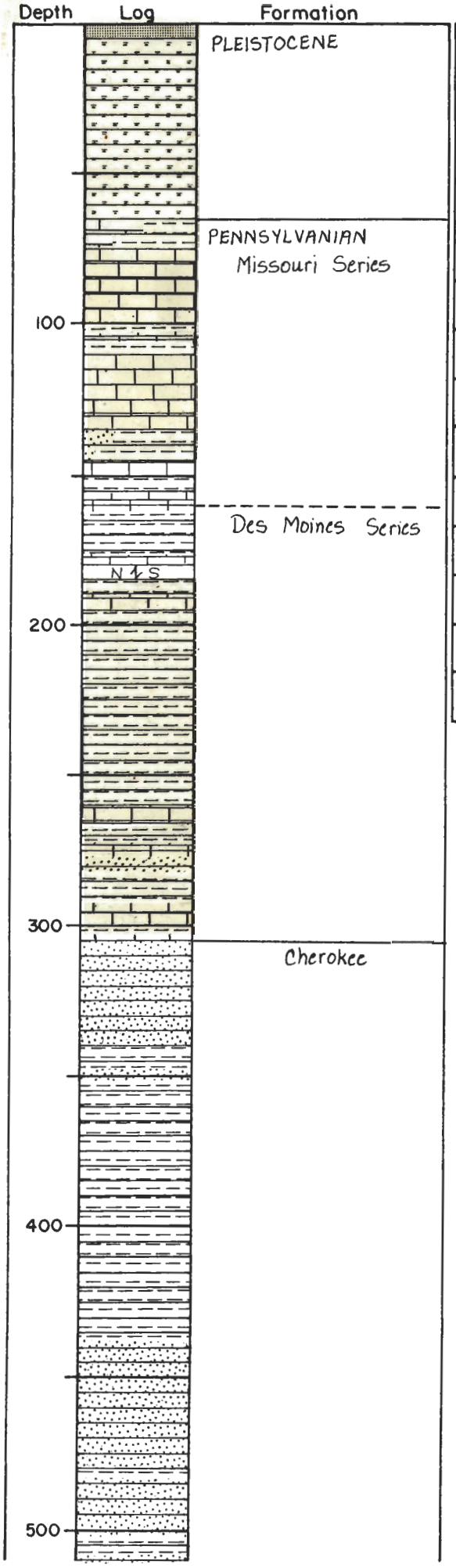
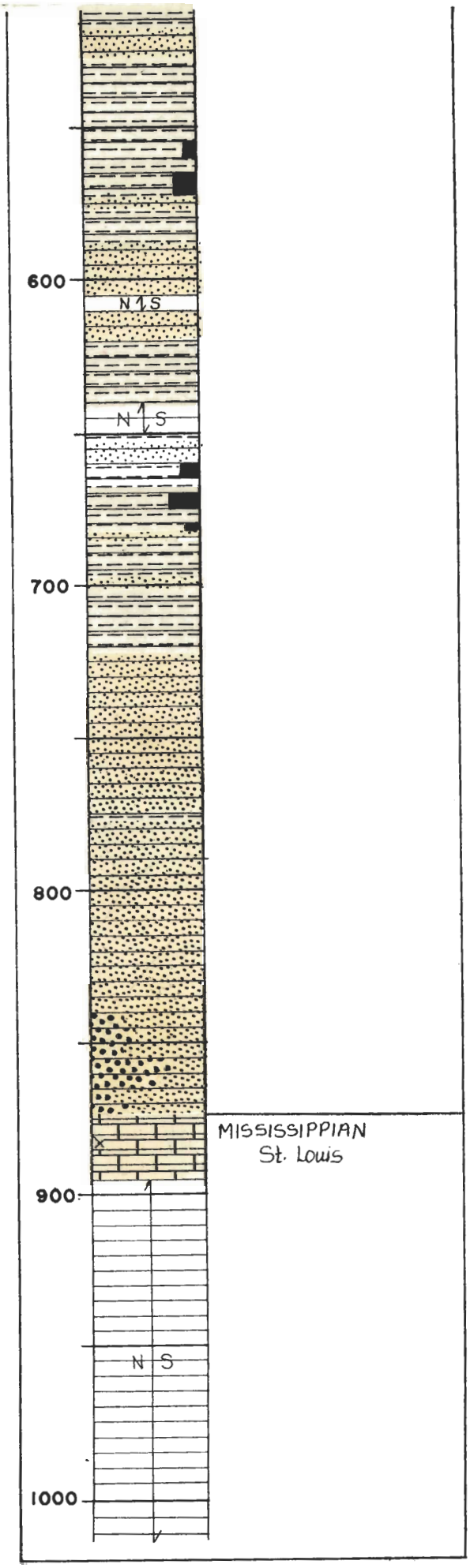


IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

Name *Winterset City Well (1967)*	State *Iowa*
Town *Winterset* County *Madison*	Loc. *SW SW NW NE*
Contractor *L. F. Winslow* Driller	Sec. *36*
Drilling Dates *12-18-66 - 3-31-67*	T. *76* N., R. *28* W.
Casing Record *85' of 24" csg. = 0-85'* *917' of 20" csg. = 0-917'* *1832' of 10" csg. set @ 2550'* *44' of 16" csg. is attached to the 10" csg. with swedge nipple. Casing is cement grouted.*	
S.W.L. *381'* G.P.M. *1461'* D.D. *38'*	
Remarks *Acidized with 4500 gal. HCl*	Elev. *1120'*
	T.D. *2964'*
Logged By *Northup - 1967*	I.G.S. No. *W-19221*

