

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 96

Summary of Williston Oil & Gas Company Boeckel et al #1
Mercer County, North Dakota
Well #377 - Permit #393

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Williston Oil & Gas Company - Boeckel et al #1, Mercer County, North Dakota, C SW SW Section 10, T. 144N., R. 88W. Elevation 2047 ground.

The Boeckel #1 was spudded September 8, 1953 and 10 3/4 inch casing was set at 637.69 feet with 400 sacks of cement. The well was completed as a dry hole and was abandoned November 5, 1953. Total depth 9,014 feet.

Twenty five foot cement plugs were set at the following depths:

8910'	1560'
6930'	1260'
4800'	630'
4350'	25'

Formation tops were determined from sample and electric logs, and were corrected to electric logs unless otherwise stated. Not all lithologic tops were called in the following list. Colors were determined from the rock color chart.

Formation Tops

Cretaceous System	
Pierre Formation	1552
Niobrara Formation	2905
Greenhorn Formation	3695
"Muddy" Zone	4140
Dakota	4385
Jurassic System	
Morrison Formation	4790
Sundance Formation	4850
Piper Formation	5412
Triassic System	
Spearfish Formation	5580
Permian System	
Minnekahta Formation	5715
Opeche Formation	5731
Pennsylvanian System	
Minnelusa Formation	5880
Mississippian System	
Amsden Formation	5970
Big Snowy Group	6250
Kibbey Formation	6793
Charles Formation	6975
Mission Canyon Formation	7540
Lodgepole Formation	7940

Englewood Formation	8680
Devonian System	
Lyelton Formation	8720
Nisku Formation	8932

3000-3020	Shale, medium gray, bentonitic.
3020-3040	Shale, medium gray, bentonitic, slightly calcareous, pyrite.
3040-3060	Shale, medium gray, bentonitic, calcareous, pyrite.
3060-3080	Shale as above with a few shell fragments.
3080-3100	Shale, medium gray, bentonitic, slightly calcareous with a few shell fragments.
3100-3120	Shale, medium gray, bentonitic, slightly calcareous, small amount of white crystalline limestone.
3120-3140	Shale, medium gray, bentonitic, slightly calcareous, some shell fragments, pyrite.
3140-3160	Shale, medium gray, bentonitic, calcareous, pyrite.
3160-3180	Shale as above with shell fragments, small amount of white crystalline limestone.
3180-3220	Shale, medium gray, slightly bentonitic, calcareous, micaceous, pyrite.
3220-3240	Shale, medium gray, bentonitic, very calcareous shell fragments, pyrite.
3240-3260	Shale, medium gray, slightly bentonitic, calcareous.
3260-3280	Shale as above, with shell fragments, pyrite.
3280-3300	Shale, medium gray, bentonitic, calcareous, micaceous, shell fragments.
3300-3320	Shale as above, also some white specks.
3320-3340	Shale, medium to medium dark gray, bentonitic, calcareous, micaceous.
3340-3360	Shale as above.
3360-3380	Shale, medium gray, bentonitic, calcareous, with a few white specks.
3380-3400	Shale, medium gray, bentonitic, calcareous shell fragments.
3400-3420	Shale, medium gray, bentonitic, calcareous, pyrite.
3420-3460	Shale, medium to medium dark gray, bentonitic, slightly calcareous, pyrite, shell fragments.
3460-3480	Shale, medium to medium dark gray, bentonitic, calcareous.
3480-3500	Shale as above with shell fragments.
3500-3520	Shale as above, few shell fragments.
3520-3540	Shale, medium to medium dark gray, bentonitic, calcareous.
3540-3560	Shale as above with shell fragments.
3560-3580	Shale as above.
3580-3600	Shale, medium gray, bentonitic, calcareous, shell fragments.
3600-3620	Shale, medium dark gray, slightly bentonitic.
3620-3640	Shale, medium to medium dark gray, slightly bentonitic, calcareous.
3640-3660	Shale, medium dark gray, slightly bentonitic.
3660-3700	Shale, dark gray to black.
3700-3720	Shale, medium gray to medium dark gray, slightly calcareous, shell fragments.
3720-3740	Shale, medium gray, bentonitic, calcareous, medium dark gray shale.
3740-3760	Shale, medium dark gray, calcareous, white specks.

3760-3780 Shale, medium gray to medium dark gray, calcareous white specks, some light gray, fine grained limestone.

3780-3800 Shale, dark gray, medium dark gray, few white specks.

3800-3820 Shale, medium dark gray to dark gray, white specks.

3820-3840 Shale, dark gray.

3840-3860 Shale, dark gray, slightly calcareous, pyrite.

3860-3900 Shale, dark gray, medium gray, slightly calcareous.

3900-3920 Shale, medium dark gray, lightly calcareous, a few shell fragments, pyrite.

3920-3940 Shale as above.

3940-3960 Shale, dark gray to black, shell fragments.

