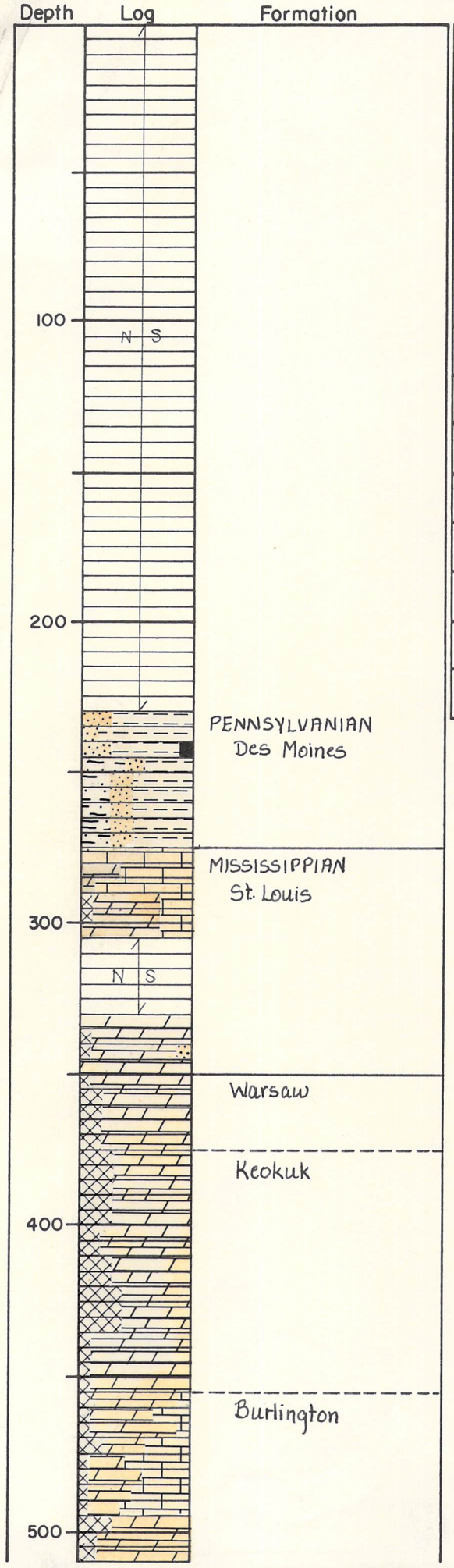
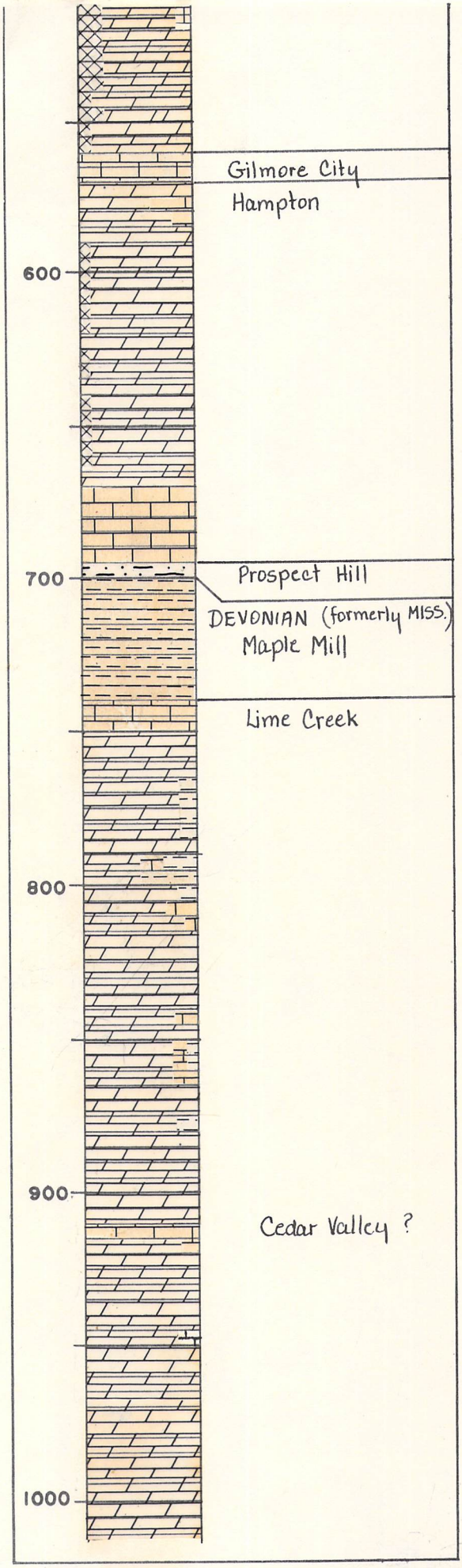


