

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 121

Summary of the Lion Oil Company - Carl & Sylvia Skarphol No. 1  
Bottineau County, North Dakota  
Permit #896 - Well #884

By John L. Hainer  
September, 1955

Lion Oil Company - Skarphol No. 1, Bottineau County, North Dakota.  
Location 1980 feet from north line and 1980 feet from west line of Section 33,  
Township 164N., Range 77W. Elevation K.B. 1591. Total Depth 3018 feet.

The Lion Oil - Skarphol No. 1 was spudded June 8, 1955, drilled to a  
total depth of 3018 feet and completed as a new oil discovery July 18, 1955.

Completion Test Data:

The completion test commenced June 26. Test lasted 3 hours on flow. Flow  
pressure on tubing 50 lbs/sq. in.; size tubing 2 3/8"; size choke 24/64"; shut  
in pressure 200. Result of test: 192 bbls oil per 24 hours; gas-oil ratio - 90  
cu. feet gas per bbl of oil; no water; gravity of oil 37.0 API.

Perforation was in the Mission Canyon formation from 2980' to 2987'. Top  
of pay 2980'. Well was acidized with 200 gallons. 15% acid.

On August 3, 1955, a 24 hour potential test on pump produced 75 bbls. of  
oil and 84 bbls. of water. On September 4, 1955, a 24 hour potential test on  
pump produced 60 bbls. of oil and 122 bbls. of water.

Cored Intervals:

Core #1 2931 to 2975	Core #3 2988 to 2998
Core #2 2975 to 2988	Core #4 2998 to 3018

Drill Stem Tests:

DST #1 2913-2975, tool open 3 hours with weak blow 1 1/2 hours and died.  
Rec. 95' oil and gas cut mud, Flow Pressure 0-45#, shut in pressures  
20 minutes 90#.

DST #2 2972-2988, tool open 3 hours, good blow, gas to surface 37 minutes.  
Rec. 2190' clean oil, 60' highly oil and gas cut mud, no water. Flow  
pressure 45-640#, shut in pressure 1/2 hours 1275#.

DST #3 2988-2998, tool open 3 hours, shut in 1/2 hours, 5/8" choke. Gas to  
surface in 1 hour 13 minutes. Flared for rest of test. Rec. 615'  
clean oil, 135' salt water. IHP 1630#, FHP 1556#, FPO 290#, SIP  
1350#.

CASING RECORD

Size	Put in Well	Left in Well	Sacks of Cement
8 5/8"	349' 2"	349' 2"	200
5 1/2"	3003' 0"	3003' 0"	125

Logs Run: Electrical, Microlaterlog and Radiation logs.

Formation tops were picked from samples and electric logs; corrected to the electric logs. Not all formation tops are called in the following list. Colors are from the rock color chart.

#### FORMATION TOPS

Cretaceous System	
Greenhorn Formation	1564
Dakota Group	1977
Jurassic System	2288?
Sundance Formation	2373
Piper Lime	2614
Triassic System	
Spearfish Formation	2857
Mississippian System	
Mission Canyon Formation	2971
Total Depth	3018

0-40	Glacial gravel, predominantly coarse, angular quartz sand.
40-70	Glacial material, predominantly medium to fine, angular quartz sand.
70-130	Shale, medium gray, lumpy.
130-220	Shale, medium gray, lumpy to massive.
220-270	Shale, medium light gray, massive.
370-397	Missing.
397-440	Shale, as above, angular quartz and limestone caving.
440-480	Shale, medium gray, lumpy.
480-580	Shale, medium light to medium gray, massive.
580-760	Shale, medium light gray, massive.
760-800	Shale, medium light gray, lumpy. Little bentonite, white.
800-880	Shale, light to medium light gray, massive.
880-920	Shale, medium light gray, lumpy, bentonitic.
920-980	Shale, medium gray to light olive gray 5Y6/1, lumpy, bentonitic.
980-1020	Shale, as above, little limestone, brownish gray 5YR4/1, very finely crystalline.
1020-1040	Shale, black, carbonaceous, fissile.
1040-1060	Shale, dark gray, fissile.
1060-1100	Shale, as above with bentonite, white to bluish white.
1100-1160	Shale, medium to dark gray, lumpy to fissile, bentonite as above.
1160-1200	Shale as above with much bentonite.
1200-1340	Shale, medium dark gray, lumpy, bentonitic.
1340-1380	Shale, as above, Inoceramus prisms.
1380-1400	Shale, dark gray, foliated, "white specks", calcareous Inoceramus prisms.
1400-1460	Shale, medium dark gray, lumpy to foliated, slightly bentonitic, little pyrite.
1460-1520	Shale, dark gray, fissile, some shale as above.
1520-1560	Shale, medium dark gray, fissile to lumpy, Inoceramus, prisms.
1560-1580	Limestone, medium light gray, composed of broken Inoceramus prisms cemented together, shaly. Shale, medium dark gray, fissile to foliated with some "white specks" Inoceramus prisms.
1580-1600	Shale, medium dark gray, fissile to foliate with "white specks".

1600-1700 Shale as above, Inoceramus prisms. Little pyrite.