3960-3980 Shale, dark gray to black, slightly bentonitic.

3980-4020 Shale, dark gray to black.

4020-4030 Shale, dark gray, medium dark gray, slightly bentonitic.

4030-4040 Shale, medium dark gray, slightly bentonitic, pyrite.

4040-4050 Shale, dark gray to black.

4050-4060 Shale, medium dark gray.

4060-4070 Shale, dark gray to black, micaceous.

4070-4080 Shale as above, pyrite.

4080-4100 Shale, medium gray, slightly calcareous.

4100-4120 Shale, medium dark gray.

4120-4150 Shale, medium dark gray.

4150-4170 Shale, medium to medium dark gray, slightly calcareous.

4170-4180 Shale as above, some sandstone, light gray, fine grained, well sorted.

4180-4200 Shale, medium gray to dark gray, slightly bentonitic.

4200-4210 Shale, medium gray to dark gray, pyrite.

4210-4220 Shale, medium gray, bentonitic.

4220-4230 Shale, medium gray, bentonitic, pyrite.

4230-4240 Shale as above.

4240-4260 Shale, medium gray, bentonitic.

4260-4270 Shale as above, pyrite.

4270-4280 Shale as above.

4280-4300 Shale, medium gray bentonitic.

4300-4310 Shale, medium gray to medium dark gray, some sandstone, light gray, very fine grained, silty.

4310-4320 Shale, medium gray to medium dark gray, bentonitic.

4320-4340 Shale as above, small amounts of white crystalline limestone, sandstone, light gray, very fine grained, silty.

4340-4350 Shale as above, some sandstone as above.

4350-4360 Shale as above, sandstone as above.

4360-4370 Shale as above, sandstone, light gray, fine grained, calcareous.

4380-4390 Shale, dark gray, some sandstone as above.

4390-4400 Shale, dark gray, sandstone, light gray, fine grained, silty.

4400-4410 Shale, medium gray to dark gray, slightly bentonitic, some sandstone as above.

4410-4420 Shale, medium gray, bentonitic, some sandstone as above.

4420-4430 Shale as above, sandstone as above and light gray, medium grained, calcareous cement.

4430-4450 Shale, medium gray to medium dark gray, bentonitic, sandstone as above.

4450-4460 Shale as above, much sandstone as above.

4460-4470 Shale as above, some sandstone as above.

4470-4480 Shale as above, sandstone light brownish gray, fine grained, calcareous.

4480-4500 Shale, medium dark gray, bentonitic, sandstone as above.

4500-4510 Shale as above, pyrite, sandstone colorless medium grained calcareous cement, small amounts.

4510-4520 Shale as above, sandstone as above, also light gray fine grained in small amounts.

4520-4530 Shale, medium to medium dark gray, bentonitic, sandstone, light gray, fine grained.

4530-4540 Shale as above, some sandstone as above.

4540-4550 Shale as above, pyrite, small amount sandstone as above.

4550-4560 Shale, medium gray, bentonitic, pyrite, sandstone light gray, fine grained, silty.

4560-4570 Shale as above.

4570-4580 Shale as above, pyrite.

4580-4590 Shale as above, sandstone light gray, fine grained.

4590-4600 Shale, medium to medium dark gray bentonitic, some sandstone as above, sandstone white, medium grained, calcareous.

4600-4610 Shale as above, sandstone, light gray, fine grained.

4610-4620 Shale, medium gray, bentonitic, sandstone as above.

4640-4650 Shale, medium gray, bentonitic, sandstone as above and white medium grained.

4650-4670 Shale as above, pyrite, sandstone, light gray, fine grained, red stained.

4670-4680 Shale as above, pyrite, sandstone, light gray, fine grained.

4680-4690 Shale, medium to dark gray, sandstone as above.

4690-4700 Shale and sandstone as above.

4710-4720 Sandstone, loose, medium to coarse, frosted, subrounded, shale as above.

4720-4730 Sandstone loose as above and light gray, fine grained, shale as above.

4730-4740 Shale, medium gray, slightly bentonitic, sandstone, loose, medium grained, frosted, light gray, fine grained.

4740-4760 Sandstone, light gray, medium to fine grained, fairly well sorted, much shale as above.

4760-4770 Sandstone, loose, medium to coarse grained, subrounded, shale as above.

4770-4780 Shale, medium dark gray, pyrite, some sandstone as above.

4780-4790 Shale as above, pyrite.

4790-4820 Shale, medium to medium dark gray, silty.

4820-4830 Shale, medium gray, pyrite.

4830-4850 Shale, medium gray, silty.

4850-4860 Shale as above, sandstone, light brownish gray, fine grained, slightly calcareous.

4860-4870 Sandstone, light brown, fine grained, silty, calcareous, shale as above.

4870-4880 Shale, medium to medium dark gray, sandstone as above.

