NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 245

Summary of the Amerada Petroleum Corporation - Antelope Unit "A" No. 1
McKenzie County, North Dakota
Well No. 2373 - Permit No. 2385

by William P. Eastwood
February 1961

Amerada Petroleum Corporation - Antelope Unit "A" No. 1, located in NE 1/4, SE 1/4, Section 1, Township 152N., Range 95W. (2100 feet from south line and 1000 feet from east line), McKenzie County, North Dakota. Elevation of K.B. 2117 feet above sea level. Contractor: Worley and Harrel, 304 Enterprise Building, Tulsa, Oklahoma.

The drilling permit was issued June 22, 1959. The well was spudded on June 22, 1959, and surface casing was set during week of July 4, 1959. Total depth of 15,135 feet was reached during the week preceding January 2, 1960. The well was completed as a producer from the Duperow formation on February 25, 1960, and as a producer from the Interlake formation on April 7, 1960. Discovery well of Antelope-Duperow and Antelope-Silurian fields.

Drill Stem Tests (tests 1-8 by Howco; 9-14 by Johnson)

1. Run #1. No indication of tool opening; found hydrosprings did not open.

Run #2. 10,380-10,450 (Birdbear). 3 1/2" DP, 2500' water cushion, 5/8" opening in tool. Opened tool at 5:55 AM for 4 hour test. Air immediately with weak blow gradually increasing, increased to strong blow in 15 minutes. Strong blow with gas to surface in 1 hour 25 minutes, water cushion to surface in 2 hours 55 minutes, flowed water cushion to pit for 25 minutes, switched to test tank at 9:15 AM. Shut well in at 9:55 AM for 30 minutes BHP, pulled packers free, 1 hour working gas out of 3 1/2" DP, pulled tools inside 7 5/8" OD casing and reversed out, recovered 13.5 bbls
oil, no water, unable to get gas reading. Recovered a total of 30.5 bbls of 41.2 corrected gravity oil. 340 feet of free oil and 210 feet of salt water inside 5 1/2" OD DC. IHP 5255#, IFP 1170#, FFP 1000#, 1/2 hour BHP at 10 minute intervals at 10 minutes 3740#; at 20 minutes 3865#; at 30 minutes 3950#; FHP 5300#, BHT 254° F.

2. Run #1. 10,570-10,640 (Duperow). 3 1/2" DP, 2500' water cushion, 5/8" opening in tool. Opened tool at 5:00 PM, air immediately with weak blow gradually increasing to strong blow in 10 minutes. Packer gave way in 15 minutes after opening tool.

Run #2. 10,570-10,640 (Duperow). 4 hour test, 3 1/2" DP, 2500' water cushion, 5/8" opening in tool. Opened tool at 2:55 AM. Air immediately with weak blow gradually increasing to strong blow in 20 minutes, gas to surface in 1 hour 20 minutes. Strong blow continued for remainder of test. No fluid to surface, closed tool at 6:55 AM for 30 minutes BHP, pulled packers free at 7:25 AM, recovered 10,310 feet of fluid as follows: 2500 feet water cushion unloaded, 5240 feet of oil and gas unloaded, 1992 feet reversed out and recovered, 10.08 bbls oil, 300 feet oil below circ. sub., 278 feet gas cut

salt water, corrected gravity of oil 39.8. IHP 5380#; IFP 1240#; FFP 2780#;10 minute BHP 4330#; 20 minute BHP 4510#; 30 minute BHP 4600#; FHP 5335#.

3. 10,674-10,706, top 10,672, (Duperow). 4 hour test, 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 4:45 PM with air immediately with strong blow; strong blow continued for 1 hour and gradually started decreasing and died in 3 hours 40 minutes. Closed tool at 8:45 PM for 30 minutes BHP, pulled packers free at 9:15 PM. Recovered 9894 feet of fluid as follows: 1500 feet water cushion, 8394 feet of salt water, no oil or gas. IHP 5490#, IFP 1405#, FFP 5125#, 1/2 hour BHP at 10 minutes 5125#, at 20 minutes 5125#, at 30 minutes 5125#, FHP 5420#, BHT 250^0 F.

4. 10,702-10,781, top 10,710, (Duperow). 1 hour 5 minute test, 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 7:40 AM. Air immediately with weak blow increasing to strong blow in 2 minutes, water cushion to surface in 24 minutes, oil to surface in 31 minutes, switched well to test tank at 8:15 AM. Closed tool in at 8:45 AM for 30 minutes BHP, pulled packers free at 9:20 AM, reversed out 33.60 bbls oil, gas volume 30,152 cubic feet per hour, GOR 449, corrected gravity 40.4. Recovered a total of 68.88 bbls oil flowed and reversed out. Recovered 540 feet of fluid as follows: in 5" OD DC, 360 feet highly gas cut oil unloaded, 180 feet highly gas cut drilling mud estimate 40% oil, no show of water. IHP 5540#, IFP 1330#, FFP 2420#, 1/2 hour BHP at 10 minute intervals, at 10 minutes 4760#, at 20 minutes 4800#, at 30 minutes 4960#, FHP 5540#, BHT 254^0 F.

5. 10,808-10,888 (Duperow). 2 hour test, 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 1:25 PM with air immediately with weak blow gradually decreasing, and died in 20 minutes. Dead for remainder of test, closed tool at 3:25 PM. Pulled packers free at 3:55 PM. Recovered 1820 feet of fluid as follows: 1500 feet water cushion, 320 feet gas cut drilling mud. IFP 765#, IHP 5680#, FFP 905#, 1/2 hour BHP at 10 minute intervals, at 10 minutes 4055#, at 20 minutes 4170#, at 30 minutes 4280#, FHP 5650#.

6. 11,120-11,179, top 11,110, (Dawson Bay). 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 2:05 AM, packers did not hold, left both packer rubbers in hole.

7. 11,738-11,813, top 11,742, (Silurian). 4 hour test, 3 1/2" DP, water cushion 1500', 5/8" opening in tool. Opened tool at 4:45 AM with gas blow for 2 1/2 hours, gradually decreasing for remainder of test, closed tool in at 8:45 AM for 30 minutes BHP. Pulled packers free at 9:15 AM. Recovered 9700 feet of fluid as follows: 1500 feet highly gas cut water cushion unloaded, 7230 feet highly gas cut oil unloaded, 790 feet gas cut oil, 180 feet of salt water with salt crystals. IHP 6220#, IFP 860#, FFP 2440#, 30 minute BHP at 10 minute intervals; at 10 minutes 5365#, at 20 minutes 5410#, at 30 minutes 5455#, FHP 6490#, BHT 268^0 F.

8. Run #1. 11,812-11,871, top 11,742, (Silurian). 2 hour 20 minute test, 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 5:10 PM. Air immediately with weak blow decreasing for 20 minutes and died. Dead for 1 hour. By-passed fluid, no blow, dead for 1 hour, closed tool at 7:30 PM for BHP, pulled packer free at 8:00 PM. Chart shows tool did not open. Recovered 1500 feet of fluid as follows: 1500 feet water cushion.

Run #2. 11,812-11,871, top 11,742, (Silurian). 3 1/2" DP, 1500' water cushion, 5/8" opening in tool, opened tool at 5:20 AM with air immediately, weak blow, decreasing and died in 1 hour. By-passed fluid and lost fluid. Pulled packer free at 6:50 AM. Recovered 5930 feet of fluid as follows: 1500 feet water cushion, 4430 feet of drilling mud, no show of oil. Charts showed tool opened and plugged until fluid by-passed, packers gave way.

Run #3. 11,822-11,872, top 11,742, (Silurian). 2 hour test, 3 1/2" DP, 1500' water cushion, 5/8" opening in tool. Opened tool at 3:05 AM. Air immediately with weak blow gradually decreasing and died in 10 minutes. Dead for 1 hour, by-passed fluid, no blow, dead for remainder of test. No indication that tool opened. Closed tool in at 5:05 AM for 30 minutes BHP. Pulled packers free at 5:40 AM. Recovered 1880 feet of fluid as follows: 1500 feet of gas cut water cushion with trace of oil on top of water cushion, 200 feet of gas cut drilling mud, 180 feet of gas cut salt water. Salt content 363,000 PPM. IHP 6410#, IFP 890#, FFP 1010#, 1/2 hour BHP at 10 minute intervals; at 10 minutes 4160#, at 20 minutes 4910#, at 30 minutes 5220#, FHP 6405#, BHT 265^{0} F.

9. 11,871-11,930, top 11,742, (Silurian). 20 minute test, 3 1/2" DP, 1500' water cushion, 3/4" opening in tool. Opened tool at 2:30 PM with air immediately, weak blow gradually decreasing in 15 minutes, packers gave way in 20 minutes, pulled packers free at 2:55 PM. Recovered 2550 feet of fluid as follows: 1230 feet of gas cut water cushion; 270 feet of gas cut muddy water cushion, unloaded; 180 feet of highly gas cut, muddy salt water, unloaded (salt content 313,000 PPM); 270 feet of highly gas cut drilling mud, unloaded; 600 feet of highly gas cut drilling mud. No show of oil. IHP 6605#, IFP 800#, FFP 915#, FHP 6595#, BHT 248^{0} F.

10. 12,404-12,524, top 12,272, (Silurian). 2 hour test, 3 1/2" DP, 2500' water cushion, 3/4" opening in tool. Opened tool at 10:20 PM with air immediately, strong blow for 3 minutes, gradually decreasing and dead in 55 minutes. Dead for 1 hour 5 minutes. Recovered 11,729 feet of fluid as follows: 2500 feet water cushion, 633 feet drilling mud, 8138 feet slightly muddy salt water (359,700 PPM), 458 feet salt water with salt crystals. IHP 6925#, IFP 3118#, FFP 6145#, No BHP - could not close tool, FHP 6925#, BHT 279^{0} F.

11. 12,695-12,765, top 12,640, (Silurian). 2 hour test, 3 1/2" DP, 2800' water cushion, 3/4" opening in tool. Opened tool at 6:20 AM with air immediately, weak blow for 10 minutes and died. Lost approximately 40 feet of mud out of 7 5/8" OD casing. Dead for 1 hour, by-passed fluid, no blow. Dead for 50 minutes, closed tool at 8:20 AM for 30 minutes BHP. Pulled packers free at 8:50 AM. Recovered 3946 feet of fluid as follows: 2800 feet water cushion, 964 feet drilling mud, 182 feet gas cut drilling mud, no show of oil or water. IHP 6985#, IFP 1832#, FFP 1875#, 10 minute BHP 2588#, 20 minute BHP 3270#, 30 minute BHP 4025#, FHP 6970#, BHT 274^{0} F.

12. 13,164-13,304, top 13,908, (Red River). 2 hour test, 3 1/2" DP, 3300' water cushion, 3/4" opening in tool. Opened tool at 4:35 AM with air immediately, weak blow gradually decreasing and died in 15 minutes, dead for 45 minutes, by-passed fluid, few bubbles and died, dead for remainder of test. Unable to shut tool in for BHP, pulled packers free at 7:15 AM. Recovered 3410 feet of fluid as follows: 3120 feet gas cut water cushion, 180 feet highly gas cut mud cut water cushion, 110 feet highly gas cut drilling mud. No show of oil. IHP 7150#, IFP 1515#, FFP 1500#, FHP 7170#, BHT 250^{0} F.

13. 13,970-14,033, top 13,960, (Winnipeg Sand). 1 hour test, 3 1/2" DP, 4100' water cushion, 3/4" opening in tool. Opened tool at 10:40 PM with air immediately, few weak bubbles for 20 minutes and died, dead for 40 minutes, (no indication at surface that tool opened). By-passed fluid and packer gave way. Recovered 5743 feet of fluid as follows: 4100 feet water cushion, 1643 feet drilling mud. No show of oil. Left 1/2 of bottom packer rubber in hole. BHT 285^0 F.

14. Run #1. 13,975-14,055, top 13,960, (Winnipeg Sand). 3 1/2" DP, 4100' water cushion, 3/4" opening in tool. Opened tool at 9:30 AM and packer gave way immediately. Recovered 6260 feet of fluid as follows: 4100 feet of water cushion,2160 feet of drilling mud. No show of oil.

Run #2. 13,950-14,055, top 13,960, (Winnipeg Sand). 6 minute test, 3 1/2" DP, 4100' water cushion, 3/4" opening in tool. Opened tool at 6:55 PM with air immediately, few bubbles, packer gave way in 6 minutes after tool opened. Recovered 4460 feet of fluid as follows: 4100 feet of water cushion, 360 feet of gas cut drilling mud. No show of oil. Left both packer rubbers in hole.

