

SOUTH DAKOTA  
STATE GEOLOGICAL SURVEY  
E.P. Rothrock, State Geologist

REPORT OF INVESTIGATIONS  
NO. 4

LOGS OF SOME DEEP WELLS  
IN WESTERN SOUTH DAKOTA

University of South Dakota  
Vermillion, South Dakota

Revised Edition  
1946

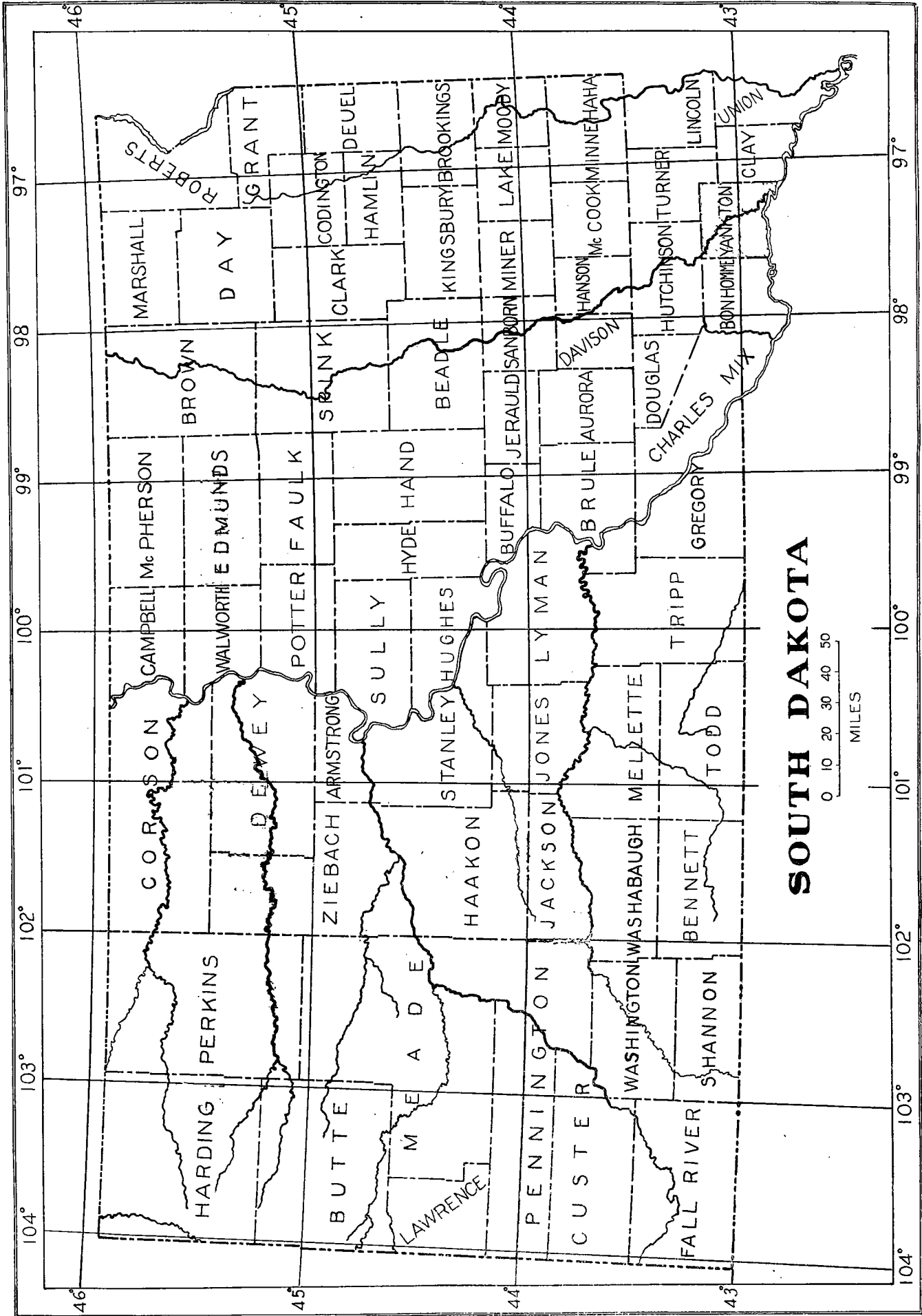
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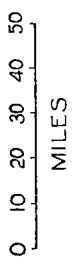
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**SOUTH DAKOTA**



## LOGS OF SOME DEEP WELLS IN WESTERN SOUTH DAKOTA

### Forward

The demand for logs of deep wells drilled in the state has been so great that the stock of Report of Investigations No. 4 has been exhausted for several years. Since this report was published in 1936 there has been a considerable increase in deep well drilling in South Dakota and excellent logs are available from most of the newer wells. The older records, however, still are very useful in guiding oil and water prospecting and, therefore, the Survey is republishing this report.

A number of changes have been made in the interest of greater spread and accuracy. Certain records of wells east of the Missouri river have been added and some minor changes are to be found in the older logs. These were brought to light by information unearthed since the logs were first published.

The Survey has just completed a careful examination of the cuttings of all deep wells in its files. This is to be published as a separate report. Some of these logs had been published as drillers' logs or from company reports in the first edition of this report. These logs have been omitted and will appear in the new publication just mentioned.

The logs in these two publications will contain the best geological subsurface information available to date and it is hoped will supply useful information on South Dakota stratigraphy to users of such data.

E.P. Rothrock  
State Geologist  
1946

## Forward

This compilation of well logs has been made in answer to a persistent demand for information concerning bed rock formations underlying western South Dakota. Interest in the oil possibilities of this region and the problem of the declining artesian water head has given rise to many inquiries for the information which can be obtained from the logs of wells drilled in this region. The demand has come from oil companies, geologists, engineers, municipalities and land owners. It has not been possible to include all the wells that have been drilled because of lack of usable records and various other reasons. The logs included, however, represent the best information available.

These logs have been selected from the files of the State Geological Survey, having been collected over a long period of years by various Survey employees. They are presented here as they were given. Most of them are drillers' records. Others had to be obtained by relying on the memory of persons otherwise interested in the drilling. A very few were obtained from records made by company geologists from carefully collected samples. Coming from so many sources it is obvious that there will not be complete agreement in the terms used for various types of sediments and in the details of the logs. By interpolation, however, the main features of stratigraphy can be obtained.

Acknowledgment of the courtesy of the many companies and individuals who have made these logs available is hereby given. Most of the early wells and several of the recent ones were furnished by the Norbeck Drilling Company of Redfield, South Dakota. Railroad and oil companies have generously furnished logs and well owners and private individuals have given a great deal of very helpful information.

Acknowledgment is also made of the careful and painstaking work of Mrs. Doris L.M. Anderson which made this compilation possible.

Correlations of these logs with the formations outcropping about the Black Hills have been included in some instances where it was reasonably certain that they were accurate. Those made by company geologists from carefully sampled wells are so indicated. In some logs formation names were used by the drillers and such names are indicated in quotation marks. Correlations not otherwise indicated were made on a lithologic basis by the State Geologist.

E.P. Rothrock  
State Geologist  
1936



AURORA COUNTY

City of Plankinton Well

LOCATION: Sec. 22, T. 103 N., R. 64 W., Aurora County  
 OWNER: City of Plankinton  
 DRILLER:  
 DATE OF DRILLING: 1904  
 CURB ELEVATION: 1530'  
 SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper  
 227, p. 68.

		Feet	
		0 - 145	Drift and clay
<u>Niobrara</u>		145 - 256	Chalk rock
		256 - 266	Sand and soft water
		266 - 538	Shale, some sandy layers
	<i>Dakota</i>	538 - 543	Sandstone, with flow <span style="float: right;">+ 892' at.</span>
		543 - 763	Shale, probably with a flow at 646'
		763 - 793	Sandstone with main flow
	<i>P. &amp; L</i>	793 - 795	Quartzite (probably Sioux quartzite) <span style="float: right;">+ 892' at.</span>

REMARKS: It is believed that the top of the Dakota lies at a depth of 538' in this well. (Quartzite is reported at a depth of 850' at White Lake, with the top of Dakota Sandstone at 790')  
 850

Raesley Well

LOCATION: SW.  $\frac{1}{4}$ , Sec. 28, T. 103 N., R. 63 W., Aurora County  
 OWNER:  
 DRILLER:  
 DATE OF DRILLING: Before 1909  
 CURB ELEVATION: 1490  
 SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper  
 227, p. 67.

		Feet	
		0 - 90	Drift
<u>Niobrara</u>		90 - 230	Chalk rock
		230 - 260	Sand rock, with soft water
Probably Green-		260 - 308	Blue shale
<u>horn limestone</u>		308 - 328	Hard layers

	328 - 477	Shale
	477 - 489	Hard sandstone, first flow
<u>Graneros</u> - - - - -	489 - 605	Blue sandy shale
	605 - 610	Sand rock; second flow, 100 gal.
	610 - 675	Shale, with hard layers
<u>Dakota</u> - - - - -	675 - 705	Sandstone; third flow, 100 gal. + 815
	705 - 716	Gray shale

REMARKS: In this record the sandstone at the top of the Carlile shale at 230' is only 30' thick and its amount is found to be extremely variable in other wells in the vicinity.

White Lake Well

LOCATION: Sec. 14, T. 103 N., R. 66 W., Aurora County

OWNER:

DRILLER:

DATE OF DRILLING: 1887

CURB ELEVATION: 1630'

SOURCE OF INFORMATION: U.S. Geol. Survey, 17th Ann. Rept., Part II, Pl. LXXXVIII.

Feet

	0 - 40	Yellow clay
	40 - 90	Blue clay
	90 - 120	Blue sandy clay
	120 - 470	Shales
	470 - 480	Lime and pyrites
	480 - 585	Shale
	585 - 600	Hard lime and shale
	600 - 790	Blue clay
<u>Dakota</u>	790 - 792	Sandstone
	792 - 805	Pyrites and shale
	805 - 842	Shale and lime
	842 - 850	Sandstone
<u>Ac. - t</u>	850 - 863	Quartzite

BEADLE COUNTY

State Fair Grounds Well

*Huron, S. Dak.*

*1-110N-62E*

LOCATION: State Fair Grounds, Beadle County  
 OWNER: State Fish & Game Commission  
 DRILLER: Deepening done by Aberdeen Independent Drilling Co.  
 DATE OF DRILLING: Completed April, 1941  
 CURB ELEVATION: *1250'*  
 SOURCE OF INFORMATION: Correlation by E.P. Rothrock

	Feet	
Glacial drift Niobrara	10 - 95	Most of clay washed out so that samples look like sand. Angular quartz grains; bits of limestone. Volcanic and metamorphic rocks. Typical. All samples show same character.
	95 - 225	Shale, probably Niobrara formation. Drilling samples showed gray mud filled with sand grains like those of the drift. At 130" definite flakes of shale were observed and are found in most samples to 230". Where not present the clay in the sample indicates a shaly or chalky horizon.
	225 - 245	Chalk rock. Aragonite crystals from shells and some clusters of pyrite crystals.
	245 - 255	Shale; cuttings show black mud.
	255 - 365	Sand. Samples show clean quartz sand with much pyrite in the top and bottom. Most of it is fine sand but should be good water horizon if it is as thick as cuttings indicate.
	365 - 395	Shale, gray
	395 - 425	Fine sand; clean
	425 - 435	Clay, gray
	435 - 445	Fine sand
	445 - 475	Clay; considerable pyrite
	475 - 485	Sand with gray limestone grains and a few aragonite crystals from shells

Probable Greenhorn equiv.	485 - 505	Gray limestone with abundant aragonite crystals from shells and clusters of pyrite crystals
Probable Carlile equiv.	505 - 545	Clay, gray
	545 - 575	Sand, well cemented. Considerable pyrite
	575 - 585	Limestone like 485-505 above
	585 - 595	Clay, pyrite and shell fragments
	595 - 605	Gray limestone like 575-585 above
	605 - 695	Gray shale; some samples show clay only; others, flakes of gray shale.
	695 - 705	Limestone, dark gray; sugary texture
	705 - 755	Gray shale, containing pyrite and gypsum
	755 - 765	Limestone; gray and tan
	765 - 825	Shale contains much fine sand at 800'.
	825 - 845	Sandstone
	845 - 1005	Shale, gray, in flakes
	1005 - 1055	Sandy shale. Samples show no flakes or but a few and contain much fine quartz sand in a clay matrix.
Dakota = + 1055 ft.	1055 - 1128	Sand; fairly well cemented. Lower portion apparently quartzitic.
	1128 - 1133	Sand; first piece of plagioclase feldspar observed.
	1133 - 1138	Sand like above. A few pieces of lignite coal.
Pre-Cambrian = + 1138 ft.	1138 - 1153	Quartzite. All quartz grains broken
	1153 - 1176	Arkosic quartzite. Considerable amount of quartz flakes either from very hard quartzites or quartz veins
	1176 - 1178	Granite; fine broken quartz; orthoclase and plagioclase feldspars. Chips of hornblende in upper 2'. Core at 1178' shows typical diamond shaped cross section of hornblende crystals.

REMARKS: This record is made from cuttings obtained from jetting rig. Samples are therefore badly mixed. Except at bottom, samples were taken at each 10' with no indication of the exact location of change. The contacts, therefore, are placed halfway between samples, indicating passage from one bed to the next.

BON HOMME COUNTY

C.M. & St. P. Ry. Co. at Scotland

LOCATION: Sec. 8, T. 96 N., R. 58 W., Bon Homme County

OWNER:

DRILLER:

DATE OF DRILLING: About 1892

CURB ELEVATION: 1340'

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 34

Feet

0	-	75	Yellow till; blue till		
75	-	90	Blue clay		
90	-	130	Chalk		
130	-	155	Sandstone (water)		
155	-	195	Blue clay		
195	-	330	Gray shale		
330	-	360	Shaly sandstone		
360	-	395	Blue clay		
395	-	425	Shaley sandstone (water)		
425	-	431	Chalk		
431	-	436	Blue clay		
436	-	476	Chalk		
<i>Data 1 + 864</i>		476	-	510	Shaly sandstone (water)
		510	-	528	Sandstone
		528	-	560	Shaly sandstone
		560	-	585	Shaly sandstone
		585	-	668	Sandstone
		668	-	685	Chalk
<i>102-4-780</i>		685	-	-----	Quartzite

REMARKS: Stopped flowing in 1912.

Springfield--Mill Well

LOCATION: Sec. 27, T. 93 N., R. 60 W., Bon Homme County

OWNER:

DRILLER:

DATE OF DRILLING:

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.,  
Part II, Pl. XCIII

Feet

0	-	50	Soil and clay
50	-	150	Chalk

150 - 440 Shale  
440 - 518 Shale and sand; water  
518 - 530 Hard cap  
530 - 592 Sand rock, water

REMARKS: Production was 3290 gal. per minute flow; well diameter, 8".

Tyndall--Town Well

LOCATION: Sec. 6, T. 94 N., R. 59 W., Bon Homme County

OWNER:

DRILLER:

DATE OF DRILLING:

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey Part II, 17th Ann.  
Rept. Pl. XCII

Feet

0 - 40 Loam followed by yellow clay  
40 - 215 Blue clay  
215 - 315 Shale  
315 - 322 Hard rock  
322 - 397 Shale  
397 - 457 Sand  
457 - 700 Shale  
700 - 735 Sand rock; water

REMARKS: Diameter, 4 $\frac{1}{2}$ "; production, 530 gal. per minute

BROWN COUNTY

Aberdeen City Well #4

LOCATION: Sec. 12 (?), T. 123 N., R. 64 W., Brown County

OWNER: City of Aberdeen

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 1300'

SOURCE OF INFORMATION: U.S.G.S. Folio 165

	Feet		
Quaternary	0	- 2	Black soil
	2	- 20	Yellow clay or loam
	20	- 32	Blue clay or till
	32	- 90	Quicksand
Pierre, Niobrara and Benton	90	- 185	Dark gray waxy shale
	185	- 310	Black shale, somewhat calcareous
	310	- 397	Brown shale
	397	- 420	Gray shale, slightly calcareous
	420	- 600	Light gray shale, very slightly calcareous
	600	- 700	Dark gray shale, somewhat calcareous
	700	- 800	Light gray shale
Dakota = +500'	800	- 920	Light gray sand and shale
	920	- 935	Sand rock, calcareous--380 gal. flow
	935	- 995	Conglomerate (claystone nodules in sand, somewhat calcareous)
	995	- 1000	White sand rock (calcareous)--flow 300 gal.
	1000	- 1077	Blue shale
	1077	- 1100	White fine grained sand rock; flow 400 gal.
	1100	- 1135	Conglomerate (sand nodules cemented with iron pyrite, etc.)
	1135	- 1172	Blue shale, somewhat calcareous
	1172	- 1177	Pink and white shale
	1177	- 1211	White sand rock (medium white water worn quartz sand); no water
Algonkian = +89'	1211	- 1257	Quartzite (coarse gray water worn quartz sand)
Granite	1257	- 1290	Granite, medium gray

REMARKS: 1080 gal. per minute flow

Columbia Town Well

LOCATION: Sec. 28, T. 125 N., R. 62 W., Brown County

OWNER: Town of Columbia

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 1305'

SOURCE OF INFORMATION: U.S.G.S. 17th Ann. Rept. Part II,  
Pl. LXXIII, pp. 618-19

	Feet	
	0 - 20	Yellow clay
	20 - 28	Quicksand
	28 - 38	Blue clay
	38 - 68	Quicksand
	68 - 82	Gravel
	82 - 90	Blue clay
	90 - 105	Quicksand
	105 - 114	Hardpan
	114 - 469	Gray shale
	469 - 471	Hard limestone
	471 - 514	Tough, blue shale
	514 - 519	Hard limestone
	519 - 719	Blue shale
<i>10.3.1914</i>	719 - 721	Sandstone
	721 - 751	Sandy shale, small flow
	751 - 801	Gray shale
	801 - 856	Sandy shale, small flow
	856 - 862	Broken limestone
	862 - 867	Sandstone, flow
	867 - 887	Blue shale
	887 - 892	Pyrites and lime
	892 - 902	Sandstone, flow
	902 - 927	Lime, sand and shale
	927 - 964	Sandstone, main flow

REMARKS: 940 gal. per minute production



## BRULE COUNTY

Although approximately 150 wells have been drilled for water in Brule county, only a few logs are available. The following are included because they will be useful in throwing light on problems in the county west of the Missouri river. All of the following wells were drilled for water.

