NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 213

Summary of the Monsanto Chemical Co., Lion Oil Division - Robert M. Bly #1
Well No. 2132 - Permit No. 2144

by William P. Eastwood
June, 1959

Monsanto Chemical Co. #1 Bly located in Cen. NE 1/4, NW 1/4, sec. 36, T. 163N., R. 92W., Burke County, North Dakota. Elevation of Kelley bushing - 1947 ft; ground level - 1936 ft. Drilling contractors - Cactus Drilling Corporation, San Angelo, Texas.

The well was spudded Dec. 31, 1958 and drilled to a depth of 6,210 ft. It was completed as a producer in the Nesson zone on Jan. 26, 1959.

Drill Stem Tests:
#1 6068-97 - Shut in 60 minutes, open 60 minutes, strong blow for 10 minutes, decreasing to weak in 30 minutes. Received 270 ft. of fluid; 180 ft. slightly gas-cut mud, 90 ft. of very heavily gas-cut mud, slightly oil-cut. FP 130-150#, IP 2900-1360#.

#2 6108-58 - Shut in 30 minutes, open 45 minutes, shut in 60 minutes, gas to surface in 1 1/2 minutes, mud in 37 minutes, oil in 42 minutes estimated 40 barrels oil per hour, 3/4" choke, FP 455-484#, SIP 2775-2749#, HP 3521#.

Perforations:
Perforated 6110-30 with 2 holes per foot. Acidized with 500 gallons mud acid. Shut in 20 minutes, reversed out, kicked off and flowed in 5 minutes; flowed 8 1/2 barrels oil in 1 hour. With 10/64" choke, tubing pressure 1000#, casing pressure 600#; flowed 7 barrels oil for 90 minutes through 13/64" choke, tubing pressure 1050#, casing pressure 600#; flowed 121 barrels oil in 5 1/2 hours through 20/64" choke, tubing pressure 950#, casing pressure 475#, flowed at rate of 22 barrels oil per hour on 5 1/2 hour test; shut in tubing pressure 1175#, shut in casing pressure 650#. IPF 326 barrels of oil in 16 hours, 16/64" choke, tubing pressure 1000#, casing pressure 475#, 39.4 API, estimated GOR - 900.

Casing Record:
502 feet of 8 5/8 inch surface casing cemented with 360 sacks.
6,199.5 feet of 5 1/2 inch production casing cemented in with 275 sacks.
6,137 feet of 2 3/8" inch tubing.

Core Record:
1. 6071-97, recovered 26 feet.
2. 6104-31, recovered 27 feet.
3. 6131-58, recovered 27 feet.

Logs Run:
Laterolog-gamma ray, microlaterolog, sonic log, (all Schlumberger).

Formation tops were determined by the samples and mechanical logs. Color names used are those of the National Research Council’s Color Chart.
FORMATION TOPS

Cretaceous System
  Pierre fm. 1,125
  Greenhorn fm. 3,350
  Mowry fm. 3,623
  Fall River 3,960

Jurassic System
  Swift Em (?) 4,290
  Rierdon fm. 4,655
  Piper fm. 4,835
  “Piper limestone” 5,020

Triassic (?) System
  Spearfish fm. 5,263

Mississippian System
  Charles fm. 5,624
  Midale zone 6,078
  Nesson zone 6,110
  T.D. 6,210
  P.B. 6,173