Completion Data:

1. (Deadwood) Perforated 15,097-15,111 with 4 shots per foot, acidized with 500 gallons mud acid, swabbed 0 barrels oil, 21 barrels BS & W in 13 hours. Reacidized with 2,000 gallons, flowed 0 barrels oil, 0 barrels water in 11 3/4 hours. Squeezed perforations with 71 sacks.

2. (Deadwood) Perforated 14,292-14,308; 14,224-14,264; 14,166-14,180 with 4 shots per foot, acidized with 1,000 gallons mud acid, swabbed load water and acid water to pit for 3 3/4 hours. Reacidized with 1,000 gallons, flowed 0 barrels fluid in 9 hours on various sized chokes. Flowed 0 barrels fluid, gas volume 119.3 MCF in 4 hours on 6/64" choke, TP 4800#. Flowed 1.5 barrels condensate, 5 barrels BS & W in 11 hours on various sized chokes, gravity 48.7^0. Flowed 0.69 barrels fluid, 97% water, 3% condensate in 4 1/2 hours on 24/64" choke, TP 2520#. Set bridge plug at 14,150.

3. (Winnipeg) Perforated 13,966-13,996; 14,010-14,046; 14,068-14,112. Acidized with 1,000 gallons BJ mud acid. Swabbed. Reacidized with 500 gallons BJ mud acid and 3,000 gallons regular acid. Flowed 0 barrels fluid in 9 hours on various sized chokes, gas volume 858 MCF daily, TP 100#. Flowed 0 barrels fluid in 4 hours on 3/4" choke, gas volume 859 MCF daily, TP 115#. Squeezed perforations with 240 sacks.

4. (Red River) Perforated 13,183-13,199; 13,267-13,293. Acidized with 500 gallons mud acid and 3,000 gallons regular acid. Swabbed load water and acid residue to pit for 12 hours, swabbed dry. Squeezed perforations with 95 sacks.

5. (Interlake) Perforated 11,824-11,860. Acidized with 2,000 gallons regular acid. Swabbed 67 barrels oil (gravity 43^0), 58 barrels salt water and BS in 9 hours. Flowed 3 hours on 3/4" choke. Swabbed 7 hours, recovered 110 barrels oil, 28 barrels salt water and BS.

Perforated 11,876-11,922. Acidized with 2,000 gallons regular acid. Swabbed (from all Silurian perforations) 17 barrels oil, 85 barrels salt water

in 11 hours. Swabbed 33 barrels oil, 72 barrels BS & W in 10 hours. Squeezed perforations with 84 sacks.

Perforated 11,747-11,812; 11,824-11,846 with 4 shots per foot. Acidized with 500 gallons mud acid and 1500 gallons regular acid. Flowed 27 barrels oil in 2 1/2 hours on 30/64" choke, TP 250#, gravity 44.9^0. Flowed 79 barrels oil, 16 barrels salt water and acid residue in 6 1/2 hours on 20/64" choke, TP 400#.

Swabbed 3 hours, flowed 2 hours on 3/4" choke, recovered 47 barrels oil, 1 barrel salt water, TP 90#. IFP 79 barrels oil, 16 barrels salt water and acid residue in 6 1/2 hours on 20/64" choke, TP 400#, gravity 44.9^0.

Final completion report: Flowed 242 barrels oil with 3.97% water in 24 hours. Gravity 44.9^0. GOR 1037. 14/64" choke, 2 3/8" tubing. TP 425#, SIP 2150#. Perforations at 11,747-11,812 and 11,824-11,846. Production Packers set at 11,695 and 11,625.

6. (Duperow) Perforated 10,722-10,724 and 10,744-10,798 with 4 shots per foot. Swabbed 184 barrels load oil in 13 hours; swabbed 90 barrels oil, 10 barrels BS & W in 8 hours; acidized with 1,000 gallons regular acid. Flowed 101 1/2 barrels oil, 187 barrels BS & W and acid water in 9 1/2 hours on various sized chokes. TP 500, gravity 40.1^0. Flowed 99 1/2 barrels oil, 209 barrels salt water in 7 hours on 20/64" choke, TP 500#. Squeezed perforations with 80 sacks.

Perforated 10,748-10,798 with 4 shots per foot. Acidized with 500 gallons regular acid. Flowed 154.5 barrels oil, 6 gallons acid water in 6 1/2 hours on 18/64" and 20/64" choke. TP 1500#, gravity 36.5^0.

Swabbed 6 hours, flowed 4 hours on 24/64" choke. Recovered 120 barrels oil, 21 barrels salt water, TP 325#.

Flowed 153 barrels oil, 10 barrels water in 15 hours on 12/64" choke, TP 900#. Flowed 100 barrels oil in 9 hours on 12/64" choke, TP 900#.

IFP 252 barrels oil, 10 barrels water per day on 12/64" choke, TP 900#, GOR 1314, gravity 36.5^0.

Final completion report: Flowed 253 barrels oil, 3.8% water per day. Gravity 36.5^0, GOR 1314. 12/64" choke, 2 3/8". tubing. Casing pressure 410#, tubing pressure 920#, shut-in pressure 1880#. Perforations at 10,748-10,798.

Casing and tubing record:

5,210 feet of 9 5/8" surface casing cemented with 1580 sacks. Top of cement at surface.

10,281 feet of 7 5/8" casing cemented with 250 sacks. Top of cement at 6,809.

4,983 feet of 5 1/2" casing liner between 10,074 to 15,057. Cemented with 650 sacks, squeezed top of liner with 100 sacks.

11,695 feet of 2 3/8" OD EUE tubing.

9,976 feet of 2 3/8" OD EUE tubing.

Baker Model "D" production packers set at 11,695 and 11,625.

Core record:

1. Birdbear and Duperow. 10,450-10,508. Cut and recovered 58 feet.
2. Interlake. 11,748-11,781. Cut 33 feet, recovered 29 1/2 feet.
3. Interlake. 11,781-11,813. Cut 32 feet, recovered 24 feet.
4. Interlake. 11,813-11,871. Cut and recovered 58 feet.
5. Interlake. 11,871-11,930. Cut and recovered 58 feet.
6. Stony Mountain and Red River. 13,053-13,111. Cut and recovered 58 feet.
7. Red River, 13,111-13,169. Cut and recovered 58 feet.
8. Red River. 13,169-13,227. Cut and recovered 58 feet.
9. Red River. 13,227-13,282. Cut 55 feet, recovered 34 feet.
10. Winnipeg. 13,961-14,019. Cut 58 feet, recovered 14 feet.
11. Winnipeg. 14,019-14,033. Cut 14 feet, recovered 3 1/2 feet.
12. Winnipeg. 14,057-14,088. Cut and recovered 31 feet.
13. Winnipeg and Deadwood. 14,088-14,146. Cut 58 feet, recovered 31 feet.
14. Deadwood. 14,146-14,176. Cut and recovered 30 feet.
15. Deadwood. 14,176-14,221. Cut 45 feet, recovered 35 feet.
16. Deadwood. 14,221-14,224. Cut 3 feet, recovered 6 inches.
17. Deadwood. 14,224-14,225. Cut and recovered 1 foot.
18. Deadwood. 14,253-14,311. Cut and recovered 58 feet.
19. Deadwood. 14,311-14,369. Cut and recovered 58 feet.
20. Deadwood and Precambrian. 15,113-15,135. Cut 22 feet, recovered 21 1/2 feet.

Mechanical Logs:

Schlumberger Gamma Ray-Laterolog - 10,282-15,138.
Schlumberger Microcaliper-Microlaterolog - 10,282-15,139.
Schlumberger Gamma Ray-Sonic - 10,282-15,135.
Schlumberger Depth Determination - 4920-5798.
Wireline, Inc. Gamma Ray-Neutron - 10,000-15,120.

Note: The Wireline log averages about 20 feet higher than corresponding points on the Schlumberger logs.

The formation tops were determined from the samples and Schlumberger logs. Color names are those used in the Rock Color Chart of the National Research Council Limestone petrography terms are those used by Folk (1959, Bulletin of American Association of Petroleum Geologists, vol. 43, no. 1, pp. 1-38).

FORMATION TOPS

Mississippian	
Madison group	7,901 (sample)
Bakken formation	10,126
Devonian	
Three Forks formation	10,210
Birdbear formation	10,398
Duperow formation	10,483
Souris River formation	10,886
Dawson Bay formation	11,113
Prairie formation	11,252
Winnipegosis formation	11,422

Silurian		
	Interlake	11,747
Ordovician		
	Stony mountain formation	12,952
	Red River formation	13,109
	Winnipeg formation	13,764
Cambro-Ordovician		
	Deadwood formation	14,112
Precambrian		15,115

7810-7870 Abundant black fissile shale, common moderate red sandy shale and siltstone.
7870-7890 As above, with rare pale red (10R6/2) silty sandstone.
7890-7910 Black and red shale as above. Common pale red (10R6/2) calcareous silty sandstone.

7901 Sample top of Madison.
7910-8150 Abundant halite fragments, most of them rounded, but rare ones still showing cubic cleavage. Black and red shale cavings.
8150-8170 Black and red shale cavings. Rare white anhydrite.
8170-8210 Black and red shale cavings. Rare white anhydrite; rare, medium light gray, salty, limy, microsucrosic dolomite; rare, medium light gray, porous oomicrosparite limestone.
8210-8250 Abundant salt fragments. Shale cavings.
8250-8310 Limestone, pale yellowish brown, fine crystalline (micrite and microsparite), and limestone, oomicrosparite, with good porosity as in 8170-8210 above. Also rare pale yellowish brown pelmicro-sparite limestone with well developed secondary porosity. Black and red shale cavings.
8310-8330 Halite.
8330-8370 Limestone, pelmicrosparite with secondary porosity, pale yellowish brown microsparite and very moderate yellowish brown sub-lithographic limestone. Rare to common medium gray anhydritic, limy dolomite. Black and red shale cavings. Rare to common white anhydrite.
8370-8410 Abundant moderate yellowish sublithographic (micrite) limestone; common pale yellowish brown anhydritic, very finely crystalline (microsparite) limestone.
8410-8450 Abundant pale yellowish brown limestone, as above. Rare moderate yellowish brown limestone as above. The moderate yellowish brown limestone has slight pinpoint porosity, but very low permeability.
8450-8510 Abundant moderate to pale yellowish brown limestone with slight to very good pinpoint porosity. The more porous fragments are lighter in color and seem to consist of very finely crystalline calcite. The less porous fragments are darker in color and are sublithographic. Rare white and light bluish gray (5B7/1) anhydrite. Black and red shale cavings.
8510-8530 Limestone, as above, with a great amount of halite coating the rock fragments and with common to rare pieces of halite and white anhydrite.
8530-8580 Abundant bluish gray, slightly limy, very fine crystalline anhydrite. Rare moderate yellowish brown, very fine crystalline limestone.

8580-8590	Limestone, moderate yellowish brown sublithographic to finely crystalline (micrite to microsparite). Common anhydrite, as above.
8590-8640	Limestone, as above, with common pale yellowish brown pelmicrosparite limestone. Little porosity in any of the types of limestone. Rare very pale orange anhydrite at 8610-8620.
8640-8660	Limestone, pale yellowish brown pelmicrosparite limestone with poor to fair intergranular porosity. Good oil staining. Common moderate yellowish brown sublithographic (micrite) limestone.
8660-8710	Limestone, moderate yellowish brown, micrite and pelmicrite, tight. Common to rare oil-stained pelmicrosparite, as above.
8710-8730	As above, with common to abundant pale yellowish brown pelmicrosparite but no oil staining. Rare moderate yellowish brown oopelmicrosparite. Rare pinpoint porosity in the pelmicrite.
8730-8800	Limestone, as above. Rare to common very light gray anhydrite. No oopelmicrosparite.
8800-8850	Limestone, moderate yellowish brown, micrite and pelmicrite with rare patches of sparite. Rare fragments of moderate yellowish brown oointrasparite. Common pale yellowish brown micrite and rare pelmicrite. Low pinpoint porosity.
8850-8870	As above, with rare pale yellowish brown slightly oil stained microsparite with numerous small pores.
8870-8890	Common porous microsparite, as above, common pale yellowish brown micrite and pelmicrite with slight pinpoint porosity.
8890-8930	Common dark yellowish brown fine crystalline microsparite slightly oil stained limestone rare pale yellowish brown pelmicrite with patches of sparite.
8930-8970	Abundant microsparite dark yellowish brown limestone as above. Very good pinpoint and intergranular porosity. Rare to common non-porous limestone as above.
8970-9070	Limestone, dark yellowish brown, pelmicrite and pelmicrosparite. Very small pellets scattered in a matrix of sublithographic to finely crystalline limestone. Rare brachiopod fragments. Low porosity. Rare crinoid fragments.
9070-9080	Limestone as above, slightly shaly. Rare pale yellowish brown intramicrosparite. The small intraclasts are probably fossil fragments.
9080-9150	Abundant intramicrosparite and intramicrite as above. Rare moderate to dark yellowish brown limestone as above.
9150-9160	As above with common white very fine crystalline soft limestone.
9160-9190	Limestone pale to moderate yellowish brown, intrasparite with numerous fossil fragments. Common white limestone as above.
9190-9220	As above with common to abundant dark yellowish brown sublithographic to pelmicrite limestone.
9220-9240	Dark yellowish brown limestone as above with common pale to moderate yellowish brown intramicrite with numerous fossil fragments.
9240-9280	Limestone, dark to moderate yellowish brown, pelmicrite with rare fossil fragments.
9280-9370	Limestone, moderate to pale yellowish brown, intramicrite and intramicrosparite with common fossil fragments. Common to rare dark yellowish brown limestone as above. Rare red and black shale cavings.
9370-9440	Dark yellowish brown limestone as above, common moderate yellowish brown limestone as above.