Explanation of Colors

- Soil
- Loess, Silt or Siltstone
- Drift
- Sand & Gravel
- Shale
- Sandstone
- Limestone
- Dolomite
- Chert
- Gypsum or Anhydrite
- Oolitic Limestone
- N S No Samples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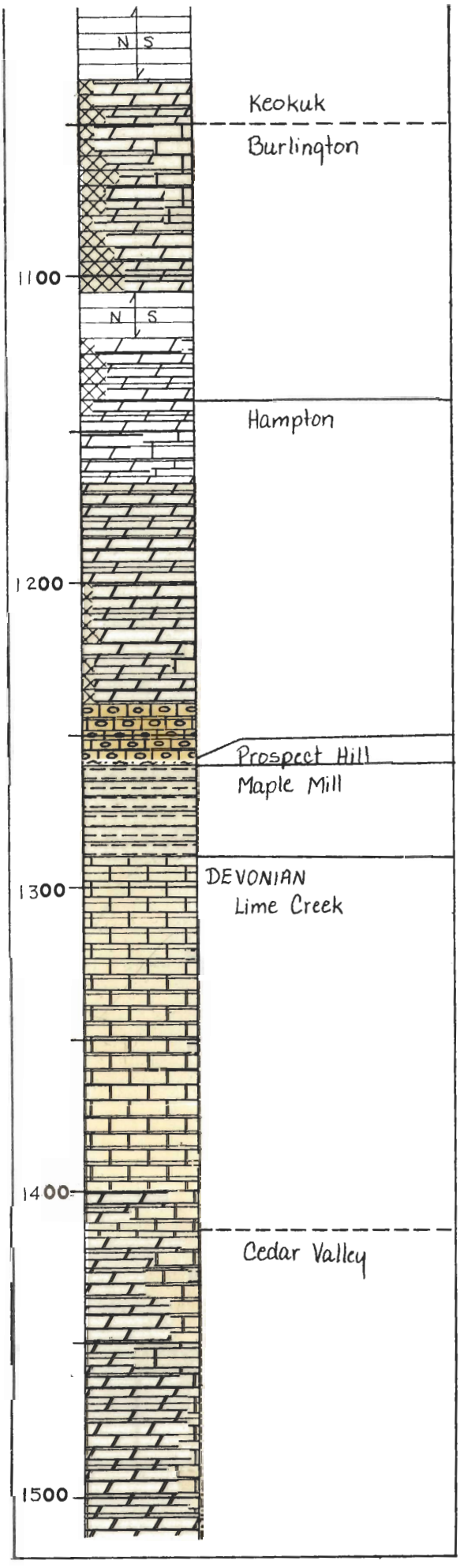
N S
N S
700
800
MISSISSIPPIAN
St. Louis
900
N S
1000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Burlington
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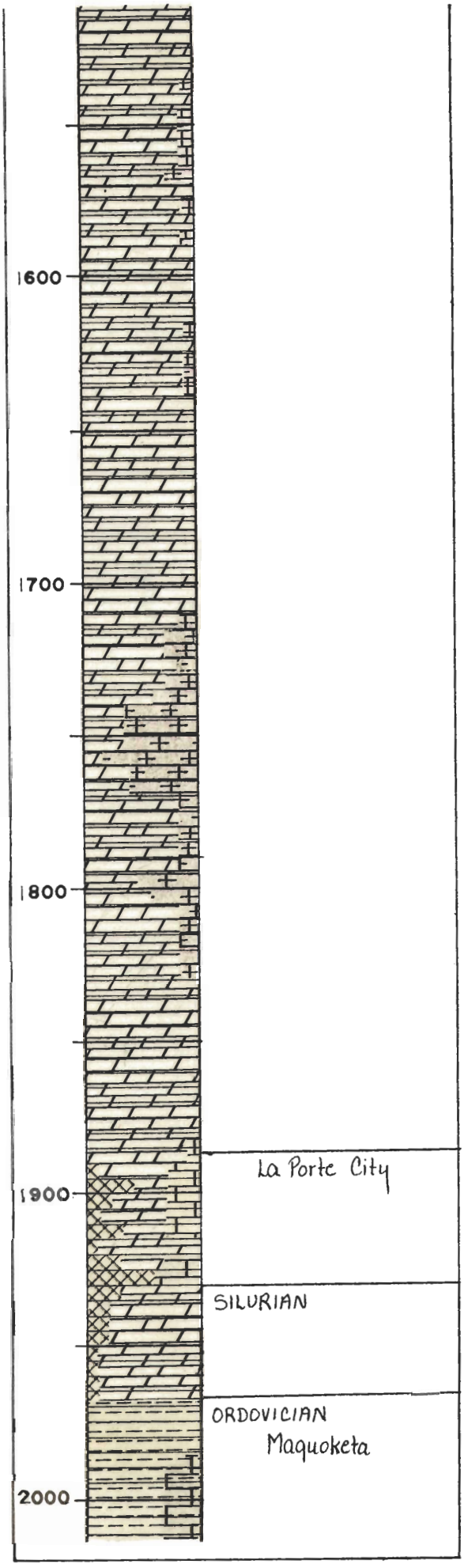
N S
Hampton
1200
Prospect Hill
Maple Mill
DEVONIAN
Lime Creek
1300
1400
Cedar Valley
1500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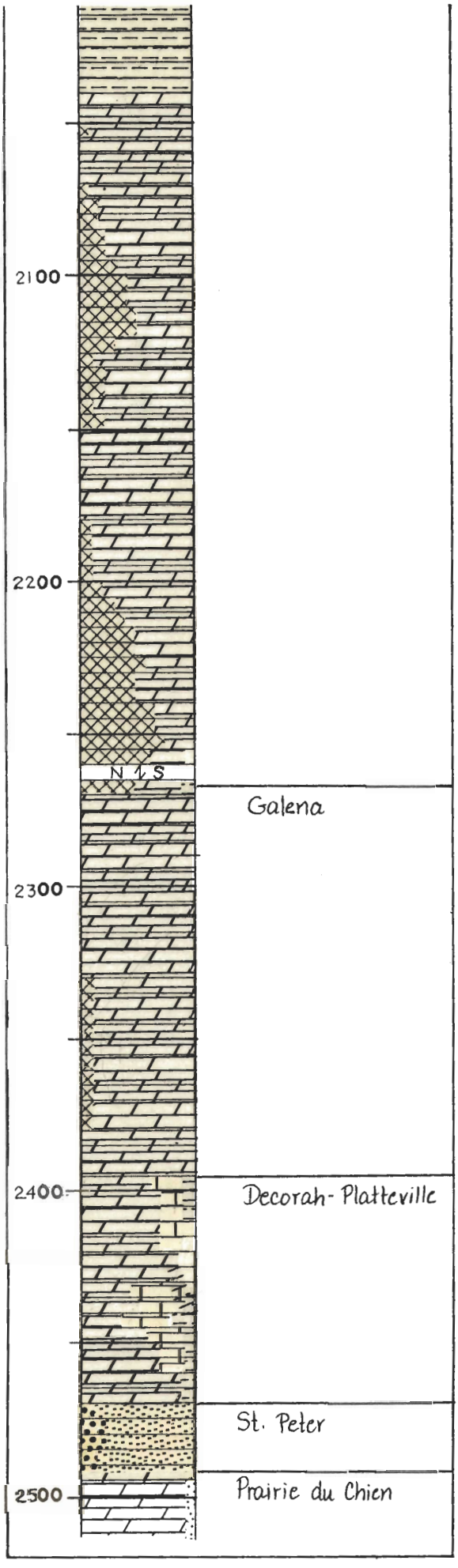
1700
1800
1900
2000
La Porte City
SILURIAN
ORDOVICIAN
Maquoketa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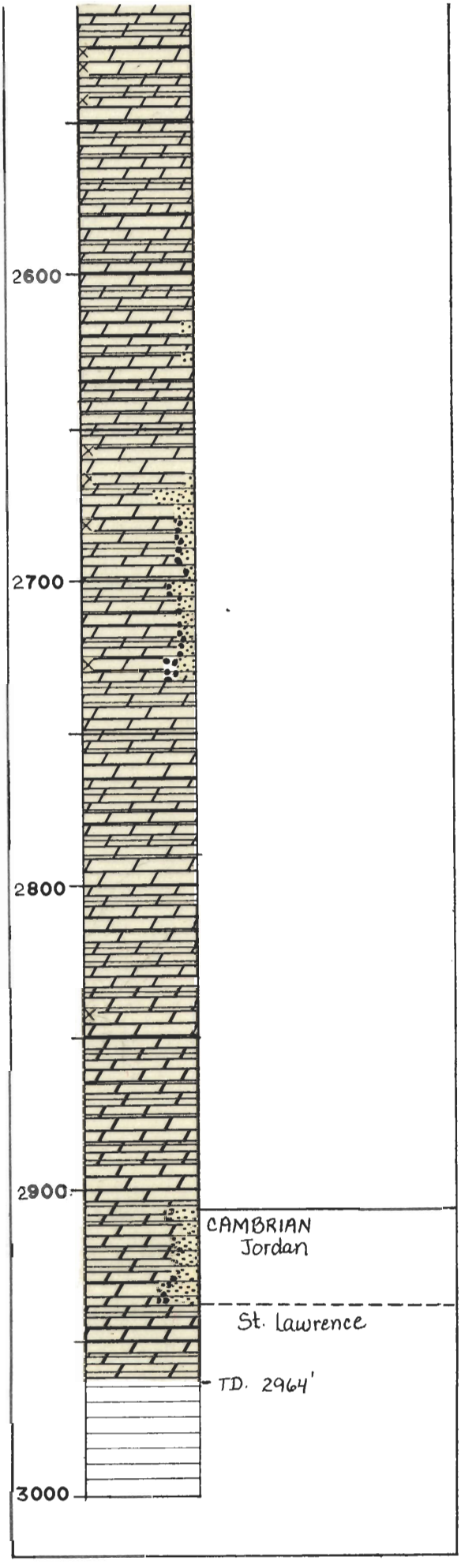
2200
N
S
Galena
2300
2400
Decorah- Platteville
St. Peter
2500
Prairie du Chien


