

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR 11

Summary of the Barnett Gaier No. 1 Well

Stutsman County, North Dakota

By Sidney B. Anderson

Barnett Drilling Company - John Gaier Well No. 1, Stutsman County, North Dakota, NW 1/4, NW 1/4, Section 11, T. 141N. R.67W. (660 feet S. of N. line, 660 feet E. of W. line, Section 11). Elevation: 1863 D. F. - 1857 G. L.

The Barnett Gaier was spudded October 19, 1951 and 10 3/4 inch casing was run at 320 feet. The well was completed November 13, 1951.

Tests: DST: Open twenty minutes. 3395' to 4145' good steady blow; recovered 3480' fluid: 900' mud and 2580' slightly salty water. Hydro P. 1950 lbs; IFP 1555; FFP 1710; BHSIP 1785 in 10 minutes, final Hydro P. 1910.

Water Analysis:

	mg's/liter
Total solids	5316
Fe or Na	None
Ca	139
Mg	21
SO ₄ 's	1752
Cl	1514
CO ₃	0
HCO ₃	299
Na H ₂ S	0
Ph	8.2
SpG @ 60°F	1.004
Res @ 68°F in Ohm-meters	1.49

Formation tops determined from sample and electric logs.

FORMATION TOPS

	<u>Depth</u>
Cretaceous System	
Niobrara formation	1048
Greenhorn Member	1555
Dakota Group	2052
Jurassic System	
Morrison Formation	2224
Ellis Group	2290
Mississippian System	
Madison (Lodgepole)	2420
Englewood Formation	2856
Devonian System	2905
Silurian System	3062

	<u>Depth</u>
Ordovician System	
Stony Mountain Shale Member	3125
Red River Formation	3218
Winnipeg Formation	3790
Winnipeg Sand	3989
Pre-Cambrian	4137

BARNETT GAIER NO. 1

<u>From</u>	<u>To</u>	<u>Formation</u>
0	40	Till, yellow brown sandy shale; calcareous; fine to coarse rounded quartz grains.
40	80	Fine gravels.
80	170	Fine gravels and gray shale.
170	180	Gray shale and little gravel as above.
180	240	Gray sandy shale, and little medium to coarse gravel (180-200).
240	320	Sandy gray shale, little fine to coarse gravel. Shale, soft, calcareous, lumpy.
320	340	Sandstone, fine to coarse grain; very light gray calcareous siltstone.
340	430	Sand, medium to coarse; much colorless quartz, rounded to subrounded.
430	450	Gravels, medium to coarse.
450	460	Shale, medium light gray and gravel as above.
460	470	Gravel, coarse.
470	480	Shale, medium light gray, coarse gravel.
480	530	Shale, medium light gray, little coarse gravel. (cave)?
530	940	Shale, medium light gray N7. (few pieces very coarse gravel 540' - 50).
940	1000	Shale, light olive gray, soft, lumpy.
1000	1010	Shale, medium light gray N7, few pieces of light olive gray limestone.
1010	1080	Shale, dark gray N3, lumpy. 1010' - 1020' few pieces of limestone as above.
1080	1120	Shale, medium dark gray, few white specks. (1100' - 1120' some buff limestone) Little medium to coarse quartz sand 1110 - 20, cave.
1120	1130	Shale as above and much quartz and lime. Fine gravel, quite rounded cave.
1130	1170	Shale as above and some quartz and lime. Fine gravel, quite rounded cave.
1170	1180	Shale, medium to medium dark gray, some limestone pebbles rounded.
1180	1190	Shale, dark gray N3, some white specks.
1190	1220	Shale, medium to medium dark gray.
1220	1230	Shale, dark gray N3.
1230	1240	Shale, dark to medium gray.
1240	1250	Shale, medium gray, little quartz sand cave?
1250	1280	Shale, medium gray, white specks.

