

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 49

Summary of Calvert Exploration and Don Traders, Inc., Martin A. Voeller #1
Permit #377, Well #361

By LaVerne B. Nelson
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Calvert Exploration Don Traders Inc.- Martin A. Voeller #1, Pierce County, North Dakota, C SW/4 NW/4, Section 22, T 154N., R. 74W. (660 feet from south line and 660 feet from west line, Section 22). Elevation 1533 G.L., 1545 K.B.

The Martin A. Voeller #1 was spudded August 22, 1953 and 10 3/4 inch surface casing was run at 296 feet. The well was drilled to 3511 feet, plugged and abandoned.

Fifteen sack plugs were set at top of surface casing, Upper Cretaceous-253, Lower Cretaceous-2068, Upper Jurassic-2353, Mississippian (Mission Canyon)-3140, Mississippian (Lodgepole)-3316.

Formation tops determined from sample and electric logs, not all lithologic formation tops called in following list.

Formation Tops

<u>Formation</u>	<u>Depth</u>
Cretaceous System	
Niobrara Formation	1103
Greenhorn member	1580
Dakota	2070
Jurassic System	
Morrison Formation	2317
Sundance Formation	2394
Piper	2655
Triassic System	
Spearfish Formation	2900
Mississippian System	
Charles Formation	2960
Mission Canyon	3140
Lodgepole	3349
Total depth	3511

<u>From</u>	<u>To</u>	<u>Formation</u>
312	410	Shale, dark greenish gray 5G silty claystone, very slightly calcareous, lumpy, spongy, numerous small mica flakes.
410	470	Shale, dark greenish gray 5GY not calcareous, sandy claystone with ironstone concretions, lumpy, friable, mica flakes.
470	590	Shale, higher degree, of induration-slaty, brittle, greenish gray 5G, no ironstone add sandstone concretions.
590	620	Shale, same with decrease in induration, brittle-compact.

<u>rom</u>	<u>To</u>	<u>Formation</u>
620	650	Shale, becoming more silty.
650	830	Shale, same with some greenish gray 5G bentonite.
830	860	Same, some white bentonite.
860	920	Shale, greenish gray 5GY spongy, large amount of greenish gray bentonite.
920	1010	Shale greenish gray 5GY, lumpy spongy, greenish gray and white, bentonite, earthy luster.
1010	1100	Shale, dark gray to grayish black earthy luster, lumpy, disaggregated few white bentonite inclusions.
1100	1190	Shale, medium gray to medium light gray clayey-mudstone, earthy, lumpy, disaggregated, highly calcareous cement with white calcareous specks, some bentonite.
1190	1220	Shale, medium light to medium dark gray N, silty claystone, earthy flaky, brittle, highly calcareous.
1220	1250	Shale, same as above but becoming more compact to spongy.
1250	1370	Shale, same becoming brittle and decrease in calcareous content.
1370	1430	Shale, medium dark gray to dark gray N, claystone, earthy, compact, spongy to brittle, not calcareous.
1430	1520	Shale, same with some fine grained sandstone fragments.
1520	1580	Shale, medium light to medium gray N, claystone, waxy luster lumpy, disaggregated to spongy, trace of calcareous cement and pyrite, bentonitic.
1580	1640	Shale, medium to medium dark gray N, earthy, lumpy mudstone, compact to brittle, large amount of calcareous material, prismatic calcite shell fragments.
1640	1700	Shale, medium to medium dark gray N, highly calcareous, silty mudstone, earthy luster, lumpy with some laminated structure, compact to brittle, numerous prismatic calcite shell fragments.
1700	2010	Shale, medium dark gray to dark gray N, earthy to resinous luster compact, platy, some bentonite.
2010	2080	Shale, medium gray to medium dark gray N, earthy, lumpy mudstone with a tendency toward platiness, disaggregated, silty, very slightly calcareous.
	2081	3/4 hour, shale, medium gray to medium dark gray N, earthy, some quartz pebbles, siltstone and pyrite.
2081	2120	Shale, medium gray to medium dark gray N, numerous clear quartz pebbles, small amount of pyrite present, sandstone cemented with calcite.
2120	2160	Shale, medium gray to medium dark gray N, some poorly sorted angular to subangular clear quartz grain, some highly calcareous sandstone and ironstone concretions, traces of pyrite.
2160	2190	Shale, medium to medium dark gray shale, some poorly sorted, subangular to round quartz grains, a few ironstone concretions present.
2190	2200	Shale, some lignite and pyrite present, silty shale.
2200	2210	Shale, same marked increase in amount of ironstone concretions and quartz grains.
2210	2260	Shale, same very little ironstone concretions.