2600
2700
2800
2900
3000
CAMBRIAN
Jordan
St. Lawrence
TD. 2964'

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSIS
(Dissolved constituents in milligrams per liter)

Town - Well No. · Owner	Date of coll.	Depth (ft.)	Geol. source	°F	Diss. solids	Fe	Mn	Ca	Mg	K	Na	CO_3	HCO_3	SO_4	Cl	F	NO_3	Hardness cal. as $CaCO_3$ tot.	carb.	non carb.	pH	Cond	D-2246
Winterset Cedar Lake	3/16/82		surface Reservoir	45	307	.19	.95	63	16	13	13	0	287	19	18	0.3	6.1	225	225	0	7.6	580	
Winterset well + infilt. gallery	"	30	Middle River alluvium	54	418	.04	.26	130	15	4.1	11	0	379	39	11	2.7	7.7	379	311	68	7.2	720	
Winterset deep well (1967)	2/10/70	2964	Jordan	85	1960	3.4	<.05	136	44	23	450	0	273	930	220	2.5	<0.1	520	224	296	7.5	2700	*

NOTES: * Reported to be 9.6 pCi/L

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

LAB. NO. 2538
MINERAL NO. 5819
26 April 1967

TOWN Winterset COUNTY Madison
OWNER OF SUPPLY City of Winterset
COLLECTOR'S NAME Richard C Northup-IGS
DATE COLLECTED 31 March 1967 DATE RECEIVED 3 April 1967
REPORT TO: NAME H G Hershey
ADDRESS Iowa Geological Survey
Iowa City, Iowa 52240

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Winterset city well Total depth 2964'-cased to 2550'-open hole 2550'-2964'
Started drilling 18 Dec 66-finished 12 March 67 well located NW Sec 36

WELL PUMPED 22 3/4 HRS. AT 1461 GPM. DATE OF PREVIOUS SAMPLE
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °F 86 ALKALINITY (ppm $CaCO_3$) P T pH
IS A POLYPHOSPHATE BEING USED?

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 290 x 10^{-5}. TURBIDITY
DISSOLVED SOLIDS 1970 SOLUBLE IRON (Fe) 1.2
TOTAL SOLIDS 1970 SILICA (SiO_2) 14 TOTAL IRON (Fe) 1.2
ALKALINITY (ppm $CaCO_3$) P None T 218 pH 6.95 DATE 3 April 1967

POSITIVE IONS		NEGATIVE IONS	
K+	28	NO_3--	2.5
Na+	370	F-	2.3
Ca++	164	Cl-	360
Mg++	68.0	SO_4--	760
Mn++	0.12	HCO_3-	266
Al+++		CO_3--	None

HARDNESS AS $CaCO_3$ 690 ppm 40.3 gpg
Very slightly turbid on receipt in lab

ANALYST Ryan, Pierson, Peterson
lls

R. L. MORRIS
PRINCIPAL CHEMIST

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

LAB. NO. 2539
MINERAL NO. 5820
26 April 1967

TOWN Winterset COUNTY Madison
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME George W Otto
DATE COLLECTED 1 April 1967 DATE RECEIVED 3 April 1967
REPORT TO: NAME Board of Trustees
ADDRESS Electric Light Plant, Waterworks
Winterset, Iowa 50273

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Winterset Jordan Well, 2953'
Constructed 18 Dec 1966-31 March 1967

WELL PUMPED 47 HRS. AT 1251-1461 GPM. DATE OF PREVIOUS SAMPLE 31 March 1967
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °F 88.7 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) 0.48
TOTAL SOLIDS 1870 SILICA (SiO_2) 14 TOTAL IRON (Fe) 0.48
ALKALINITY (ppm $CaCO_3$) P None T 215 pH 7.1 DATE 3 April 1967

POSITIVE IONS		NEGATIVE IONS	
K^+	27	NO_3 — [redacted]	2.5
Na^+	370	F^-	2.3
Ca^{++}	148	Cl^-	310
Mg^{++}	55.9	SO_4^{--}	760
Mn^{++}	< 0.05	HCO_3^-	262
Al^{+++}		CO_3^{--}	None

HARDNESS AS $CaCO_3$ 610 ppm 35.6 gpg
Clear on receipt in lab

ANALYST Ryan, Pierson, Peterson
lls

R. L. MORRIS
PRINCIPAL CHEMIST

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

LAB NO. 3821
MINERAL NO. 7169
13 Mar 19 69 bj

TOWN Winterset COUNTY Madison
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Jack W. Clemens
DATE COLLECTED 5 Feb 69 DATE RECEIVED 6 Feb 69
REPORT TO: NAME EES
ADDRESS SDH