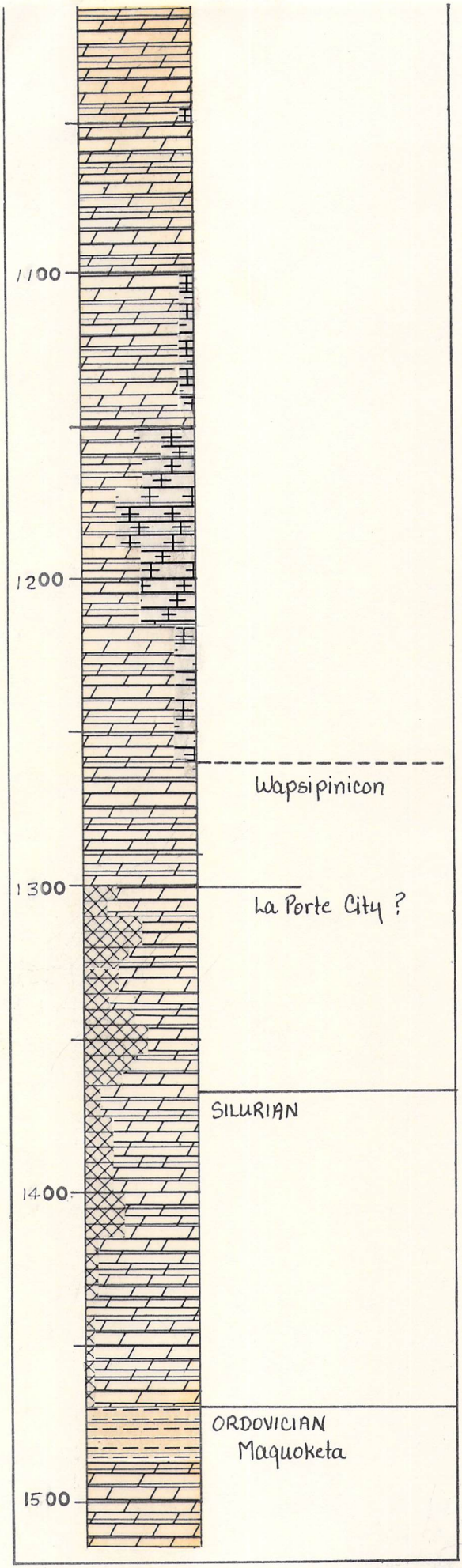
IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