### Chamberlain City Wells

LOCATION: Sec. 15, T. 104 N., R. 71 W., Brule County

OWNER: City of Chamberlain

DRILLER: Page Guthrie and Mahanna and Johnson

DATE OF DRILLING: 1891 and 1900

CURB ELEVATION: 1547'

SOURCE OF INFORMATION: Secured by T.W. Robinson, Jr., from the Chamberlain Register of August 30, 1900, and from Wm. Mussman, City Auditor  
Correlation by E.P. Rothrock, January, 1936

	Feet	
Alluvium ?	0 - 3	Soil
	3 - 20	Clay
	20 - 30	Marl
	30 - 110	Clay
Pierre	110 - 125	Blue clay
	125 - 155	Oil rock
Niobrara	155 - 200	Chalk rock
	200 - 250	Chalk rock, dark
	250 - 400	Chalk rock
Carlile	400 - 415	Shale
Greenhorn	415 - 521	Slate rock
Graneros	521 - 538	Sand rock (Greenhorn ?)
	538 - 550	Shale
	550 - 600	Shale with thin layers of clay
	600 - 713	Shale
Dakota = + 834 ft.	713 - 720	Sand rock, first flow and shell, hard rock contains iron
	720 - 750	Shale
	750 - 758	Chalk
	758 - 775	Sand rock; water in upper 2', flow: $\frac{1}{4}$ gal. per minute
	775 - 780	Shale
	780 - 800	Mixture of shale, sand and pyrites. The drilling below this point (780') so mixed the formation with the flowing water that could not determine just what formation was.

	800 -- 806	Sand rock
	806 -- 812	Soft shale
	812 -- 850	Sand rock, hard
	850 -- 892	Sand rock, soft
	892 -- 902	Quick sand
Fuson ?	902 -- 980	Shale. Struck water at 960' which flowed about 2" over 6" pipe, of which there were 873' 3" in hole.
Lakota	980 -- 983	Sand. In this vein the flow increased to 44" above top of 4" pipe which was perforated through.

REMARKS: This record is a compilation of two well logs, one drilled to 785' by Page Guthrie in 1891 and the other located 100' north of it, drilled to 983' by Mahanna and Johnson in 1900.

Power Well, Chamberlain

LOCATION: T. 104 N., R. 71 W., Brule County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227,  
p. 75

Feet

0 -- 22	Sand and gravel
22 -- 42	Blue clay
42 -- 132	Chalk rock
132 -- 498	Blue clay, tough and dark below
498 -- 507	Sand
507 -- 555	Tough dark clay
555 -- 584	Sand and clay with flow
584 -- 612	Fine dark sand, very fine below
612 -- 619	Hard sand rock
619 -- 633	Compact sandstone
633 -- 689	Sandstone under capstone yielding a flow of 4350 gal. per minute from an 8" pipe

Kimball Town Well

LOCATION: SE.  $\frac{1}{4}$ , Sec. 3, T. 103 N., R. 68 W., Brule County  
OWNER:  
DRILLER:  
DATE OF DRILLING: Before 1895  
CURB ELEVATION: Approximately 1785'  
SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept., Part II,  
Pl. LXXXIX

Feet

0 - 230	Clay
230 - 330	Quicksand
330 - 940	Shale
940 - 960	Sand rock
960 - 980	"Salt" and rock
980 - 988	Hard rock
988 - 1068	Soft sand rock

REMARKS: Well diameter,  $4\frac{1}{4}$ "; production, 185 gal. per minute

Well on Carpenter Farm, near Pukwana

LOCATION: Sec. 35, T. 104 N., R. 70 W., Brule County  
OWNER:  
DRILLER:  
DATE OF DRILLING: Before 1909  
CURB ELEVATION:  
SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper  
227, p. 75

Feet

0 - 60	Black loam
60 - 72	Yellow sand
72 - 196	Blue clay
196 - 435	Chalk rock
435 - 536	Black clay
536 - 559	First sand
559 - 749	Blue-black clay
749 - 771	Second sand
771 - 845	Light chalky clay
845 - 907	Third sand ("Dakota" sandstone)

REMARKS: This well is on high land and the chalk rock is overlain  
by over 100' of Pierre clay

Well No. 2 of Town of Pukwana

LOCATION: Sec. 26, T. 104 N., R. 70 W., Brule County

OWNER: Town of Pukwana

DRILLER: Olaf Rasmussen, Kimball, South Dakota

DATE OF DRILLING: 1912

CURB ELEVATION: 1582'

SOURCE OF INFORMATION: Collected by B.A. Iverson, 1912, as reported by Olaf Rasmussen

Feet

0 - 50	Boulder clay
50 - 225	Pierre shale
225 - 425	Niobrara chalk
425 - 785	Benton shale
785 - 790	Unreported
790 - 830	Dakota sandstone

REMARKS: 49 lb. pressure per sq. in. Temperature, 60°

BUFFALO COUNTY

Crow Creek Agency

LOCATION: On Missouri River, Buffalo County  
OWNER:  
DRILLER: U.S. Indian Service  
DATE OF DRILLING: 1896  
CURB ELEVATION:  
SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper  
227, p. 76

Feet

40 - 78	Gravelly beds, some clay
78 - 88	Gray clay on thin bed of small gravel
88 - 242	Gray shale
242 - 252	Gray limestone
252 - 409	Gray chalk, etc., with first flow at 409'
409 - 435	Pyrites
435 - 700	Shale (?) on 3' layer of pyrites
700 - 760	Shale with pyrites
760 - 780	Sandstone; main flow

REMARKS: Closed pressure, 180 lbs. plus; temperature, 72°

Drifting Goose Community Well

LOCATION: Sec. 8, T. 107 N., R. 71 W., Buffalo County  
OWNER: Drifting Goose  
DRILLER:  
DATE OF DRILLING:  
CURB ELEVATION:  
SOURCE OF INFORMATION:

Feet

0 - 20	Gumbo
20 - 250	Gray shale. 3" casing to 120". Dark lines show coupling and lead packing between 2" and 3" pipe. 3" pipe driven to water tight joint in shale
250 - 350	Medium gray shale
350 - 520	Medium gray shale
520 -	Cap rock 10" thick. Dark tough formation below same

520 -- 700	Shale
700 -- 800	Very loose formation with numerous layers of pyrites of iron
800 -- 900	About the same as above. Tough shale, light gray and brownish tinge in color. 10" of gray quartzite
900 - 955	Unrecorded
955 -- 965	Sand rock

REMARKS: Approximately 50 gal. per minute production

BUTTE COUNTY

Blanche Hamilton Oil Test No. 1

LOCATION: SE.  $\frac{1}{4}$ , NE.  $\frac{1}{4}$ , Sec. 32, T. 8 N., R. 1 E., Butte County

OWNER:

DRILLER: Wy-Tex Oil Company

DATE OF DRILLING: 1932

CURB ELEVATION: Approximately 3500'

SOURCE OF INFORMATION: Furnished by R.P. Harmon, driller

Feet		
		Well starts in "Sundance" formation
10	-- 40	Water sand at 30'
40	-- 70	Limestone
70	-- 145	Soft limestone
145	-- 210	Red rock
210	-- 235	Soft red rock, showing gypsum
235	-- 260	Hard red rock
260	-- 300	Red rock
300	-- 325	Red rock, caving
325	-- 355	Red rock
355	-- 390	Red rock, caving
390	-- 400	Red rock
400	-- 460	Red rock
460	-- 810	Red rock
810	-- 860	Red rock, hole caving, dump water
860	-- 890	Red rock, caving
890	-- 975	Red rock
975	-- 980	Limestone
980	-- 990	Hard limestone
990	-- 1000	Very hard limestone
1000	-- 1014	Hard limestone
1014	-- 1020	Broken sand
1020	-- 1030	Conglomerate and hard shells
1030	-- 1050	Shale with hard shells
1050	-- 1080	Red clay, caving
1080	-- 1100	Red sandstone
1100	-- 1117	Red sandstone, red clay breaks
1117	-- 1120	Hard limestone
1120	-- 1135	Hard gray limestone
1135	-- 1140	Hard sand
1140	-- 1155	White water sand
1155	-- 1170	Hard sand
1170	-- 1180	Water sand
1180	-- 1185	Lime
1185	-- 1190	Hard lime
1190	-- 1200	Hard brown sand
1200	-- 1205	Pink lime

1205 - 1215	Water sand, very hard
1215 - 1230	Hard white lime
1230 - 1250	Sand
1250 - 1255	Hard sandy shell
1255 - 1260	Soft coarse sand showing gas
1260 - 1265	Soft sand
1265 - 1270	Lime
1270 - 1275	Hard sand
1275 - 1280	Hard lime shell
1280 - 1285	Soft pink lime
1285 - 1295	Pink lime
1295 - 1300	Red sandstone
1300 - 1310	Dark gray lime, hard
1310 - 1315	Hard sand
1315 - 1325	White sand
1325 - 1328	Hard lime shell
1328 - 1335	Light gray limestone
1335 - 1345	Dark gray limestone
1345 - 1355	Pink lime with breaks of chert
1355 - 1365	Hard pink lime, chert breaks
1365 - 1385	Pink lime with breaks, brown shale (cuttings from well show salmon colored sandstone)
1385 - 1400	Pink lime
1400 - 1407	Red clay
1407 - 1415	Conglomerate
1415 - 1435	Conglomeration, blue, green shale; red clay; chalk and chert
1435 - 1445	Running sand
1445 - 1450	Conglomerate
1450 - 1458	Sand, showing more water
1458 - 1462	Sand
1462 - 1510	Pink sand
1510 - 1520	Sand
1520 - 1527	Hard sandy limestone
1527 - 1529	Soft gray sand, show of oil and gas

REMARKS: The Blanche Hamilton Well No. 1 was drilled as an oil test by the Wy-Tex Oil Company. It lies in the foot hills of the Black Hills and furnishes a representative log for that part of the county. The well is located 9 miles west of Belle Fourche.



Chambers Ranch Well

LOCATION: SW.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 8, T. 8 N., R. 1 E., Butte County  
OWNER:  
DRILLER:  
DATE OF DRILLING: 1899  
CURB ELEVATION: Approximately 3450'  
SOURCE OF INFORMATION: U.S. Geol. Survey Water-Supply Paper 227

	Feet	
<u>Dakota-Lakota</u>	0 - 10	Soil
	10 - 300	Sandstone and clay; water rising to 100' at -180'
	300 - 490	Clay, some sandstone
<u>Sundance</u>	490 - 540	Reddish sandstone; water rising to 100' in gray sandstone at -540'
	540 - 580	Green shale and clay
<u>Spearfish</u>	580 - 685	Red sandstone
	685 - 700	Red beds under hard ironstone layer

REMARKS: Obtained no flow and was finally abandoned

Experiment Farm Well at Newell

LOCATION: 2 miles NW. of Newell, Butte County, NE.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , NE.  $\frac{1}{4}$ ,  
Sec. 24, T. 9 N., R. 5 E.  
OWNER:  
DRILLER: C.C. Miller, Newell, and Fred Goodstein, Casper, Wyoming  
DATE OF DRILLING: Commenced July 12, 1934; completed, 1935  
CURB ELEVATION: 2874'  
SOURCE OF INFORMATION: Cuttings on file at State School of Mines,  
Rapid City; correlation by John Paul Gries

	Feet	
CRETACEOUS		
<u>Pierre</u>	0 - 800	Shale, gray
<u>Niobrara</u>	800 - 990	Shale, gray, calcareous
<u>Carlile</u>	990 - 1380	Shale, gray
<u>Greenhorn</u>	1380 - 1410	Shale; gray, calcareous
<u>Graneros</u>	1410 - 2400	Shale, gray
<u>Dakota</u>	2400 - 2440	Sandstone, colorless to yellow
<u>Fuson</u>	2440 - 2535	Shale, brick-red to green
<u>Lakota</u>	2535 - 2570	Sandstone, white to colorless
	2570 - 2580	Sandstone, colorless to yellow
	2580 - 2640	Sandstone, siltstone and clay

JURASSIC

<u>Morrison</u>	2640 - 2800	Clay, green, some layers silty; many rounded sand grains
<u>Sundance</u>	2800 - 3010	Clay, silt and sand, gray to green
	3010 - 3120	Clay, silt and sand, light gray to green, glauconitic
	3120 - 3200	Clay, silty, gray, brown and buff
	3200 - 3280	Sandstone, white to buff, glauconitic
	3280 - 3290	Clay, gray

TRIASSIC

<u>Spearfish</u>	3290 - 3500	Shale, grading from chocolate brown above to reddish brown below
	3500 - 3520	Anhydrite, gypsum, some limestone and sand, white to gray
	3520 - 3530	Sand, colorless to orange, sharp
	3530 - 4160	Shale, red-brown, some gypsum
	4160 - 4200	Shale, white to buff and pink, some calcareous
	4200 - 4210	Clay, gray

PERMIAN

<u>Minnekahta</u>	4210 - 4270	Limestone, pink to white, some red clay
<u>Opeche</u>	4270 - 4350	Shale, red and limestone, red to white

PENNSYLVANIAN

<u>Minnelusa</u>	4350 - 4400	Sandstone, colorless, to bottom of hole at 4400
------------------	-------------	--

REMARKS: Abstract of detailed study: subdivision of the Cretaceous shales is based primarily on lithology. Likely a study of the microfossils would increase the thickness of the Greenhorn at the expense of the Graneros. Thickening of the Jurassic section is the most conspicuous feature when compared with the measured Black Hills section.

CHARLES MIX COUNTY

Lake Andes Well

LOCATION: Sec. 9, T. 96 N., R. 65 W., Charles Mix County

OWNER:

DRILLER: U.S. Government

DATE OF DRILLING: Before 1896

CURB ELEVATION: 1650

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227  
and U.S. Geol. Survey 18th Ann. Rept.,  
Part 4, Pl. XXXVIII

Feet

0 - 20	Yellow gravelly clay
20 - 45	Blue clay and hardpan
45 - 55	Sand and gravel
55 - 130	Blue boulder clay
130 - 163	Sand and gravel
163 - 180	Black shale ("Pierre"?)
180 - 265	Blue shale, with lime
265 - 280	Lime rock (chalk?)
280 - 335	Yellow sandy shale
335 - 475	Gray shale
475 - 520	Blue shale, with lime
520 - 550	Shelly lime rock
550 - 615	Blue shale
615 - 623	Sandstone, light color
623 - 725	Blue shale with sand and pyrites
725 - 773	Sandstone, light color
773 - 775 $\frac{1}{2}$	Soapstone

REMARKS: Production, 1500 gal. per minute; temperature, 70°;  
pressure, 70 lbs. per sq. in.

"The sandy beds that lie a short distance below the supposed chalk probably represent the sandstone member which is persistent under a wide area in southeastern South Dakota. The layers of lime rock which extend from 520 to 550' represent the Greenhorn limestone horizon in the Benton group. The precise boundary between the Benton and Dakota is difficult to discern in the record as given, but probably it is at a depth of 725', the sandstone extending from this depth to 773' and yielding a 1500 gallon flow of water."

## Driller's Well Log

### Abbreviated Palensky Oil Test

LOCATION: SE. corner, NW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 15, T. 95 N., R. 65 W.,  
Charles Mix County

OWNER: J.E. Palensky, et al.

DRILLER: R.H. Ewart

DATE OF DRILLING: 1928 and 1929

CURB ELEVATION: 1728'

SOURCE OF INFORMATION: R.H. Ewart

Feet			
0	-	20	Glacial drift
20	-	30	Reddish brown clay
30	-	40	Blue clay, shaley
40	-	60	Grey shale
60	-	80	Blue shale, clayey
80	-	120	Grey sticky shale
120	-	200	Bluish grey shale
200	-	315	Grey shale
315	-	380	Dark grey shale
380	-	440	Light grey shale
440	-	500	Grey shale, caving
500	-	505	Light grey shale
505	-	520	Grey sand, water at 506', rose 90' to 100' in casing; first 10' soft; last 5' firm
520	-	532	Grey sand, firm
532	-	550	Brown sand; first half soft; second half hard
550	-	570	Grey sand
570	-	640	Light grey shale
640	-	680	Grey shale
680	-	720	Light grey shale
720	-	740	Grey shale
740	-	765	Dark grey shale
765	-	775	Blue sandy shale
775	-	800	Dark sandy shale
800	-	835	Dark brown shale
835	-	855	Light brown shale
855	-	865	Brown shale
865	-	875	Brown sand, very loose. Water rose to about 350' of the top.
875	-	890	Brown, fine firmer (one very hard place 3" thick)
890	-	900	Sticky grey shale
900	-	910	Sticky brown shale
910	-	925	Sticky grey shale

925 - 932	Light sand; water rose in casing within 300' of top
932 - 965	Light sand, water
965 - 967	Grey shale
967 - 990	Soft sand, light; water
990 - 1020	Quicksand
1020 - 1021	White shale or light grey
1021 - 1026	Very hard sand
1026 - 1030	Grey sandy shale
1030 - 1108	Quicksand
1108 - 1110	Hard shell, sandy lime
1110 - 1115	Shale
1115 - 1158	Quicksand
1158 - 1160	Hard shell, sandy lime
1160 - 1171	Sand
1171 - 1174	Sand, shale
1174 - 1180	Sand, light
1180 - 1185	Grey shale
1185 - 1200	Sand
1200 - 1205	Sand
1205 - 1215	Sand and shells, streaks of shale
1215 - 1225	Hard sand
1225 - 1240	Sand, shaley
1240 - 1280	Light grey shale
1280 - 1288	Various colors
1288 - 1290	Very light grey slippery shale
1290 - 1300	Brown shale with thin sandy streaks
1300 - 1305	Light sand. Water to 200' of top (the last water sand to date 1820' depth)
1305 - 1315	Light sand; loose running sand
1315 - 1330	Firmer sand
1330 - 1335	Sandy shale; light grey
1335 - 1342	Hard sand
1342 - 1345	Hard sandy shale, grey
1345 - 1361	Sandy, grey lime
1361 - 1365	Soft lime, white
1365 - 1367	Hard sand
1367 - 1375	Dark limey sand
1375 - 1389	Dark grey limey sand
1389 - 1425	Hard sandy lime, greyish
1425 - 1453	Hard sandy lime, greyish
1453 - 1456	Pinkish hard quartzite commences
1456 - 1570	Quartzite
1570 - 1610	Quartzite, softer
1610 - 1620	Quartzite, hard
1620 - 1630	Quartzite, softer
1630 - 1638	Quartzite, hard
1638 - 1642	Quartzite, softer and sandy; some lime
1642 - 1653	Quartzite, hard
1653 - 1657	Quartzite, softer, little lime showing up