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Jordan Well Discharge 2965 1967

WELL PUMPED 4 HRS. AT 800 GPM. DATE OF PREVIOUS SAMPLE 1967
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °F 83 ALKALINITY (ppm $CaCO_3$) P T pH
IS A POLYPHOSPHATE BEING USED? No
Iron (ppmFe) 1.0+

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 270 x 10^5 TURBIDITY
DISSOLVED SOLIDS 1880 **SOLUBLE IRON (Fe)** 1.6
TOTAL SOLIDS 1880 SILICA (SiO_2) 15 TOTAL IRON (Fe) 1.6
ALKALINITY (ppm $CaCO_3$) P None T 212 pH 7.15 DATE 6 Feb 69

POSITIVE IONS		NEGATIVE IONS	
K+	33	NO_3–	< 0.1
Na+	380	F–	2.7
Ca++	140	Cl–	250
Mg++	51.0	SO_4– –	810
Mn++	< 0.05	HCO_3–	155
Al+++		CO_3– –	None

HARDNESS AS $CaCO_3$ 560 ppm 32.7 gpg

ANALYST Ryan, Morlan

R. L. MORRIS
JHG PRINCIPAL CHEMIST

don't code

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

LAB. NO. 4040
MINERAL NO. 7820
25 Mar 19 70 bj

TOWN Winterset COUNTY Madison
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Earle Scheetz
DATE COLLECTED 26 Feb 70 DATE RECEIVED 26 Feb 70
REPORT TO: NAME IGS
ADDRESS Iowa City

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Waste water after DuPont treatment

WELL PUMPED 48 HRS. AT 75 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 710 x 10^{-5}. TURBIDITY
DISSOLVED SOLIDS 6320 SOLUBLE IRON (Fe) 1.5
TOTAL SOLIDS 6320 SILICA (SiO_2) 15 TOTAL IRON (Fe) 1.5
ALKALINITY (ppm $CaCO_3$) P None T 186 pH 6.5 DATE 26 Feb 70

POSITIVE IONS		NEGATIVE IONS	
K^+	52	NO_3^-	< 0.1
Na^+	1200	F^-	4.8
Ca^{++}	440	Cl^-	280
Mg^{++}	175	SO_4^{--}	3800
Mn^{++}	0.39	HCO_3^-	227
Al^{+++}		CO_3^{--}	None

HARDNESS AS $CaCO_3$ 1820 ppm 106 gpg
No turbidity observation by collector. Appeared slightly turbid and yellow-brown in color on receipt in lab.

ANALYST Ryan, Marian

R. L. MORRIS
JHG PRINCIPAL CHEMIST

coded copy

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

LAB. NO. 4039
MINERAL NO. 7819
25 Mar 19 70 bj

TOWN Winterset COUNTY Madison
OWNER OF SUPPLY Municipal
COLLECTOR'S NAME Earle Scheetz
DATE COLLECTED 26 Feb 70 DATE RECEIVED 26 Feb 70
REPORT TO: NAME IGS
ADDRESS Iowa City

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
Sample taken after going through DuPont treatment

WELL PUMPED 48 HRS. AT 750 GPM. DATE OF PREVIOUS SAMPLE
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Not stated
TEMPERATURE 74F ALKALINITY (ppm $CaCO_3$) P T pH
IS A POLYPHOSPHATE BEING USED?

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 130 x 10^{-5}. TURBIDITY
DISSOLVED SOLIDS 776 SOLUBLE IRON (Fe) 0.40
TOTAL SOLIDS 776 SILICA (SiO_2) 11 TOTAL IRON (Fe) 0.40
ALKALINITY (ppm $CaCO_3$) P None T 86.0 pH 6.4 DATE 26 Feb 70

POSITIVE IONS		NEGATIVE IONS	
K^+	14	NO_3^-	< 0.1
Na^+	260	F^-	2.0
Ca^{++}	17.6	Cl^-	200
Mg^{++}	1.9	SO_4^{--}	260
Mn^{++}	< 0.05	HCO_3^-	105
Al^{+++}		CO_3^{--}	None

HARDNESS AS $CaCO_3$ 52.0 ppm 3.0 gpg
No turbidity observation by collector. Appeared clear on receipt in laboratory.

ANALYST Ryan, Morlan

R. L. MORRIS
JHG PRINCIPAL CHEMIST

9-250

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. ______
District ______

Sheet 1

Winterset City Well 3/30-31/67 After Acidizing With 450 Gal HCL

SWL = 381'

	Date 3/30 Time	DD	PL	5" orifice 6" pipe	GPM	Remarks
AM	11:00	20	401	60"	948	Pumped. Water slightly yellow with acid
	11:03	20	401	60"	948	" " " "
	11:08	20	401	60"	948	" " " "
	11:10	19	400	60"	948	" " " "
	11:13	19	400	60"	948	" " " "
	11:19	18	399	63"	968	Water becoming clear Sp Conductivity 53.7
	11:30	18	399	63"	968	Water clear
	11:40	18	399	63"	968	"
	11:41	22	403	75½"	1056 ±	Increased pumping rate
	11:50	22	403	75½"	1056 ±	Water clear
PM	12:00	21	402	75½"	1056 ±	" "
	12:15	21	402	74½"	1050 ±	" " Temp. 26° F.
	12:30	20	401	74½"	1055 ±	" "
	12:35	22	403	76"	1060 ±	" "
	1:00	22	403	75½"	1056 ±	" "
	1:30	22	403	75"	1052 ±	
	2:00	22	403	75"	1056 ±	
	2:30	22	403	74"	1052 ±	
	3:00	22	403	74"	1050 ±	
	3:30	22	403	74"	1050 ±	
	4:00	22	403	74"	1050	
	4:30	22	403	74"	1050	
	5:00	22	403	74"	1050	
	5:30	22	403	73"	1045 ±	
	6:00	22	403	72"	1040 ±	
	6:30	22	403	72"	1040 ±	Pump off to install 7" orifice
	6:55			7" orifice 10" pipe	1040 ±	Pumping resumed
	7:00	24	405	36	1251	Water clear Temp 26°
	7:30	26	405	36	1251	" "
	8:00	26	405	36	1251	" "
	8:30	26	405	36	1251	" "

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington ________ District ________

