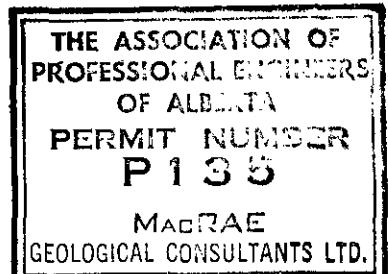


REPORT  
on the  
DRILLING AND ABANDONMENT  
of  
Union Decalta Good Hope A-40  
NTS 96-K-7, Grid Corner  
Unit A, Section 40



Reported by:

MACRAE GEOLOGICAL CONSULTANTS LTD.

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March, 1975

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GEOLOGICAL SUMMARY & PERTINENT DATA

Company: Union Oil Company of Canada Limited,  
 335 Eighth Avenue South West,  
 Calgary, Alberta.

Well Name: Union Decalta Good Hope A-40

Location: NTS 96-K-7: Grid Corner  
 Unit A, Section 40

Coordinates:  $124^{\circ} 35' 52''$  West  
 $66^{\circ} 29' 10''$  North

Well Classification: New Field Wildcat

Unique Well Identifier: 300A406630124300

Drilling Authority: No. 786

Land Permit: No. 6421

Elevations: Kelly Bushing - 1456 feet  
 Ground - 1444 feet

Objective: To test the porous basal Cambrian Sands  
 of the Old Fort Island Formation; also,  
 to test the porous sandstone units in the  
 lower part of the Mount Cap Formation  
 where they have been faulted and folded  
 along Good Hope Ridge.

Final Status: Dryhole - Abandoned

Stratigraphy:

<u>Marker</u>	<u>Top</u>	<u>Subsea</u>
Lower Ordovician:		
Cherty Unit	Surface	+1444
Rhythmic Unit	1383	- 73
Cyclic Unit	1950	- 494
Cambrian:		
Saline River	2342	- 886
Salt	2742	-1286
Mount Cap	4000	-2544
Old Fort Island	4880	-3424
Proterozoic:	5060	-3604

GEOLOGICAL SUMMARY & PERTINENT DATA

Total Depth: 5225

Formation Tests: None

Cored Intervals: None

Oil Shows: None

Gas Shows: See Gas Log

Schlumberger Logs:

Gamma Ray-Neutron Log: Run No. 1, 2498 - 40  
Run No. 2, 3154 - 1400

Gamma Ray: Run No. 1, 4240 - 3100

Gas Logging: Frontier Mud Logging Ltd.

Contractor: Tri-City Drilling (1968) Ltd.

Rig: No. 2

Hole Size: 17<sup>1</sup>/<sub>2</sub>" - surface to 39 feet  
12<sup>1</sup>/<sub>2</sub>" - 39 to 700 feet  
8<sup>3</sup>/<sub>4</sub>" - 700 to 3325 feet  
6<sup>1</sup>/<sub>4</sub>" - 3325 to 5225 feet

Casing Record: 13<sup>3</sup>/<sub>8</sub>"; 5<sup>1</sup>/<sub>4</sub>.5#; K-55 - Landed at 38 feet  
9<sup>5</sup>/<sub>8</sub>"; 36#; K-55 - Landed at 688.24 feet  
7"; 23#; J-55 & N-80 - Landed at 3325 feet

Plugs: No. 1 - 4280-4180  
No. 2 - 3375-3275

Spud Date: December 14, 1974 at 6:00 P.M.

Rig Released: January 28, 1975 at 4:00 P.M.

SAMPLE DESCRIPTIONS

0 - 20      No samples.

20 - 30      100% Dolomite - light buff to light grey, crypto-x-line to very finely crystalline, trace iron oxide stain, no visible porosity.

30 - 40      100% Dolomite - light buff, occasionally light grey, very finely crystalline, no visible porosity.

40 - 50      60% Dolomite - light buff to pinkish-buff, very finely to finely crystalline, some small quartz crystals, occasional medium vug, overall porosity estimated poor.  
40% Chert - light grey, some medium grey, very hard.

50 - 60      90% Dolomite - medium grey to medium greyish-brown, common yellowish-buff, very finely crystalline to occasionally medium crystalline, some yellow and pink iron oxide stain, trace vug, generally no porosity.  
10% Chert - light to medium grey, as above.

60 - 70      100% Dolomite - light pinkish-grey or light rusty-grey, micro-x-line, iron oxide stain, no visible porosity.  
Tr. Chert.

70 - 80      90% Dolomite - light grey mottled light pinkish-grey, micro-x-line, patchy iron oxide stain associated with vugs and fractures, generally poor vuggy porosity.  
10% Chert - light grey.

80 - 90      80% Dolomite - whitish-grey to light grey with tinge of yellow, micro-x-line to ill-formed finely crystalline, some patchy yellow iron oxide stain, no visible porosity.  
20% Chert - light grey, commonly milky white.

90 - 100      100% Dolomite - light grey, crypto-x-line to micro-x-line, with some large opaque to translucent calcite crystals, estimate no porosity.

100 - 110      100% Dolomite - light grey to whitish-grey, crypto-x-line to occasionally micro-x-line, trace calcite crystals, trace iron oxide stain, no visible porosity.

110 - 120      100% Dolomite - light buff, crypto-x-line to micro-x-line, trace iron oxide stain, no visible porosity.  
Tr. Chert.

SAMPLE DESCRIPTIONS (cont'd)

120 - 130 100% Dolomite - buff with yellowish-tinge, crypto-x-lline to micro-x-lline, trace quartz crystals, very weak iron oxide stain, trace vuggy porosity.

130 - 140 100% Dolomite - light buff to light grey, crypto-x-lline, trace yellowish-iron oxide stain, no visible porosity.  
Tr. Chert.

140 - 150 90% Dolomite - light buff, finely crystalline, trace quartz crystals, estimate very poor vuggy porosity.  
10% Chert - milky white to light grey.

150 - 160 95% Dolomite - light buff to light grey, crypto-x-lline to micro-x-lline, no visible porosity.  
5% Chert - milky white to light grey.

160 - 170 100% Dolomite - light buffish-grey, crypto-x-lline to commonly finely to medium crystalline, common yellowish iron oxide stain, estimate poor inter-crystalline porosity.

170 - 180 100% Dolomite - light grey. some light buff, as above, crypto-x-lline to micro-x-lline, some quartz crystals, estimate poor vuggy porosity.

180 - 190 60% Dolomite - light yellowish-grey, finely crystalline, some quartz crystals, estimate poor vuggy porosity.  
40% Dolomite - light grey, crypto-x-lline, no visible porosity.  
Tr. Chert.

190 - 200 60% Dolomite - light buff to buff, micro-x-lline to finely crystalline, trace very small crystals - quartz and possibly dolomite, very poor vuggy porosity.  
30% Dolomite - light grey, crypto-x-lline to micro-x-lline, no visible porosity.  
10% Chert - milky white to light grey.

200 - 210 100% Dolomite - buff, very finely to finely crystalline, estimate poor to fair inter-x-lline porosity.

NOTE: Hole now making some water; hence start foam drilling.

210 - 220 100% Dolomite - buff to light grey, finely crystalline to occasionally crypto-x-lline, estimate fair inter-x-lline porosity.

SAMPLE DESCRIPTIONS (cont'd)

220 - 230 100% Dolomite - light grey, some light buff, crypto-x-lline, some quartz and dolomite crystals, estimate very poor vuggy porosity.

