

# NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 192

Summary of the T.F. Hodge - State #1  
Divide County, North Dakota  
Well No. 596 - Permit No. 610

by Robert M. Eisenhard  
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The T.F. Hodge - State #1 is located in the NE of NE of Sec. 36, T. 160N., R. 95W., Divide County, North Dakota. The elevation is 2354 feet G.L. and 2365 feet K.B.

The T.F. Hodge State #1 was spudded June 30, 1954 and 10 3/4" casing was set at 343 feet with 275 sacks of cement. The well was drilled to a depth of 8260 feet, plugged and abandoned July 29, 1954.

Logs: Electric, Microlaterolog, and laterolog.

Cores: None.

Tests: None.

## Plugging Record:

7698'-7750'	20 sacks of cement
4678'-4730'	20 sacks of cement
283'- 343'	30 sacks of cement
0'- 20'	10 sacks of cement

Formation tops were picked from samples and electric logs; corrected to electric logs. Not all formation tops are called. Colors are from the rock color chart, distributed by the Geological Society of America.

## FORMATION TOPS

Cretaceous System	
Pierre formation	1700
Niobrara formation	3732
Greenhorn formation	4130
Dakota group	4425
Dakota group sandstone	4738
Jurassic System	5105?
Piper limestone	5910
Triassic System	
Spearfish formation	6105
Mississippian System	
Amsden formation	6450? (By Log)
Big Snowy group	6490
Kibbey sandstone	6827
Kibbey limestone	6942
Charles formation	7112

340-380 Shale, yellowish gray 5Y7/2 soft, lumpy; much lignite.  
 380-420 Shale, yellowish gray 5Y7/2 some soft, lumpy, some silty; minor very light brownish gray shale 5YR7/1; some lignite.  
 420-440 Shale, yellowish gray 5Y7/2 lumpy, some silty, some lignite.  
 440-520 Shale, yellowish gray 5Y7/2 lumpy and medium brownish gray 5YR5/1; some lignite.  
 520-550 Shale, yellowish gray 5Y7/2 lumpy, calcareous some lignite; white calcareous siltstone.  
 550-570 Shale, yellowish gray 5Y7/2 lumpy, calcareous, some silty; minor lignite.  
 570-590 Shale, yellowish gray 5Y7/2 to 5Y8/1, some calcareous, some silty.  
 590-650 Shale, yellowish gray 5Y8/1, calcareous.  
 650-670 Shale, light gray and yellowish gray 5Y8/1, calcareous.  
 670-680 Shale, yellowish gray 5Y8/1, very light gray and light brownish gray.  
 680-730 Shale, yellowish gray 5Y7/2 and 5Y8/1 calcareous.  
 730-750 Shale, brownish medium light gray and light brownish gray, lumpy.  
 750-780 Shale, yellowish gray 5Y7/2, lumpy, silty in part.  
 780-790 Shale as above; minor medium brownish gray shale 5YR5/1.  
 790-800 Shale, light gray, lumpy.  
 800-850 Shale, light gray, lumpy and minor medium brownish gray 5YR5/1.  
 850-860 Shale, light gray, lumpy.  
 860-880 Shale, light brownish gray, minor light gray.  
 880-950 Shale, brownish light gray, lumpy.  
 950-1000 Shale, brownish light gray, lumpy, silty; minor light brownish gray.  
 1000-1010 Shale, brownish light gray, lumpy.  
 1010-1020 Shale, very light brownish gray 5YR7/1, lumpy.  
 1020-1100 Shale, brownish light gray, lumpy.  
 1100-1110 Shale, brownish light gray, lumpy; some lignite.  
 1110-1130 Shale, brownish light gray, lumpy, some silty and minor medium brownish gray 5YR5/1; some lignite.  
 1130-1200 Shale, brownish light gray, lumpy; minor lignite.  
 1200-1210 Shale, light brownish gray.  
 1210-1230 Shale, brownish light gray, lumpy, some lignite.  
 1230-1270 Shale brownish light gray and minor medium brownish gray; much lignite.  
 1270-1300 Shale, brownish light gray, lumpy; much lignite.  
 1300-1330 Shale, brownish light gray, lumpy and minor medium brownish gray, some lignite.  
 1330-1340 Shale, medium brownish gray 5YR5/1; minor white soft siltstone; minor lignite.  
 1340-1350 Shale, light brownish gray, lumpy minor white soft siltstone, some lignite.  
 1350-1370 Shale, brownish light gray lumpy, some lignite.  
 1370-1400 Shale, brownish light gray, lumpy and minor light brownish gray; minor soft white siltstone and minor lignite.  
 1400-1500 Shale, brownish medium light gray to light brownish gray, lumpy, some silty, minor lignite.  
 1500-1550 Sandstone, white with calcareous cement to brownish medium light gray, loosely consolidated, grains from fine to silt size; some silty shale as above.  
 1550-1570 Sandstone, as above; minor medium brownish gray 5YR5/1 shale.  
 1570-1630 Sandstone, as above; minor light gray shale.

