# NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 236

Summary of the Calvert Drilling, Inc. - #1 Ray Craig
Logan County, North Dakota
Well #1347 - Permit #1359

by James Chmelik, Graduate Student
Dept. of Geology- University of North Dakota
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Calvert Drilling, Inc. - #1 Ray Craig. Location: 660 feet from north line and 660 feet from west line in the NW 1/4 NW 1/4 Section 25, T. 136N., R. 71W. Elevation 1906 G.L., 1917 K.B. Total depth 4562 feet.

The Calvert Drilling, Inc., - #1 Ray Craig was spudded January 11, 1957; drilled to a total depth of 4562 feet, found dry and plugged on January 23, 1957.

Logs:
Electrical and gamma ray-neutron to 4569 feet.

Cores: None.

Drill Stem Tests:
DST #1 3501' - 3584'. Open 30 minutes. Shut in 15 minutes. Opened with strong blow equalizing toward end of test.
Recovered - 3223' fluid: 720' slightly mud cut water
2503' slightly salty water
Pressures:
Initial flow 1040#
Final flow 1430#
Shut in 1440#
Initial hydrostatic 1860#
Final hydrostatic 1920#

DST #2 4330' - 4342'. Open 10 minutes. Shut in 15 minutes. Opened with strong blow, continued throughout test.
Recovered - 2342' fresh water muddy at top
240' loose sand with water
Pressures:
Initial flow 1877#
Final flow 1877#
Shut in 2142#
Initial hydrostatic 2542#
Final hydrostatic 2542#

Casing Record:
Set 10 3/4" surface casing at 1917' K.B. with 220 sacks cement of 2% chloride.

Plugging Record:

4562' to 4331' mud
4331' to 4271' 20 sacks cement
3570' to 3510' 20 sacks cement
3315' to 3255' 20 sacks cement
2672' to 2612' 20 sacks cement
2223' to 2153' 20 sacks cement
220' to 180' 20 sacks cement
10' to 0' 5 sacks cement

Formation tops were determined from Schlumberger logs in conjunction with samples. Colors and descriptive numbers were taken from the Goddard, and others, 1951 Rock Color Chart distributed by the Geological Society of America, New York, New York.

FORMATION TOPS

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| Cretaceous System | |
| Pierre shale | 310 |
| Niobrara formation | 1080 |
| Greenhorn formation | 1616 |
| Dakota group | 1961 |
| Newcastle sandstone | 2033 |
| Fall River formation | 2225 |
| Jurassic System | |
| Piper limestone | 2550 |
| Mississippian System | |
| Madison formation | 2672 |
| Bottineau interval | 2834 |
| Bakken formation | 3283 |
| Devonian Undifferentiated | 3315 |
| Ordovician System | |
| Stony Mountain formation | 3398 |
| Red River formation | 3570 |
| Winnipeg formation | |
| Upper | 4123 |
| Middle | 4208 |
| Lower | 4340 |
| Cambrian System | |
| Deadwood formation | 4350 |
| Precambrian | 4562 |

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| 0-60 | Till, grayish brown 5Y5/2, fragments of medium gray fissile shale. |
| 60-90 | Sand, light olive gray 5Y6/1, medium to coarse grained, few granules. |
| 90-120 | Sand, light olive gray 5Y5/2, medium to coarse grained, few till fragments. |
| 120-150 | Sand, as above, with few pebbles. |
| 150-180 | Gravel, mainly pebble sized, probably outwash. |
| 188-210 | Sand and granules, very coarse, abundant gray shale fragments. |
| 210-253 | Missing. |
| 253-283 | Sand and granules, very coarse. |
| 283-310 | Till, greenish gray 5GY6/1, fissile, slightly calcareous, little grayish bentonite. |

