

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 262

Summary of the Traugott Drilling Company-Hattie Bakke #1
Walsh County, North Dakota
Well No. 2623 - Permit No. 2635

by John P. Bluemle
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The Traugott Drilling Company-Hattie Bakke #1, Walsh County, North Dakota. Location: Center NE NW Section 9, T. 156N., R. 58W., Elevation: 1562 K.B. Total Depth: 2500'.

The Traugott Drilling Company-Hattie Bakke #1 was spudded April 4, 1960; drilled to a total depth of 2500 feet, found dry and plugged May 4, 1960. No drill stem tests were taken and no cores were cut. Induction electrical log was run by Schlumberger.

Logging Record:

Schlumberger induction-electrical log. Run one 5/2/60, 160-2489.

Casing Record:

Set 8 5/8" surface casing at 154 feet with 45 sacks of cement.

Plugging Record:

<u>Plug Set</u>	<u>Sacks Cement</u>
1770 feet (above Red River)	20
1460 feet (above Silurian)	20
1150 feet (above Dakota)	20
170 feet (base of surface casing)	20
surface	5

Formation tops were determined from samples and electric log. Doubtful or obscure formation tops were not picked. Color names are from the 1951 Rock Color Chart distributed by the Geological Society of America.

FORMATION TOPS

Cretaceous System	
Niobrara Formation	360
Greenhorn Formation	762
Belle Fourche Formation	848
Mowry Formation	990
Fall River Formation	1152
Jurassic System	1257
Silurian System	1463
Ordovician System	
Stonewall Formation	1569
Stony Mountain Formation	
Gunton Member	1620
Stoughton Member	1665
Red River Formation	1762
Winnipeg Formation	
Roughlock Member	2310
Icebox Member	2377
Pre-Cambrian	2496
T.D.	2500

0-10 Sand, subangular to subrounded, medium grained to fine grained, predominantly light olive gray, non-calcareous, fissile shale but with rounded grains of quartz, limestone and various metamorphic particles; particles of sodium sulphate; abundant grayish orange clay.

10-20 Gravel, angular to subrounded of the same composition as above without evaporites; shale chips, non-calcareous, are apparently Pierre; grayish orange clay, as above.

20-30 Gravel, angular to rounded, predominantly rounded; Pierre chips are angular, Niobrara chips are well rounded; abundant limestone and dolomite as well as angular chips from igneous and metamorphic rocks; no clay.

30-40 Shale, medium dark gray, non-calcareous to slightly calcareous, massive, micromicaceous, compact; some sand, as above.

40-50 Shale, essentially non-calcareous, similar to above; less sand, as above.

50-60 Shale, medium gray, non-calcareous, massive, compact, micromicaceous.

60-100 Shale, medium gray with a brownish caste, non-calcareous, massive, compact, slightly resinous; has a dolomitic tendency; becomes slightly fissile and spongy at 70 feet; becomes more micromicaceous at 80 feet.

100-120 Shale, medium gray, non-calcareous, massive to fissile, resinous, micromicaceous.

120-130 Shale, medium light gray with an olive caste; a few of the lightest pieces are slightly dolomitic, otherwise noncalcareous; massive to fissile, resinous, compact.

130-150 Shale, as above; with pale yellowish brown inclusions and chips of limestone, of essentially the same texture, luster and induration as the shale; acid alters limestone color to yellowish gray.

150-160 Shale, as above; no limestone.

160-180 Shale, light olive gray, slightly calcareous, resinous, fissile; inoceramus prisms at 170.

180-190 Shale, medium light gray, non-calcareous, massive to fissile, micromicaceous, resinous, very slightly dolomitic.

190-220 Shale, light gray, very slightly calcareous, fissile to flaky, resinous, spongy to compact; slightly increased calcareousness downward.

220-270 Shale, light gray to medium light gray, slightly calcareous, massive to fissile, compact to spongy; small yellowish gray inclusions of limestone at 240 feet; a few silty chips.

270-290 Shale, medium light gray, non-calcareous, massive to fissile, compact; olive caste at 280.

290-300 Shale, as above; except tends to be spongy; chips of pale yellowish brown dolomite, resinous, microsucrosic, with elongated dark inclusions; pinpoint porosity.

