NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR N0. 190

Summary of the Carter Oil Company - Oscar Fossum #1
Bottineau County, North Dakota
Well No. 1431 - Permit No. 1443

by Jay Garske
March 1958

Carter Oil Company - Oscar Fossum #1 Location: Center NE 1/4 NE 1/4 Section 31 T. 162N. R. 81W. Elevation: 1511 K.B. Total Depth: 4310 feet. Plug Back Depth: 4016.

The Carter Oil Company - Oscar Fossum #1 was spudded April 22, 1957 and completed as a producing well May 27, 1957.

Logs:

Electrical, Laterolog-3 Gamma Ray, Microlaterolog, and Gamma Ray-Neutron.

Cores:

#1 3722 - 3738	#6 3982 - 3987
#2 3758 - 3765	#7 3987 - 3997
#3 3786 - 3791	#8 3997 - 4007
#4 3791 - 3798	#9 4007 - 4022
#5 3977 - 3982	

Tests:

DST #1; 3752-3759. 3/4" choke, no cushion. Tool open 4 hours, weak blow 4 hours. Recovered: 100 feet of slightly oil and gas cut mud, 60 feet of oil and gas cut water, and 535 feet of salt water. Pressures: IBHFP 40#, FBHFP 283#, SIP (30 min.) 1828#, Initial Hydro. 2112#, Final Hydro. 2093#.

DST #2; 3784-3791. Open 3 hours, 3/4" choke, no cushion. Opened with weak blow, increased to strong blow in 3 hours. Recovered: 125 feet of heavily gas and oil cut mud, 205 feet of gas cut free oil, and 120 feet of salt water. Gravity of free oil 29.3° at 60°. Pressures: IBHFP 85#, FBHFP 153#, SIP (30 min.) 1828#, Initial Hydro. 2111#, Final Hydro. 2096#. Tool closed early due to water flow from annulus.

DST #3; 3790-3798. 3/4" choke, NC, open 4 hours, weak blow 4 hours. Recovered 325 feet of fluid - 30 feet of oil cut mud, 60 feet of slightly oil and gas cut mud, and 235 feet of muddy salt water. Pressures: IBHFP 40#, FBHFP 154#, SIP (30 min.) 1895#, Initial Hydro. 2448#, Final Hydro. 2275#.

DST #4; 3972-3977. Open 4 hours, 3/4" choke, NC, strong blow 4 hours. Recovered: 35 feet of oil cut mud, 60 feet of heavily gas cut mud oil emulsion, and 240 feet of heavily gas cut, sulphuric free oil. Gravity 25° corrected. Pressures: IBHFP 55#, FBHFP 113#, SIP (30 min.) 1666#, IHP 2418#, FHP 2328#.

DST #5; 3974-3982. Open 4 hours, 3/4" choke, NC, gas to surface in 2 hours and 12 minutes, 3 foot flare. Recovered: 200 feet of muddy gassy oil, 675 feet of clean oil, 23.8° API at 60°, and 5 feet of water.

Pressures: IFBHP 85#, FFBHP 370#, SIP (30 min.) 1721#, IHMP 2498#, FHMP 2390#.

DST #6; 3982-3987. Open 4 hours, 3/4" choke NC, very weak blow throughout. Recovered 35 feet of mud, 60 feet of very slightly oil and gas cut mud, 60 feet of slightly oil cut mud, 100 feet of oil and gas cut mud and 20 feet of very slightly oil and gas cut water. Pressures: FP 28-102#, SIP (30 min.) 1776#, HP 2466-2371#.

DST #7; 3987-3997. 3/4" choke, NC, gas to surface in 1 hour and 50 minutes. Recovered: 30 feet of mud, 60 feet of oil and gas cut mud, 60 feet of mud and gas cut oil, 865 feet of free oil, 28° at 80°, 1.5% mud, and 30 feet of muddy water. Pressures: IFBHP 70#, FFBHP 393#, SIP (30 min.) 1853#, IHMP 2473#, FHMP 2451#.

