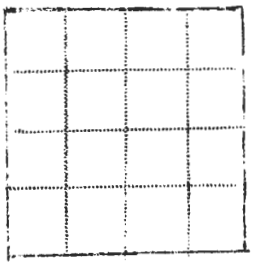
W10712

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

Location: 1/4 mi. W.

Town: WEST BEND (NE) (SW) County PALO ALTO

SW, NE sec. 13 T. 94 N., R. 31 (W.) Twp



Well name and number

Owner CITY OF WEST BEND (1959) Address WEST BEND, IOWA

Tenant Address

Contractor THORPE WELL CO. Address 2340 SIXTH AVE. DES MOINES, IOWA

Drillers SPRING 1959

Drilling dates

Well data:
Altitudes: Drilling curb feet; Land surface feet

Determined by

Topographic position

Total depth: Reported 1360 feet; Measured feet

Drilling method ROTARY

Hole and casing data 220 OF 10" CASING 0-220

50 OF 7" CASING 465-515

60 OF 7" CASING 846-1006

Original depth to water 107 ft. above below Date

Source of data

Sources of water: Principal

Others

PRODUCTION DATA

Date _____

Static water level 107

Pumping water level 215

Yield (g.p.m.) 415 - WATER TEMPERATURE 54

Measuring point _____

Duration of pumping _____

Specific capacity _____

LABORATORY DATA

SA3-7,8,9

Well No. W10718 Sample range 0-13160 No. of samples 273

No. of dupls. and cond. 263 - good Washed range 115-13160

Samples prepared by Fishwild Date 6/12/59 6/26/59 8/10/59

Logged by NORTHUP Date 8/26/59

Correlations by _____ Date 8/26/59

THORPE WELL COMPANY

1340 SIXTH AVENUE
DES MOINES, IOWA

W10712

Drilled for City of West Bend *at* West Bend, Iowa

Well is located 1/4 *miles* [redacted] *W and* ____ *miles N-E-S-W from* City

in the ____ ¼ ____ ¼ *Section* ____ *Township* ____ *Range* ____

Drilling started ____ *19*__ *Completed* ____ *19*__

Well No ____ *Kind of Well* Straight wall *Depth* 1360' *Size hole started* 13 3/4 *in.*

Finish 9 5/8 & 6 1/4 *G. P. M.* 415 *Static Head* 107' *Pumping level from surface* 215'

Water was first encountered at ____ *in* ____ *Approx. Amt.* ____ *Temp.* 54°

Remarks ____

(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
10"ID	220'	220'	0			
7" OD	50'	515'	465			
7" OD	160'	1006'	846'			

Driller Bob Yarbro *From Surface to* ____ *feet*

Driller Bernard Ruth *From* ____ *feet to* ____ *feet*

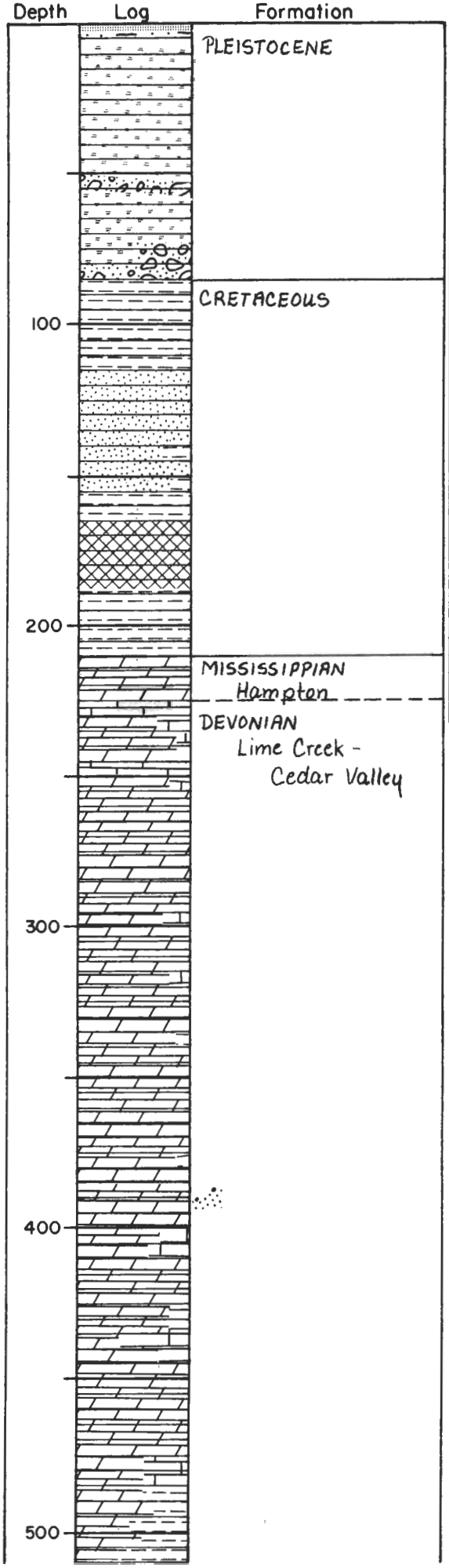
Driller Bill Faust *From* ____ *feet to* ____ *feet*