*Drillers + 428' at*

*Pro-E = 427' at*

*Shale*

1657 -- 1698 Quartzite, hard and sandy  
1698 -- 1743 Quartzite, softer lime shows up  
considerable  
1743 -- 1749 Quartzite, softer  
1749 -- 1761 Quartzite, hard, sandy  
1761 -- 1768 Quartzite, softer, very limey,  
gas-petroleum smell  
1768 -- 1776 Quartzite, fine, sandy, hard  
1776 -- 1796 Quartzite, more lime, softer bailing  
water, whitish light color  
1796 -- 1802 Quartzite, hard  
1802 -- 1820 Quartzite, softer, limey, little sand  
bailing water whitish, light color  
1820 -- 1855 Quartzite, hard  
1855 -- 1867 Little softer quartzite  
1867 -- 1874 Softer quartzite  
1874 -- 1879 Hard lime, quartzite  
1879 -- 1913 Hard quartzite  
1913 -- 1928 Little softer, more reddish  
1928 -- 1946 Hard quartzite, red  
1946 -- 1953 Hard quartzite  
1953 -- 1956 Hard lime, quartzite  
1956 -- 1958 Nearly all lime  
1958 -- 1960 Hard lime, quartzite  
1960 -- 1970 All lime, little softer  
1970 -- 1979 Darker red lime  
1979 -- 1983 Lime reddish  
1983 -- 1988 Lime reddish (bailings seem muddier)  
1988 -- 1998 All lime  
1998 -- 2049 All lime. From 2003 to 2049', lighter  
in color, some quartzite falls in  
2049 -- 2057 More red, not so hard  
2057 -- 2063 Hard  
2063 -- 2080 Softer  
2080 -- 2085 Softer lime  
2085 -- 2137 Lime, hard  
2137 -- 2157 All lime  
2157 -- 2181 Lime. Oil showings, wet gas stink  
2181 -- 2186 Lime and quartzite, very hard  
2186 -- 2196 Hard quartzite streak in the lime  
2196 -- 2210 More lime, little sand, red quartzite  
2210 -- 2213 Harder quartzite  
2213 -- 2215 Harder, limey sand showing up more  
2215 -- 2220 Harder, stink and oil showings  
2220 -- 2223 Little softer  
2223 -- 2225 Hard limey sand, more sand  
2225 -- 2228 Softer, more sandy, wet gas and oil  
showings  
2228 -- 2232 Wet gas and oil showings  
2232 -- 2240 Hard lime, shell, white or light grey

2240	--	2244	Fine, light grey sandy lime gas-oil
2244	--	2250	Little coarser, not so white
2250	--	2254	Hard fine shell, limey, grey
2254	--	2260	Sandy lime, coarser, darker grey
2260	--	2264	Coarser, darker grey
2264	--	2268	Sandy lime, grey
2268	--	2272	Sandy lime
2272	--	2275	All lime hard, light color
2275	--	2278	Light color. All lime, little stink
2278	--	2281	Light color, more stink; oil showings
2281	--	2284	Light color
2284	--	2287	Light color, more wet gas stink
2287	--	2290	Little brownish sand showing up
2290	--	2293	Lime, trifle sand, bailings light grey
2293	--	2301	All lime. Strong stink
2301	--	2304	All lime, small amt. sand. Good stink
2304	--	2307	All lime. Bailings little reddish, hard
2307	--	2311	All lime. Chocolate red bailings
2311			All lime. Oil showing, rotten petroleum stink. Bailings red, medium hard, little grit, running to sand, drab color bailings
2311	--	2330	Lime showing up sandy conditions

REMARKS: This driller's log is the only record available on this well. The presence of pink quartzite was verified and its depth is accurate. The presence of lime beneath the quartzite was not verified by the survey. Some of the gas shows proved to be acetylene upon analysis, evidently generated from the carbon in the bits. Oil shows were not verified by the survey.

Yankton Agency

LOCATION: T. 94 N., R. 64 W., Charles Mix County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227  
and U.S. Geol. Survey 18th Ann. Rept.

Feet

0	--	1	Soil
1	--	25	Yellow sandy clay
25	--	44	Gray shale
44	--	75	Blue shale
75	--	91	Blue shale with chalk and gravel
91	--	114	Yellow sand and gravel
114	--	117	Grey rock
117	--	123	Gray shale
123	--	144	Gray limestone and pyrites
144	--	178	Sandy shale and sand. Much water which rises to -65'
178	--	199	Blue shale
199	--	275	Black shale, with pyrites and shells
275	--	380	Blue shale, tough
380	--	420	Black shale, with pyrites and shells
420	--	421	Sand with flow of 10 gal. per hour Temperature 56°
421	--	448	Brown shale, with streaks of sand and lime rock
448	--	497	Black shale, with thin sandy streak; flow 7 gal. per min. at 482-485'
497	--	500	Gray shale
500	--	531	Black shale with pyrite streaks
531	--	552	Gray shale
552	--	556	Sandstone; third flow, 15 gal. per min.
556	--	577	Gray shale
577	--	579	Sandstone; fourth flow, soft water, 30 gal. per min.
579	--	641	Gray shale full of lime and pyrite streaks, 2 to 1/2" thick
641	--	651	Sandstone. very soft, hard water, temperature 70°



CLARK COUNTY

Bohri Bros. Well

LOCATION: SE.  $\frac{1}{4}$ , Sec. 22, T 117 N., R. 59 E., Clark County

OWNER: Bohri Bros.

DRILLER:

DATE OF DRILLING: 1892

CURB ELEVATION: 1490'

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

0	-	37	Yellow clay
37	-	66	Blue clay
66	-	80	Sand, clay and gravel
80	-	100	Sand, clay and gravel
100	-	126	Hardpan
126	-	184	Gray shale
184	-	194	Blue shale
194	-	199	Slate
199	-	279	Blue shale
279	-	344	Gray shale
344	-	434	Blue shale
434	-	524	Dark brown shale
524	-	1005	Blue shale with thin layer of sand rock and shale
1005	-	1025	Sand rock with flow
1025	-	1053	Lime rock with thin layer of sand
1053	-	1143	Shale /containing small flow
1143	-	1198	Green shale (rock layers)
1198	-	1200	Hard rock. Total depth, but casing extended only to 1075'

REMARKS: Pressure 80 lbs. per sq. inch

CLAY COUNTY

University of South Dakota Well

LOCATION: Sec. 13, T. 92 N., R. 52 W., Clay County

OWNER: University of South Dakota

DRILLER:

DATE OF DRILLING: Sometime between 1909 and 1912

CURB ELEVATION: 1225 plus

SOURCE OF INFORMATION: State Geological Survey log

Feet

0 -	5	Black soil
5 -	20	Loess
20 -	50	Yellow drift
50 -	75	Calcareous drift, blue
75 -	100	Gray drift
100 -	110	No sample
110 -	175	Sand, buff colored, medium sizing. Quartz grains clear, angular
175 -	210	Greenhorn--unsorted, much chalk, several large pieces of limestone
210 -	300	Graneros shale, with streak of fine grained buff sand at 250'
300 -	420	Dakota-Lakota group
300		Sand, fine, pink, with round frosted grains
350		Sand, coarse, buff; ocean sand
350 -	360	Sand, gray, typical Lakota
400		Sand, coarse, buff
420 -	444	Fine grey sand

CUSTER COUNTY

Two logs from wells drilled in Custer county are presented below. One is from a well drilled at Buffalo Gap for a city water supply. The other is from an oil test drilled on the Barker structure in the southwestern part of the county.

Adams No. 1 Oil Test

LOCATION: NE.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 34, T. 6 S., R. 2 E., Custer County

OWNER:

DRILLER: Barker Structure Drilling Company

DATE OF DRILLING: 1932, March to the fall

CURB ELEVATION:

SOURCE OF INFORMATION: Furnished by the company

	Feet		
Sundance	0 -	40	Gray sand
	40 -	110	Blue shale
Spearfish	110 -	222	Red shale
	222 -	235	Sandy shale and water. Water struck at 225'
	235 -	375	Red shale
	375 -	405	Lime, white (gypsum?)
	405 -	420	Red shale
	420 -	440	Lime
	440 -	455	Red shale
	455 -	500	Lime
	500 -	575	Red shale, shelly (hard lime shells)
	575 -	600	Lime
	600 -	650	Red shale and shells like above
Minnekahta	650 -	675	Hard lime
Opeche	675 -	700	Red shale
	700 -	725	Red sandy shale
Minnelusa	725 -	765	Limestone
	765 -	835	Red sandy shale
	835 -	845	Sand, water
	845 -	908	Quicksand
	908 -	1265	Sandy lime
	1265 -	1275	Red shale
	1275 -	1290	Red limy shells
Pahasapa	1290 -	1580	Solid lime. Sulphur gas at 1390'
	1580 -	1595	Blue lime
	1595 -	1602	White lime
	1602 -	1616	Lime and water

REMARKS: This is the third well drilled on the Barker Structure by this company.

Buffalo Gap Well

LOCATION: SW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 29, T. 6 S., R. 7 E., Custer  
County

OWNER:

DRILLER: Norbeck Company

DATE OF DRILLING: Completed August, 1935

CURB ELEVATION: 3277.4'

SOURCE OF INFORMATION: Harold Norbeck

Feet			
0	-	7	Blue shale
7	-	20	Gray shale
20	-	30	Gray shale with thin limestone shells
30	-	75	Blue shale
75	-	90	Gray shale with some limestone shells;
90	-	180	Black shale /some water
180	-	200	Dark gray shale
200	-	230	Gray shale
230	-	250	Black shale
250	-	270	Gray shale, some bentonite
270	-	340	Gray shale
340	-	390	Blue shale
390	-	400	Blue shale, some bentonite
400	-	420	Gray shale
420	-	490	Black shale
490	-	510	Black shale with bentonite
510	-	610	Dark gray shale, slightly sandy
610	-	780	Sandy dark gray shale
780	-	870	Gray shale
870	-	980	Dark gray shale
980	-	1070	Dark gray shale and black shale
1070	-	1090	Dark gray shale
1090	-	1100	Black shale
1100	-	1110	Dark gray shale
1110	-	1120	Red brown shale, no sample could be obtained
1120	-	1130	Buff sand
1130	-	1150	Fine buff sand
1150	-	1160	Sand with shale and iron
1160	-	1180	Dark gray shale with sand and coal
1180	-	1190	Sandy shale, coal, lime and iron
1190	-	1212	Light gray shale
1212	-	1220	Buff sand, medium fine
1220	-	1260	Dark shale with lime
1260	-	1275	Gray shale
1275	-	1280	Gray sand, medium fine
1280	-	1285	Sandy shale

1285 - 1300	Light gray shale with lime
1300 - 1400	Gray shale with lime
1400 - 1436	Sandy dark gray shale with lime
1436 - 1440	Sandy buff shale
1440 - 1500	Light gray shale, much lime
1500 - 1515	Dark gray shale
1515 - 1538	Dark gray shale with lime; no samples

DAVISON COUNTY

Mitchell City Water Works Well

LOCATION: Sec. 22, T. 103 N., R. 60 W., Davison county

OWNER: City of Mitchell

DRILLER:

DATE OF DRILLING:

CURB ELEVATION:

SOURCE OF INFORMATION:

Feet		
0	-- 30	Yellow clay
30	-- 70	Blue clay
70	-- 135	Chalk rock
135	-- 153	Water bearing sandstone
153	-- 290	Soft gray shale
290	-- 300	Hard dry sandstone
300	-- 507	Blue shale
507	-- 530	Water bearing sandstone containing 2½' vein of coal
530	-- 538	Hard dry sandstone

DAY COUNTY

Andover Well

LOCATION: Sec. 35, T. 123 N., R. 59 W., Day County

OWNER: City of Andover

DRILLER: Swan Bros., Andover

DATE OF DRILLING: 1882

CURB ELEVATION: 1505'

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.,  
Part II, Fig. 52, p. 620; Water Supply  
Paper 227

Feet

0 -	50	Soil, sand and clay
50 -	75	Blue clay
75 -	575	Blue shale
575 -	590	Limestone
590 -	1070	Shale with streaks of limestone
1070 -	1075	Sandstone (flow)

REMARKS: Production, 300 gal. per minute; pressure, 90 lbs.  
per sq. inch

DEWEY COUNTY

Although two wells were drilled for water at the Cheyenne Indian Agency in Dewey county, only the log of the old well is available. At White Horse the U.S. Indian Service drilled a well for water, a log of which was furnished by the drillers, the Norbeck Company.

Cheyenne Indian Agency Well

LOCATION: SE.  $\frac{1}{4}$ , Sec. 2, T. 12 N., R. 31 E., Dewey County

OWNER: U.S. Indian Service

DRILLER:

DATE OF DRILLING: Before 1909

CURB ELEVATION: 1537'

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper  
227, p. 85. Log furnished by A.E. Swan.

Feet

0 -	21	Yellowish gravelly clay
21 -	26	Sandstone boulders and shale fragments
26 -	40	Hard shale
40 -	280	Firm blue shale
280 -	390	Blue shale, soft
390 -	485	Black shale
485 -	500	Sandy shale
500 -	515	Gray shale
515 -	575	Hard shale
575 -	700	Dark gray shale; gas at 650'
700 -	1050	Black shale with occasional beds of hard sandstone
1050 -	1200	Blue shale
1200 -	1311	Dark gray shale; gas
1311 -	1317	Yellow lime rock, soft
<i>1317 -</i>	<i>1323</i>	<i>White sandstone flow</i>
1323 -	1337	Brownish shale

REMARKS: Temperature, 79° or 80°



Well at White Horse

LOCATION: SE.  $\frac{1}{4}$ , Sec. 12, T. 15 N., R. 26 E., Dewey County  
OWNER: U.S. Indian Service  
DRILLER: Norbeck Company  
DATE OF DRILLING: December, 1934  
CURB ELEVATION: 1720'  
SOURCE OF INFORMATION: Harold Norbeck

	Feet	
	0 - 21	Clay
	21 - 26	Gravel
	26 - 1472	Shale
	1472 - 1539	Lime rock with streaks of shale
	1539 - 1817	Shale
	1817 - 1857	Sandy shale
	1857 - 1859	Shale
	1859 - 1980	Shale with streaks of sand
<i>Dakota = -260'</i>	1980 - 2001	Sand with streaks of shale
	2001 - 2008	Sand
	2008 - 2021	Sand

DOUGLAS COUNTY

Armour Town Well

LOCATION: Sec. 12, T. 98 N., R. 64 W., Douglas County  
OWNER: City of Armour  
DRILLER:  
DATE OF DRILLING: 1896  
CURB ELEVATION: 1550  
SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.,  
Part II, Pl. XC

Feet

0 - 40	Soil and yellow clay, sandy
40 - 87	Blue clay, greasy
87 - 206	Blue shale
206 - 255	Black shale
255 - 307	Chalk rock
307 - 333	Blue lime rock
333 - 390	Yellow sand rock with gray sand at base
390 - 440	Blue shale
440 - 465	"Soapstone"
465 - 606	Gray and blue shale
606 - 631	Lime rock
631 - 691	Blue shale
691 - 701	Sand and shale
701 - 757	Sand rock

REMARKS: Production 1590 gal. per minute; pressure 55 lbs.  
per sq. inch

FALL RIVER COUNTY

Several wells have been drilled for water in Fall River county, most of them by municipalities. Seven or eight oil tests have been made by various companies. Only a few of these have given permission to publish the logs of their wells. The Red Canyon well gave a showing of oil.

Ardmore Well

LOCATION: Sec. 9, T. 12 S., R. 4 E., Ardmore, Fall River County

OWNER: City of Ardmore

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 3557'

SOURCE OF INFORMATION: From G.C. Caylor, Ardmore

	Feet		
	0 -	35	Clay
Niobrara	35 -	50	Blue putty-like clay
and	50 -	53	Gravel, sand and clay
Carlile	53 -	80	Black shale
	80 -	505	Grayish black shale
<u>Greenhorn</u>	505 -	560	Limestone
<u>Graneros</u>	560 -	1390	Shale
<u>Dakota</u>	1390 -	1530	Sandstone
<u>Fuson</u>	1530 -	1730	
<u>Lakota</u>	1730 -	1735	Sandstone

Dillon Oil Test

LOCATION: NW.  $\frac{1}{4}$ , Sec. 24, T. 10 S., R. 1 E., Fall River County  
OWNER: Dillon Oil Company  
DRILLER: Dillon Oil Company  
DATE OF DRILLING: July, 1929 to May, 1930  
CURB ELEVATION:  
SOURCE OF INFORMATION: W.L. Dillon

Feet		
0	- 1202	Shale
1202	- 1226	Sandstone "Dakota"
1226	- 1236	White chalk
1236	- 1255	Dark gray chalk
1255	- 1275	Pink shale
1275	- 1280	Sandy shale
1280	- 1295	White sand. Water at 1280
1295	- 1305	White sand
1305	- 1320	White sand
1320	- 1355	Gray shale
1355	- 1360	Blue shale
1360	- 1365	White shale "Fuson-Morrison"
1365	- 1385	Pink shale
1385	- 1390	Light sandy shale
1390	- 1395	Red shale
1395	- 1400	White shale
1400	- 1425	Light sand, "Lakota-Sundance"
1425	- 1480	Light sand
1480	- 1506	Blue shale
1506	- 1510	Gray sandy shale
1510	- 1515	Blue shale
1515	- 1525	Blue shale
1525	- 1535	Gray sand
1535	- 1541	Blue shale
1541	- 1548	Gray sand
1548	- 1558	Blue shale
1558	- 1568	Sand

Edgemont Well No. 2

LOCATION: Sec. 1, T. 9 S., R. 2 E., Fall River County  
 OWNER:  
 DRILLER: Norbeck and Nicholson  
 DATE OF DRILLING: 1910  
 CURB ELEVATION: 3451'  
 SOURCE OF INFORMATION:

		Feet	
	0 -	20	Gumbo
	20 -	50	Sand and gravel; 4 bailers of water per hour, 60°
	50 -	115	Dark shale, sandy shales, muddy streaks, gray shale to 300
	115 -	330	Dark shale
<i>Dakota = 43121 et</i>	330 -	337	Water sand, water within 20' of top of hole
	337 -	370	"Fuson"
<i>Fuson</i>	370 -	379	Gray and red shale
	379 -	382	Hard red shale
	382 -	395	Sticky gray shale
	395 -	405	Shale
	405 -	410	Pyrites of iron
	410 -	415	White shale and sandy shells
	415 -	423	Sandy shale
<i>Dakota</i>	423 -	429	Sand
	429 -	436	Blue shale
	436 -	438	Sand
	438 -	446	White sandy shale
	446 -	455	Sand
	455 -	460	Shale
	460 -	475	Hard, sharp sand
	475 -	500	Gray shale
	500 -	518	Sandy shale
	518 -	521	White shale
	521 -	526	White muddy shale
	526 -	528	Hard sand
	528 -	530	Gray shale
	530 -	540	Sharp lime
	540 -	550	Hard lime
	550 -	573	Light, sharp, sandy shale
	573 -	590	White sand
<i>Norrickson</i>	590 -	615	Brown shale
	615 -	620	White shale
	620 -	642	Brown shale
	642 -	676	Hard lime
	676 -	678	Sand
	678 -	684	Hard black shale