DST #8; 3997-4007, Open 2 hours, 3/4" choke, NC, steady to strong blow for 2 hours, gas to surface in 2 hours and 10 minutes. Recovered: 45 feet of slightly oil and gas cut mud, 60 feet of mud and gas cut oil, 330 feet of oil, 21° at 68°, 1% BS & W, and 105 feet of salt water. Pressures: FP 40-215#, SIP (30 min.) 1878#, HP 2476-2393#.

DST #9; 4007-4019. (Straddle packer), 3/4" choke, NC, steady strong blow for 4 hours. Recovered, 50 feet of very slightly oil cut mud, 360 feet of very slightly oil cut and heavily water cut mud, 1535 feet of muddy and oil flecked salt water with strong sulphur odor. Pressures: IFBHP 60#, FFBHP 911#, SIP (30 min.) 1886#, IHMP 2465#, FHMP 2369#.

Perforations:

4 shots per foot from 3974-3980. Swabbed dry. Acidized with 150 gallons of mud acid & swabbed 5 barrels of oil per hour, no water. Acidized with 750 gallons & swabbed 6 barrels of oil and 4 barrels of water per hour.

Completion Data:

Initial production was 137 barrels of oil per day, 38% water. API gravity 31.5 (based on 7 hour swab test).

Casing Record:

10 3/4" casing set at 311 feet with 200 sacks of cement
7" casing set at 4046 feet with 150 sacks of cement

Formation tops were determined from samples and electric logs, corrected to the electric logs. Doubtful or obscure formations were not picked. Colors and descriptive numbers were taken from the Goddard, et. al., 1951 Rock-Color chart distributed by the Geological Society of America, New York, N.Y.

FORMATION TOPS

Cretaceous System	
Greenhorn formation	1917
Basal Cretaceous sandstone	2422
Jurassic System	
Rierdon formation	2910
Piper limestone	3247
Triassic System	
Spearfish formation	3518

Mississippian System	
Charles formation	3730
Midale	3753
Mission	
Canyon formation	3973
MC - 2	4114
MC - 1	4129

0-460	Missing.
460-1500	Shale, greenish gray 5GY6/1, fissile, compact, some lumpy, spongy.
1500-1560	Shale, as above to light olive gray, and numerous fragments from clay ironstone concretions, moderate yellowish brown 10YR5/4 to dusky yellowish brown 10YR2/2.
1560-1620	Shale, as above, clay ironstone fragments as above, and some brownish gray to brownish black shale, lumpy, soft, spongy.
1620-1660	Shale, brownish gray to brownish black, as above.
1660-1680	Shale, greenish gray, lumpy, soft, spongy, little hard, compact.
1680-1700	Shale, brownish black, lumpy, spongy, and little greenish gray shale as above.
1700-1720	Shale, brownish black to grayish black, lumpy, soft, spongy.
1720-1840	Shale, as above, to greenish gray.
1840-1860	Shale, as above, mostly greenish gray.
1860-1880	Shale, as above, mostly grayish black.
1880-1920	Shale, greenish gray and dark gray, lumpy, compact to spongy, much with moderate yellowish brown and dusky yellowish brown iron staining.
1920-2020	Shale, greenish gray, and medium dark gray to grayish black, lumpy, compact to spongy, some with soft, white calcareous specks.
2020-2040	Shale, black, carbonaceous, fissile to lumpy, compact.
2040-2120	Shale, dark gray, little greenish gray, fissile to lumpy, mostly brittle to compact, little spongy, calcareous in part.
2120-2140	Shale, dark gray to grayish black, little greenish gray, fissile to lumpy, mostly compact.
2140-2220	Shale, greenish gray, lumpy, spongy, little compact.
2220-2420	Shale, as above, much dark gray to grayish black.
2421	Circulation sample; 1/2 hour: Shale, as above.
2420-2470	Shale, greenish gray, lumpy, spongy, bentonitic.
2470-2500	Shale, as above to dark gray, compact.
2500-2510	Quartz, medium to coarse loose grains, subangular to well rounded, vitreous to frosted, colorless.
2510-2520	Shale, greenish gray and dark gray, compact, and few loose quartz grains as above.
2520-2620	Shale, as above, numerous loose quartz grains, medium to coarse, mostly subangular to angular, vitreous, colorless, and few pieces of very fine grained sandstone, friable, calcareous, white.
2620-2680	Shale and loose quartz grains, as above.
2680-2710	Shale, as above.
2710-2780	Shale, and some loose quartz as above (2620-80).
2780-2790	Quartz, medium to coarse loose grains, subangular to well rounded, mostly vitreous, some frosted, colorless, some with reddish and brownish tint.
2790-2800	Shale, medium dark gray to grayish black and greenish gray 5GY6/1, fissile, compact, and some free quartz as above.
2800-2810	Quartz, as above, and little shale as above.

