

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 149

Summary of the Shell Oil Company Gifford Marchus No. 1
Well No. 706 - Permit No. 719

by Dan E. Hanson

Shell Oil Company - Gifford Marchus No. 1, Pierce County, North Dakota.
Location: 2090 feet from north line and 510 feet from east line of Section 23
- Twp. 157N. - Rge. 70W. Elevation: 1641 Grd., 1652 K.B. Total depth - 4997
ft.

The Shell Oil Company - Gifford Marchus No. 1 was spudded September 13,
1954, drilled to a total depth of 4997 feet, found dry and plugged September
27, 1954. No drill stem tests or cores were taken. Electrical, Micro, and
Gamma Ray-Neutron logs were run by Schlumberger September 27, 1954.

Casing Record

Set - 8 5/8" surface casing at 236' with 175 sacks construction cement.

Plugging Record

Cement plugs of 10 sacks each were set at the following depths: 4940';
4215'; 3810'; 3000'; 2570'; 2350'; 1980'; 1890'; and 248'. 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	1066
Greenhorn formation	1472
Dakota group sands	1877
Jurassic system	
Piper Limestone	2344
Mississippian system	
Lodgepole formation	2550
Englewood formation	2957
Devonian system	
Lyleton formation	2983
"Nisku" formation	2990
Duperow formation	3055
Ashern formation	3677
Silurian system	
Interlake group	3720
Ordovician system	
Stony Mountain formation	
upper member	4050
lower member	4115
Red River formation	4205

Winnipeg formation	
shale member	4760
sandstone member	4930
Total Depth	4997

0-270	Missing.
270-370	Shale, medium gray, soft, massive, spongy to compact. Traces light brownish gray silt. Blue gray bentonite.
370-410	Missing.
410-900	Shale, medium gray, massive, compact to soft. Traces massive, spongy and trace of light green gray bentonite at 410-460. Traces light brownish gray shale, massive, compact at 540-610.
900-1030	Shale, medium gray soft, massive, spongy, traces of white to light gray bentonite.
1030-1100	Shale, medium gray to dark gray, soft, compact, spongy, lumpy. Traces of light blue gray, light green gray, and light gray bentonite flakes.
1100-1250	Shale, medium gray, massive, soft, compact, calcareous, "white specks" disaggregated.
1250-1410	Shale, medium dark gray to dark gray, soft, lumpy, spongy, with traces of pyrite. Slightly calcareous.
1410-1490	Shale, dark gray, soft, lumpy, spongy. With traces of light bentonite.
1490-1610	Shale, medium gray to dark gray, calcareous, massive, spongy to compact, "white specks". Calcite prisms and traces of pyrite. Few chunks of shaly, fine crystalline, light gray, limestone. Traces Globigerina.
1610-1870	Shale, medium dark gray to dark gray, soft, lumpy, spongy. Traces of light gray to light blue gray bentonite. Much Greenhorn cave.
1870-1910	Shale, as above, with traces medium grained, clear, subangular to rounded quartz grains.
1910-1990	Sandstone, fine to coarse grained, clear white pink, subangular to rounded, loose quartz grains. Traces of light reddish brown, fine grained, calcareous cemented quartzose sandstone pyrite.
1990-2050	Shale, medium gray, massive, soft. With loose quartz grains as above, pyrite and traces of light brownish gray shale.
2050-2080	Shale, greenish gray, soft, massive to flaky. Traces of light brownish gray, massive shale. Gray shale, as above, loose quartz grains, as above.
2080-2100	Sandstone, light gray to light greenish gray, calcareous, fine grained, quartzose, sandstone. Quartz and shale as above.
2100-2170	Shale, medium gray, soft, flaky to massive, spongy, with much light red brown massive, soft shale, slightly calcareous. Traces of fine grained, light gray to white calcareous quartzose sandstone. Small amount of anhydrite. Traces green gray, waxy, shale.
2170-2190	Limestone, fine to coarse, crystalline, white, light gray, with carbonaceous streaks. Massive to disaggregated, dark reddish brown and green gray shales, slightly calcareous. Traces anhydrite, pyrite, and fine-grained, calcareous, white, quartzose sandstone.
2190-2270	Shale, medium gray, flaky to massive. With much red brown and green gray shale as above. Trace anhydrite, limestone, and sandstones as above.

2270-2280 Limestone, yellowish gray, very fine grained to sublithographic. Much medium gray, lumpy and flaky, soft shale. With green gray and red brown massive and flaky shales. Traces of pyrite.