300-320 Shale, as above, fissile, spongy; bentonitic; some of the shale is flaky and disaggregated.

320-360 Shale, as above, highly bentonitic; shale contains a few rounded sand grains; bentonite increases downward and shale becomes more disaggregated and calcareous; predominant color of the bentonite is yellowish gray.

360-370 Shale, medium dark gray, non-calcareous, fissile and light olive gray, highly calcareous, massive; white specks in olive shale; abundant bentonite, bluish white to yellowish gray.

370-380 Shale, light brownish gray, highly calcareous, massive, abundant white specks; also some dark gray shale, as above; some bentonite.

380-400 Shale, light brownish gray, highly calcareous, abundant white specks, larger than above; shale is massive to fissile and tends to be spongy.

400-420 Shale, light olive gray, highly calcareous, abundant white specks; shale is massive, spongy.

420-430 Shale, as above; abundant yellowish gray bentonite.

430-460 Shale, light olive gray and medium dark gray, flaky to fissile, highly calcareous with white specks; generally disaggregated; but becoming more compact downward.

460-470 Limestone, very light gray, grainy to chalky; high tubular and cavernous porosity; also shale, as above; bentonite.

470-480 Shale, as from 430-460; bentonite, very light gray; limestone, as above.

480-500 Shale, medium dark gray, calcareous, disaggregated, some fissility, also light gray shale and bentonite, as above.

500-560 Shale, dark gray, very slightly calcareous, micromicaceous, fissile, resinous; increasing calcareous downward and becoming flaky.

560-570 Shale, dark brownish gray (5YR3/1), highly calcareous, fissile, resinous, micromicaceous.

570-600 Shale, medium gray, calcareous, micromicaceous, tiny white specks, massive, bentonite, yellowish gray and light bluish gray; chips of calcite and calcite prisms of *Inoceramus*.

600-640 Shale, medium dark gray to light olive gray, calcareous, massive, bentonitic, white specks, some fissile pieces, pyrite; very spongy at 630, with decreased calcareousness.

640-710 Shale, medium dark gray, slightly calcareous, loose and disaggregated, bentonitic; micromicaceous at 660. Samples consist of very large chips or pieces of caved material.

710-730 Shale, medium dark gray, calcareous, with abundant light bluish gray bentonite; some pieces of shale have white specks.

730-750 Shale, medium gray, massive to fissile with black, sooty inclusions and some coal; also yellowish gray chips of limestone; bentonite; shale is slightly darker downward.

750-760 Shale, grayish black, slightly calcareous, flaky, disaggregated.

760-780 Shale, olive gray, fissile to flaky, tiny white specks, spongy, calcareous; becomes medium gray and massive at 770.

780-800 Shale, dark gray, fissile, micromicaceous, highly calcareous; slightly lighter downward with a few calcite prisms and pyrite crystals.

800-820 Limestone, yellowish gray, sandy, grainy; abundant calcite prisms, shell fragments of *Inoceramus*; also shale, medium light gray.

820-900 Shale, olive gray, fissile, white specks which are pressed to parallel bedding; calcite prisms, chips of limestone composed primarily of small consolidated prisms of calcite.

900-910 Shale, medium gray, flaky to disaggregated, calcareous, abundant white specks, calcite prisms.

910-920 Shale, dark gray, fissile, micromicaceous, calcareous; bentonite, yellowish gray.

920-950 Shale, as between 900 and 910; clusters of calcite prisms, bentonite, as above; medium dark gray shale mixed in at 930 and abundant calcite prisms.

950-990 Shale, medium gray, white specks and limestone inclusions, calcareous, massive, spongy; darker chips, as above at 960; bentonitic at 970.

990-1090 Shale, medium gray, fissile, calcareous; abundant bentonite; pyritic at 1020; samples are poor from 1060-1090, consisting mostly of drilling mud.

1090-1150 Shale, medium gray, disaggregated, finely divided pyrite, a few calcite prisms; dark chips at 1100 and some bentonite, a few grains of rounded quartz at 1120 and cemented with bentonite at 1140.

1150-1160 Shale, as above; sand, primarily rounded, frosted grains of quartz with a few subangular and frosted grains.

1160-1180 Sand, fine to medium grained, subangular to well rounded, a few frosted, mainly clear, mainly quartz; pyrite as cement in some chips of sandy shale; shale, as above; pyrite is abundant at 1170.