1630-1640 Sandstone, as above; minor medium brownish gray 5YR5/1 shale.  
 1640-1690 Sandstone, white, calcareous, fine grained to very light olive gray 5Y6/4, poorly cemented with argillaceous cement, fine grained to silty.  
 1690-1700 Sandstone, as above; minor light brownish gray shale.  
 1700-1800 Sandstone, as above with grain size up to medium many free grains.  
 1800-1820 Sandstone, as above, silty; medium olive gray 5Y5/1 and medium brownish gray 5YR5/1 silty shale.  
 1820-1860 Shale, brownish medium light gray, in part, silty.  
 1860-1900 Shale, as above; much loosely cemented sandstone and siltstone from above.  
 1900-1980 Shale, medium light gray.  
 1980-2040 Shale, medium light gray and medium light greenish gray 5GY7/1.  
 2040-2140 Shale, medium light gray and light gray.  
 2140-2160 Shale, medium light gray and greenish gray 5GY6/1.  
 2160-2270 Shale, medium light gray.  
 2270-2550 Shale, medium light gray and medium gray.  
 2550-2570 Shale, medium light gray, some silty.  
 2570-2660 Shale, medium light gray.  
 2660-3070 Shale, medium gray to medium light gray.  
 3070-3100 Shale, medium light gray and very light olive gray 5Y7/1.  
 3100-3540 Shale, medium light gray.  
 3540-3810 Shale, medium gray to medium light gray.  
 3810-3900 Shale, dark gray, some calcareous with abundant white specks; minor medium light gray shale.  
 3900-3910 Shale, medium dark gray to medium light gray; very minor or medium dark gray, calcareous, with abundant white specks.  
 3910-4010 Shale, medium dark gray to medium light gray.  
 4010-4060 Shale, dark gray to medium light gray; minor slightly calcareous dark gray shale with abundant white specks.  
 4060-4260 Shale, dark gray to medium light gray.  
 4260-4300 Shale, dark gray to medium light gray; minor dark gray calcareous shale with white specks.  
 4300-4590 Shale, dark gray to medium light gray.  
 4590-4610 Shale, medium dark gray to medium light gray.  
 4610-4700 Shale, dark gray to medium light gray.  
 4700-4720 Shale, medium dark gray.  
 4720-4750 Shale, medium dark gray and minor medium light gray; minor very light gray well cemented siltstone.  
 4750-4850 Shale, medium dark gray and medium light gray; white fine grained quartz sandstone and very light gray siltstone.  
 4850-4930 Shale, medium dark gray to medium gray; minor white sandstone as above.  
 4930-4950 Shale and minor sandstone as above; very minor dusky red shale.  
 4950-5030 Shale, medium dark gray to medium light gray, minor greenish gray 5GY6/1 and dusky red.  
 5030-5110 Shale, medium dark gray to medium light gray.  
 5110-5150 Shale, medium dark gray, fissile; minor medium light gray shale.  
 5150-5180 Shale, medium dark gray and medium light gray and greenish gray 5GY6/1.  
 5180-5200 Shale, as above; minor white quartz very fine grained sandstone and siltstone.  
 5200-5260 Shale, medium gray, medium light gray, greenish gray 5GY6/1 and dusky red.

5260-5300 Shale, medium gray, medium light gray and very minor greenish gray 5GY6/1 and dusky red.

5300-5330 Shale, as above; minor white calcareous quartz very fine grained sandstone; very minor, light gray, slightly glauconitic siltstone.

5330-5340 Shale, dark gray and medium light gray.

5340-5380 Shale, as above with minor very dusky red purple to moderate red 5R4/6 and greenish gray 5GY6/1 shale.

5380-5400 Shale, medium dark gray and medium light gray.

5400-5460 Shale, medium dark gray, medium light gray, light greenish gray 5G8/1 and minor moderate red 5R4/6.

5460-5510 Shale, as above; minor light greenish gray 5G8/1 slightly calcareous siltstone.

