	941'	440'		14"	227'
8"	126'	1330'	1204'			
8"	1182'	1182'	2' above floor-cut off at floor.			
5"	1295'	2475'	1182'	5" and 8" welded with swedge.		

Driller Albert Jackson From Surface to 2723 feet

Driller Willie Miller From 1045 feet to 2529 feet

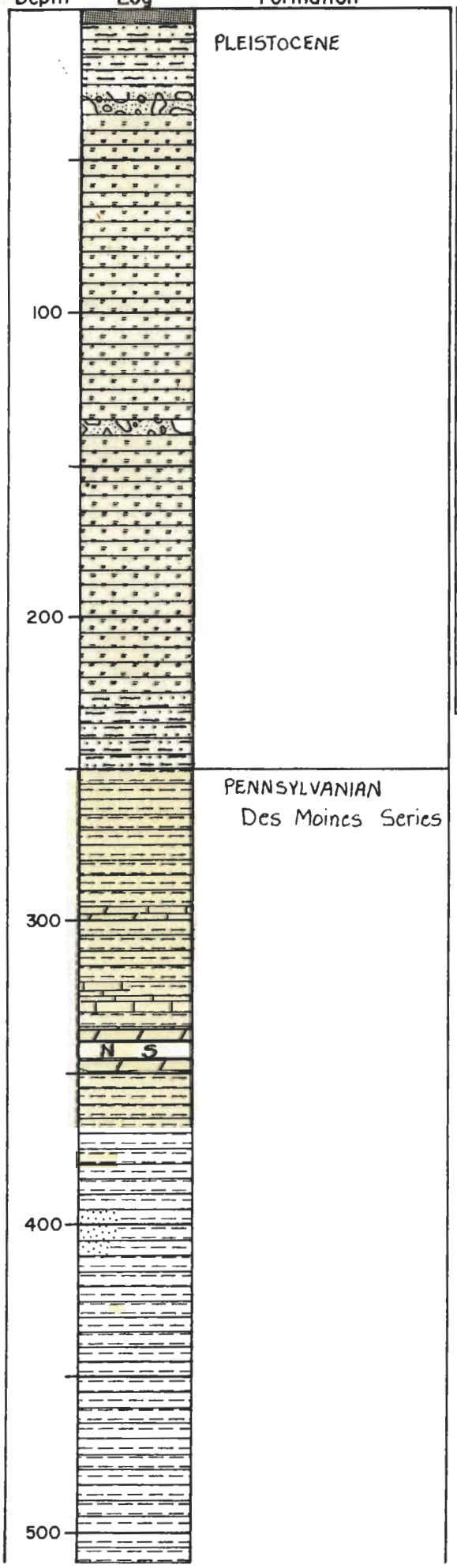
Driller Wes McCallie From 0 feet to 751 feet

AMOUNT IN FEET	KIND OF SOIL OR FORMATION (BE SPECIFIC)	TOTAL DEPTH FEET
7	Dark Soil	7
269	Dark Clay	276
91	Lime Shells and Shale	367
76	Shale	443
26	Lime	469
236	Blue and Black Shale - Some Lime Shells	705
38	Lime and Shale	743
20	Lime	763
49	Lime-Pirite and Shale	812
88	Lime	900
35	Green Shale	935
35	Brown Lime	970
7	Dark Shale	977
43	Lime - Brown and Gray	1020
4	Dark Shale	1024

LOG CONTINUED--Page

AMOUNT IN FEET	KIND OF SOIL OR FORMATION (BE SPECIFIC)	TOTAL DEPTH FEET
61	Lime-Gray	1185
25	Lime-Brown	1210
27	Lime-Gray	1237
8	Shale-Green	1245
10	LIme-Gray	1255
20	Shale-Lime Ledges	1275
17	Shale-Gray	1292
143	Lime-Gray	1435
30	Lime-Brown	1465
4	Shale-White	1469
167	Lime-Gray	1636
9	Shale-White	1645
140	LIme-Gray	1785
6	Shale-Green	1791
37	LIme-Brown	1828
5	Shale-Gray	1833
62	Lime-Gray	1895
30	Shale-Lime Shell	1925
5	Lime-Gray	1930
103	Shale-White	2033
39	Lime-Gray	2072
21	Lime And Chert	2093
97	LIme-Gray-Sharp	2190
30	Shale-Green	2220
122	Lime-Gray	2342
13	Lime-Brown	2355
45	St. Peter Sand	2400
24	LIme Gray	2448
12	Prairie du Chien Sand	2460
26	Lime-Gray	2486
4	Shale-White	2490
75	Lime-Gray	2565
26	Lime-Soft-Brown	2591
14	Lime-Gray	2605
55	Sand-White-Jordan	2660
29	Lime-Gray (Some Crevices from 2670 to 2680	2689
21	LIme-Black	2710
13	Red-Bed	2723

