

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 176

Summary of the Calvert Drilling Inc. - Peter C. Peterson #1
Burke County, North Dakota
Well #974 - Permit #986

by James Peterson
June 1957

Calvert Drilling Inc., Peter C. Peterson #1, Burke County, North Dakota.
Location: C SE 1/4 NE 1/4 Sec. 22-T163N-R89W. Elevation: 1896 KB.

The Calvert Drilling Inc., Peter C. Peterson #1 was spudded September 28, 1955, drilled to a total depth of 5584, found dry, and plugged October 20, 1955.

Logs:

Schlumberger electric, 620' - 5580'
Schlumberger microlateral, 4580' - 5580'

Tests:

DST #1, 5180-5247', Tool open 1 hour; shut in 45 minutes. Recovered 30' drilling fluid. IHP 2880 psi; IF 0 psi; FF 35 psi; SI 1950 psi; FH 2880 psi.

DST #2, 5307-5357', Tool open 4 hours; shut in 1 hour. Gas to surface in 1 hour and 25 minutes. Recovered 155' slightly oil cut sulphur mud, 60' oil cut sulphur mud, 60' mud cut oil, slightly salty, 120' oil cut salt water, 455' total recovery. IH 2950 psi; IF 25 psi; FF 360 psi; SI 2085 psi; FH 2900 psi. All fluid recovery was heavily gas cut.

DST #3, (Mis-run) 5306-5336', Tool open 3 hours 11 minutes; shut in 30 minutes. Recovered 1380' muddy salt water, slightly gas cut, 3274' sulphur cut salt water, 4654' total recovery. IH 2950 psi; IF 2175 psi; FF 2350 psi; SI 2400 psi; FH 2925 psi; Mis-run caused by failure of the bottom packer.

DST #3 (re-run) 5310-5343', tool open 4 hours, shut in 45 minutes. Recovered 210' very slightly oil and gas cut mud, 60' as above, slightly salty, 120' mud cut salt water, 390' total recovery. IH 2950 psi; IF 25 psi; FF 210 psi; SI 1575 psi; FH 2950 psi. This was a re-run of test #3 where there was packer failure. This was, as DST #3, a straddle packer test.

Casing Record:

10 3/4" casing at 610' with 380 sacks cement.

Plugging Record:

5584-5320, mud; 5320-5270, 20 sacks cement; 5270-3580, mud; 3580-3530, 20 sacks cement; 3530-630, mud; 630-590, 20 sacks cement; 10-0, 5 sacks cement.

Formation tops were determined from samples and electric logs. Doubtful or obscure formation tops were not picked. Color names and identifying numbers are taken from the 1948 Rock-Color chart which is distributed by the National Research Council, Washington, D.C.

FORMATION TOPS

Cretaceous System

Pierre formation	985
Niobrara formation	2700
Greenhorn formation	3003
Basal Cretaceous sandstone	3557

Jurassic System

Morrison formation	3800
Piper formation	4590

Triassic System

Spearfish formation	4795
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Mississippian System