230 - 240 100% Dolomite - light buffish-grey, finely crystalline with some crypto-x-lline, estimate poor to fair inter-x-lline porosity.  
Tr. Chert - milky white.

240 - 250 80% Dolomite - light buff, micro-x-lline to finely crystalline, trace very small crystals (quartz?), estimate very poor vuggy porosity.  
20% Chert - light grey to milky white.

250 - 260 50% Dolomite - light grey, crypto-x-lline to micro-x-lline, no visible porosity.  
50% Dolomite - light yellowish-buff to light grey, finely crystalline, trace medium crystalline, trace euhedral dolomite crystals, estimate poor to fair inter-x-lline porosity.

260 - 270 90% Dolomite - yellowish-buff to light grey, finely to coarsely crystalline, common yellowish and pink iron oxide stain, common medium quartz crystals, estimate fair vuggy porosity.  
10% Chert, milk white.

270 - 280 90% Dolomite - light grey, some light buff, some yellowish-buff, some spotted red, crypto-x-lline to micro-x-lline, patchy stains of iron oxide, common quartz crystals, fair vuggy porosity.  
10% Chert - light grey and milky white.

280 - 290 100% Dolomite - light grey to light buff, crypto-x-lline to micro-x-lline, abundant quartz crystals, estimate good vuggy porosity.

290 - 340 No samples - no foam or air returns.

340 - 350 80% Dolomite - buff, some light grey, crypto-x-lline to ill-formed medium crystalline, some quartz crystals, estimate poor vuggy porosity.  
20% Chert - milk white to light grey.

350 - 360 70% Dolomite - buff, ill-formed finely to medium crystalline, some quartz crystals, estimate poor vuggy porosity.  
30% Chert - milk white to light grey.

SAMPLE DESCRIPTIONS (cont'd)

360 - 370      90% Dolomite - dark buff, some dark grey, micro-x-lline to some ill-formed medium crystalline, slightly argillaceous, no visible porosity.  
                   10% Chert - milk white.

370 - 380      70% Chert - white to milk white, very hard.  
                   30% Dolomite - as above, with some quartz crystals, estimate fair vuggy porosity.

380 - 390      No samples - no returns.

390 - 400      90% Chert - light buff to light grey, sublithographic to lithographic (silicified dolomite), trace vugs.  
                   10% Dolomite - buff, medium crystalline, no visible porosity.

400 - 410      70% Chert - light grey to white, lithographic to sub-lithographic, (silicified dolomite).  
                   30% Dolomite - buff to medium grey, fine to medium crystalline, no visible porosity.

410 - 420      90% Dolomite - light buff to buff, some dark grey, finely to medium crystalline, trace argillaceous, no visible porosity.  
                   10% Chert - milk white, some light grey.

420 - 430      70% Dolomite - light grey to white, some light buff, micro-x-lline, trace quartz crystals, trace vuggy porosity.  
                   30% Chert - milk white.

430 - 440      90% Dolomite - light buff, some buff, very finely crystalline, trace vuggy porosity.  
                   10% Chert - white.

440 - 450      90% Dolomite - light buff, crypto-x-lline to very finely crystalline, some quartz crystals, very poor vuggy porosity.  
                   10% Chert - white.

450 - 460      100% Dolomite - light buff to buff, common light grey, very finely to finely crystalline, no visible porosity.  
                   Tr. Chert.

460 - 470      100% Dolomite - light buff to buff, some white, very finely to finely crystalline, estimate very poor vuggy porosity.

SAMPLE DESCRIPTIONS (cont'd)

470 - 480 100% Dolomite - buff, micro-x-lime to finely crystalline, no visible porosity.  
Tr. Chert - white.

480 - 490 100% Dolomite - buff, finely crystalline, slightly argillaceous, no visible porosity.

490 - 500 90% Dolomite - buff, micro-y-lime to crypto-x-lime, slightly argillaceous, no visible porosity.  
10% Chert - white - trace bird's eye structure.

500 - 510 100% Dolomite - light buff, trace medium grey, micro-x-lime, no visible porosity.

510 - 520 100% Dolomite - light buff, occasionally whitish-grey, trace medium grey, micro-x-lime to very finely crystalline, no visible porosity.

520 - 530 100% Dolomite - light buff, very finely crystalline, trace crypto-x-lime, no visible porosity.

530 - 540 100% Dolomite - light buff, some stained light yellow (iron oxide), very finely crystalline, trace quartz crystals, poor vuggy porosity.

540 - 550 100% Dolomite - light buff, micro-y-lime to very finely crystalline, trace finely to medium crystalline, some quartz crystals, very poor vuggy porosity.  
Tr. Chert - white.

550 - 560 No sample.

560 - 570 100% Dolomite - medium tan, some light buff, occasionally medium grey, crypto-x-lime, slightly argillaceous, silty, no visible porosity.

570 - 580 No sample - no air returns.

580 - 590 100% Dolomite - buff, common medium grey, crypto-y-lime, some finely to coarsely crystalline, silty, no visible porosity.

590 - 600 No sample - no air returns.

600 - 610 No sample - no air returns.

610 - 620 100% Dolomite - mottled buff and light grey, trace medium grey, micro-y-lime, slightly silty, no visible porosity.

SAMPLE DESCRIPTIONS (cont'd)

620 - 630 100% Dolomite - buff, trace medium grey, micro-x-lime, slightly silty, no visible porosity, some mineral fluorescence.

630 - 640 100% Dolomite - buff, occasionally tan, occasionally medium grey, micro-x-lime, slightly silty, no visible porosity.

640 - 650 100% Dolomite - buff to light buff, trace medium grey, crypto-x-lime to micro-x-lime, occasionally finely crystalline, trace iron oxide stain, slightly silty, no visible porosity.

650 - 660 100% Dolomite - buff to medium tan, trace medium grey, micro-x-lime to trace finely crystalline, trace iron oxide stain, some iron oxide fragments associated with finely crystalline, silty, no visible porosity.

660 - 670 100% Dolomite - light buffish-grey, mottled buff, very finely crystalline, silty, no visible porosity.

670 - 680 100% Dolomite - buff, common medium grey, some light buff, very finely to medium crystalline, some crypto-x-lime, trace finely pyritic, slightly silty, no visible porosity.

680 - 690 100% Dolomite - light buff, occasionally medium grey, micro-x-lime to very finely crystalline, common finely to coarsely crystalline, trace iron oxide stain, no visible porosity.

690 - 700 100% Dolomite - buff, some medium grey, micro-x-lime, trace finely to medium crystalline, trace finely pyritic, slightly silty, no visible porosity.  
Tr. Chert - light grey.

700 - 710 100% Dolomite - buff, occasionally light grey, very finely to finely crystalline, slightly silty, no visible porosity.

710 - 720 100% Dolomite - buff, fine to medium crystalline, occasionally crypto-x-lime, trace iron oxide stain associated with fractures, silty, trace vuggy porosity.

720 - 730 100% Dolomite - light buff to whitish-grey, finely to coarsely crystalline, occasionally clear euhedral dolomite rhombs, trace silty, trace vuggy porosity.

SAMPLE DESCRIPTIONS (cont'd)

730 - 740 100% Dolomite - light buff, medium crystalline, some finely to coarsely crystalline, some small clear dolomite rhombs, estimate very poor vuggy porosity.

740 - 750 100% Dolomite - light buff to occasionally buff, some yellowish-buff, fine to coarsely crystalline, some small clear dolomite rhombs, estimate very poor vuggy porosity.

750 - 760 100% Dolomite - light buff, trace rose buff, medium to very coarsely crystalline, trace vuggy porosity.