8" and 5" pipe cemented on outside from bottom to top solid with 680 sacks

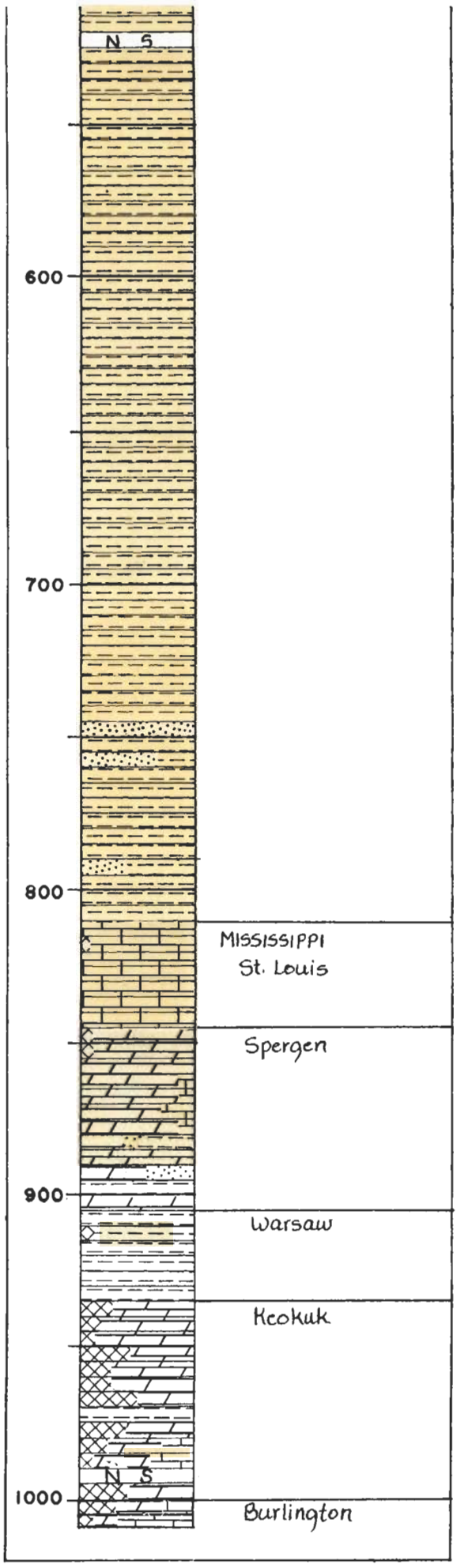


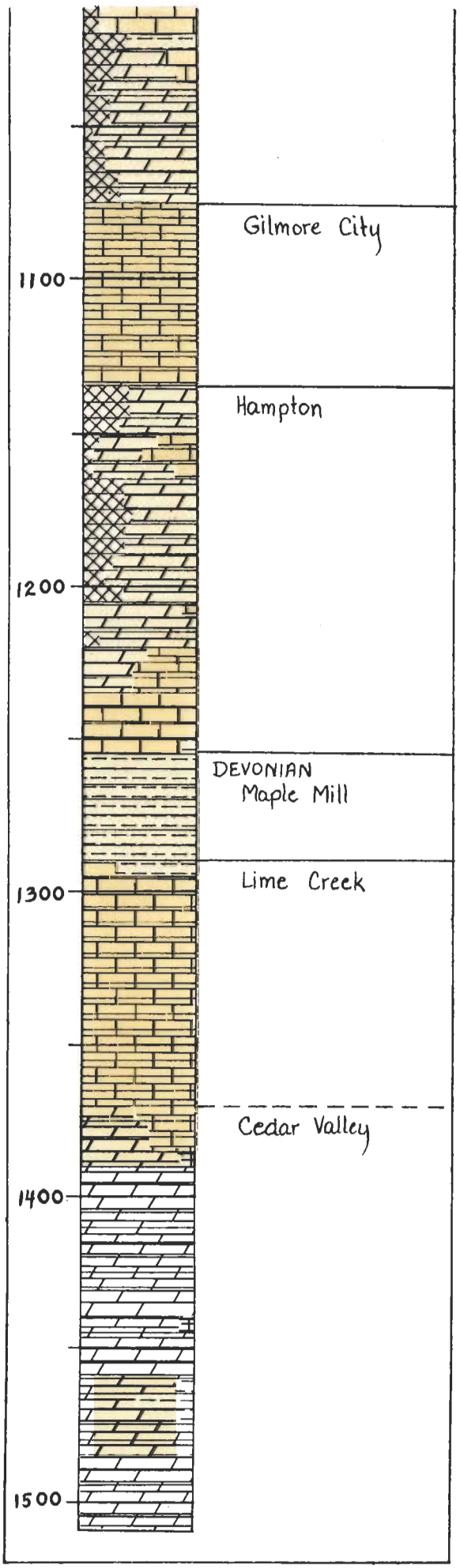
IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