AMOUNT IN FEET	KIND OF SOIL OR FORMATION (BE SPECIFIC)	TOTAL DEPTH FEET
2	top soil	2
3	Yellow clay	5
5	Boulder at 10' - yellow clay	10
5	Gray clay & streaks of sand	15
18	Med. gravel & gray clay	33
44	Gray sandy clay	77
8	Med. to fine sand	85
25	Gray shale	110
1	Lime streak	111
5	Gray shale	116
34	Lime - very soft	150
3	Red shale	153
10	Gray shale - sandy	163
2	Red shale	165
23	Thin streak of coal & hard limestone	188

--over--

17	Blue shale	205
3	Sandstone	208
7	Blue shale & lime streaks	215
156	Limestone - brown & gray	371
4	Streak of hard shale	375
60	Gray limestone	435
50	Brown limestone	485
25	Blue shale	510
15	Brown limestone	525
3	Blue shale & limestone streaks	528
40	Brown, gray lime stone & shale streaks	568
3	Blue shale	571
6	Brown limestone	577
2	Gray shale	579
26	Gray & brown limestone	605
10	Gray shay limestone	615
35	Sandstone	650
80	Gray limestone	730
25	Brown limestone & shale streaks	755
65	Brown limestone	820
5	Gray limestone	825
37	Gray limestone & hard shale streaks	862
10	Hard gray & white limes	872
38	Green shale	910
12	Brown shale & brown li one	922
3	Gray limestone	925
7	Green, shale & traces of te sand	932
3	Very hard black rock, py s of iron	935
10	Green shale & white sand eaks	945
53	White sand & traces of sl	998
1	Pyrites of iron	999
93	Hard gray limestone & ch	1092
28	Hard gray limestone & ch streaks of hard sand	1120
90	Hard gray limestone & ch	1210
25	Brown limestone & streak anhydrites	1235
15	Dark gray limestone & stre of sandstone	1250
30	Sandstone & limestone stre	1280
70	White sandstone	1350
5	Sandstone, broken with dolo	1355
5	Dolomite & blue shale streaks	1360