2810-2820	Quartz, as above, to angular, and little shale as above.
2820-2840	Shale, as above.
2840-2920	Shale, as above, and little very fine grained sandstone, friable, calcareous, yellowish gray 5Y8/1.
2920-2930	Shale, as above, and much limestone, very fine granular, porous, very pale orange to pale yellowish brown, with black carbonaceous streaks.
2930-3120	Shale, medium dark gray to grayish black, and light olive gray to greenish gray 5GY6/1, fissile, compact, very silty in part.
3120-3160	Shale, as above, and little sandstone, very fine grained, friable, calcareous, pale yellowish brown.
3160-3170	Shale, as above, and few pieces of limestone, very fine granular, dense, very pale orange.
3170-3240	Shale, as above.
3240-3250	Shale, as above, and some limestone, dolomitic, very fine crystalline, dense, very pale orange.
3250-3270	Shale, medium gray to black and greenish gray 5GY6/l, fissile to splintery, compact, and little limestone, as above.
3273	Circulation samples; 1/2 hour: Shale and limestone as above. 3/4 hour: Sandstone, fine grained, moderately well cemented, calcareous, yellowish gray, and little shale and limestone, as above.
3270-3290	Shale, as above.
3290-3320	Shale, greenish gray 5GY6/1, grayish red 10R4/2 and medium dark gray to black, fissile to lumpy, compact to crumbly.
3320-3360	Shale, as above, and little limestone, very fine crystalline, dense, white to yellowish gray.
3360-3400	Shale, as above, and limestone, as above to light olive gray.
3400-3500	Shale, greenish gray, grayish red, and medium gray to black, fissile to splintery, compact, and little limestone as above.
3500-3520	Shale, and limestone, as above and much caved material.
3520-3560	Shale, as above, some argillaceous limestone, very pale orange to pale yellowish brown and greenish gray 5GY6/1, and little sandstone, very fine grained, moderately well cemented, slightly calcareous, moderate, reddish orange.
3563	Circulation sample: Shale, as above, and much sandstone as above to moderate reddish brown.
3560-3580	Shale, medium gray to black and greenish gray 5GY6/1, fissile, compact, and some sandstone as above.
3582	Circulation samples; 1/2 hour. Shale and some sandstone, as above. 3/4 hour: Sandstone, as above.
3580-3610	Shale and little sandstone, as above.
3612	Circulation samples; 1/2 hour: Shale, and much sandstone, as above. 3/4 hour: Sandstone, as above.
3610-3630	Shale and little sandstone, as above.
3630-3650	Sandstone, fine to medium grained, rounded, well cemented, moderate reddish orange to moderate reddish brown, some medium sized loose quartz grains, rounded to well rounded, frosted, colorless to moderate reddish orange, and little shale as above.
3650-3690	Shale, as above and little loose quartz and sandstone as above.
3693	Circulation sample; 3/4 hour: Shale, free quartz and sandstone as above.
3690-3700	Shale, medium gray to black, and greenish gray 5GY6/l, fissile, compact, and some sandstone and free quartz as above.