684	--	710	Soft muddy shale
710	--	715	Hard, sandy shale
715	--	720	White, shale
720	--	733	Soft, white shale
733	--	755	Soft, white shale
755	--	757	Lime
757	--	765	Mixed lime and white shale
765	--	773	Red rock
773	--	797	White sand
797	--	800	Hard shale
800	--	820	Sandy shale
820	--	855	Hard sandy shale
855	--	958	Blue shale
958	--	967	Hard lime and sandy shells
967	--	970	White shale
970	--	988	Pink shale
988	--	994	Red rock
994	--	1000	Hard shale
1000	--	1014	Hard white shale
1014	--	1025	Shale and shells
1025	--	1040	Hard red rock and shelly
1040	--	1042	Hard red rock
1042	--	1060	White muddy shale
1060	--	1068	Hard shale
1068	--	1074	Blue shale
1074	--	1075	Hard blue shale
1075	--	1096	Blue shale
1096	--	1100	Water sand
1100	--	1128	Hard blue shale
1128	--	1164	Gray shale
1164	--	1178	Dark or blue shale
1178	--	1189	Soft, white sand
1189	--	1219	Hard, white sand
1219	--	1232	5 gal. flow of water
1232	--	1245	Water sand
1245	--	1254	Hard and shelly shale
1254	--	1266	Red rock
1266	--	1290	Red rock; 12 in. pipe at 1275'
1290	--	1410	Soft red rock
1410	--	1626	Hard red rock
1626	--	1654	Hard light sand
1654	--	1670	Hard white lime
1670	--	1690	Red rock
1690	--	1700	Red mud, cavey
1700	--	1750	Red rock, hard and broken or crevices, with mud seam at 1720'
1750	--	1758	Hard and close red sand
1758	--	1845	Soft red sand with flow of water at 1845'
1845	--	1855	Red rock with red sandstone at 1855
1855	--	1900	White sandstone

	1900 - 1930	Red sandstone
	1930 - 1970	White lime
	1970 - 1973	Hard pink lime
	1973 - 1978	Hard gray lime
	1978 - 2082	Hard white lime
	2082 - 2144	Red, gray and white lime mixed, very sandy
	2144 - 2225	Cavey red rock
	2225 - 2255	Sandy red rock
	2255 - 2276	Gray sand
	2276 - 2285	Blue shale
	2285 - 2288	Lime
	2288 - 2300	Lime, set 8" pipe at 2289
	2300 - 2325	Red rock
<i>Minnacota?</i>	2325 - 2349	Gray sand, oil sand
	2349 - 2380	Soft gray sand
	2380 - 2410	Soft, white sand
	2410 - 2450	Hard, dark lime
	2450 - 2490	Hard, black lime
	2490 - 2525	Hard, dark lime
	2525 - 2535	Sandy lime
	2535 - 2560	Mixed sandy shells and blue shale
	2560 - 2600	Blue shale
	2600 - 2615	Sticky blue shale
	2615 - 2635	Sticky red rock
	2635 - 2645	Hard sandy formation
	2645 - 2660	Sand
	2660 - 2685	Red cave
	2685 - 2697	Hard sand
	2697 - 2725	Red rock
	2725 - 2800	Hard, white limestone shells with streaks of red rock
	2800 - 2825	Shelly red rock
	2825 - 2829	Sand
	2829 - 2920	Red rock; set 6" pipe at 2911
<i>Panosepa</i>	2920 - 2936	Dark limestone; flow 42 gal.; temperature 100°
	2936 - 2950	Dark limestone; flow 60 gal. per minute
	2950 - 2983	Big flow; 575 gal. per minute; 95 lb. pressure, temperature 126° F.

May be same as Burlington Railroad well at Edgewood, E1. 3450'  
or similar - see R.I. # 57, p 68

Red Canyon (Cleveland Stone Co.) Oil Test

LOCATION: NE., NE., SW., Sec. 17, T. 8 S., R. 3 E., 4 mi. NE.  
of Edgemont, Fall River County

OWNER: Cleveland Stone Company

DRILLER: Hollingsworth Oil Company

DATE OF DRILLING: August 8, 1924, to August 1, 1925

CURB ELEVATION: 3635 plus

SOURCE OF INFORMATION: Driller's log--correlations by W.W. Rubey

	Feet		
	0 -	8	(Quaternary terrace deposits) clay
Dakota	8 -	70	Sandstone
Fuson	70 -	72	Red shale
	72 -	112	Gray shale
	112 -	120	Hard gray shale carrying Fe pyrites
Lakota	120 -	162	"Morrison" sand carrying H <sub>2</sub> O
	162 -	170	Hard white lime rock
	170 -	214	Gray shale
	214 -	222	White sand
	222 -	224	Green shale streaked with gray
	224 -	230	Green shale
	230 -	235	Gray shale
	235 -	265	Gray shale streaked with sand and white talc
	265 -	275	Gray and white shale
	275 -	285	White shale
	285 -	305	Gray shale
	305 -	309	Cap rock
	309 -	373	Hard gray shale
Morrison	373 -	402	Brown shale
	402 -	414	Black and brown shale
	414 -	476	Black shale
	476 -	488	Gray and black shale
	488 -	505	Gray shale
	505 -	548	Black gray shale
Sundance	548 -	569	Light gray shale streaked with lime
	569 -	600	Gray shale, very sticky
	600 -	621	Gray shale streaked with lime
	621 -	631	Gray shale
	631 -	657	Hard gray lime
	657 -	669	Gray shale and lime
	669 -	676	Gray shale and hard gray lime
	676 -	680	Hard gray lime
	680 -	683	Gray lime
	683 -	694	Hard gray lime
	694 -	716	Shell and gray lime
	716 -	738	Soft gray lime
	738 -	767	Red shale



	767	--	812	Red shale and gray lime
	812	--	862	Gray shale
	862	--	903	Sticky light blue shale
	903	--	912	Gray shale
	912	--	920	Gray lime and shale
	920	--	972	Sand, carrying water
	972	--	977	Gray shale
Spearfish-	977	--	1155	Red sandy shale
Opeche	1155	--	1190	Red sticky shale
	1190	--	1625	Red beds
Minnelusa	1625	--	1720	Gray lime (cuttings)
	1720	--	1730	Light gray lime
	1730	--	1741	Hard white lime
	1741	--	1790	Gray lime
	1790	--	1810	Pink and red lime
	1810	--	1840	Gray hard lime
	1840	--	1855	Lime
	1855	--	1890	Gray and white lime
	1890	--	1930	Red and white streaks of lime (water at 1910)
	1930	--	1940	White lime
	1940	--	1951	Gray lime
	1951	--	1970	Gray hard lime
	1970	--	1983	Red and gray lime
	1983	--	2001	Black lime, gas and some colors (gas sand at base)
	2001	--	2040	Gray lime (set 5 3/16)
	2040	--	2055	Brown lime
	2055	--	2060	Gray lime
	2060	--	2073	Black lime
	2073	--	2075	Gray lime
	2075	--	2081	Rotten black lime
	2081	--	2085	Dark gray cap <i>Amdam?</i>
	2085	--	2089	"Amdam", carrying oil (cuttings)
Pahasapa	2089	--	2230	Hard gray lime (cuttings) at 2102, 2114 and 2230)

REMARKS: 2 <sup>MCF</sup> mi. gas, 5 bbls. produced; starts in gravel on Dakota near top. Black oil 41° Be (fresh)

FAULK COUNTY

Well Near Orient

LOCATION: Sec. 18, T. 117 N., R. 68 W., Faulk County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1909

CURB ELEVATION: 1530

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

	0 -	20	Yellow clay
	20 -	47	Blue clay
	47 -	394	Shale, black, blue and gray, with thin layer of lime rock at base furnishing small flow
	394 -	1070	Shales, gray, blue and black
1780 = 4460d	1070 -	1110	Hard sandstone
	1110 -	1165	Sand, lime, pyrites and shale
	1165 -	1215	Sandstone; 950 gal. flow
			Total depth

REMARKS: Pressure--130 lbs. till it was clogged. Water head 1865' above sea level. Flows reported in thin bed of lime rock at 394', 1070' and 1165'; production--950 gal. per minute flow; diameter of well--6" and 5 $\frac{1}{4}$ "

GRANT COUNTY

Milbank Milwaukee Railroad Well No. 1

LOCATION: At Milbank, Grant County 6 - 120 N - 48 W  
 OWNER: Milwaukee Railroad  
 DRILLER:  
 DATE OF DRILLING: 1937  
 CURB ELEVATION: 1140 est R  
 SOURCE OF INFORMATION: From samples furnished by P.S. Privey,  
 Milwaukee R.R. civil engineer. Correla-  
 tions by E.P. Rothrock.

	Feet		
Glacial drift	8 -	24	Quartz sand and coal identified
	24 -	41	Like above. Most pebbles fairly well rounded quartz grains
<u>Benton series</u>	41 -	85	Blue shale. Pearl from shell fragments
	85 -	140	Blue shale. Fine shaley sand
	140 -	142	Fine sandstone made of angular pieces clear quartz
	142 -	158	Sandy shale in flakes. This is apparently a very shaley phase of the overlying sandy layer. Grains in flakes appear to be very small quartz particles.
	158 -	230	Black shale, more fissile than that above. Pyrite; no fossils
	230 -	249	Gray shale
	249 -	256	Fine grained quartz grit. Some coal pieces. Considerable gypsum and pyrite, quartzite
	256 -	273	Poorly washed sample made of broken quartz like above stuck together with drilling mud. Gypsum flakes conspicuous. Apparently quartzite
	273 -	279	Dark gray shale
	279 -	285	Shale like above. Gypsum flakes very abundant
	285 -	300	Blue shale like above. Apparently a gumbo clay; does not show flakes
	300 -	302	Sand of broken quartz grains and much gypsum
	302 -	304	Blue shale. Fossils apparently plant impressions. Shell fragments
	304 -	308	Gumbo clay like above

Dakota series = + 832 def. 308 - 312

Quartz sand. Subangular and rounded grains, the latter frosted. Broken quartz fragments with inclusions of ferromagnesian minerals. Plagioclase. Pyrite crystals cementing rounded quartz grains.

312 - 315

Rounded quartz like above. Also broken quartz. One piece laminated quartz with much pyrite. Looks like quartz schist. Ferromagnesian minerals included in broken quartz veins. Rounded feldspar grains

315 - 317

Feldspar. Orthoclase (?) Plagioclase. Some grains well rounded and frosted with inclusions of ferromagnesian mineral. Broken pieces of mica schist.

Round feldspar grains cleaved. This is apparently a basal sandstone with material having been derived from a granite with inclusions of schist. One piece biotite mica. Unless there has been a great deal of material added from a higher sand this is not a sample from the pre-Cambrian. Abundant small shale flakes either indicate parting of shale in sand or have been introduced from above. Iron in sample indicates drilling rather difficult.

Milbank Well No. 2

LOCATION: At Milbank

OWNER: Milwaukee Railroad

DRILLER:

DATE OF DRILLING: 1939

CURB ELEVATION: 140 est. R

SOURCE OF INFORMATION: From samples furnished by P.S. Privey, Milwaukee R.R. civil engineer. Correlations by E.P. Rothrock

Feet		
0	- 20	Yellow till
20	- 24	Blue till
24	- 40	Blue clay with quartz sand grains. Blue till
40	- 45	Sand. Angular grains of quartz with some feldspar and black minerals. Glacial drift. Bottom of glacial drift
45	- 72	Gray fluffy clay on sand grains of well rounded quartz. Latter probably from glacial beds. Very calcareous. Much sand. The sample seems to have passed from glacial sand into chalky material
72	- 120	Blue shale. Very plastic. Some small pyrite grains
120	- 154	Blue shale like above. Very plastic.
154	- 198	Blue-gray shale, like above. Very plastic
198	- 275	Gray clay like above
275	- 278	Abundant foraminifera. Globe-shaped and pointed forms abundant. Rods of aragonite from shell. Sand-like grains of broken limestone. A few pyrite crystals. Greenhorn (?) The abundance of aragonite rods indicates an abundance of pelecypod shells. Forams, pelecypods and calcite crystals suggest Greenhorn. Blue flakes of shale apparent from above
278	- 292	No sample
292	- 315	Shale, plastic. Blue-black clays like those above 275
315	- 334	Shale. Blue gray. Plastic like above.

De Kola = 4806 et.

- 334 - 338 Quartz grains. Medium size. Well-rounded and frosted
- 338 - 342 White sand. Medium to coarse well rounded and frosted, some pyrite; some clear rock crystals apparently broken by drilling from large grains. Good water sand
- 342 - 346 White sand like above
- 346 - 350 White sand like above. About the same proportion. 50% broken. Other 50% well rounded. Apparently sand was partly quartzitic.
- 350 - 354 Sand like above. Larger per cent of grains broken
- 354 - 360 Whiter than above. Sand made of quartz grains, nearly all of which are broken. Apparently white quartzite from rounded grains and portions of rounded grains broken in drilling indicate quartzite. Scattered pyrite crystals
- 360 - 373 \*Dakota series. White quartzite, like above. Grains nearly all rock crystal. One piece of coal
- 373 - 377 Like above. White quartzite
- 377 - 381 More like above. Slightly more scattered pyrite. Very few rounded grains apparently well cemented quartzite. Few pieces of iron from bit
- 381 - 383 Like above but broken to finer pieces. No mica or feldspar visible. Scattered, rounded grains still present. Small, unbroken fragments show very tightly cemented quartzite
- 383 - 385 Just like above, but finer. Average grain size of fine sand. Rounded grains still in evidence, although most of them are badly broken, indicating a well cemented quartzite. A few fragments of coal. Sand arkosic, although feldspars are not abundant
- 385 - 395 Ten feet much like above. Fragments indicate hard drilling. A few fragments of gray shale apparently from higher up in the well. No feldspar noted
- 395 - 402 Quartzite. Firmly cemented. Enough iron in cement to give it a reddish tan color. Feldspar piece; scattered

feldspars but no mica. Rounded grains extremely scarce. Cleaved flakes. More abundant than in overlying samples. Some quartz milky and some brown. This sample is not Milbank granite. The increased percentage of feldspars, however, indicate that granite formations are not far below. The absence of mica flakes, however, and the presence of occasional rounded grains show that this is a sandstone. This is an arkosic sandstone which has been firmly cemented into a light quartzite.

GREGORY COUNTY

Well at Fort Randall

LOCATION: T. 95 N., R. 66 W., Gregory County

OWNER: U.S. Government

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.  
Part II, Fig. 58; U.S. Geol. Survey  
Water Supply Paper 227

Feet

0 - 100	Gumbo and clay
100 - 460	Soft stone
460 - 520	Sandstone; 600 gal. flow
520 - 576	Blue clay
576 - 610	Very hard rock

REMARKS: "This record is probably very inaccurate, but it appears to indicate that the Dakota sandstone was entered at a depth of 460' or very much nearer the surface than would be expected from the experience of wells on the other side of the river. Possibly the flow is from a sandstone in the Benton group, but the large volume of water is difficult to account for on this supposition. It is claimed that the hard rock in the bottom of the well was granite or quartzite, but this is also very uncertain."

Darton, Water Supply Paper 227



HAAKON COUNTY

Bierwagen (West Fork or Plum Creek) Oil Test

LOCATION: NW.  $\frac{1}{4}$ , Sec. 11, T. 6 N., R. 21 E., Haakon County

OWNER: Dan Bierwagen

DRILLER: Haakon County Development Company

DATE OF DRILLING: 1921

CURB ELEVATION: 2079

SOURCE OF INFORMATION: Log furnished by E.H. Pohle

	Feet		
	0 -	3	Soil
Pierre?	3 -	20	Yellowish gray shale, calcareous
	20 -	50	Gray shale, calcareous
	50 -	78	Dark ferruginous shale, not calcareous
	78 -	100	Gray shale with numerous Inoceramus shells
	100 -	118	Gray shale, calcareous
	118 -	146	Light gray shale
	146 -	180	Hard gray shale with numerous concretions
	180 -	200	Dark shale, not calcareous
	200 -	215	Hard gray shale, not calcareous
	215 -	225	Light gray shale, not calcareous
	225 -	290	Hard gray shale, not calcareous
	290 -	359	Hard gray shale, not calcareous
	359 -	364	Sandstone, calcareous
	364 -	373	Shale and hard slabs
	373 -	378	Sandstone, calcareous
	378 -	425	Gray shale
	425 -	490	Gray shale with hard streaks and small concretions
	490 -	500	Light gray shale, very calcareous thin slabs of limestone
	500 -	510	Gray shale buff limestone 1" thick, Inoceramus impressions in shale
	510 -	515	Sandy clay, hard compact dark shale with more Inoceramus impressions
	515 -	1111 $\frac{1}{2}$	Record missing
Niobrara	1111 $\frac{1}{2}$ -	1112 $\frac{1}{4}$	Sand, contains some gas
Carlile			
Greenhorn?	1397 $\frac{3}{4}$ -	1399 $\frac{1}{4}$	Sand
	1418 $\frac{1}{2}$ -	1420 $\frac{1}{2}$	Sand
	1440 -	1443	Sand

Graneros?	1517 - 1521	Sandy shale
	1599 - 1603	Sand
	1615 - 1617	Sand
	1644 - 1646	Sand
	1830 - 1831	Sand
	1859 - 1860	Sand
Dakota	1894 - 1913	Sand streaks
	1956 - 1976	Sand streaks; could not bail below 1400'
	2000 - 2009	Sand, flowed 8 gal. per minute
	2009 - 2070	Sand streaks
	2070 - 2080	Sand, flowed 20 gal. per minute with 30 lb. pressure and gas with water

Midland Well

LOCATION: T. 1 N., R. 25 E., at Midland, Haakon County  
 OWNER: Stroppel Hotel  
 DRILLER: Norbeck Company  
 DATE OF DRILLING:  
 CURB ELEVATION:  
 SOURCE OF INFORMATION:

	Feet	
Pierre	0 - 35	Quartz sand, well rounded, frosted to clear
	35 - 50	Quartz sand, clear, well rounded, small amount tourmaline, feldspar and iron concretions
	50 - 55	Black shale, non-calcareous white, quartz sand and iron concretions
	55 - 105	Dark gray shale; few quartz grains, pyrite
	105 - 230	Dark gray shale, pyrite in places
	230 - 250	Dark gray shale, few quartz grains
	250 - 331	Dark gray shale, slightly calcareous
	331 - 353	Dark gray shale, non-calcareous
	353 - 374	Dark gray shale, few calcareous grains, some quartz grains and spindles of gypsum
	374 - 535	Dark gray shale, non-calcareous
	535 - 555	Dark gray shale, spindles of gypsum
	555 - 617	Dark gray shale, non-calcareous, soft light gray to white shale, calcareous

	617 - 645	Dark gray shale
	645 - 735	Gray shale, non-calcareous, few clear quartz grains, pyrite in places
	735 - 760	Shale, dark gray, non-calcareous, very few quartz grains and pyrite
	760 - 780	Dark gray shale
	780 - 955	Shale, dark gray and light gray
	955 - 960	Shale, dark gray, few quartz grains and pyrite
	960 - 995	Missing samples
Niobrara	995 - 1005	Dark gray shale, few pieces white speckled and very calcareous, top of Niobrara
	1005 - 1015	Dark gray shale, speckled shale, calcareous and few white calcareous grains
	1015 - 1145	Black shale, speckled and calcareous shale, numerous white calcareous grains
	1145 - 1160	Dark gray shale, fewer speckled pieces
	1160 - 1190	Dark gray shale more calcareous material than above
	1190 - 1205	Shale, dark gray and non-calcareous, few speckled grains
	1205 - 1240	Dark gray shale with more calcareous, white speckled grains
Carlile	1240 - 1280	Shale, thin, fissile, dark gray, slightly calcareous, top of Carlile shale
	1280 - 1430	Black shale, non-calcareous, dark gray shale, some slightly calcareous
	1430 - 1445	Dark gray shale, quartz sand
	1445 - 1460	Black and dark gray shale, some pieces calcareous
	1460 - 1470	Black shale, non-calcareous, few quartz grains
	1470 - 1485	Shale, black and dark gray
	1485 - 1510	Black shale, clear quartz grains, angular to subangular, some opaque, round grains
	1510 - 1550	Shale, black and non-calcareous, dark shale, some calcareous
	1550 - 1555	Black and dark gray shale, quartz sand, coarse and well rounded
	1555 - 1570	Fine quartz sand, angular to rounded black shale, pyrite
	1570 - 1575	Black and dark gray shale, pyrite
	1575 - 1590	Black shale, fine quartz sand, frosted and rounded

1590 - 1600	Black and dark gray shale
1600 - 1615	Black shale, quartz sand, quartz pebbles
1615 - 1665	Black shale, quartz sand, very abundant pyrite, iron oxide
1665 - 1720	Black shale, not so much pyrite and sand
1720 - 1735	Shale, dark gray to black, quartz grains, fine, well rounded, pyrite
1735 - 1775	Very fine white quartz sand, grains well rounded, frosted, gray shale, small amount of pyrite, shale increases down
1775 - 1780	Black shale, very small amount of sand and pyrite
1780 - 1785	

Railroad Well at Nowlin

LOCATION: SW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 10, T. 1 N., R. 23 E., Haakon County  
 OWNER: Chicago and Northwestern Railway Company  
 DRILLER: Norbeck and Nicholson  
 DATE OF DRILLING:  
 CURB ELEVATION: Approximately 1965'  
 SOURCE OF INFORMATION: Chicago and Northwestern Railway Company

Feet

0 - 1770	Mainly shale
1770 - 1842	Mainly sandstone

*Notes + 195' etc.*

REMARKS: Flow of 125 gal. per minute. Pressure about 72 lbs. per sq. inch. Temperature 121°

Philip Municipal Well

LOCATION: SW.  $\frac{1}{4}$ , Sec. 13, T. 1 N., R. 20 E., Haakon County

OWNER: City of Philip

DRILLER: Norbeck Company

DATE OF DRILLING: 1930's

CURB ELEVATION: 2158'

SOURCE OF INFORMATION: Don Junkman, man in charge of well

Feet

0 - 1980	Unrecorded
<i>Dakota? = +178 et.</i> 1980 - 2080	First flow at 1980', 1 gal. per minute. Second flow at 2080', 4 to 5 gal. per minute
2080 - 2292	Unrecorded
2180? - 2292	Third flow, bottom of well, 14 gal. per minute. Hard rock at bottom of well. Drill made 3" in 4 to 5 days. Temperature second flow 117°

HAND COUNTY

Miller City Well

LOCATION: Sec. 10, T. 112 N., R. 68 W., Hand County

OWNER: City of Miller

DRILLER:

DATE OF DRILLING: 1941

CURB ELEVATION: Approximately 1565

SOURCE OF INFORMATION:

Feet	
0 - 500	Unrecorded
500 - 510	Chalk, shale, quartz grains: 60% shale; 30% chalk; 10% quartz grains. Scattered pyrite. This is apparently chalk.
510 - 520	Probably Niobrara. Look like first samples
520 - 530	Speckled shale, typical of Niobrara, 80%. Scattered black shale and very few quartz grains
530 - 540	Speckled shale like above
540 - 550	Black shale. Speckled shale, 60%, Niobrara (?)
550 - 560	Speckled shale. Gray shale frag- ments, still Niobrara
560 - 570	Speckled shale. 70% gray shale. Much like above
570 - 580	Speckled shale. Chalk pieces, Niobrara (?)
580 - 590	Chalk, Niobrara
590 - 600	Gray shale. Chalk, pyrite, quartz grains. Looks very much like pre- ceding. Larger percentage of shale, however
600 - 610	Abundant sand grains. Clear and rusty quartz; subangular
610 - 620	Shale; considerable sand, but not so abundant as above. Large chunks of lime, probably concretions
620 - 630	Shale; concretionary limestone fairly abundant. Bits of shells; sand grains in abundance
630 - 640	Shale; few chunks of concretionary limestone
640 - 650	Shale
650 - 660	Shale, fossils, shell fragments, pyrite

660 - 670 Shale. Fairly high percentage of sand grains  
 670 - 690 Gray shale  
 690 - 720 Shale with abundant limestone chips. Limestone gray or brown and in rounded chunks, 10% limestone  
 720 - 730 Very fine, round sand grains, much pyrite. Apparently sandy shale  
 730 - 740 Shale, like above, but with more shale  
 740 - 750 Dark, flaky, black shale  
 750 - 760 Chalky shale, limestone, Greenhorn (?)  
 Much shell aragonite  
 760 - 830 Shale with chalky, speckled abundant limey pieces and shell aragonite like above  
 830 - 840 No sample  
 840 - 850 Black shale  
 850 - 860 Limestone, chalk like above  
 860 - 870 Dark shale 80%; speckled shale 5%; limestone chalks 10%; shell aragonite abundant  
 870 - 880 Dark shale  
 880 - 890 Shale like above  
 890 - 910 Shale  
 910 - 920 Shale with minor limestone fragments  
 920 - 930 Shale with abundant limestone and much pyrite  
 930 - 940 Quartz sand; much pyrite; apparently thin, sandy limestone like those found in Carlile formation  
 940 - 960 Layer light gray limestone pieces much like large concretions in Fall River county; black shale with scattered quartz sand grains  
 960 - 970 Black shale  
 970 - 980 Shale with abundant pyrite. Scattered quartz sand grains  
 980 -1000 Shale with abundant gray limestone  
 1000 -1030 Dark shale  
 1030 -1040 Shale with limestone fragments; fossils; much pyrite  
 1040 -1050 Black shale  
 1050 -1060 More shale with fragments of gray sugary limestone; probably concretionary  
 1060 -1070 Black shale  
 1070 -1080 Sugary limestone fragments in shale. Less than 10% limestone  
 1080 -1090 Shale  
 1090 -1100 Shale; considerable fine gypsum crystals

1100 - 1110  
1110 - 1120  
1120 - 1130

Gray shale  
Shale  
Sand; quartz, fine angular pieces,  
clear; top Dakota formation

Dakota 445' el.



HANSON COUNTY

W. Ozanne Well

LOCATION: Sec. 8, T. 104 N., R. 57 W., Hanson County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.  
Part II, Pl. LXXXIV

Feet

0 - 22	Red clay
22 - 142	Blue clay
142 - 242	Sand and gravel
242 - 282	Shale
282 - 302	Sand and gravel
302 - 347	Hard shale
347 - 440	Soft shale
440 - 547	Pyrites, 4" thick, followed by soft shale
547 - 567	Red sandstone
567 - 589	No record; total depth

REMARKS: Production, 50 gal. flow

## HARDING COUNTY

### Holman No. 1 (Camp Crook) Oil Test

LOCATION: NW.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 34, T. 20 N., R. 1 E., Harding County

OWNER:

DRILLER: Kennedy-Miller, Northwest Oil Development Company

DATE OF DRILLING: September, 1931, to October, 1932

CURB ELEVATION:

SOURCE OF INFORMATION: M.D. Miller, manager

	Feet	
"Fox Hills"	0 - 15	Surface
	15 - 19	Sand and gravel, water
	19 - 23	Yellow clay
	23 - 54	Sand, (water)
	54 - 139	Gray water sand, streaks of coal
	139 - 186	Gray sandy shale and chalk
	186 - 187	Rock
"Pierre"	187 - 385	Sticky shale
	385 - 407	Shale first showing shells, fossils
	407 - 408	Rock
	408 - 540	Hard shale
	540 - 575	Pyrites, some shells
	575 - 595	Sandy shale
	595 - 732	Hard shale
	732 - 733	Rock
	733 - 768	Shale
	768 - 769	Rock
	769 - 779	<b>Shale</b>
	779 - 780	Rock
	780 - 805	Shale
	805 - 806	Rock
	806 - 820	Shale
	820 - 821	Rock
	821 - 946	Sandy shale, very little sand
	946 - 987	Hard sandy shale
"Judith River"	987 - 1008	Sandy shale
	1008 - 1009	Rock
	1009 - 1058	Sandy shale
	1058 - 1145	Sandy shale (more sand than shale) showed gas
	1145 - 1224	Alternate layers of sand and shale
	1224 - 1225	Rock
	1225 - 1258	Shale
	1258 - 1286	Sandy shale
	1286 - 1365	Hard sandy shale
	1365 - 1378	Dark sandy shale and bentonite

	1378 - 1572	Dark sandy shale with shells
	1572 - 1597	Sandy shale
	1597 - 1598	Rock
	1598 - 1658	Sticky gumbo
	1658 - 1659	Rock
	1659 - 1723	Shells and shale
	1723 - 1726	Shale
	1726 - 1727	Rock
"Eagle" sand	1727 - 1836	Black-white sand, green streaks
	1836 - 1851	Very hard shale
	1851 - 1890	Sand (shell at bottom)
-----	1890 - 1964	Sandy shale
	1964 - 2002	Hard shale (brown concretions)

REMARKS: This log is a record of an oil test drilled north of Camp Crook near the extreme northwestern corner of the state.

HUGHES COUNTY

Pierre City Well No. 3

LOCATION: T. 110 N., R. 79 W., Hughes County  
OWNER: City of Pierre  
DRILLER: Lewis Greenough  
DATE OF DRILLING: 1910  
CURB ELEVATION:  
SOURCE OF INFORMATION: Reported to E.C. Perisho in 1910

	Feet	
0 -	300	Soft material, sand, mud, boulder clay, etc.
300 -	350	Upper shale
350 -	650	"Pierre" shale; rubber-like substance which looked like asphaltum, burned with black smoke; odor like asphaltum, 25'; water greasy
650 -	960	"Benton" shale
960 -	1280	"Dakota" sandstone; first flow
1280 -	1300	Soft sandstone, main flow; large volume of water

Pierre City Well

LOCATION: NW.  $\frac{1}{4}$ , SE.  $\frac{1}{4}$ , Sec. 4, T. 110 N., R. 79 W., Hughes County  
OWNER: City of Pierre  
DRILLER: Norbeck Company  
DATE OF DRILLING: 1929  
CURB ELEVATION: Approximately 1440'  
SOURCE OF INFORMATION:

	Feet	
0 -	60	Silt or yellow sandy clay
60 -	210	Gray shale
210 -	850	Dark shale; at 850' a 2 gal. flow and a little gas
850 -	1160	Dark to gray shale with scattered streaks of sandstone
1160 -	1165	Sandstone
1165 -	1310	Unrecorded
1310 -	1316	Good sandstone
1316 -	1341	Gray shale and small layers of sandstone; perforated from 1159 to 1341'

Well at Indian School, East Pierre

LOCATION: East Pierre, Hughes County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1896

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept.,  
Part II, Pl. LXXVII

Feet		
0 -	72	Sandy clay and blue clay
72 -	92	Gray shale
92 -	180	Blue shale, hard streaks
180 -	250	Black shale
250 -	320	Blue shale
320 -	465	Gray shale
465 -	468	Blue lime, hard
468 -	600	Dark gray shale
600 -	710	Blue shale
710 -	870	Dark gray shale
870 -	875	Yellow lime
875 -	1150	Blue shale with streaks of sand and rock below
1150 -	1170	Sand rock with flow
1170 -	1192	Light shale

REMARKS: Production 900 gal. flow

HUTCHINSON COUNTY

City Well at Menno

LOCATION: Sec. 9, T. 97 N., R. 57 W., Hutchinson County

OWNER: City of Menno

DRILLER: Norbeck-Nicholson Company

DATE OF DRILLING: 1909

CURB ELEVATION: Approximately 1327'

SOURCE OF INFORMATION:

Feet		
0	- 2	Black loam
2	- 4	Yellow clay
4	- 8	Yellow sand
8	- 20	Yellow clay
20	- 30	Blue clay
30	- 33	Blue sand
33	- 55	Blue clay
55	- 65	Gravel and sand
65	- 85	Blue clay
85	- 140	Gray shale
140	- 160	Sand rock
160	- 200	Gray shale
200	- 247	Chalk rock
247	- 349	Gray shale
349	- 349'8"	Hard rock
349'8"	- 358'8"	Gray shale
358'8"	- 363'8"	Quartzite or granite

HYDE COUNTY

Highmore City Well

LOCATION: Sec. 11, T. 112 N., R. 72 W., Hyde County

OWNER: City of Highmore

DRILLER:

DATE OF DRILLING: Before 1909

CURB ELEVATION: 1890"

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

0	-	240	Soil, clay and gravel
240	-	740	Blue shale
740	-	815	Hard gray shale, pyrites
815	-	1086	Blue shale
1086	-	1310	Gray shale mixed with sand
1310	-	1314	Shale and pyrites
1314	-	1430	Blue shale
<i>Dakota = 1430'</i>	-	1430	Sandstone; no flow
1442	-	1537	Sandy shale on bed of hard sand
1537	-	1552	Soft sandstone

## JACKSON COUNTY

The only well record available for Jackson county is that of an oil test made by F.C. Weaver near the White river. A good water supply was secured and the well was taken over by the City of Kadoka.

### Granger No. 1 (Weaver or Kadoka) Oil Test

LOCATION: NW.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 32, T. 3 S., R. 22 E., Jackson County  
 OWNER: City of Kadoka  
 DRILLER: F.C. Weaver  
 DATE OF DRILLING: Commenced 1928; completed 1935  
 CURB ELEVATION: 2138.7  
 SOURCE OF INFORMATION: F.C. Weaver

#### Feet

0 -	20	Silt
20 -	35	Gravel, sand (water)
35 -	1800	Shale
1800 -	1818	Oil sand (trace of oil)
1818 -	1950	Shale
1950 -	2400	Sand which we called the "Dakota" with streaks of shale here and there. No record kept of the amount or thickness.
2400 -	2500	Shales
2550 -	2610	Cavy shales
2610 -	3000	Sand with streaks of shale, "Lakota" big water
3000 -	3300	Shales and lime shells
3300 -	3320	Green shale
3320 -	3340	Sand, water, "Morrison"
3340 -	3365	Green shale
3365 -	3395	Cavy brown shale
3395 -	3450	Gray clay
3450 -	3500	Sandy shales, shells
3500 -	3525	Sandy cement shales
3525 -	3610	Gray clay, some sand
3610 -	3628	Shells, shale, brown
3628 -	3640	Gray clay with considerable red clay in streaks



JERAULD COUNTY

S.H. Albert Well

LOCATION: Sec. 5, T. 108 N., R. 65 <sup>W</sup>~~E~~., Jerauld County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1909

CURB ELEVATION: 1600 <sup>55'</sup> ~~55'~~ <sup>R</sup>

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

	0 -	47	Drift
	47 -	400	Shale with layers of pyrites and a layer carrying many shells at 290
	400 -	415	Chalkstone
	415 -	460	Shale (top of Benton)
	460 -	490	Sandstone; contains water
	490 -	586	Shales with sandstone layers
	586 -	705	Shale
	705 -	725	Hard rock
	725 -	899	Shale with thin limestone at 801 and sandstone at 845
	899 -	914	Sandstone; small flow
	914 -	1003	Compact shale
<i>Dakota = 5' below st.</i>	1003 -	1043	Hard sandstone (top of Dakota)
	1043 -	1057	Sandstone with 200 gal. flow

## JONES COUNTY

Most of the wells in Jones county have been drilled for water by the railroads and municipalities. As the information on all of them is meager, only two well records are included here.

### Railroad Well at Capa

LOCATION: Sec. 22, T. 2 N., R. 26 E., Jones County  
 OWNER: Chicago and Northwestern Railway Company  
 DRILLER: Norbeck and Nicholson Company  
 DATE OF DRILLING:  
 CURB ELEVATION: 1774'  
 SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

	Feet	
	0 - 1000	Unrecorded
Greenhorn ?	1000	Thin strata of limestone
	1000 - 1500	Unrecorded
Dakota	1500 - 1580	Dakota sandstone entered at 1500 .
		Gas encountered at 1560'. Rises in considerable amount. At 1560 to 1580' water began to flow at 18 gal. per minute
	1580 - 1650	Unrecorded
Lakota ?	1650 - 1689½	Main flow, 100 gal. per minute

REMARKS: Temperature 118°; production 100 gal. per minute

### Railroad Well at Draper

LOCATION: Sec. 33, T. 1 S., R. 30 E., Jones County  
 OWNER: Chicago, Milwaukee, St. Paul and Pacific Railroad  
 DRILLER: Norbeck and Nicholson Company  
 DATE OF DRILLING: 1907  
 CURB ELEVATION: 2230.5'  
 SOURCE OF INFORMATION: Furnished by the railroad company

	Feet	
	0 - 20	Surface soil
Uncorrelated	20 - 1557	Shale, mostly blue
	1557 - 1560	Hard rock
	1560 - 1870	Hard shale with thin, very frequent layers of sand rock (not porous)

Subst. # 361 d.