Wintersat City Well 3/30-31/67

	3/30/67 Time	DD	PL	7" Drive 10" Pipe	GPM	Remarks
PM	8:45	38	416	50	1461	Water Clean
	9:00	38	416	50	1461	" " Specific Capacity 38.4 Gallons Per ft. Drawdown
	10:00	38	416	50	1461	" "
	11:00	38	416	50	1461	" "
3/31/67 AM	12:00	38	416	50	1461	" "
	1:00	38	416	50	1461	" "
	2:00	38	416	50	1461	" "
	3:00	38	416	50	1461	" "
	4:00	38	416	50	1461	" "
	5:00	38	416	50	1461	" "
	6:00	38	416	50	1461	" "
	7:00	38	416	50	1461	" "
	8:00	38	416	50	1461	" "
	9:00	38	416	50	1461	" "
	10:00	37	416	50	1461	Took Water Sample
	11:00	37	416	50	1461	
P.M.	12:00	37	416	50	1461	
	1:00	37	416	50	1461	
	2:00	37	416	50	1461	
	3:00	37	416	50	1461	
	4:00	37	416	50	1461	
	5:00	37	416	50	1461	
	6:00	37	416	50	1461	
	7:00	37	416	50	1461	
	8:00	37	416	50	1461	
	9:00	37	416	50	1461	
	10:00	37	416	50	1461	
	11:00	37	416	50	1461	
4/1 A.M.	12:00	37	416	50	1461	
	1:00	37	416	50	1461	
	2:00	37	416	50	1461	

continued

	Time	D.D.	PL	7x10	GPM
AM	3:00	37	416	50	1461
	4:00	37	416	50	1461
	5:00	37	416	50	1461
	6:00	37	416	50	1461
	7:00	37	416	50	1461
	8:00	36	415	49	1446
	9:00	36	415	49	1446
	10:00	36	415	49	1446

S.W.L. 374.20' Elect. Measure 10:30 AM. - 4-1-67
Water Temp. 31.5°C
Recovery 30' - 30 Sec. 37' - 45 Sec. - 1 Min. 40' Full
D.D. Not corrected by Elect. Measure

CITY OF WINTERSET

WINTERSET, IOWA

MAYOR AND CITY COUNCIL

BOARD OF TRUSTEES
ELECTRIC LIGHT PLANT, WATERWORKS

WATER TESTS MADE BY WILLIAM GORDON

SAMPLE			IRON	HARDNESS	PH	FLUORIDE	ALKALINITY
# 1	1:30 PM	3/22/67	1.2	16	8.4	4.0	400
#2	5:30 PM	3/22/67	1.1	18+	8.4	3.2	275
#3	2:00 PM	3/30/67	3.5	14+	6.8	2.9	250
#4	7:00 AM	3/31/67	1.25	13	6.8	2.90	230
#5	11:00 AM	3/31/67	1.25	9+/10-	6.8	2.95	218
#6	3:00 PM	3/31/67	.5*	15.5	8.1 *	-	200*
#7	7:00 AM	4/1/67	.3	11+/12-	7.5	3.0	210
#8	9:00 AM	4/1/67	.3	11+/12-	7.4	2.96	206

* Test by Veenstra & Kimm

PUMPED WELL -

3/22/67 - 10:00 AM to 5:30 PM at 536 gpm max. (Prior to acidizing)

3/28/67 8:15 PM to 9:30 PM Well acidized.

3/30/67 1:30 AM to 6:15 AM Pumped to clear up.

3/30/67 11:00 AM to 10:00 AM 4/1 = Test period.

April 3, 1967

MEMORANDUM

TO: Dr. H. G. Hershey

FROM: Richard C. Northup

RE: Pumping Test at Winterset

The New Jordan well at Winterset was pumped last Thursday and Friday. At Mr. Winslows' request I went out to take measurements and pick up a water sample. Previous to this test, the well was acidized with 4500 gallons of 20% muriatic acid. This was pressurized with air, enabling the acid to get back into the formation. The well was then pumped for several hours to remove most of the acid, and then allowed to recover, before beginning the official test, which started at 11:00am Thursday, March 30. Static water level was 381', and the accompanying tabulation shows the amount of drawdown and gallonage. A steady rate of 1461 gpm was reached at 8:30 pm with 38 feet of Drawdown and was to be maintaned at this rate until conclusion of the test. The engineering company-Veenstra and Kimm, of West Des Moines, decided to continue the test a while longer, possibly into Saturday to check on any changes in the water chemistry. The chloride was still high, probably due to the acid treatment, and they wanted to see if it would level off on decrease. A tabulation of four partial analyses is also attached to this memo. Mr. George Otto, Winterset city engineer, will see that we get the results from the remainder of the test. However, there should be little or no change as they intend to continue at the same rate. He will also see that we get recovery measurements . At the close of the preliminary test the well reportedly recovered to static level within five minutes.

This test clearly shows the desireability of acidizing these Jordan wells to improve specific capacity. In the case of Winterset the well originally made only 614 gpm with 149' of drawdown as against 1461 gpm with 38' of drawdown after treatment.

noted RSH

Partial analyses of water from Winterset City well

Before acidizing

1:30 PM 3/22/67

Iron 1.2
Fluoride 4.0
P.H. 7 8.4+
Alkalinity 400
Hardness 16 grains
Temp 88°

5:30 PM 3/22/67
Iron 1.1
Fluoride 3.2
P.H. 8.4+
Alkalinity 2.75
Hardness 18 grains
Temp 88°

After acidizing

2:00 PM 3/30/67

Iron 3.5
Fluoride 2.9
P.H. 6.4
Alkalinity 250
Hardness 14 grains
Chloride 1400 ppm
Sulphate 700 ppm
Temp 86°

7:00 AM 3/31/67

Iron 1.25
Fluoride 2.9
P.H. 7 -
Alkalinity 230
Hardness 13 grains
Temp 86°

Winterset City Well 3/30/67

After acidizing with 4500 cal Hcl
5" orofice
6" Pipe
SWL 381
519' of airline
PL 411' @ 800 GPM

Time	DD	PL	7" orofice 10" pipe	GPM	Remarks
11:00					Pump off on
11:30	20	401	60"	948	Water sli. yellow from acid
11:08	20	401	60"	948	Water sli. yellow from aicd
11:10	19	400	60"	948	Water sli. yellow from acid
11:13	19	400	60"	948	Water sli. yellow from acid
11:19	18	399	63"	968	Water Becomming clear sp. capacity 53.7
11:30	18	399	63"	968	Water clear
11:40	18	399	630	968	Water clear
11:41	22	403	75½	1056±	increasing pump rate
11:50 PM	22	403	75½	1056±	Water clear
12:00	21	402	75½	1056±	Water clear
12:15	21	402	74½	1050±	Water clear Temp. 86°
12:30	20	401	74½	1056±	Water clear
12:35	22	403	76	1060±	Water clear
1:00	22	403	75½	1056	Water clear
1:30	22	403	75	1056	Water clear
2:00	22	403	75	1056	water clear
2:30	22	403	74	1050±	Water clear
3:00	22	403	74	1050±	Water clear
3:30	22	403	74	1050±	Water clear
4:00	22	403	74	1050±	Water clear
4:30	22	403	74	1050±	Water clear
5:00	22	403	74	1050±	Water clear
5:30	22	403	73	1043±	Water clear
6:00	22	403	72	1040±	Water clear
6:30	22	403	72	1040±	Pump off to install larger orofice
6:55			7" orofice 10" pipe		Pumping resumed
7:00	24	405	36	1251	Water clear Temp. 86°
7:30	26	405	36	1251	Water clear Temp 86°
8:00	26	405	36	1251	Water clear Temp. 86°
8:30	26	405	36	1251	Water clear Temp. 86° increased rate
8:45	38	416	50	1461	Water clear
9:00	38	416	50	1461	SP capacity 38.4 gal.per ft. DO
10:00	38	416	50	1461	Water clear Temp. 86°
11:00	38	416	50	1461	Water clear
12:00	38	416	50	1461	
1:00	38	416	50	1461	