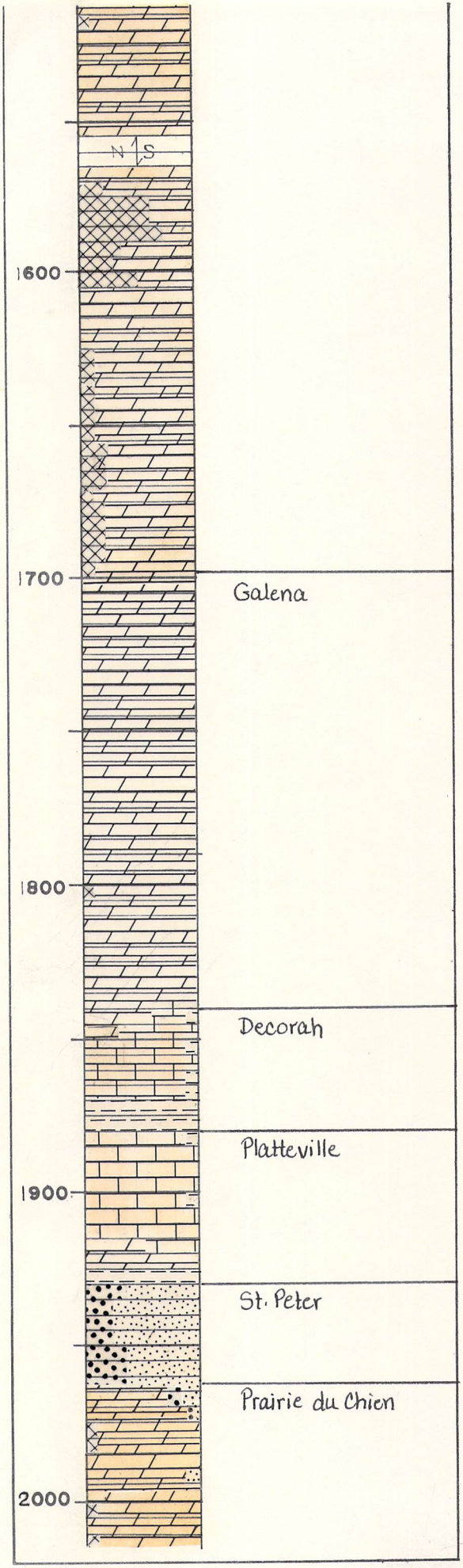
Name West Des Moines City Well (1967)	**State** Iowa
Town West Des Moines **County** Polk	**Loc.** SESESW
Contractor L. F. Winslow **Driller**	**Sec.** 10
Drilling Dates April 11, 1967 – June 23, 1967	**T.** 78 **N., R.** 25 **W.**
Casing Record 48' of 30" csg. 0-48'	
412' of 16" csg. 0-412'	
1613' of 10" csg. 412-2025'	
S.W.L. 79' **G.P.M.** 2150 **D.D.** 14'	
Remarks Acidized w/8,400 Gal. HCL	**Elev.** 822'
	T.D. 2460'
Logged By Northup June 1967	**I.G.S. No.** W-19416