760 - 770 100% Dolomite - light buff, some light yellowish-buff, medium to very coarsely crystalline, trace finely crystalline, some clear small dolomite rhombs, estimate very poor vuggy porosity.  
Tr. Green shale.

770 - 780 100% Dolomite - light buff, fine to very coarsely crystalline, trace clear dolomite rhombs, slightly silty, estimate very poor vuggy porosity.

780 - 790 100% Dolomite - light buff, fine to medium crystalline, occasionally coarsely crystalline, occasionally micro-x-line, no visible porosity.

790 - 800 100% Dolomite - light buff, trace medium grey, finely to medium crystalline, commonly coarsely crystalline, no visible porosity.

800 - 810 100% Dolomite - light buff, trace red and pink iron oxide stain, occasionally medium grey, fine to medium crystalline, some clear dolomite rhombs, estimate poor vuggy porosity.

810 - 820 100% Dolomite - light buff, occasionally medium grey, very finely to finely crystalline, some medium crystalline, trace clear dolomite rhombs, no visible porosity.

820 - 830 100% Dolomite - light buff, occasionally medium grey, finely to medium crystalline, occasionally coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

830 - 840 100% Dolomite - light buff, fine to medium crystalline, common clear dolomite rhombs, estimate poor vuggy porosity.

SAMPLE DESCRIPTIONS (cont'd)

840 - 850 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity, trace pyrite.

850 - 860 100% Dolomite - light buff, occasionally medium grey, finely to medium crystalline, some micro-x-lline, some clear dolomite rhombs, estimate poor vuggy porosity.

860 - 870 100% Dolomite - light buff, occasionally medium grey, finely to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

870 - 880 100% Dolomite - light buff, fine to coarsely crystalline, trace clear dolomite rhombs, slightly silty, no visible porosity.

880 - 890 100% Dolomite - light buff, fine to coarsely crystalline, trace clear dolomite rhombs, no visible porosity.

890 - 900 100% Dolomite - light buff, medium to coarsely crystalline, some finely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

900 - 910 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, trace clear dolomite rhombs, no visible porosity.

910 - 920 100% Dolomite - light buff, very finely to finely crystalline, some medium to coarsely crystalline, common finely crystalline clear dolomite rhombs, slightly silty, estimate very poor vuggy porosity.

930 - 940 100% Dolomite - light buff, fine to coarsely crystalline, some micro-x-lline, some clear dolomite rhombs, estimate poor vuggy porosity.

940 - 950 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, trace clear dolomite rhombs, possible very poor inter-x-lline porosity.

950 - 960 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

SAMPLE DESCRIPTIONS (cont'd)

960 - 970 100% Dolomite - light buff, medium to coarsely crystalline, trace clear dolomite rhombs, no visible porosity.  
 Tr. Dolomite - medium grey, micro-x-line, argillaceous, no visible porosity.

970 - 980 100% Dolomite - light buff, medium to coarsely crystalline, common clear dolomite rhombs, estimate poor to fair vuggy porosity.

980 - 990 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity and very poor inter-x-line porosity, trace iron oxide stain.  
 Tr. Dolomite - medium grey, micro-x-line, argillaceous, no visible porosity.

990 - 1000 100% Dolomite - light buff, medium to coarsely crystalline, common finely crystalline, common clear dolomite rhombs, estimate poor vuggy porosity.

1000 - 1010 100% Dolomite - light buff, finely to coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

1010 - 1020 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, trace clear dolomite rhombs, no visible porosity.

1020 - 1030 No sample - no returns.

1030 - 1040 No sample - no returns.

1040 - 1050 100% Dolomite - light buff, fine to coarsely crystalline, common clear dolomite rhombs, estimate poor vuggy porosity.

1050 - 1060 100% Dolomite - as above, estimate poor vuggy porosity.

1060 - 1070 No sample - no returns.

1070 - 1080 No sample - no returns.

1080 - 1090 100% Dolomite - light buff, fine to coarsely crystalline, common clear dolomite rhombs, estimate very poor vuggy porosity.

SAMPLE DESCRIPTIONS (cont'd)

1090 - 1100 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, common small clear dolomite rhombs, trace iron oxide stain, very poor vuggy porosity.

1100 - 1110 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, occasional clear dolomite rhombs, no visible porosity.

1110 - 1120 100% Dolomite - light buff, finely to medium crystalline, occasionally coarsely crystalline, some clear dolomite rhombs, trace vuggy porosity.

1120 - 1130 100% Dolomite - light buff, fine to coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

1130 - 1140 No sample - no returns.

1140 - 1150 100% Dolomite - light buff, fine to medium crystalline, some coarsely to very coarsely crystalline, occasional clear dolomite rhombs, no visible porosity.

1150 - 1160 100% Dolomite - light buff, fine to medium crystalline, occasionally coarsely crystalline, some clear dolomite rhombs, estimate no visible porosity.

1160 - 1170 100% Dolomite - light buff, fine to medium crystalline, trace coarsely crystalline, some clear dolomite rhombs, estimate no visible porosity.

1170 - 1180 100% Dolomite - light buff, fine to coarsely crystalline, trace clear dolomite rhombs, no visible porosity.

1180 - 1190 100% Dolomite - light buff, fine to medium crystalline, some clear dolomite rhombs, trace pyritic, estimate no porosity.

1190 - 1200 No sample - no returns.

1200 - 1210 No sample - no returns.

1210 - 1220 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, trace clear dolomite rhombs, no visible porosity.

1220 - 1230 No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

1230 - 1240 No sample - no returns.

1240 - 1250 100% Dolomite - light buff, trace pink (iron oxide stain), some clear dolomite rhombs, estimate very poor vuggy porosity.

1250 - 1260 No sample - no returns.

1260 - 1270 100% Dolomite - light buff, fine to medium crystalline, some coarsely crystalline, common very small dolomite rhombs, estimate very poor vuggy porosity.

1270 - 1280 No sample - no returns.

1280 - 1290 No sample - no returns.

1290 - 1300 100% Dolomite - light buff, finely to medium crystalline, some coarsely crystalline, some small clear dolomite crystals, estimate very poor vuggy porosity.

1300 - 1310 No sample - no returns.

1310 - 1320 100% Dolomite - light buff, firely to coarsely crystalline, occasional clear dolomite rhombs, estimate no porosity.

1320 - 1330 100% Dolomite - light buff, finely to coarsely crystalline, trace pink (iron oxide stain), some clear dolomite rhombs, estimate very poor vuggy porosity.

1330 - 1340 100% Dolomite - light buff, finely to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

1340 - 1350 100% Dolomite - light buff, firely to medium crystalline, very small clear dolomite rhombs, estimate very poor vuggy porosity.

1350 - 1360 No sample - no returns.

1360 - 1370 No sample - no returns.

1370 - 1380 No sample - no returns.

1380 - 1390 No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

1300 - 1400 100% Dolomite - light buff, finely to medium crystalline, some clear dolomite rhombs, estimate very poor vuggy porosity.

1400 - 1410 No sample - no returns.

1410 - 1420 No sample - no returns.

1420 - 1430 No sample - no returns.

1430 - 1440 100% Dolomite - light buff, finely to medium crystalline, some coarsely crystalline, common clear dolomite rhombs, estimate poor to fair vuggy porosity.

1440 - 1450 No sample - no returns.

1450 - 1460 No sample - no returns.

1460 - 1470 No sample - no returns.

1470 - 1480 No sample - no returns.