9440-9600 Limestone, moderate yellowish brown, sublithographic (micrite) with rare patches of sparite. Rare brachiopod fragments. Red shale cavings.

9600-10120 Limestone, moderate to dark yellowish brown, micrite and rare pelmicrite. Rare brachiopod fragments. Red and black shale cavings. Color of the limestone changes to a dark brownish gray toward the base. Common lost circulation material (mica flakes) at 9880-90 and 10,010-50.

10120 Sample top of Bakken formation.

10126 Log top of Bakken formation.

10120-10150 Abundant black, blocky shale. Common to rare limestone as above.

10150-10160 Shale as above, rare brownish gray fine grained, limy sandstone. Rare to common limestone cavings.

10160-10180 Abundant sandstone as above. Common shale as above. Rare limestone cavings.

10180-10200 Common to abundant black shale, common sandstone, limestone cavings.

10,210 Top of Three Forks formation

10200-10220 Abundant sandstone as above, common shale as above, common lost circulation material.

10220-10230 Abundant black shale as above, common sandstone as above. Very rare greenish gray shale and light red (5R6/6) limy anhydrite.

10230-10250 Abundant very pale orange, fine grained tightly cemented, slightly limy quartz sandstone. Very rare pale green (10G6/2) shale.

10250-10270 As above with rare medium sized well rounded reddish quartz grains and common colorless angular quartz fragments.

10270-10300 Abundant sandstone as above but slightly darker in color. Very faint cut in carbon tetrachloride. Abundant lost circulation material.

10300-10320 Sandstone, as above, rare very pale orange, sandy dolomite.

10320-10340 Common pale green limy siltstone; rare sandstone, as above.

10340-10360 As above, rare white anhydrite. Rare pale yellowish brown microsucrosic dolomite.

10360-10370 Abundant pale green, slightly limy, blocky shale. Common moderate red silty shale.

10370-10380 Pale green shale, as above; rare moderate yellowish brown limy microsucrosic dolomite.

DST #1, 10,380-10,450 (Three Forks and Birdbear). Open 4 hours, gas to surface in 1 hour 25 minutes. Flowed 17 barrels of oil in 40 minutes. Recovered 340 feet of free oil (gravity 41.2^0) and 210 feet of salt water.

10380-10385 Common shale, as above. Abundant moderate yellowish brown microsucrosic (microsparite) limestone and limy dolomite.

10385-10395 Anhydrite, pale to moderate yellowish brown, fine crystalline, very slightly limy.

10398 Top of Birdbear formation

10395-10405 Limestone, dark yellowish brown, sublithographic. Rare pale yellowish brown, microsucrosic, limy dolomite, with slight oil staining. Slight cut. Rare anhydrite, as above, and very rare white anhydrite.

10405-10410 Abundant pale yellowish brown, microsucrosic, limy dolomite, no stain, no cut. Rare to common limestone and anhydrite, as above.

10410-10415 Limestone, two types. Most abundant is a pale yellowish brown intrapelsparite consisting of small intraclasts and possible pellets closely packed with a fine crystalline calcite cement. This type has scattered pinpoint porosity. The other type, almost as abundant, is a dark yellowish brown pelmicrite consisting of small moderate yellowish brown pellets or rounded small intraclasts loosely scattered through a dark yellowish brown sublithographic matrix. No porosity seen.

10415-10425 Abundant intrapelsparite, as above. Rare pelmicrite, as above. No oil stain and no cut.

10425-10430 Limestone, pale to moderate yellowish brown. Intrasparite, as above, but with the fragments slightly larger (with rare oolite-like bodies) and more pinpoint porosity. Contains rare milky calcite crystal masses. Some of the fragments have moderate yellowish brown algal (?) filaments.

10430-10445 Limestone, texture appears to be similar to above limestone. Heavy light brown oil stain. Excellent cut in carbon tetrachloride. Sample also has good oil odor.

10445-10450 Limestone, moderate yellowish brown, sucrosic, intrasparite. Medium-sized intraclasts in a sucrosic calcite crystal matrix. Good intercrystalline porosity. Good stain. Good cut.

Core #1. 10,450-10,508. Recovered 58 feet.

10450-10452 Limestone, dark yellowish brown, pelmicrite. Rare, very small pellets loosely scattered in a sublithographic matrix. Very rare ostracode (?) valves. Rare rounded masses of clear calcite crystals. Dead oil stain on fracture or styolite surfaces. Common closed fractures. Imporous and impermeable.

10452-10456 Limestone, moderate yellowish brown, microsparite. Fair intercrystalline porosity. Rock also contains indistinct bordered inclusions of above type of limestone. Rare brachiopod fragments.

10456-10458 Limestone, moderate to dark yellowish brown. Intra-dismicrite. Small subrounded intraclasts in a sublithographic matrix containing small sublinear inclusions of fine-crystalline clear calcite. Common algal (?) fragments. Rare ostracode (?) valves. In places, the matrix appears to have been slightly changed to microsparite. Tight.

10458-10462 Limestone, moderate yellowish brown, pelmicrite. Small pellets and rare algal (?) fragments loosely scattered in a sublithographic matrix. Rare small inclusions of white calcite. Tight. Slight stain, no cut.

10462-10466 Limestone, moderate yellowish brown, pelintramicrite. Numerous small pellets and very rare large rounded intraclasts in a sublithographic matrix. Tight.

10466-10468 As above, but dark yellowish brown and with abundant ostracode valves and rare small snail shells. More pelletoid than above. Some of the ostracode shells are filled with fine-crystalline calcite, and others are only lined with calcite and have an interior cavity. Lenses and inclusions of the rock consist of microsparite with slight intercrystalline porosity, but most of the rock is imporous.

10468-10470 Limestone, moderate yellowish brown, microsparite. No pellets or fossils seen. Slight stain. No cut. Poor intercrystalline porosity.

10470-10472 Dolomite, limy. Finely crystalline. Moderate yellowish brown. Common dark gray shaly laminae. Rare pyrite nodules. Good intercrystalline porosity. No stain.

10472-10474 Anhydrite, limy, pale green. Fine-crystalline to crypto-crystalline.

10474-10478 Dolomite, moderate to dark yellowish brown, finely crystalline, faintly laminated. Poor porosity.

10478-10482 Dolomite, anhydritic, moderate yellowish brown, crypto-crystalline. Contains very rare rounded quartz (?) grains. Rare small pyrite crystals.

10483 Top of Duperow formation

10482-10488 Anhydrite, moderate yellowish brown, fine crystalline. Dolomitic or limy in places where it resembles a pelmicrite limestone. Maybe has replaced a limestone.

10488-10490 Dolomite, limy, pale yellowish brown, fine crystalline, contains thin very limy laminae.

10490-10492 Limestone, dark yellowish brown, sublithographic (micrite), faintly laminated. Contains many small very dark brown dolomite (?) crystals.

10492-10496 Anhydrite, dark yellowish brown, not limy or dolomitic, fine crystalline.

10496-10498 Limestone, moderate yellowish brown, very fine crystalline (microsparite) with small inclusions of clear calcite. Rare algal (?) filaments. Very low porosity.

10498-10502 Limestone, as above with thin shaly laminae. Rare brachiopod fragments.

10502-10504 Limestone, moderate yellowish brown, pelmicrite with very small pellets. Common calcispheres (?) and ostracode valves. Tight.

10504-10506 Limestone, moderate yellowish brown with a grayish tinge. Very finely crystalline (microsparite). Very low porosity.

10506-10508 Limestone, moderate yellowish brown, microsparite with common algal (?) fragments. End of Core #1.

10508-10520 Limestone, moderate yellowish brown, sublithographic (micrite). Rare to common pale yellowish brown microsparite limestone, slightly anhydritic.

10520-10524 Limestone, as above with very common light bluish gray (5B7/1) very fine crystalline limy anhydrite.

10524-10528 Abundant anhydrite as above, common pale yellowish brown micro-sparite as above, common to rare moderate yellowish brown micrite as above.

10528-10532 Abundant moderate to pale yellowish brown, fine crystalline, anhydrite, common anhydrite and limestone as above. Rare dark yellowish brown or cryptocrystalline anhydrite.

10532-10536	Limestone, dark to moderate yellowish brown micrite, common pale yellowish brown microsparite, rare to common yellowish brown and light bluish gray anhydrite as above.
10536-10538	Abundant light bluish gray to medium light gray, anhydrite, common dark yellowish micrite, rare pale yellowish brown limestone and anhydrite as above.
10538-10542	Common dark yellowish brown limestone as above, common pale yellowish brown microsparite as above, rare anhydrite.
10542-10546	As above with rare light gray finely crystalline (micro-sucrosic) limy dolomite.
10546-10554	Dark yellowish brown limestone as above, common moderate to pale microsparite limestone with fair intercrystalline porosity. Common to rare pale yellow brown anhydrite.
10554-10560	Abundant moderate yellowish brown micrite limestone common dark yellowish brown limestone as above.
	DST #2 Run 2. 10,562-10,640. Open four hours, shut in 30 minutes. Gas to surface 1 hours 20 minutes, 5240 feet oil and gas unloaded, reversed out 10.8 barrels oil; recovered 300 feet oil, 278 feet gas cut salt water. Gravity 39.8°.
10560-10566	Limestone as above with common to rare moderate yellowish brown pelmicrite limestone.
10566-10572	Abundant light bluish gray to light gray fine crystalline anhydrite. Common limestone as above. Common to rare moderate yellowish brown cryptocrystalline anhydrite.
10572-10574	Common moderate to dark yellowish brown micrite anhydritic limestone, common anhydrite as above.
10574-10576	Abundant limestone as above, common anhydrite as above.
10576-10582	Abundant pale to moderate yellowish brown pelmicrite limestone containing very small pellets. Common to rare anhydrite as above. Limestone has a few very small pinpoint pores.
10582-10584	Abundant limestone as above, common to rare dark yellowish brown micrite limestone.
10584-10586	As above with rare pale yellowish brown microsucrosic (microsparite)limestone with slight oil stain and very weak cut. Fair intercrystalline porosity.
10586-10592	Limestone, moderate yellowish brown microsparite as above with slight stain and very weak cut. Common pale yellowish brown microsparite limestone with excellent pinpoint porosity, good stain, and fair cut. Rare limestone and anhydrite as above.
10592-10596	Abundant pale to moderate yellowish brown pelmicrite limestone, rare brachiopod fragments, very small pellets. Rare moderate to dark yellowish brown micrite limestone. Rare microsparite oil-stained limestone as above.
10596-10600	Abundant microsparite, oil-stained limestone as above with low intercrystalline porosity. Common pelmicrite limestone as above.
10600-10602	Common dark yellowish brown micrite limestone, common pelmicrite and microsparite limestone as above.

10602-10620 Abundant pale yellowish brown microsucrosic to sucrosic (microsparite) slightly stained dolomitic limestone. Common pelmicrite limestone as above. Microsparite limestone consists of pale yellowish brown fine-grained crystals in a very finely granular very pale orange matrix. Intercrystalline porosity and permeability is low. The small crystals may be dolomite.

10620-10622 Dolomite, limy. Moderate yellowish brown. Sucrosic. Good intercrystalline and pinpoint porosity and permeability. Slight stain. Very weak cut.

10622-10624 Abundant pale yellowish brown to very pale orange pelmicrite and micrite limestone, common dark yellowish brown micrite limestone. Very rare dolomite as above.

10624-10626 Abundant limy dolomite as above, common limestone as above.