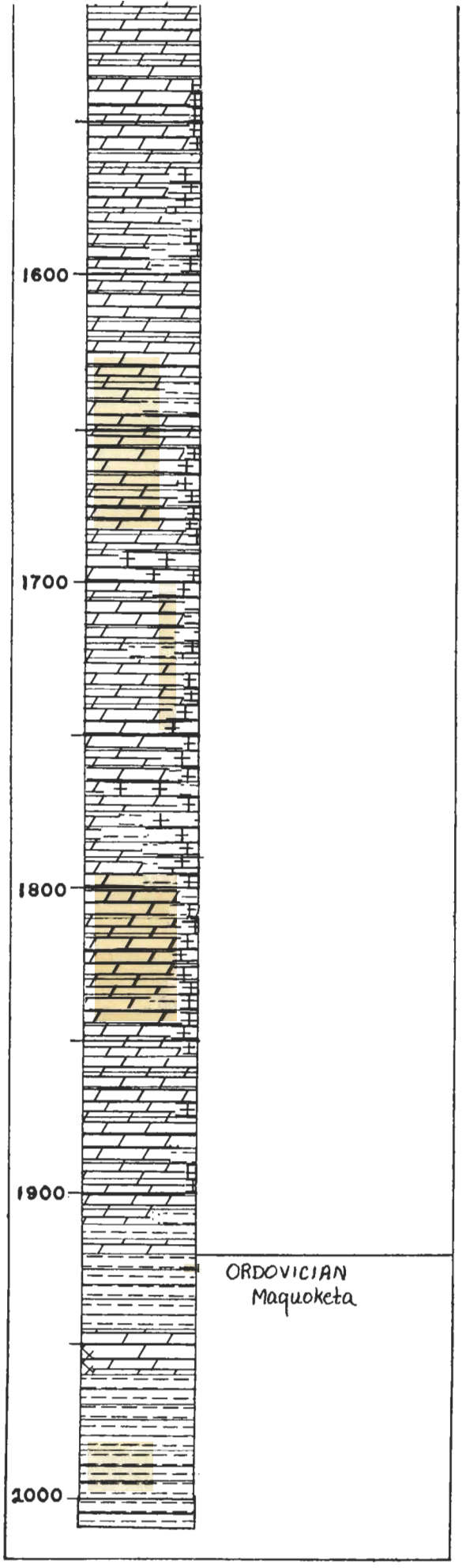
Name: ADAIR TOWN WELL (1968)	State: IOWA
Town: ADAIR — County: ADAIR	Loc.: NW NW NE
Contractor: THORPE WELL CO. — Driller:	Sec.: 4
Drilling Dates: APRIL 11, 1968 - October, 1968	T. N., R.: 77N. 33W.
Casing Record: 469' of 12" csg. 0-469'; 501' of 10" csg. 440'-941'; 126' of 8" csg. 1204'-1330'; 287' of 7" csg. 1566'-1853'; 1182' of 8" csg. 0-1182'; 1295' of 5" csg. 1180'-2475';	
S.W.L., G.P.M., D.D.,: 590' 125 176'	
AFTER ACIDIZING: 590' 240' 45'	
Remarks: 8" and 5" strings connected with swedge nipple and cemented from top to bottom, using 680' sacks cement.	Elev.: 1391'
	T.D.: 2720'
Logged By: NORTHUP 1968	I.G.S. No.: W-20388