1480 - 1490 No sample - no returns.

1490 - 1500 No sample - no returns.

1500 - 1510 No sample - no returns.

1510 - 1520 No sample - no returns.

1520 - 1530 No sample - no returns.

1530 - 1540 No sample - no returns.

1540 - 1550 No sample - no returns.

1550 - 1560 100% Dolomite - light buff, trace pink (iron oxide stain), fine to medium crystalline, some coarsely crystalline, some clear dolomite rhombs, estimate poor vuggy porosity.

1560 - 1570 No sample - no returns.

1570 - 1580 No sample - no returns.

1580 - 1590 No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

1590 - 1600	No sample - no returns.
1600 - 1610	No sample - no returns.
1610 - 1620	No sample - no returns.
1620 - 1630	No sample - no returns.
1630 - 1640	No sample - no returns.
1640 - 1650	No sample - no returns.
1650 - 1660	No sample - no returns.
1660 - 1670	No sample - no returns.
1670 - 1680	No sample - no returns.
1680 - 1690	No sample - no returns.
1690 - 1700	No sample - no returns.
1700 - 1710	No sample - no returns.
1710 - 1720	No sample - no returns.
1720 - 1730	No sample - no returns.
1730 - 1740	No sample - no returns.
1740 - 1750	No sample - no returns.
1750 - 1760	No sample - no returns.
1760 - 1770	No sample - no returns.
1770 - 1780	No sample - no returns.
1780 - 1790	No sample - no returns.
1790 - 1800	No sample - no returns.
1800 - 1810	No sample - no returns.
1810 - 1820	No sample - no returns.
1820 - 1830	No sample - no returns.
1830 - 1840	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

1840 - 1850	No sample - no returns.
1850 - 1860	No sample - no returns.
1860 - 1870	No sample - no returns.
1870 - 1880	No sample - no returns.
1880 - 1890	No sample - no returns.
1890 - 1900	No sample - no returns.
1900 - 1910	No sample - no returns.
1910 - 1920	No sample - no returns.
1920 - 1930	No sample - no returns.
1930 - 1940	No sample - no returns.
1940 - 1950	No sample - no returns.
1950 - 1960	No sample - no returns.
1960 - 1970	No sample - no returns.
1970 - 1980	No sample - no returns.
1980 - 1990	No sample - no returns.
1990 - 2000	No sample - no returns.
2000 - 2010	No sample - no returns.
2010 - 2020	No sample - no returns.
2020 - 2030	No sample - no returns.
2030 - 2040	No sample - no returns.
2040 - 2050	No sample - no returns.
2050 - 2060	No sample - no returns.
2060 - 2070	No sample - no returns.
2070 - 2080	No sample - no returns.
2080 - 2090	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

2090 - 2100	No sample - no returns.
2100 - 2110	No sample - no returns.
2110 - 2120	No sample - no returns.
2120 - 2130	No sample - no returns.
2130 - 2140	No sample - no returns.
2140 - 2150	No sample - no returns.
2150 - 2160	No sample - no returns.
2160 - 2170	No sample - no returns.
2170 - 2180	No sample - no returns.
2180 - 2190	No sample - no returns.
2190 - 2200	No sample - no returns.
2200 - 2210	No sample - no returns.
2210 - 2220	No sample - no returns.
2220 - 2230	No sample - no returns.
2230 - 2240	No sample - no returns.
2240 - 2250	No sample - no returns.
2250 - 2260	No sample - no returns.
2260 - 2270	No sample - no returns.
2270 - 2280	No sample - no returns.
2280 - 2290	No sample - no returns.
2290 - 2300	No sample - no returns.
2300 - 2310	No sample - no returns.
2310 - 2320	No sample - no returns.
2320 - 2330	No sample - no returns.
2330 - 2340	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

2340 - 2350	No sample - no returns.
2350 - 2360	No sample - no returns.
2360 - 2370	No sample - no returns.
2370 - 2380	No sample - no returns.
2380 - 2390	No sample - no returns.
2390 - 2400	No sample - no returns.
2400 - 2410	No sample - no returns.
2410 - 2420	No sample - no returns.
2420 - 2430	No sample - no returns.
2430 - 2440	No sample - no returns.
2440 - 2450	No sample - no returns.
2450 - 2460	No sample - no returns.
2460 - 2470	No sample - no returns.
2470 - 2480	No sample - no returns.
2480 - 2490	No sample - no returns.
2490 - 2500	No sample - no returns.
2500 - 2510	No sample - no returns.
2510 - 2520	No sample - no returns.
2520 - 2530	No sample - no returns.
2530 - 2540	No sample - no returns.
2540 - 2550	No sample - no returns.
2550 - 2560	No sample - no returns.
2560 - 2570	No sample - no returns.
2570 - 2580	No sample - no returns.
2580 - 2590	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

2590 - 2600	No sample - no returns.
2600 - 2610	No sample - no returns.
2610 - 2620	No sample - no returns.
2620 - 2630	No sample - no returns.
2630 - 2640	No sample - no returns.
2640 - 2650	No sample - no returns.
2650 - 2660	No sample - no returns.
2660 - 2670	No sample - no returns.
2670 - 2680	No sample - no returns.
2680 - 2690	No sample - no returns.
2690 - 2700	No sample - no returns.
2700 - 2710	No sample - no returns.
2710 - 2720	No sample - no returns.
2720 - 2730	No sample - no returns.
2730 - 2740	No sample - no returns.
2740 - 2750	No sample - no returns.
2750 - 2760	No sample - no returns.
2760 - 2770	No sample - no returns.
2770 - 2780	No sample - no returns.
2780 - 2790	No sample - no returns.
2790 - 2800	No sample - no returns.
2800 - 2810	No sample - no returns.
2810 - 2820	No sample - no returns.
2820 - 2830	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

2830 - 2840	No sample - no returns.
2840 - 2850	No sample - no returns.
2850 - 2860	No sample - no returns.
2860 - 2870	No sample - no returns.
2870 - 2880	No sample - no returns.
2880 - 2890	No sample - no returns.
2890 - 2900	No sample - no returns.
2900 - 2910	No sample - no returns.
2910 - 2920	No sample - no returns.
2920 - 2930	No sample - no returns.
2930 - 2940	No sample - no returns.
2940 - 2950	No sample - no returns.
2950 - 2960	No sample - no returns.
2960 - 2970	No sample - no returns.
2970 - 2980	No sample - no returns.
2980 - 2990	No sample - no returns.
2990 - 3000	No sample - no returns.
3000 - 3010	No sample - no returns.
3010 - 3020	No sample - no returns.
3020 - 3030	No sample - no returns.
3030 - 3040	No sample - no returns.
3040 - 3050	No sample - no returns.
3050 - 3060	No sample - no returns.
3060 - 3070	No sample - no returns.
3070 - 3080	No sample - no returns.
3080 - 3090	No sample - no returns.

SAMPLE DESCRIPTIONS (cont'd)

3090 - 3100	No sample - no returns.
3100 - 3110	No sample - no returns.
3110 - 3120	No sample - no returns.
3120 - 3130	No sample - no returns.
3130 - 3140	No sample - no returns.
3140 - 3150	No sample - no returns.
3150 - 3160	No sample - no returns.
3160 - 3170	No sample - no returns.
3170 - 3180	No sample - no returns.
3180 - 3190	No sample - no returns.
3190 - 3200	No sample - no returns.
3200 - 3210	No sample - no returns.
3210 - 3220	No sample - no returns.
3220 - 3230	No sample - no returns.
3230 - 3240	No sample - no returns.
3240 - 3250	No sample - no returns.
3250 - 3260	No sample - no returns.
3260 - 3270	No sample - no returns.
3270 - 3280	No sample - no returns.
3280 - 3290	No sample - no returns.
3290 - 3300	No sample - no returns.
3300 - 3310	No sample - no returns.
3310 - 3320	No sample - no returns.
3320 - 3330	100% Cavings of cement, iron filings, rubber, green shale, dolomite and anhydrite.