Charles formation	5065
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810-840	Lignite; sandstone, very light gray, very fine grained, very calcareous.
840-870	Shale, medium light gray, calcareous. Interbedded limestone, medium gray, finely crystalline, argillaceous.
870-900	Shale, medium light gray, bentonitic to medium dark gray, interbedded lignite. Occasional shell fragments.
900-1140	Missing.
1140-1170	Shale, medium light gray, lumpy, rust stains, interbedded white, bentonite.
1170-1200	Shale as above, shell fragments, Inoceramus prisms.
1200-1290	Shale, medium gray, lumpy.
1290-1350	Shale, light gray, lumpy, bentonitic to compact.
1350-1410	Shale, light gray, compact to lumpy, micaceous.
1410-1440	Shale, medium light gray, lumpy, bentonitic.
1440-1470	Shale as above, white bentonite.
1470-1550	Shale, medium light gray, lumpy, bentonitic.
1550-2120	Shale as above; slightly bentonitic.
2120-2400	Shale, medium light gray, compact; shale as above. Occasional shell fragments.
2400-2700	Shale, medium light gray to medium gray, lumpy to platy, occasional shell fragments.
2700-2760	Shale, medium to medium dark gray, soft white calcareous specks, platy; shale, dark gray, platy; shale as above.
2760-2820	Shale, light gray to medium light gray, lumpy, bentonitic.
2820-2850	Shale, light gray, platy to medium dark gray, platy.
2850-2920	Shale, light gray, lumpy to platy, occasional sublithographic limestone fragments.
2920-2980	Shale, medium light gray, platy to lumpy, a few shell fragments and Inoceramus fragments.
2980-3030	Shale as above; shale, light olive gray, platy to medium dark gray, platy. Cavings.
3030-3070	Shale, medium dark gray, platy; soft, white, calcareous specks. Limestone fragments, light gray, lithographic, finely crystalline, shaley. Inoceramus prisms.
3070-3120	Shale, medium light gray, to medium gray, lumpy to platy. Shell fragments.
3120-3220	Shale, medium light gray, lumpy. Shale, medium dark gray, platy.
3220-3250	Shale, medium light gray, platy to medium dark gray, platy. Inoceramus prisms, shell fragments.

3250-3370 Shale, medium light gray, lumpy, bentonitic to platy to medium dark gray, platy.

3370-3570 Shale, medium light gray, lumpy, bentonitic to medium gray, platy.

3570-3620 Sandstone, very light gray, sub-angular, very fine to fine grained, well sorted, vitreous sand grains. Siltstone, very light gray.

3620-3770 Shale, medium light gray to medium gray, parts sandy to silty. Scattered quartz granules, frosted. Sandstone as above. Cavings.

3770-3810 As above; sandstone, coarse grained, sub-angular, pitted and frosted.

3810-3940 Shale, predominantly medium light gray, lumpy to platy; shale, dark reddish brown to pale red. Shell fragments.

3940-3980 Shale as above; shale, moderate yellowish brown (10YR5/4). Sandstone fragments, light gray, very fine grained.

3980-4090 Siltstone, light gray to light greenish gray, calcareous to fine grained, calcareous sandstone. Shale as above.

4090-4120 Siltstone as above, shale, light greenish gray (5G8/1), subwaxy, fissile, shale, light gray, platy.

4120-4220 Shale, medium light grays platy, siltstone, medium light gray, calcareous, argillaceous.

4220-4310 Shale, predominantly medium light gray, fairly compact; limestone, light gray, subcrystalline, sublithographic and argillaceous to crystalline, lithographic.

4310-4370 Shale, light brownish gray, platy to splintery to greenish gray, subwaxy, platy. Shale as above.

4370-4440 Shale as above; siltstone to very fine sandstone, very light gray, calcareous; limestone, light gray, grainy to fragmental.

4440-4480 Limestone, very light gray, sublithographic, very finely granular to fragmental; shale, light brownish gray to medium light gray, platy to splintery; very fine grained sandstone as above.

4480-4530 Shale as above, limestone, sandstone as above.

4530-4610 Limestone, very light gray, sublithographic, fine granular texture, dolomitic; shale as above.

4610-4660 Limestone, very light gray, microsucrosic, sublithographic.

4660-4690 Limestone, light gray to medium light gray, lithographic; shale, medium light gray to grayish red (10R4/2).

4690-4720 Limestone, light gray, granular, anhydritic; shale as above. Anhydrite, very light gray, subcrystalline to crystalline.

4720-4760 Shale, grayish red, platy, interbedded with crystalline anhydrite.

4760-4800 Anhydrite, very light gray, crystalline to light gray, sub-crystalline; shale as above.

4800-4820 Siltstone, light brown (5YR6/4), slightly calcareous, white crystalline anhydrite inclusions. Occasional very light gray, subcrystalline, sublithographic, limestone fragments.

