

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 230

Summary of the Continental Oil Company - State #1
Dunn County, North Dakota
Well No. 2230 - Permit No. 2242

by Herbert A. Mendoza
April, 1960

The Continental Oil Co., State #1, located in SW 1/4, SW 1/4, Sec. 36, T. 147N., R. 96W., Dunn County, North Dakota. Elevation of K.B. 2647 feet; ground level 2632 feet.

The well was spudded March 14, 1959 and drilled to a depth of 10,492 feet, plugged and abandoned as a dry hole on May 5, 1959.

Logs Run:

Laterolog with gamma ray
Microlaterolog
Sonic log

Core Record:

#1 9775-9833 full recovery
#2 9833-9891 full recovery

Drill Stem Tests:

DST #1: Packer at 9780-TD 9992. Open 1 hour, shut in 30 minutes. ISIP 4510, 30 minutes, FSIP 4070, IFP 915, FFP 1060, IHP 5730, FHP 5650, 2000' water cushion. Recovered 630' black salty sulfur water.

DST #2: Packer at 10,007-10,039. Open 2 hours, shut in 30 minutes, ISIP 4755, FSIP 3258, IFP 852, FFP 852, IHP 5928, FHP 5928. Recovered 60' mud with sulfur odor. 2000' water cushion.

Casing Record:

13 3/8" OD, 54.5#, J-55 ST & C, 8 rd. surface casing set at 760' and cemented with 450 sacks 50-50 Posmix and 200 sacks neat cement. Fluid settled down to 26' below surface. Cemented with 50 sacks from 55' to surface.

Plugging record:

#1 9620-9700 with 25 sacks cement
#2 5800-5880 with 25 sacks cement
#3 723-760 (surface casing) with 30 sacks
10.9 pounds mud between plugs.

Formation tops were determined from samples and mechanical logs. Doubtful or obscure formations were not picked. Colors and descriptive numbers were taken from Goddard, et al., 1951 Rock Color Chart distributed by the Geological Society of America, New York, New York.

FORMATION TOPS

| | | |
|--------------------------|--------|--|
| Cretaceous System | | |
| Pierre formation | 2280 | |
| Niobrara formation | 4425 | |
| Greenhorn formation | 4924 | |
| Mowry formation | 5402 | |
| Fall River member | 5797 | |
| Jurassic System | 6110 | |
| Piper limestone | 6918 | |
| Triassic System | | |
| Spearfish formation | 7155 | |
| Permian System | | |
| Minnekahta formation | 7546 | |
| Opeche formation | 7578 | |
| Pennsylvanian System | | |
| Minnelusa formation | 7950 | |
| "Amsden" formation | 8097? | |
| Mississippian System | | |
| Big Snowy Group | | |
| "Heath" formation | 8485 | |
| Otter formation | 8622 | |
| Kibbey sand | 8777 | |
| Kibbey limestone | 8942 | |
| Madison Group | | |
| Poplar interval | 9090 | |
| Ratcliffe interval | 9590 | |
| Midale sub-interval | 9772 | |
| Madison undifferentiated | 9838 | |
| Total depth | 10,492 | |

| | |
|-----------|--|
| 40-160 | Lignite, black, vitreous, common sandstone, light gray, fine grained, detrital, calcareous cement. |
| 160-190 | Sandstone as above, rare lignite. |
| 190-220 | Sandstone as above, abundant quartz sand grains, fine to coarse, common lignite. |
| 220-600 | Lignite, black to brownish black (5YR2/1), vitreous to peaty, common sandstone and quartz as above. |
| 600-780 | Lignite as above. |
| 780-840 | Cement cavings? |
| 840-990 | Lignite, black, common cement cavings? |
| 990-1110 | Lignite as above. |
| 1110-1200 | Same as above, common limestone, light gray, fine crystalline, argillaceous, common shell fragments. |
| 1200-1440 | Lignite, black to brownish gray (5YR2/1), peaty. |
| 1440-1710 | Same as above, common quartz grains, common fossil fragments. |
| 1710-2650 | Missing. |
| 2650-3040 | Lignite, black, vitreous, common shale, medium light gray, soft, silty, slightly calcareous, common shell fragments. |
| 3040-3190 | Shale, medium light gray, platy, medium hard, slightly silty, common lignite cavings? |
| 3190-4000 | Shale, medium light gray, platy, hard, argillaceous, rare white specks and calcite prisms. |

4000-4500 Shale, medium light gray to medium gray, platy, soft, rare bentonite, light gray, spongy, rare white specks and calcite prisms, lignite cavings?

4500-4590 Shale as above, abundant white specks, rare calcite prisms.

4590-4610 Cavings?

4610-4810 Shale, medium gray, platy, medium hard, common white specks and amorphous pyrite, shell fragments.

4810-4860 Shale, grayish black to black, splintery, medium hard.

4860-5000 Shale, black to medium light gray, platy, soft to medium hard.