3701 Circulation samples; 1/2 hour: Shale and little sandstone, as above. 1 hour: Sandstone and loose quartz, as above.
3700-3710 Shale and little sandstone, as above.
3710-3715 Sandstone, very fine to fine grained, friable, calcareous, moderate orange pink to moderate reddish brown, and some loose quartz, fine to coarse grained, subangular to well rounded, little vitreous, clear, mostly frosted, colorless, and tinted moderate orange pink to moderate reddish brown.
3714 Circulation sample; 3/4 hour: Sandstone and loose quartz, as above.
3715-3720 Shale, medium gray to black, and greenish gray 5GY6/1, fissile, compact, and little sandstone as above.
3722 Circulation sample; 1 hour: Shale and much sandstone, as above.

Core #1 (3722-3738)
3722-3723 Siltstone, moderate reddish orange, compact.
3723-3724 Shale, silty, dark reddish brown 10R3/4, brittle.
372L-3727 Siltstone, moderate reddish orange, compact.
3727-3728 Anhydrite, brittle, dense, banded, grayish red 5R4/2, and moderate yellowish brown 10YR5/4.
3728-3729 Anhydrite, brittle, dense, grayish red 5R4/2, and very pale orange.
3729-3730 Anhydrite, dense, brittle, pale brown 5Y5/2 to dusky brown 5YR2/2.
3730-3731 Anhydrite, dense, pale red 5R6/2
3731-3732 Anhydrite, dense, pale yellowish brown.
3732-3733 Anhydrite, dense, dark yellowish brown.
3733-3735 Anhydrite, dense, grayish, red 10R4/2.
3735-3738 Anhydrite, dense, pale yellowish brown.

Samples
3735-3740 Anhydrite, dense, grayish red 10R4/2, and pale yellowish brown, some limestone, anhydritic, very fine crystalline, dense, very pale orange, and shale cavings.
3740-3745 Limestone, anhydritic, very fine crystalline, dense, pale yellowish brown, and shale cavings.
3745-3760 Limestone, as above, poor samples, mostly shale cavings.
3758- Circulation sample; 1 hour: Limestone, as above, and shale cavings.

Core #2 (3758-3765)
3758-3759 Limestone, fine granular, fair porosity, pale yellowish brown, good fluorescence and very good cut.
3759-3760 Limestone, fine granular, scattered fair porosity, very pale orange, fair fluorescence, slight cut.
3760-3761 Limestone, fine, granular, fair pinpoint porosity, very pale orange.
3761-3765 Limestone, fine granular, dense, very pale orange.

Samples
3767 Circulation sample; 3/4 hour: Limestone, fine crystalline, dense, very pale orange, and shale, medium gray to black and greenish gray 5GY6/1, fissile, compact.
3765-3775 Shale, as above, and few pieces of limestone, as above.

3775-3785 Limestone, sublithographic, dense, very pale orange, and little shale as above.
3786 Circulation sample; 1 hour: Limestone, dense as above, and some fine granular limestone, with good tubular to cavernous porosity, pale yellowish brown, distinct dark brown stain, very good fluorescence and excellent cut.

Core #3 (3186-3791)
3789-3787 Limestone, sublithographic, dense, very pale orange, with some subcrystalline, dusky brown dolomite inclusions.
3787-3788 Limestone, sublithographic, dense, very pale, orange, stylolitic.
3788-3789 Limestone, sublithographic, dense, very pale orange, with crystallized, white, colorless and dark yellowish brown anhydrite, filling fractures.
3789-3791 Limestone, sublithographic, dense, pale yellowish brown.