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| 310-400 | Shale, greenish gray 5GY6/1, lumpy to fissile, calcareous, some gray bentonite. |
| 400-430 | Shale, medium gray N5, very fissile, slightly micaceous, little grayish bentonite. |
| 430-520 | Shale, as above, slightly calcareous. |
| 520-550 | Shale, as above, but more fissile. |
| 550-700 | Shale, medium dark gray N4, calcareous, little grayish bentonite. |
| 700-730 | Shale, medium gray N5, very fissile, slightly micaceous, small amount of bentonite, first Inoceramus prisms. |
| 730-880 | Shale, as above, slightly calcareous. |
| 880-910 | Shale, as above, Inoceramus prisms more abundant. |
| 910-970 | Shale, as above, more lumpy grayish bentonite. |
| 970-1120 | Shale, medium gray N5, fissile to lumpy, slightly micaceous and bentonitic, slightly calcareous. |
| 1120-1210 | Shale, medium dark gray N4 to brownish gray 5YR4/1, very calcareous, slightly lignitic, small amount light gray bentonite. |
| 1210-1270 | Shale, medium gray N4 to dark gray N3, very calcareous, slightly fissile, small white calcareous flecks, little light gray bentonite. |
| 1270-1360 | Shale, medium light gray N6 to greenish gray 5GY6/1, fissile to lumpy, very calcareous, small white calcareous flecks, slightly micaceous. |
| 1360-1480 | Shale, as above, medium gray N5 to medium dark gray N4. |
| 1480-1600 | Shale, medium gray N5, calcareous, lumpy to slightly fissile, compact. |
| 1600-1690 | Shale, medium gray N5, lumpy to fissile, calcareous, small amount of gypsum and pyrite, little grayish bentonite. |
| 1690-1780 | Shale, medium gray N5, lumpy to fissile, compact, calcareous, Inoceramus prisms with pyrite, some grayish bentonite, few medium sand grains. |
| 1780-1810 | Shale, as above, to dark gray N3. |
| 1810-1840 | Shale, as above, more calcareous, few medium sand grains. |
| 1840-1900 | Shale, medium dark gray N4, lumpy to slightly fissile, calcareous, small white flecks, Inoceramus prisms, small amount of gypsum and pyrite. |
| 1900-1960 | Shale, medium gray N5, to medium dark gray N4, fissile to lumpy, calcareous Inoceramus prisms, small amount of pyrite and gypsum. |
| 1960-2020 | Shale, as above, with more gypsum. |
| 2020-2110 | Shale, dark gray N3, fissile, calcareous, little glauconite, some pyrite and gypsum, little limestone, Inoceramus prisms, few loose quartz grains. |
| 2110-2190 | Shale, dark gray N3 to dark greenish gray 5GY4/1, fissile and in very thin fragments, calcareous, few small white flecks, white bentonite fragments, Inoceramus prisms, pyrite, a few loose quartz sand grains. |
| 2190-2220 | Shale, medium dark gray N4, fissile, calcareous, Inoceramus prisms, little pyrite, few medium sand grains. |
| 2220-2250 | Sand, medium gray, medium grained, rounded to subangular, some shale with pyrite and Inoceramus prisms. |
| 2250-2290 | Sand, medium gray, fine to medium grained, little glauconite, little shale and limestone, few siderite (?) pellets. |
| 2290-2350 | Sand, as above, with little bentonite and glauconite, small amount pyrite and green waxy shale, few siderite (?) pellets. |
| 2350-2380 | Shale, medium dark gray N4 to greenish gray, calcareous, little bentonite and few sand grains. |