4880-4890 Shale as above, much sandstone as above.

4890-4910 Shale, medium gray, sandstone as above.

4910-4920 Sandstone, light gray, pale brown, fine grained, silty, large amounts of shale as above.

4920-4930 Sandstone, light gray, fine grained, much shale, medium gray.

4930-4940 Shale, medium gray, much sandstone as above.

4940-4950 Sandstone, light gray, fine grained, calcareous, silty shale, medium dark gray.

4960-4970 Sandstone as above, some shale as above.

4570-4990 Shale, medium gray, silty, sandstone as above.

4990-5000 Shale, medium to medium dark gray, some sandstone as above.

5000-5010 Shale, medium dark gray, silty, slightly calcareous, little sandstone as above.

5010-5030 Shale as above, much sandstone, light yellowish gray, fine grained, calcareous.

5030-5040 Shale as above, some sandstone as above.

5040-5050 Shale as above, much sandstone as above.

5050-5060 Sandstone, light gray to yellowish gray, fine grained, friable, calcareous, much shale as above.

5060-5070 Sandstone as above, some shale as above.

5070-5080 Sandstone as above, little shale as above.

5080-5090 Sandstone as above, some shale as above.

5090-5100 Sandstone as above, some shale, medium gray, silty.

5100-5110 Sandstone as above, some shale as above and light greenish gray, calcareous.

5110-5120 Sandstone as above, much shale as above.

5120-5130 Shale, light greenish gray, calcareous, some sandstone, light gray, fine grained, silty.

5130-5140 Shale, as above and medium gray.

5140-5150 Shale as above.

5150-5160 Shale, light greenish gray, calcareous, medium dark gray, little sandstone fine grained, light gray.

5160-5190 Shale as above, little sandstone as above,

5190-5200 Shale as above, little sandstone, light gray, fine grained.

5200-5220 Shale, pale brown, sandy, calcareous, also light greenish gray shale.

5220-5250 Shale, greenish gray, silty, slightly calcareous.

5250-5260 Shale as above, some sandstone, light brown, fine grained, silty.

5260-5270 Shale as above, also medium gray shale, some sandstone as above.

5270-5280 Shale, light greenish gray and pale brown, silty calcareous, pyrite, some sandstone as above.

5280-5290 Sandstone, light brownish gray, silty, much shale as above.

5290-5300 Shale, light greenish gray, calcareous and reddish brown silty, calcareous shale, some sandstone as above.

5300-5310 Shale, greenish gray, calcareous and reddish brown, silty, calcareous, some white crystalline limestone, sandstone as above.

5310-5320 Shale as above, sandstone, light gray and pale brown, fine grained calcareous.

5320-5330 Sandstone, light gray, fine grained, calcareous, shale, greenish gray.

5330-5340 Sandstone as above, much shale, greenish gray and reddish brown, silty, calcareous.

5340-5350 Shale as above, some sandstone as above.

5350-5360 Shale, greenish gray, some sandstone as above.

5360-5370 Shale as above with reddish brown, silty.

5370-5380 Shale, greenish gray, calcareous, inoceramus ?

5380-5390 Shale as above, some sandstone, light gray, fine grained.

5390-5410 Shale as above and reddish brown, silty, calcareous shale.
 5410-5420 Shale as above, some limestone, white, dense.
 5420-5430 Shale, light greenish gray, calcareous, silty.
 5430-5440 Limestone, white to light gray, fine grained, dolomitic, shale, light, greenish gray and reddish brown, calcareous.
 5440-5450 Shale as above, some dolomite as above.
 5450-5460 Limestone, white to light gray, dense, crystalline, shale, variegated, greenish gray and reddish brown.
 5460-5470 Shale, variegated, mostly light greenish gray, silty, some reddish brown, limestone as above,
 5480-5490 Limestone as above, much variegated shale as above.
 5490-5500 Limestone, white to light gray, dense crystalline, shales, variegated, mostly greenish gray, reddish brown.
 5500-5510 Limestone as above, shales, variegated as above.
 5510-5520 Limestone as above, much shale, mostly reddish brown, some greenish gray.
 5520-5530 Shale, mostly reddish brown, some greenish gray, some limestone as above. Few pieces of gypsum.
 5530-5540 Shale as above, some limestone as above.
 5540-5550 Shale, variegated as above, mostly greenish gray, some limestone as above, few pieces of gypsum.
 5550-5560 Shale, moderate reddish brown, some greenish gray, some limestone as above, anhydrite, white, crystalline.
 5560-5570 Shale, moderate reddish brown, some greenish gray, some limestone as above, anhydrite as above, gypsum.
 5570-5580 Shale as above, anhydrite, gypsum. Some limestone as above.
 5580-5590 Shale as above, gypsum.
 5590-5610 Shale, moderate reddish brown, silty, some greenish gray, gypsum.
 5610-5620 Siltstone, moderate reddish brown, gypsum, some shale, greenish gray.
 5620-5630 Siltstone, with gypsum as above, calcareous, shale greenish gray, and reddish brown.
 5630-5640 Siltstone and gypsum as above, much shale, medium gray and greenish gray.
 5640-5650 Siltstone, moderate reddish brown, slightly calcareous, sandy, gypsum, shale, medium gray, greenish gray.
 5650-5660 Siltstone as above, some shale as above.
 5660-5670 Siltstone as above, gypsum and anhydrite, shale as above.
 5670-5680 Sandstone, medium to fine grained, silty, reddish brown gypsum, shale as above.
 5680-5690 Sandstone as above, and loose, medium, rounded, frosted grained white anhydrite, shale as above.
 5690-5700 Sandstone, reddish brown, fine grained, silty, calcareous shale, variegated as above.
 5700-5710 Sandstone as above, also pink medium to fine grained, shale as above.
 5710-5720 Sandstone as above, white anhydrite, some shale, medium gray.
 5720-5730 Limestone, white crystalline, siltstone, reddish brown.
 5730-5760 Shale as above, siltstone as above, calcareous.
 5760-5770 Siltstone, reddish brown, sandy, shale as above.
 5770-5800 Siltstone as above, calcareous, shale, greenish gray and medium gray.
 5800-5810 Siltstone as above, shale as above, pyrite.