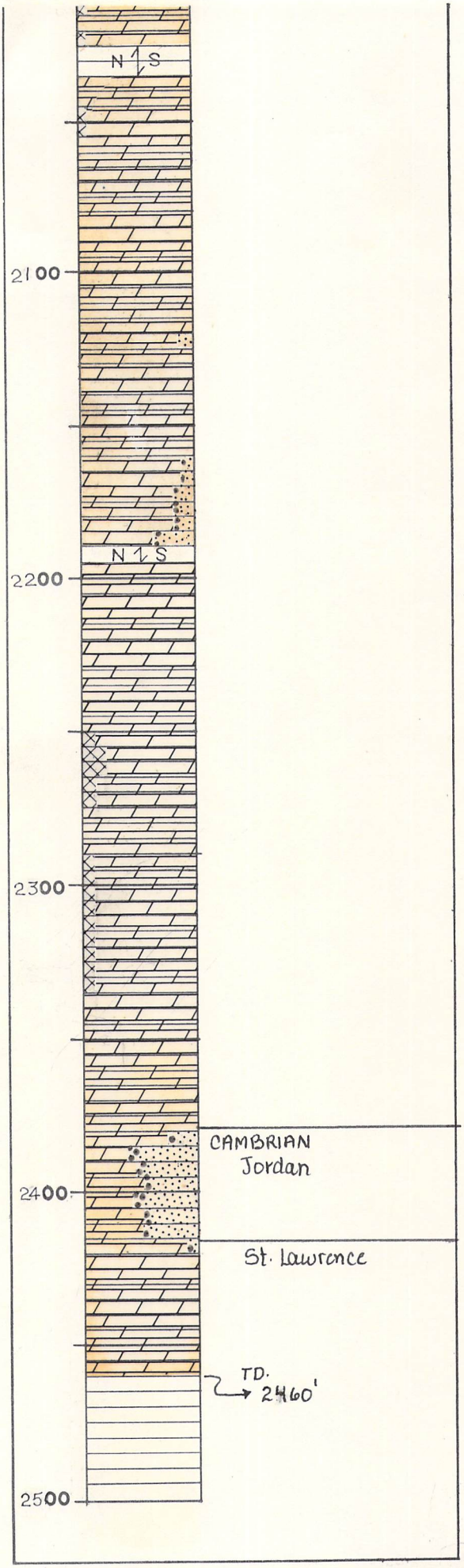
Explanation of Colors

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


Gilmore City
Hampton
600
Prospect Hill
700
DEVONIAN (formerly MISS.)
Maple Mill
Lime Creek
800
900
Cedar Valley ?
1000


1100
1200
Wapsipinicon
1300
La Porte City ?
SILURIAN
1400
ORDOVICIAN
Maquoketa
1500


N
S
1600
1700
1800
1900
2000
Galena
Decorah
Platteville
St. Peter
Prairie du Chien


N S
2100
N S
2200
2300
CAMBRIAN
Jordan
2400
St. Lawrence
TD.
2460'
2500

COMPANY West Des Moines City Well FARM WELL NO.

SEC. TWP. RGE. LOC. COUNTY STATE

CONTRACTOR Winslow SIZE HOLE DRILL PIPE

REMARKS: Depth Measurments are taken from Kelly Bushing 12' above ground level SIZE PUMP LINERS LENGTH STROKE

48' of 30" csg.
2025' of 10" csg

DATE

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1900 / 01		17	
02		15	
03		16	
04		19	
05		19	
06		18	
07		16	
08		17	
09		17	
10		25	
11		19	
12		20	
13		18	
14		15	
15		16	
16		15	
17		13	
18		13	
19		10	
20		12	
21		18	
22		10	Viscosity 42 : wt. 9.9
23		14	
24		11	
25		15	
26		11	
27		18	
28		14	
29		19	
30		11	
31		1	Top ST Piton 1930'
32		1	
33		1	
34		1	
35		2	
36		5	
37		10	
38		7	
39		3	
40		5	
41		2	
42		1	
43		1	
44		1	
45		1	
46		1	
47		1	
48		2	
49		1	
50		1	

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1450 / 51		1	
52		1	
53		2	
54		1	
55		1	
56		1	
57		1	
58		1	
59		1	
60		1	
61		1	
62		2	
63		2	Top Prairie du Chien 1963
64		6	
65		8	
66		7	
67		5	
68		4	
69		4	
70		5	
71		4	
72		5	
73		4	
74		4	
75		5	
76		4	
77		7	
78		6	
79		6	
1980		6	
81		10	
82		8	
83		7	
84		6	
85		8	

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

COMPANY FARM WELL NO.

SEC. TWP. RGE. LOC. COUNTY STATE

CONTRACTOR SIZE HOLE DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1985/86		8	
87		8	
88		8	
89		6	
90		10	
91		7	
92		13	
93		7	
94		10	
95		16	
96		10	
97		7	
98		10	
99		8	
2800		6	
01		11	
02		8	
03		9	
04		6	
05		7	
06		11	
07		10	
08		12	
09		12	
10		13	
11		7	
12		10	
13		15	
14		12	
15		10	
16		11	
17		7	
18		8	
19		6	
20		7	
21		8	
22		8	
23		9	
24		11	
25		11	

DEPTH	TIME O'CLOCK	MIN.	REMARKS

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

COMPANY FARM WELL NO.