530-540 Abundant lignite and light gray to greenish gray shale.
540-550 As above.
550-560 As above.
560-570 As above.
570-580 As above, rare very pale orange quartzite pebbles.
580-590 As above.
590-600 Lignite, and greenish gray shale, as above.
600-610 Abundant shale, as above, slightly limy, rare, lignite.
610-620 Abundant lignite with common greenish gray shale.
620-630 Shale as above, very rare lignite.
630-640 Abundant lignite, rare shale as above, rare pink quartzite pebbles, rare moderate yellowish brown siltstone.
640-650 Abundant shale, as above, rare lignite.
650-660 As above.
660-670 As above.
670-680 Avery abundant lignite, rare greenish gray shale.
680-690 As above, rare very light gray fine-grained sandstone.
690-700 Abundant greenish gray shale as above with common pale reddish brown shale.
700-710 Shale, silty as above with rare reddish brown siltstone.
710-720 As above.
720-730 As above, red-brown shale more common than the greenish shale.
730-740 Greenish-gray silty shale, as above.
740-750 As above, common reddish brown silty shale, very rare white chert & black lignite.
750-760 Greenish gray to pale pale olive, silty shale.
760-770 As above.
770-780 As above, slightly sandy.
780-790 Missing.
790-800 As above, stained reddish brown (heated in dryer?)
800-810 Shale as above.
810-820 Shale as above, rare fine grained sandstone, quartz and glauconite (?) grains with white matrix.
820-830 Lignite.  
830-840 Lignite.  
840-850 Lignite, rare greenish gray shale.  
850-860 As above.  
860-880 As above.  
880-890 Sandstone, medium to coarse grained, subrounded quartz, chert & dark mineral grains, shaly; very rare lignite.  
890-910 Missing.  
910-920 Sandstone and common lignite as above.  
920-930 As above.  
930-940 Light gray to white sandstone and greenish gray shale.  
940-950 As above, rare lignite.  
950-960 Sandstone and shale as above.  
960-970 As above with rare pale yellowish brown chert(?).  
970-980 Shale and medium to coarse grained sandstone, as above.  
980-990 As above.  
990-1000 As above, rare dark gray shale.  
1000-1010 Missing.  
1010-1020 Common pale olive shale, common white sandstone, as above, rare pale yellowish brown chert and black lignite.  
1020-1030 Shale, silty, as above, rare lignite.  
1030-1040 As above.  
1040-1060 As above.  
1060-1070 Sandstone, very light gray to white, medium to coarse grained subrounded to rounded quartz grains in a white matrix, friable, rare brown shale and black lignite. Sandstone slightly glauconitic.  
1070-1080 Missing.  
1080-1090 Abundant sandstone and rare lignite and shale as above.  
1090-1100 As above.  
1100-1110 Missing.  
1110-1120 Very light gray to white, clayey shale, slightly sandy, common lignite and black shale.  
1125 Top of Pierre  
1120-1130 Sandy shale, rounded to subrounded medium to coarse quartz grains “Floating” in a very light gray to white shale, rare lignite and brown shale.  
1130-1140 As above, rare black shale.  
1140-1150 Sandy shale as above, rare lignite and brown shale.  
1150-1160 As above.  
1160-1170 As above with medium gray sandy shale.  
1170-1190 As above.  
1190-1200 Medium gray finely sandy and silty shale.  
1200-1220 As above.  
1220-1230 Medium gray and light gray shale.  
1230-1240 Light gray to white sandy shale.  
1240-1250 Sandy shale as above.  
1250-1260 Shale, medium gray, silty, pyritic, rare white shale as above.  
1260-1300 Medium gray shale, as above, rare lignite and sandstone cavings.  
1300-1350 Shale as above.  
1350-1400 As above.  
1400-1600 Missing.
1600-1650 Medium gray to medium light gray silty shale, rare greenish gray shale. Rare lignite cavings.
1650-1700 Missing.
1700-1800 Medium gray to dark gray shale. Rare lignite and red brown siltstone cavings.
1800-1850 As above, rare white sandstone and mollusk fragments.
1850-1900 As above.
1900-1950 Medium gray, rarely dark gray, silty, pyritic shale, rare mollusk fragments, rare lignite cavings.