Gen. Data

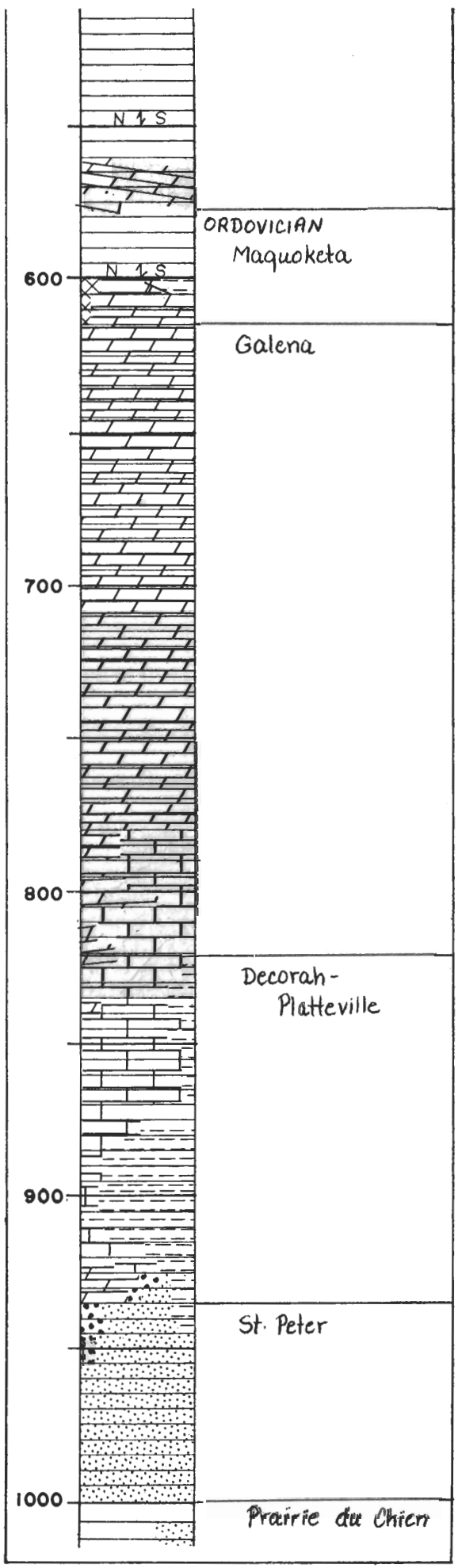


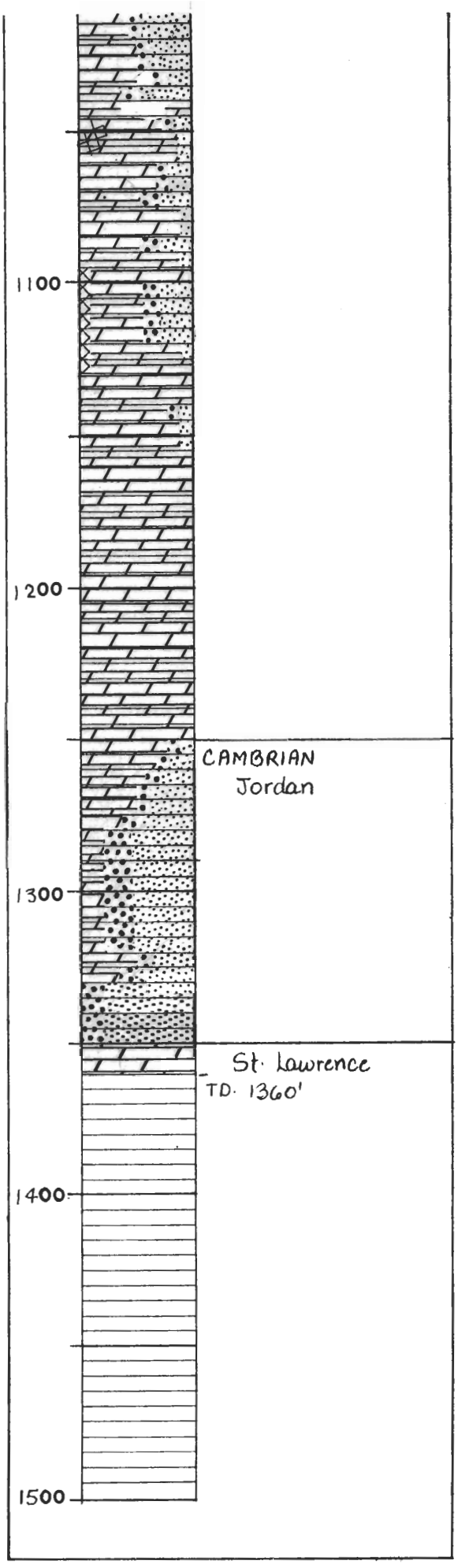
IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

Name: West Bend City Well	State: Iowa
Town: West Bend — County: Palo Alto	Loc.
Contractor: Thorpe Well Co. — Driller	Sec. 13
Drilling Dates: Spring - 1959	T. 94 N., R. 31 W
Casing Record: 220' of 10" csg: 0-220' 50' of 7" csg: 465-515' 160' of 7" liner: 846'-1006'	
S.W.L. 107 — G.P.M. 415 — D.D. 108	
Remarks: Water Temp. 54°	Elev. 1205
	T.D. 1360
Logged By: Aug. 26, 1959 Northup	I.G.S. No. W-10712

Explanation of Colors

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


N S
ORDOVICIAN
Maquoketa
N S
600
Galena
700
800
Decorah-
Platteville
900
St. Peter
1000
Prairie du Chien


1100
1200
CAMBRIAN
Jordan
1300
St. Lawrence
TD. 1360'
1400
1500

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSES
(Dissolved constituents in parts per million)

