

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 274

Summary of the Continental Oil Company - Gust Schuh No. 1
Well No. 3492 - Permit No. 3504
Mercer County, North Dakota

by Clarence G. Carlson
May 1967

The Continental Oil Company - Gust Schuh No. 1 well is located in SW SE Section 25, T. 146N., R. 90W., Mercer County, North Dakota. Elevation: 2297 G.L., 2309 K.B.

The well was spudded January 20, 1964, drilled to a total depth of 10,356 feet, plugged and abandoned February 29, 1964.

Cores: 8470-8525

Drill Stem Tests:

8455-8525 Initial opening 2 minutes; shut in 30 minutes, open 1 hour with fair blow throughout test. Shut in 1 1/2 hours; recovered 740 feet of water cushion, 3,375 feet of black, very salty sulphur water with strong H₂S. IHP 4693#, ISIP 2786#, IF 696#, FF 1623#, FSIP 3230#, FHP 4680#, BHT - 170⁰ F.

10,070-10,121 Initial opening 2 minutes, initial shut in 30 minutes, final opening 2 hours with weak blow throughout test, FSI 1 hour, recovered 2,135 feet of water cushion and 475 feet of slightly mud cut salt water. IHP 5434#, ISIP 4614#, IFP 974#, FFP 1145#, FSIP 4299#, FHP 5442#, BHT - 195⁰ F.

Plugging Record:

<u>Plug Set</u>	<u>Sacks cement</u>
10,150-9,990	50 sacks
8,810-8,420	110 sacks
6,770-6,610	50 sacks
5,450-5,100	100 sacks
360- 235	50 sacks
20- 0	10 sacks

Casing Record:

Set 10 3/4" at 300 feet with 250 sacks of cement.

Logs:

Laterolog-gamma ray
Sonic
Velocity Survey

The formation tops were determined from samples and logs and corrected to log tops. Not all formations were called in the following list. Color names are those used in the Rock Color Chart of the National Research Council.

FORMATION TOPS

Cretaceous System	
Greenhorn	4297
Mowry	4704
Fall River-Lakota	5024
Jurassic System	5418
Rierdon	5847
Triassic System	
Spearfish	6302
Permian System	
Minnekahta	6409
Opeche	6436
Pennsylvanian System	
Minnelusa	6664
Tyler	7242
Mississippian System	
Big Snowy	7430
Kibbey Limestone	7530
Madison	7704
Ratcliffe interval	8034
Frobisher-Alida interval	8273
Bakken	9606
Devonian System	
Three Forks	9668
Birdbear	9897
Duperow	9980

1450-1510	Shale, medium gray, lumpy, soft, bentonitic.
1510-1570	Shale, medium dark gray, flaky.
1570-1800	Shale, medium dark gray and medium gray, lumpy to flaky.
1800-1990	Shale, medium dark gray to medium light gray, flaky, fissile and lumpy.
1990-2110	Shale, light gray and medium light gray, bentonitic; also shale, as above.
2110-2200	Shale, medium gray, lumpy to platy.
2200-2440	Shale, medium dark gray, flaky to platy.
2440-2470	Shale, medium light gray, lumpy, compact.
2470-2500	Shale, medium dark gray, flaky to platy.
2500-2650	Shale, medium light gray, lumpy, compact.
2650-2770	Shale, medium dark gray, flaky to platy.
2860-2920	Shale, as above.
3100-3130	Shale, medium dark gray and medium gray, platy and flaky.
3130-3390	Shale, medium dark gray, platy.
3450-3480	Shale, as above.
4180-4200	Shale, dark gray, fissile.
4600-4700	Shale, dark gray, fissile.
4780-4820	Shale, medium gray and dark gray, platy and fissile; a few chips of sandstone, very light gray, very fine to fine grained, calcareous.
4820-4830	Shale, dark gray, fissile to platy.
4830-4840	Shale, medium gray, platy and as above.
4840-5040	Shale, dark gray, fissile.
5040-5150	Shale, as above; some sandstone, very light gray, very fine to fine grained.

5170-5190 Sandstone, very light gray, very fine to fine grained, calcareous; much shale, as above.