<u>From</u>	<u>To</u>	<u>Formation</u>
1280	1290	Shale, medium to medium dark gray (inoceramus prisms and pyrite).
1290	1430	Shale, medium gray (pyrite. 1300' 10'. Little gray limestone 1350' - 70').
1430	1440	Shale, medium gray to light gray.
1440	1480	Shale, medium gray, lumpy, soft.
1480	1500	Shale, medium dark gray to dark gray.
1500	1510	Shale, dark gray N3.
1510	1560	Shale, medium gray. Bentonitic, slightly calcareous.
1560	1570	Shale, dark gray N3.
1570	1600	Shale, dark gray (few white specks 1590-1600). Medium to light olive gray limestone, saccharoidal.
1600	1610	Shale, dark gray and few pieces of limestone as above.
1610	1620	Shale, dark gray N3, white specks; gray limestone as above.
1620	1630	Shale, medium gray, limestone as above.
1630	1770	Shale, medium gray.
1770	1780	Shale, dark gray N3.
1780	1830	Shale, medium dark gray (little bluish bentonite 1800').
1830	1842	Shale, medium dark gray to dark gray, N3.
1842	1860	Shale as above and fine grained gray sandstone.
1860	1910	Shale as above.
1910	1916	Shale as above and fine grained gray sandstone, tan sandstone. Circulation 1900-1916.
1916	1920	Shale as above.
1920	1930	Shale as above and grayish orange fine sandstone.
1930	1950	Grayish orange fine sandstone, not calcareous.
1950	1960	Shale and little sandstone as above.
1960	1970	Shale as above.
1970	1980	Shale and sandstone as above. Gray sandy limestone.
1980	1990	Shale as above and little colorless to dark gray sandstone. Not calcareous
1990	2000	Shale as above.
2000	2030	Shale, as above, and some gray orange fine sandstone.
2030	2050	Shale as above.
Dakota		
2050	2060	Fine grained gray sandstone, and shale as above. Circulation ½ hour.
	2060	Glauconitic fine grained sandstone and shale as above. Circulation 1 hour.
	2060	Dark gray N3 shale, reddish shale and gray sandstone. Circulation 1 1/2 hours.
2060	2070	Dark gray N3 shale, reddish siltstone, and gray sandstone.
2070	2080	Dark gray N3 and medium gray shale. Little gray fine grained sandstone.
2080	2090	Shale, medium gray and gray fine grained sandstone.
2090	2100	Shale, dark gray N3 and reddish siltstone.

<u>From</u>	<u>To</u>	<u>Formation</u>
2100	2120	Shale, medium gray, slightly calcareous; gray orange, very fine grained sandstone.
2120	2150	Shale, mediums gray.
2150	2160	Sandstone, white to gray orange, very fine grained, medium gray shale.
2160	2170	Sandstone, white to gray orange, very fine grained. Little reddish siltstone.
2170	2180	Sandstone, white to gray, fine to medium grained, little gray orange sandstone, fine grained; medium gray shale.
2180	2190	Sandstone, medium gray, fine to medium grained; medium gray shale.
2190	2240	Sandstone, medium gray, fine to medium grained.
2240	2270	Sandstone, white to light gray, sandstone concretionary pellets. Gray orange rounded pieces of sandstone, 10YR7/4. Little shale, medium gray.
2270	2280	Sandstone, medium to coarse. Quartz, sand, and concretionary pellets.
2280	2290	Sandstone; medium to coarse, sub-rounded to rounded quartz sand.
2290	2300	Shale, medium gray; some sand as above.
2300	2310	Sandstone, whitish to light gray, fine grained. Slightly calcareous. One piece glauconite, 2300 - 2310 feet.
2310	2330	Same as above, slightly glauconitic.
2330	2350	Shale, medium gray to medium light gray. Sandstone as above.
2350	2360	Limestone, oolitic to microconglomeratic, to light gray.
2360	2370	Limestone, as above, whitish to yellow gray or light gray sandstone.
2370	2380	Sandstone, whitish to light gray, fine grained; medium gray shale.
2380	2390	Sandstone as above. Medium gray shale.
2390	2400	Limestone, whitish sandy, dense. Piece of brownish oolitic limestone. Shale and sandstone as above.
2400	2430	Shale, medium to medium light gray; few pieces sandstone as above (cave?)
2430	2440	Shale as above; very fine grained, gray orange pink, sandy? dolomite. 5YR7/2.
2440	2450	Dolomite as above, some vugular porosity and dark gray shale N3.
2450	2460	Dolomite as above and white dense limestone. Piece of very porous gray dolomite.
2460	2470	Shale, dark gray to medium gray, little limestone and dolomite as above.
2470	2480	Shale, gray orange 10YR7/4 and dark gray N3. Very little sandstone and limestone as above
2480	2490	White limestone as above, some brown gray very porous dolomite and dark gray shale N3.
2490	2500	Limestone, whitish dense.
2500	2510	Limestone, whitish to pinkish gray, dense.