1870 - 1882	Very hard rock
1882 - 1986	Artesian sandstone. This sandstone was very hard, not very porous; in some places had layers of sandy shale
1986 - 2005	White shale with a few streaks that were sandy

Fuson ? - - - -

KINGSBURY COUNTY

City Well at De Smet

LOCATION: Sec. 33, T. 111 N., R. 56 W., Kingsbury County

OWNER: City of De Smet

DRILLER:

DATE OF DRILLING: Before 1909

CURB ELEVATION: 1770

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227  
Correlation by N.H. Darton

Feet

0 - 104	Drift
104 - 1185	Pierre, Niobrara, Benton. Report from another log
763 - 793	First water-bearing sands
865 - 895	First water-bearing sands according to another report

Feet

0 - 44	Clay
44 - 104	Sand
104 - 840	Shale
840 - 865	Hard rock
865 - 985	Sandstone; water rising to -40'
985 - 1185	Shale or "soapstone" with fish teeth at 1145'
1185 - 1456	Sandstone; water rising to -40'
1456 - 1470	Hard rock
1470 - 1610	Sandstone; water rising to -20'

REMARKS: "Boring was sunk with the hope of finding an artesian flow but was unsuccessful owing to the height of the land. It is claimed that a large volume of water was found but it failed to reach the surface by 20 to 40'." N.H. Darton

LAKE COUNTY

Madison City Well

LOCATION: Sec. 7, T. 106 N., R. 52 W., Lake County

OWNER: City of Madison

DRILLER: J.W. Emberg

DATE OF DRILLING:

CURB ELEVATION: 1669'

SOURCE OF INFORMATION: Log furnished by J.W. Emberg for Roy Baker, consulting engineer, Madison

Feet

0 -	10	Top soil, yellow clay subsoil
10 -	24	Sand and gravel (water bearing strata 12 to 24')
24 -	250	Blue clay
250 -	255	Fine sand (apparently dry)
255 -	550	Black shale
550 -	570	Fine loose sand (Dakota sandstone, water)
570 -	590	Black shale
590 -	610	Fine loose sand (water)
610 -	930	Black shale
930 -	950	Fine loose sand (water)
950 -	1103	Alternating layers shale and fine sand (water bearing). Water below 950' very hard

Dakota #1119e1

Well was developed in strata at 930' to 950' with #30 Johnson screen, sand packed. Static water level 143' below surface. Pumped with air lift. When furnishing 165 G.P.M. would draw down to 220'.

REMARKS: Production 165 gal. per minute.

LAWRENCE COUNTY

Chas. Thompson Oil Test

LOCATION: NW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 22, T. 6 N. R. 4 E., Lawrence County

OWNER: Durst & Smith, Belle Fourche

DRILLER: Preston Oil Company, Denver, Colorado

DATE OF DRILLING: October, 1924

CURB ELEVATION:

SOURCE OF INFORMATION: Log furnished by Charles C. Haas

Feet		
0	- 351	Surface in the red beds of the Spearfish formation
351	- 396	Minnekahta limestone, hard, a little water at base
396	- 531	Opeche formation, light shales above, red shale to near base, red sandstone and shale at base
531	- 555	Minnelusa sandstone, 25' of calcareous brought first water in quantity of about 2000 bbls. per day; sweet soft water; no oil showing
555	- 560	Second flow nearly doubling the first, broken into when they reached the porous section of the Ten Sleep member
560	- 690	Bottom of the Ten Sleep member; no oil: no more water but apparently a lesser amount, possibly due to leakage above
690	- 938	Bottom of the Amsden member. A series of alternating hard and soft sandstone, limes and chert members. Very little water added but much lost; near bottom
938	- 1020	Hole was carried down into the Pahasapa limestone to 1020 when drilling was discontinued

REMARKS: Drilled with star as oil prospect for Preston Oil Company;  
3500 acres under lease

LYMAN COUNTY

Kennebec Well

LOCATION: T. 105 N., R. 75 W., Lyman County  
 OWNER: Chicago, Milwaukee, St. Paul & Pacific Railroad  
 DRILLER:  
 DATE OF DRILLING: Complete 1907  
 CURB ELEVATION: 1688  
 SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

	Feet	
Dakota? = + 442	1246	Principal flow; presumably at top of formation
	1301	Total depth; 50 gal. flow from Dakota sandstone

REMARKS: temperature 96°

Lower Brule Well No. 1

LOCATION: SE.  $\frac{1}{4}$ , Sec. 28, T. 106 N., R. 71 W., Lyman County  
 OWNER: U.S. Indian Service  
 DRILLER: Anton Sather  
 DATE OF DRILLING: 1940  
 CURB ELEVATION:  
 SOURCE OF INFORMATION:

	Feet	
1	20	Gray shale, breaks into small chunks, a few crystals and pieces of pearl from shells
20	40	Gray shale like above
40	60	Light gray shale, considerable shell fragments
60	80	Shale, like above; one calcareous pipe-like serpula; few sand grains in the mud may be from surface
80	100	Shale like above, aragonite crystals and shell fragments still conspicuous
100	120	Like above, gray shale
120	140	Gray clay like above
140	160	Gray clay, a little pyrite
160	180	Shale like above, much shell fragments and conspicuous pyrite
180	200	More shale, light gray, chalky appearance, probably top of the Niobrara

200 - 220 Chalky clay like above  
 220 - 240 Like above, one piece of iron carbonate concretion  
 240 - 260 Flaky chalk, light gray to white  
 260 - 280 Like above, very chalky, some pieces very fine sand  
 280 - 300 More chalk, flaky chalk like above, no sand visible  
 300 - 320 Flaky chalk, dark gray shale flakes and sand grains  
 320 - 340 Flakes of chalk and gray shale  
 340 - 360 Gray flaky chalk and shale like above  
 360 - 380 Flaky chalk like above, some flakes gray and shaly, still Niobrara  
 380 - 400 Flaky chalk and gray flaky shale, probably calcareous; fossil fragments fairly abundant  
 400 - 420 Chalk flakes and gray calcareous shale flakes like above, still Niobrara  
 420 - 440 Like above, one grain very fine sandstone, like sandstone last noted above  
 440 - 460 Gray mud well sprinkled with chalk flakes and small quartz grains; appears to be shaly chalk with some sand  
 460 - 480 Chalk shale flakes, grains of gray, very fine sand like above  
 480 - 520 Flaky chalk  
 520 - 540 Chalk flakes abundant, dark gray flaky shale is new, looks like a contact at the base of chalk  
 540 - 560 Like above, gray shale more abundant  
 560 - 580 Dark gray shale flakes, shell fragments, few aragonite shell crystals, flakes of chalk in the minority  
 580 - 600 Dark gray shale flakes still abundant, some chalk flakes, probably from above contact  
 600 - 620 Chalk fragments of gray shale like above  
 620 - 640 Gray flaky shale like above  
 640 - 660 Like above, chalk fragments and gray shale, much flaky chalk, few gray shale fragments, apparently a chalk horizon in Benton below Niobrara  
 660 - 680 Like above, many fossil fragments  
 680 - 695 Limestone, light gray  
 695 - 700 Gray shale and chalk  
 700 - 720 Dark gray shale in flakes, chalk flakes conspicuous by their absence  
 720 - 740 Poorly washed sample, gray flaky shale  
 740 - 760 Gray flaky shale, grains of fine, well-cemented sandstone, light gray to cream color, apparently from water sand



Lower Brule Well No. 2

LOCATION: SE.  $\frac{1}{4}$ , Sec. 12, T. 106 N., R. 72 W., Lyman County  
OWNER: U.S. Indian Service  
DRILLER: Anton Sather  
DATE OF DRILLING: 1940  
CURB ELEVATION: 1472'  
SOURCE OF INFORMATION:

Feet		
1	- 20	Poorly washed gray shale
20	- 80	Gray shale, non-calcareous
80	- 140	Light gray clay, aragonite crystals from shells
140	- 200	More mud, non-calcareous
200	- 220	Flakes of chalk, some quartz sand grains in mud, chalky shale
220	- 240	Small shale flakes and few sand grains, material evidently a gray shale
240	- 260	Gray flaky shale, chalk flakes and scattered quartz grains
260	- 300	Gray shale flakes, scattered quartz grains
300	- 320	Gray flaky shale, calcareous
320	- 340	Gray flaky shale
340	- 360	Chalk flakes, gray shale
360	- 380	Drilling mud, some gray shale flakes
380	- 400	Gray shale flakes and chalk flakes, abundant
400	- 420	Chalk flakes and gray shale
420	- 460	Gray flaky shale, a little pyrite and aragonite crystals
460	- 480	Gray shale, not much chalk
480	- 520	Shale flakes
520	- 540	Gray flakes, bits of shell fragments
540	- 600	Very fine quartz grains, chalky flakes and shale flakes
600	- 620	Shale same as above, few scattered quartz grains, some pyrite, fossil fragments

Lower Brule Well No. 3

LOCATION: E.  $\frac{1}{2}$ , Sec. 7, T. 106 N., R. 72 W., Lyman County  
OWNER: U.S. Indian Service  
DRILLER: Anton Sather  
DATE OF DRILLING: 1940  
CURB ELEVATION:  
SOURCE OF INFORMATION:

Feet	
0 - 30	Unrecorded
30 - 40	Chalky shale, some pyrite
40 - 60	Fragments of shells, pyrite nodules, bits of shale and stray pieces of quartz; shale is calcareous; iron carbonate concretions
60 - 80	Abundant limy fragments, apparently limy shale, bits of shell comprise 1/5 of sample, gypsum also present as selenite, some pyrite, apparently a shale from which most of the shale has been washed in preparing sample
80 - 100	Limy gray shale and gypsum, aragonite shell crystals
100 - 120	Gray shale flakes with much gypsum, many shell fragments
120 - 140	Like above, gray shale and gypsum
140 - 160	Little chalky limestone, mostly shale and gypsum
160 - 180	Drilling mud, some gray shale flakes, gypsum abundant, pyrite present
180 - 200	Fine crystalline lime, looks like sand, well cemented but effervesces briskly in acid; similar lime was noted in Wells 1 and 2. Most of sample gray shale, much pyrite, bits of iron carbonate
200 - 260	Gray shale
260 - 280	Gray shale; considerable gray crystalline calcite and pyrite, aragonite crystals common
280 - 300	Gray shale abundant, grains of crystalline calcite and pyrite, buff sugary lime probably concretionary; apparently a shale formation with abundant fossils
300 - 320	Shale flakes like above, much gray crystalline, lime, some sugary buff lime, considerable pyrite

320 - 340 Gray shale like above, some gray granular limestone, fossil impressions, apparently makes the bed from which sample was taken, much pyrite and gray shale in sample, latter probably from above  
 340 - 360 Gray shale flakes, granular lime present in lesser amount  
 360 - 380 Like above except larger percentage of granular lime  
 380 - 400 Same as above, one grain fine sand, bulk of sample gray shale  
 400 - 420 Well washed sample, leaves residue largely of lime grains, pyrite and fossil fragments  
 420 - 460 Flaky shale, crystalline limestone, calcareous shale, pyrite, gypsum; nothing new  
 460 - 480 Shale flakes, pyrite like above  
 480 - 500 Pyrite and shale  
 500 - 540 Largely gray crystalline lime, few quartz grains and abundant shale fragments  
 540 - 560 Poorly washed sample, same as above  
 560 - 580 Gray flaky shale like above, aragonite crystals, some calcite crystals  
 580 - 680 Pyrite, sugary lime, probably from concretions, gray shale like above  
 680 - 700 Largely pyrite, sugary lime and aragonite crystals  
 700 - 740 Same as above, very little shale  
 740 - 760 Like above, gray shale, sugary and crystalline lime, considerable gypsum  
 760 - 780 Flaky shale as above  
 780 - 800 Flaky shale predominated, as above, pyrite concretions, sugary limestone like above

Lower Brule Well No. 4

LOCATION: SE.  $\frac{1}{4}$ , Sec. 28, T. 106 N., R. 72 W., Lyman County  
OWNER: U.S. Indian Service  
DRILLER: Anton Sather  
DATE OF DRILLING: 1940  
CURB ELEVATION:  
SOURCE OF INFORMATION:

Feet	
1 - 20	Gypsum and red shale
20 - 40	Drilling mud with much gypsum
40 - 80	More gypsum and drilling mud, some flakes of shale
80 - 120	Like above, conspicuous brick-red shale or clay grains, also gray pieces
120 - 160	Few aragonite crystals from shells present
160 - 180	<b>Most</b> material like above, two grains of fine sandstone enclosing much pyrite; one grain gray granular limestone such as occurred in other wells
180 - 220	Gray shale in flakes, sugary limestone, aragonite crystals
220 - 260	Crystalline limestone, pyrite, much gray flaky shale
260 - 280	Gray flaky shale, non-calcareous
280 - 420	Crystalline limestone and gray flaky shale
420 - 460	Crystalline limestone with lesser amounts of pyrite and gray shale, materials like above except that limestone predominates
460 - 640	Shale and pyrite and aragonite crystals; nothing new
640 - 720	Pyrite, calcite crystals, shale
720 - 780	Grain of quartz, same as above
780 - 800	Gray flakes of shale and pyrite grains and gray crystalline limestone and buff sugary limestone and aragonite crystals

Manganese Pilot Plant at Oacoma

LOCATION: Sec. 9, T. 104 N., R. 72 W., Lyman County

OWNER: U.S. Bureau of Mines

DRILLER: A.V. De Pue

DATE OF DRILLING: Spring, 1941

CURB ELEVATION: 1539'

SOURCE OF INFORMATION: Well log given by United States Bureau of Mines  
Correlation by E.P. Rothrock and D.C. Lavier

	Feet	
	0 - 20	Yellow clay; evidently part of the Pierre
<u>Pierre</u>	20 - 270	Blue shale
<u>Niobrara</u>	270 - 330	Soft chalk rock
<u>Carlile</u>	330 - 400	Dark shale; 1' of hard rock 335-336'
	400 - 465	Hard shale; 2' 3" of hard rock 368-370'
	465 - 495	Shale
	495 - 535	Medium shale
<u>Greenhorn</u>	535 - 575	Shelly rock, hard shells being only a few feet apart and medium hard rock from 543-548'
	575 - 620	Shale with a few hard shells
<u>Graneros</u>	620 - 678	Shale with a real hard shell of a few inches at 678'
	678 - 720	Shale formation with a few hard shells of rock
	720 - 751	Hard shale with hard shells or rock
	751 - 767	Hard shell rocks a few feet apart (probably concretions)
	767 - 780	Real hard rock from 767-768' in dark shale formation
<u>Dakota</u> = 4759 ft.	780 - 800	Some sand rock from 790-800' and good sandstone from 800'
	800 - 860	Good sandstone
<u>Fuson?</u>	860 - 872	Shale

REMARKS: Production 391 gal. per minute; shut in pressure 36 lbs. per sq. inch

McClure Well

LOCATION: Sec. 31, T. 108 N., R. 78 W., Lyman County  
OWNER:  
DRILLER:  
DATE OF DRILLING: Before 1909  
CURB ELEVATION: 1917  
SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

0 - 20 Yellow shale  
20 - 820 Blue shale  
820 - 1090 Black shale  
1090 - 1094 Hard shale  
1094 - 1294 Black slate with layers of hard limestone  
1294 - 1320 Sandy shale  
1320 - 1470 Black shale with sandy streaks  
1470 - 1510 Muddy sandstone, black shale and shelly limestone  
1510 - 1550 Gray shale and fine sandstone mixed  
1550 - 1552 Very hard rock  
1552 - 1555 Shale  
1555 - 1585 Sandstone  
1585 - 1623 Sandy shale

Dakota = + 362' 21"

REMARKS: Pressure 20 lbs.;

"There is some uncertainty in this record as to whether the Dakota sandstone was reached at 1470' or 1555'."

Railroad Well at Presho

LOCATION: Sec. 10, T. 105 N., R. 77 W., Lyman County  
OWNER: Chicago, Milwaukee, St. Paul and Pacific Railroad  
DRILLER: Norbeck Company  
DATE OF DRILLING: 1934  
CURB ELEVATION: 1767  
SOURCE OF INFORMATION:

Feet

0 - 90 Alluvium  
90 - 984 Shale with limestone lenses  
984 - 1022 Shale with soft thin limestone  
1022 - 1347 Shale with hard limestone lenses  
1347 - 1353 Sandy shale  
1353 - 1414 Water bearing sandstone  
1414 - 1480 Alternate sandstone and shale

Dakota = 414' 21"

REMARKS: Production 180 gal. per minute

MARSHALL COUNTY

Britton City Well

appx 24

LOCATION: T. 127 N., R. 58 W., Marshall County

OWNER: City of Britton

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION: 1320 *ast* *R*

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept., Part II, Fig. 51

Feet

	0 -	90	Sand	
	90 -	115	Blue clay	
	115 -	825	Blue shale	
<i>Greenkian?</i>	825 -	880	Limestone (first flow 880!)	<i>Greenkian?</i>
	880 -	906	Sand and shale	
<i>Graneros</i>	906 -	976	Shale, lime, coal and pyrites (main flow at 976!)	
<i>Dakota +344'</i>	976 -	1004	Sandstone (flow)	
<i>Pte C = +316</i>	1004		Slate	

REMARKS: Production 600 gal. per minute; temperature 64°; pressure 115 lbs. per sq. inch

McCOOK COUNTY

Salem City Well

Sec 13?