5810-5820 Siltstone as above, shale as above.

5820-5830 Siltstone, dark reddish brown, very calcareous shales, medium gray, greenish gray.

5830-5840 Siltstone as above and moderate reddish brown sandstone, shales, variegated as above.

5840-5850 Sandstone, moderate pink, medium to fine grained, also loose, rounded, frosted, pale pink, siltstone and shales as above.

5850-5860 Sandstone, white to moderate pink, medium to fine grained, calcareous, siltstone as above, shale, medium gray.

5860-5870 Sandstone as above, some siltstone and shale as above.

5870-5880 Sandstone as above.

5880-5890 Sandstone as above, much shale, medium gray, siltstone.

5890-5900 Sandstone as above, siltstone as above, some shale as above.

5900-5910 Sandstone as above, siltstone as above, much shale as above.

5910-5920 Sandstone as above, some dolomite, pink, crystalline, shale, medium gray, greenish gray.

5920-5930 Sandstone as above, some dolomite and shales as above.

5930-5940 Sandstone, moderate pink, medium to fine grained, calcareous shales as above.

5940-5950 Sandstone as above, some shale as above.

5950-5960 Sandstone as above, some shale as above.

5960-5970 Sandstone as above, some shale as above, little dolomite, white, crystalline.

5970-5980 Sandstone as above, limestone, white to pale pink dense.

5980-5990 Dolomite, light gray, microcrystalline, gray chert, some sandstone as above.

5990-6000 Dolomite, light gray, microcrystalline, chert light gray, sandstone pink, medium to fine grained.

6000-6010 Dolomite, light gray to pale pink, microcrystalline, limey sandstone as above.

6010-6020 Dolomite as above, sandstone as above.

6020-6030 Dolomite as above, sandstone as above, shale, greenish gray and medium gray.

6030-6040 Shale, medium dark gray, greenish gray, dolomite as above.

6040-6050 Shale, medium gray reddish brown, dolomite as above.

6050-6070 Shale, reddish brown, greenish gray, calcareous anhydrite.

6070-6080 Shale, mostly greenish gray, some reddish brown, anhydrite.

6080-6090 Shale as above, anhydrite.

6090-6100 Shale as above, anhydrite, dolomite, white, crystalline.

6100-6110 Shale as above, dolomite as above.

6110-6120 Shale, mostly reddish brown, greenish gray, anhydrite, dolomite, white and pale pink, microcrystalline.

6120-6130 Shale as above, anhydrite, dolomite as above.

6130-6140 Shale as above, some dolomite as above.

6140-6150 Shale as above, and medium gray, dolomite as above.

6150-6160 Shale as above, anhydrite, dolomite as above.

6160-6170 Shale, variegated as above, mostly medium gray, anhydrite sandstone colorless, medium grained.

6170-6180 Shale as above, anhydrite sandstone as above, dolomite, light gray microcrystalline.

6180-6190 Shale, variegated, anhydrite, dolomite, light gray microcrystalline.

6190-6200 Shale as above.

6200-6210 Shale as above, dolomite as above.

6220-6230 Shale as above, little dolomite, as above.

6230-6240 Shale, variegated, anhydrite.

6240-6250 Shale, variegated as above, anhydrite, little dolomite, light gray, microcrystalline.

6250-6260 Shale as above, anhydrite, much dolomite pale pink to light gray, microcrystalline, limey.

6260-6270 Dolomite as above, shale, medium dark gray.

6270-6280 Dolomite, as above, much shale, medium gray, reddish brown, slightly calcareous.