Time	DD	PL	10" orofice 7" Pipe	GPM	Remarks
2:00	38	416	50	1461	
3:00	38	416	50	1461	
4:00	38	416	50	1461	
5:00	38	416	50	1461	
6:00	38	416	50	1461	
7:00	38	416	50	1461	
8:00	38	416	50	1461	
9:00	38	416	50	1461	
10:00	37	416	50	1461	Took water sample

See balance of test on accompanying sheets

September 15, 1969

TO: W. L. Steinhilber

FROM: R. A. Karsten

SUBJECT: Jordan well, Winterset, Iowa

Last week I was visiting Mr. Henry Stabus, S. C. S., U. S. D. A., at Indianola, Iowa. I met one of his technicians from the Winterset office who informed me that Winterset is not using their Jordan well because of its bad taste and putrid odor. They are presently relying on surface water (a lake that is badly silted in) and two shallow wells (from my understanding an alluvial source south of the city).

I was also informed that a meeting recently took place which proposed a large scale surface-water impondment that would provide water for Winterset, a number of small communities plus farmers who live in proximity to Winterset, and these other small communities.

The following is the casing record of the Winterset Jordan well taken from the sample log:

85' of 24"	0-85'
917' of 20"	0-917'
1832' of 10"	set at 2550'
44' of 16"	is attached to the 10" with a swedge nipple. Casing is cement grouted.

Attached are three copies of mineral analyses.

No major change in quality of water — probably no leaks. It's just poor water.

WLS

Winterset well folder

March 1, 1967

MEMORANDUM

TO: Dr. H. G. Hershey

FROM: Richard C. Northup

RE: Winterset City Well

At the request of Mr. Ed Winslow, I made a trip to Winterset on Tuesday, February 28 to pick a casing point for the new city well. Top of the St. Peter was picked at 2470' on the basis of well cuttings and drilling time. The Prairie du Chien came in at 2493'. Drilling was continued to 2550' where their main string of 10" casing will be set and cemented. They will then continue to the Jordan and St. Lawrence and complete.

MEMO
March 14, 1967

TO: Dr. Hershey
FROM: Richard C. Northup

Re: Winterset City Well

At Mr. Winslow's request I drove to Winterset on Sunday, March 12th to check the top of the Jordan and St. Lawrence Formations in the new city well, and to advise them as to where to stop drilling. The Jordan came in at 2910' ± and the St. Lawrence at 2937'. Drilling continued to 2964 at which point pump trouble developed and it was decided to pull out of the hole. This was only a foot below our arbitrary stopping point of 2965', or 27 feet into the St. Lawrence.

Winslow is now looking for a suitable pump with which to test the well and will call us in time for the testing. As they want to clean out the mud cake on the side of the hole with scrapers, and pump in fresh water to displace the drilling mud, it will probably be next week sometime before they are ready to pump.

All remaining samples were brought in and should be ready for detailed study soon.

Memo

Phone call 11/17/77

Called the city water supt 462-3601

They have no plans to use the Jordan well again. The city has grant money now and they plan to increase the capacity of their reservoir

BJ Horick

August 10/1984

Michael Linn, Winterset Chamber of Commerce, called requesting information on the City's unused Jordan well. Having spent $300,000. on it, and unable to use it because of objectionable water quality, the City is now investigating the potential of it as a heat source. Sent copy of Jordan aquifer report, copy of log, and file memos on construction and pumping test.

Jean C. Prior

STATE HYGIENIC LABORATORY–WATER ANALYSIS

Iowa City, Iowa 52240

Sample TAKEN 3/22/67 BEFORE ACIDIZING

Please print with BLACK MEDIUM SOFT lead pencil only

Town Winterset County Madison

Collector Edward Winslow Date Collected 3-22-67

Sampling Point City well

Purpose of Sampling Sulphate, Chlorine, Iron & Hardness

SENDER

Name H.G. Hershey

Street Iowa Geol. Survey

City Geol. Survey Bldg, Iowa Iowa City

Zip Code

PLEASE PRINT PLAINLY

Owner of Supply

Chlorine

Depth of Well

Type of Platform

(To be filled in by laboratory)

BACTERIAL ANALYSIS
$2.00 per sample

LB BGB

Coliform MPN

SAFE ☐ UNSAFE ☐

UNSATISFACTORY ☐

CHEMICAL ANALYSIS
$2.00 per sample

Nitrate (p p m)

SATISFACTORY ☐ UNSAFE ☐

IRON as Fe (p pm) 0.5

HARDNESS as $CaCO_3$ (p pm) 540

Est. SO_4 875 p.p.m.

Chlorine should be determined at time of sampling

FOR LABORATORY USE ONLY

1 (2) 3 4 5 6 7 8 9

10 11 12 (13) 14 15 16

LAB. NO. 467 H25365

W.J. HAUSLER, JR., Ph.D.
Director

1389

TRW REDA PUMPS

REDA PUMP COMPANY, A DIVISION OF TRW INC. • BARTLESVILLE OKLAHOMA 74003

S.W.L. measurements

9/13/74 417.55

4/15/75 419.15

DRILLER'S NOTE

It is important that a driller's notebook, filled out as completely as possible, be sent to the Iowa Geological Survey at the completion of each hole. A number of drillers have found it convenient to string samples from a single well on a heavy wire and attach the log book to them. A hole has been punched in the log book for this purpose.

Sample sacks and log books will be furnished by the Geological Survey. A copy of the log book will be made and returned if desired by the driller.

SUGGESTIONS TO DRILLERS

1. Samples should be taken from each bed passed through, and never more than 5 feet apart, even in the same bed.

2. Samples should not be washed, except to remove excess drilling mud, as washed samples may give a wrong idea of the character of the bed.