LOCATION: T. 103 N., R. 55 W., McCook County

OWNER: City of Salem

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION: 15.20 <sup>25</sup> R

SOURCE OF INFORMATION: U.S. Geol. Survey 17th Ann. Rept., Part II,  
Pl. LXXXIII

Feet

0	--	37	Yellow clay
37	--	69	Blue clay
69	--	80	Quicksand
80	--	165	Blue clay
165	--	215	Soapstone, loose sand
215	--	220	Blue shale, water rose to within 75 of surface
220	--	247	Sioux quartzite

Pro-C = 41300



MEADE COUNTY

Milin No. 1 (Bear Butte) Well

LOCATION: SW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 18, T. 6 N., R. 56 E., Meade County

OWNER: Bear Butte Oil Company

DRILLER: John P. Everett

DATE OF DRILLING:

CURB ELEVATION:

SOURCE OF INFORMATION: From a letter by John P. Everett, March 31, 1923

Feet

0 - 180	"Red beds"
180 - 220	"Minnekahta"
220 - 370	"Opeche"
370 - 820	"Minnelusa"
820 - 830	"Granite"

Fort Meade Well

LOCATION: T. 5 N., R. 5 E., Meade County

OWNER:

DRILLER:

DATE OF DRILLING: Several years before 1905

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey Prof. Paper 32

Feet

0 - 25	Sandstone and gravel
25 - 50	Buff sandstone, fine grained
50 - 75	Buff sandstone, coarser
75 - 100	Buff sandstone, medium grained
100 - 125	Gray shale
125 - 153	Yellow sandstone, fine grained
153 - 185	Gray shale
185 - 200	Coarse sandstone, dark colored
200 - 225	Gray sandstone, some shale
225 - 250	Light gray shale
250 - 288	Dark shale with pyrite
288 - 322	Sandstone, fine grained basal Lakota with shale layers
322 -	Water of good quality which rose 20 above the surface and flowed 10 to 12 gal. per minute

322 - 600	Light greenish-gray shale
600 - 603	Very dark shale
603 - 745	Blue shale
745 - 770	Red shale
770 - 771	Blue shale
771 - 1440	Red shale with gypsum at 800' and some gray shale at 850 and 940'; gypsum, 910 to 930'
1440 - 1450	Limestone (Minnekahta)

O.W. Wells Artesian Well

LOCATION: Sec. 29, T. 7 N., R. 5 E., Meade County  
 OWNER: Durst & Smith  
 DRILLER:  
 DATE OF DRILLING: 1925  
 CURB ELEVATION: 3180 est R  
 SOURCE OF INFORMATION:

	Feet	
	0 - 30	Surface soil, gumbo, upper Graneros
	30 - 40	Soil merging to shale, dark
	40	First water coming from thin bentonite bed
	40 - 300	Dark shales, reported oil shows
	300 - 504	Light colored "Mowry" shales
	504 - 635	Shales, very dark, "Lower Graneros"
	635 - 650	"Newcastle sands," a little water
	650 - 675	Dark shales in "Themopolis"
<i>Dakota = T2505</i>	675 - 740	"Dakota sandstone" fine "bird shot" conglomerates at base (same amount of water)
	740 - 765	"Fuson" shales, red and light colored (slight oil showing in water for a few days, then none)
	765 - 790	"Lakota sandstone"

REMARKS: Production 1500 bbls. per 24 hours of sweet soft water

## Zeal Well

LOCATION: SE.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 16, T. 9, R. 17, Meade County

OWNER: Cosden Company

DRILLER:

DATE OF DRILLING: 1927

CURB ELEVATION: 2177.8

SOURCE OF INFORMATION:

Feet			
1	-	50	Brown shale
50	-	100	Dark shale
100	-	117	Light shale
117	-	145	Dark shale
145	-	864	Brown shale
864	-	1090	Blue shale
1090	-	1240	Gray shale
1240	-	1290	Light gray shale
1290	-	1445	Gray shale
1445	-	1985	Brown shale
1985	-	2047	Brown shale with a little sand
2047	-	2060	Lime shell
2060	-	2075	Black shale
2075	-	2077	Lime shell
2077	-	2310	Dark gray shale
2310	-	2313	Lime shell
2313	-	2544	Dark gray shale, some sand at bottom
2544			Struck water sand, possibly was in sand a couple feet
2544	-	2551	Water sand, water raised within 300 of the top
2551	-	2565	Sand and lime in formation, mixture formation
2565	-	2570	Gray shale at 2566 cemented casing to shut off water
2570	-	2578	Gray shale or near the Dakota sand
2578	-	2600	Gray sand
2600	-	2672	White sand, Dakota sand and artesian flow, water tasted salty, warm
2672	-	2752	Blue shale
2752	-	2820	Black shale, just going into a sand, "Dakota"
2820	-	2822	Very hard sand, very large flow of artesian water, very warm
2822	-	2925	Sand, total thickness of sand 105, called the "Lakota," large flow hot water
2925	-	2970	Gray shale and the formation at bottom was sandy
2970			Total depth

MELLETTE COUNTY

When the Chicago and Northwestern Railway extended their railroad line to Wood, South Dakota, in 1929 they drilled two water wells in Mellette county, one at Mosher and the other at Wood.

Railroad Well at Mosher

LOCATION: SE.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 12, T. 40 N., R. 25 W., Mellette County

OWNER: Chicago and Northwestern Railway

DRILLER: Norbeck Company

DATE OF DRILLING: August to October, 1929

CURB ELEVATION: 2040'

SOURCE OF INFORMATION: Chicago and Northwestern Railway

Feet

0	--	25	Yellow clay
25	--	483	Blue shale
483	--	643	Blue shale with occasional hard streaks
643	--	1266	Blue shale
1266	--	1363	Very hard blue shale
1363	--	1656	Hard shale
1656	--	1681	Open hole; water

REMARKS: Production 40 gal. per minute

Railroad Well at Wood

LOCATION: NW.  $\frac{1}{4}$ , SW.  $\frac{1}{4}$ , Sec. 25, T. 41 N., R. 27 W., Mellette County

OWNER: Chicago and Northwestern Railway

DRILLER: Norbeck Company

DATE OF DRILLING: November, 1929, to February, 1930

CURB ELEVATION: 2150'

SOURCE OF INFORMATION: Chicago and Northwestern Railway

Feet

0	--	130 $\frac{1}{2}$	Clay
130 $\frac{1}{2}$	--	517 $\frac{1}{2}$	Blue shale
517 $\frac{1}{2}$	--	617 $\frac{1}{2}$	Soft shale
617 $\frac{1}{2}$	--	1500 $\frac{1}{2}$	Blue shale with frequent streaks of very hard shale
1500 $\frac{1}{2}$	--	1530 $\frac{1}{2}$	Leak
1530 $\frac{1}{2}$	--	1744 $\frac{1}{2}$	Blue shale with frequent hard streaks
1744 $\frac{1}{2}$	--	1834	Sand rock

REMARKS: Production 40 gal. per minute

MINER COUNTY

George Johns Farm Well

LOCATION: Sec. 28, T. 105, R. 58, Miner County

OWNER:

DRILLER:

DATE OF DRILLING:

CURB ELEVATION:

SOURCE OF INFORMATION:

Feet		
0 -	4	Black soil
4 -	40	Yellow clay
40 -	110	Blue clay
110 -	123	Sand and gravel
123 -	140	Quicksand
140 -	148	Blue clay
148 -	160	Gravel
160 -	200	Quicksand
200 -	230	Shale
230 -	250	Sand
250 -	303	Shale
303 -	311	Pink sand

MOODY COUNTY

Well Near Trent

LOCATION: Sec. 8, T. 105 N., R. 48 W., Moody County

OWNER:

DRILLER:

DATE OF DRILLING: Before 1895

CURB ELEVATION:

SOURCE OF INFORMATION: U.S. Geol. Survey Water Supply Paper 227

Feet

0 - 180	Yellow clay and blue clay
180 - 192	Sand; no water
192 - 220	Sandy clay
220 - 230	Sand; some water
230 - 360	Clay with thin bed of sand at 300'
360 - 363	Sand with main water supply

PENNINGTON COUNTY

Conata Oil Test

LOCATION: SW.  $\frac{1}{4}$ , NW.  $\frac{1}{4}$ , Sec. 11, T. 4 S., R. 16 E., Pennington  
County

OWNER:

DRILLER: M.S. Campbell

DATE OF DRILLING: 1925-1926

CURB ELEVATION: 2478 est.

SOURCE OF INFORMATION: J.B. Campbell, Interior

Feet

0	--	50	Yellow clay
50	--	665	Blue shale
665	--	770	Gray shale
770	--	865	Black shale
865	--	870	Gray sand
870	--	1158	Black shale
1158	--	1186	Brown shale
1186	--	1310	Gray shale
1310	--	1325	Brown shale
1325	--	1400	Gray shale
1400	--	1490	Sand, brown
1490	--	1640	Blue shale
1640	--	1670	Dark sand
1670	--	1740	Gray sandy shale
1740	--	1830	Black shale
1830	--	1850	White sand
1850	--	1870	Black shale
1870	--	1900	Blue shale
1900	--	1910	Sand carrying water
1910	--	1930	Blue shale
1930	--	1940	Gray shale
1940	--	2075	Sand, water bearing; gas and some oil
		2050-2090'	
2075	--	2090	Shale
2090	--	2100	Sand
2100	--	2150	Shale, dark
2150	--	2156	Sand, water 1900' in hole; 8 $\frac{1}{4}$ " casing
2156	--	2162	Black shale
2162	--	2170	Brown sand
2170	--	2180	White water sand
2180	--	2195	Shale
2195	--	2200	Gray lime
2200	--	2225	White water sand
2225	--	2234	Limestone
2234	--	2239	Black shale
2239	--	2247	Sand
2247	--	2252	Lime
2252	--	2260	Dry sand
2260	--	2315	Lime sand and shale
2315	--	2455	Dark blue shale; gas at 2350'
2455	--	2467	Coarse gray sand

## PERKINS COUNTY

Due to the abundance of shallow water supplies, only one deep well has been drilled in Perkins county. It is located at Lemmon and was drilled by the Chicago, Milwaukee, St. Paul and Pacific Railroad for water.

### Railroad Well at Lemmon

LOCATION: Sec. 5, T. 23 N., R. 16 E., Perkins County

OWNER: Chicago, Milwaukee, St. Paul and Pacific Railroad

DRILLER: Norbeck Company

DATE OF DRILLING: 1935

CURB ELEVATION:

SOURCE OF INFORMATION: Chicago, Milwaukee, St. Paul and Pacific R.R.

#### Feet

0	-	53	Yellow clay
53	-	55	Water sand
55	-	63	Boulder
63	-	158	Dark clay
158	-	162	Rock
162	-	175	Sand
175	-	178	Sandy clay
178	-	189	Sand
189	-	219	Shale, rock 6"
219	-	259	Shale
259	-	262	Rock
262	-	270	Sand
270	-	280	Hard clay
280	-	322	Sand
322	-	336	Blue clay
336	-	344	Sand
344	-	371	Sandy clay
371	-	395	Clay
395	-	430	Clay with sand streaks
430	-	441	Clay
441	-	443	Rock
443	-	455	Clay
455	-	457	Sand
457	-	567	Clay, 8" rock
567	-	589	Clay, rock 1"
589	-	593	Rock
593	-	599	Sand, no water
599	-	696	Clay
696	-	704	Sandy clay
704	-	706	Hard sand
706	-	717	Clay
717	-	728	Sand



728 -	735	Clay
735 -	760	Sand
760 -	790	Sandy clay
790 -	836	Clay
836 -	868	Sand
868 -	889	Clay
889 -	917	Clay
917 -	959	Sandy clay
959 -	1004	Clay
1004 -	1007	Rock
1007 -	1010	Sand
1010 -	1116	Clay

SANBORN COUNTY

Artesian City Well

LOCATION: Sec. 9, T. 106, R. 59, Sanborn County

OWNER: City of Artesian

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 1315'

SOURCE OF INFORMATION:

		Feet	
	0 -	63	Drift deposits
	63 -	123	Dark shale
	123 -	250	Dark shale with lime rock and pyrites, thin bed of sandstone at base
	250 -	675	Dark shale
<i>Dakota = + 640</i>	675 -	680	Sandstone with 50 gal. flow
	680 -	684	Hard sandstone (?)
	684 -	708	Sandstone with 120 gal. flow

REMARKS: Flow from Dakota sandstone

SHANNON COUNTY

Slim Buttes Oil Test

LOCATION: Sec. 24, T. 36 N., R. 48 W., Shannon County

OWNER:

DRILLER:

DATE OF DRILLING: 1931.

CURB ELEVATION:

SOURCE OF INFORMATION: Driller's log furnished by J.L. Warren and L.L. Attken--correlation by E.F. Schramm

Feet

Carlile and			
Greenhorn	0 -	500	Black shale
Graneros	500 -	560	Pencil shale, fissile and slate caved badly
	560 -	860	Very black shale, heavy
	860 -	998	Sand, showed gas 875-890', balance dry and hard
	998 -	1035	Sandy shale
	1035 -	1060	Blue shale
	1060 -	1090	Shale, bluish black, sandy, badly broken
	1090 -	1120	More in place, black shale, very gummy
	1120 -	1215	Blue shale, very gummy
	1215 -	1260	Brown shale
	1260 -	1280	Blue shale
	1280 -	1310	Brown shale carrying light sandy shale
	1310 -	1330	Lighter shale
	1330 -	1340	Pure white clay
	1340 -	1385	Blue shale
Dakota	1385 -	1405	Dark sand, dry at top
	1405 -	1460	At 1405' the sand ran out into a slate and we got water that raised 300' in hole; this slate ran out at 1410' and was replaced by white sand to 1460' and the water raised up to about 75' higher
Fuson	1460 -	1463	Limestone, shelly
	1463 -	1550	Blue shale
Lakota	1550 -	1558	Sand, water bearing
	1558 -	1570	Blue shale
	1570 -	1600	Dark sand, dry
	1600 -	1620	Brown sandy shale
	1620 -	1630	Blue shale
	1630 -	1680	Sandy blue, red, brown shale
	1680 -	1720	A river sand that carried water and raised to same level as the other

Unkpapa	1720 - 1880	Shaley red bed
	1880 - 1886	Clear white sand that carried water, raised to same level
	1886 - 1896	White clay in which water was shut off
	1896 - 1912	Brown sand, the lower part of this sand water bearing
Sundance	1912 - 1920	Red beds, shaley, very red
	1920 - 1928	Hard limestone
	1928 - 1950	Clayey shale, yellow, brown, red intermixed
	1950 - 2000	Blue shale
	2000 - 2050	Brown shale
	2050 - 2070	Dry sand, brown
	2070 - 2090	Water came in this sand and at bottom raised to level of other water
	2090 - 2110	Blue shale
	2110 - 2165	Gray sand and more water
	Spearfish	2165 - 2180
2180 - 2190		Sandy, reddish clay
2190 - 2264		This same clay but got very red, sandy
2264 - 2268		Hard white limy shale
2268 - 2400		Red rock with shale breaks in it; carried quartz shells that were very hard
2400 - 2410		A soft, white material that broke up like sand but was not gritty; warm sulphur water came in here that raised about 25' higher than the level of the other water
2410 - 2418		A limy sand, very hard, white and red streaked
Minnekahta		2418 - 2430
	2430 - 2445	Greyish brown limestone or hard shale

SPINK COUNTY

State School Well

LOCATION: Sec. 3, T. 116, R. 64, Spink County, at State School,  
Redfield

OWNER: State School

DRILLER: Norbeck Company

DATE OF DRILLING:

CURB ELEVATION: 1300'

SOURCE OF INFORMATION: Harold Norbeck

	Feet	
	1 - 3	Sand
	3 - 10	Yellow clay
	10 - 25	Sand and gravel
	25 - 145	Blue clay
	145 - 520	Shale
6-10-17	520 - 530	Lime rock
6-10-17	530 - 850	Dark shale
	850 - 860	Loose gray shale (Norbeck says probably loose because of scattering sands)
	860 - 864	Solid shale
	864 - 874	Tough hard shale
6-10-17	874 - 882	Sand rock, fair water bearing
	882 - 905	Gray shale
	905 - 915	Poor sand, water bearing
	915 - 935	Very good sand
	935 - 942	Gray shale
	942 - 948	Fair sand
	948 - 968	Gray shale
	968 - 970	Sand, water
	970 - 986	Shale
	986 - 1014	Very good sand, water
	1014 - 1021	Gray, tough, sandy shale
	1021 - 1035	Gray shale

REMARKS: Well furnished from 5 or 6 sands. All drain into the same pipe. Sand packing around the casing.

STANLEY COUNTY

Meers Township Well

LOCATION: Sec. 8, T. 5 N., R. 28 E., Stanley County  
 OWNER: Meers Township  
 DRILLER: Norbeck Company  
 DATE OF DRILLING: 1911.  
 CURB ELEVATION: 1925'  
 SOURCE OF INFORMATION:

Feet		
0 -	6	Black gumbo
6 -	40	Yellow shale
40 -	130	Blue shale
130 -	1000	Gray shale
1000 -	1130	Gray shale with layers of limestone
1130 -	1132	Very hard rock
1132 -	1500	Gray shale with layers of limestone
1500 -	1610	Muddy sandstone with streaks of gray shale, sand
1610 -	1640	Sandstone
1640 -	1690	Sandy shale with streaks of sandstone
1690 -	1750	Sandstone, water and gas
1750 -	1790	Red shale

REMARKS: Production 26 gal. per minute, gas; temperature 100°

Standing Butte Oil Test

LOCATION: Sec. 9, T. 7 N., R. 27 E., Stanley County  
 OWNER: South Dakota Development and Refining Company  
 DRILLER: Several contractors  
 DATE OF DRILLING:  
 CURB ELEVATION: 1958.1'  
 SOURCE OF INFORMATION: Information furnished by the company

Feet		
<u>Pierre</u>	1 - 927	"Pierre" shale
<u>Niobrara?</u>	927 - 933	Gray shale rock
	933 - 963	Gray sandy shale carrying dry gas
<u>Carlile</u>	963 - 1400	Shale
<u>Greenhorn</u>	1400 - 1450	Sand and water
<u>Graneros</u>	1450 - 1735	Shale

Dakota	1735 - 1905	"Dakota" sandstone carrying water with gas and oil showing
Fuson	1905 - 1940	"Fuson" shale
Lakota	1940 - 1976	"Lakota" stone
Morrison	1976 - 2190	"Morrison" shale
?	2190 - 2270	Base of the "Morrison" or upper "Sundance"
Sundance	2270 - 2279	Limestock, penetrating lower sandstone
	2279 - 2290	Water sand
	2290 - 2292	Lime rock
	2292 - 2294	Pyrites, iron, shell
	2294 - 2307	Loose white sand
	2307 - 2325	Gray shale
	2325 - 2350	Water sand with great water flow
	2350 - 2356	Coal
	2356 - 2382	Sandstone
	2382 - 2385	White sand
	2385 - 2392	Sandstone
	2392 - 2402	Fuller's earth
	2402 - 2405	Sandstone
	2405 - 2412	Clay
Spearfish	2412 - 2559	Red beds carrying streaks of gypsum and sand
Minnekahta	2559 - 2560	Oil sand
	2560 - 2564	Red bed
	2564 - 2570	Tar sands carrying oil
Opeche	2570 - 2615	Red beds
Minnelusa	2615 - 2620	Sand showing tar
	2620 - 2625	Black sand
	2625 - 2657	Hard sand rock showing gas and tar
	2657 - 2659	Black flakey shale
	2659 - 2660	Gypsum
	2660 - 2665	Broken formation of sand and shale, more gas
	2665 - 2670	Broken formation, some gypsum
	2670 - 2680	Sand rock
	2680 - 2685	Broken formation
	2685 - 2727	Tough gray shale
	2727 - 2730	Pink formation showing lime
	2730 - 2755	Pink rock
	2755 - 2764	Limestone shells, conglomerate between
	2764 - 2771	Pink sticky formation
	2771 - 2781	Conglomerate
	2781 - 2787	Gray shale
	2787 - 2798	Conglomerate
	2798 - 2830	Conglomerate, gas showing
	2830 - 2840	Broken formation, gypsum and lime
	2840 - 2848	Lime and gypsum
	2848 - 2873	Red shale
	2873 - 2877	Black shale