10626-10628 As in 10622-10624 above.

10628-10640 Missing.

10640-10644 Abundant pale to moderate yellowish brown anhydrite rare limestone as above. Maybe cavings (?).

10644-10648 Abundant moderate yellowish brown sucrosic dolomitic limestone; fine to medium dolomite (?) crystals in a very finely granular limestone matrix. Fair porosity. Rare limestone as above. No stain, no cut.

10648-10656 Moderate to dark yellowish brown sucrosic dolomitic limestone as above but with better intercrystalline porosity. Slight stain. Good cut.

10656-10674 Dolomitic limestone as above but with more matrix and thus less porosity.

DST #3 10,674-10,706. Open 4 hours, shut in 30 minutes. Recovered water cushion and 8,394 feet salt water.

10674-10678 Abundant moderate to dark yellowish brown micrite limestone, common moderate yellowish brown sucrosic dolomitic limestone as above.

10678-10682 Very abundant micrite limestone as above, rare dolomitic limestone as above.

10682-10686 Abundant moderate yellowish brown dolomitic sucrosic limestone as above, low intercrystalline porosity. Common to rare micrite limestone and above.

10686-10688 As above but the dolomitic limestone has less matrix and so is more porous, could be called limy dolomite. No stain, no cut.

10688-10690 Dolomitic, limestone as above but finer crystalline (microsucrosic) and less porous.

10690-10702 Dolomitic limestone, moderate yellowish brown, sucrosic, good intercrystalline and pinpoint porosity and permeability. No cut.

DST #4 10,702-10,781. Open 1 hour 5 minutes, shut in 30 minutes. Oil to surface in 31 minutes, flowed 35.28 barrels of oil in 30 minutes, reversed out 33.6 barrels of oil, gas volume 30,152 cubic feet per hour; gravity 40.4^{0}, recovered 360 feet highly gas cut oil, 180 feet highly gas cut drilling mud.

10702-10706 Dolomitic sucrosic limestone as above, common dark yellowish brown micrite limestone. Rare moderate yellowish brown micrite limestone.

10706-	Circulation sample. Dolomitic microsucrosic limestone, common dark yellowish brown micrite limestone.
10706-10724	Abundant limy sucrosic dolomite, moderate yellowish brown, good intercrystalline porosity. No stain, no cut.
10724-10728	Abundant moderate to dark yellowish brown micrite limestone, rare to common limy dolomite as above.
10728-10778	Perforated interval. Flowed 253 barrels oil per day, GOR - 1314, 3.8% water, gravity - 36.5^0.
10728-10730	Dolomite, limy, pale to moderate yellowish brown, finely granular to microsucrosic to sucrosic, fair to slight inter-crystalline porosity. No stain, no cut.
10730-10736	Abundant moderate yellowish brown sucrosic dolomitic limestone, fair porosity, common pale yellowish brown very finely granular (microsparite) limy dolomite, low porosity. Common moderate yellowish brown medium crystalline dolomitic limestone with very low porosity.
10736-10738	Limestone, moderate yellowish brown, micrite with common sparite mostly very low porosity with rare patches of porous sucrosic limestone, no stain, no cut.
10738-10744	As above with rare pale yellowish brown micrite and pelmicrite limestone.
10744-10748	Black, oil-stained, sucrosic limestone. Good porosity, heavy stain, good cut. Common pale to moderate yellowish brown sucrosic limestone with pale yellow brown crystals in a very finely granular matrix, low porosity. Common very pale yellowish brown very finely granular limy dolomite.
10748-10750	Abundant moderate yellowish brown sparite to sucrosic limestone as above, common oil-stained limestone as above.
10750-10754	Limestone, moderate to dark yellowish brown, micrite. Rare to common microsparite and sparite limestone as above. No stain, no cut.
10754-10762	Abundant moderate yellowish brown medium crystalline (sparite) to sucrosic. Poor to fair intercrystalline porosity. No stain, no cut. Rare micrite limestone as above.
10762-10764	Limestone, moderate to dark yellowish brown, micrite. Very low to no porosity. Rare sparite & sucrosic limestone as above.
10764-10770	Abundant pale yellowish brown micrite and pelmicrite parts of which are altered to microsucrosic limestone. Common to rare dark yellowish brown micrite limestone as above.
10770-10772	As above with more microsucrosic limestone. No stain, no cut.
10772-10778	Abundant moderate to dark yellowish brown sucrosic dolomitic (?) limestone. Good stain, good cut. Good intercrystalline and pinpoint porosity. Common limestone as above.
10778-10780	Very abundant oil-stained limestone as above. Rare tight pelmicrite limestone as above.
10780-10790	Circulation sample, 1/2 hour. Oil-stained limestone as above. Rare very finely granular, very light gray limy dolomite, as above, good stain good cut.
10790-10792	Abundant dark yellowish brown micrite limestone common pale yellowish brown fine crystalline anhydrite.
10792-10796	Dark yellowish brown limestone as above, common very light gray, very fine crystalline (microsparite) dolomitic limestone.
10796-10804	Abundant pale to moderate yellowish brown pelmicrite limestone with very small pellets. Common dark yellowish brown limestone as above. Low to no porosity.

DST #5 10,808-10,888. Open 2 hours, shut in 30 minutes. Recovered water cushion and 320 feet of gas cut drilling mud.

10804-10810 Abundant pelmicrite as above. Pellets more numerous and appear to consist mostly of yellowish brown dolomite (?) crystals. Rare to common micrite limestone as above.

10810-10814 Common very finely granular, pale yellowish brown to light gray limy dolomite. Common dark yellowish micrite limestone.

10814-10822 Abundant pale yellowish brown micrite and pelmicrite limestone, common dark yellowish brown micrite limestone.

10822-10826 Abundant dark yellowish brown tight micrite limestone as above. Common pale yellowish brown micrite and pelmicrite as above.

10826-10832 As above with rare dark yellowish brown cryptocrystalline anhydrite.

10832-10836 Abundant pale yellowish brown micrite and pelmicrite limestone, low porosity. Rare dark yellowish brown limestone and anhydrite as above. Rare medium light gray very finely granular limy dolomite.

10836-10840 Abundant pelmicrite limestone as above. Common yellowish gray (5Y8/1) finely granular limy dolomite. Rare dark limestone as above.

10840-10850 Abundant yellowish gray limy dolomite as above. Common to rare moderate yellowish brown sucrosic limy dolomite with fair intercrystalline porosity. Rare dark limestone as above.

10850-10854 As above but dark yellowish brown micrite limestone is more common and with common pale yellowish brown micrite limestone.

10854-10856 Abundant white fine to medium crystalline (sparite) limestone, common dark and pale yellowish brown limestone as above.

10856-10858 Common pale yellowish brown micrite limestone common very pale orange to white very finely granular limestone. Rare white sparite as above.

10858-10860 Very abundant pale yellowish brown pelmicrite and pelmicro-sparite, slight porosity. Common white limestone as above.

10860-10872 Abundant dark yellowish brown micrite limestone, common pale yellowish brown pelmicrite and pelmicrosparite.

10872-10888 Very abundant dark limestone as above. Rare light gray very finely granular to microsucrosic limy dolomite and rare pale yellowish brown microsparite limestone.

10886 Top of Souris River formation

10388 Circulation sample, 15 minutes. As above.

10888-10896 As above with common pale yellowish brown very fine crystalline anhydritic limy dolomite.

10896-10900 Abundant light gray to pale yellowish brown, microsucrosic limy dolomite, slight intercrystalline porosity. Common dark micrite limestone as above.

10900-10904 Abundant dark yellowish brown micrite limestone, tight. Rare limy dolomite as above.

10904-10908 Abundant light gray, microsucrosic limy dolomite common dark yellowish brown limestone as above.

10908-10912 Abundant dark limestone as above. Common to rare limy dolomite as above.

10912-10936 Abundant dolomite as above, common to rare limestone as above. Dolomite becomes darker toward base.

10936-10942	Abundant moderate yellowish brown pelsparite limestone with low porosity. Rare dolomite as above.
10942-10954	Very abundant medium light gray slightly limy dolomite micro-sucrosic, low porosity.
10954-10960	Common dolomite as above. Common dark yellowish brown micrite limestone.
10960-10970	Abundant dolomite as above, common to rare limestone as above.
10970-10972	Common tight limestone as above, common yellowish gray to very light gray microsucrosic limy dolomite.
10972-10980	Very abundant limestone as above, rare dolomite.
10980-10984	Abundant micrite limestone as above, common light gray micro-sucrosic limy dolomite.
10984-10996	Very abundant limestone, rare dolomite, lost circulation material at 10992-10994.
10996-10998	Abundant moderate yellowish brown sucrosic slightly dolomitic sucrosic limestone, good intergranular and pinpoint porosity, good stain, faint cut. Common dark yellowish brown micrite limestone.
10998-11008	Abundant dark limestone as above. Common light gray to medium light gray microsucrosic limy dolomite. Abundant lost circulation material. No stain or cut.
11008-11020	Abundant medium light gray dolomite as above. Rare limestone as above.
11020-11028	Abundant dolomite as above with common pale yellowish brown fine crystalline limy dolomite. Low porosity. Rare limestone.
11028-11032	Abundant very pale orange to pale yellowish brown microsucrosic limy dolomite, common moderate to pale yellowish brown fine crystalline limy dolomite. Very rare dark limestone.
11032-11036	Abundant dark yellowish brown micrite limestone, low porosity. Common dolomite as above.
11036-11054	Very abundant limestone as above. Rare dolomite as above.
11054	Circulation sample. As above.
11054-11056	Abundant moderate yellowish brown very sucrosic limy dolomite. Good intercrystalline and pinpoint porosity. Slight stain, no cut. Rare to common limestone as above.
11056-11078	Very abundant dark yellowish brown micrite limestone. Tight, rare light gray limy dolomite.
11078-11092	Abundant pale yellowish brown micrite limestone. Common to rare dark yellowish brown limestone as above. Scattered pinpoint porosity. No stain. Pinpoint porosity gets better below 11086.
11092-11100	Limestone as above with rare medium light gray microsucrosic limy dolomite.
11100-11102	Limestone as above, common dolomite as above.
11102-11110	As above with common dark yellowish brown very fine crystalline slightly dolomitic limestone. Lost circulation material 11106-11110.

11113 Top of Dawson Bay formation

11110-11114	Very abundant pale yellowish brown sub-lithographic (micrite) limestone. No porosity. Common lost circulation material.
11114-11116	As above with common to rare very pale orange to white, fine to medium crystalline (microsparite), microsucrosic limestone with fair intercrystalline porosity.

11116-11118 Abundant pale yellowish brown to very pale orange limestone, mostly medium crystalline (microsparite) and tight but many fragments are sucrosic with fair intercrystalline porosity. Common pale yellowish brown micrite limestone as above. No staining on any of the types of limestone.

DST #6 11,120-11,179 (Dawson Bay). Packers did not hold. Missrun.

11118-11122 Abundant dark yellowish brown oil-stained sucrosic limestone. Fair to good porosity. Probably same as sucrosic limestone immediately above but stained darker. Good cut. Common pale yellowish brown micrite and microsparite limestone as above.

11122-11130 As above but unstained sucrosic limestone, is more common.

11130-11134 As above, not as dark a stain or as good a cut. Rare dark yellowish brown micrite limestone.

11134-11140 Abundant dark yellowish brown micrite limestone, common moderate to pale yellowish brown sucrosic limestone with slight oil stain. Common pale yellowish brown to white very fine crystalline (microsparite) limestone.

11140-11162 Missing.

11162-11168 Abundant moderate to dark yellowish brown sucrosic limy dolomite. Excellent intercrystalline and pinpoint porosity. Slight stain, weak cut. Common to rare dark yellowish brown micrite limestone as above.

11168-11185 Abundant dark micrite limestone as above, common sucrosic dolomite as above. Rare pale yellowish brown microsucrosic dolomite. The sucrosic dolomite may only appear to be limy because the rock is very porous and the small crystals are more exposed to acid.

11185-11235 Very abundant dark micrite limestone as above with very rare pinpoint porosity. Rare sucrosic dolomite as above.

11235-11240 Common to abundant very pale orange to white microsucrosic slightly limy dolomite. Fair intercrystalline porosity. Common dark micrite limestone as above.

11240-11245 Abundant pale to moderate yellowish brown microsucrosic dolomite. Common micrite limestone as above.

11245-11250 Abundant dark micrite limestone as above, common pale yellowish brown micrite limestone, common sucrosic dolomite as above.

11252 Top of Prairie formation

Microcaliper and microlaterologs indicate salt from 11,252 to 11,378 and interbedded salt and insoluble beds from 11,378 to 11,422. Samples from 11,252 to 11,422 are probably mostly cavings.