6280-6290 Shale, variegated as above, much dolomite as above.

6290-6300 Sandstone colorless, medium, rounded, much dolomite as above, some shale as above.

6300-6310 Sandstone as above, slightly calcareous, some dolomite pink, microcrystalline.

6310-6320 Sandstone as above, some shale, pale red, greenish gray.

6320-6330 Dolomite, light gray to pink microcrystalline, some sandstone as above, little shale as above.

6330-6340 Dolomite as above, some shale as above.

6340-6350 Dolomite as above, shale, moderate red, medium gray.

6350-6360 Dolomite as above, shale as above.

6360-6370 Dolomite as above, shale as above.

6370-6380 Dolomite, light gray, moderate pink, microcrystalline, shale, medium gray, moderate reddish brown.

6380-6390 Shale, mostly moderate reddish brown, much dolomite as above.

6390-6400 Shale, same as above, some dolomite as above.

6410-6420 Shale, same as above, some dolomite as above.

6420-6430 Shale as above, some dusky yellow, calcareous little dolomite as above.

6430-6440 Shale, moderate reddish brown, medium gray, dusky yellow sandstone loose rounded, medium grained, dolomite as above.

6440-6450 Shale, moderate reddish brown, much dolomite, light gray, microcrystalline.

6450-6460 Limestone, light gray, microcrystalline, shale moderate reddish brown, dusky yellow, dolomite.

6460-6470 Dolomite, light gray, microcrystalline, shale as above.

6470-6480 Shale, moderate reddish brown, also dusky yellow calcareous.

6480-6510 Shale as above, little limestone, light gray.

6510-6520 Shale as above, some limestone, white to light gray, microcrystalline.

6520-6530 Shale, moderate red to reddish brown, limestone as above.

6530-6540 Shale, variegated, reddish brown, dusky yellow, pale green.

6540-6550 Shale, as above, some limestone, light gray microcrystalline.

6550-6560 Shale, variegated, sandstone loose medium, rounded colorless to pale yellow.

6560-6570 Shale as above, little sand as above.

6570-6590 Shale as above, sandstone medium grained, various colored, light gray, pale yellow grayish red.

6590-6600 Shale, variegated, moderate reddish brown, dusky yellow pale green, little sandstone as above.

6600-6640 Shale as above, limestone, white, dense.

6640-6650 Shale, variegated, reddish brown, pale green medium gray dusky yellow, limestone white, dense.

6650-6660 Shale as above, dolomite light gray, dense, limey.

6660-6670 Shale as above, some sandstone loose, medium grained, dolomite as above.

6670-6680 Shale as above, sandstone medium grained, light red, calcareous.

6680-6690 Shale, variegated as above, sandstone as above.

6690-6700 Sandstone, light red, medium grained, shale, as above.

6700-6740 Sandstone, light red, medium grained, slightly calcareous, little shale as above.

6740-6750 Sandstone, light red, medium to fine grained, slightly calcareous, some shale, variegated.

6750-6760 Sandstone as above, shale, variegated, medium gray, reddish brown, pale green.

6760-6770 Shale, variegated as above, sandstone as above, limestone white, dense (little).

6770-6780 Sandstone as above, much shale as above, little limestone as above.

6780-6790 Sandstone as above, and grayish pink, medium to coarse grained calcareous, shale medium gray, reddish brown.

6790-6800 Shale, variegated some sandstone as above, some limestone white, microcrystalline.

6800-6810 Limestone, white to light gray, finely crystalline, dense few shell fragments.

6810-6820 Limestone as above, also some gray, medium to fine grained.

6820-6830 Limestone, white to light gray, dense, and light gray, medium to fine grained, earthy.

6830-6840 Limestone, dense as above and earthy as above, some oolitic.

6840-6850 Limestone as above, little shale variegated.

6850-6860 Sandstone, yellowish gray, fine grained, calcareous, limestone as above, shale variegated.

6860-6870 Shale as above, reddish brown, yellowish orange medium gray, pale green, sandstone as above.

6870-6880 Limestone, white, finely crystalline, dense, shales as above.

6880-6890 Shale as above, some sandstone light gray fine grained calcareous.

6890-6900 Shale as above, sandstone as above, some limestone, white, dense.

6900-6910 Shale, variegated, limestone white, finely crystalline, dense.

6910-6920 Shale, variegated, sandstone grayish orange, fine grained, silty, calcareous.

6920-6930 Shale as above, little sandstone as above.

6930-6950 Shale as above, some limestone white, microcrystalline.

6950-6960 Shale as above, dolomite, light gray, fine grained.

6960-6980 Dolomite, light gray, fine grained, limey, some shale as above.

6980-6990 Dolomite as above, much shale, as above, anhydrite.

6990-7000 Shale variegated, anhydrite, some dolomite as above.

7000-7010 Shale, as above, anhydrite, limestone light gray, fine grained earthy.