1180-1210 Sand, medium grained, subangular to well rounded, frosted to mainly clear, mainly quartz; remainder is pyrite.

1210-1230 Limestone, composed of tiny crystals of calcite; fragmental grain makeup, abundant pyrite; sand, as above.

1230-1240 Shale, medium dark gray, silty, calcareous, resinous, some sand, as above; much yellowish gray bentonite; some reddish brown siltstone.

1240-1250 Gravel, mixture of all sizes of sand; angular to rounded quartz, otherwise subangular pieces of shale; sample has a reddish caste due to pale reddish brown siltstone, non-calcareous; abundant pellets of iron carbonate.

1250-1260 Siltstone, pale red (10R6/2) to pale reddish brown; sandy, pinkish gray clusters of prisms of calcite.

1260-1270 Siltstone, sandy, moderate yellowish brown with yellow stains; a few chips of shale; siltstone is calcareous.

1270-1300 Shale, medium gray, fissile; siltstone, as above; some bentonite; a few sand grains; a little pale red (5R6/2) clay; amount of shale increases downward.

1300-1320 Limestone, oolitic, pinkish gray, intergranular porosity; also abundant shale and siltstone, as above; fossils, probably oyster shells.

1320-1370 Siltstone, moderate reddish orange, calcareous; shale, as above, decreasing downward; color of siltstone becomes more variable, generally darker downward; limestone, as above but grayish orange at 1330; selenite and gypsum; a typical evaporitic sequence.

1370-1390 Limestone, grainy to oolitic, yellowish gray; silty; shale, as above, abundant pale reddish brown and pale yellowish brown siltstone at 1380.

1390-1400 Limestone, dolomitic, yellowish gray, microsucrosic, dense; also limestone, light gray, with spherical oolites of chert of a bluish caste; some reddish siltstone.

1400-1420 Siltstone, pale reddish brown; also selenite, bentonite and limestone, all similar to the interval 1320-1370.

1420-1430 Limestone, pinkish gray, grainy to chalky, dense with a tendency to be fractured; also cherty, oolitic to fragmental limestone; oolites and fragments are spherical to irregular.

1430-1460 Poor samples; predominantly reddish siltstone and gray shale but with limestone, gypsum and calcite prisms.

1460-1470 Limestone, dolomitic, grayish orange with green streaks; micro-sucrosic, dense but with some cavernous porosity; calcite inclusions; moderate red, slightly calcareous chips of shale.

1470-1480 Limestone, dolomitic, very pale orange and grayish green (10GY5/2), microsucrosic, moderate amount of cavernous and vuggy porosity.

1480-1500 Dolomite, calcic and limestone, dolomitic, as above; dolomite is grayish orange pink, dense; fossiliferous, subcrystalline to sucrosic.

1500-1510 Dolomite, as above; varicolored with yellow and pink hues dominant; also oolitic dolomite, very high intergranular porosity, large spherical subcrystalline oolites.

1510-1530 Dolomite, pale red (5R6/2), calcic with circular limy, lighter hued inclusions; grainy; also moderate orange pink, sub-crystalline pure dolomite, varicolored calcic dolomite, as above; the pure dolomite tends to be more fractured downward.

1530-1540 Dolomite, calcic, varicolored; as above, dolomite, abundant rounded grains of quartz included, color is mostly very pale orange; some intergranular porosity.

1540-1550 Dolomite, varicolored as between 1510 and 1530.

1550-1570 Dolomite, calcic, grayish orange pink, sucrosic, pinpoint porosity; a few more calcareous inclusions; porosity increases downward.

1570-1580 Dolomite, calcic, grayish orange pink; circular lighter colored inclusions, silty, sucrosic; tendency to be pinker than above; some pinpoint porosity.

1580-1600 Limestone, dolomitic, very pale orange, slabby, dense; dolomite, as above.

1600-1620 Limestone, dolomitic, very pale orange, slabby, dense, silty, tends to be fractured.

1620-1640 Dolomite, calcic, very pale orange, some cavernous porosity, sucrosic; also grayish orange pink silty limestone, similar to dolomite between 1570 and 1580.