SAMPLE DESCRIPTIONS (cont'd)

3330 - 3340 100% Cavings of cement, iron filing, some rubber, chert, red and green shale and anhydrite.

3340 - 3350 75% Cavings of cement, iron filings, as above.  
20% Anhydrite - pale buff, white, some medium grey.  
5% Dolomite - tan, very finely crystalline, no visible porosity.

NOTE: Increase lag time to 1 min. per 100 feet.

3350 - 3360 60% Anhydrite - light grey to white, common pale buff, crypto-x-lime, hard.  
40% Dolomite - medium greyish-brown, micro-x-lime, common very fine pin point porosity, trace vugs, estimate poor to fair porosity.  
(Cement cavings common.)

3360 - 3370 60% Dolomite - light buff, occasionally tan, micro-x-lime, some small vugs, trace fair porosity, generally very poor porosity.  
40% Anhydrite - white to light grey, pale orange, hard.

3370 - 3380 70% Dolomite - light buff, micro-x-lime, argillaceous, trace fair small vuggy porosity.  
30% Anhydrite - pale orange, medium grey, trace white, hard.

3380 - 3390 70% Dolomite - light buff, micro-x-lime, very argillaceous in part, generally no visible porosity.  
30% Anhydrite - white to light grey, common light buff, hard.

3390 - 3400 60% Dolomite - light buff, micro-x-lime, argillaceous, some very poor pin point porosity, occasional chip with fair vuggy porosity, generally very poor porosity.  
40% Anhydrite - pale orange, light grey, crypto-x-lime, hard.

3400 - 3410 70% Dolomite - light buff to light grey, crypto-x-lime to micro-x-lime, argillaceous, common pin point and small vuggy porosity, porosity - poor.  
30% Anhydrite - pale tan, some medium grey, crypto-x-lime, hard.

3410 - 3420 50% Dolomite - light buff to buff, crypto-x-lime, argillaceous, trace vuggy porosity.  
50% Anhydrite - pale buff, light to medium grey.

SAMPLE DESCRIPTIONS (cont'd)

3 <sup>4</sup> 20 - 3 <sup>4</sup> 30	60% Anhydrite - light grey to white, crypto-x-lime, hard. 40% Dolomite - light buff to buff, micro-x-lime, argillaceous, occasional medium to coarse fossil pellets with fair to good porosity, overall porosity very poor.
3 <sup>4</sup> 30 - 3 <sup>4</sup> 40	50% Anhydrite - light grey to white, occasionally pale orange to buff, crypto-x-lime, hard. 50% Dolomite - light buff, micro-x-lime, trace fossil pellets, generally no visible porosity, trace pyrite.
3 <sup>4</sup> 40 - 3 <sup>4</sup> 50	70% Anhydrite - pale orange to buff, very argillaceous, occasionally light to medium grey, crypto-x-lime, hard. 30% Dolomite - buff to light brown, crypto-x-lime, occasional chip with fossil pellets, as above, generally poor vuggy porosity, trace pyrite.
3 <sup>4</sup> 50 - 3 <sup>4</sup> 60	70% Anhydrite - light grey to white, common pale orange to buff. 30% Dolomite - buff, micro-x-lime, argillaceous, trace fossil pellets, poor vuggy porosity.
3 <sup>4</sup> 60 - 3 <sup>4</sup> 70	50% Anhydrite - light grey, commonly buff, crypto-x-lime, hard. 50% Dolomite - light buff, crypto-x-lime to micro-x-lime, argillaceous, occasional chip with fair vuggy porosity, overall porosity very poor.
3 <sup>4</sup> 70 - 3 <sup>4</sup> 80	60% Anhydrite - white to light grey, trace red, common light tan, crypto-x-lime, hard. 40% Dolomite - buffish-grey, micro-x-lime, trace vuggy porosity, anhydritic and argillaceous.
3 <sup>4</sup> 80 - 3 <sup>4</sup> 90	50% Anhydrite - light grey to light buff, crypto-x-lime, hard. 50% Dolomite - buff, micro-x-lime, argillaceous and anhydritic, trace vuggy porosity.
3 <sup>4</sup> 90 - 3500	70% Dolomite - light buffish-grey, micro-x-lime, occasionally sucrosic, anhydritic and argillaceous, trace pin point and small vuggy porosity. 30% Anhydrite - white, light grey, common light tan, crypto-x-lime, hard.

SAMPLE DESCRIPTIONS (cont'd)

3500 - 3510    80% Dolomite - light greyish-buff, micro-x-lime, very argillaceous, anhydritic, trace vuggy porosity.  
                   20% Anhydrite - white to light grey, some pale buff, crypto-x-lime, hard.

3510 - 3520    70% Dolomite - buff, micro-x-lime, argillaceous and anhydritic, trace vuggy porosity.  
                   30% Anhydrite - white to light grey, some pale orange to buff crypto-x-lime, hard.  
                   Tr. Shale - medium greyish-green, dolomitic, chunky, medium hard.

3520 - 3530    65% Dolomite - light buffish-grey, micro-x-lime to crypto-x-lime, anhydritic, very argillaceous, trace free quartz crystals, trace vuggy porosity.  
                   25% Anhydrite - white, common pale buff, crypto-x-lime, hard.  
                   10% Shale - medium greenish-grey, as above.

3530 - 3540    40% Dolomite - light buffish-grey, micro-x-lime, anhydritic and argillaceous, no visible porosity.  
                   40% Anhydrite - white, common light tan, crypto-x-lime, hard.  
                   20% Shale - medium greenish-grey, dolomitic, chunky, medium hard.

3540 - 3550    60% Dolomite - buffish-grey, micro-x-lime, argillaceous, trace vuggy porosity, trace quartz and dolomite crystals.  
                   30% Shale - medium greenish-grey, dolomitic, platy, medium hard.  
                   10% Anhydrite - as above.

3550 - 3560    90% Dolomite - buffish-grey, micro-x-lime to crypto-x-lime, very argillaceous, some quartz crystals, very poor vuggy porosity.  
                   ✓ 10% Salt - clear to yellow, coarsely crystalline.

3560 - 3570    45% Dolomite - buffish-grey, micro-x-lime to crypto-x-lime, very argillaceous, no visible porosity.  
                   40% Shale - medium greenish-grey, dolomitic, platy to chunky, medium hard.  
                   ✓ 10% Salt - clear.  
                   5% Anhydrite - as above.

SAMPLE DESCRIPTIONS (cont'd)

3570 - 3580    90% Dolomite - buffish-grey, crypto-x-lline to micro-x-lline, some small quartz crystals, trace dolomite crystals, estimate poor vuggy porosity.  
                   10% Shale - medium green, dolomitic, chunky, medium hard.  
                   ✓ Tr. Salt.

3580 - 3590    30% Anhydrite - light to medium grey, crypto-x-lline, hard.  
                   30% Dolomite - buffish-grey, crypto-x-lline, argillaceous, with trace quartz crystals, estimate no porosity.  
                   30% Shale - bright green, dolomitic, chunky to platy, medium hard.  
                   ✓ 10% Salt.