<u>From</u>	<u>To</u>	<u>Formation</u>
2260	2280	Sandstone poorly sorted, angular to subangular grains, virerous to slightly frosted grains, small amount of pyrite and ironstone concretions.
2280	2300	Sandstone same, increase in amount of shale and fragments of sandstone with calcareous cement.
2300	2350	Sandstone, same decrease of shale content to minor amount.
2350	2390	Sandstone, same increase of Shale, some lignite.
2390	2400	Sandstone, same increase in amount of the larger sized grains.
2400	2420	Sandstone, poorly sorted, some large angular to subangular grains 4-5 mm in diameter, some limestone present, minor amount of white to pink chert.
2420	2430	Same decrease in larger quartz grains, becoming better sorted, some greenish gray shale.
2430	2440	Sandstone, poorly sorted, angular to sub angular grains, pitted and frosted, the grains are not cemented, some moderate reddish brown 10R4/6 to dark reddish brown, limey siltstone.
2440	2450	Sandstone, same decrease in reddish brown siltstone.
2450	2480	Shale, medium gray N to greenish gray 5GY, earthy to waxy luster, platy, compact to brittle, slightly pyritic, some siltstone.
2480	2500	Shale, medium gray N to greenish gray 5GY, waxy to soapy luster, platy, brittle, quite limey.
2500	2510	Shale, same decrease in limey content.
2510	2570	Shale, medium gray N to greenish gray 5GY, earthy, luster, splintery to flaky, compact to brittle, some siltstone.
2570	2590	Shale, same, a few fragmental pieces of sucrosic, limestone.
2590	2620	Shale, medium gray N5, slightly calcareous, some reddish brown calcareous siltstone.
2620	2660	Shale, same highly calcareous.
2660	2680	Limestone, dense, microsucrosic dolomitic limestone, yellowish gray 5Y8/1.
2680	2700	Limestone, same increase in shale content.
2700	2710	Limestone, sandstone, rhombic, fine grained limestone, fine grained, calcareous, well sorted sandstone, few free subangular quartz grains.
2710	2720	Missing samples.
2720	2740	Sandstone, poorly sorted, angular to subangular, pitted and frosted grains, medium to coarse red iron staining on a few quartz grains.
2740	2760	Limestone, white N9 to yellowish gray 5Y8/1, sub-lithographic.
2760	2770	Shale, medium light gray N6 to medium dark gray N5, slightly calcareous.
2770	2830	Limestone, white N9 to yellowish gray 5Y8/1, sub-lithographic, dense.
2830	2870	Limestone, same texture changing to sucrosic to crystalline.
2870	2900	Limestone, same becoming very silty and some medium gray shale.

<u>rom</u>	<u>To</u>	<u>Formation</u>
2900	2940	Shale, dark reddish brown 10R3/4, siltstone, few medium, frosted sand grains, a little anhydrite and gypsum.
2940	2950	Shale, same increase in calcareous content and medium gray N5 to dark greenish gray 5YR4/1 shale.
2950	2960	Shale, medium gray N5 to medium dark gray N4 shale, calcareous, bentonitic, anhydrite crystals, and a few sand grains.
2960	2980	Shale, same increase in amount of anhydrite a little fine grained white anhydrite.
2980	3010	Shale, medium gray N5 brittle to spongy, some dark reddish brown 10R3/4 siltstone, grayish yellow 5Y8/4 limestone, a little grayish pink 5R8/2 to moderate pink 5R7/4 anhydrite.
3010	3020	Shale, same large increase in amount of anhydrite.
3020	3030	Anhydrite, dense sublithographic, moderate pink 5R7/4 to light red 5R6/6.
3030	3040	Anhydrite, same increase in amount of shale present.
3040	3060	Shale, calcareous, silty medium gray N5 to medium dark gray N6 shale, some anhydrite.
3060	3070	Missing samples.
3070	3080	Anhydrite, moderate pink 5R7/4 dense, anhydrite white to grayish yellow 5Y8/4 silty.
3080	3140	Anhydrite, white to grayish yellow 5Y8/4 anhydrite dense, sublithographic.
3140	3147	Anhydrite, same, some limestone, white to buff, fine grained.
3147	3170	3/4 hour, Limestone, yellowish gray 5Y7/2, very fine grainy to subcrystalline, pinpoint porosity.
3170	3180	Limestone, yellowish gray 5Y7/2 to light olive gray 5Y5/2, sublithographic, microsucrosic, tubular porosity.
3180	3210	Limestone, same, some very pale blue 5B8/2 to pale blue 5B6/2 anhydrite, some silty shale some white and pinkish red.
3210	3230	Limestone, white to buff crystalline sucrosic, medium to fine grained, same loosely cemented anhydrite, silty shale.
3230	3270	Limestone, yellowish gray 5Y7/2 to light olive gray 5Y5/2, sucrosic, medium grained, tubular to cavernous porosity, some oolites.
3270	3300	Limestone, yellowish gray 5Y7/2, microsucrosic, fine grained, tubular porosity.
3300	3310	Limestone, same, some dark gray, calcareous, shale.
3310	3320	Limestone, yellowish gray 5Y7/2, finely sucrosic, pinpoint porosity, a little anhydrite, calcareous.
3320	3330	Shale, medium light gray N6 to medium gray N5, calcareous, platy, shale, much grayish white limestone, some anhydrite and ironstone concretions.
3330	3340	Limestone, very light gray N9 to light gray N7, shaly, sucrosic limestone, a little anhydrite and ironstone concretions.
3340	3350	Shale, light gray N7 to medium light gray N6, highly calcareous, spongy, platy, shale, some white N9 to very light gray, N8 limestone, a few dark reddish brown 10R3/4 ironstone concretions and anhydrite.

<u>rom</u>	<u>To</u>	<u>Formation</u>
3350	3360	Shale, same large increase in amount of anhydrite.
3360	3400	Shale, limestone, medium gray N5, slightly calcareous shale, some anhydrite and dark reddish brown 10R3/4 ironstone concretions, much very light gray N8 limestone.
3400	3440	Limestone, very light gray, sucrosic limestone, some medium gray shale, a little anhydrite and ironstone concretions.
3440	3450	Limestone, white N9 to very light gray N8, microsucrosic.
3450	3470	Limestone, light gray N8, shaly, little anhydrite, medium gray N5, friable to spongy shale.
3470	3480	Limestone, very light gray N8, sucrosic.
3480	3509	Limestone, light gray N7, sucrosic, shaly, some dark reddish brown 10R3/4 ironstone concretions, little anhydrite.