<u>From</u>	<u>To</u>	<u>Formation</u>
2510	2520	Limestone, whitish to light brown crystalline dense, with some pinkish staining. Some porosity.
2520	2530	Shale, dark gray N3 carbonaceous; limestone as above.
2530	2550	Limestone, whitish to pinkish, crystalline to slightly saccharoidal. Dark gray N3 carbonaceous shale 2540'-2550'.
2550	2570	Shale, dark gray N3 carbonaceous; limestone as above.
2570	2590	Limestone, whitish to pinkish gray, fragmental to slightly saccharoidal.
2590	2615	Pinkish gray 5YR8/1 fragmental limestone.
Core		
2615	2619	Dolomite, grayish pink 5R8/2, fine grained dense.
2622	2624	Limestone, grayish pink, 5R8/2, fine grained dense.
2628	2630	Limestone, pale red 10R6/2 fine grained, dense.
2430	2640	Pale red with pale purple band, shell cast. Fine grained dense limestone.
2640	2648	Limestone, pale red purple oolitic to fragmental and buff fragmental. Some pinpoint porosity.
Cuttings		
2648	2660	Limestone, pale red to buff, fine granular to fragmental, little pinpoint porosity.
2660	2670	Same as above.
2670	2690	Limestone, very pale orange, 10YR8/2 to gray orange pink 5YR7/2 fragmental, dense. Little pinpoint porosity.
2690	2697	Limestone, very pale orange to gray orange pink fragmental, dense.
	2697	Circulation 30 minutes. Limestone, whitish, fragmental. Some pinpoint porosity.
2697	2700	Limestone, whitish fragmental to oolitic, fair porosity.
2700	2790	Same as above. Slightly oolitic to fragmental, fair to good porosity.
2790	2800	Same as above. Very pale yellow brown saccharoidal limestone.
2800	2840	Limestone, gray orange pink saccharoidal, little pinpoint porosity.
2840	2850	Limestone, pale red brown fragmental and saccharoidal dolomitic limestone.
2850	2860	Limestone, pale red brown fragmental and saccharoidal; whitish fragmental limestone.
2860	2867	Limestone, pale red brown as above, gray red 10R4/2, fine granular to fragmental.
2867	2880	Limestone, same as above. Little medium gray shale.
2880	2890	Shale, medium dark gray N4 to dark gray N3. Limestone as above, little red shale.
2890	2900	Shale, medium, dark gray to dark gray, little limestone as above (cave?).
2900	2920	Shale as above and pale red saccharoidal dolomite, fair porosity.

<u>From</u>	<u>To</u>	<u>Formation</u>
2920	2950	Very pale yellow brown saccharoidal dolomite or dolomitic limestone. Fair porosity.
2950	2960	Same as above, gray orange pink sandy dolomite.
2960	2990	Pale yellow brown saccharoidal dolomite. Fair porosity.
2990	3000	Limestone, pale yellow brown or buff and very light gray, dense.
3000	3010	Same as above. Little light brown oolitic limestone, some slightly sandy.
3010	3020	Limestone, very pale yellow brown dense to slightly oolitic.
3020	3030	Limestone, light gray dense, finely crystalline, some slightly oolitic.
3030	3050	Pale red, finely granular dolomite. Little pinpoint porosity.
3050	3060	Limestone, dense, finely crystalline, pale red.
3060	3070	Limestone, pale red to tan, dense,
3070	3080	Limestone, pale red to whitish, dense.
3080	3090	Whitish sandy dolomitic limestone.
3090	3110	Dolomite, moderate orange pink 10R7/4 saccharoidal sandy. Some whitish saccharoidal sandy dolomite. Fair porosity.
3110	3120	Moderate orange pink saccharoidal and pale red brown dolomite. Some whitish dolomite saccharoidal; dense to slightly saccharoidal, fair porosity.
3120	3130	Dolomite, moderate orange pink to pale red brown saccharoidal. Good pinpoint porosity.
3130	3140	Dolomite, mostly moderate orange pink; some pale red brown, finely crystalline to saccharoidal. Fair porosity.
3140	3150	Dolomite as above to light gray fragmental dense limestone.
3150	3160	Limestone as above, some slightly sandy.
3160	3170	Limestone as above, light gray. Much glauconite.
3170	3180	Limestone, very light gray to gray red purple dense, mostly streaks.
3180	3190	Same as above. Finely granular to saccharoidal. Some porosity.
3190	3210	Light gray, slightly sandy limestone, finely granular; some medium dark gray shale, little pale red dolomite.
3210	3220	Same as above. Slightly sandy, finely granular to slightly saccharoidal. Little reddish to gray shale and pinkish dolomite, piece white calcite. (crinoid stem? or coral).
3220	3230	Shale, medium dark gray and reddish. Little limestone and dolomite as above.
3230	3240	Limestone, pale red 10R6/2, dense, finely crystalline.
3240	3250	Shale, dark gray N3 and medium gray N5, dense finely crystalline limestone.
Circ.	3248	Dolomite, pale red 10R6/2 finely granular, dense.
3250	3260	Dolomite, pale red 10R6/2 slightly saccharoidal, slightly sandy.