5510-5570 Shale, medium dark gray, medium light gray, greenish gray 5GY6/1 and very minor dusk red.

5570-5670 Shale, greenish gray 5GY6/1, medium light gray, minor medium dark gray.

5670-5820 Shale, greenish gray 5GY6/1, minor medium dark gray and light dusky red 5R4/4.

5820-5830 Shale, as above; minor calcareous white very fine grained quartz sandstone.

5830-5850 Shale, greenish gray 5GY6/1, light dusky red 5R4/4, some mottled greenish gray and light dusky red, medium dark gray and medium light gray.

5850-5960 Shale, as above; white to very pale orange fine crystalline dolomitic limestone some including very fine quartz grains.

5960-6030 Shale, dark gray, medium light gray, light dusky red 5R4/4 and greenish gray 5GY6/1; angular to subrounded clear to milky and iron stained, very coarse quartz grains; some very light gray to white dolomite; minor white soft gypsum.

6030-6080 Shale, greenish gray 5GY6/1, medium gray, minor dusky red; minor crystalline white anhydrite.

6080-6130 Shale as above; some moderate reddish orange slightly calcareous siltstone.

6130-6180 Siltstone, slightly calcareous, moderate reddish orange; some shale as above.

6180-6320 Siltstone, moderate reddish orange, slightly calcareous; dark gray, medium light gray and greenish gray 5GY6/1 and dusky red shale.

6320-6350 Siltstone and very fine sandstone, moderate reddish orange slightly calcareous, some grains up to medium sand size, rounded, orange stained and pitted, shale, as above.

6350-6370 Shale, dusky red, grayish green 10GY5/2 and minor medium dark gray to medium light gray; some moderate reddish orange siltstone and sandstone as above.

6370-6440 Shales greenish gray 5GY6/1 and 10GY5/2, dark gray to medium light gray and dusky red; some moderate reddish orange siltstone and sandstone, as above.

6440-6460 Shale, greenish gray 5GY6/1, medium light gray and moderate red 5R4/6 to moderate reddish brown.

6460-6470 Shale, moderate reddish brown to grayish red 5R4/2, and some medium dark gray and greenish gray 5GY6/1.

6470-6480 Shale, as above and minor pale yellowish orange shale.

6480-6490 Shale, moderate red 5R5/4 to grayish red 5R4/2 and minor pale yellowish orange.

6490-6510 Shale, moderate red 5R4/6 fissile.

6510-6520 Shale, pale reddish brown to light dusky red 5R4/4, minor greenish gray 5GY6/1 and pale yellowish orange.

6520-6530 Shale, medium reddish brown 10R4/4 to light dusky red 5R4/4.

6530-6560 Shale, greenish gray 5GY6/1, medium dark gray, medium reddish brown 10R4/4 and light dusky red 5R4/4.

6560-6580 Shale, moderate red 5R4/6 to dusky red.

6580-6590 Shale, as above; some very coarse subangular to rounded quartz grains.

6590-6620 Shale, as above and some greenish gray 5GY6/1 shale.

6620-6650 Shale, grayish red 5R4/2, moderate red 5R4/6 and dark gray, fissile.

6650-6670 Shale, dark gray and minor moderate red 5R4/6, light dusky red and greenish gray 5GY6/1; light greenish gray 5GY8/1 calcareous, soft, claystone.

6670-6690 Shale, medium light gray, medium dark gray, dark gray, moderate yellowish green, grayish red 5R4/2, and moderate red 5R4/6.

6690-6700 Shale, moderate red to light dusky red, and dark gray.

6700-6720 Shale, greenish gray 5GY6/1, moderate red 5R4/6, and medium dark gray; some pinkish gray soft argillaceous limestone.

6720-6730 Shale, dark gray, grayish green 10GY5/2, moderate red 5R4/6 and grayish red 5R4/2; pinkish gray to white fine crystalline limestone with red and black specks.

6730-6740 Shale, dusky red, moderate red 5R4/6, dark gray, and medium gray; grayish orange pink argillaceous, soft, limestone.

6740-6790 Shale, moderate red 5R4/6, light dusky red 5R4/4, greenish gray 5GY6/1 and medium dark gray to medium light gray; minor grayish orange pink, argillaceous, soft limestone.

6790-6810 Shale, as above; pale red purple fine crystalline limestone.

6810-6830 Shale, moderate red 5R4/6, light dusky red 5R4/4, grayish green 10GY5/2, dark gray and medium light gray; white to pinkish gray medium crystalline limestone, some with silt size quartz grains included.