3. Fill out the label on each sample bag with the name of the well and the depth interval which the sample represents.

4. Make frequent use of the "Description" column to explain the material being drilled.

5. Note depth and thickness of all water-bearing layers.

6. Note the quality of the water from each layer: as hard, soft, salty, alkaline, or sulphur bearing.

7. Note height to which water from each layer rises in well, and give flow or capacity in gallons per minute.

8. Fossils, such as oyster, clam, and other shells, are important and should be placed in bags with the material with which they are found and carefully labeled as to the depth from which they were obtained.

9. If you do not understand what is wanted, or desire information on any point, write to the Iowa Geological Survey, Iowa City, Iowa.

10. Samples may be boxed and sent to IOWA GEOLOGICAL SURVEY, IOWA CITY, IOWA, EXPRESS COLLECT.

The Iowa Geological Survey desires to assist and cooperate with owners and drillers in every way possible, and will be glad to answer questions and assist in the solution of problems at any time.

A-8823

Elev. 1120' Ground

WELL RECORD

Well is located ____ N/E miles S/W and ____ N/E miles S/W from

Winterset (Nearest Town) in Madison (County),

in the ____ ¼ ____ ¼ Sec. ____ T. ____ R. ____

Owner City of Winterset Well No. 1

Postoffice address Winterset

Contractor Winslow

Address Maysville

Driller ____

Well begun 12/18, 1966

completed ____, 19____

Rig used—Cable, Rotary, Jet, or ____

Depth of well ____ (Feet)

Size of hole (note total amount of each size) ____

Main water supply at ____ (Feet below surface)

Final water head ____ (Feet above or below surface)

Is well pumped? ____

Yield ____ (Gallons per minute)

Water level when pumping ____

Position of well ____ (Upland, valley, side hill, etc.)

Date and Time	Water Level	SOURCE OF WATER		Production in Gallons per Minute	Pumping Level
		Depth	Type of Rock		

NOTE: Water levels should be recorded at time of change AND at regular intervals; for example each morning before drilling starts or at the end of each 100 feet of drilling.

RECORD OF PERMANENT CASING

Size Pipe	Amount of Pipe	Depth to Bottom of Pipe	Depth to Top of Pipe	Type° and Weight of Pipe	DIAGRAM OF WELL
24"	85'	85'	0		
20"	917'	917'	0		Drilled 15" Hole To 2558'. Will Set And Cement 10" Csg. With A Short Intermediate String Of 15" Csg. Attached To The 10" And 20" Strings
10"					

°As cast, wrought iron, steel, concrete, etc.

Is screen used?_____ Diameter_____ (Inches)

Length_____ (Feet) Depth to bottom_____

Depth to top_____ Slot size_____

Are packers or seals used?_____

Kind _____

Where used_____

Kind of pump_____ Dia._____ (Inches)

Capacity of pump_____ (g.p.m.)

Power used_____ (Kind and amount)

Depth to bottom of pump line_____feet,

including_____feet tailpiece.

Remarks on construction of well_____

_____

SAMPLE NO.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
				MEASUREMENTS ON WELL ARE
				KELLY BUSHING - APP. 12'
				ABOVE GROUND LEVEL)

SAMPLE NO.	DEPTH From	DEPTH To	~~THICKNESS~~ MINUTES	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.	MINUTES
	2400	2401	13	2417 - 18	16
		02	14	19	13
		03	8	20	7
		04	16	21	
		05	14	22	12
		06	15	23	15
		07	19	24	12
		08	18	25	10
		09	12	26	10
		10	11	27	10
		11	14	28	11
		12	23	29	7
		13	22	30	7
		14	35	31	7
		15	30 - TRIP - 12:00AM	32	8
			11	OBS 58 33	10
		17	9	34	

SAMPLE NO.	DEPTH From	DEPTH To	~~THICKNESS~~ Minutes
	2434	2435	8
		[illegible]	7
		[illegible]	8
		38	12
		39	14
	Specks Pyrite?	40	18
		41	19
		42	13
		43	18
		44	25
		45	22
		46	15
		47	18
		48	16
		49	14
		50	16
		51	15

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		Minutes
2451	-2452	17
McGregor-?	53	17
Pecatonica	54	10
	55	10
	56	8
	57	10
	58	12
	59	9
	60	8
	61	8
	62	7
	63	9
	64	9
	65	9
	66	10
	67	10
	68	8

SAMPLE NO.	DEPTH From	DEPTH To	~~THICKNESS~~ Minutes Per Ft
	2468	2469	
Top St. Peter	2469	70	
@2470'		71	
		72	
		73	
		74	
		75	
		76	
		77	
		78	
		79	1
		80	1
		81	1
		82	1
		83	
		84	1
		85	

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.	Minutes Per Ft
2485 - 2486	1
87	1
88	1
89	1½
90	1½
91	4
92	3 ~ Top Prdc
93	6
94	6
95	8
96	8
97	6
98	6
99	5
2500	2
01	5
02	5
03	

SAMPLE NO.	DEPTH From	DEPTH To	THICKNESS Min. Per Ft.
	2503	2504	4
		05	5
		06	4
		07	5
		08	7
		09	9
		10	5
		11	5
		12	[illegible]
		13	[illegible]
		14	[illegible]
		15	5
		16	5
		[illegible]	7
		18	7
		19	5
		20	[illegible]

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		Min. Per Ft.
2520	2521	8
	22	[illegible]
	23	6
	24	6
	[illegible]	7
	26	15
	27	10
	28	15
	29	12
	30	13
	31	9
	32	8
	33	13
	34	12
	35	10
	36	11
	37	9

SAMPLE NO.	DEPTH From	DEPTH To	THICKNESS Minutes
	2350	2351	5
		52	7
		53	8
		54	8
		55	9
		56	6
		57	6
		58	7
		59	9
		60	8
		61	8
		62	
		63	6
		64	9
		65	10
		66	8
		67	10

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.	Minutes
2367 - 2368	3
69	2
70	2
71	6
72	7
73	5
74	7
75	8
76	7
77	7
78	6
79	7
80	7
81	6
82	10
83	11
84	9

FOR FIGURING, CASING TALLY, ETC.

		Minutes
2384	2385	9
	86	10
	87	11
	88	13
	89	19
	90	22
	91	18
	92	18
	93	17
	94	15
	95	17
	96	13
	97	16
	98	15
	99	16
	2400	

FOR FIGURING, CASING TALLY, ETC.

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A-8823

WELL RECORD

Well is located ____ N/E miles S/W and ____ N/E miles S/W from

Winterset (Nearest Town) in Madison (County),

in the NW¼ NE¼ Sec. 36 T. 76N R. 28W

Owner City of Winterset Well No. ____

Postoffice address Winterset, Iowa

Contractor L. F. Winslow

Address ____

Driller ____

Well begun Dec. 19, 19 44;

completed ____, 19 44

Rig used—Cable, (Rotary), Jet, or ____

Depth of well 2967 (Feet)

Size of hole (note total amount of each size) ____

Main water supply at ____ (Feet below surface)

Final water head ____ (Feet above or below surface)

Is well pumped? ____

Yield ____ (Gallons per minute)

Water level when pumping ____

Position of well ____ (Upland, valley, side hill, etc.)