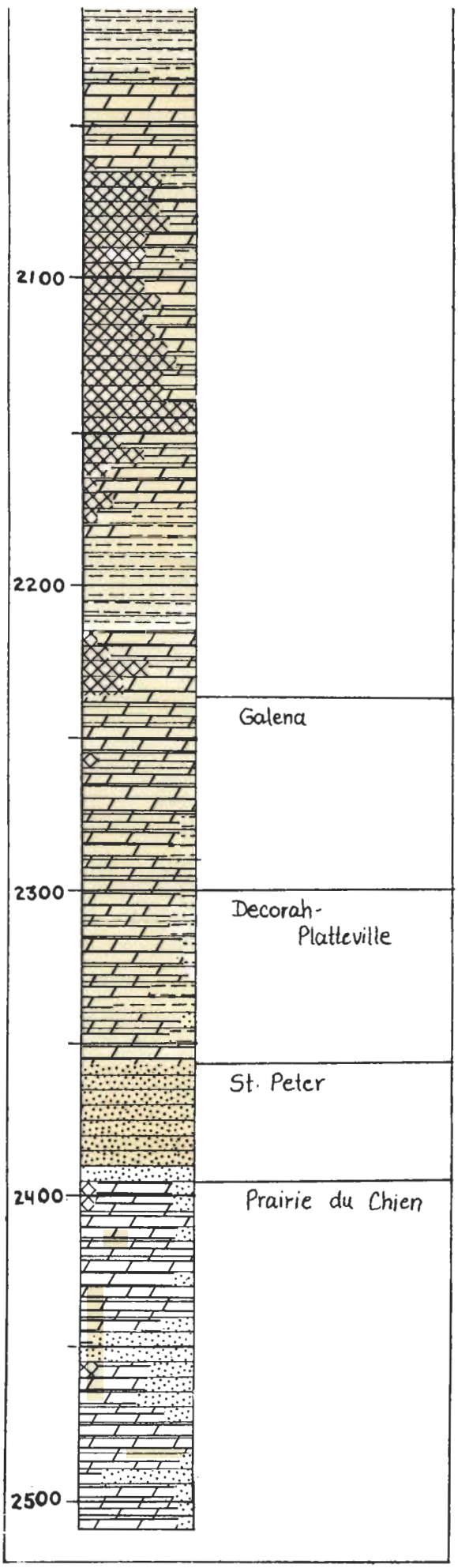
Explanation of Colors

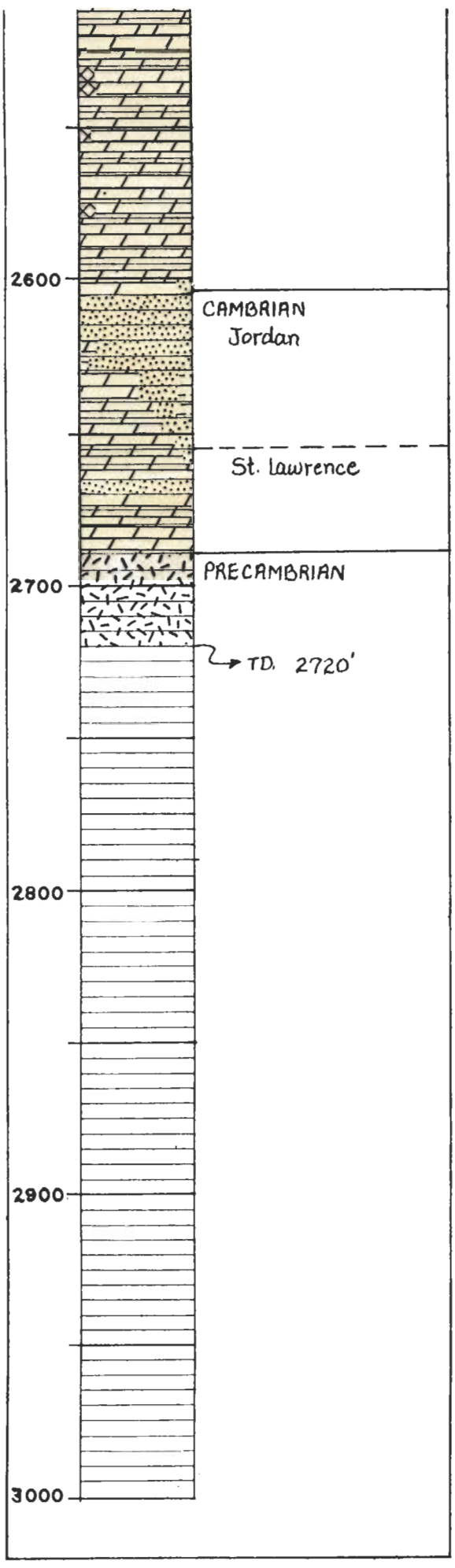
- Soil
- Loess, Silt or Siltstone
- Drift
- Sand & Gravel
- Shale
- Sandstone
- Limestone
- Dolomite
- Chert
- Gypsum or Anhydrite
- Precambrian
- N S No Samples


N S
600
700
800
MISSISSIPPI
St. Louis
Spergen
900
Warsaw
Keokuk
N S
1000
Burlington


Gilmore City
1100
Hampton
1200
DEVONIAN
Maple Mill
Lime Creek
1300
Cedar Valley
1400
1500


1600
1700
1800
1900
2000
ORDOVICIAN
Maquoketa


2100
2200
2300
2400
2500
Galena
Decorah-
Platteville
St. Peter
Prairie du Chien


2600
CAMBRIAN
Jordan
St. lawrence
PRECAMBRIAN
2700
TD. 2720'
2800
2900
3000

W-20388
077 33W 04 ABB
ADAIR TOWN WELL
(1968)

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Card Q

State: IOWA [19] (1–2) County: ADAIR [01] (3–4) Town: ADAIR

Well No. [4 1 3 0 1 5 N] Latitude (5–11) [0 9 4 3 9 1 3] Longitude (12–18) Seq. No. [2] (19) Date [1 0 2 4 6 8] M D Y (20–25)

Sampling Depth [ ] (26–29) Type [ ] (30) Kx10^6 [2700] (31–35) pH [7.7] (36–38) Temp. °F [ ] (39–41)

SiO_2 [12.] (42–44) Ca [176.] (45–49) Mg [61.] (50–53) Na [300.] (54–58) K [37.] (59–61)

HCO_3 [212] (62–65) CO_3 [0] (66–67) SO_4 [780.] (68–72) Cl [320.] (73–78) Source No. [3] (79) [Q] (80)

Card R

Duplicate Columns 1-25 from Card Q

F [3.1] (26–28) NO_3 [18.] (29–32) PO_4 [ ] (33–35) B [ ] (36–38) Al [ ] (39–41) Fe [1.5] (42–45)

Mn [0.05] (46–49) Cu [ ] (50–52) Pb [ ] (53–54) Zn [ ] (55–57)

Solids Determined [1870] (58–63) Calc. [ ] (64–69) Ca,Mg [690] (70–73) Hardness Non-Carb. [516] (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 $CaCO_3$ [171] (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: MACGOWAN Punched by: MACGOWAN Date: 7-14-72

Published:

W-20388
077 33W 04 ABB
ADAIR TOWN WELL
(1968)

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Card Q

State: IOWA (17) County: ADAIR (01) Town: ADAIR

Well No. Latitude 411015N (5–11) Longitude 0943913 (12–18) Seq. No. 2 (19) Date M 10 D 24 Y 68 (20–25)

Sampling Depth ____ (26–29) Type ____ (30) Kx10^6 2600 (31–35) pH 7.3 (36–38) Temp. °F ____ (39–41)

SiO_2 12. (42–44) Ca 176. (45–49) Mg 63. (50–53) Na 300. (54–58) K 37. (59–61)

HCO_3 215 (62–65) CO_3 0 (66–67) SO_4 760. (68–72) Cl 320. (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F 3.0 (26–28) NO_3 1.2 (29–32) PO_4 ____ (33–35) B ____ (36–38) Al ____ (39–41) Fe 1.4 (42–45)

Mn .015 (46–49) Cu ____ (50–52) Pb ____ (53–54) Zn ____ (55–57)

Solids Determined 1870 (58–63) Calc. ____ (64–69) Ca,Mg .101 (70–73) Hardness Non-Carb. 525 (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 $CaCO_3$ 176 (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: MACGOWAN

Punched by: MACGOWAN Date: 7-14-72

Published: ____

W-20388
077 33W 04 ABB
ADAIR TOWN WELL (1968)

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Card Q

State: IOWA (19) (1-2) County: ADAIR (01) (3-4) Town: ADAIR

Well No. (Latitude) 413015N (5-11) (Longitude) 0943913 (12-18) Seq. No. 2 (19) Date (M D Y) 01 13 69 (20-25)