11250-11255 Abundant moderate red silty limy shale, very rare limestone as above.

11255-11260 Very abundant dark limestone as above, rare red shale.

11260-11275 Abundant moderate yellowish brown very sucrosic dolomite. Excellent porosity. May be cavings.

11275-11285 Common dolomite as above. Common dark yellowish brown micrite limestone. Common pale yellowish brown micrite and micro-sucrosic limestone.

11285-11290 Abundant moderate to dark yellowish brown micrite and pelmicrite with rare brachiopod fragments. Rare red shale.

11290-11295 As in 11275-11285 above.
11295-11300 Abundant pale yellowish brown to very pale orange sub-lithographic slightly limy dolomite. Rare fragments of dolomite crystals. Some of the dolomite contains rare small pellets.
11300-11325 Abundant moderate red shale. Rare dark micrite limestone.
11325-11375 Halite fragments.
11375-11385 Abundant moderate red silty shale, rare medium light gray limy microsucrosic dolomite. Rare to common fragments of salt.
11385-11400 Red shale as above with common medium gray limy silty shale.
11400-11405 Abundant dark yellowish brown micrite limestone, nonporous. Very common moderate to dark yellowish brown slightly limy sucrosic dolomite with fair to good intercrystalline & pinpoint porosity.
11405-11420 Abundant moderate red shale, rare dark gray shale. Rare to common white masses of fine crystalline halite.

11422 Top of Winnipegosis formation
11420-11425 Abundant pale yellowish brown very finely granular limestone and dolomitic limestone. Common red shale as above.
11425-11430 As above abundant halite fragments.
11430-11440 Very abundant dark yellowish brown micrite limestone, common dolomitic limestone as above. Rare moderate red shale.
11440-11445 Abundant dark yellowish brown limestone as above. Common moderate to dark yellowish brown sucrosic dolomite.
11445-11450 Dark limestone as above. Common pale yellowish brown micrite limestone.
11450-11465 Dark limestone as above. Common pale yellowish brown very finely granular limestone.
11465-11480 Very abundant dark limestone as above contains patches and veins of sparry calcite.
11480-11485 Dark limestone as above. Common light gray pelmicrosparite limestone. Rare moderate red shale.
11485-11490 Limestone as above. Common moderate to dark yellowish brown sucrosic dolomite with good intercrystalline and pinpoint porosity.
11490-11520 Dark yellowish brown micrite limestone as above. Scattered pinpoint porosity. Common pale yellow brown very finely granular limestone.
11520-11525 Abundant pale yellow brown limestone as above, common dark yellow brown limestone as above.
11525-11585 Abundant dark limestone as above with patches of sparite and rare brachiopod fragments. Common pale limestone as above. Rare red shale cavings.
11585-11590 Abundant pale to moderate yellowish brown very finely granular (microsparite) dolomitic limestone. Common dark micrite limestone as above.
11590-11595 Very abundant dark limestone as above, common dolomitic limestone as above.
11595-11615 As 11585-11590 above.
11615-11620 Abundant moderate yellowish brown sucrosic limy dolomite. Good intercrystalline and pinpoint porosity. Slight stain, weak cut. Common dark limestone as above with scattered pinpoint porosity.
11620-11675 Very abundant dark yellow brown tight limestone rare moderate red shale.

11675-11705 Common dark limestone as above, common medium light gray very finely granular to microsucrosic limy dolomite. Moderate red shale cavings.

11705-11710 As above. Some of the dolomite has a reddish tinge which may have been caused by overheating during drying the samples.

11710-11720 Abundant finely granular to microsucrosic medium light gray limy dolomite. Common to rare dark limestone as above. Rare red shale cavings.

11720-11725 Abundant very pale yellowish brown to very pale orange fine to medium crystalline dolomite. Scattered pinpoint porosity. Moderate red and grayish red (5R4/2) shale. Abundant lost circulation material. Rare very pale orange sucrosic dolomite.

11725-11732 Abundant medium light gray very finely granular slightly limy dolomite. Common moderate red shale and pale red slightly limy dolomite.

11732-11738 Abundant pale red (5R6/2) slightly limy very fine crystalline to cryptocrystalline dolomite. Rare moderate red shale cavings.

DST #7 11,738-11,813. Open 4 hours, shut in 30 minutes. Recovered 1500 feet highly gas cut water cushion unloaded, 7230 feet highly gas cut oil unloaded. 790 feet gas cut oil, 180' salt water with salt crystals.

11738-11740 Abundant very pale orange microsucrosic to cryptocrystalline slightly limy dolomite. Common pale red dolomite as above.

11740-11744 Abundant pale red dolomite as above. Common light-colored dolomite as above.

11747 Top of Interlake formation

11744-11748 Abundant very pale yellowish brown cryptocrystalline and microsucrosic dolomite as above.

Core #2 11,748-11,781. Cut 33 feet, recovered 29 1/2 feet.

11748-11754 Dolomite, limy. Pale yellowish brown. Fine crystalline with small vugs filled and lined with fine calcite crystals. Some of the vugs are stained red. Slight oil staining on fracture surfaces. Common calcite veins.

11754-11756 Dolomite, limy, microsucrosic, very pale orange to white. Common calcite veins and crystals. No staining.

11756-11760 As above, spotty stain in small areas where the carbonate crystals are slightly larger. Good cut in carbon tetrachloride. The rock may be a dolomitic limestone. Good porosity but probably low permeablility. Staining also occurs in pores and very small vugs and in body cavities of rare fossils (ostracodes).

11760-11762 Dolomite, light brown with reddish staining in small vugs and veins. Very slightly limy. No stain. Scattered pores and small vugs. Very low permeablility.

11762-11764 Dolomite, limy, very light gray to white. Cryptocrystalline. Common small vugs and veins lined and filled with oil-stained calcite (?) crystals.

11764-11768 As above appears brecciated with halite-filled veins and pores. Slight oil staining as above.

11768-11772	Dolomite, white, limy, microsucrosic. Rare small vugs. No oil staining. Good intercrystalline porosity but probably poor permeability.
11772-11776	As above with common pores and small vugs which have a spotty oil stain.
11776-11778	Dolomite as above. Rare pores, some of which are filled by small calcite (?) or dolomite (?) crystals or by large halite crystals. No oil stain.
11778-11781	Missing.
	Core #3 11,781-11,813. Cut 32 feet, recovered 24 feet.
11781-11786	Dolomite, dark yellowish brown, very fine crystalline to micro-sucrosic. Subconchoidal fracture. Very low porosity and permeability. No oil staining. Common ghosts and molds of smooth-shelled ostracodes.
11786-11788	Dolomite, white, slightly limy. Numerous small wormhole-like cavities lined with oil-stained drusy calcite crystals. Some of the cavities filled with large halite crystals.
11788-11790	Dolomite, white, limy, microsucrosic. Abundant oil stained pores. Rare vugs partially filled with calcite crystals. Good porosity. Good stain, good cut.
11790-11792	Limestone, pale to moderate yellowish brown. Pelmicrite with small patches of sparite and lenses intramicrite. Intraclasts are of medium to coarse size, have fair sorting and are well rounded. Pellets in the pelmicrite are very small. Very low porosity. No oil-staining.
11792-11794	Limestone as above with rare small oil-stained pores.
11794-11796	Limestone as above with common oil-stained pores and wormhole-like cavities. Some of the porosity filled with calcite and halite crystals.
11796-11798	Dolomite, limy, very pale orange to white, microsucrosic. Small vugs and pores filled with calcite. No stain. Dolomite, limy, dark yellowish brown, very fine crystalline, subconchoidal fracture, styolitic finely laminated. Low porosity. No stain.
11798-11800	Dolomite (?) limy, pale to moderate yellowish brown. Has texture of intrasparite with small rounded intraclasts tightly packed in a yellowish brown cement. Numerous small oil-stained, drusy calcite lined, pores which are parallel to the bedding plane. Replaced by very pale yellowish brown microsucrosic limy dolomite.
11800-11805	Dolomite, limy, very fine crystalline. Tight very rare oil-stained pores. Calcite filling.
11805-11813	Missing.
	Core - #4 11,813-11,871. Cut and recovered 58 feet.
11813-11816	Dolomite, very limy, white, microsucrosic, with spotty oil stain in scattered pores.
11816-11820	As above, better oil stain, contains common medium and coarse sized rounded intraclasts.
11820-11822	Limestone, dolomitic, pale yellowish brown pelmicrite with very rare small pellets. Tight. Rare oil-stained pores. Rare calcite crystals.

	DST Run #8 11,822-11,871. Open 2 hours, shut in 30 minutes. Recovered 1500 feet gas cut water cushion with traces of oil, 200 feet gas cut drilling mud, 180 feet gas cut salt water.
11822-11824	Limestone as above, less dolomitic. More small pellets. Styolitic with dead oil stain.
11824-11826	Dolomitic limestone as above, spotty stain.
11826-11828	Dolomite, moderate to dark yellowish brown very slightly limy. Very fine crystalline with scattered small pellets and large intraclasts. One of the intraclasts is a dolomitic pelsparite. Common crystals of calcite and halite. Low porosity.
11828-11830	Dolomite, limy, white, microsucrosic. Low porosity. Very spotty stain on fracture surfaces.
11830-11832	Limy dolomite as above. Abundant oil-stained small vugs and wormhole-like cavities. Porosity lined with drusy calcite.
11832-11834	Unstained microsucrosic dolomite as above separated by a small styolite from a white dolomitic intrapelmicrosparite limestone. No staining in either type.
11834-11838	Microsucrosic dolomite spotty stain in calcite-lined pores and vugs.
11838-11840	Limy microsucrosic dolomite as above with relict intraclasts. Spotty staining as above.
11840-11842	As above with common to abundant small white pellets in a finely granular matrix. Limy dolomite or dolomitic lime.
11842-11844	White limy microsucrosic dolomite as above. Calcite fillings in the pores and wormhole-like cavities.
11844-11846	Limestone, dolomitic, moderate yellowish brown, pelmicro-sparite with pellets or small rounded intraclasts closely packed in a very finely granular oil-stained matrix. Contains fair pinpoint porosity with good staining. Cement may be a very fine crystal limestone. Also contains anastomosing veins and laminae of white microsucrosic limy dolomite with good staining in pores and wormhole-like cavities.
11846-11848	White limy microsucrosic dolomite. Common small brown dolomite (?) crystals. No staining.
11848-11850	Limestone, dolomitic. As in 11844-11846 above but with common coarse-sized rounded intraclasts. Common small vugs with oil staining.
11850-11854	Dolomite, pale yellowish brown, microsucrosic limy. Thin carbonaceous laminae and streaks. Fair intergranular porosity. No staining.
11854-11856	Limestone and dolomite as in 11844-11846 above.
11856-11858	Limestone, pale yellowish brown, micrite, tight, contains rare small pellets and common rounded calcite inclusions which may be vug fillings. Slight staining on fracture surfaces.
11858-11862	Dolomite, limy, pale yellowish brown, microsucrosic. Fair intercrystalline porosity. No stain.
11862-11864	Limestone, microsparite and microsucrosic. Common small brownish dolomite crystals in a microsparite matrix. Fair intercrystalline porosity, no stain. Pale yellowish brown.
11864-11866	Limestone, moderate yellowish brown, micrite, very slightly dolomitic, tight, low porosity. Styolitic.
11866-11868	Limestone as in 11862-11864 above.