1950-2000 Medium gray silty shale becoming dark gray toward base, rare light gray sandy shale at about 1970-80. Rare mollusk fragments and lignite cavings.
2000-2050 Medium gray and dark gray silty shale, rare mollusk fragments, rare cavings of lignite and white limey, glauconitic sandstone.
2050-2100 Shale, as above.
2100-2160 As above.
2160-2200 As above.
2200-2250 Medium gray and dark gray shale, rare light gray sandstone.
2250-2300 As above, sandy at 2270-80.
2300-2350 AS above.
2350-2400 Medium gray, silty, slightly pyritic shale.
2400-2450 As above.
2450-2470 As above.
2470-2510 Missing.
2510-2550 As above, common light gray silty shale 2510-2530.
2550-2600 Medium gray shale, as above.
2600-2650 Medium gray to dark gray silty and pyritic shale.
2650-2700 As above.
2700-2750 As above with abundant dark gray to grayish black shale at 2710-2740.
2750-2800 Medium gray and dark gray, clayey, micaceous shale.
2500-2850 As above.
2850-2900 As above.
2900-2950 As above with rare white shale.
2950-3000 As above.
3000-3050 As above.
3050-3100 As above.
3100-3140 As above.
3140-3150 Dark gray limy shale with white specks.
3150-3200 As above, with dark gray non-speckled shale and common medium gray shale.
3200-3230 As above.
3230-3240 Abundant medium gray shale, common dark gray, slightly limy shale, rare white limestone.
3240-3250 As above with common speckled shale.
3250-3260 Shale, as above, with rare white limestone.
3260-3270 As above, speckled shale very rare.
3270-3280 As above.
3280-3290 Shale, as above.
3290-3300 Medium gray and dark gray shale.
3300-3350 As above, rare mollusk fragments and white limestone, very rare pyrite.
3350  Top of Greenhorn fm.
3350-3400  As above, rare white sandy limestone at 3380-90.
3400-3430  Abundant medium gray shale, common dark gray shale, rare white limestone and mollusk fragments.
3430-3450  Abundant dark gray shale, common medium gray shale, rare limestone and mollusk fragments.
3450-3460  Shale, as above, rare light gray to white, limy sandstone.
3460-3500  As above.
3500-3510  As above, rare dark yellowish brown limestone.
3510-3550  As above, rare speckled shale.
3550-3600  Shale, as above, rare limestone and sandstone, as above.
3623  Top of Mowry fm.
3600-3650  Dark gray and medium gray shale.
3650-3700  As above.
3700-3750  Dark gray clayey shale and medium gray silty shale.
3750-3800  As above.
3800-3850  As above.
3850-3900  As above, rare light gray, medium-grained sandstone.
3900-3950  Shale and very rare sandstone, as above.
3960  Top of Fall River fm.
3950-4000  As above with very rare pyrite.
4000-4050  Dark gray shale, as above; common medium gray shale as above, and rare sandstone and, pyrite as above.
4050-4100  As above, rare mollusk fragments; rare dark yellowish brown siltstone.
4100-4150  Shale, as above.
4150-4200  Dark gray shale and medium gray silty shale, as above.
4200-4250  As above.
4290  Top of Swift fm.
4250-4300  As above.
4300-4350  As above.
4350-4400  As above, rare quartz grains and mollusk fragments.
4400-4450  Shale as above.
4490-4500  As above.
4500-4550  As above, with rare white medium-grained sandstone.
4550-4600  Shale and rare sandstone, as above. Very rare white sandy limestone.
4600-4650  As above, rare greenish gray fine grained sandstone and shale.
4655  Top of Rierdon fm.
4650-4700  As above.
4700-4750  Shale, dark gray, medium gray, and greenish gray, as above.
4750-4830  Missing.
4835  Top of Piper fm.
4830-4840  Abundant greenish gray clayey and silty shale, common reddish brown shale; rare pink, medium-grained quartz sandstone; rare light gray to white medium-grained quartz sandstone; very rare yellowish brown and violet shale. Very rare black shale.
4840-4870  As above, rare white limestone.
4870-4880  Shale, as above, common white limey sandstone. Rare pale
yellowish-brown limestone.