	2877 - 2880	Red shale
	2880 - 2910	Lime, gypsum, black shale
	2910 - 2920	Tough yellow clay
	2920 - 2930	Red shale
	2930 - 2935	Hard sandstone, shell
	2935 - 2940	Sand, small flow water
	2940 - 2967	Sand, very sharp
	2967 - 2990	Light sandy shale
	2990 - 3010	Gray sandy shale
	3010 - 3027	Sandy, heavy water flow
Pahasapa	3027 - 3090	White lime, medium hard
	3090 - 3160	Lime, very hard
	3160 - 3170	Lime, medium hard
	3170 - 3508	Lime with hard, medium and soft layers

Wendt Well

LOCATION: Sec. 5 or 6, T. 3 N., R. 29 E., Stanley County  
 OWNER: Chicago and Northwestern Railway Company  
 DRILLER: Norbeck and Nicholson  
 DATE OF DRILLING:  
 CURB ELEVATION: 1592'  
 SOURCE OF INFORMATION:

Feet

	0 - 1280	Shale
Dakota	1280 - 1395	Shale, limestone and sandstone

REMARKS: Temperature 100°

Willow Creek Township Well No. 3

LOCATION: SE.  $\frac{1}{4}$ , Sec. 22, T. 5 N., R. 29 E., Stanley County  
 OWNER: Willow Creek Township  
 DRILLER: Norbeck Company  
 DATE OF DRILLING: March, 1911  
 CURB ELEVATION: 1934'  
 SOURCE OF INFORMATION:

Feet

Pierre, Niobrara, Carlile, Greenhorn and Graneros	0 - 3	Black gumbo
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	3 - 25	Yellow shale
	25 - 260	Blue shale
	260 - 920	Gray shale
	920 - 930	Black sand
	930 - 1460	Gray shale with layers of limestone
	1460 - 1520	Muddy sandstone with streaks of gray shale
	1520 - 1600	Gray shale
Dakota = 334 el.	1600 - 1640	Sandstone
	1640 - 1700	Sandy shale with small streaks of sandstone
	1700 - 1760	Sandstone (water sand)
?	1760 - 1768	Red shale

REMARKS: Production, water stands within 6' of surface

SULLY COUNTY

Deep Well at Oneida

LOCATION: NW.  $\frac{1}{4}$ , Sec. 11, T. 114 <sup>N</sup>S., R. 77 W., Sully County  
OWNER: Oneida  
DRILLER:  
DATE OF DRILLING:  
CURB ELEVATION: 1925'  
SOURCE OF INFORMATION: Water Supply Paper 227

Feet

0 -	3	Black soil
3 -	34	Yellow clay
34 -	170	Blue clay and gravel pockets
170 -	950	Blue shale with hard shells
950 -	1200	Black shale with slate
1200 -	1260	Gray shale
1260 -	1400	Blue shale
1400 -	1560	Shale, sandy streaks
1560 -	1630	Sandstone with a few hard "shells;" first flow
1630 -	1717	Sand rock; second flow

11650 = +365

ERRATUM: Oneida should be spelled "Onida."

## TODD COUNTY

The U.S. Indian Service drilled a well for water in 1895-97 on the Rosebud Indian Reservation in Todd county. Although the log of this well has been published in U.S. Geological Survey Water Supply Paper 227, p. 132, it is included here again, as it is of interest in making a study of the formations underlying western South Dakota.

### Rosebud Well

LOCATION: Sec. 27, T. 38 N., R. 30 W., Rosebud Indian Agency

OWNER: U.S. Indian Service

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 2688'

SOURCE OF INFORMATION: Mr. Wright and Dr. McChesne, Indian Agents

	Feet	
Tertiary	0 -- 350	"Tertiary" sands and clays
Pierre,	350 -- 1390	Dark gray shales, water encountered at 1390' which rose 250' in well
Niobrara,	1390 -- 1550	Light gray shales with water at 1490'
Carlile	1550 -- 1730	Light gray limy shales
	1730 -- 1860	Dark shales
Greenhorn	1860 -- 1880	Sandstone and limestone
	1880 -- 1885	Hard sandstone with water rising 1280' in well *
Graneros	1885 -- 1920	Shale, darker below
	1920 -- 1950	Hard sandstone
	1950 -- 2075	Soft shales with thin limestone bed at 2060'
	2075 -- 2100	Unknown
	2100 -- 2140	Gray sandstone, hard at top
	2140 -- 2150	Soft shale
	2150 -- 2175	Porous sand rock with considerable water which rose within 500 (?) of the surface
	2175 -- 2210	Unknown
	2210 -- 2240	Shale
Dakota = 448' cl	2240 -- 2290	Sandstone
	2290 -- 2292	Gray shale
	2292 -- 2500	Fine-grained sandstone with some shale and pyrites; water mainly at 2295'

TURNER COUNTY

Viborg City Well

LOCATION: Sec. 35, T. 97 N., R. 53 W., Turner County  
 OWNER: City of Viborg  
 DRILLER:  
 DATE OF DRILLING: Completed April, 1937  
 CURB ELEVATION: 1300 est.  
 SOURCE OF INFORMATION: Driller's log

Feet

	0 - 60	Clay and conglomerate
	60 - 175	Chalk rock
	175 - 679	Shale
<i>Dakota = +621 ft.</i>	679 - 718.8	In sandstone. Water rises in this well to a point 133 from the top.

*State Survey 1931*

<i>Depth</i>	<i>Elevation</i>	<i>Top.</i>
40	1260	U. Nebraska chert
160	1140	Codell Sand
370	930	Greenhorn
390	910	Graneros
430	870	Dakota
490	810	Fuson
630	670	Lakota
725	575	St. Louis
732	+ 568	T. D.

YANKTON COUNTY

Yankton City Well

LOCATION: Sec. 13, T. 93 N., R. 56 W., Yankton County

OWNER: City of Yankton

DRILLER:

DATE OF DRILLING:

CURB ELEVATION: 1200 est R

SOURCE OF INFORMATION: Water Supply Paper 227

		Feet	
	0	-- 25	Yellow clay
	25	-- 55	Blue clay
	55	-- 115	Chalk
	115	-- 415	Clays, Benton
	415	-- 615	Alternations of sandstone and clay, the latter predominating
<u>Dakota = +585 el.</u>	615	-- 625	Principal water bearing horizon
	625	-- 898	Alternations of sandstone and clay
<u>Pre-E? = +302 el.</u>	898	-- 942	"Granite"

(?)

## ZIEBACH COUNTY

The Irish Creek Oil Company drilled a test for oil in 1924-25 in northern Ziebach county. A log and diamond drill core were furnished the State Geological Survey and a report made by W.L. Russell has been published as Circular 18 of the State Geological Survey.

The Cosden Oil Company made a test for oil six miles south of Red Elm on the Ole Tanberg farm in 1928-30. A study of the cuttings and a correlation of the formations encountered was made by Mrs. E.R. Applin, the results of which were published in the Journal of Paleontology, vol. 7, pp. 217-20, 1933.

The U.S. Indian Service drilled two water wells in the county in 1934-35, one at the Cherry Creek school and the other at the Red Scaffold school.

### Well at Cherry Creek Station

LOCATION: Sec. 31, T. 7 N., R. 22 E., Ziebach County

OWNER:

DRILLER: Norbeck Company

DATE OF DRILLING: Completed November 15, 1934

CURB ELEVATION: 1739.8'

SOURCE OF INFORMATION: Correlations by E.P. Rothrock and T.W. Robinson

	Feet	
Pierre	0 - 40	Yellow clay
	40 - 576	Blue shale
	576 - 630	Blue shale with streaks of hard shell
	630 - 647	Blue shale
	647 - 648	Lime shell
	648 - 657	Blue shale
	657 - 658	Lime shell
	658 - 770	Black shale
	770 - 990	Blue shale, bottom of Pierre at 850'
Niobrara	990 - 993	Soft loose shale, may contain very fine sand
	993 - 1120	Blue shale
Carlile	1120 - 1265	Sandy shale
	1265 - 1441	Shale
Greenhorn	1441 - 1475	Limestone with some streaks of shale
Graneros	1475 - 1639	Shale
	1639 - 1641	White shale
	1641 - 1660	Shale
	1660 - 1669	White shale

Dakota	1669 - 1755	Shale
	1755 - 1757	Sand
7-15'	1757 - 1762	Shale
	1762 - 1764	Sand
	1764 - 1780	Shale
	1780 - 1781	Sand
	1781 - 1806	Shale
	1806 - 1818	Sand
	1818 - 1834	Shale
	1834 - 1843	Hard shale with fine sand
	1843 - 1854	Shale
	1854 - 1878	Sand

Irish Creek Oil Test

LOCATION: SE.  $\frac{1}{4}$  Sec. 17, T. 15 N., R. 20 E., Ziebach County

OWNER: Irish Creek Oil Company

DRILLER: Longyear

DATE OF DRILLING: 1924-1925

CURB ELEVATION:

SOURCE OF INFORMATION: Circular 18, S. Dak. Geol. Survey; correlation by W.L. Russell

	Feet	
Fox Hills	0 - 80	No core
	80 - 139	Blue and gray shale and yellowish gray sandstone
Pierre	139 - 260	Bluish gray shale, containing silt occasionally
	260 - 335	Very fine grained, shaly, greenish gray sandstone
	335 - 396	Grayish blue shale, innumerable lingulae
	396 - 460	Light bluish gray shale
	460 - 522	Dark gray, calcareous shale, with numerous white specks, some chalky layers
	522 - 587	Dark gray, non-calcareous shale
	587 - 589	Dark gray, calcareous shale
	589 - 599	Dark gray, clay shale
	599 - 612	Light bluish gray shale
	612 - 1445	Light bluish gray, dolomitic shale
	1445 - 1585	Very dark gray oil shale, fish scales
Niobrara	1585 - 1865	Bluish gray shale
	1865 - 1885	Hard, gray, impure chalk
	1885 - 1925	Dark and light bluish gray calcareous shales

	1925 - 1960	Bluish gray, calcareous shale and shaly limestone, chalky layers
Carlile	1960 - 2049	Bluish gray, clay shale
	2049 - 2350	Carlile shale; shale, bluish gray, rather light in color, non-calcareous with a few traces of silt
Greenhorn	2350 - 2417	Calcareous grayish-black shale, containing a few scattered chalky specks with innumerable very thin streaks of limestone, containing numerous shells; limestone very small portion of whole
	2417 - 2420	Harder, shaly limestone
Graneros	2420 - 2574	"Graneros" shale; dark bluish gray or bluish black, calcareous shale, rather chalky, containing fish scales
	2574 - 2680	Dark bluish-gray non-calcareous shale

Ole Tanberg No. 1 Well

LOCATION: Sec. 9, T. 11, R. 19 E., Ziebach County  
 OWNER: Cosden Oil Company  
 DRILLER: Cosden Oil Company  
 DATE OF DRILLING: October 23, 1928, to August 17, 1930  
 CURB ELEVATION: 2327.5'  
 SOURCE OF INFORMATION:

Feet		
0 -	45	Surface clay (yellowish sand)
45 -	155	Shale
155 -	275	Shale and boulders
275 -	409	Shale
409 -	432	Gumbo and boulders
432 -	857	Hard shale and boulders
857 -	861	Rock
861 -	1131	Hard shale and boulders
1131 -	1171	Lime rock and gumbo
1171 -	1186	Hard shale and boulders
1186 -	1308	Lime and shale
1308 -	1340	Shale and boulders
1340 -	1460	Sticky shale
1460 -	1490	Gumbo
1490 -	1640	Shale and shell
1640 -	1660	Shale and boulders
1660 -	1730	Hard shale
1730 -	1754	Limestone and shale
1754 -	1770	Lime



1770 - 1785	Shale and lime
1785 - 1805	Hard lime
1805 - 1819	Sandy lime
1819 - 1870	Lime and shale
1870 - 1895	Shale and boulders
1895 - 1927	Gumbo
1927 - 1933	Gypsum
1933 - 1945	Lime
1945 - 1961	Gumbo
1961 - 2000	Sticky shale
2000 - 2040	Shale and boulders
2040 - 2114	Gumbo
2114 - 2164	Sticky shale
2164 - 2174	Shale and boulders
2174 - 2265	Lime
2265 - 2281	Lime and shale
2281 - 2339	Lime
2339 - 2356	Lime and shale
2356 - 2388	Sticky shale
2388 - 2400	Gumbo and boulders
2400 - 2459	Shale and gumbo
2459 - 2465	Gumbo
2465 - 2570	Shale
2570 - 2571	Lime
2571 - 2615	Shale
2615 - 2619	Lime
2619 - 2635	Shale
2635 - 2658	Shale and boulders
2658 - 2668	Broken lime and shale
2668 - 2673	Limy shale
2673 - 2683	Sticky shale
2683 - 2697	Limy shale
2697 - 2713	Lime
2713 - 2715	Lime shale
2715 - 2724	Lime
2724 - 2733	Shale
2733 - 2738	Lime and shale
2738 - 2740	Shale
2740 - 2747	Sand
2747 - 2767	Sandy shale
2767 - 2771	Hard shale
2771 - 2787	Sandy shale and lime
2787 - 2789	Lime
2789 - 2795	Shale
2795 - 2810	Gypsum and gumbo
2810 - 2882	Sticky shale
2882 - 2887	Lime and gypsum
2887 - 2930	Shale
2930 - 2943	Shale and shells
2943 - 2961	Shale and gypsum
2961 - 2964	Rock

*Data to = -413'el.*

2964 - 2967	Lime rock
2967 - 2976	Hard shale and sand
2976 - 2986	Sandy lime and shale
2986 - 3000	Sand and shale
3000 - 3045	Hard sand
3045 - 3057	Sand and broken shale
3057 - 3100	Sandy shale
3100 - 3108	Hard shale
3108 - 3120	Sandy shale
3120 - 3161	Black shale
3161 - 3180	Black shale and sand
3180 - 3182	Rock
3182 - 3220	Sandy shale
3220 - 3226	Shale and sand
3226 - 3231	Sandy shale
3231 - 3267	Sand and shale
3267 - 3287	Shale
3287 - 3348	Red bed
3348 - 3358	Red bed and shale
3358 - 3365	Limy shale
3365 - 3387	Shale and lime
3387 - 3389	Sandy lime
3389 - 3396	Broken sand
3396 - 3402	Broken sand and shale
3402 - 3405	Broken lime and shale
3405 - 3465	Red bed
3465 - 3503	Flinty red rocks
Spearfish - 3503 - 3528	Red bed
3528 - 3536	Broken red bed
3536 - 3543	Broken red bed and rock
3543 - 3550	Broken red bed
3550 - 3556	Lime
3556 - 3575	Lime and red bed
3575 - 3584	Broken red rock and lime
3584 - 3587	Broken red bed
3587 - 3588	Hard sandy lime
3588 - 3593	Broken lime
3593 - 3600	Soft shale
3600 - 3604	Anhydrite and gypsum; twisted off drill pipe; could not fish it out.

Correlation by Esther R. Applin, Journal of Paleontology, vol. 7, 1933, pp. 217-220

0 - 40	No record
40 - 280	Fox Hills
280 - 1640	Pierre
1640 - 1840	Niobrara
1840 - 2177	Carlile
2177 - 2380	Greenhorn
2380 - 2745	Graneros
2745 - 2765	Dakota

2765 -- 2971 Fuson  
 2971 -- 3039 Lakota  
 3039 -- 3220 Morrison  
 3220 -- 3505 Sundance  
 3505 -- 3581 Spearfish

Well at Red Scaffold

LOCATION: Junction of Red Scaffold and Cherry Creeks  
 OWNER: U.S. Indian Service  
 DRILLER: Norbeck Company  
 DATE OF DRILLING: November 1, 1934, to February 25, 1935  
 CURB ELEVATION: 1996.01  
 SOURCE OF INFORMATION:

6-94-19 E

	Feet		
Pierre,	0	15	Sandy clay
Niobrara	15	17	Gravel
(1200-1400'),	17	20	Yellow clay
and Carlile	20	75	Shale
	75	77	Lime shell
	77	112	Shale
	112	115	Lime shell
	115	180	Shale (thin lime shell at 180')
	180	225	Shale
	225	252	Sticky shale
	252	253	Lime shell
	253	280	Shale
	280	290	Sticky shale
	290	510	Shale
	510	535	Harder shale
	535	540	Leaky formation (lost about 2000 gal. of mud)
	540	630	Shale
	630	650	Harder shale
	650	1040	Shale with numerous thin scattered lime shells
	1040	1043	Lime shell
	1043	1080	Shale
	1080	1240	Coarse sandy shale
	1240	1325	Harder shale
	1325	1390	Shale
	1390	1425	Sandy shale
	1425	1500	Shale
	1500	1540	Crumbly shale
	1540	1560	Hard shale
	1560	1640	Soft shale

	1640 - 1660	Crumbly shale
	1660 - 1785	Softer shale with numerous lime shells
Greenhorn	1785 - 1795	Alternating lime shells and shale
	1795 - 1805	Lime (probably Greenhorn limestone)
	1805 - 1930	Shale (leaky formation about 1850'; thin lime shells at 1890' and 1900')
Graneros	1930 - 1940	Shale; sandy and light colored
	1940 - 2205	Crumbly shale alternating with lime shells
	2205 - 2210	Lime shell
	2210 - 2250	Shale
Dakota	2250 - 2255	Hard sand
	2255 - 2268	Sand
	2268 - 2310	Shale
	2310 - 2330	Sandy shale
	2330 - 2352	Water bearing sand
	2352 - 2353	Hard sandstone
	2353 - 2365	Alternating hard sand and shale
	2365 - 2385	Hard sandy shale; streaks of sand

REMARKS: 6 $\frac{1}{4}$ " casing extends from bottom of well to point 2' above ground; production 500 gal. per minute; temperature 120°; casing perforated 2330' to 2385'; shut in surface pressure 120 lbs. per sq. inch