3590 - 3600    70% Dolomite - light buffish-grey, crypto-x-lline, argillaceous and anhydritic, no visible porosity.  
                   30% Shale - bright green, dolomitic, chunky, medium hard.

3600 - 3610    50% Dolomitic, buffish-grey, crypto-x--line, argillaceous, anhydritic, generally no visible porosity.  
                   30% Shale - medium greenish-grey, dolomitic, chunky, medium hard.  
                   20% Anhydrite - light grey, crypto-x-lline, hard.

3610 - 3620    40% Anhydrite - buffish-grey, crypto-x-lline, dolomitic in part, hard.  
                   30% Shale - medium greenish-grey to green, silty, dolomitic, chunky to platy, medium hard.  
                   30% Dolomite - buffish-grey, crypto-x-lline to micro-x-lline, anhydritic and argillaceous, no visible porosity.

3620 - 3630    60% Dolomite - buffish-grey, micro-x-lline to crypto-x-lline, argillaceous, no visible porosity.  
                   20% Anhydrite - light grey, as above.  
                   20% Shale - medium greenish-grey to green, dolomitic, as above.

3630 - 3640    60% Dolomite - greyish-buff, crypto-x-lline, argillaceous, slightly anhydritic, occasional quartz crystal, trace vuggy porosity.  
                   40% Anhydrite - light grey, occasionally white, common buffish-grey, hard.  
                   ✓ Tr. Salt - clear.

SAMPLE DESCRIPTIONS (cont'd)

3640 - 3650    60% Anhydrite - white to pale buff, crypto-x-lime, hard.  
                   40% Dolomite - buff, micro-x-lime, argillaceous, very slightly anhydritic, trace vuggy porosity.  
                   Tr. Shale - green, as above.

3650 - 3660    60% Dolomite - buffish-grey, earthy in part, micro-x-lime, very argillaceous, shaly, trace quartz crystals, estimate trace porosity.  
                   40% Anhydrite - white to light grey, common pale buff.  
                   Tr. Shale - green.

3660 - 3670    70% Dolomite - greyish-buff, micro-x-lime, argillaceous and anhydritic, no visible porosity.  
                   20% Anhydrite - buff to light grey, crypto-x-lime, hard.  
                   10% Shale - green, dolomitic, chunky, medium hard.

3670 - 3680    50% Anhydrite - light grey, light tan, crypto-x-lime, hard.  
                   50% Dolomite - buff to light brown, micro-x-lime, earthy in part, argillaceous and anhydritic, trace quartz crystals, trace drusy structure, trace vuggy porosity.  
                   Tr. Shale - green.

3680 - 3690    70% Dolomite - buffish-grey to buff, micro-x-lime, earthy, argillaceous and anhydritic, shaly, no visible porosity.  
                   30% Anhydrite - light to medium grey, some pale orange, light tan, crypto-x-lime, hard.

3690 - 3700    50% Dolomite - greyish-buff, micro-x-lime, anhydritic, very argillaceous, no visible porosity.  
                   40% Anhydrite - white to medium grey, some light buff, crypto-x-lime to very finely crystalline, hard.  
                   10% Shale - medium greyish-green, dolomitic, chunky, medium hard.

3700 - 3710    60% Dolomite - buff, micro-x-lime to crypto-x-lime, anhydritic, very argillaceous, shaly, no visible porosity.  
                   30% Shale - medium greyish-green, dolomitic, chunky, medium hard.  
                   10% Anhydrite - as above.

3710 - 3720    50% Dolomite - greyish-buff, micro-x-lime to crypto-x-lime, anhydritic, argillaceous, no visible porosity.  
                   40% Shale - medium greyish-grey, dolomitic, chunky,  
                   10% Anhydrite - as above.

SAMPLE DESCRIPTIONS (cont'd)

3720 - 3730      50% Anhydrite - white to light grey, common pale orange, crypto-x-lime, hard.  
                   30% Dolomite - buff, honeycomb porosity, slightly argillaceous, good porosity.  
                   20% Dolomite - buffish-grey, micro-x-lime, argillaceous, no visible porosity.

3730 - 3740      50% Anhydrite - light grey to white, common pale orange, crypto-x-lime, hard.  
                   30% Shale - medium greyish-green, silty, dolomitic, chunky.  
                   10% Dolomite - buff, honeycomb porosity - good.  
                   10% Dolomite - brown, micro-x-lime to crypto-x-lime, some earthy, argillaceous, trace porosity.

3740 - 3750      50% Anhydrite - light grey to white, common pale orange, as above.  
                   30% Shale - medium greyish-green, silty, dolomitic, as above.  
                   10% Dolomite - buff, honeycomb porosity - good.  
                   10% Dolomite - medium brown, micro-x-lime, trace pin point porosity.

3750 - 3760      40% Anhydrite - light grey to white, common pale orange, crypto-x-lime, hard.  
                   30% Shale - medium greenish-grey, dolomitic.  
                   30% Dolomite - medium brown, micro-x-lime, some earthy, trace honeycomb porosity, poor vuggy porosity.

3760 - 3770      40% Dolomite - buffish-grey, some medium brown, crypto-x-lime to micro-x-lime, very argillaceous, shaly, generally no visible porosity, with few chips with fair vuggy porosity.  
                   30% Anhydrite - light grey to white, some medium grey, as above.  
                   30% Shale - medium greenish-grey, dolomitic, chunky.

3770 - 3780      50% Shale - medium greyish-green to green.  
                   30% Anhydrite - as above.  
                   20% Dolomite - buff to greyish-buff, micro-x-lime, argillaceous, anhydritic, no visible porosity.

3780 - 3790      70% Shale - bright green to medium greyish-green, slightly dolomitic, chunky to platy, medium hard.  
                   20% Anhydrite - white to light grey, some pale orange, crypto-x-lime, hard.  
                   10% Dolomite - as above.

SAMPLE DESCRIPTIONS (cont'd)

3790 - 3800      70% Shale - medium green, some greyish-green, chunky, medium hard.  
                   30% Dolomite - medium brown, very finely to finely crystalline, argillaceous, fair to good pin point and inter-crystalline porosity, pseudo oil stain, no fluorescence, no cut, no odour.

3800 - 3810      60% Shale - green, some greyish-green, dolomitic, silty in part, chunky, medium hard.  
                   30% Dolomite - limy, medium brown, finely crystalline, argillaceous, good inter-crystalline porosity, some pin point and small vuggy porosity, pseudo oil stain, no fluorescence, no cut, no odour.  
                   10% Anhydrite - white, as above.

3810 - 3820      60% Shale - bright green, dolomitic, chunky, medium hard.  
                   40% Dolomite - limy, medium brown, micro-crystalline to very finely crystalline, occasionally finely crystalline, argillaceous, fair pin point and small vuggy porosity.  
                   Tr. Anhydrite.

3820 - 3830      60% Shale - bright green, dolomitic, chunky, medium hard.  
                   40% Dolomite - limy, medium brown, micro-crystalline to finely crystalline, some inter-crystalline porosity, some small vuggy and pin point porosity, porosity fair, pseudo oil stain, possible dull brown fluorescence, no cut, no odour.

3830 - 3840      70% Shale - medium grey, very dolomitic, chunky, hard.  
                   10% Shale - green, as above.  
                   10% Dolomite - limy, medium brown, very finely crystalline, argillaceous, very poor pin point porosity.  
                   10% Anhydrite - white to pale tan, crypto-crystalline, hard.