5000-5050 Shale, black, platy, medium hard.

5050-5300 White specks, common shale, dark gray, platy, medium hard, common calcite prisms.

5300-5500 Shale, dark gray, platy, soft, common white specks and calcite prisms.

5500-5600 Shale, dark gray to medium light gray, platy, soft.

5600-5820 Shale, dark gray, platy, common sandstone, very light gray, fine grained, poor to well cemented.

5820-5870 Shale, black, splintery, soft.

5870-6030 Shale as above, common sandstone, light gray, fine grained, well cemented, slightly micaceous, abundant quartz grains, coarse, sub-rounded, shell fragments.

6030-6130 Shale, black to medium light gray, platy, soft bentonitic to argillaceous, common siderite pellets.

6130-6210 Shale as above, common sandstone, fine grained, quartzose, well cemented, rare siderite pellets.

6210-6450 Shale, light gray to dark gray, platy, common sandstone, medium light gray, fine grained, well cemented, slightly glauconitic.

6450-6580 Sandstone, light gray, fine grained, calcareous cementation, glauconitic, abundant shale as above, common limestone, medium light gray, cryptocrystalline, dense.

6580-6700 Shale, medium light to dark gray, platy, soft, rare sandstone as above, calcareous.

6700-6760 Limestone, medium gray, fine to medium crystalline, grainy, common shale as above.

6760-6790 Shale, medium gray, platy, soft, common limestone as above.

6790-6840 Shale, medium to dark gray, platy to splintery, soft, common siltstone, moderate red (5R5/4), fine grained, argillaceous, slightly calcareous.

6840-6920 Shale and siltstone as above, common limestone, medium gray, fine to medium crystalline, grainy.

6920-6990 Limestone, pale yellowish brown (10YR6/2) to moderate pink, (5R7/4), fine crystalline, dense, common shale dark gray, platy, soft.

6990-7000 Same as above, common siltstone, moderate red (5R4/6), fine grained, argillaceous, calcareous.

7000-7040 Shale, medium gray, platy, soft, abundant sandstone, moderate red (5R4/6), fine grained, well cemented common siltstone as above.

7040-7180 Sandstone as above, common shale, dark gray, splintery.

7180-7200 Same as above, common anhydrite, white.

7200-7340 Siltstone, moderate red (5R4/6), fine grained, argillaceous to arenaceous, slightly anhydritic, common shale as above.

7340-7530 Same as above, common sandstone, pale reddish brown (10R5/4), fine to medium grained, well cemented.

7530-7600 Limestone, light red (5R6/6) to pale reddish brown (10R5/4), fine crystalline, dense, common cavings?

7600-7620 Cavings?

7620-7670 Shale, dark gray, splintery, medium hard, common siltstone, moderate reddish brown (10R6/6) fine grained, common mica cavings?

7670-7760 Cavings?

7760-7820 Halite, clear, anhedral.

7820-7900 Siltstone, moderate reddish brown (10R6/6), fine grained, common halite as above.

7900-7990 Siltstone, as above, common shale, dark gray, splintery, soft, common cavings?

7990-8000 Same as above, abundant dolomite, moderate pink (5R7/4), fine crystalline, dense.

8000-8010 Dolomite as above.

8010-8230 Limestone, grayish orange pink (5YR7/2) to pale red (5R6/2), fine crystalline, dense, dolomitic, rare to common sandstone, grayish pink (5R8/2), fine grained, well cemented.

8230-8250 Sandstone as above, little limestone as above.

8250-8270 Cavings?

8270-8290 Limestone, grayish red (10R4/2) to grayish pink (5R8/2), fine crystalline, dense, common sandstone and shale cavings?, rare chert, white, ordinary.

8290-8400 Limestone, yellowish gray (5Y7/2) to grayish pink (5R8/2), crypto-crystalline, dense, common chert, white, smooth, porcelaneous.

8400-8530 Limestone, pale yellowish brown (10YR6/2) to pale red (5R6/2), fine crystalline, slightly dolomitic, dense, common shale cavings?

8530-8650 Shale, dark gray to black, platy, soft, waxy, common cavings?

8650-8800 Shale, black to varicolored, platy, soft, rare limestone, greenish gray (5G6/1), to yellowish gray (5Y7/2), fine crystalline, dense.

8800-8860 As above, rare sandstone, very light gray, fine grained, well cemented.

8860-8870 Cavings?

8870-8900 Shale, dark gray to black, platy, soft, common sandstone, grayish orange pink (5YR7/2), fine grained, well cemented, common limestone, pale yellowish brown (10YR6/2), fine crystalline, dense.

8900-8950 Sandstone, pale red (10R6/2), fine grained, well cemented, common shale, dark gray, platy.

8950-8990 Sandstone, white to pale red (10R6/2), fine to medium grained, well cemented, common limestone, pale brown (5YR5/2), very fine crystalline dense.

8990-9050 Limestone as above, common sandstone, as above, shale cavings?