11868-11871	Dolomite, white, limy. Microsucrosic with good inter-crystalline porosity, no stain. Abundant intraclasts (?) of moderate to dark yellowish brown very fine crystalline dolomite.
	DST #9 11,871-11#930 (Interlake) 20 minute test. Gradually decreasing weak blow. Packers failed. Recovered 1230 feet of gas cut water cushion; 270 feet of gas cut muddy water cushion, unloaded; 180 feet of highly gas cut muddy salt water, unloaded; 870 feet highly gas cut drilling mud. No show of oil.
11871-11872	Missing.
	Core #5 11,872-11,930 Cut and recovered 58 feet.
11872-11874	Dolomite, slightly limy, very light gray. White dolomitic intraclasts scattered in a light gray matrix. Good spotty stain in pores and very small lenses. Good porosity probably poor permeablility.
11874-11876	As above, more common small oil-stained pores.
11876-11878	Dolomite, white, limy, microsucrosic. Good intercrystalline porosity. No oil stain.
11878-11880	As above and with a piece of dolomite with scattered intra-lasts as in 11868-11871 above and containing numerous small pores filled with very small oil stained dolomite or calcite crystals. One very large intraclast consists of medium gray pelintramicrite consisting of small rounded intraclasts and medium sized pellets closely packed in a sublithographic matrix and containing abundant oil-stained pinpoint pores.
11880-11882	White microsucrosic dolomite as above.
11882-11884	Dolomite, medium gray, very fine crystalline to sub-lithographic. Contains abundant pores and small vugs filled with fine oil-stained crystals. Cut by veins of white micro-sucrosic unstained limy dolomite as above.
11884-11888	Dolomite (?), very limy, white, microsucrosic, no stain. Contains common linear and rounded fragments (algal fragments ?) of pale yellowish brown dolomite. Could be a dolomitic limestone.
11888-11890	Dolomite, medium gray, as in 11882-11884 above with common wormhole-like (algal remains ?) of white microsucrosic limy dolomite. No stain.
11890-11892	Dolomite as above and a piece of pale yellowish brown pel-microsparite with patches of white and clear anhydrite (?).
11892-11894	Limestone, pale yellowish brown, micrite to microsparite, rare small pellets and ostracode valves. Rare small inclusions of clear anhydrite (?) crystals.
11894-11896	Dolomite medium gray with inclusions and veins of white limy microsucrosic dolomite. Texture of the gray dolomite is intra-pelmicrite with small rounded intraclasts and pellets in a fine crystalline to sublithographic matrix and with many of the intersticles containing tiny oil-stained calcite or dolomite crystals. Good spotty stain and pinpoint porosity. Good cut.
11896-11898	As above with much less porosity and less staining. One chip is white microsucrosic limy dolomite with common rounded inclusion of gray dolomite.

11898-11900	Limestone, as in 11892-11894 above.
11900-11902	Dolomite, medium gray, as in 11894-11896 above but with less white dolomite. Abundant pinpoint pores and good stain.
11902-11904	Dolomite, limy, very light gray to white, microsucrosic. Common ghosts of small pellets. Good intercrystalline porosity, no stain.
11904-11906	Dolomite, slightly limy, medium light gray, as in 11900-11902 above.
11906-11908	Dolomite, white slightly limy, microsucrosic but with low intercrystalline porosity.
11908-11910	Dolomite, as in 11900-11902 and 11904-11906 above.
11910-11914	White limy microsucrosic dolomite with good intercrystalline porosity.
11914-11916	Limestone, medium gray, pelmicrite. Abundant very small pellets in a sublithographic matrix. Common small linear calcite crystal masses. Very low porosity, no stain.
11916-11918	Dolomite (?), as in 11904-11906 above. Good pinpoint porosity and slight spotty stain.
11918-11920	Dolomite, slightly limy, pale yellowish brown, very fine crystalline to sublithographic low porosity, no stain.
11920-11922	Limestone, moderate yellowish brown, micrite with rare small pellets. Tight, no stain.
11922-11924	Dolomite (?) limy, white, microsucrosic to very fine crystalline. Ghosts of algal (?) structures and small pellets.
11924-11926	Limestone, dolomitic, pelmicrosparite, abundant moderate-sized pellets and rare small intraclasts closely packed in a micro-sparite, to micrite matrix. Scattered pinpoint porosity.
11926-11928	Dolomite, white, limy microsucrosic. Fair intercrystalline porosity.
11928-11930	Limestone, moderate yellowish brown, micrite with lenses of white microsucrosic limy dolomite with very spotty oil staining. End of Core
11930-11932	Abundant pale yellowish brown to very pale orange micro-sucrosic limy dolomite. Rare pale yellowish brown micrite limestone. Rare moderate brown shale.
11932-11938	Abundant very light gray sublithographic (micrite) limestone. Rare very pale orange dolomite as above.
11938-11940	As above with rare pale yellowish bran micrite limestone.
11940-11942	As above with common pale yellowish brown very fine crystalline dolomite containing scattered pinpoint porosity.
11942-11944	Very abundant very pale orange microsucrosic dolomite. Rare very light gray to very pale yellowish brown sublithographic limestone and dolomite as above.
11944-11946	As above, common very light gray dolomite as above.
11946-11950	Abundant very pale orange dolomite as above, rare very light gray dolomite as above.
11950-11952	Abundant very pale orange microsucrosic dolomite as above. Common very pale orange limy dolomite containing many medium-sized pellets and with good pinpoint porosity. Rare light gray dolomite as above.
11952-11960	Abundant microsucrosic dolomite and rare very light gray dolomite as above. Very rare pelletoid dolomite as above.
11960-11964	Rare dolomite as above. Rare very light gray finely crystalline limestone.

11964-11968	Abundant very pale orange microsucrosic dolomite. Common pale yellowish brown, very fine crystalline limestone.
11968-11984	Common microsucrosic dolomite and fine crystalline limestone as above. Very common pale to moderate yellowish brown pelletoid very limy dolomite with good to fair pinpoint porosity.
11984-11990	Common limestone and microsucrosic dolomite as above. Less common limy pelletoid dolomite as above.
11990-11992	Abundant very pale orange microsucrosic dolomite common pale yellowish brown micrite limestone, rare pelletoid dolomite as above.
11992-11994	As above with rare dark yellowish brown micrite limestone.
11994-11996	As above, common moderate yellowish brown microsucrosic limy dolomite.
11996-12010	Abundant very pale orange microsucrosic dolomite. Common light gray micrite limestone; common very pale orange to white microsucrosic pelletoid limy dolomite.
12010-12030	Abundant microsucrosic dolomite as above, common pelletoid dolomite as above. Rare limestone as above. Pelletoid dolomite has good pinpoint porosity but no oil staining.
12030-12040	Common microsucrosic dolomite and pelletoid dolomite as above. Common pale yellowish brown microsucrosic, very slightly limy dolomite with low porosity.
12040-12075	Abundant pale yellowish brown microsucrosic dolomite as above. Common very pale orange microsucrosic and pelletoid dolomite as above.
12075-12085	Abundant pale yellowish brown very fine crystalline to sub-lithographic (micrite) dolomite containing scattered small pellets. Common to rare very pale orange dolomite as above.
12085-12115	As above, common pale yellowish brown very fine crystalline dolomite containing, scattered medium-sized pellets. Scattered pinpoint porosity. Very rare very pale orange dolomite as above.
12115-12125	Very abundant very pale orange, very fine crystalline to sub-lithographic dolomite. Rare pale yellowish brown dolomite as above. Rare lost circulation material.
12125-12175	As above, with common pale yellowish brown to very pale orange, very fine crystalline dolomite having good pinpoint porosity. Some of the chips of dolomite contain abundant small white pellets in a cement of very fine crystalline dolomite.
12150-12155	Missing.
12175-12200	Abundant pale yellowish brown very fine crystalline to sub-lithographic dolomite with scattered pinpoint porosity. Common to rare very pale orange very fine crystalline dolomite as above.
12200-12210	As above with common moderate to dark yellowish brown very fine crystalline dolomite.
12205-12210	Missing.
12210-12215	Abundant pale yellowish brown sublithographic dolomite as above containing scattered small pellets. Rare very pale orange dolomite as above. Rare pale yellowish brown, with pinkish tinge, dolomite containing fine quartz (?) grains.
12215-12235	As above with common pinkish sandy dolomite as above. Very low porosity.

12235-12245	Abundant pinkish, sandy (?) dolomite as above. Common very pale orange dolomite as above.
12245-12270	Abundant medium gray, very fine grained, sandy dolomite, some of it being a sandstone with dolomite cement. Common pinkish sandy dolomite as above. Rare pale yellowish brown fine crystalline dolomite with moderate red stain. Rare masses of small quartz crystals. All sandstone appears tight.
12270-12285	Abundant very pale orange very fine crystalline dolomite. Rare gray and pinkish sandy dolomite as above.
12285-12315	Abundant very pale orange, very fine crystalline dolomite as above. Tight. Contains rare small pyrite crystals. Very rare gray dolomite as above.
12315-12325	Abundant very pale orange dolomite as above. Rare to common pale yellowish brown very fine crystalline dolomite.
12325-12385	Dolomite, very fine to fine crystalline as above. Slight intercrystalline porosity. Rare clear gypsum (?). Rare lost circulation material (mica).
12385-12405	Dolomite, very pale yellowish brown to very pale orange, fine crystalline. Slight intercrystalline porosity.
	DST #10 12,404-12,524 Interlake. 2 hour test. Strong blow immediately for 3 minutes, gradually decreasing and died in 3 minutes. Recovered water cushion, 633 feet of drilling mud, 8138 slightly muddy salt water, 458 salt water with salt crystals.
12405-12420	Dolomite, pale yellowish brown, fine crystalline. Slight intercrystalline. Rare to common very fine crystalline pale medium yellowish brown dolomite.
12420-12445	Dolomite, pale yellowish brown, very fine crystalline with rare fine crystalline dolomite. Very poor porosity.
12445-12460	Dolomite, very pale yellowish brown, very fine crystalline to sublithographic. Rare moderate yellowish brown fine crystalline dolomite with very poor pinpoint porosity.
12460-12470	Dolomite, moderate to dark yellowish brown, fine to very fine crystalline. Common pale yellowish brown very fine crystalline dolomite. Rare white, chalky chert (?).
12470-12495	Dolomite, pale to moderate yellowish brown, fine to very fine crystalline. Rare very pale orange microsucrosic dolomite. Very rare white chalky chert.
12495-12505	Dolomite, moderate to dark yellowish brown, fine crystalline. Rare pinpoint porosity and very slight intercrystalline porosity.
12505-12510	As above with rare white chalky or powdery chert or else very fine grained sandstone.
12510-12530	Dolomite, moderate yellowish brown, very fine crystalline. Rare very light gray very fine crystalline dolomite.
12530-12535	Dolomite, pale yellowish brown, fine crystalline to microsucrosic. Very low intercrystalline porosity.
12535-12560	As above with common moderate yellowish brown fine crystalline to microsucrosic dolomite. Rare pale yellowish brown sucrosic dolomite with poor intercrystalline porosity.
12560-12575	Dolomite, pale yellowish brown, fine crystalline to microsucrosic. Low intercrystalline porosity.

12575-12580	Dolomite, as above, with rare pinpoint porosity. Very common dark yellowish brown fine crystalline dolomite.
12580-12585	Very abundant dark yellowish brown dolomite as above. Rare pale yellowish brown microsucrosic and sucrosic dolomite as above.
12585-12600	Abundant pale yellowish brown very fine to fine crystalline to microsucrosic dolomite as above. Common to rare dark yellowish brown dolomite as above.
12600-12605	Abundant pale yellowish brown very fine crystalline dolomite. Rare pale yellowish brown fine crystalline to microsucrosic dolomite.
12605-12620	As above with very common moderate to dark yellowish brown, fine to medium crystalline dolomite with poor to fair pinpoint porosity.
12620-12630	Very abundant very pale yellowish brown very fine crystalline dolomite. Rare dark yellowish brown dolomite as above.
12630-12650	Abundant dark yellowish brown dolomite as above. Common pale yellowish brown dolomite as above. Very rare fragments of white anhydrite.
12650-12655	Abundant pale to moderate yellowish brown very fine crystalline dolomite. Common dark dolomite as above.
12655-12665	Very abundant dark yellowish fine crystalline dolomite with white anhydrite (?) inclusions. Rare pale dolomite as above. Rare white anhydrite (?) fragments.
12665-12670	Dolomite as above, common white to pale yellowish brown fine crystalline anhydrite.
12670-12675	Dolomite as above, rare anhydrite as above, common lost circulation material (mica flakes).
12675-12685	Abundant dark dolomite as above, common very pale orange fine crystalline to microsucrosic dolomite. Common anhydrite as above.
12685-12695	Dolomite as above, rare anhydrite, rare very pale yellowish brown very fine crystalline dolomite.
	DST #11 12,695-12,765. Open 2 hours, shut in 30 minutes. Weak blow for 10 minutes and died. Recovered 2800 feet of water cushion, 964 feet of drilling mud 182 feet of gas cut drilling mud, no show of oil or water.
12695-12715	Abundant dark yellowish brown sublithographic (micrite) limestone. Very rare dolomite and anhydrite as above. Rare medium light gray microsucrosic limestone. No stain.
12715-12725	Abundant pale yellowish brown, fine crystalline dolomite. Rare limestone as above. No stain.
12725-12735	Dolomite and limestone as above. Common moderate yellowish brown microsucrosic to sucrosic limestone. Fair inter-crystalline porosity. Good stain and good cut.
12735-12745	Very abundant pale yellowish brown, very fine crystalline dolomite containing scattered pinpoint pores, no stain and no cut. Rare micrite limestone and oil-stained limestone, as above.
12745-12750	Abundant medium gray to dark gray sublithographic (micrite) limestone containing patches of white fine crystalline calcite and fragments of brachiopods (?). Rare dolomite as above. No stain, no cut.