1640-1650 Limestone, very pale orange, small quartz sand grains included, slabby to grainy; some tubular and cavernous porosity; tends to be fractured.

1650-1680 Limestone, as above but more dolomitic; dolomite, subcrystalline, dense, some fracturing, grayish orange; silty and sandy at 1670.

1680-1700 Dolomite, calcic, light brown (5YR6/4), dense to abundant cavernous porosity; abundant light brown silty; sandy between 1690 and 1700 feet.

1700-1720 Dolomite, calcic, as above and varicolored with shades of purple common; calcite inclusions in veins; silty to sandy; dense to porous; pale yellowish brown limestone at 1710.

1720-1760 Limestone, pale yellowish brown, highly fossiliferous, fragmental with variable texture; whorls and some coral; also varicolored carbonates, as above.

1760-1800 Limestone, very pale orange, grainy, dense; tends to become slabby downward and fractured; a few chalky pieces at 1790.

1800-1820 Dolomite, calcic, grayish orange pink to light brown, silty to sandy, slabby to sucrosic dense; a few chips of limestone composed mostly of calcite.

1820-1840 Limestone, same colors as dolomite, above; slabby to micro-sucrosic, calcite inclusions, fossiliferous, becomes more dolomitic downward.

1840-1890 Dolomite, calcic, very pale orange with purple streaks, sub-crystalline, fossiliferous, pinpoint porosity becoming vuggy downward, a few pinkish stains at 1860 and slightly coarser textured; fragmental and grayish orange pink chips at 1880.

1890-1960 Dolomite, calcic, very pale orange to grayish orange pink; the latter is more dolomitic; vuggy, purple streaks, sucrosic to rhombic; fossiliferous; a few fragmental chips; poor samples from 1920 to 1940; becomes more calcareous downward.

1960-1990 Limestone, very pale orange to grayish orange pink, grainy to oolitic to fragmental; some pinpoint porosity; more porous at 1970 with red and purple chips; a few chips have high inter-granular porosity.

1990-2040 Dolomite, pale yellowish brown, rhombic to sucrosic, very porous, and limestone, as above; limestone becomes dominant at 2010 feet and fragmental at 2020 feet.

2040-2090 Limestone, very pale orange to grayish orange pink, grainy to fragmental, dense with some pinpoint porosity; tends to be pseudo-oolitic with rounded clastic grains, probably shale as inclusions; some inclusions are rhombic dolomite.

2090-2110 Limestone, chalky to very pale orange oolitic and fragmental to grainy; fossiliferous (brachiopods), pinpoint porosity.

2110-2190 Limestone, very pale orange, grainy to slabby, fossiliferous, pinpoint porosity; fragmental with dolomite fragments at 2120; calcite inclusions at 2140; limestone becomes vuggy at 2160.

2190-2210 Limestone, very pale orange, slabby, vuggy, clastic and dolomite inclusions; color becomes variable at 2200 feet.

2210-2240 Limestone, pale yellowish brown, slabby, dense, fossiliferous, a few fragmental pieces; becomes grayish and argillaceous at 2230.

2240-2310 Limestone, yellowish gray, slabby to grainy, fragmental with inclusions of dolomite; streaked with black and purple; fossiliferous, mostly dense but with some cavernous porosity; cherty; poor samples from 2270 to 2300 feet consist mainly of shale.

2310-2350 Limestone, as above and shaly, yellowish gray, fragmental to slabby, silty; pyritic; fossiliferous.

2350-2380 Limestone, as above; shale, greenish gray, calcareous; shale increases slightly downward and becomes waxy.

2380-2400 Shale, greenish gray, non-calcareous, waxy, fissile to splintery, pyritic, fossiliferous; also limestone, as above; shale becomes flaky and brownish at 2390.

2400-2450 Shale, pale green (10G6/2), waxy, splintery, dissociates in water; dark gray waxy chips mixed in at 2420 are also splintery.

2450-2480 Shale, pale green, as above; dark gray and brownish gray, same characteristics as the green; the three become mixed in about equal parts at 2460.

2480-2490 Shale, as above, plus dark yellowish brown chips waxy, massive, non-calcareous.

2490-2500 Shale, as above; chips of slightly calcareous granite consisting primarily of quartz and amphibole (?) in varying ratios.

2500 Total Depth.