5210-5240 A little sandstone, as above; a few loose medium to coarse, sub-rounded sand grains; much shale, as above.

5260-5270 Siltstone, very light gray to light brownish gray, calcareous grading to very fine grained sandstone; some shale, light gray and pinkish gray, waxy, soft, lumpy.

5270-5280 Shale, light gray to olive gray, platy, calcareous; a little sandstone, as above.

5300-5330 Shale, pale reddish brown, pale olive and light gray, lumpy, waxy.

5330-5360 Shale, as above; some sandstone, very light gray, very fine to fine grained.

5360-5390 Shale, light gray, olive gray and some pale reddish brown, lumpy to platy, waxy.

5390-5400 Shale, as above; some pyrite and sandstone, very fine to fine grained, pyrite cemented.

5400-5410 Shale, as above.

5410-5420 Shale, as above; some loose, rounded to subrounded quartz grains; a few chips of sandstone, light gray, fine grained.

5420-5450 Loose, subrounded to rounded, colorless quartz grains; a little pyrite cemented sandstone; some shale, light gray and olive gray.

5450-5470 Shale, light gray and olive gray, fissile, calcareous.

5470-5480 Sandstone, very light gray, very fine to fine grained, calcareous, silty; some shale, light to medium light gray, fissile to platy.

5480-5500 Shale, medium light gray, platy and fissile, calcareous.

5500-5530 Shale, as above; a little sandstone, very light gray, fine grained.

5530-5570 Sandstone, very light gray, very fine to fine grained, calcareous.

5570-5660 Sandstone, very light gray to light brownish gray, very fine to fine grained, calcareous, silty.

5660-5690 Shale, various shades of gray; some sandstone, as above; a little shale, greenish gray, platy.

5690-5730 Shale, greenish gray, platy to fissile, very slightly calcareous; sandstone, as above.

5730-5810 Sandstone, very light gray, very fine to fine grained, silty, calcareous; shale, olive gray to greenish gray, fissile to platy, calcareous.

5810-5870 Shale, as above; some sandstone, as above.

5880-5940 Shale, olive gray, pale olive, platy and fissile, calcareous.

5940-5960 Shale, as above and pale reddish brown, platy, calcareous.

5960-5970 Shale, grayish red to pale reddish brown, platy, calcareous.

5970-6000 Shale, as above; some limestone, very light gray, finely crystalline, fragmental.

6000-6010 Limestone, very light gray, fine to medium crystalline, fragmental, sandy; some sandstone, very light gray, fine grained, calcareous.

6010-6050 Sandstone, very light gray, very fine to fine grained, calcareous; some limestone, as above.

6050-6080 Shale, greenish gray and olive gray, platy to fissile, calcareous.

6080-6090 Limestone, very light gray, very finely crystalline, dense; some shale, greenish gray and grayish red, platy, calcareous.

6090-6160 Limestone, very light gray, very finely crystalline to fine grained, a little chert, light gray.

6160-6180 Limestone, light gray, very finely crystalline, dense.

6180-6220 Limestone, yellowish gray to light gray, finely crystalline, dense.

6220-6240 Shale, grayish red, lumpy, slightly calcareous; traces of gypsum; limestone as above.

6240-6320 Shale, grayish red to moderate orange pink, lumpy, calcareous; white gypsum.

6320-6330 Shale and gypsum, as above; some siltstone, moderate reddish orange, calcareous.

6330-6380 Siltstone, moderate reddish orange, calcareous; some gypsum, white to colorless.

6380-6450 Siltstone, as above with some scattered rounded, frosted, medium sand grains.

6450-6470 Limestone, pinkish gray, finely crystalline to pale red.

6480-6540 Siltstone, moderate reddish orange, calcareous.

6540-6610 Shale, grayish red, lumpy, calcareous; siltstone as above.

6610-6640 Siltstone, pale reddish brown to moderate reddish orange, slightly calcareous.

6640-6650 Dolomite, very light gray, very finely crystalline; some white to pink chert; siltstone, as above.

6650-6670 Chert, white to pink.

6670-6690 Chert, as above; a few chips of sandstone, grayish pink, fine to very fine grained.