SEC. TWP. RGE. LOC. COUNTY STATE

CONTRACTOR SIZE HOLE DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2036/40		10	
45		15	
50		17	
55		16	
60		17	
65		15	
70		15	
75		17	
80		17	
85		16	
90		20	
95		18	
2100		19	
5		13	
10		12	
15		16	
20		22	
25		15	
30		15	
2135		20	
40		21	
45		20	
50		21	
55		19	
60		22	
65		22	
70		20	
75		20	
80		20	
85		20	
90		18	
95		18	
2200		6	
01		2	
02		4	
03		4	
04		6	
05		7	
06		7	
07		4	
08		3	
09		5	
10		2	
11		3	
12		3	
13		2	
14		3	
2215		5	

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2215/16		1	
17		2	
18		3	
19		2	
20		4	
21		3	
22		3	
23		2	
24		2	
25		3	
26		2	
27		2	
28		2	
29		4	
30		4	
31		3	
32		3	
33		2	
34		2	
35		2	
36		1	
37		1	
38		3	
39		2	
40		2	
41		2	
42		4	
43		3	
44		5	
45		4	
46		3	
47		5	
48		4	
49		4	
50		4	
51		4	
52		3	
53		4	
54		4	
55		3	
60		16	
65		12	
70		14	
75		13	
80		15	
85		20	
90		20	
95		20	
2300		20	

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

SEC. TWP. . RGE. LOC. COUNTY STATE

CONTRACTOR SIZE HOLE DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2360/5			5 Sacks MUD
10			
15			
16		5	
17		5	
18		6	
19		5	
20		6	
21		6	
22		5	
23		4	
24		4	
25		5	
26		4	
27		4	
28		2	
29		3	
30		4	
31		4	
32		5	
33		5	
34		4	
35		3	
36		5	
37		5	
38		5	
39		5	
40		6	
41		7	
42		5	
43		5	
44		6	
45		6	
46		5	
47		5	
48		5	
49		5	
50		3	
51		7	
52		4	
53		5	
54		4	
55		4	
56		4	
57		2	
58		2	
59		5	
2360		6	

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2360/61		7	
62		5	
63		6	
64		6	
65		2	
66		4	
67		4	
68		6	
69		2	
2370		6	
71		9	
72		11	
73		8	
74		2	Tip Jordan 2373 ?
2375		4	
76		4	
77		3	
78		4	
79		3	
80		4	
81		4	
82		2	
83		3	
84		4	
85		5	
86		4	
87		4	
88		6	
89		5	
90		2	
91		4	
92		4	
93		5	
94		5	
95		7	
96		6	
97		5	
98		5	
99		5	
2400		2	
1		5	
2		4	
3		6	
4		6	
5		9	
6		7	
7		5	
8		7	
9		7	
2410		9	

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

LOC. COUNTY STATE

CONTRACTOR SIZE HOLE DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2410 / 11		11	
12		10	
13		12	
14		13	
15		12	
16		9	TOP ST. LAWRENCE?
17		8	
18		8	
19		7	
20		5	
21		8	
22		7	
23		8	
24		9	
26		13	
26		6	
27		6	
28		7	
29		8	
30		7	
31		8	
32		8	
33		9	
34		4	
35		6	
36		4	
37		4	
38		4	
39		6	
40		6	
41		6	

DEPTH	TIME O'CLOCK	MIN.	REMARKS

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

GW West Des Moines Gen. Data (Polk Co.)

January 4, 1967

Mr. J. W. Kimm
Veenstra & Kimm
924 Fourth Street
West Des Moines, Iowa 50265

Dear Mr. Kimm:

Enclosed is our estimate of the geologic section down through the St. Lawrence Dolomite at West Des Moines, Iowa. All depths are referred to a starting elevation of 820 feet above sea level in the vicinity of the existing city shallow well field located immediately west of 15th Street between Maple and Railroad Streets. According to our maps this places it on a terrace of the Raccoon River in the SE¼ SE¼ SW¼ sec. 10, T. 78N., R. 25W., Polk County.