4880-4890 Shale and sandstone, as above; common pale yellowish-brown glauconitic limestone.
4890-4900 As above, oolitic limestone.
4900-4910 As above.
4910-4920 Greenish gray and black shale, common pale yellowish-brown to white sandy and oolitic limestone, rare greenish gray medium to fine grained sandstone.
4920-4930 Shale and sandstone as above, common pale yellowish-brown limy shale, rare limestone as above.
4930-4940 As above, reddish brown shale.
4940-4950 As above.
4950-4960 Greenish gray shale and sandstone, black shale (cave?) common white limy sandstone, rare limestone as above.
4960-4970 Shale as above, rare sandstone and limestone as above.
4970-4980 As above, rare dark gray sandstone.
4980-4990 Shale as above, common greenish gray micaceous fine-grained sandstone, rare white limy sandstone and white limestone.
4990-5000 Shale, as above, rare limestone and sandstone as above.
5000-5010 As above, common light gray to white sandy limestone.
5010-5020 Medium gray to dark gray shales, rare limestone and sandstone as above.

5020 Top of "Piper limestone".
5020-5030 As above.
5030-5040 As above.
5040-5050 Shale as above, common white, fine crystalline limestone.
5050-5060 As above with silty greenish gray shale.
5060-5070 Abundant limestone as above; common shale as above.
5070-5080 As above.
5080-5090 Abundant shale as above; common white limestone as above.
5090-5100 Shale as above; rare limestone as above.
5100-5110 Shale, as above.
5110-5120 Missing.
5120-5130 Dark gray shale, common reddish brown shale; very rare white limestone.
5133 Circulation sample as above.
5130-5140 Abundant greenish gray shale and dark gray shale; rare reddish brown shale and white limestone.
5140-5150 Shale as above.
5150-5200 As above.
5200-5230 Missing.
5230-5240 Shale, as above; common white gypsum.
5240-5260 Missing.