4820-4830 Shale, grayish red (10R4/2), platy to fissile. Siltstone as above.

4830-4850 As above. Occasional very light gray, very fine grained, calcareous sandstone fragments. Anhydrite fragments, white, crystalline.

4850-4950 Siltstone, light brown (5YR6/4), slightly calcareous. Shale fragments as above. Occasional crystalline limestone and anhydrite fragments.

4950-5040 Siltstone as above, some anhydrite inclusions. Coarse sand grains, round to sub-round. Occasional sublithographic limestone fragments.

5040-5050 Siltstone as above.

5050-5060 Circulation 1 hour. Siltstone, light brown, a few fragments with secondary anhydrite. Sand grain inclusions.

5060-5080 Anhydrite, pale red (10R6/2) to light gray, subcrystalline, slightly calcareous.

5080-5100 Anhydrite, pale red to moderate red (5R5/4) as above.

5100-5120 Anhydrite, light gray to pale red as above.

5120-5132 Limestone, very light gray, very fine granular, sub-lithographic, light brownish gray, crystalline, secondary calcite replacement; light olive gray crystalline anhydrite.

5132 Circulation 1 1/4 hour. As above.

5140-5160 As Above.

5160 Circulation 1 hour. Limestone, very light gray, very fine granular, sublithographic. Light brownish gray, crystalline anhydrite inclusions.

5170-5188 Anhydrite, light gray, subcrystalline, dense.

5188 Circulation 1 1/4 hour. Anhydrite as above.

5190-5210 Limestone, very light gray, granular; secondary replacement by crystalline, light olive gray anhydrite.

5210-5227 Limestone as above. Anhydrite, medium light gray, sub-crystalline.

5227-5232 Anhydrite, medium light gray, subcrystalline.

5232-5243 Limestone as above.

5243-5252 Anhydrite as above.

5252-5270 Limestone, very light gray, very fine granular, sub-lithographic, fossiliferous, crystallized anhydrite inclusions, light brownish gray.

5270-5280 Limestone as above. Anhydrite, medium light gray, rounded. Cavings.

5280 Circulation 1 hour. Anhydrite, pale brown, very calcareous, siliceous, subcrystalline, sharp fragments.

5280-5294 No samples.

5294 Circulation 1 1/4 hour. Limestone, very light gray, fine granular, interbedded light brownish gray anhydrite.

5300-5320 Anhydrite, medium light gray, subcrystalline. Cavings.

5325-5340 Circulation 1 1/2 hour. Limestone, very light gray to yellowish gray, granular, sublithographic. Very poor samples.

5340-5357 Limestone, very light gray, fine granular to fragmental, anhydrite replacement.

5357 Circulation 1 1/2 hour. Limestone, very light gray, fine granular. Secondary replacement in limestone by brownish gray, crystalline anhydrite.

5360-5370 As above. Cavings.

5370-5390 Limestone, medium light to light brownish gray, subcrystalline, lithographic, sharp brittle fragments, dense.

5390-5400 Limestone, medium light to light brownish gray, subcrystalline, oolitic. Colorless crystalline calcite in fractures and vugs.

5400-5430 Limestone, medium light gray, very oolitic, as above.

5430 Limestone, medium light gray, subcrystalline, dense, oolitic.

5440-5460 Missing.

5460 Circulation 1 1/2 hour. Limestone, very light gray, finely crystalline matrix, oolitic. Crystalline calcite in fractures and vugs. Some vugular and pinpoint porosity.

5480-5497 Limestone, light gray, subcrystalline, oolitic, tight. Limestone as above.

5497 Circulation 1 1/2 hour. Limestone, very light gray. Sub-
 lithographic, fine grainy matrix, abundant oolites.
5500-5540 As above.
5540 Limestone, light gray, subcrystalline, oolitic, lithographic,
 limestone as above.
5570 End of samples.
5584 Total depth.