6630-6870 Shale, as above; white to light moderate red 5R5/6, very fine to medium calcareous cemented, quartz sandstone, grains rounded to subrounded.

6870-6940 Shale, moderate red 5R4/6, dusky red 5R3/4, dark gray, and minor greenish gray 5GY6/1, fissile.

6940-6950 Shale, as above; pale yellowish brown to very pale orange, very fine crystalline, limestone.

6950-6960 Limestone, pale yellowish brown to white, very fine crystalline, minor shale from above.

6960-7010 Limestone as above, with extreme caving material.

7010-7040 Shale, dark gray, grayish purple 5RP4/2, dusky red, moderate red 5R4/6 and greenish gray.

7040-7060 Shale, as above; some moderate reddish orange calcareous siltstone; some angular to subrounded, clear, very coarse quartz grains.

7060-7080 Shale, moderate red 5R4/6, light dusky red and minor greenish gray, 5GY6/1.

7080-7100 Shale, moderate red 5R4/6, light dusky red 5R4/4, greenish gray 5GY6/1, dark gray, and moderate reddish orange.

7100-7110 Shale, as above; minor grayish orange pink anhydrite limestone and fine crystalline anhydrite.

7110-7137 Shale, cavings as above; minor grayish orange pink to white fine crystallized anhydrite.

7137-7207 Salt, (by logs); cavings in samples.

7207-7222 Shale, light dusky red 5R4/4, moderate red 5R5/4, dark gray, greenish gray 5GY6/1 and pale reddish brown; some white fine crystalline anhydrite; some yellowish gray sucrosic limestone with some porosity (7220-7230).

7222-7237 Salt (by logs); cavings in samples.

7237-7250 Anhydrite, very pale orange to white, very fine crystalline.

7250-7260 Limestone, medium gray to medium light gray, sublithographic; minor dark gray, moderate red 5R4/6 and dusky red shale.

7260-7270 Limestone and shale as above; minor oolitic medium light gray limestone with good porosity.

7270-7290 Salt, (by logs); cavings in samples.

7290-7310 Shale, dark gray, moderate red 5R4/6 to dusky red, and medium light gray; white fine crystalline anhydrite; medium gray sublithographic limestone.

7310-7320 Shale, as above; medium light gray argillaceous limestone.

7320-7330 Limestone, medium dark gray to light gray, very fine crystalline.

7330-7370 Salt (by logs), cavings in samples.

7370-7380 Limestone, light brownish gray to white, very fine crystalline; some white fine crystalline anhydrite.

7380-7400 Shale, dark gray, greenish gray 5GY6/1, moderate red 5R4/6, and dusky red; some limestone as above.

7400-7410 Anhydrite, fine crystalline, white; some shale as above.

7410-7420 Shale, moderate red 5R4/6 to dusky red, minor light greenish gray 5GY8/1, medium dark gray and greenish gray 5GY6/1; some anhydrite as above.

7420-7430 Anhydrite, very light gray to white; some shale as above.

7430-7440 Limestone, medium light gray to very light gray, very fine crystalline, dense; much shale, as above; some anhydrite as above.

7440-7450 Shale, moderate red 5R4/6 to light dusky red, minor grayish green 10GY5/2 and dark gray; minor light olive gray microsucrosic and medium light gray, very fine crystalline limestone.

7450-7460 Anhydrite, light gray to white, very fine crystalline; some shale as above.

7460-7480 Limestone, medium brownish gray 5YR5/1 to very light brownish gray 5YR7/1, very fine crystalline, minor fragmental and minor sucrosic, some scattered good porosity; some shale as above. Salt indicated by logs 7465-7469.

7480-7490 Limestone, medium brownish gray 5YR5/1 to very light brownish gray 5YR7/1, very fine crystalline. Salt indicated by logs 7480-7483.

7490-7500 Limestone, as above.

7500-7520 Shale, moderate red 5R4/6 to light dusky red 5R4/4; medium light gray to very light gray anhydrite.

7520-7530 Shale, moderate red 5R4/6, light dusky red 5R 4/4, dark gray and greenish gray; white sublithographic anhydrite.

7530-7540 Shale and anhydrite, as above; medium brownish gray to very light brownish gray 5YR7/1 very fine crystalline and sucrosic.

7540-7550 Anhydrite, medium gray to very light gray, sublithographic, some slightly calcareous; medium gray very fine crystalline limestone.