5263 Top of Spearfish fm.
5260-5270 Shale and gypsum, as above, rare white limestone.
5270-5320 Missing.
5320-5330 Abundant greenish gray and brown clayey shale, common reddish brown fine-grained sandstone; rare white gypsum.
5330-5340 Shale and sandstone, as above; rare greenish-gray sandstone and black shale (cave?)
5340-5350 Abundant reddish brown splintery shale; common greenish gray shale and reddish brown sandstone.
5350-5360  As above.
5360  Circulated sample as above.
5360-5370  Abundant dark gray & greenish gray shales, common reddish brown shale and sandstone.
5370-5400  As above, rare white gypsum and anhydrite, very rare white limestone.
5400-5450  Shales and sandstones, as above, with rare medium gray silty and limy shale.
5450-5500  Variegated shales and reddish brown sandstone as above.
5500-5550  As above, reddish brown shales predominate.
5550-5580  As above, dark gray and medium gray shales predominate.
5580-5590  Shales as above, abundant reddish brown, fine to medium grained poorly sorted sandstone.
5590-5600  Abundant dark gray medium gray and greenish gray shales, common sandstone as above.
5600-5610  As above.
5610-5620  As above, rare dark gray silty and sandy shale.
5624  Top of Charles fm.
5620-5630  As above, rare reddish brown shale and medium gray fine-grained silty sandstone.
5630-5640  Abundant dark gray, medium gray and greenish gray shales, common reddish brown shale and sandstone, very rare brown limy shale and medium gray sandstone.
5640-5650  As above, reddish brown shales and sandstones predominate, common white to pink anhydrite.
5651  Circulation - 1 hour. Abundant dark gray and greenish gray shales, common reddish brown shale and white to pink anhydrite.
5650-5660  As above.
5660-5670  As above with very rare greenish sandstone and pale brown limy shale.
5670-5680  Abundant dark gray and medium gray shale, common reddish brown shale and white to pink anhydrite, rare greenish gray shale.
5680-5690  Abundant light red to moderate pink pseudo-oolitic anhydritic limestone, rare fine crystalline limestone of the same color, common dark gray shale and white anhydrite as above.
5690-5700  Very abundant limestone as above, common dark gray and medium gray shale as above (cavings?).
5700-5710  Common shale as above, common reddish brown very-fine-grained limy sandstone, rare white to pink anhydrite, very rare limestone as above.
5710-5720  As above.
5720-5730  Abundant white to light pink and very pale orange earthy limestone, rare white and pink anhydrite, common dark gray shale (cave?), rare reddish brown shale and sandstone.
5730-5740  As above, rare moderate red limestone.
5740-5750  Abundant white to very pale orange, fine-crystalline limestone, rare white anhydrite, rare black shale cavings.
5750-5760  As above, with rare very pale orange pseudo-oolitic limestone.
5760-5770  Common white to moderate red limy anhydrite, rare limestone as above, rare moderate red limestone, black and medium gray shale cavings.
5770-5780  Abundant dark gray to medium gray shale, common anhydrite as above, very rare limestone as above.
5780-5790 Black and reddish brown shale, common white limy anhydrite.
5797 Circulation - 1 hour. Abundant white limy anhydrite, common very pale orange fine crystalline limestone, common black shale.
5800-5810 Abundant black and medium gray shale, common anhydrite and limestone as above.
5810-5820 As above, rare medium gray fine crystalline limestone.
5820-5830 Black shale and white anhydrite as above; rare grayish purple limestone.
5830-5840 Missing.
5840-5850 As above.
5850-5860 Black and medium gray shale (cavings?) rare limestone and anhydrite as above.
5860-5870 Black and medium gray sandy shale, rare reddish brown shale, very rare white anhydrite.
5870-5880 As above, badly caved.
5880-5890 As above.
5893 Circulated sample as above.
5890-5900 Common medium gray fine crystalline, very pale orange pseudo-oolitic anhydritic limestone; common white anhydrite, common reddish-brown shale and black shale.
5900-5910 Pale yellowish brown, fine-crystalline to coarsely crystalline and pseudo-oolitic limestone, rare white anhydrite, common black and medium gray shale cavings.
5910-5920 As above.
5920-5930 Very abundant black and medium gray shale, rare white anhydrite.
5930-5940 Shale, as above.
5940-5950 Shale and anhydrite, as above; very rare pale yellowish brown fine crystalline limestone.
5950-5960 Shale and rare anhydrite as above.
5960-5970 As above.
5970-5980 As above.
5980-5990 As above.
5990-6000 As above, rare medium gray sandy shale.
6000-6005 Pale yellowish brown medium crystalline limestone, slightly anhydritic. Cavings as above.
6005-6010 Abundant moderate yellowish brown fine crystalline to finely granular limestone.
6010-6013 Limestone as above, badly caved.
6013 Circulation - 1 hour. As above.
6010-6015 Medium gray and dark gray shale, rare white anhydrite.
6015-6020 As above, with rare yellowish brown finely granular limestone.
6020-6025 As above.
6025-6030 As above.
6030-6035 As above with dark blue-gray anhydrite.
6035-6040 Shale as above, white and bluish gray anhydrite as above.
6040-6045 As above, abundant anhydrite.
6045-6050 Abundant moderate yellowish brown fine-crystalline limestone, common bluish gray anhydrite as above, shale cavings as above.
6050-6055 Anhydrite and shale as above, rare limestone as above.
6055-6060 As above with rare yellowish brown anhydrite.
6060-6065 Shale and abundant anhydrite as above.
6065-6070 As above, very rare pale yellowish brown limestone.
6071 Circulation - 1 hour. Shale cavings.
Core #1

6070-6071 Limestone, very light gray, finely granular, brach shells, good porosity, weak fluorescence.

6071-6072 Dolomite, pale yellowish brown, fine crystalline, dense, anhydritic.

6072-6073 Dolomite, limy, pale yellowish brown, medium crystalline, anhydritic, tight.

6073-6074 Limestone, pale yellowish brown, finely granular, good porosity, good cut and fluorescence.

6074-6075 Anhydrite, dark gray, shaly and limy, dense.