Core #4 (3791-3798)
3791-3792 Limestone, fragmental, fair porosity, dark yellowish brown, some crystallized, dusky brown, fracture filling anhydrite, little brown staining, fair fluorescence and very good cut.
3792-3793 Limestone, sublithographic, dense, very pale orange, with bands of fragmental limestone, as above.
3793-3797 Limestone, sublithographic, dense, very pale orange, with crystallized, moderate brown anhydrite inclusions.
3797-3798 Limestone, as above, and anhydrite, dense, grayish red 5R4/2.

Samples
3800-3815 Anhydrite, dense, pale red 5R6/2, and much caved material.
3815-3820 Limestone, mostly fragmental, dense, pale yellowish brown, some very, fine granular, dense, very pale orange, and few pieces lithographic, dense, dark yellowish brown.
3822 Circulation sample; 1 hour: Limestone, very fine granular, dense, very pale orange.
3820-3825 Limestone, as above.
3825-3910 Anhydrite, mostly dense, little soft, earthy, light gray to white, and shale cavings.
3910-3925 Anhydrite, dense, pale yellowish brown to very pale orange.
3925-3970 Anhydrite, dense, pale yellowish brown to very pale orange and light gray to white.
3970-3975 Limestone, dolomitic, very fine granular, dense, pale yellowish brown.
3977 Circulation sample; 1 1/4 hours: Limestone, very, fine granular, scattered pinpoint porosity, pale yellowish brown to very pale orange.

Core #5 (3977-3982)
3977-3978 Limestone, fine granular, fair porosity, pale, yellowish brown, good fluorescence, and cut.
3978-3981 Limestone, dolomitic, sucrosic, very good interstitial, vugular porosity, dark yellowish brown, saturated, strong odor, good fluorescence and excellent cut.
3981-3982 Limestone, as above, with some clear, vitreous, crystallized anhydrite.

Core #6 (3982-3984)

3982-3984 Limestone, cryptocrystalline, little vugular porosity, fractures very pale orange.

3984-3985 Limestone, very fine granular, fair porosity, very pale orange, some staining, dark brown to black, good scattered fluorescence and fair cut.

3985-3986 Limestone, fine granular, fair vugular porosity, very pale orange, little brown staining, very good scatterd fluorescence, and good cut.

3986-3987 Limestone, as above with slight staining, good scattered fluorescence and fair cut.

Core #7 (3987-3797)

3987-3990 Limestone, cryptocrystalline to very fine granular, fair to good vugular porosity, very pale orange to pale yellowish brown, scattered brown oil stain, good spotty fluorescence and fair to good cut.

3990-3993 Limestone, microsucrosic, good interstitial and vugular porosity, dark yellowish brown, saturated, strong odor, good fluorescence, and excellent cut.

3993-3994 Limestone, microsucrosic, little vugular and interstitial porosity, pale yellowish brown, some brown oil stain, fair scattered fluorescence, and fair cut.

3994-3997 Limestone, oil stained as above, and some interbedded fine crystalline, very pale orange limestone.

Core #8 (3997-4007)

3997-4002 Limestone, microsucrosic, scattered vugular porosity, very pale orange to pale yellowish brown, scattered dark brown stain, good spotty fluorescence, and fair to good cut.

4002-4003 Limestone, very, fine crystalline, dense, very pale orange, with vitreous, colorless to dark yellowish brown, crystallized anhydrite inclusions.

4003-4004 Limestone, very fine granular, little vugular porosity, very pale orange, scattered dark brown stain, slight spotty fluorescence and fair cut.

4004-4005 Limestone, fine crystalline, dense, very pale orange.

4005-4006 Limestone, as above, and very fine granular limestone, very pale orange, scattered pinpoint and vugular porosity, some dark brown stain, fair spotty fluorescence and fair cut.

4006-4007 Limestone, fine crystalline, dense, very pale orange, with vitreous, colorless to moderate brown 5YR4/4, crystallized anhydrite inclusions.