7550-7560 Limestone, medium brownish gray and medium dark gray, fine crystalline and microsucrosic; minor dark gray and moderate red 5R4/6 shale; minor white sublithographic anhydrite.

7560-7610 Anhydrite, medium light gray to white, very fine crystalline to sublithographic; limestone and shale as above.

7610-7644 Salt, (by logs); samples are cavings.

7644-7660 Anhydrite, medium light gray to white, sublithographic; pale yellowish brown to medium brownish gray 5YR5/1 fine crystalline limestone; minor dark gray, moderate red 5R4/6 and dusky red shale.

7660-7680 Limestone, very pale yellowish brown 10YR7/2 and medium brownish gray, microsucrosic and fragmental, slight porosity and some cut.

7680-7690 Limestone, as above; much medium light gray to white sublithographic anhydrite.

7690-7700 Anhydrite, light gray to white, very fine crystalline to sublithographic.

7700-7720 Anhydrite, as above; some very pale yellowish brown 10YR7/2 very fine crystalline to medium brownish gray 5YR5/1 recrystallized fragmental limestone.

7720-7740 Limestone, very pale yellowish brown 10YR7/2 microsucrosic, dolomitic, and medium brownish gray 5YR5/1 recrystallized fragmental; some anhydrite as above.

7740-7750 Limestone, very pale yellowish brown 10YR7/2 and medium brownish gray 5YR5/1 fine crystalline; slight scattered porosity, some cut.

7750-7760 Limestone, yellowish gray 5Y7/2 to light brownish black 5YR3/1, microsucrosic to fine crystalline; minor very light gray anhydrite.

7760-7780 Limestone, medium brownish gray to brownish medium dark gray, recrystallized fragmental.

7780-7810 Limestone, very pale yellowish brown 10YR7/2, microsucrosic and recrystallized fragmental and minor brownish dark gray recrystallized fragmental; some cut in microsucrosic fragments.

7810-7830 Limestone, very pale yellowish brown, microsucrosic, and medium brownish gray, fine crystalline; some cut in microsucrosic fragments.

7830-7840 Limestone, as above and some very pale yellowish brown 10YR7/2 to yellowish gray 5Y7/2, oolitic.

7840-7850 Limestone, yellowish gray 5Y7/2 to very light gray fine crystalline, microsucrosic, and some oolitic; some scattered good porosity with black asphaltic material in porosity, good cut.

7850-7860 Shale, dark gray and medium light gray; minor limestone as above.

7860-7870 Limestone, medium light gray to very light gray, fine crystalline; some shale as above.

7870-7900 Limestone, light brownish black 5YR3/1 to pale yellowish brown, recrystallized fragmental and fine crystalline, minor oolitic.

7900-7950 Limestone, medium brownish gray 5YR5/1 to yellowish gray 5Y8/1, recrystallized fragmental.

7950-7970 Limestone, brownish gray to yellowish gray 5Y7/2, fine crystalline to recrystallized fragmental, some cut.

7970-7980 Limestone, as above; minor black asphaltic material with good cut.

7980-7990 Shale, greenish gray 5GY6/1 and dark gray; limestone as above.

7990-8000 Limestone, pale yellowish brown to yellowish gray 5Y7/2, fine crystalline, minor soft white with brownish gray streaks.

8000-8030 Limestone, brownish gray to very pale yellowish brown 10YR7/2, fine crystalline and recrystallized fragmental, some soft, white anhydrite, brownish gray limestone.

8030-8050 Limestone, light olive gray 5Y6/1 and medium brownish gray 5Y5/1, fine crystalline.

8050-8060 Limestone, as above, and some recrystallized fragment medium brownish gray 5Y5/1.

8060-8080 Limestone, as above, and minor pale yellowish brown, oolitic limestone.

8080-8090 Limestone, medium brownish gray 5YR5/1 to very pale yellowish brown 10YR7/2 fine crystalline and recrystallized fragmental.

8090-8100 Shale, medium gray, some soft and calcareous, and dark gray; some limestone as above.

8100-8130 Limestone, light brownish black 5YR3/1 to very light brownish gray 5YR7/1, recrystallized fragmental.

8130-8150 Limestone, brownish gray to very light brownish gray 5YR7/1, fine crystalline.

8150-8170 Limestone, as above and some very light brownish gray recrystallized fragmental limestone.

8170-8190 Limestone, light brownish gray to white, fine crystalline and minor recrystallized fragmental.

8190-8260 Limestone, brownish gray to white, fine crystalline.

8260 Total depth.