12750-12755 Dark yellowish brown limestone and pale yellowish brown dolomite as above. Common oil-stained limestone as above. Very abundant large mica (vermiculite?) flakes.

12755-12765 Limestone and dolomite as above? Poorly washed.

12765-12775 Abundant dark yellowish brown fine to medium crystalline dolomite, rare dark limestone as above. Abundant mica flakes.

12775-12780 Common pale yellowish brown very fine crystalline dolomite, common dark yellowish brown dolomite, rare dark yellowish brown micrite limestone, as above.

12780-12800 Very abundant dark yellowish brown microsucrosic dolomite. Rare pale yellowish brown very fine crystalline dolomite. Rare dark yellowish brown limestone.

12800-12805 Abundant dark yellowish brown micrite limestone, common pale yellowish brown micrite to microsucrosic limestone.

12805-12820 As above, with rare very pale orange, very fine crystalline dolomite.

12820-12825 Abundant pale yellowish brown limestone, sublithographic with fair pinpoint porosity and microsucrosic. Slight stain, faint cut. Rare dark yellowish brown limestone and very pale orange dolomite as above.

12820-12845 Abundant very pale yellowish brown, to very light gray, very fine crystalline to sublithographic, slightly limy dolomite. Rare limestone and dolomite as above.

12845-12870 Abundant pale to moderate yellowish brown, cryptocrystalline dolomite, rare light gray dolomite as above, rare dark limestone as above.

12870-12875 Abundant medium light gray, fine crystalline, slightly limy dolomite. Rare dark yellowish brown dolomite as above.

12875-12915 Very abundant dark yellowish brown to dark gray dolomite as above.

12915-12945 Dolomite as above with common moderate yellowish brown, fine to medium crystalline dolomite. Abundant mica flakes at 12925-12930.

12945-12950 Limestone, dark yellowish brown, micrite to microsucrosic.

12952 Top of Stony Mountain formation

12950-13025 Dolomite, moderate yellowish brown, fine crystalline to micro-sucrosic, slightly limy. Fair intercrystalline and pinpoint porosity. Rare to common limestone as above.

13025-13035 Dolomite, dark yellowish brown, limy, fine crystalline. Rare dolomite and limestone as above.

13035-13053 Limestone, dark yellowish brown to dark gray, micrite with common masses of sparry calcite. After examining the Stony Mountain core below, most of the so-called limestone is probably a very limy shale.

Core #6 13,053-13,111. Cut and recovered 58 feet.

13053-13070 Shale, very limy, waxy, non-fissile, dark gray. Interbedded and interlaminated with dark to moderate yellowish brown micro-sparite and sparry limestone (coarsely crystalline) containing abundant fossil fragments. Some of the limy shale is finely laminated and is subfissile.

13070-13074 Limestone, dark yellowish brown, micrite, with very rare small pellets and rare small fossil fragments. Very low porosity. Contains numerous small black fragments of unknown affinity and common masses of fine crystalline pyrite.

13074-13108 Shale, limy, as above. Interbedded with micrite and sparry limestone as above. Common whole and fragmentary brachiopods and colonial corals.

13109 Top of Red River formation

13108-13111 Linestone, moderate to dark yellowish brown, pelmicrosparite with small patches of white calcite. Rare to common small pellets and fossil fragments in a microsparite matrix. Tight.

Core #7 13,111-13,169. Cut and recovered 58 feet.

13111-13132 Limestone, micrite and microsparite. Dead oil stain on fracture surfaces. Rare inclusions of clear calcite.

13132-13134 Anhydrite, pale to moderate yellowish brown, fine to medium crystalline slightly friable. Slight to fair intercrystalline porosity.

13134-13136 Anhydrite, dark yellowish brown, fine crystalline lath-shaped (?) crystals. Tight.

13136-13138 Dolomite, very fine crystalline, moderate yellowish brown, thin shaly laminae.

13138-13142 Limestone, moderate to dark yellowish brown, micrite, to micro-sparite. Tight and dense.

13142-13158 Limestone, moderate to dark yellowish brown. Sublithographic (micrite). Subconchoidal fracture. Dead oil stain on fracture surfaces. Laminated with very dark yellowish brown laminae.

13158-13160 Anhydrite, moderate to dark yellowish brown. Fine to medium crystalline. Very slightly limy. Slight intercrystalline porosity.

13160-13162 Dolomite, pale yellowish brown, slightly limy, fine crystalline to microsucrosic. Abundant inclusions of small brown dolomite crystals and rare, clear anhydrite crystals. Very low porosity. No stain.

13162-13164 Dolomite, dark yellowish brown, fine crystalline to micro-sucrosic, limy. Low intercrystalline porosity no stain.

DST #12. 13,164-13,304. Open 2 hours, unable to close tool. Weak blow for 15 minutes and died. Recovered 3120 feet of gas cut water cushion, 180 feet of highly gas cut and mud cut water cushion, 110 feet of highly gas cut drilling mud. No show of oil.

13164-13166 Dolomite, dark yellowish brown, shaly, microsucrosic, limy.

13166-13169 Anhydrite, white to moderate yellowish brown, medium crystalline. Slight intercrystalline porosity.

Core #8. 13,169-13,227. Cut and recovered 58 feet.

13169-13174 Limestone, dark yellowish brown, microsparite. Very low inter-crystalline porosity. No stain.

13174-13180 Limestone as above with slight oil stain and very weak cut.

13180-13184	Dolomite, dark yellowish brown, limy, microsucrosic, no oil stain. Fair intercrystalline porosity. Rare pinpoint porosity.
13184-13186	Dolomite, as above, slight stain, weak cut.
13186-13190	Limestone, dark yellowish brown micrite, slight stain on fracture surfaces.
13190-13192	Limestone as above with common elliptical masses of clear and pale yellowish brown fine crystalline calcite. These appear to be fillings of fossil cavities.
13192-13196	Limestone, micrite, dark yellowish brown, no fossils seen. Common large inclusions of coarse-grained clear, lath-shaped crystals (gypsum?).
13196-13198	Limestone, as above, no inclusions seen. _
13198-13202	Limestone, as above, common masses of coarse calcite crystals. Rare small fossil fragments.
13202-13204	Limestone, as above, abundant linear and rounded masses of medium to coarse crystalline calcite. Probably fossil fillings or replacements. Some are the size and shape of ostracodes, others are much larger.
13204-13206	Limestone, as above; with a piece of dark yellowish brown pelmicrite consisting of small pellets and fossil fragments loosely packed in a sublithographic matrix.
13206-13210	Limestone, pelmicrite, as above. Common impressions of brachiopods and rare small horn corals.
13210-13227	Limestone, dark yellowish brown, micrite, rare to common fossil fragments and small calcite masses. Tight, very low porosity. Slight oil stain on fracture surfaces. Rare large masses of coarse calcite and rare brachiopod impressions
	Core #19. 13,227-13,282. Cut 55 feet, recovered 34 feet.
13227-13234	Anhydrite, moderate to dark yellowish brown, fine crystalline. Slightly limy. Changing to medium crystalline with slight intercrystalline porosity.
13234-13236	Dolomite, anhydritic, pale yellowish brown, limy, contains abundant small needle-shaped anhydrite (?) crystals.
13236-13238	Anhydrite, slightly limy, pale to moderate yellowish brown. Fine crystalline. Laminated with some of the laminae containing abundant small pale yellowish brown pellets.
13238-13240	Anhydrite, dark yellowish brown, fine to medium crystalline. Not limy.
13240-13244	Anhydrite, as above, with thin limy laminae.
13244-13250	Dolomite, pale yellowish brown, very finely crystalline, slightly limy. No stain. Very low porosity. Rare small lath-shaped dark brown anhydrite crystals.
13250-13252	Anhydrite, clear to dark yellowish brown. Rare large dark yellowish brown pellets. Medium crystalline.
13252-13254	Dolomite, pale yellowish brown, microsucrosic, with thin dark yellowish brown anhydrite laminae.
13254-13261	Dolomite as above, no laminae seen. End of Core.
13261-13273	Abundant dolomite, pale yellowish brown, very fine crystalline to microsucrosic. Slightly limy, with rare small brown anhydrite crystals. Rare dark yellowish brown micrite limestone.

13273-13285 Dolomite as above, common dark limestone as above. Rare pale yellowish brown fine crystalline anhydrite.
13285-13315 Limestone, dark yellowish brown, micrite. Rare dolomite as above.
13315-13320 Limestone as above, contains rare masses of coarse crystalline calcite.
13320-13335 Limestone as above. Common dark yellowish brown microsucrosic to fine crystalline dolomite.
13335-13340 Limestone as above. Common dark to moderate yellowish brown dolomite. Rare dark yellowish brown medium crystalline anhydrite.
13340-13355 Abundant dolomite as above, common to rare limestone and anhydrite as above. Dolomite is microsucrosic to sucrosic with fair intercrystalline porosity and with no stain.
13355-13385 Abundant limestone as above, common dolomite as above.
13385-13435 Limestone as above. Rare dolomite as above.
13435-13440 Limestone as above. Rare dark yellowish brown fine crystalline limy anhydrite.
13440-13480 Common limestone as above, common anhydrite as above.
13480-13495 Common limestone as above, common dark yellowish brown anhydrite (?) limestone. Very rare anhydrite as above.
13495-13525 Limestone, micrite, as above, common to rare pale yellowish brown microsucrosic limy dolomite.
13525-13600 Common dark yellowish brown micrite limestone as above. Common dark yellowish brown medium to fine crystalline anhydritic limestone or dolomitic anhydrite.
13600-13715 Limestone, dark yellowish brown, micrite to microsparite. May be anhydritic. Slight intercrystalline porosity.
13715-13780 Limestone, dark yellowish brown, mostly micrite less common microsparite.

13764 Top of Winnipeg formation
13780-13800 Limestone as above, rare medium light gray shaly limestone. Very rare black shale (cavings)?. Common dark yellowish brown to black sucrosic limestone.
13800-13815 Abundant dark gray to black sucrosic shaly limestone, or limy siltstone. Rare limestone as above.
13815-13820 Abundant silty shale, dark gray to black with faint greenish tinge. Rare limestone and silty limestone as above.
13820-13845 Shale, dark greenish gray, waxy, fissile. Rare sandy fragments.
13845-13860 Shale, dark gray to black with greenish tinge, silty, slightly sandy. Limestone and dolomite cavings (?) at 13855-13860.
13860-13870 Shale, waxy, dark greenish-gray, as above.
13870-13880 Shale, silty, black as above.
13880-13900 Waxy shale, as above.
13900-13915 Shale, silty, dark gray to black with greenish tinge.
13915-13920 Shale as above with common medium-grained very friable quartz sandstone of rounded quartz grains with secondary silica growth.
13920-13960 Shale as above. Rare sandstone. A few of the shale fragments contain scattered rounded quartz grains at 13940-13950. Rare very shaly medium-grained quartz sandstone at 13945-13950.
13960-13961 Abundant medium-grained friable quartz sandstone as above. Common shale as above.

DST #13 13,970-14,033. Open 1 hour. A few weak bubbles and died. Packer failed. Recovered 4100 feet of water cushion, 1643 feet of drilling mud. No show of oil.

DST #14 13,975-14,055. Opened tool and packer failed immediately. Recovered 4100 feet of water cushion, 2160 feet of drilling mud, No show of oil.

DST #14, Run #2. 13,950-14,055. Packer failed 6 minutes after tool opened. Recovered 4100 feet of water cushion, 360 feet of gas cut drilling, mud. No show of oil.

Core #10 13,961-14,019 Cut 58 feet, recovered 14 feet.

13961-13966	Sandstone, medium to coarse rounded quartz grains, friable, white silt matrix. Fair intergranular porosity. Medium light gray with dark gray laminae and staining. Very weak cut and staining.
13966-13970	Sandstone, as above, white, no laminae or staining. Less cement. Very friable. Rare glauconite (?) pellets.
13970-13972	As above, slight staining. No cut.
13972-13975	Sandstone, fine to medium grained with common coarse rounded grains. Yellowish gray. Not as friable as above. Abundant yellowish gray silt filling interstices. End of Core.
13976-14019	Quartz sandstone as above, common dark gray to black silty shale. Badly caved. Common very pale orange microsucrosic dolomite (cavings?).

Core #11. 14,019-14,033. Cut 14 feet, recovered 3 1/2 feet.