<u>From</u>	<u>To</u>	<u>Formation</u>
3260	3270	Very pale red, finely granular to crystalline, dense dolomite.
3270	3280	Buff fragmental limestone, little pinpoint porosity.
3280	3290	Limestone, pale red, finely crystalline, dense, dolomitic.
3290	3300	Limestone, gray orange pink 10R8/2 finely crystalline dense dolomitic.
3300	3320	Limestone, white to gray orange pink, fine crystalline dense, dolomitic.
3320	3340	Limestone, pinkish gray 5YR8/1 to gray orange pink, finely crystalline, dense, dolomitic.
3340	3350	Limestone, whitish to buff, finely crystalline to slightly saccharoidal, dense, dolomitic.
3350	3360	Limestone, buff to pinkish gray, saccharoidal, dolomitic.
3360	3370	Limestone, buff, light gray to pinkish gray saccharoidal, dolomitic.
3370	3380	Limestone, buff to gray orange pink saccharoidal, dolomitic.
3380	3390	Limestone, medium light gray N6 saccharoidal, dolomitic.
3390	3400	Dolomite, gray orange pink saccharoidal.
3400	3440	Color as above. Saccharoidal dolomitic limestone.
3440	3480	Color as above. Saccharoidal dolomitic limestone. Some pinpoint porosity.
3480	3490	Color as above. Saccharoidal dolomitic limestone. Some pinpoint porosity. Dalmanella?
3490	3500	Limestone as above.
3500	3510	Color as above. Fine crystalline dense limestone; some slightly saccharoidal dolomitic limestone.
3510	3530	Limestone, pinkish gray 5YR8/1, finely crystalline dense and fine granular sandy limestone.
3530	3540	Pinkish gray 5YR8/1, fine granular to slightly sandy, little fine crystalline, dense.
3550	3570	Limestone, pinkish gray, fine crystalline, dense to finely granular.
3570	3600	Limestone, pinkish gray, fragmental, dense.
3600	3610	Same as above. Mostly light gray to brown gray, slightly saccharoidal to finely granular limestone.
3610	3620	Limestone, pinkish gray fragmental to slightly saccharoidal.
3620	3630	Limestone, light gray fragmental to finely crystalline, dense.
3630	3640	Limestone, same as above to slightly saccharoidal.
3640	3660	Limestone, light gray, finely granular.
3660	3670	Limestone, light gray to very light brown gray, finely granular to light gray fragmental to fine crystalline, brachiopod fragments.
3670	3700	Limestone, light gray fragmental dense.
3700	3710	Limestone, light gray to very pale brown, fine crystalline to fragmental, dense.
3710	3720	Limestone, very pale yellow brown crystalline, dense.

<u>From</u>	<u>To</u>	<u>Formation</u>
3720	3730	Limestone, very pale yellow brown or buff crystalline to fragmental dense; bryozoa stem.
3730	3740	Limestone, light gray, fine crystalline, dense.
3740	3750	Limestone, very pale yellow brown to buff, crystalline to fragmental dense.
3750	3760	Limestone as above. Medium dark gray N4 shale.
3760	3795	Limestone, light gray to very light brown gray, dense, fragmental to crystalline.
3795	3800	Same as above. Few medium to coarse rounded sand grains.
3800	3810	Limestone as above. Greenish limy shale and some colorless fine grained sandstone. Bryozoa fragments.
3810	3820	Limestone as above. Greenish limy shale, little red shale. Some colorless fine grained sandstone. Bryozoa fragments.
3820	3830	Same as above. Little medium grained gray sandstone.
3830	3850	Same as above. Colorless to green, very fine sandstone or siltstone. Gray shale.
3850	3860	Greenish and red shale, little limestone as above, some slightly sandy; little sandstone as above.
3860	3870	Greenish shale, same limestone as above. Crinoids, Brachiopods.
3870	3880	Same as above. Crinoids. Brachiopods.
3880	3890	Shale, green gray 5GY6/1, light olive gray. Crinoids.
3890	3900	Shale, same as above.
3900	3910	Shale, same as above.
3910	3920	Shale, green gray 5G6/1 and dark gray N3.
3920	3930	Shale, green gray 5G6/1, little dark gray shale.
3930	3940	Shale, green gray 5G6/1, medium dark gray to dark gray shale.
3940	3960	Shale, green gray 5G6/1 and dark gray.
3960	3980	Shale, green gray 5G6/1 and gray red 10R4/2, much pyrite.
3980	3990	Shale, same as above; little reddish medium grained sandstone.
3990	3997	Circulation. Shale as above. Much medium to coarse free quartz. Pinkish and brown fine grained sandstone.
3997	4000	Mostly shale as above. Little free quartz as above.
4000	4010	Sandstone, white pinkish and dark brown fine; medium to coarse free quartz.
4010	4011	Circulation. Pinkish to reddish, glauconitic, fine to medium sandstone, not calcareous. Little coarse free quartz.
4011	4020	Brown to reddish sandstone, fine to medium glauconitic shale as above.