3840 - 3850      70% Shale - medium to dark grey, dark green, dolomitic, chunky to platy, hard.  
                   20% Dolomite - greyish-buff, micro-crystalline, argillaceous and anhydritic, no visible porosity.  
                   10% Anhydrite - medium grey to pale tan, as above.

3850 - 3860      70% Dolomite - medium brown, some greyish-brown, some dark tan, crypto-crystalline, argillaceous, no visible porosity.  
                   30% Shale - dark grey, very dolomitic, chunky, hard.  
                   10% Anhydrite - as above.

SAMPLE DESCRIPTIONS (cont'd)

3860 - 3870    40% Shale - dark grey, some dark green, very dolomitic in part, chunky, hard.  
                   40% Dolomite - brown, micro-x-line to very finely crystalline, argillaceous, no visible porosity.  
                   20% Anhydrite - light grey to medium greyish-tan, crypto-x-line, hard.

3870 - 3880    50% Shale - dark grey, occasionally dark brownish-grey, dolomitic, chunky, hard.  
                   40% Dolomite - light brown, micro-x-line to very finely crystalline, argillaceous and anhydritic, trace porosity.  
                   10% Anhydrite - light grey to white, crypto-x-line, hard.

3880 - 3890    60% Shale - dark grey, dolomitic, chunky to platy, brittle, hard.  
                   30% Dolomite - light to medium brown, micro-x-line, argillaceous, no visible porosity.  
                   10% Anhydrite - as above.

3890 - 3900    80% Shale - dark grey, dark green, dark brown, very dolomitic, chunky to platy, hard.  
                   10% Anhydrite - as above.  
                   10% Dolomite - as above.

3900 - 3910    60% Shale - dark green, some dark grey, occasionally dark brown, dolomitic, platy to blocky, hard.  
                   30% Dolomite - buff, very finely crystalline, argillaceous, very poor pin point porosity.  
                   10% Anhydrite - white to pale orange, crypto-x-line, hard.

3910 - 3920    60% Shale - dark green, occasionally dark grey, dolomitic, chunky to platy, hard.  
                   20% Dolomite - dark tan, sublithographic, very argillaceous, shaly, no visible porosity.  
                   10% Dolomite - light brown, micro-x-line to very finely crystalline, trace porosity.  
                   10% Anhydrite - as above.

3920 - 3930    60% Shale - dark green, some dark grey, dolomitic, platy.  
                   30% Dolomite - light brown, micro-x-line, argillaceous, no visible porosity.  
                   10% Dolomite - dark brown, sublithographic, very argillaceous, no visible porosity.  
                   Tr. Anhydrite.

SAMPLE DESCRIPTIONS (cont'd)

3930 - 3940	60% Shale - dark grey, common dark green, chunky to platy. 20% Dolomite - buff, micro-x-lime, argillaceous, no visible porosity. 20% Anhydrite - white, light buff, crypto-x-lime, hard.
3940 - 3950	60% Shale - dark green, some dark grey, dolomitic, platy. 30% Anhydrite - white to buff, crypto-x-lime, hard. 10% Dolomite - buff to dark brown, micro-x-lime to crypto-x-lime, as above.
3950 - 3960	60% Shale - dark grey, dark brown, dolomitic, chunky, hard. 30% Dolomite - buff, micro-x-lime, some tan and crypto-x-lime. 10% Anhydrite - as above.
3960 - 3970	80% Shale - dark grey, dark greenish-grey, some dark brown, dolomitic, chunky to platy, brittle, hard. 20% Dolomite - buff to light brown, micro-x-lime, no visible porosity. Tr. Anhydrite.
3970 - 3980	70% Shale - dark greenish-grey, some dark brown, dolomitic, chunky to platy, brittle, hard. 20% Anhydrite - light to medium grey, some pale orange, crypto-x-lime, hard. 10% Dolomite - buff, micro-x-lime, argillaceous, no visible porosity.
3980 - 3990	70% Shale - dark brownish-grey to dark greenish-grey, dolomitic, chunky, medium hard. 30% Dolomite - buff, crypto-x-lime, argillaceous, no visible porosity.
3990 - 4000	90% Shale - dark green, some dark grey, dolomitic, platy, brittle, hard. 10% Anhydrite - white, mottled white and buff, crypto-x-lime, hard, (possible fracture fill in shale).
4000 - 4010	80% Shale - dark grey to dark green, dolomitic, platy, brittle, hard. 10% Dolomite - tan, crypto-x-lime, very argillaceous, no visible porosity. 10% Anhydrite - pale buff to white, some mottled, crypto-x-lime, hard.

SAMPLE DESCRIPTIONS (cont'd)

4010 - 4020      50% Dolomite - tan, crypto-x-lline, argillaceous, no visible porosity.  
                   50% Shale - bright green, dolomitic, chunky, medium hard.  
                   Tr. Anhydrite - as above.

4020 - 4030      60% Dolomite - tan to dark buff, crypto-x-lline to lithographic, argillaceous, no visible porosity.  
                   40% Shale - bright green, some dark grey, occasional closed fracture filled with anhydrite.

4030 - 4040      70% Dolomite - dark brown to tan, some dark buff, micro-x-lline to crypto-x-lline, argillaceous, no visible porosity.  
                   30% Shale - bright green to dark greenish-grey, as above.

4040 - 4050      50% Dolomite - tan to buff, crypto-x-lline to micro-x-lline, trace very fine black flecks (bitumin?), trace argillaceous partings, very argillaceous to argillaceous, no visible porosity.  
                   40% Shale - dark grey, dark green, dolomitic, chunky to platy, brittle, hard.  
                   10% Anhydrite - white to light grey, crypto-x-lline, hard.

4050 - 4060      50% Dolomite - buff, micro-x-lline, some tan, crypto-x-lline, very argillaceous, no visible porosity.  
                   40% Shale - medium to dark green, common medium grey, dolomitic, platy, hard.  
                   10% Anhydrite - white to medium grey, crypto-x-lline, hard.

4060 - 4070      50% Shale - dark green, occasionally dark grey, dolomitic, chunky, hard.  
                   40% Dolomite - limy, brown, finely crystalline, trace argillaceous partings, trace dark brown chert.  
                   10% Anhydrite - white to pale buff to buff, crypto-x-lline, hard.

4070 - 4080      60% Shale - dark grey to dark brown, dolomitic, platy, brittle, hard.  
                   20% Dolomite - as above.  
                   20% Chert - dark brown, lithographic, very hard.

4080 - 4090      90% Shale - bright green, occasionally medium grey, dolomitic, chunky, hard.  
                   5% Chert - dark brown to black, very hard.  
                   5% Dolomite - limy, buff, micro-x-lline, argillaceous, no visible porosity.

SAMPLE DESCRIPTIONS (cont'd)

4090 - 4100 100% Shale - bright green, some medium grey, chunky, hard.  
Tr. Dolomite - as above.

4100 - 4110 100% Shale - medium to dark greyish-green, chunky to platy.  
Tr. Dolomite - as above.

4110 - 4120 100% Shale - bright green to dark green, occasionally medium brownish-grey, chunky, brittle, hard.

4120 - 4130 100% Shale - dark grey, dark greenish-grey, occasionally dark brown, platy, brittle, hard.  
Tr. Marl - light grey.

4130 - 4140 100% Shale - dark brownish-grey, occasionally dark greenish-grey to dark grey, very slightly bituminous.  
Tr. Marl - light grey.