6075-6076 Limestone, pale yellowish brown, anhydritic, finely granular, good porosity fair cut and fluorescence.

6076-6077 As above, good cut and fluorescence.

6077-6078 As above, silty, good cut and fluorescence.

6078 Top of Midale zone

6078-6079 As above.

6079-6080 As above, fair cut and fluorescence.

6080-6081 Limestone, as above, weak cut and fluorescence, with pale yellowish-brown medium crystalline to finely granular limestone, good porosity, very weak fluorescence.

6081-6082 Limestone, pale yellowish brown, finely granular, good porosity, weak fluorescence.

6082-6083 As above, dead oil stain, very weak fluorescence.

6083-6084 Limestone, finely granular, good porosity, stained, fair fluorescence.

6084-6085 Limestone, pale yellowish brown, finely granular, comminuted fossil material, fair porosity, weak fluorescence.

6085-6086 Limestone, as above.

6086-6087 Limestone, pale yellowish brown, pelletal and fossiliferous, low porosity weak fluorescence.

6087-6088 Limestone, as above and finely granular, fair porosity, good cut and fluorescence.

6088-6089 Limestone, finely granular, as above, good fluorescence, dark yellowish brown calcite crystals.

6089-6090 As above, good cut.

6090-6091 Missing.

6091-6092 As above, black carbonaceous material concentrated along a stylolite.

6092-6093 Limestone, as above, good fluorescence.

6093-6094 Limestone, as above, very weak fluorescence.

6094-6095 Limestone, pale yellowish brown, pelletal and finely granular, fair porosity, no fluorescence.

6095-6096 Limestone, pale yellowish brown, pale yellowish brown, finely granular, comminuted fossil material, algal (?), low porosity, no fluorescence.

6096-6097 Limestone, pale yellowish brown, pelletal, low porosity, no fluorescence.

5097-6098 Limestone, pale yellowish brown, finely granular, fair porosity, very weak fluorescence.

6098-6104 Missing.

6104-6105 Limestone, pale yellowish brown, finely granular and pelletal, fair porosity, very weak fluorescence.
6105-6106  Limestone, pale yellowish brown, pseudo-oolitic and finely granular, common small open vugs, good porosity, stained, excellent cut and fluorescence.

6106-6107  As above, dark yellowish brown ooids in matrix of pale yellowish brown finely granular and fine crystalline matrix, carbonaceous material along small styolite, good porosity, good fluorescence and cut.

6107-6108  Limestone, pseudo-oolitic as above, weak fluorescence. Clear anhydrite (?) crystals.

6108-6109  Limestone, as above, pseudo-oolitic, anhydritic, low porosity, very weak fluorescence.

6109-6110  Limestone, as above, weak fluorescence.

6110  Top of Nesson zone

6110-6111  As above, no anhydrite, good cut and fluorescence.

6111-6112  Oolitic limestone as above, with white anhydrite in some intergranular pores, fair cut and fluorescence.

6112-6113  Limestone, as above, anhydrite inclusions, poor intergranular porosity, fair fluorescence.

6113-6114  As above.

6114-6115  Limestone, pale yellowish brown, finely granular and pelletoid, low porosity, weak fluorescence.

6115-6116  Limestone, oolitic, anhydritic, fair intergranular porosity, fair fluorescence.

6116-6117  As above.

6117-6118  As above, oolitic and pelletoid.

6118-6119  Oolitic and anhydritic limestone as above, common intergranular pores, much staining, good cut and fluorescence.

6119-6120  Limestone, oolitic and anhydritic, as above.

6120-6121  As above, pelletoid.

6121-6122  Limestone, pale yellowish brown, finely granular to medium crystalline, low porosity, good cut and fluorescence.

6122-6123  As above, slightly pelletoid, anhydritic, fair fluorescence.

6123-6124  Limestone, oolitic and pelletoid, much intergranular pore space, much staining, good cut and fluorescence.

6124-6125  Limestone, as above, much of the pore space filled with calcite and/or anhydrite, no staining, low porosity, very weak fluorescence.