7010-7020 Limestone, white to light gray, fine grained, earthy much shale as above, anhydrite.

7020-7030 Shale as above, white anhydrite, dolomite, light gray dense.

7030-7050 Limestone, light tan, granular, earthy, shale, variegated, reddish brown, yellowish orange, medium gray.

7050-7070 Limestone, light tan, finely crystalline, some granular earthy, some shale as above.

7070-7080 Limestone as above, anhydrite, white, little shale as above.
 7080-7084 Anhydrite, white, dense, some variegated shale.
 7090-7130 Shale, variegated, red, orange, gray, green, anhydrite, white, crystalline.
 7130-7140 Limestone, light gray, finely crystalline.
 7140-7150 Limestone, light gray, finely crystalline, earthy.
 7150-7160 Limestone, light gray, finely crystalline and granular, earthy.
 7160-7170 Limestone as above, some shale, variegated.
 7170-7180 Shale, variegated, red brown medium gray, limestone as above.
 7180-7200 Shale as above, pale green, orange, red, brown, gray anhydrite, some limestone as above.
 7200-7210 Limestone, light gray, finely crystalline, shales as above.
 7210-7220 Limestone, light gray and tan, finely crystalline, shale as above.
 7220-7240 Shale, variegated, anhydrite, some limestone as above.
 7240-7250 Shale, variegated mostly medium gray, anhydrite.
 7250-7260 Shale, variegated as above, anhydrite, dolomite, light gray, dense, limey.
 7260-7270 Dolomite as above, shale as above, anhydrite.
 7270-7280 Dolomite, light gray, dense, shale as above.
 7280-7290 Shale, variegated, anhydrite, some dolomite as above.
 7290-7300 Dolomite, light gray, finely crystalline.
 7300-7310 Dolomite, light gray, finely crystalline, dense.
 7310-7320 Limestone, light tan, granular, earthy, dolomite as above.
 7320-7330 Limestone, light tan, fine grained, white anhydrite.
 7330-7340 Anhydrite, white to light gray, dense.
 7340-7360 Anhydrite as above, some limestone, light tan granular.
 7360-7370 Limestone, white to light tan, fine grained, earthy.
 7370-7380 Limestone as above, some anhydrite.
 7380-7390 Limestone, yellowish gray, fine to medium grained, earthy dolomitic.
 7390-7400 Shale, medium gray, limestone as above.
 7400-7410 Limestone, yellowish gray, fine to medium grained, earthy dolomitic.
 7410-7420 Limestone as above, some anhydrite.
 7420-7440 Limestone, light gray, finely crystalline, dolomitic.
 7440-7450 Limestone, yellowish gray, fine grained, dolomite, light gray, finely crystalline, dense.
 7450-7470 Limestone, yellowish gray, granular, dolomitic, dolomite as above, some shale reddish brown.
 7470-7480 Limestone as above, variegated.
 7480-7490 Anhydrite, white, dense, shale variegated.
 7490-7500 Anhydrite, white, dense, much shale.
 7500-7510 Anhydrite, white, dense, shale as above.
 7510-7520 Anhydrite, white, dense.
 7520-7530 Anhydrite as above.
 7530-7540 Anhydrite as above, limestone, yellowish gray, fine grained, shale, medium gray.
 7540-7560 Limestone, light brownish gray, oolitic in part.
 7560-7580 Limestone as above, mostly oolitic, some finely crystalline.
 7580-7590 Limestone, light brownish gray, finely crystalline, earthy.
 7590-7610 Limestone as above, some oolitic.
 7610-7620 Limestone as above, little oolitic.

7620-7630 Limestone, light brownish gray, finely crystalline, poor porosity.

7630-7640 Limestone as above, some shale, medium gray, little white anhydrite.

7640-7650 Limestone as above, some oolitic.

7650-7660 Limestone, brownish gray, finely crystalline, slight porosity.

7660-7680 Limestone as above, some shale, medium gray.

7680-7690 Limestone as above.

7690-7700 Limestone, light brownish gray, finely crystalline, slight porosity.

7704-7710 Limestone as above, brachiopod fragments, some shale, medium gray.

7710-7720 Limestone as above.

7720-7730 Limestone as above and some white, finely crystalline, dense.

7730-7740 Limestone, pale yellowish brown, finely crystalline and oolitic slight porosity.

7740-7760 Limestone, pale yellowish brown, finely crystalline and oolitic slight porosity

7760-7780 Limestone, pale yellowish brown, finely crystalline, slight porosity.

7780-7790 Limestone, light gray to pale yellowish brown, finely crystalline and some oolitic, little porosity.

7790-7820 Limestone, pale yellowish brown, oolitic, fair porosity.

7820-7830 Limestone as above, some shale, medium gray.

7830-7840 Limestone, pale yellowish brown, fine grained, fair porosity, some oolitic as above.

7840-7860 Limestone as above, much oolitic.