14019-14023	Sandstone, fine to medium grained, only slightly friable, poor porosity. All of core.
14023-14057	Abundant medium to coarse quartz sandstone. As in 13976-14019 above. Badly caved.

Core #12. 14,057-14,088. Cut and recovered 31 feet.

14057-14060	Sandstone, fine-grained, slightly friable, white with contorted shaly laminae. Fair porosity.
14060-14068	Sandstone, medium light gray, not friable, fine-grained tightly cemented. Very low porosity. Contains rare small pyrite grains.
14068-14070	Sandstone, medium grained, slightly friable, medium light gray. Slight stain, good cut. Fair to good intergranular porosity.
14070-14074	Sandstone, medium grained, pale yellowish brown to very light gray. Slightly friable. No stain no cut. Fair porosity.
14074-14076	Sandstone, white, medium-grained, non-friable, low porosity. No stain, no cut.
14076-14082	Sandstone as above but fine-grained.
14082-14088	Fine-grained sandstone as above, very tightly cemented.

Core #13 14,088-14,146. Cut 58 feet, recovered 41 feet.

14088-14092	Sandstone, very light gray to white, medium grained, slightly friable. Dead oil stain, no cut. Fair porosity.

14092-14104 Sandstone, medium-grained, tightly cemented, low porosity, scattered dead oil stain or contorted black shale laminae. Slight stain and cut which may have been caused by the oil base mud.

14104-14108 Sandstone, medium-grained, white, slightly friable, fair to good intergranular porosity.

14108-14112 Sandstone, medium-grained, tightly cemented, abundant black carbonaceous laminae. Low porosity. No cut.

14112 Top of Deadwood formation

14112-14114 Sandstone, white, medium grained, friable, common carbonaceous laminae.

14114-14122 Tight sandstone with laminae as in 14108-14112 above.

14122-14129 Sandstone, fine to medium grained, white, tightly cemented. Abundant white silty matrix and common greenish gray shaly veins and laminae. End of core chips.

14129-14134 Sandstone, white, medium-grained, friable to tight. Rare black sandstone and greenish gray sandstone.

14134-14146 Abundant sandstone as above. Very common greenish gray siliceous shale containing scattered rounded quartz grains. Rare to common black shale (probably the carbonaceous laminae) containing scattered sand grains.

Core #14. 14,146-14,176. Cut and recovered 30 feet.

14146-14154 Shale, siliceous, hard, greenish gray, tight. Nonfissile. Common small to large pyrite crystals.

14154-14158 Shale, as above, interbedded with moderate red fissile shale and medium gray shaly medium-grained tight sandstone.

14158-14160 Sandstone, shaly, very tight, moderate red to pinkish. Pyritic.

14160-14162 Sandstone, medium grained, very tightly cemented, white with dark pink stain, common moderate red hematite (?) nodules.

14162-14164 Sandstone, as above, grayish red (5R4/2).

14164-14176 Sandstone, grayish red as above, with interbedded grayish red sandy shale.

Core #15. 14,176-14,221. Cut 45 feet, recovered 35 feet.

14176-14184 Grayish red, medium-grained, non-friable sandstone as above. Slightly shaly becoming lighter colored toward base.

14184-14190 Sandstone, white, tightly cemented, medium to coarse grained. Patches are stained light greenish gray. Good cut in carbon tetrachloride.

14190-14192 Sandstone, medium grained, banded white and grayish red. Fair cut on fracture surfaces.

14192-14194 Sandstone, medium grained, white, non-friable, poor porosity. No stain or cut. Common conodont fragments.

14194-14198 Shale, grayish red, hard and tight interbedded with hard light greenish gray shale.

14198-14204 Sandstone, medium-grained, shaly, tight, grayish red. Slight stain and cut on fractures. Interbedded with grayish red sandy shale.

14204-14208 Shale, greenish gray, scattered sand grains.

14208-14211 Shale as above, interlaminated with white to gray sandstone. End of Core.

14211-14221 Missing.

Core #16 and #17. 14,221-14,225. Cut 4 feet recovered 1 1/2 feet.

14221-14225 Sandstone, white, medium to coarse grained. Non-friable. Poor porosity. No stain. End of core chips.

14225-14235 Abundant white, black, and grayish red medium-grained sandstone. Common to rare greenish gray and grayish red shale. Common black shale cavings (?).

14235-14253 Abundant white sandstone, medium-grained with common coarse rounded grains. Rare shale as above.

Core #18. 14,253-14,311. Cut and recovered 58 feet.

14253-14260 Sandstone, white, fine to medium-grained, fair to poor porosity. Fair stain and cut on fracture surfaces.

14260-14264 Sandstone, fine-grained, white to medium gray. Non-friable, low porosity. No oil stain. Black shaly laminae.

14264-14278 Sandstone, medium to coarse grained, white, tight, low porosity. Rare small pyrite masses. Slight stain and cut. Rare styolites.

14278-14282 Sandstone, dark gray, shaly, fine-grained with common coarse grains. No stain.

14282-14284 Shale, black, slightly dolomitic, slight oil stain and very weak cut.

14284-14286 Sandstone, dark gray, fine-grained with common coarse rounded grains. Shaly. Low porosity. No stain or cut.

14286-14290 Sandstone, white to medium light gray, medium to fine-grained. Low porosity. No stain or cut.

14290-14296 Limestone, very dark yellowish brown to dark gray sub-lithographic (micrite). Tight, no porosity. Common fossils and fragments of Linguloid brachiopods. Interbadded with black fissile shale.

14296-14298 Limestone, dark gray to dark yellowish brown, shaly with common black shale laminae. Sparite and microsparite with common fossil fragments. Very low porosity. No stain.

14298-14300 Sandstone, limy. Medium to coarse rounded clear quartz grains with a calcareous cement. Contains common medium sized pale yellowish brown carbonate pellets.

14300-14302 Sandstone, white, limy, medium to coarse grained containing large rounded nodules of dark yellowish brown fine to medium grained limy quartz sandstone.

14302-14306 Sandstone, white, limy, fine to medium grained with black shaly laminae.

14306-14311 Sandstone, as above but not as limy. End of Core.

Core #19. 14,311-14,369. Cut and recovered 58 feet.

14311-14314 Sandstone, white, medium to coarse grained, slightly limy, contorted black shaly laminae and stringers.

14314-14316 Sandstone as above. Straw colored oil stain. Good cut. Non-friable. Fair intergranular porosity.

14316-14318 Slightly limy sandstone as above, no stain.

14318-14322	Sandstone, as above with abundant moderate yellowish brown calcareous cement.
14322-14328	Sandstone, medium gray, slightly limy, fine to medium grained. Fair to good intergranular porosity.
14328-14332	Limestone, dark yellowish brown, pelmicrosparite. Very low to nil porosity. Black shaly laminae. Common to rare fossil fragments. Oil staining on fracture surfaces.
14332-14336	Shale, black, fissile. Slightly limy. Carbonaceous.
14336-14338	Dolomite, very finely crystalline, black, limy, sandy.
14338-14342	Limestone, microsparite with patches of sparite, shaly, common rounded quartz sand grains.
14342-14348	Limestone, as above, rare sand grains.
14348-14356	Sandstone, medium to coarse grained, white, slightly limy. Common to rare brown tourmaline (?) grains. Fair intergranular porosity.
14356-14358	Sandstone, as above, very limy.
14358-14362	Sandstone, as above, limy dolomite cement.
143f2-14369	Sandstone, as above, slightly limy. End of Core.
14369-14385	Abundant sandstone as above, slightly limy to non-calcareous. Rare black shale and medium gray limestone cavings.
14385-14390	As above, common grayish orange (10YR7/4) fine crystalline limy dolomite.
14390-14400	Abundant fine grained, very limy, quartz sandstone, common to rare slightly limy sandstone as above.
14400-14420	Abundant very light gray microsucrosic slightly sandy limestone. Common dark gray microsparite limestone. Rare limy sandstone.
14420-14435	Common moderate to dark yellowish brown limestone, common slightly limy medium grained quartz sandstone. Rare grayish orange limy dolomite.
14435-14480	Limestone as above with common moderate yellowish brown micro-sparite (microsucrosic) limestone. Common dark gray to black slightly limy shale.
14480-14520	Abundant limestone, pale to dark yellowish brown sub-lithographic (micrite) to microsucrosic (microsparite.) Rare shale and sandstone as above.
14520-14555	Limestone as above, common moderate red silty shale.
14555-14565	Limestone and red shale as above, common black shale.
14565-14575	Microsucrosic limestone and black shale as above, rare red shale.
14575-14580	Abundant medium-grained white quartz sandstone. Rare limestone and shale as above.
14580-14600	Abundant black shale cavings(?). Common pale yellowish brown microsucrosic limestone, rare moderate yellowish brown sub-lithographic (micrite) limestone. Very rare sandstone as above.
14600-14610	Abundant moderate yellowish brown microsparite (microsucrosic) limestone. Common black shale.
14610-14630	Abundant black shale as above, common limestone as above.
14630-14635	Abundant limestone as above, common black shale as above.
14635-14645	As above with rare medium gray, slightly glauconitic sparry (medium-crystalline) limestone.
14645-14685	As above, glauconitic limestone more common.
14685-14690	As above, aoundant black shale.

14690-14715	Abundant glauconitic limestone as above, common to rare micro-sucrosic limestone, common black shale which may be cavings.
14715-14720	As above, with common to rare fine to medium-grained slightly limy sandstone.
14720-14725	Abundant sandstone, white to light pink, not limy, medium grained, composed of angular to sub-rounded quartz grains. Rare glauconitic limestone as above common microsucrosic slightly dolomitic limestone, common black shale.
14725-14740	Abundant dolomitic limestone as above, slightly sandy. Common sandstone as above, common black shale. Rare glauconitic limestone.
14740-14750	Sandy limestone as above, rare to common fine to medium-grained sandstone, common dark greenish-gray waxy shale.
14750-14775	Very common white medium crystalline glauconitc limestone, common shale and microsucrosic limestone, as above. Rare medium-grained sandstone. Glauconite in the form of large pellets.
14775-14785	Missing.
14785-14795	As above, rare dark brown shaly sandstone.
14795-14805	Very abundant, white, glauconitic, fine to medium crystalline (microsparite to sparite) glauconitic limestone. Rare sandstone and shale cavings as above. Glauconite in the form of very fine pellets.
14805-14810	Abundant dusky brown medium grained, tightly cemented sandstone, common white fine to medium grained sandstone. Rare limestone as above.
14810-14825	Limestone as in 14795-14805 above but containing very rare small glauconite pellets. Common sandstone as above.
14825-14840	Abundant sandstone as above, common limestone as above. Sandstone composed of angular to subrounded quartz grains.
14840-14865	Abundant white glauconitic limestone with common small to medium-sized glauconite pellets, common to rare sandstone as above.
14865-14890	Abundant sandstone as above, common limestone as above. Limestone has common small glauconite pellets and rare large glauconite pellets.
14890-14910	Sandstone and limestone as above. Abundant cavings(?) of black and red shale.
14910-14925	Abundant very light gray to white medium to fine crystalline slightly glauconitic limestone. Rare white medium grained sandstone.
14925-14950	Abundant dark gray very shaly medium to coarse sandstone, common limestone as above, rare white to fine to medium-grained sandstone.
14950-14975	Sandstone, medium grained, white pink and dusky brown, common sandy and glauconitic limestone as above. Rare pale to dark greenish gray shale. Black shale cavings.
14955-14960	Missing.
14975-14990	Abundant greenish gray silty shale, common to rare very glauconitic limestone, rare sandstone.
14990-15005	Very abundant greenish gray shale, common medium-grained brownish sandstone.
15005-15045	Common dark greenish gray shale as above. Common limestone and sandstone as above.

15045-15075 Abundant white sandy glauconitic medium crystalline limestone. Common shale and sandstone as above.

15075-15090 Abundant moderate red to dusky brown silty sandstone, common glauconitic limestone. Rare shale as above.

15090-15100 Abundant glauconitic sandy limestone rare sandstone as above. Common black shale. Common light brown (5YR6/4) siltstone.

15100-15110 Shale and sandstone as above. Common white glauconitic medium-grained sandstone. Common siltstone as above.

15110-15113 Abundant non-glauconitic sandstone as above. Common shale as above. Rare glauconitic sandstone as above.

Core #20 15,113-15,135. Cut 22 feet, recovered 21 1/2 feet.

15113-15115 Sandstone, fine to medium-grained. White with greenish tinge caused by disseminated small glauconite (?) pellets. Non-friable. Fair porosity.

15115 Top of Precambrian

15115-15120 Granite, pink.

15120-15135 Igneous rock. Dark.

T. D. - 15,135

DOD - 11,830.