6690-6720 Sandstone, grayish pink to moderate pink, very fine to fine grained; chert, white to grayish pink.

6750-6790 Sandstone, moderate pink to grayish pink, very fine to fine grained.

6790-6820 Sandstone, as above; dolomite, moderate pink, very finely crystalline.

6820-6850 Dolomite, white to grayish pink, very finely crystalline to fine grained.

6850-6860 Dolomite, as above; sandstone, grayish pink to moderate pink, fine grained, to very fine grained, calcareous.

6860-6890 Sandstone, very light gray to pinkish gray, fine to very fine grained, calcareous; some dolomite, as above.

6890-6900 Dolomite, very light gray to grayish pink, fine grained.

6900-6950 Dolomite, as above; some chert, white to light gray.

6950-6970 Dolomite, as above; some chert; some sandstone, grayish pink, fine to very fine grained, calcareous; shale, greenish gray, brownish gray, platy to splintery, calcareous.

6970-6990 Shale, greenish gray, brownish gray, platy to splintery, calcareous; dolomite, as above.

6990-7010 Shale, pale reddish brown, olive gray, greenish gray, platy and splintery, calcareous; dolomite, grayish pink, very finely crystalline.

7010-7030 Dolomite, grayish pink to moderate pink, finely crystalline.

7030-7050 Dolomite, as above; shale, grayish red, platy to fissile, calcareous.

7050-7070 Shale, greenish gray, olive gray and grayish red, platy to splintery, calcareous; dolomite, as above.

7070-7100 Shale, pale reddish brown, grayish red, dark gray, platy to splintery, slightly calcareous.

7100-7140 Dolomite, light yellowish gray, finely crystalline, limy; a little chert.

7140-7190 Dolomite, as above; shale, variegated, splintery, platy, slightly calcareous.

7190-7230 Limestone, very light gray, finely crystalline, fragmental, traces of oolitic; also variegated shale, as above.

7230-7250 Limestone, light gray, finely crystalline, fragmental; shale, as above.

7250-7260 Limestone, as above; shale, dusky yellow, pale reddish brown, grayish red.

7260-7280 Limestone, yellowish gray, finely crystalline; limestone, pale red, fine grained, silty; shale, pale reddish brown, lumpy; shale, variegated, splintery, slightly calcareous.

7280-7290 Limestone, light gray, finely crystalline; shale, variegated, splintery, and fissile, slightly calcareous.

7290-7300 Shale, very dusky red, fissile, slightly calcareous; also variegated shale, as above.

7300-7310 Shale, pale red, dark gray, moderate reddish brown, lumpy in part, fissile in part.

7310-7320 Shale, as above, mostly dark gray; a few chips of coal.

7320-7350 Shale, dark gray, fissile to platy, slightly calcareous.

7350-7360 Limestone, light gray, fine grained, silty; shale, as above.

7360-7370 Shale, variegated, fissile and platy; some limestone as above.

7370-7400 Limestone, very light gray to yellowish gray, finely crystalline, fragmental; shale, as above.

7400-7430 Limestone, medium light gray, fine grained, silty, grading to a limy siltstone.

7430-7440 Shale, variegated, platy and fissile; a little limestone, as above.

7440-7490 Shale, moderate reddish brown, lumpy, waxy; also shale, as above.

7490-7520 Sandstone, pale reddish brown to moderate orange pink, very fine to fine grained, silty, slightly calcareous.

7520-7560 Sandstone, as above and sandstone, white, very fine to medium grained, slightly calcareous.

7560-7610 Limestone, pale reddish brown, fine grained, silty grading to limy siltstone; a little sandstone, pale reddish brown, very fine to fine grained, calcareous.

7610-7620 Limestone, white to very light gray, finely crystalline, dense.

7620-7640 Limestone, as above and traces of limestone, light gray, fine to medium grained, granular.

7640-7660 Limestone, light gray to light yellowish gray, finely crystalline in part, traces of oolitic to pisolitic; samples mostly shale.

7660-7750 Siltstone, pale reddish brown to moderate orange pink, calcareous.