7860-7880 Limestone, pale yellowish brown, oolitic, fair porosity, shell fragments, brachiopod.

7880-7900 Limestone as above, oolitic and finely grained, slight porosity.

7900-7920 Limestone, pale yellowish brown, oolitic.

7920-7940 Limestone, light gray, fine grained, slight porosity, some oolitic as above.

7940-7946 Limestone, light gray, fine grained, earthy, fair porosity.

7950-7960 Limestone as above, shale, medium gray.

7960-7990 Limestone, white to light gray, fine grained, brachiopod fragments, slight porosity, shale, medium gray.

7990-8005 Limestone, light gray, fine grained, yellowish brown oolitic, some shell fragments.

8005-8010 Limestone as above, shell fragments.

8010-8015 Limestone, light gray, fine grained, little porosity.

8015-8020 Limestone as above, brachiopod fragments.

8020-8025 Limestone, light gray, oolitic, earthy as above.

8025-8030 Limestone, oolitic and fine grained as above, brachiopod.

8030-8040 Limestone as above, brachiopod fragments.

8040-8045 Shale, medium gray, some limestone as above.

8045-8055 Limestone as above, some shale as above.

8055-8075 Limestone, light gray, fine grained, slight porosity, some shale.

8075-8080 Limestone as above, shell fragments.

8080-8085 Limestone, light gray, fine grained, argillaceous.

8085-8090 Limestone as above, shell fragments.

8090-8100 Limestone as above, brachiopod shells.

8100-8125 Limestone as above.
 8125-8135 Limestone, light gray, fine grained and dense, argillaceous.
 8135-8140 Limestone as above, brachiopod fragments.
 8140-8145 Limestone as above, brachiopod and molluse fragments.
 8145-8155 Limestone as above, some shale, medium gray.
 8155-8160 Limestone, light gray, fine grained, argillaceous, shell fragments.
 8160-8165 Limestone as above, shell fragments, pyrite.
 8165-8185 Limestone as above, shell fragments.
 8185-8190 Limestone as above, limestone, medium gray, dense.
 8190-8200 Limestone as above, shell fragments, shale, red, calcareous in small amounts.
 8200-8210 Limestone, light gray, finely crystalline, little porosity, shell fragments, pyrite, little shale as above.
 8210-8225 Limestone as above.
 8225-8230 Shale, medium gray, limestone, light gray, fine grained, pyrite.
 8230-8235 Shale as above, much limestone as above, shell fragments.
 8235-8240 Limestone, light gray, finely crystalline, pyrite, shell fragments.
 8240-8270 Limestone, light gray, dense, pyrite, shell fragments.
 8270-8275 Limestone, light gray, fine grained, dense.
 8275-8300 Limestone as above, shell fragments.
 8300-8320 Limestone, light to medium gray, dense, earthy.
 8320-8325 Limestone as above, shell fragments, some shale, medium gray.
 8325-8330 Limestone as above, some shale as above.
 8330-8340 Limestone as above, shell fragments.
 8340-8350 Limestone, light gray to medium gray, microcrystalline, dense, shell fragments.
 8350-8360 Limestone as above, little shale, medium gray.
 8360-8370 Limestone as above, pyrite.
 8370-8380 Limestone as above, shell fragments.
 8380-8385 Limestone as above.
 8385-8390 Limestone, light to medium gray, fine grained, earthy.
 8390-8400 Limestone as above, shell fragments, pyrite.
 8400-8410 Limestone, light to medium grey, microcrystalline, dense, shell fragments.
 8410-8420 Limestone, light to medium gray, microcrystalline, dense, pyrite, shell fragments.
 8420-8425 Limestone as above, some shale, medium gray.
 8425-8430 Limestone, light gray, microcrystalline, shale, medium gray.
 8430-8440 Limestone, light gray and medium gray, microcrystalline, much shale, medium gray.
 8440-8445 Shale, medium to light gray, limestone, white to medium gray, microcrystalline, ostracods.
 8445-8455 Shale as above, limestone, medium gray and white, microcrystalline, ostracods.
 8455-8460 Limestone, medium gray, microcrystalline, some shale, medium gray, ostracods.
 8460-8465 Shale as above, some limestone as above.
 8465-8475 Shale, light to medium gray, little limestone as above.
 8475-8480 Shale, light to medium gray, calcareous, some limestone as above.
 8480-8485 Limestone, light gray, microcrystalline, shale, medium gray.

8485-8490 Limestone, light gray, medium gray microcrystalline, shale as above.

8490-8500 Limestone as above, some shale, pyrite.

8500-8505 Limestone as above, pyrite.

8505-8510 Limestone as above, shale, medium gray, calcareous.

8510-8520 Shale as above, pyrite, little limestone as above.

8520-8530 Shale, medium gray, some limestone, light gray, fine grained.

8530-8540 Shale, medium gray, calcareous, limestone as above and medium gray, dense.