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| 2380-2410 | Shale, as above, with more quartz sand grains, and a silicified Inoceramus prism. |
| 2410-2450 | Shale, medium gray N5, fissile to slightly lumpy, calcareous, some pyrite and glauconite, little grayish bentonite, a few pieces of medium light gray N6 well cemented sandstone, little light gray siltstone. |
| 2450-2460 | Shale, as above, with a few fragments of light brown 5YR6/4 very fine grained, calcareous sandstone. |
| 2460-2470 | Sandstone, white to very light gray, fine to medium grained, slightly calcareous, very poorly indurated, shale cavings. |
| 2470-2500 | Missing. |
| 2500-2530 | Sandstone, as above, with shale cavings (?). |
| 2530-2540 | Shale, medium gray N5 to medium dark gray N4, fissile, slightly calcareous, some pyrite and bentonite, some quartz grains. |
| 2540-2560 | Shale, as above, with many Inoceramus prisms, and a few fine quartz sand grains. |
| 2560-2570 | Sandstone, light gray N7, fine grained, calcareous, friable, some reddish gray shale. |
| 2570-2590 | Sandstone, as above. Little pyrite and some shale. |
| 2590-2620 | Shale, medium gray N5 to medium dark gray N4, fissile, slightly calcareous a little pyrite and quartz sand grains, little silty shale. |
| 2620-2650 | Shale, medium light gray N6 to medium dark gray N4, fissile, slightly calcareous, much pyrite and many Inoceramus prisms, some light gray sandstone. |
| 2650-2660 | Shale, as above, with some sandstone as above, and little fine crystalline tan dolomite. |
| 2660-2670 | Dolomite, grayish orange pink 5YR7/2, microcrystallline, little reddish chert, few sand grains, shale cavings. |
| 2670-2690 | Dolomite, as above, little dolomitic limestone and sandstone. |
| 2690-2710 | Limestone, very fine crystalline, pinkish gray 5YR8/1, some shale and sand grains. |
| 2710-2720 | Limestone, finely crystalline, pinkish gray 5YR8/1 to pale red 5R6/2. |
| 2720-2750 | Limestone, finely crystalline, pale red 10R6/2 to pinkish gray 5YR8/1, few quartz sand grains, little argillaceous dolomite. |
| 2750-2770 | Limestone, finely crystalline to sublithographic, pinkish gray 5YR8/1, few quartz grains. |
| 2770-2780 | Limestone, as above, little anhydrite and quartz grains. |
| 2780-2810 | Limestone, finely crystalline, pinkish gray 5YR8/1, some finely crystalline grayish orange pink 5YR7/2 dolomite, few quartz grains. |
| 2810-2850 | Limestone, finely crystalline to sublithographic, pinkish gray 5YR8/1 to grayish orange pink 5YR7/2, little dolomite. |
| 2850-2870 | Limestone, finely crystalline to microsucrosic, grayish orange pink 5YR7/2, little dolomite and few medium quartz grains. |
| 2870-2880 | Limestone, as above, with a few pieces of white gypsum. |
| 2880-2930 | Limestone, finely crystalline to cryptocrystalline, grayish orange pink 5YR7/2 to pinkish gray 5YR8/1, little pinkish dolomite. |
| 2930-2960 | Missing. |
| 2960-2970 | Limestone, finely crystalline, pale yellow brown 10YR6/2 to grayish red 10R4/2, pinpoint porosity. |
| 2970-3000 | Limestone, and dolomitic limestone, finely crystalline to sub-lithographic grayish orange pink 5YR7/2. |