Date and **Time**	Water Level	SOURCE OF WATER		Production in Gallons per Minute	Pumping Level
		Depth	Type of Rock		

NOTE: Water levels should be recorded at time of change AND at regular intervals; for example each morning before drilling starts or at the end of each 100 feet of drilling.

RECORD OF PERMANENT CASING

Size Pipe	Amount of Pipe	Depth to Bottom of Pipe	Depth to Top of Pipe	Type* and Weight of Pipe	DIAGRAM OF WELL
	1832'	0 + 10	" Set	@ 2550	
	44'	0 + 16'	ABOVE	THE	10" Swing
	CONNECTED	WITH	SWEDGE	NIPPLE	
	917	0 + 6"			
	8'	24"			

*As cast, wrought iron, steel, concrete, etc.

Is screen used?________ Diameter________ (Inches)

Length________ (Feet) Depth to bottom________

Depth to top________ Slot size________

Are packers or seals used?________

Kind ________

Where used________

Kind of pump________ Dia.____ (Inches)

Capacity of pump________ (g.p.m.)

Power used________ (Kind and amount)

Depth to bottom of pump line________feet,

including________feet tailpiece.

Remarks on construction of well________

____

Drilling Time

SAMPLE NO.	DEPTH From	DEPTH To	THICKNESS
			MINUTES PER FOOT
	2570	2571	1
		72	7
		73	8
		74	8
		75	6
		76	5
		77	
		78	
		79	
		80	
		81	5
		82	8
		83	7
		84	
		85	
		86	

Drilling time

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.	MINUTES PER FT
2586 2587	7
88	5
89	6
90	5
91	6
92	7
93	11
94	
95	5
96	6
97	11
98	8
99	5
2600	
01	6
02	8
03	13

SAMPLE NO.	DEPTH From	DEPTH To	~~THICKNESS~~ Min. Pm Ft.
	2603	04	9
		05	9
		06	10
		07	8
		08	8
		09	6
		10	9
		11	11
		12	11
		13	10
			"
			"
		16	2
		17	2
			"
			"
			"

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		Min. Pm Ft.
2620	B.621	3
	"	5
	"	4
	"	5
	"	10
	26	8
		7
	28	8
	29	19
	30	10
	31	10
		9
		11
		13

SAMPLE NO.	DEPTH		THICKNESS	DESCRIPTION OF BEDS		
	From	To	Min. Pan Fl	KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		Min. Pan Fl
	2637	2638	18	2654	2655	10
					56	1
		40				5
		41				6
		42				
		43			60	7
		44			61	
		45			62	
		46	6		63	5
		47	6		64	6
		48	6		65	
		49	7		66	
		50	9		67	
		51	8		68	
					70	7
			9			5

SAMPLE NO.	DEPTH From	DEPTH To	~~THICKNESS~~ MIN.-PAY FT.
	2671	2672	7
		73	4
		74	[illegible]
		75	[illegible]
		76	6
		77	7
		78	10
		79	6
		80	7
		81	[illegible]
		83	12
		89	5
		95	6
			6
			5
			7

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		
2688	2689	[illegible]
	90	9
	91	5
	92	6
	93	10
	94	9
	95	9
	96	[illegible]
	97	[illegible]
	98	4
	99	10
	2700	9
	01	7
	02	
	03	

SAMPLE NO.	DEPTH From	DEPTH To	THICKNESS Min. Pm Ft.	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.	Min. Pm Ft.
	2705	2706	1	722 2723	8
		07	7		"
		08	8		10
		09	"		5
		10	8		7
		"		28	6
		"	"	29	5
		13	10	30	8
		14	"	31	7
		15		32	7
		16	10	33	7
		17	"	34	3
		18	13	35	6
		"	"	36	
		"			4
			10		4
			"		3

SAMPLE NO.	DEPTH From	DEPTH To	THICKNESS Min-Pm
	2739	2740	4
		41	4
		42	3
		43	4
		46	2
		47	
		48	
		49	
		50	1
		51	
		52	
		53	2

DESCRIPTION OF BEDS		
KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		
2756	2757	Min-Pm
	59	
	60	6
		4
	63	4
	64	4
	65	
	66	5
	67	
	68	4
	69	4
		4
		5

FOR FIGURING, CASING TALLY, ETC.

Feet	Min.
2773	
2774	6
75	5
76	4
77	5
78	8
79	8
80	7
81	4
82	
85	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	

Feet	Min. per ft.
2800-01	5
02	5
03	4
04	6
05	6
06	3
07	6
08	7
09	8
10	6
11	6
12	5
13	5
14	8
15	8
16	8
17	5
18	7

2800

FOR FIGURING, CASING TALLY, ETC.

Feet.	Min. per ft.
2832-33	8
34	8
35	9
36	6
37	9
38	8
39	6
40	7
41	10
42	8
43	7
44	7
45	7
46	7
47	6
	-
	-
	7
	7
	.
53	8
54	7
55	8
56	6
57	6
58	8
59	9
60	7

FOR FIGURING, CASING TALLY, ETC.

Feet	Min. per ft.
2865-66	8
67	6
68	7
69	8
70	9
71	10
72	6
73	6
74	6
75	8
76	6
77	7
	7
79	7
80	8
81	6
82	9
83	7
84	8
85	6
86	6
87	4
88	4
89	4
90	5
91	5
92	4
93	5
94	5
95	5
96	4
97	5
98	10
99	7
2900	7

FOR FIGURING, CASING TALLY, ETC.

FT.	MIN.-PER FT	FT.	MIN. PER FT
2900 - 01	10	2935	- 6
02	9	ST LAW - 37	- 5
03	7	38	- 8
04	9 / 10	39	8
05		40	- 8
06	9	41	- 7
07	7	42	- 9
08	6	43	- 8
09	7	44	- 7
10	7	45	- 7
11	7	46	CONN.
12	5	47	- 6
13	7	48	- 7
14	7	49	- 8
15	9	50	- 9
16	11	51	- 9
17	8	52	- 7
18	8	53	- 9
19	9	54	- 8
20	11	55	- 9
21	6	56	- 8
22	11	57	- 10
23	9	58	- 12
24	13	59	- 10
		60	- 8
		61	- 8
		62	- 12
		63	- 9
		64	- 9

23
24
30

TD 2964

FOR FIGURING, CASING TALLY, ETC.

Pump Tnook @ 2963 1/2

LLOYD SMITH
Co. SUPT. - MADISON Co
WINTERSET

1 BLK N of NW1/C SQUARE