7750-7760 Siltstone, as above; some dolomite, grayish red, finely crystalline.

7760-7770 Anhydrite, white; siltstone, as above.

7770-7780 Anhydrite, light gray, limy.

7780-7810 Anhydrite, white to light gray.

7810-7850 Anhydrite, as above; limestone, light brownish gray, finely crystalline (log indicates salt from 7810-7840), traces of pelletoidal limestone, traces of salt 7840-7850.

7850-7870 Limestone, light brownish gray, finely crystalline, and fine grained, fragmental to pelletoidal.

7870-7890 Limestone, brownish gray, very finely crystalline, dense; anhydrite, white.

7890-7910 Anhydrite, white; some limestone as above.

7910-7940 Anhydrite, white to light gray.

7940-7970 Anhydrite, white and anhydrite, medium light gray, limy.

7970-7980 Anhydrite, medium light gray, limy.
7980-7990 Anhydrite, as above and white anhydrite; some limestone, light yellowish brown, finely crystalline.
7990-8010 Limestone, light yellowish brown, fine grained, granular to finely crystalline; some white anhydrite.
8010-8060 Limestone, as above; anhydrite, medium light gray, limy.
8060-8070 Dolomite, light brownish gray, fine to medium grained; anhydrite, as above; (logs indicate salt 8050-8094).
8070-8160 Anhydrite, white to light gray.
8160-8180 Anhydrite, as above; limestone, light brownish gray, finely crystalline, fragmental.
8180-8200 Limestone, light brownish gray to brownish gray, finely crystalline, fragmental.
8200-8210 Anhydrite, white to light gray; limestone, as above.
8210-8240 Limestone, light brownish gray, finely crystalline, fragmental; some anhydrite, white to light gray.
8240-8270 Anhydrite, as above; a little limestone, as above.
8270-8290 Limestone, light brownish gray, finely crystalline, fragmental; some anhydrite, white to light gray.
8290-8310 Anhydrite, white to very light gray; some limestone, as above.
8310-8320 Anhydrite, white to medium light gray.
8320-8340 Limestone, light brownish gray, fragmental, finely crystalline.
8340-8470 Anhydrite, medium light gray to white.
8470- Circulation. Dolomite, light brownish gray, fine grained, micro-sucrosic; some anhydrite.

Cores

8470-8480 Dolomite, light brownish gray, microsucrosic; with scattered inclusions of light gray, anhydrite.
8480-8481 Dolomite, light brownish gray, microsucrosic.
8481-8483 Limestone, brownish gray, fragmental, finely crystalline, dolomitic.
8483-8484 Limestone, light brownish gray, microsucrosic, slightly silty; scattered inclusions of white to light gray anhydrite.
8484-8487 Limestone, light brownish gray, microsucrosic, dolomitic.
8487-8497 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, slight oil stain and cut with Ccl₄-8489-97.
8497-8507 Limestone, dark brownish gray, fine to coarsely crystalline, fragmental, fossiliferous, dense oil stained.
8507-8509 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, dolomitic.
8509-8511 Dolomite, light brownish gray, fine grained, limy, spotty stain, slight cut with Ccl₄.
8511-8515 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, spotty oil stain, slight cut with Ccl₄.
8515-8517 Limestone, brownish gray, very fine to finely crystalline, dense.
8517-8321 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, spotty oil stain, slight cut with Ccl₄.
8521-8525 Limestone, brownish gray, very fine to medium crystalline, fragmental, fossiliferous, dense; scattered spotty stain and slight cut with Ccl₄.

Samples

8520-8530 Dolomite, as above; some limestone, light brownish gray, fragmental, finely crystalline.

8530-8570 Limestone, light brownish gray, to brownish gray, fragmental, finely crystalline.

8570-8620 Limestone, as above; some chert, light gray, fragmental texture, slightly limy.

8620-8640 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, slightly argillaceous.

8640-8660 Limestone, very light gray to white, finely crystalline, pinpoint porosity, also limestone, as above.

8660-8670 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, slightly argillaceous.

8670-8700 Limestone, light brownish gray, medium grained, granular, silty, dolomitic.