Core #9 (4007-4022)

4007-4008 Limestone, as above.

4008-4009 Limestone, very fine crystalline, to very fine granular mostly dense, little scattered vermicular porosity, good spotty fluorescence and fair cut.

6009-4010 Limestone, very fine crystalline, dense, very pale orange, with numerous included fragments of cryptocrystalline, pale yellowish brown limestone.

4010-4011 Limestone, very fine granular, good vugular porosity, very pale orange, dark brown stain, good spotty fluorescence, and fair cut.

4011-4012	Limestone, fine crystalline, little vermicular and vugular porosity, very pale orange, to pale yellowish brown, good scattered fluorescence and fair cut.
4012-4013	Limestone, as above with little black, dead oil residue.
4013-4014	Limestone, very fine granular, little vermicular porosity, very pale orange, good scattered fluorescence, and fair cut.
4014-4015	Limestone, very fine granular to chalky, little pinpoint porosity, very pale orange.
4015-4016	Limestone, as above with fair pinpoint to tubular porosity and little dark brown staining.
4016-4017	Limestone, very fine granular, some vugular porosity, very pale orange, and fine crystalline, limestone, with excellent vugular porosity, brownish black oil stain, good odor, good spotty fluorescence and very good cut.
4017-4018	Limestone, very fine crystalline, fair vugular porosity, pale yellowish brown, with some brownish black dead oil residue.
4018-4019	Limestone, very fine crystalline, fair vugular porosity, very pale orange to pale yellowish brown, some dark brown staining, good scattered fluorescence and good cut.
4019-4022	Limestone, very fine granular, fair vugular porosity, very pale orange, numerous clear, vitreous calcite crystals lining vugular cavities.

Samples

4027	Circulation sample; 1 hour: Limestone, very fine crystalline, little pinpoint porosity, very pale orange.
4025-4030	Limestone, as above, poor sample, mostly shale cavings.
4030-4045	Limestone, fine crystalline, dense, very pale orange, and much caved shale.
4045-4075	Limestone, as above.
4075-4115	Limestone, as above and some fine to medium fragmental limestone, subrounded to rounded, good pinpoint porosity, very pale orange.
4115-4125	Limestone, dolomitic, very fine crystalline dense, greenish gray 5GY6/1, and some fine crystalline, dense, very pale orange to pale yellowish brown limestone.
4125-	Circulation sample; 1 1/4 hour: Limestone, as above.
4125-4130	Limestone, as above.
4131	Circulation sample; 1 hour: Limestone, fine crystalline, dense, very pale orange to pale yellowish brown.
4130-4160	Limestone, as above.
4160-4165	Limestone, medium oolitic, little intergranular porosity, very pale orange to pale yellowish brown.
4168	Circualtion sample; 1 hour: Limestone, as above.
4165-4190	Limestone, very fine granular, chalky in part, very pale orange to pale yellowish brown and little oolitic limestone, as above.
4190-4205	Limestone, very fine granular, dense, pale yellowish brown.
4205-4240	Limestone, very fine crystalline, dense, brownish gray, and little limestone, as above.
4240-4270	Limestone, as above, poor samples, nearly all shale cavings.
4270-4285	Limestone, fine crystalline to very fine granular, dense, very pale orange to pale yellowish brown.
4285-4290	Limestone, as above, and some fine to medium fragmental limestone, subrounded to rounded, dense, pale yellowish brown.

4290-4295	Limestone, as above, and some anhydritic limestone, very fine crystalline, dense, light brownish gray.
4295-4310	Limestone and anhydrtic limestone, as above and some light gray to very light gray dense anhydrite.
4310	Circulation sample; 1 1/2 hours: Limestone, fine crystalline, dense, anhydritic in part, light gray to very light gray, and very pale orange to pale yellowish brown.
4310	Total Depth.