1700-1840 Shale, medium light gray, massive to dark gray, foliated with some white specks. Inoceramus prisms.

1840-1880 Shale, light gray, massive, medium dark gray, foliated. Inoceramus prisms. Little pyrite.

1880-1900 Shale, medium dark gray, foliated, "white specks".

1900-1960 Shale, medium to dark gray, foliate to fissile.

1960-1980 Shale as above. Few quartz sand grains, approximately 1 mm in diameter, subrounded, clear.

1980-1990 Quartz sand as above.

1990-2030 Poor samples, predominantly shale caving. Electric log indicates sand section.

2030-2040 Quartz sand, unconsolidated, approximately 1 mm in diameter, subrounded, clear.

2040-2060 Shale, medium dark gray, foliated. Quartz sand as above.

2060-2090 Quartz sand as above.

2090-2130 Shale, medium dark gray, foliated, quartz sand, as above.

2130-2140 Shale and sand as above. Sandstone, grayish orange 10YR7/4, fine grained angular quartz with calcitic cement.

2140-2170 Shale, medium light gray, massive to medium dark gray, foliated. Sand and little sandstone as above.

2170-2200 Quartz sand, clear, subrounded to subangular, unconsolidated, approximately 0.75 mm in diameter. Shale, medium gray, lumpy.

2200-2220 Shale, medium dark gray, foliated. Little quartz sand as above. Pyrite.

2220-2240 Shale, as above. Little siltstone, light gray, calcitic cement. Little sand as above.

2240-2270 Shale, medium gray, bentonitic, lumpy.

2270-2280 Missing.

2280-2300 Shale as above. Shale, medium dark gray, foliated.

2300-2370 Shale, medium light to medium dark gray, foliated. Little, shale, greenish gray 5GY6/1 waxy.

2370-2400 Shale, as above with shale, grayish red 10R4/2 waxy.

2400-2450 Shale, medium light gray, micaceous, medium dark gray, foliated, little greenish gray, waxy.

2450-2480 Shale as above with some shale moderate reddish brown.

2480-2600 Shale, grayish red, 10R4/2, splintery, greenish gray 5GY6/1, splintery medium light to medium dark gray, fissile.

2600-2630 Shale as above. Limestone very pale orange, finely crystalline, vuggy to dense.

2630-2640 Shale as above, limestone, light gray, cryptocrystalline, dense.

2640-2660 Shale as above, limestone, pale yellowish brown, fragmental.

2660-2700 Shale, medium to medium dark gray, fissile, greenish gray and grayish red, splintery, waxy. Limestone very light gray, cryptocrystalline, dense.

2700-2710 Missing.

2710-2740 Shale and limestone as above.

2740-2750 Shale as above, little gypsum.

2750-2800 Varigated shale, gypsum, white.

2800-2840 Varigated shale and gypsum as above. Little dolomite, pale yellowish brown, cryptocrystalline.

2840-2860 Shale and gypsum as above.

2860-2900 Shale and gypsum as above. Siltstone, moderate orange pink 5YR8/4, friable, calcareous, included sand grains in the siltstone, rounded, frosted.

2900-2920 Shale and siltstone as above.

2920-2931 Siltstone light brown 5YR6/4, slightly calcareous, included sand grains as above, oil stain and cut.

Core Chips

2931-2960 Siltstone as above, oil stain and cut.

2960-2971 Siltstone as above with anhydrite.

2971-2980 Limestone, pale yellowish brown, dolomite, anhydritic, finely crystalline, dense.

2980-2982 Limestone, pale yellowish brown, granular, vuggy and pinpoint porosity oil stain and cut.

2982-2983 Limestone, pale yellowish brown, medium granular, good intergranular porosity, oil stain and cut.

2983-2989 Limestone, pale yellowish brown, finely granular, good intergranular porosity, oil stain and cut.

2989-2991 Limestone, very pale orange, fragmental and oolitic, intergranular porosity, oil stain and cut.

2991-2993 Limestone, pale yellowish brown, finely granular, intergranular porosity fair, oil stain and cut.

2993-2994 Limestone, very pale orange, oolitic and fragmental, anhydritic filling oil stain and odor.

2994-2996 Limestone, pale yellowish brown, finely crystalline, poor pinpoint porosity, oil stain and odor.

2996-2998 Limestone, pale yellowish brown, oolitic and fragmental, little oil stain and odor.

2998-2999 Limestone, pale yellowish brown, finely granular, pinpoint porosity, slight oil stain and odor.

2999-3003 Limestone, dark yellowish brown, finely granular, pinpoint porosity, heavy oil stain and odor.

3003-3005 Limestone, very pale orange, oolitic and fragmental, stylolitic, intergranular porosity, oil stain and odor.

3005-3006 Limestone, pale yellowish brown, granular, pinpoint porosity, oil stain, odor and cut.

3006-3010 Limestone, very pale orange, granular and finely fragmental, slight pinpoint porosity, odor and fluorescence but no cut with  $\text{CCl}_4$

3010-3018 Limestone, yellowish gray 5Y8/1, microsucrosic, little intergranular porosity, little oil stain, no cut.

3018 Total Depth.