

Tertiary	Surface	883		Gravels and alluvium of gray and pink quartz rounded pebbles.
Pierre Shale	883	3192		Dark gray to black clay shale, few calcareous beds, soft and gummy, with stringers of limestone and fish scales in places.
				
Niobrara (Lime)	4075	371		Shale, limey, black, brownish black looking where abundant forams giving speckled appearance with their tiny white spots. Some shale slightly silty. Also, plain and soft blue gray shale alternating. Bentonite, pyrite specks, few limestone stringers, fibrous aragonite.
Carlisle Shale	4446	206		Shale, sandy and silty shale, dark gray to black, sandy to very fine sandstone streaks gray peppered with black specks, calcareous soft. Also, limestone stringers, light orange, silty soft, and bentonite. Shales are calcareous and in part white specked with forams, and with few fish fragments. The lower approximately 25' becoming limey sand, sandy lime, and some hard limestone.
Greenhorn (Limestone)	4652	7		Limestone, brown, dense, hard, cherty looking. Sandy limestone to very fine and limey sandstone hard, tight, and gray. Softer and silty streaks inocaramus prisms. Some black shale.
Graneros Shale	4659	228	4858 to 4883	Shale, silty siltstone, black, much speckled with forams. Silty lime stringers. Plain shale dark gray, much calcareous. In lower portion few thin sandstone beds, gray very fine, speckled with glauconite and black specks.
Dakota Sandstone	4887	203	4883-4906 4906-4916 4916-4936 4986-5001 5001-5011 5011-5056 5056-5092	Sandstone, very fine to fine and well sorted grains angular to subangular, light gray where barren, mostly noncalcareous, little or no cementation.



CORE RECORD

Core No. 1 from 4858 to 4883		Cut 25 ft. Rec. 25 ft.
4858-4883	25	Shale, black, poker chipped.

Core No. 2 from 4883 to 4906

4883-4887
4887-4906

4
19

Cut 23 ft. Rec. 23 ft.

Shale poker chipped.
Sand, fine grain, good saturation medium hard, with thin shale breaks in upper part. Vertical fractures in lower 2 ft. of sand.

Core No. 3 from 4906 to 4916

4906-4908

2

Cut 10 ft. Rec. 8 ft.

Siltstone, gray, hard, with carbonaceous material and mica.

4908-4914

6

Shale, hard, gray, with carbonaceous material. Lost.

4914-4916

2

Core No. 4 from 4916 to 4936

4914-4917

3

Cut 20 ft. Rec. 22 ft.

Shale, gray, hard, with some carbonaceous material. Sand, gray, hard, very fine grain, slight porosity under microscope, with thin shale streaks. No odor or stain no fluorescence.

4917-4918 $\frac{1}{2}$

1 $\frac{1}{2}$

Shale, black, hard, with carbonaceous material and mica.

4918 $\frac{1}{2}$ -4924

5 $\frac{1}{2}$

Sand, gray, very fine grain, very slight porosity under microscope, laminated with black mica and shale. No odor or stain, no fluorescence.

4924-4925

1

Shale, black, hard.

4925-4936

11

Core No. 5 from 4986 to 5001

Cut 15 ft. Rec. 15 ft.

4986-4991

5

Shale, black, hard with bentonite.

4991-4994

3

Sand, fine grain, gray hard, tight, no odor or stain.

4994-4996

2

Sand, fine grain, hard, tight, light stain and odor.

4996-4998

2

Shale, hard, black.

4998-5001

3

Sand, very fine grain, hard, tight, good stain and odor.

Core No. 6 from 5001 to 5011

Cut 10 ft. Rec. 10 ft.

5001-5002

1

Sand, fine grain, hard with vertical fracture fair odor and stain.

5002-5011

9

Sandy shale, siltstone and shale, hard.

Core No. 7 from 5011 to 5056

Cut 45 ft. Rec. 45 ft.

5011-5019

8

Shale, black and hard.

5019-5021

2

Sand, gray, very fine grain, hard tight, no odor or stain.

5021-5023

2

Shale, black, and hard.

5023-5024

1

Sand, gray very fine grain, hard, tight, no odor or stain.

5024-5031

7

Shale, black, and hard.

5031-5034

3

Sand, with shale laminations, white, fine grain, hard, tight, no odor or stain.

5034-5035

1

Shale, black, and hard.

Core No. 7 continued 5035-5042	7	Sand, white, hard, tight, laminated, with shale, no odor or stain.
5042-5056 ⁴	14	Shale, black, hard, laminated with siltstone.
Core No. 8 from 5056 to 5092		Cut 36 ft. Rec. 36 ft.
5056-5071	15	Shale, black, hard, laminated with sand and siltstone.
5071-5074	3	Sand, fine grain, hard, tight, no odor or stain.
5074-5080	6	Sandy, shale, black, hard.
5080-5092	12	Sand, gray, hard, tight, laminated with shale, which is abundant, no odor or stain.

DRILL STEM RECORD

DST No. 1 December 23, 1950
Total Depth 4906
Packer Set at 4890
Tool Opened 45 min.

Recovered gas to surface in 5 minutes and oil flowed to surface in 40 minutes. A very small amount of water was found immediately above testing tool. There was estimated 3 gallon which was lost when attempting to catch a sample of same.

Flowing pressure initial 600 psi.
Flowing pressure final 1025 psi.
Static pressure after 15 min. 1250 psi.

DST No. 2 December 29, 1950
Total Depth 5001
Packer Set at 4991 $\frac{1}{2}$
Tool Opened 1 hour 20 min.

Recovered very small blow of air during first 30 minutes of testing after which the blow increased slightly. There was not enough blow to measure with pitot tube. Gas did not appear at the surface at the end of the testing period (still air). Recovered 20 ft. of drilling mud with very small gas odor but no indication of oil or water.

Flowing pressure initial zero
Flowing pressure final zero
Static pressure after 15 min. 530 psi.

DST No. 3 December 30, 1950
Total Depth 5011
Packer Set at 4992 $\frac{1}{2}$
Tool Open 2 hours

Recovered small blow of air throughout testing period. The flow was too small to measure with pitot tube. Recovered 20 ft. of slightly oil and gas cut mud when drill pipe was pulled with no indication of water.

Flowing pressure initial zero
Flowing pressure final zero
Static pressure after 15 min. 600 psi.

FORMATION TOPS FROM ELECTRIC LOG

Tertiary	Surface
Pierre	883
Niobrara	4075
Carlisle	4446
Greenhorn	4652
Graneros	4659
Dakota "D"	4887
Dakota "J"	4990
Schlumberger TD	5028
Dakota "M"	5000

Plugged back from total depth 5090 to 4917 1-10-51 with 75 sacks of cement, 2% chloride.

✓ 1-10-51 perforated from 4888 to 4906 Lane Wells measurements with 108-15/32" hole with conventional gun.

Cores - Drill Stem Tests and Total Depth have been corrected to Lane Well's Gamma Ray Neutron Log.

EWO-YMD 2-19-51