Sampling Depth ____ (26-29) Type ____ (30) Kx10^6 2800 (31-35) pH 7.2 (36-38) Temp. °F ____ (39-41)

SiO_2 13. (42-44) Ca 200. (45-49) Mg 63. (50-53) Na 320. (54-58) K 4.0 (59-61)

HCO_3 232 (62-65) CO_3 0 (66-67) SO_4 760. (68-72) Cl 350. (73-78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F .30 (26-28) NO_3 3.5 (29-32) PO_4 ____ (33-35) B ____ (36-38) Al ____ (39-41) Fe 3.2 (42-45)

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

Solids Determined 1920 (58-63) Calc. ____ (64-69) Ca,Mg 760 (70-73) Hardness Non-Carb. 570 (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 $CaCO_3$ 190 (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: MACGOWAN

Punched by: MACGOWAN Date: 7-14-72

Published: ____

W-20388
077 33W 04 ABB
ADAIR TOWN WELL (1968)

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Card Q

State: IOWA (19) County: ADAIR (01) Town: ADAIR

Well No. Latitude 413015N (5–11) Longitude 0943913 (12–18) Seq. No. 2 (19) Date M D Y 05 26 69 (20–25)

Sampling Depth (26–29) Type (30) Kx10^6 2700 (31–35) pH 7.3 (36–38) Temp. °F (39–41)

SiO_2 13. (42–44) Ca 184. (45–49) Mg 58. (50–53) Na 330. (54–58) K 5.1 (59–61)

HCO_3 207 (62–65) CO_3 0 (66–67) SO_4 770. (68–72) Cl 320. (73–78) Source No. 3 Q (79–80)

Card R

Duplicate Columns 1-25 from Card Q

F 3.1 (26–28) NO_3 0.5 (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe .44 (42–45)

Mn .006 (46–49) Cu (50–52) Pb (53–54) Zn (55–57)

Solids Determined 1870 (58–63) Calc. (64–69) Hardness Ca,Mg 700 (70–73) Non-Carb. 530 (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 $CaCO_3$ 170 (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: MACGOWAN

Punched by: MACGOWAN Date: 7-14-72

Published:

WF 20388

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 2182
MINERAL NO. 7054
19 Nov 19 68 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Thorpe Well Company
DATE COLLECTED 24 Oct 68 DATE RECEIVED 1 Nov 68
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC., New Jordan well to be acidized by Thorpe Well Co.

WELL PUMPED ____ HRS. AT ____ GPM. DATE OF PREVIOUS SAMPLE ____
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Not stated
TEMPERATURE °C ____ ALKALINITY (ppm $CaCO_3$) P ____ T ____ pH ____
IS A POLYPHOSPHATE BEING USED? ____

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 260 x 10^{-5}. TURBIDITY ____
DISSOLVED SOLIDS 1870 SOLUBLE IRON (Fe) 1.4
TOTAL SOLIDS 1870 SILICA (SiO_2) 12 TOTAL IRON (Fe) 1.4
ALKALINITY (ppm $CaCO_3$) P None T 176 pH 7.35 DATE 1 Nov 68

POSITIVE IONS		NEGATIVE IONS	
K+	37	NO_3–	1.2
Na+	300	F–	3.0
Ca++	176	Cl–	320
Mg++	63.2	SO_4--	760
Mn++	< 0.05	HCO_3–	215
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 701 ppm 40.9 gpg

No turbidity observation by collector. Slightly cloudy with a few brown particles on receipt in laboratory. Extended time lapse between collection of sample and receipt in lab makes it improbable that a completely accurate mineral analysis could be obtained which would reflect the condition at time of sampling. This data is probably at best an approximation of the mineral quality of the sample at the time it was collected.

ANALYST Ryan, Pierson, Morlan
R. L. MORRIS
JHG PRINCIPAL CHEMIST

WR# 20388

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 2185
MINERAL NO. 7057
19 Nov 19 68 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Thorpe Well Co.
DATE COLLECTED 25 Oct 68 DATE RECEIVED 1 Nov 68
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
New Jordan well - after acidizing 9:50 pm to 10:30 pm

WELL PUMPED ____ HRS. AT ____ GPM. DATE OF PREVIOUS SAMPLE ____
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Not stated
TEMPERATURE °C ____ ALKALINITY (ppm $CaCO_3$) P ____ T ____ pH ____
IS A POLYPHOSPHATE BEING USED? ____

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 480 x 10^{-5}. TURBIDITY ____
DISSOLVED SOLIDS 3300 SOLUBLE IRON (Fe) 2.7 (on receipt in lab)
TOTAL SOLIDS 3300 SILICA (SiO_2) 12 TOTAL IRON (Fe) 7.4
ALKALINITY (ppm $CaCO_3$) P None T 258 pH 6.1 DATE 1 Nov 68

POSITIVE IONS		NEGATIVE IONS	
K^+	46	NO_3^-	0.6
Na^+	300	F^-	2.5
Ca^{++}	440	Cl^-	1100
Mg^{++}	180	SO_4^{--}	900
Mn^{++}	0.55	HCO_3^-	315
Al^{+++}		CO_3^{--}	None

HARDNESS AS $CaCO_3$ 1840 ppm 107 gpg

No turbidity observation by collector. Turbid and yellow-brown in color on receipt in lab. Filtered for mineral analysis. All determinations except total solids and total iron made on filtered sample. Ionic balance is beyond ~~the acceptable limit of error, probably with Cl, HCO_3 or SO_4 somewhat high, but because of reasons behind the sampling this is being reported for whatever value~~ might be derived from the data. DWE

