

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 151

Summary of the Shell Oil Company - Murphy Christensen No. 1
Well No. 645 - Permit No. 659

by Dan E. Hansen

Shell Oil Company - Murphy Christensen No. 1, Benson County, North Dakota. Location: 500 feet from the north line and 1820 feet from the west line of Sec. 27 - Twp. 153N. - Rge. 67W. Elevation: 1481 ground.

The Shell Oil Company - Murphy Christensen No. 1 was spudded July 2, 1954; drilled to a total depth of 2485 feet; found dry and plugged July 10, 1954. No oil shows reported. No drill stem tests taken. Sidewall cores were taken at 2205', 2108 ½, 1922', and 1911'. Electrical, Micro, and Gamma Ray-Neutron logs were run by Schlumberger July 9, 1954.

Casing Record

Set 8 5/8" surface casing at 200' with 200 sacks of construction cement.

Plugging Record

Cement plugs of 10 sacks each were set at the following depths: 2430'; 2130'; 2030'; 1870'; 1590'; and 200'. A plug of 5 sacks was set at the surface.

Formation tops were determined from samples and electric logs. Doubtful or obscure formation tops were not picked. Color names and identifying numbers are from the 1948 Rock-Color Chart (second printing, 1951) distributed by the Geological Society of America, New York, N.Y.

FORMATION TOPS

Cretaceous system	
Niobrara formation	673
Greenhorn formation	1140
Dakota group sands	1580
Jurassic system	
Piper limestone	2020
Mississippian system	
*Lodgepole formation	2117?
Devonian system	
"Nisku" formation	2437

* In the surrounding wells the section occurring in this well from 2117 to 2273 is largely anhydrite and placed in the Jurassic.

0-100	Sandstone and pebbles of clear, white, angular quartz, greenstone fragments; well rounded light gray limestone; angular-subrounded pale yellowish brown dolomite; and angular fragments of granite (biotitic). With much massive compact, resinous medium gray shale, and pebbles of same, has greenishgray tinge.
100-590	Shale, medium gray to greenish gray (weathers dark), massive, compact, resinous to soapy. Casing shoe at about 204 (EL. depth). End of cement casing 330'. Fragments of brownish gray shale at 570-590.

590-710 Shale, medium gray, lumpy and spongy, soft, bentonitic. Traces of very light gray and light greenish gray bentonite. Traces of calcite prisms. Traces soft light brownish gray shale.

710-720 Shale, dark gray, flaky, spongy, and disaggregated, micaceous, and soft. Traces of pyrite calcite prisms.

720-790 Shale, medium gray to dark gray, as above. "White specks" at 790-800 and calcareous.

800-960 Samples missing.

960-970 Shale, medium gray to dark gray, soft, flaky, spongy, bentonitic, calcareous. With small amount of "white specks", traces of fossil shells, and calcite prisms.

970-1000 Samples missing.

1000-1010 Shale, as above.

1010-1030 Samples missing.

1030-1040 Shale, as above.

1040-1080 Samples missing.

1080-1090 Shale, medium dark gray flaky, spongy and disaggregated, earthy. Traces of pyrite, light gray bentonite.

1090-1200 Samples missing.

1200-1240 Shale, medium gray to dark gray, calcareous "white specks", flaky, disaggregated, soft and spongy. Large amounts of calcite prisms, Globigerina and other foraminifera, and traces of pyrite.

1240-1310 Shale as above, calcite prisms as above and traces of pyrite and light gray bentonite.

1310-1610 Shale, medium dark gray to dark gray, flaky, spongy and disaggregated, micaceous, slightly calcareous. Much Pierre and Greenhorn samples. Poor samples not representative of this section.

1610-1630 Shale, medium dark gray, soft, spongy and flaky, micaceous with medium to coarse grained, angular to well rounded, clear, loose, quartz grains.

1630-1670 Shale, medium gray to medium, dark gray, soft, flaky, disaggregated, spongy, silky. With medium to coarse grained iron carbonate, siltstone concretions, yellowish gray to light reddish brown; and traces of pyrite. Small amount of loose quartz grains as above.

1670-1750 Shale, concretions, pyrite, and loose quartz grains as above. Plus small fragments of white, fine grained, calcareous, friable, angular quartzose sandstone. Interval from 1680-1750 also contains light brownish gray fine grained quartzose sandstone cemented by iron carbonate.

1750-1770 Shale, medium dark gray, dark gray, as above. Small amounts of iron carbonate, siltstone concretions and loose fine grained angular quartz grains. Extremely poor samples.

1770-1810 Shale, medium dark gray, soft, micaceous, flaky to lumpy and spongy, silky. Traces of fine grained, white angular quartz grains.

1810-1820 Sandstone, coarse grained, white, pink, clear, angular to well rounded, pitted to frosted, loose quartz grains. With subrounded gray chert (coarse) and pyrite.

1820-1850 Sandstone, as above, but very coarse grained, and containing very coarse subangular grains of white chert and light brownish gray, polished, limestone grains.

1850-1920 Shale, medium gray, soft, micaceous, flaky, laminated, silky. With sandstone as above, plus small amount of light gray, calcareous cemented, friable, angular, fine grained, quartzose sandstone fragments. Trace of anhydrite and light blue gray bentonite.

1920-1930 Samples missing.

1930-1950 Shale, medium light gray to medium dark gray, soft, micaceous, silky, flaky to spongy. Traces of loose quartz grains as above and gray chert.

1950-2035 Sandstone, very coarse, subangular to rounded, pink, white, clear, pitted, loose, quartz grains and subangular gray and white polished chert grains. Much pyrite. Shale as above. Interval from 1965-1995 contains much medium to coarse grained iron carbonate, siltstone concretions. From 2000-2035 traces of dark greenish gray, waxy, massive and splintery shale.

2035-2045 Limestone, yellowish gray, very fine grained, chalky, very sandy with fine to medium grained, angular, quartz grains. Limestone grades into calcareous quartz sandstone.

2045-2050 Limestone, dolomitic, very pale orange, very fine grained, microsucrosic grainy. Traces of anhydrite.

2050-2075 Limestone, as above, none dolomitic.

2075-2125 Shale, dark gray mainly. Much reddish brown, massive, calcareous, soapy shale; and greenish gray shale, calcareous splintery, waxy shale. Much cave of coarse quartz grains. Traces of anhydrite.

2125-2175 Limestone, grayish orange pink to light gray, medium to very fine grained soft. Small amount white anhydrite. With traces of above shale. Much reddish brown, splintery, soapy, shale from 2165 to 2175.

2175-2275 Limestone, pale red, very fine grained, microsucrosic, and limestone, grayish orange pink to light gray, medium to coarse grained, fossil fragments (brachiopods).

2275-2320 Limestone, grayish pink to grayish orange pink, fine to medium grained to sublithographic. Much white chert.

2320-2375 Dolomite, light brownish gray, dense, fine crystalline to sublithographic, with above limestone and much white chert.

2375-2430 Limestone, grayish pink, fine grained, microsucrosic, with small amount fragmental, medium grained, angular to rounded. White chert.

2430-2445 Limestone, as above, plus dark gray, soft, micaceous, laminated shale. With loose, well rounded frosted, quartz grains and loose pyrite.

2445-2480 Dolomite, grayish orange pink to moderate orange pink, fine to medium grained, much pinpoint and intergranular porosity.

2480-2485 Dolomite, as above, light brown gray with some vuggy porosity.

2485-2485 Dolomite, as above, light brown.

2485 Total Depth.