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| 3000-3020 | Limestone, finely crystalline, some dolomitic limestone, pale yellowish brown 10YR6/2, few white chert fragments. |
| 3020-3040 | Limestone, fine to medium crystalline, very light gray N8 to grayish orange pink 5YR7/2, some mottled limestone. |
| 3040-3130 | Limestone, finely crystalline to sublithographic, grayish orange pink 5YR7/2, some dolomitic limestone. |
| 3130-3150 | Limestone, finely crystalline to microsucrosic, grayish pink 5R8/2, some argillaceous limestone. |
| 3150-3190 | Limestone, as above, with little reddish dolomite. |
| 3190-3200 | Missing. |
| 3200-3220 | Limestone, finely crystalline, grayish pink 5R8/2. |
| 3220-3300 | Dolomite, microsucrosic to finely crystalline, grayish orange pink 5YR7/2, some finely crystalline limestone as above. |
| 3300-3320 | Dolomite, microsucrosic to finely crystalline, grayish orange pink 5YR7/2 to light brownish gray 5YR6/1, some dolomitic limestone. |
| 3320-3360 | Dolomite, as above, to pale red 10R6/2. |
| 3360-3400 | Dolomite, microsucrosic to finely crystalline, pinkish gray 5YR8/1 to pale red 5R6/2, little pinpoint porosity. |
| 3400-3420 | Dolomite, as above, to light gray N7. |
| 3420-3475 | Dolomite, microcrystalline, medium light gray N6 to pinkish gray 5YR8/1, some microsucrosic with little pinpoint porosity. |
| 3475-3480 | Dolomite, microcrystalline, pinkish gray 5YR8/1 to grayish orange pink 5YR7/2. |
| 3483 | Circulation 3 3/4 hours. Dolomite, as above. |
| 3483-3490 | Dolomite, as above. |
| 3490-3505 | Dolomite, microcrystalline to microsucrosic, grayish orange pink 5YR7/2. |
| 3505-3520 | Dolomite, as above, to light gray N7. |
| 3520-3539 | Missing. |
| 3539 | Circulation 1/3 hour. Dolomite, microcrystalline and micro-sucrosic, grayish orange pink 5YR7/2, with little argillaceous limestone. |
| 3539-3550 | Limestone, argillaceous, medium gray N5, some dolomite as above. |
| 3550-3570 | Dolomite, microcrystalline, grayish orange pink 5YR7/2, some argillaceous limestone. |
| 3570-3584 | Missing. |
| 3584-3610 | Dolomite, microcrystalline, grayish orange pink 5YR7/2, little limestone. |
| 3610-3710 | Dolomite, microcrystalline, grayish orange pink 5YR7/2. |
| 3710-3760 | Dolomite, medium to fine crystalline, grayish orange pink 5YR7/2, some microsucrosic. |
| 3760-3770 | Dolomite, as above, with little white chert. |
| 3770-3870 | Dolomite, as above with little dark gray argillaceous limestone. |
| 3870-3900 | Dolomite, fine crystalline, to cryptocrystalline, grayish orange pink, 5YR7/2, little white chert. |
| 3900-4000 | Dolomite, fine crystalline, grayish orange pink 5YR7/2, little white chert and pyrite, little argillaceous limestone. |
| 4000-4020 | Dolomite, fine crystalline, pale red 5R6/2, and dolomitic limestone, cryptocrystalline, pinkish gray 5YR8/1, with some chert and pyrite. |
| 4020-4040 | Dolomite, as above, with little light gray limestone and greenish gray siltstone. |
| 4040-4050 | Dolomite, as above, with little medium gray shale. |
| 4050-4080 | Limestone, finely crystalline, pinkish gray 5YR8/1, with little dolomite |

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| 4080-4090 | Limestone, as above, with few medium sand grains. |
| 4090-4110 | Limestone, finely crystalline, pinkish gray 5YR8/1, slightly dolomitic, some fine to medium sand grains. |
| 4110-4140 | Limestone, as above, with much fine to medium sand grains. |
| 4140-4150 | Shale, medium gray N5, with much very fine sand. |
| 4150-4160 | Shale, as above, with much light gray calcareous siltstone. |
| 4160-4170 | Siltstone, light gray N7, little reddish dolomite and little sand. |
| 4170-4180 | Siltstone, as above, with little limestone and dolomite. |
| 4180-4210 | Shale, medium light gray N6, fissile, some siltstone, limestone, and little dolomite. |
| 4210-4220 | Shale, greenish gray 5G6/1, splintery, crinoid columnals. |
| 4220-4270 | Shale, as above, with few phosphate (?) pellets, little pink dolomite, and crinoid columnals. |
| 4270-4290 | Shale, as above, with little white chert. |
| 4290-4300 | Shale, splintery to platy, greenish gray 5GY6/1, little dolomite, few fine sand grains. |
| 4300-4310 | Missing. |
| 4310-4330 | Shale, as above, with little pyrite. |
| 4334 | Circulation 3 3/4 hours. Shale, as above, little tan limestone and little black shale, few fine angular sand grains. |
| 4340-4360 | Shale, as above, with little reddish shale, and light brown sand. |
| 4360-4370 | Shale, as above, with little reddish shale and light gray siltstone. |
| 4370-4380 | Missing. |
| 4380-4420 | Sandstone, very fine to silt size, pale red 10R6/2, little glauconite. |
| 4420-4470 | Sandstone, very fine to silt size, pale red 10R6/2 to darker red hues, little glauconite, shale cavings. |
| 4470-4550 | Sandstone, very fine grained, pale red 5R6/2, little glauconite, shale cavings. |
| 4550-4562 | Weathered granite, granite wash, reddish quartz and feldspar, much shale cavings. |
| 4562 | Total depth. Circulation 2 1/2 hours. Weathered granite as above with shale cavings. |