ANALYST Ryan, Pierson, Morlan JHG R. L. MORRIS PRINCIPAL CHEMIST

WP# 20388

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 2188
MINERAL NO. 7060
19 Nov 19 68 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Thorpe Well Co.
DATE COLLECTED 26 Oct 68 DATE RECEIVED 1 Nov 68
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC., New Jordan well - after acidizing "last sample at end of test"

WELL PUMPED ____ HRS. AT ____ GPM. DATE OF PREVIOUS SAMPLE ____
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Not stated
TEMPERATURE °C ____ ALKALINITY (ppm $CaCO_3$) P ____ T ____ pH ____
IS A POLYPHOSPHATE BEING USED? ____

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 450 x 10^{-5}. TURBIDITY ____
DISSOLVED SOLIDS 3310 SOLUBLE IRON (Fe) 0.06 (on receipt in lab)
TOTAL SOLIDS 3340 SILICA (SiO_2) 12 TOTAL IRON (Fe) 7.8
ALKALINITY (ppm $CaCO_3$) P None T 254 pH 6.7 DATE 1 Nov 68

POSITIVE IONS		NEGATIVE IONS	
K+	44	NO_3–	0.4
Na+	300	F–	3.1
Ca++	440	Cl–	1100
Mg++	177	SO_4--	790
Mn++	0.60	HCO_3–	310
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 1830 ppm 107 gpg

No turbidity observation by collector. Cloudy with yellow-orange color and many small floating dark particles on receipt in lab. Filtered for mineral analysis. All determinations except total solids and total iron made on filtered sample.

ANALYST Ryan, Pierson, Morlan

R. L. MORRIS
JHG PRINCIPAL CHEMIST

Wtr 26389

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 2189
MINERAL NO. 7061
19 Nov 19 68 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Thorpe Well for IGS
DATE COLLECTED 24 Oct 68 DATE RECEIVED 1 Nov 68
REPORT TO: NAME IGS
ADDRESS Iowa City

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC., New Jordan Well

WELL PUMPED _____ HRS. AT _____ GPM. DATE OF PREVIOUS SAMPLE _____
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Not stated
TEMPERATURE °C _____ ALKALINITY (ppm $CaCO_3$) P _____ T _____ pH _____
IS A POLYPHOSPHATE BEING USED? _____

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 270 x 10^{-5}. TURBIDITY _____
DISSOLVED SOLIDS 1870 SOLUBLE IRON (Fe) 2.0
TOTAL SOLIDS 1870 SILICA (SiO_2) 12 TOTAL IRON (Fe) 2.0
ALKALINITY (ppm $CaCO_3$) P None T 174 pH 7.55 DATE 1 Nov 68

POSITIVE IONS		NEGATIVE IONS	
K+	37	NO_3–	1.8
Na+	300	F–	3.1
Ca++	176	Cl–	320
Mg++	60.8	SO_4--	770
Mn++	< 0.05	HCO_3–	212
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 690 ppm 40.3 gpg
Yellow in color on receipt in laboratory.

ANALYST Ryan, Pierson, Morlan

R. L. MORRIS
JHG PRINCIPAL CHEMIST

WH 20388

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 3377
MINERAL NO. 7134
Mar 11 19 69 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Marvin Tibben
DATE COLLECTED 13 Jan 69 DATE RECEIVED 14 Jan 69
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Jordan #3 2700' 1968

WELL PUMPED 200 HRS. AT 100 GPM. DATE OF PREVIOUS SAMPLE None
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °F 71 ALKALINITY (ppm $CaCO_3$) P ____ T ____ pH ____
IS A POLYPHOSPHATE BEING USED? No

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 280 x 10^{-5}. TURBIDITY ____
DISSOLVED SOLIDS 1920 SOLUBLE IRON (Fe) 3.2
TOTAL SOLIDS 1920 SILICA (SiO_2) 13 TOTAL IRON (Fe) 3.2
ALKALINITY (ppm $CaCO_3$) P None T 190 pH 7.2 DATE 14 Jan 69

POSITIVE IONS		NEGATIVE IONS	
K+	40	NO_3–	3.5
Na+	320	F–	3.0
Ca++	200	Cl–	350
Mg++	63.2	SO_4--	760
Mn++	< 0.05	HCO_3–	232
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 760 ppm 44.4 gpg
Yellow in color on receipt in laboratory.

ANALYST Ryan, Morlan

R. L. MORRIS
JHG PRINCIPAL CHEMIST

WH 20388

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 5380
MINERAL NO. 7341
23 Jun 19 69 bj

TOWN Adair COUNTY Adair
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Marvin Tibben
DATE COLLECTED 26 May 69 DATE RECEIVED 27 May 69
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC., Jordan Well #3 At well 2700' 1968

WELL PUMPED 10 HRS. AT 100 GPM. DATE OF PREVIOUS SAMPLE 19 Nov 68
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °C F 71 ALKALINITY (ppm $CaCO_3$) P ____ T ____ pH ____
IS A POLYPHOSPHATE BEING USED? No

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 270 x 10^{-5}. TURBIDITY ____
DISSOLVED SOLIDS 1870 SOLUBLE IRON (Fe) 4.4
TOTAL SOLIDS 1870 SILICA (SiO_2) 13 TOTAL IRON (Fe) 4.4
ALKALINITY (ppm $CaCO_3$) P None T 170 pH 7.3 DATE 27 May 69

POSITIVE IONS		NEGATIVE IONS	
K+	51	NO_3–	0.5
Na+	330	F–	3.1
Ca++	184	Cl–	320
Mg++	58.3	SO_4--	770
Mn++	0.06	HCO_3–	207
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 700 ppm 40.9 gpg

Slightly cloudy with yellow color

ANALYST Ryan, Wright

JHG

R. L. MORRIS
PRINCIPAL CHEMIST

Adair well folder
1968

August 28, 1968

Mr. Orian Atchison
Thorpe Well Company
Box 1376
Des Moines, Iowa

Dear Mr. Atchison:

Reference is made to the samples received from the Adair City Well (2,275-2,410 feet) and to our phone calls regarding same. This will verify that we have picked the top of the St. Peter at 2,355 feet and the Prairie du Chien at 2,395 feet.