Based on the favorable results obtained at Jordan wells drilled in the greater Des Moines area in recent years, the prospects appear excellent that a well penetrating this aquifer at West Des Moines can be developed to yield 1,000 gallons a minute or more of water of good quality. Most of these wells are cased from the surface into the upper part of the Prairie du Chien Dolomite with the casing grouted in place for its full length with neat cement to assure a good seal and protect the pipe from corrosion. Analyses of the water from the present shallow city wells and from deep Jordan supplies in the surrounding vicinity does not indicate important differences, although the dissolved solids content of the Jordan water probably will be somewhat higher. The Jordan water may also be moderately high in fluorides. The temperature of the water from the shallow aquifer is about 54° F; whereas, the water from the Jordan will be about 68-72° F.

We trust this is the information you wished. If any questions remain or if we can be of additional assistance in this matter, please let us know.

Very truly yours,

H. G. Hershey

HGH-PJH/1
Enclosure

Anticipated Geologic Section at West Des Moines, Iowa
(Approximate surface elevation 820 feet above sea level)
as Forecast by the Iowa and U.S. Geological Surveys

Formation	Thickness (ft.)	Depth Range (ft.)
Quaternary System		
Recent and Pleistocene Series (thin soil and silt at top, underlain by alluvial materials chiefly sand and gravel; may include some glacial till)	25 - 50	0 - 35±
Pennsylvanian System		
Des Moines Series (mostly shale, locally includes interbedded sandstones and 1 or 2 thin coal beds)	275±	35± - 310±
Mississippian System		
St. Louis Formation (limestone, dolomite, and sandstone, in variable percentages)	60	310± - 370
Warsaw-Keokuk-Burlington Formations (mostly dolomite and chert, some thin shales in upper part)	200	370 - 570
Gilmore City Limestone, oolitic	15	570 - 585
Hampton Formation (dolomite and minor chert)	90	585 - 675
North Hill Limestone	15	675 - 690
Prospect Hill Siltstone	5	690 - 695
Maple Mill Shale	20	695 - 715
Devonian System		
Aplington Dolomite	10	715 - 725
Sheffield Shale	10	725 - 735
Lime Creek Formation (mostly limestone, some dolomite, some shale in upper part)	120	735 - 855
Cedar Valley Formation (dolomite, with disseminated and bedded gypsum and anhydrite in lower 2/3's)	420	855 -- 1275
Wapsipinicon Formation (dolomite, probably includes some gypsum - anhydrite, mostly chert in lower part)	100	1275 - 1375
Silurian System		
Niagaran Series (dolomite, some chert)	45	1375 - 1420
Ordovician System		
Maquoketa Formation (thin shale at top, underlain by dolomite and chert)	295	1420 - 1715
Galena Formation (dolomite with minor chert in lower half)	165	1715 - 1880

Formation	Thickness(ft.)	Depth Range(ft.)
Decorah-Platteville Formations (limestone, dolomite, and shale in variable percentages)	65	1880 - 1945
St. Peter Sandstone	40	1945 - 1985
Prairie du Chien Formation (upper half sandy and cherty dolomite; Root Valley Sandstone Member 60±' thick near middle; lower half dolomite with some chert and little or no sand)	400	1985 - 2385
Cambrian System		
Jordan Sandstone, includes some dolomite	40	2385 - 2425
St. Lawrence Dolomite, silty	100±	2425 - 2525±

255-2559
Area Code 515

Veenstra & Kimm

CONSULTING ENGINEERS

H.R. Veenstra J.W. Kimm

924 Fourth Street
West Des Moines, Iowa
50265

December 20, 1966

IOWA GEOLOGICAL SURVEY
DEC 21 1966

Iowa Geological Survey
Geological Survey Building
Iowa City, Iowa 52240

Attn: Dr. H. G. Hershey

Proposed Jordan Well
West Des Moines, Iowa

Gentlemen:

The West Des Moines' Waterworks is contemplating construction of a deep well to meet increasing demands for water. Would you please furnish us, if possible, with a forecast of the formations which will be encountered in construction of a deep well to the Jordan sandstone in the West Des Moines area.