COUNTY Palo Alto

TOWN - Well No. / Use - Location	Date of coll.	Depth (ft.)	Geol. source	°F.	Diss. solids	Fe	Mn	Ca	Mg	K/Na Na+ K(as Na)	HCO_3	SO_4	Cl	F	NO_3	Hardness (calc. as $CaCO_3$) Tot.	Carb.	Non-carb.	pH	Cond.
West Bend Co-op Creamery	3/23/45	1078	Dev. Sat. Sten	51	661	0.8	0.0	118	50	57	494	189	6.5	1.0	0.18	500	405	95	7.3	

NOTES:

Palo Alto

October 6, 1958

TO: Dr. H. G. Hershey
FROM: Charles Brown
SUBJECT: West Bends water supply and call to Tom Thorpe.

In response to a telephone call from Tom Thorpe, October 2, 1958, Orville Van Eck prepared these comments for a call to Thorpe this morning.

Apparently Thorpe never tested deep enough and will now do so. He will save samples

CB

To: Tom Thorpe
Subject: Well at West Bend, Palo Alto County.

Thorpe drilled a well in 1949 for this town. The well was 115 T.D. and entered the Dakota sandstone at 107 feet. Ten feet of 8 inch screen was set at 115 feet and gravel packed. This well had a static water level of 10 feet, with a drawdown of 38 feet after pumping at 100 gpm for 21 hours. The well was located in the SW corner NE$\frac{1}{4}$, Sec. 13 T 94 N., R. 31 W.

The Co-op creamery in West Bend, located in SE$\frac{1}{4}$, SW$\frac{1}{4}$, NE $\frac{1}{4}$, sec. 13, T. 94 N., R. 31 W., has a well 1078 feet deep which had the following section:

		From-To	Feet
Pleistocene			
	Till	0 - 110	110
Cretaceous			
	Graneros shale	110 - 140	30
	Dakota Sandstone (some sh)	140 - 235	95
Mississippian			
	Hampton (dolemite)	235 - 275	40
Devonian			
	Lime Creek (ls. some sh.	275 - 300	25
	Shell Rock (dolemite)	300 - 350	50
	Cedar Valley (dol. some sh.)	350 - 630	80
Ordovician			
	Magnoketa (dol & ls., some chert		
	Galena (ls and dol.)	357	
	Decorah-Platterville (ls and sh.)		
	St. Peter sandstone	90+	

The well was cased as follows:

244 feet of 8 inch casing 0 -244
137 feet 8 inch at 6 inch liner set at 992
Open hole 244 - 854 and 992 - 1078

When the well was at 516 feet it produced 50 gpm with a drawdown of 40 from a static water level of 55 feet. On completion it produced 161 gpm with a 15-foot drawdown from a static water level of 56 feet. See pumping test

We do not have a mineral anaysis of the shallow Dakota sandstone well that Thorpe drilled for the town in 1949. However, another Dakota

← We do now. Samples were obtained 9/16/58 Also from the new 118' well

analysis shows a high dissolved solids content, total hardness and moderately high sulphate content. Copies of analysis are attached.

Most of the wells in the vicinity are cased through the Dakota. Probably because of the sand problem. Thorpe may have overcome this with their gravel pack.

The possibility that they may find a thicker Dakota section would not seem too good. The evidence we have does not show that this aquifer is being heavily drawn upon. In the well they did drill, we do not have evidence that they have penetrated all of the Dakota. However, the Co-op creamery well does have a 20 foot shale section in the middle of the Dakota that may prove troublesome.

To sum up, a deeper well than they drilled for the city would probably have a thicker section of Dakota Sandstone. Probably no reason for moving the location a great distance, other than to avoid interference.

9/16/58

West Bend Town No. 2 115' deep pumping 110 gpm
" No. 3 118' 76 gpm

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSIS
(Dissolved constituents in parts per million)

Town - Well No Owner	Date of coll.	Depth (ft.)	Geol. source	°F	Diss. solids	Fe	Mn	Ca	Mg	K/Na K	 Na	CO_3	HCO_3	SO_4	Cl	F	NO_3	Hardness cal. as $CaCO_3$ tot	 carb	 non carb	pH	Cond
West Bend Co-op Creamery	3/23/45	1078	Dev. St. Peter	51	661	0.8	0.0	118	50	57		[illegible]	494	189	6.5	1.0	.18	500	405	95	7.3	

NOTES:

Palo Alto

May 15, 1959

TO: Dr. H. G. Hershey
FROM: Richard Northup
SUBJECT: West Bend City Well

Thorpe well Co. phoned Friday morning in regard to the well at West Bend. They have reportedly drilled just below the St. Peter sandstone into the Prairie du Chien (St. Peter 945-998) and have run a pumping test which made 185 g.p.m. The water is coming from the St. Peter, Dakota, and the entire section between according to Thorpe. They are in doubt as to whether to try to develop the well as is or to drill to the Jordan. At any rate they requested a revised forecast to the Jordan, and I have given the information to Paul.