As you have now penetrated 60 feet into the Prairie du Chien and as the shale section from 2,180 to 2,215 feet is open, it would seem advisable to set casing as soon as dolomite is reached again. The sandstone reported from 2,448 to 2,455 feet would probably not be as firm a setting for the pipe as the dolomite; and also there is the possibility that this high in the Prairie du Chien, it may be a crevice fill rather than a bedded sandstone. However, the upper Prairie du Chien (Willow River Member) is often quite sandy, in its own right, and we note that this was the case in the Stuart City well. In this case the Willow River had a total thickness of 115 feet, with the underlying Root Valley Member running 75 feet in thickness. We recommend too that casing be set before reaching the Root Valley, which could yield considerable good water. Also your driller, Mr. Jackson, reported no change in the static water level which he reports as having remained at approximately 300 feet since above the St. Peter; and it would seem best to get the casing set before any large surge of water might possibly loosen the open shale above 2,215 feet.

We trust that you will have a satisfactory casing and cement job on the Adair well. Please let us know if we can be of further service.

Very truly yours,

H. G. Hershey

RCN/t

GW Adair Town well (1968)
folder
Adair Co.

MEMO

September 30, 1968

TO: Dr. H. G. Hershey

FROM: Richard C. Northup

RE: Progress on Adair City Well

A trip was made to Adair on Thursday, September 26, to check and bring in the samples from the new City Well. Drilling has been very slow, making only ten to fifteen feet a day, but by Friday noon had reached a depth of 2665 feet. The samples show 50 feet of sandstone from 2605'-2655' and then dolomite again from 2655'-2665'. I am still not certain just where they are in the section, but the fifty feet of sandstone fits the expected thickness of the Root Valley rather than the Jordan, which normally would run around thirty to thirty five feet. The dolomite which was drilled in the last ten feet is cream to pink in color, fine to medium crystalline, and free of sand. This resembles the Oneota. However, the dolomite from 2395' to 2605' also looks like Oneota and this together with the thin galena and Decorah-Platteville section above the St. Peter leaves some room for doubt. They will drill ahead, and Mr. Atchison at Thorpe Well Company wants the driller to send us the samples every day or two until they are through so we can keep abreast. Should they be in the St. Lawrence, I would expect the samples to become increasingly glauconitic after a forty or fifty foot penetration. No glauconite occurs from 2655'-2665'.

IOWA GEOLOGICAL SURVEY

JAN 2 1 1969

6

NOTICE OF HEARING ON AN APPLICATION FOR A PERMIT TO WITHDRAW WATER IN ADAIR COUNTY, IOWA

Notice is hereby given that there is now on file in the Office of the Iowa Natural Resources Council, James Grimes Building, Des Moines, Iowa, an application from the Town of Adair, Iowa, for a permit to withdraw water from a new Jordan well on its land in the NW 1/4 of the NE 1/4 of Section 4, T77N, R33W, Adair County, Iowa, for municipal use within and without the corporate limits of said town.

Applicant requests a permit to withdraw water from the new well in the maximum quantity of 36,500,000 gallons per year at a maximum rate of 200 gallons per minute throughout each year in addition to the water obtained from its existing wells.

Notice is further given that a public hearing will be held at 9:30 A.M., on February 14, 1969, at the Adair County Courthouse, Greenfield, Iowa, at which time and place or at any adjournment, the Water Commissioner or his Deputy will take evidence by the applicant and any other person either in support of or in opposition to the granting of a permit.

#1-R-12-W-5023
1/16/69 mh

Louis F. Gieseke

Louis F. Gieseke
Deputy Water Commissioner

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IOWA GEOLOGICAL SURVEY

MAR 1 0 1969

STATE OF IOWA

OFFICE OF THE WATER COMMISSIONER

DETERMINATION ON APPLICATION: #1-R-12-W-5113

FROM: Town of Adair
Adair
Iowa 50002

Filed: March 5, 1969

Hearing held at Greenfield, Iowa, on February 14, 1969.

APPEARANCES:

For the applicant:
Town of Adair, Iowa

Marvin L. Tibben
Supterintendent of Public Works

Thorpe Well Company
Bill McKain, Representative
Box 1376
Des Moines, Iowa 50313

For the opponents:
None

File #5001

To the Iowa Natural Resources Council:

Pursuant to Chapter 455A, Iowa Code 1966, a public hearing on the application of the Town of Adair, Iowa, for a permit to withdraw water for municipal use was conducted, commencing at 9:30 A.M., on February 14, 1969, at the Adair County Courthouse, Greenfield, Iowa.