8700-8730 Limestone, light brownish gray, fine grained, fragmental, fossiliferous, slightly argillaceous.

8730-8750 Dolomite, light brownish gray, fine grained, granular.

8750-8760 Dolomite, as above; some limestone, light brownish gray, fossiliferous, fragmental, fine grained.

8760-8800 Limestone, as above.

8800-8930 Limestone, light gray, fine to medium crystalline, fragmental, fossiliferous.

8930-9080 Limestone, light gray, fine to medium crystalline, fragmental, fossiliferous.

9080-9150 Limestone, light gray, fine to medium crystalline, fragmental, fossiliferous, siliceous.

9150-9160 Limestone, light gray to medium light gray, finely crystalline.

9160-9240 Limestone, light gray, fine grained, fragmental, fossiliferous.

9240-9390 Limestone, light gray, finely crystalline, fragmental, fossiliferous, siliceous.

9390-9430 Limestone, as above; some chert, light gray to medium light gray.

9430-9490 Limestone, light gray to medium light gray, finely crystalline, siliceous.

9490-9620 Limestone, medium light gray to medium gray, finely crystalline, siliceous.

9620-9630 Shale, brownish black, lumpy to platy, compact, slightly calcareous.

9630-9640 Shale, as above; limestone, very light gray, fine grained.

9640-9670 Limestone, light gray, fine grained, silty.

9670-9700 Shale, brownish black, platy to fissile, compact; dolomite, very light gray, fine grained, silty.

9700-9710 Dolomite, very pale orange, finely crystalline.

9720-9730 Dolomite, grayish orange pink to light brown, fine to medium crystalline.

9730-9740 Dolomite, grayish orange pink to very pale orange, fine to medium crystalline; a little shale, light greenish gray, platy, compact, calcareous.

9740-9760 Dolomite, as above; shale, grayish red, slightly calcareous.

9760-9780 Dolomite, as above.

9780-9800 Dolomite, as above; shale, grayish red, calcareous.

9800-9810 Dolomite, grayish orange pink, fine to medium crystalline; a little shale, greenish gray, calcareous.

9810-9830 Shale, grayish red, calcareous; dolomite, pale reddish brown, fine grained, argillaceous.

9830-9850 Dolomite, light gray, fine grained, silty; dolomite, grayish orange pink, fine to medium crystalline.

9850-9910 Dolomite, grayish red to pale reddish brown, silty, argillaceous; dolomite, light gray to light greenish gray, silty.

9910-9920 Limestone, brownish gray, fine to medium crystalline, dense.

9920-9960 Limestone, very light gray, fine grained, pinpoint porosity, also limestone, as above.

9960-9980 Limestone, brownish gray to light brownish gray, finely crystalline to fine grained, mostly dense.

9980-9990 Limestone, light brownish gray, fine to medium crystalline, fragmental in part.

9990-10000 Limestone, very light brownish gray, fine grained, slightly argillaceous.

10000-10010 Limestone, light brownish gray, fine grained, fragmental and finely crystalline, dense.

10010-10030 Limestone, very light brownish gray, fine grained, microsucrosic; also limestone, as above.

10030-10070 Limestone, very light to light brownish gray, finely crystalline, fragmental in part.

10070-10090 Limestone, very light to light brownish gray, fine grained, fragmental in part; dolomite, light brownish gray, fine to medium grained, granular.

10090-10160 Dolomite, light brownish gray, fine to medium grained, granular; some limestone, light brownish gray to very light brownish gray, fine grained, fragmental.

10160-10190 Limestone, light brownish gray, finely crystalline, dense to fine grained.

10190-10200 Limestone, light brownish gray to very light brownish gray, fine grained, slightly silty.

10200-10210 Limestone, brownish gray, finely crystalline; some limestone, as above.

10210-10230 Limestone, very light brownish gray, fine grained, microsucrosic.

10230-10260 Limestone, brownish gray to light brownish gray, finely crystalline; also limestone, as above.

10260-10290 Limestone, light brownish gray to very light brownish gray, fine grained, fragmental in part, microsucrosic in part.

10290-10344 Limestone, light brownish gray, finely crystalline; also limestone, light brownish gray, as above.