6125-6126  Limestone, pale yellowish brown, fine crystalline and oolitic, oil stain in intergranular pores, good cut and fluorescence.

6126-6127  Limestone, as above, intergranular pores filled with calcite and/or anhydrite, slight porosity, no staining, weak cut and fluorescence.

6127-6128  As above.

6128-6129  As above.

6129-6130  As above, slight staining, fluorescence and cut as above.

6130-6131  Limestone, as above, oolitic and pelletoid.

6131-6132  As above with many open intergranular pores, good cut and fluorescence.

6132-6133  Limestone, slightly porous, as above.

6133-6134  Limestone, moderate yellowish brown, fine to medium crystalline, slightly pelletoid, pale yellowish brown anhydrite crystals in fractures, low porosity, weak fluorescence.
6134-6135 Limestone, moderate yellowish brown, oolitic on anhydritic, fair porosity, slight stain, fair cut and fluorescence.
6135-6136 Limestone, as above with a great amount of anhydrite, large vugs lined with anhydrite crystals, very weak fluorescence.
6136-6137 Limestone, pseudo-oolitic and pelletoid, rare intergranular pores, low porosity, fair cut and fluorescence.
6137-6138 As above.
6138-6139 Limestone, pale yellowish brown, medium crystalline and pelletoid, common brownish anhydrite (?) crystals. Weak cut.
6139-6140 As above with much white anhydrite, low porosity, fair cut and fluorescence.
6140-6141 As above, slight oil stain.
6141-6142 Limestone, pale yellowish brown, finely granular, good porosity weak cut and fluorescence.
6142-6143 Limestone, pale yellowish brown, medium crystalline with patches of very light gray fine crystalline limestone and with common colorless calcite and/or anhydrite crystals, low porosity, no staining, the light gray limestone seems to be replacing the yellowish brown part. No cut.
6143-6144 Limestone, moderate yellowish brown, fine crystalline-fragmental, slight staining in the matrix between the fragments, low porosity, no cut.
6144-6145 Limestone, moderate yellowish brown, fine crystalline, low porosity no stain, no cut.
6145-6146 Limestone, dolomitic, pale yellowish brown, fine crystalline, low porosity, no cut.
6146-6147 As above.
6147-6148 Limestone, very light gray, finely granular, good to fair porosity, no cut.
6148-6149 Limestone, very light gray, finely granular to finely pelletoid.
6149-6150 Limestone, pale yellowish brown, finely granular, good porosity, very weak fluorescence.
6150-6151 As above.
6151-6152 As above, weak cut.
6152-6153 Limestone, pale yellowish brown, finely granular and pelletoid, fair porosity, very weak cut.
6153-6154 As above, dark brown pellets and small pellet fragments in pale yellowish brown granular matrix.
6154-6155 Limestone, light gray, medium crystalline, slight porosity.
6155-6156 Limestone, yellowish brown, pelletoid, low porosity.
6156-6157 Limestone, moderate yellowish brown; fine crystalline to sub-lithographic, slight stain, low porosity.
6157-6158 As above.
6158-6159 Circulation - 1/2 hour. Abundant moderate yellowish brown sub-lithographic limestone, common black shale cavings.
6159-6165 Common very light gray finely granular limestone and pale yellowish brown pelletoid limestone.
6165-6170 As above with yellowish brown pelletoid limestone more common.
6170-6175 As above.
6175-6180 As above with rare very pale orange to white fine crystalline limestone.
6180-6185 Abundant moderate yellowish brown fine crystalline limestone, common very light gray finely granular dolomitic limestone.
6185-6190 As above.
6190-6195  As above with rare yellowish brown pelletoid limestone.
6195-6200  Abundant pale yellowish brown pelletoid limestone slightly oil-stained with common moderate yellowish brown sublithographic limestone and rare yellowish brown finely granular limestone.
6200-6205  Abundant pale yellowish brown pelletoid limestone, black shale cavings.
6205-6210  As above.
6210       Total Depth.