Palo Alto

May 15, 1959

Thorpe Well Company
Post Office Box 1376
Des Moines, Iowa

Dear Mr. Thorpe:

In response to your telephone call of May 15 concerning information on the strata below the St. Peter sandstone down through the Jordan sandstone at West Bend, Iowa, we have assembled the pertinent data as follows:

The West Bend Co-op Creamery well which has a starting elevation of 1205 feet penetrated the St. Peter sandstone at a depth of about 985 feet and continued down in the same formation to a total depth of 1078 feet. In the well you are now drilling for the city you have reported the St. Peter between 945 and 998 feet and the top of the underlying Prairie du Chien at 998 feet.

According to our maps the top of the Jordan sandstone should occur at about 110 feet below sea level at West Bend or about 1315 feet below the surface in the creamery well. If the top of the Prairie du Chien was encountered at 998 feet in the city well, the top of the Jordan is expected about 237 feet lower or at about 1235 feet. However, as we do not have the correct starting elevation of the new city well and the nearest deep Jordan well records are at Algona and Ringsted, some allowance should be made for adjusting the predicted depths.

The Prairie du Chien formation consists mostly of dolomite although the upper half is very sandy. The Jordan sandstone probably will be about 100 feet thick. Below it is about 125 feet of silty and glauconitic dolomite belonging to the St. Lawrence formation.

To sum up, the following is the anticipated geologic section below the bottom of your present drilling:

Formation	Thickness (ft)	Depth Range (ft)
Ordovician system		
Prairie du Chien formation	237	998-1235
Cambrian system		
Jordan sandstone	100	1235-1335
St. Lawrence dolomite	125	1335-1460

We trust this is the information you wished. If there are any questions remaining or if we can be of further help in any way, please let us know.

Very truly yours,

H. G. Hershey

PJH:mc

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	0	2	2	TOP SOIL
	2	5	3	YELLOW CLAY
	5	10	5	BOULDER AT 10' YELLOW CLAY
	10	15	5	GRAY CLAY & STREAKS OF SAND
	15	33	18	MED. GRAVEL & GRAY CLAY
	33	77	44	GRAY SANDY CLAY
	77	85	8	MED. TO FINE SAND
	85	110	25	GRAY SHALE
	110	111	1	LIME STREAK
	111	116	5	GRAY SHALE
	116	150	34	LIME VERY SOFT
	150	153	3	RED SHALE
	153	163	10	GRAY SHALE SANDY
	163	165	2	RED SHALE
	165	188	23	THIN STREAK OF COAL HARD LIME STONE
	188	205	17	BLUE SHALE
	205	208	3	SANDSTONE

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	208	215'	7	BLUE SHALE & LIME STREAKS
	215'	280	65'	LIME STONE BROWN & GRAY
	280	371	91	DOLOMITE & LIME STONE
	371	375'	4	STREAK OF HARD SHALE
	375'	435'	60	GRAY LIMESTONE
	435'	485'	50	BROWN LIMESTONE
	485'	510	25'	BLUE SHALE
	510	525'	15'	BROWN LIMESTONE
	525'	528	3	BLUE SHALE & LIMESTONE BREAKS
	528	568	40	BROWN, GRAY LIMESTONE & SHALE BREAKS
	568	571	3	BLUE SHALE
	571	577	6	BROWN LIME STONE
	577	579	2	GRAY SHALE
	579	605'	26	GRAY & BROWN LIMESTONE
	605'	615'	10	GRAY LIMESTONE
	615'	650	35'	SAND STONE
	650	730	80	GRAY LIMESTONE