2280-2305 Shale, red brown, silty, slightly calcareous, and green gray, waxy, flaky to splintery. Small amounts of medium coarse, loose, rounded and angular quartz grains and pyrite fragments. Traces of anhydrite, very fine grained, calcareous, light gray quartzose and yellowish gray fine grained sublithographic limestone.

2305-2355 Shale, red brown, silty, slightly calcareous, massive. Much green gray, slightly calcareous, flaky, splintery shale, mottled by red and medium gray, soft, spongy shale. Small amounts of anhydrite, pyritized fossil fragments, and calcareous, fine grained, white, quartzose sandstone.

2355-2370 Limestone, pinkish gray, fine grained, sublithographic with rounded medium grained quartz grading into quartzose sandstone. A few fragments have vuggy porosity.

2370-2380 Limestone, as above, much green-gray, medium gray, platy shale. Traces of above samples.

2380-2460 Limestone, yellowish gray, very fine grained to sublithographic, dense. Much medium gray shale, green gray, fissle, compact and red brown fissle to massive.

2460-2545 Anhydrite, white, crystalline, dense. Much medium gray shale, massive, calcareous. Traces above limestone. 2510-2525 contains much red-brown massive, blocky shale.

2545-2560 Shale, red brown, slightly calcareous, massive to flaky and disaggregated soft. Much green-gray, soft, flaky, compact shale. Traces above anhydrite.

2560-2575 Limestone, grayish orange pink, fine grained, microsucrosic, to coarse grained, crystalline. Mottled by red coloring. Intergranular and vuggy porosity. Some inclusions of anhydrite. Trace of white pink chert.

2575-2645 Limestone, grayish-orange pink, fragmental crystalline, no visible porosity. Traces of brachiopod fragments. Medium grained.

2645-2655 Shale, dark red brown, massive, blocky, much microscopic mica. With soft medium dark gray flaky shale.

2655-2675 Limestone, grayish orange pink, very fine grained to sublithographic with some fragmental chunks.

2675-2775 Limestone, light gray, argillaceous, medium to coarse, fragmental, recemented with no visible porosity, subangular to rounded. Fragments of crinoid stems and brachiopod shells. Medium gray, massive, calcareous shale, compact. Traces light gray to clear chert from 2740-2755. Much red brown, massive shale at 2770-2775.

2775-2805 Limestone, light gray, very fine to medium grained, grainy. Light gray to white chert present.

2805-2905 Limestone, pinkish gray, very fine grained, crystalline, grainy to sublithographic. Much light brownish gray and white chert. From 2875-2905 the chert is white pinkish gray.

2905-2960 Limestone, pinkish gray, fine to medium grained, crystalline, fragmental grainy. Small vuggy porosity in some fragments. White pink chert.

2960-2975 Shale, olive gray, flaky, compact, calcareous velvety.

2975-3050 Dolomite, light brownish gray, fine medium grained, grainy. Trace intergranular porosity.

3050-3060 Shale, green gray, splintery, calcareous, massive, waxy with much medium gray, massive, compact shale. From 3055-3060 much red-brown silty, massive shale, and pink crystalline anhydrite.

3060-3155 Limestone, grayish orange pink, fine medium grained, granular. Traces of anhydrite and anhydrite filling in intergranular pores from 3080-3090. Interval 3110-3115 contains traces of oolites.

3155-3175 Limestone, grayish orange pink, fine grained, grainy and sub-lithographic to medium coarse fragmental. Fossil fragments.

3175-3185 Limestones dolomitic, medium light gray, fine medium grained, granular with intergranular and vuggy porosity.

3185-3230 Limestone, dolomitic, light brownish gray, medium grained, granular with intergranular and vuggy porosity. Some white anhydrite and anhydrite filling.

3230-3240 Limestone, pinkish gray, fine grained to sublithographic.

3240-3285 Limestone, dolomitic, light brownish gray, medium grained, granular, with intergranular and vuggy porosity. Some white anhydrite and anhydrite fill. Some fragments, coarse, crystalline.

3285-3295 Shale, red brown, massive, compact with flaky, waxy, green gray and massive medium gray shale. Traces medium grained, subrounded quartz grains.

3295-3305 Limestone, pinkish gray, very fine grained to sublithographic, some purple mottling, dolomitic.

3305-3375 Limestone, dolomitic, yellowish gray, very fine grained to sub-lithographic, microsucrosic. Much red and green shales, and white anhydrite.

3375-3450 Dolomite, pale yellowish brown, fine medium grained, granular with some fragmental. Trace white pink anhydrite and few traces light gray chert. Medium gray flaky, shales.