9050-9130 Cavings?

9130-9250 Halite, clear, amorphous.

9250-9410 Shale cavings? coated with salt.

9410-9460 Limestone, pale yellowish brown (10YR6/2) fine crystalline, dense, coated with salt.

9460-9540 Cavings?

9540-9600 Limestone, pale yellowish brown (10YR6/2) to yellowish gray (5Y7/2), fine to medium crystalline, dense to pinpoint porosity, common shale cavings?, slightly salt coated, rare anhydrite, white, grainy.

9600-9650 Shale and mica cavings.

9650-9660 Halite, clear, anhedral, common black shale, salt coated.

9660-9730 Cavings?

9730-9780 Limestone, pale yellowish brown (10YR6/2), fine crystalline, dense, abundant shale cavings? common anhydrite, white to light bluish gray (5B7/1), dense, grainy.

Core #1

9775-9780 Limestone, light brownish gray (5YR6/1), medium crystalline, sucrosic, calcitic, slightly porous, fossiliferous.

9780-9781 Same as above, oil-stained stylolite seam, fair "cut".

9781-9782 Limestone, very light brownish gray (5YR8/1), medium crystalline, sucrosic, shows banding.

9782-9791 As above, mottled, unidentified brachiopods.

9791-9792 Limestone, light brownish gray (5YR6/1), medium crystalline, sucrosic, unidentified "algae"?

9792-9795 Same as above, no fossils.

9795-9797 Limestone as above, slightly oil-stained, along stylolite seams, fair "cut"

9797-9801 As above, no oil stains.

9801-9802 Limestone, light brownish gray (5YR6/1), fine to medium crystalline, calcitic, oil stains, good fluorescence, little "cut".

9802-9809 Limestone as above, slight fluorescence, good "cut" along stylolite seams.

9809-9812 As above, no oil stains.

9812-9815 Limestone, medium dark gray, fine crystalline, dense, stylolitic, banded, fair fluorescence, good "cut".

9815-9823 Limestone, medium brownish gray (5YR5/1), fine crystalline, dense fossiliferous.

9823-9829 Limestone as above, slight fluorescence, little "cut".

9829-9833 As above, no oil stains.

Core #2

9833-9834 Limestone, medium dark gray, fine crystalline, dense, Chonetes.

9834-9835 Limestone, olive gray (5Y4/1), medium crystalline, pinpoint porosity, oil-stained, fair fluorescence, good "cut".

9835-9838 As above, dense, no oil stains.

9838-9847 Limestone, medium brownish gray (5YR5/1), fine to medium, dense to pinpoint porosity, very little fluorescence, little "cut", good cut along stylolite seams and vertical fractures.

9847-9850 Limestone, olive gray (5Y4/1), medium crystalline, little pinpoint porosity, fair fluorescence, little to fair "cut".

9857-9858 Limestone, medium brownish gray (5YR5/1), fine crystalline, dense, common anhydrite, pale brown (5YR5/2), euhedral, fair fluorescence, fair "cut".

9858-9860 Limestone, grayish orange pink (5YR7/2), medium crystalline, sucrosic.

9860-9866 Anhydrite, medium gray to very light gray, very fine crystalline, dense, very hard, possibly cherty.

9866-9868 Anhydrite, very light gray, cryptocrystalline, hard, dense, slightly oil-stained, fair fluorescence, no "cut".

9868-9869 Limestone, medium dark gray, medium crystalline, dense, fair fluorescence, little "cut".

9869-9877 Anhydrite, medium dark gray to light brownish gray (5YR6/1), cryptocrystalline, hard, dense.

9877-9879 Limestone, medium gray, medium crystalline, sucrosic, dense.
 9879-9883 Limestone, brownish black (5YR2/1), fine crystalline, dense, oil-stained, fair fluorescence, fair "cut".
 9883-9884 Limestone, dark gray, fine, dense, fair fluorescence, good "cut".
 9884-9886 Limestone, medium dark gray, fine, dense.
 9886-9887 Limestone, light gray, fine, dense, interbedded anhydrite, very light gray, fine crystalline, hard.
 9887-9890 Anhydrite, very light gray, fine, dense, oil-stained, fair fluorescence, no "cut".
 9890-9891 Limestone, medium dark to dark gray, fine, dense, fair fluorescence, little cut.
 9890-9910 Cavings.
 9910-10150 Limestone, pale brown (5YR5/2), fine crystalline, dense, common black shale cavings?, common anhydrite, light gray to light bluish gray (5B7/1), dense.
 10150-10350 Limestone, yellowish gray (5Y7/2) to pale yellowish brown (10YR6/2), fine to medium crystalline, dense to grainy, common cavings?
 10350-10489 Limestone, pale yellowish brown (10YR6/2), medium crystalline, dense to grainy, common anhydrite, white to very light gray, dense, slightly calcareous, common shale cavings?
 10489 Total depth.