Lit 5

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	230	255	25	BROWN LIME & SHALE BREAKS
	255	320	65	BROWN LIMESTONE
	320	325	5	GRAY LIMESTONE
	325	362	37	GRAY LIME & SHALE HARD BREAKS
	362	372	10	HARD GRAY & WHITE LIMESTONE
	372	410	38	Shale (GREEN)
	410	422	12	BROWN SHALE & BROWN LIMESTONE
	422	425	3	GRAY LIMESTONE
	425	432	7	GREEN SHALE & TRACES of WHITE SAND
	432	435	3	VERY HARD BLACK ROCK (Pyrites of Iron)
	435	445	10	GREEN, WHITE SHALE & SAND BREAKS
	445	498	53	WHITE SAND & TRACES of SHALE
	498	499	1	Pyrites of Iron
	499	1006	7	Gray Limestone, Very Hard
	1006	1092	86	Hard Gray Lime & Chert
	1092	1120	28	Gray Lime & Chert & Streaks of Hard Sand
	1120	1210	90	Hard Gray Lime & Chert

NEXT PAGE

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	1810	1835	25	Brown Lime & Streaks of Anhydrites
	1835	1850	15	Dark Gray Lime & Streaks of Sand Stone
	1850	1280	30	Sandstoned Limestone streaks
	1280	1350	70	Sandstone
	1350	1355	5	Sandstone, Broken with Limestone
	1355	1360	5	Hard Brown Limestone, Blue Shale

15 27

21-2
DRILL 4 3/4"

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
				— TEST PUMP — 5-7-59
				Bowl - 16-stage 8" MC 8'-10"
				5"-14p. col. & $1\frac{3}{16}$" shaft 215'-0"
				6"-14p. col. & $1\frac{3}{16}$" shaft 85'-0"
				$16\frac{1}{2}$ x 6 disch. head
				Johnson Gear PB2, $1\frac{1}{2}$:1
				Continental Eng.

43 joints of 2½" on job

Sample No.	DEPTH From	DEPTH To	THICKNESS
29—	Kelly		29—
.5'	Lift 6¼"		29.5'
2—	Sub	5 7/16 o.d.	31.5'
1.3	Sub	5 9/16 O.D	32.8
29.5'	1	3½" o.d.	62-1
30-8	2		92-9
30-4	3		123.1
29-6	4		152.7
30-8	5		183.3
2-4	Sub		185.7
937.3	31 joints 2⅜ D.P.		1122.10
29.6	32		1152.4
30.1	33		1182.5
30.3	34		1212.8
30.11	35		1243.7
30.4	36		1273.11
30.8	37		1304.1

DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.		
30.10	37	1334.11
30.3	38	1365.2

9 5/8" Kits Hughes W7

FOR FIGURING, CASING TALLY, ETC.

33 — Kelly less 4'		29 —
4 - 3' B.H. + Subs		33 - 3
21 — Drill Collars	1.	54 - 3
20 —	2.	74 - 3
20 —	3.	94 - 3
30 - 8	DRILL PIPE (3½) 1	124 - 11
30 - 8	2	155 - 7
30 - 4	3	185 - 11
29 - 6	4	215 - 5
29 - 5	5 (2½)	244 - 10
30 - 10	1	275 - 8
30 - 8	2	306 - 4
30 - 5	3	336 - 9
30 - 8	4	367 - 5
29 - 5	5	396 - 10
30 - 8	6	427 - 6
29 - 5	7	456 - 11
30 - 1	8	487 - 0
28 - 2	9	515 - 2

FOR FIGURING, CASING TALLY, ETC. 515 - 2

30 - 7	10.	545 - 9
30 - 7	11.	576 - 4
30 - 6	12.	606 - 10
30 - 10	13.	637 - 8
30 - 2	14.	667 - 10
30 - 10	15.	698 - 8
30 - 4	16.	729 - 0
29 —	17.	758 —
30 - 7	18.	788 - 2
30 - 7	19.	819 - 2
30 - 9	20.	849 - 11
30 - 6	21.	880 - 5
28 - 2	22.	908 - 7
30 - 4	23.	938 - 11
30 - 7	24.	969 - 6
30 - 8	25.	1000 - 2
30 - 7	26	1030 - 9

FOR FIGURING, CASING TALLY, ETC.

786		786 —
30 - 2	27	816 - 2
29 —	28	845 - 2
30 - 8	29	876 - 3
30 - 6	30	906 - 9
15 - 8		922 - 7
		29 -
		951 - 7

FOR FIGURING, CASING TALLY, ETC.