3450-3505 Limestone, light gray, fine grained to sublithographic, microsucrosic, with pale yellow brown dolomite as above.

3505-3525 Dolomite, pale yellowish brown, fine medium grained, granular to sucrosic.

3525-3555 Shale, red brown, micro-micaceous, massive, compact with flaky, compact, waxy green shale and dolomite as above.

3555-3595 Limestone, pinkish gray, fine grained, crystalline, dense to medium grained, fragmental, vuggy porosity.

3595-3615 Dolomite, dark yellowish brown, fine medium grained, granular, vuggy, intergranular porosity.

3615-3685 Limestone, pale yellowish brown to yellowish gray, very fine grained, crystalline to coarse grained, fragmental. Brachiopod fragments.

3685-3695 Dolomite, pale yellowish brown, granular, fine medium grained, with limestone as above, and with small amount white, crystalline, anhydrite.

3695-3705 Silt and shale, moderate orange pink to pale red brown, calcareous, massive shale to loose silt.

3705-3735 Siltstone, pale reddish brown, dolomitic.

3735-3790 Dolomite, light brownish gray, fine grained, sucrosic. Interval from 3780 to 3790 is medium grained, granular, intergranular and vuggy porosity. With some coarse, fragmental dolomite.

3790-3810 Dolomite, pinkish gray to white, sublithographic to very fine grained, white and pink chert and cherty dolomite.

3810-3845 Dolomite, white to pinkish gray, very fine to medium grained, sucrosic, and fine grained crystalline. Somewhat cherty. Much soft, white, dense, limestone from 3820-3835.

3845-3920 Dolomite, pinkish gray to yellowish gray, very fine grained, microsucrosic to sublithographic. With traces of fine grained, chalky limestone. Traces medium gray, green gray, and red brown massive shales and white anhydrite at 3860-3875.

3920-4060 Dolomite, pinkish gray, fine grained, granular to crystalline and sublithographic. Cherty. From 4035-4055 red staining.

4060-4070 Shale, red brown, massive, calcareous. Mostly light brownish gray, fine grained crystalline dolomite. Fragments of fine grained, calcareous, quartzose sandstone and loose fine medium grained, rounded, frosted quartz grains.

4070-4125 Dolomite, yellowish gray, fine grained, granular.

4125-4205 Limestone, light gray, fine grained chalky to fragmental, coarse grained, carbonaceous, bryozoan and brachiopod fragments. Medium gray, flaky to massive shales. Trace of white, fine grained crystalline anhydrite. Traces red brown, massive, calcareous shale at 4195-4205.

4205-4215 Dolomite, limey, grayish pink, fine grained crystalline.

4215-4280 Limestone, slightly dolomitic, grayish orange pink, fine grained, crystalline. Becoming dolomitic and granular from 4245 to 4260.

4280-4310 Limestone, dolomitic, yellowish gray, very fine grained, fragments with cemented, non-porous, medium grained oolites. Vuggy porosity in small amounts.

4310-4340 Limestone, dolomitic, yellowish gray, very fine grained crystalline and granular. Fragments of light brownish gray cherty dolomite. Very cherty at 4335-4340.

4340-4425 Limestone, yellowish gray, fine grained, microsucrosic, some anhydrite filling and fine grained crystalline limestone as above.

4425-4445 Limestone, yellowish gray, fine grained crystalline to sublithographic.

4445-4515 Limestone, yellowish gray, fine grained, crystalline with small percentage of fragments microsucrosic and fragmental.

4515-4620 Limestone, light brownish gray, fine to medium grained, granular with medium grained, rounded, cemented, dense, fragmental, yellowish gray limestone at 4525-4535.

4620-4670 Limestone, light gray, fine grained, microsucrosic to very fine grained, crystalline.

4670-4730 Limestone, pinkish gray to light olive gray, fine grained, crystalline.

4730-4795 Limestone, light gray, fine to medium grained, crystalline and fragmental, traces red brown, green, splintery shale and pink anhydrite.

4795-4960 Shale, greenish gray, splintery, waxy, compact. Few red stains and red brown shale chips.

4960-4990 Sandstone, white medium coarse grained subangular to rounded, frosted. Some calcareous and anhydrite cemented, but generally loose. Shale as above.

4990-4997 Sandstone, as above, plus angular chunks of pale red feldspar, clear quartz with small amount of biotite. Fragments, white fine grained, calcareous cement, quartzose, angular, glauconitic, sandstone.

4997 Total Depth.