8540-8550 Limestone, medium gray, microcrystalline, dense, shale, medium gray.

8550-8560 Limestone as above, much shale as above.

8560-8580 Limestone, medium gray, microcrystalline, dense, earthy.

8580-8590 Limestone, medium to light gray, microcrystalline, dense, slightly argillaceous.

8590-8595 Limestone as above, some shale, medium gray, pyrite.

8595-8605 Limestone, light gray, fine grained, argillaceous.

8610-8615 Shale, grayish black, some limestone, light gray, finely crystalline.

8615-8620 Shale as above, much limestone as above and medium gray, finely crystalline.

8620-8630 Limestone, medium gray, finely crystalline, some shale as above.

8630-8640 Limestone, medium gray and light gray, finely crystalline.

8640-8645 Limestone as above, pyrite.

8645-8655 Limestone as above, some shale, medium gray.

8655-8665 Limestone, light gray, microcrystalline, dense, pyrite.

8665-8680 Limestone as above, much shale, grayish black, calcareous.

8680-8685 Shale, grayish black, calcareous, little limestone, light gray, finely crystalline

8685-8690 Limestone, light gray, oolitic, pyrite, much shale as above.

8690-8700 Limestone, medium gray and light gray, finely crystalline, some oolitic, some shale as above.

8700-8705 Limestone, light gray, oolitic, fair porosity, some shale, grayish black, calcareous.

8705-8710 Limestone, light gray, fine grained and oolitic.

8715-8720 Limestone, light gray, fine grained, shale, grayish black and medium gray, calcareous.

8720-8725 Dolomite, yellowish gray, fine grained, limey.

8726 Circulation 2-1/6 hrs. - Dolomite as above, shale, grayish green, calcareous, grayish black.

8725-8730 Shale, grayish black, medium gray.

8730-8735 Shale as above, little limestone light gray, finely crystalline.

8735-8740 Shale as above, much limestone as above.

8740-8750 Dolomite, pale orange, fine grained, some green shale, calcareous.

8750-8755 Dolomite, grayish orange, fine grained, some shale as above.

8755-8765 Dolomite as above, shale as above, shale, reddish brown, silty, calcareous.

8770-8795 Dolomite as above, shale, greenish gray, calcareous.

8795-8800 Dolomite, grayish orange, reddish brown, limey, some shale, greenish gray, shell fragments.

8800-8810 Dolomite as above, some shale as above, medium gray.

8810-8820 Dolomite as above, little shale as above.

8820-8830 Dolomite and shale as above, little limestone white finely crystalline.

8830-8840 Dolomite as above, some limestone, pale grayish orange, fine grained, shale, medium gray, greenish gray.

8840-8845 Dolomite, grayish orange, fine grained, some limestone, pale orange, fine grained, little shale, medium gray.

8845-8850 Dolomite as above, limestone as above, also white finely crystalline, little greenish gray shale.

8850-8860 Limestone, pale orange, fine grained silty, little green and medium gray shale.

8860-8865 Limestone as above, some dolomite, reddish orange, fine grained, silty, shale, greenish gray, reddish brown.

8865-8875 Shale, dark gray, little limestone and dolomite as above.

8875-8880 Dolomite, grayish orange, fine grained, limey, shale, dark gray.

8880-8885 Dolomite as above, some limestone, pale orange, fine grained, silty, some shale, green and dark gray.

8885-8890 Dolomite and limestone as above, much shale as above.

8890-8900 Limestone, pale orange, fine grained silty, some shale, dark gray, little sandstone, loose, medium rounded, frosted.

8900-8910 Limestone as above, dolomite, pale orange, fine grained, some shale, dark gray, greenish gray.

8910-8915 Limestone as above, some dolomite as above, shale, dark gray.

8915-8925 Limestone and dolomite as above, shale, medium gray, white anhydrite.

8925-8930 Limestone, pale orange, finely crystalline, silty in part.

8930-8940 Limestone as above, little shale, medium gray.

8940-8950 Limestone, pale yellowish gray, finely crystalline, earthy, little porosity.

8950-8960 Limestone as above, some shale, medium gray.

8960-8965 Limestone, yellowish gray, finely crystalline to fine grained, little light gray anhydrite.

8965-8970 Limestone, yellowish gray, fine grained and fragmental, little porosity.

8970-8975 Limestone as above.

8975-8980 Limestone as above, some white anhydrite.

8980-8985 Limestone, light gray to yellowish gray, finely crystalline to fine grained.

8985-8990 Limestone as above, little white gypsum.

8990-9000 Limestone as above.

9000 Circulation 1/2 hour, limestone, light gray, finely crystalline, earthy.

9000 Circulation 1 hour, limestone, light gray, finely crystalline, earthy, some medium gray limestone.

9000 Circulation 1 1/2 hours, limestone as above.

9014 Total Depth