FINDINGS:

On the basis of the application, evidence presented at the hearing, and consideration of other pertinent factors, the following findings are made:

1. Applicant, Town of Adair, Iowa, has submitted an application for a permit to withdraw water for municipal use from a new Jordan well on its land in the NW 1/4 of the NE 1/4 of Section 4, T77N, R33W, Adair County, Iowa, in addition to the water obtained from its existing wells.

2. Applicant requests a permit to withdraw water from the new well in the maximum quantity of 36,500,000 gallons per year at a maximum rate of 200 gallons per minute (gpm) throughout each year for the maximum legal period of ten years.

3. Notice of the public hearing on this application was duly published on January 22 and 29, 1969, in the Adair County Free Press, a newspaper published at Greenfield, Iowa, and of general circulation in Adair County, Iowa.

4. Applicant is purportedly the titleholder of record of the land described herein.

5. Applicant town presently obtains its municipal water from three shallow wells and a Cedar Valley limestone well. The shallow wells were constructed during 1946 and are 48-inch wells about 30 feet deep. The Cedar Valley limestone well was constructed during 1941 and is a 6-inch well about 1750 feet deep. The shallow wells are often dry during the summer months when the demand for water is the highest and the water from the 1750-foot well is of poor quality. Said four wells will be maintained on a standby basis after the new well is placed in service. It is anticipated that the 1750-foot well may be used occassionally and the shallow wells will be used only rarely, if at all.

6. Applicant's new well was completed during December, 1968. It is a 6-inch well, 2723 feet deep, terminating just below the Jordan sandstone formation, its primary aquifer. Water is also obtained from the Prairie du Chien formation which was left open. The top 2475 feet are cased and cement grouted and the bottom 248-foot section is a 6-inch open hole. The well's normal static water level is about 500 feet. It had a drawdown of 63 feet during a 200-gpm pumping test and

25 feet during a 107-gpm pumping test. The normal withdrawal rate from this well will be about 100 gpm for several years and then may be increased to approximately 200 gpm. The well has been approved by the Iowa State Department of Health. It is anticipated that applicant's 1750-foot well and the new Jordan well may be pumped simultaneously during certain periods. The normal withdrawal rate from said 1750-foot well is 45 gpm. Any permit granted pursuant to this application should authorize a maximum withdrawal rate of 245 gpm.

7. The nearest wells utilizing the Jordan sandstone aquifer are about 20 miles from applicant town. It is anticipated that applicant's proposed use of water from its new Jordan well will have no material affect on any wells in the vicinity.

8. Applicant's present population is about 800 persons. Its projected 1980 population is about 1000. An increase in industrial use of water is anticipated. Applicant's present use of water is about 20,000,000 gallons per year. Its average day is about 55,000 gallons and its maximum day is approximately 63,000 gallons. The maximum day is limited to the capacity of the existing wells. The requested quantity of 36,500,000 gallons of water represents an average daily per capita use of 100 gallons for a population of 1000 persons. This appears to be a reasonable use of water for municipal purposes in the Town of Adair, Adair County, Iowa.

9. Existing water storage facilities in Adair consist of a 55,000-gallon elevated storage tank. No changes are anticipated in said storage facilities or in applicant's treatment facilities which consists primarily of iron removal. A master meter measures all water in the system as it enters the treatment plant. Applicant's reports of water used will be based on this master meter and will be submitted to the Office of the Water Commissioner quarterly.

10. Adair is served by a municipal sewage collector and treatment system that has been approved by the State Department of Health.

11. The ability and intent of the applicant to devote a reasonable quantity of water to a beneficial use seems evident. There is no evidence that the use of water pursuant to a permit granted in accordance with the conclusions contained herein (a) will constitute a waste of the water resources of the State, (b) will be incompatible with the state comprehensive plan for resources, (c) will impair the

effect of pollution control laws of this state or the navigability of any navigable watercourse, or (d) will be detrimental to the public interest or to the interests of property owners with prior or superior rights who might be affected.

12. The request for a permit is not contested.

CONCLUSIONS:

1. A permit should be granted to the Town of Adair, Iowa, to withdraw water for municipal use from three existing wells about 30 feet deep, one existing Cedar Valley limestone well about 1750 feet deep and a new Jordan sandstone well 2723 feet deep on its land in the NW 1/4 of the NE 1/4 of Section 4, T77N, R33W, Adair County, Iowa.

2. The permit should provide that:

   a. Permittee may withdraw only that quantity of water that can be used beneficially but not in excess of 36,500,000 gallons per year at a maximum rate of 245 gallons per minute throughout each year.

   b. Water withdrawn pursuant to this permit shall be used for municipal purposes within and without the corporate limits of said Town of Adair consistent with the municipal distribution system and other provisions of law.

   c. This permit will terminate on March 4, 1979.

   d. Permittee shall comply with all applicable provisions of State law and the rules and regulations of federal, state, and local health and water pollution control agencies in the construction and operation of said wells and in the disposal of wastes from said Town of Adair.

   e. Permittee shall maintain accurate and up-to-date records of water use, water levels, and pumping rates from said wells and shall furnish such records pursuant to direction of the Water Commissioner.

3. Permittee is advised that pursuant to Section 455A.29, Iowa Code 1966, the authority to withdraw water provided by this permit may be modified, cancelled, or suspended if the permitted withdrawals result in substantial injury to any private of public interests.

DETERMINATION:

A permit consistent with these findings and conclusions may properly be granted under the authority of the Water Commissioner of the State of Iowa.

Louis F. Gieseke

Louis F. Gieseke
Deputy Water Commissioner

Filed with the Iowa Natural Resources Council, James Grimes Building, Des Moines, Iowa, on March 5, 1969.