The location of the well will be near the existing shallow well field at approximate ground elevation 820, USGS datum.

Yours very truly,

VEENSTRA & KIMM

By J. W. Kimm

JWK:mad
10213
cc: Ray Hall

GW West Des Moines well folder (1967) Polk Co.

June 28, 1967

MEMORANDUM

TO: Dr. H. G. Hershey

FROM: Richard Northup

Erickson!

RE: Pumping test at West Des Moines

The final pumping test for the New Jordan well at West Des Moines, was conducted last week, June 22-23. At the request of Mr. Ed Winslow the contractor, and Mr. Bob Brickson, of Veenstra and Kimm Engineering Co., I attended the test. A previous test, conducted on June 5, yielded 867 gpm, with static water level of 83' and pumping level of 306', for specific capacity of 3.88 gallons per foot of drawdown. The well was then acidized with 8400 gallons of treatment acid. After increasing the pumping rate through several stages, the well yielded 2150 gpm. Static on the second test was 79', with pumping level of 172' or specific capacity of 23.1 gallons per foot of drawdown, when pumping at this rate. The specific capacity was higher yet while pumping the well at around 1000 to 1500 gpm. A complete record of the pumping figures is attached for your inspection.

Water sample was collected near the conclusion of the test which officially ended at 10:30 AM, June 23rd. Mr. Erickson decided to keep pumping a while longer to see if there was any notable change in water quality. Preliminary check showed the water to be good, with total hardness of 340 ppm, PH of 9, and iron .32 ppm. Our official sample was delivered to the lab in Des Moines just before noon on Friday.

I believe that you will agree that this test, and the ones at Winterset last spring, clearly show the advantages of a good acid job, properly handled, in increasing the yeild and improving the specific capacity in many of these Jordan wells. The cost of the acid job, while naturally adding to the expense of the well, will more than be offset within a year by much more reasonable pumping costs.

GW West Des Moines
Geo Data
(Polk Co.)

MEMO

October 9, 1968

TO: Dr. H. G. Hershey

FROM: Richard C. Northup

RE: West Des Moines City Well.

Bob Erickson, Veenstra & Kimm Engineering Co. at West Des Moines, phoned Wednesday morning to advise that ammonia has shown up in the new Jordan well completed last year. While the amount is small (1.3ppm) they are somewhat concerned as to the source, and whether there is a chance of its increasing. According to all records, both the surface casing and the deep casing set 100 feet into the Prairie du Chien, were satifactorily cemented, the cement circulating to the surface, which would rule out any surface or near surface contamination. As to a deeper source, it seems unlikely. At least I know of no Jordan or other deep well showing anything of this kind. I am inclined to believe that it is coming in from the surface somehow though they can find no likely nearby source. The Penn Dixie Cement plant is about a half mile away, but they would not be likely to use ammonia or other nitrate compound. There is always a remote possibility that there could be a break in the casing near the surface allowing water from the sand and gravel ~~near the surface~~ TO ENTER THE WELL, and I suggested that perhaps they could run a caliper or temperature log as an aid to locating any trouble of this kind, and that Haliburton or Schlumberger should be qualified to run this kind of log. Mr. Erickson also reports a pumping level of from five to ten feet lower than when the well was tested. The well was acidized after the first pumping test and had (and still has) excellent yield and capacity.

It would help if they could take monthly water samples to see if the ammonia content is increasing. Ammonium pollution may come from organic waste products

Info from Varner Well Company on 3/14/74

The West Des Moines city well No. 2 (1971) was acidized with 3000 gallons of HCl, 15°. This was the original development. The acid was injected through the pump column. The well was sealed at the pump base during this operation.