4140 - 4150 90% Shale - dark greenish-grey to dark brown, trace closed fractures filled with anhydrite.  
10% Limestone - tan, sublithographic, no visible porosity.

4150 - 4160 60% Shale - medium to dark green, chunky, hard.  
35% Limestone - tan, mottled light grey, lithographic to micro-x-line, argillaceous, no visible porosity.  
5% Sandstone - mottled green and light grey, very fine to fine grained, quartzose and glauconite, well cemented, trace porosity.

4160 - 4170 80% Shale - medium green, trace dark brown, platy, papery.  
20% Limestone - tan, slightly mottled light grey, crypto-x-line, argillaceous, no visible porosity.

4170 - 4180 80% Shale - medium greyish-brown, common dark grey, blocky to platy, hard.  
20% Limestone - tan, slightly mottled light grey, crypto-x-line, argillaceous, no visible porosity.

4180 - 4190 90% Shale - dark green, chunky to platy to splintery.  
10% Limestone - light to dark tan, slightly mottled light grey, very argillaceous, no visible porosity.

SAMPLE DESCRIPTIONS (cont'd)

4190 - 4200	90% Shale - medium to dark green, as above. 10% Limestone - dark tan, slightly mottled light grey, crypto-x-line, argillaceous, no visible porosity. Tr. Sandstone - medium greyish-green, fine grained, quartzose, and <u>glauc</u> onite - very well cemented, dolomitic, tight.
4200 - 4210	95% Shale - green, medium to dark green, trace brown, platy to splintery, hard. 5% Limestone - medium to dark tan, slightly mottled light grey, crypto-x-line, argillaceous, no visible porosity.
4210 - 4220	85% Shale - green, as above. 10% Siltstone - light to medium grey, slight greenish tinge, quartzose, dolomitic, hard. 5% Limestone - as above.
4220 - 4230	80% Shale - dark green, some dark greenish-grey, platy to splintery, hard. 10% Siltstone - light grey, very argillaceous, soft. 10% Siltstone - light to medium grey, quartzose, dolomitic.
4230 - 4240	90% Shale - dark greenish-grey, platy, splintery, hard. 10% Siltstone - light grey, clean, quartzose, dolomitic, hard.
4240 - 4250	60% Shale - dark grey to dark greenish-grey, platy to splintery, hard, with trace black brachiopod. 35% Siltstone - medium greenish-grey, slightly dirty, quartzose, very slightly dolomitic, hard. 5% Limestone - tan, slightly mottled light grey, crypto-x-line, argillaceous, hard.
4250 - 4260	60% Shale - green, dark greenish-grey, some dark grey, platy, some blocky, hard. 40% Siltstone - light grey, some medium greenish-grey, clean, quartzose, trace glauconitic, limy, hard.
4260 - 4270	70% Siltstone - light grey, quartzose, micaceous, dolomitic, hard. 30% Shale - dark green to dark greenish-grey, platy, occasionally splintery and blocky, hard.
4270 - 4280	60% Siltstone - light grey, quartzose, slightly micaceous, dolomitic, hard. 40% Shale - dark greenish-grey, some dark grey, occasionally dark brown, platy, some splintery, hard.

SAMPLE DESCRIPTIONS (cont'd)

4280 - 4290    40% Siltstone - light grey, quartzose, micaceous, dolomitic, hard.  
                   30% Shale - dark green, some dark grey, as above.  
                   30% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.

4290 - 4300    40% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   40% Siltstone - light grey, quartzose, very slightly micaceous, dolomitic, hard.  
                   20% Shale - green, some dark greenish-grey, platy to splintery, hard.

4300 - 4310    50% Siltstone - light grey, quartzose, common medium greenish-grey, slightly micaceous, chunky, hard.  
                   30% Limestone - tan, slightly mottled light grey, as above.  
                   20% Shale - green, as above.

4310 - 4320    40% Siltstone - light grey, some greenish-grey, quartzose, micaceous, dolomitic, hard.  
                   30% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   30% Shale - green to dark greenish-grey, as above.

4320 - 4330    60% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   30% Shale - medium to dark green, some dark grey, platy to splintery, hard.  
                   10% Siltstone - light grey, quartzose, as above.

4330 - 4340    70% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   20% Shale - green, as above.  
                   10% Siltstone - light grey, quartzose, micaceous, dolomitic.

4340 - 4350    70% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   30% Shale - medium to dark green, as above.

4350 - 4360    70% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   30% Shale - medium to dark grey, some greenish-grey, platy to splintery, hard.

4360 - 4370    70% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                   30% Shale - green, platy to splintery, hard.

SAMPLE DESCRIPTIONS (cont'd)

4370 - 4380      90% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                     10% Shale - green, chunky, hard.

4380 - 4390      80% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                     20% Shale - green, as above.

4390 - 4400      90% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                     10% Shale - green, as above.

4400 - 4410      80% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                     20% Shale - green, platy to splintery, hard.

4410 - 4420      80% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.  
                     20% Shale - green, as above.

4420 - 4430      90% Limestone - dark tan to tan, crypto-x-lime to micro-x-lime, argillaceous, somewhat shaly, no visible porosity.  
                     10% Shale - green, as above.

4430 - 4440      70% Limestone - tan to dark tan, crypto-x-lime to micro-x-lime, argillaceous, no visible porosity, with some white to light buff chert.  
                     30% Shale - green, common blackish-grey, some dark greyish-brown, slightly bituminous in part, platy to blocky.

4440 - 4450      50% Shale - green, common dark greyish-brown to black, platy to splintery, hard.  
                     30% Limestone - tan, slightly mottled light grey, crypto-x-lime to micro-x-lime, argillaceous, no visible porosity, with trace of light buff chert.  
                     20% Siltstone - light grey, quartzose, micaceous, hard.

4450 - 4460      80% Shale - dark greyish-brown, common green, platy, hard.  
                     20% Limestone - dark tan, slightly mottled light grey, crypto-x-lime to micro-x-lime, very argillaceous, shaly, no visible porosity.

4460 - 4470      70% Shale - dark greyish-brown to dark grey, common green, platy, hard.  
                     30% Limestone - tan, slightly mottled light grey, crypto-x-lime, argillaceous, no visible porosity.

SAMPLE DESCRIPTIONS (cont'd)

4470 - 4480      60% Shale - dark grey, dark brown, green, platy to chunky, hard.  
                   40% Dolomite - limy, mottled buff and tan, some medium crystalline, common crypto-x-lline, argillaceous, no visible porosity.

4480 - 4490      70% Shale - green, some dark grey, chunky, hard.  
                   20% Limestone - tan, slightly mottled light grey, crypto-x-lline, argillaceous, no visible porosity.  
                   10% Dolomite - buff, medium crystalline, as above.

4500 - 4510      40% Siltstone - light grey, clean, quartzose, slightly micaceous, hard.  
                   40% Shale - dark grey, dark brownish-grey, occasionally green, chunky, hard.  
                   20% Limestone - dark brown, crypto-x-lline to micro-x-lline, very argillaceous, no visible porosity.

4510 - 4520      60% Siltstone - whitish-grey, clean, quartzose, slightly micaceous, hard.  
                   20% Dolomite - limy, dark tan, slightly mottled light grey, crypto-x-lline, argillaceous, no visible porosity.  
                   20% Shale - green, occasionally dark greyish-brown, splintery to chunky, hard.

4520 - 4530      50% Shale - dark grey, platy to splintery, hard.  
                   40% Siltstone - light grey, with slightly greenish-tinge, quartzose, slightly micaceous, hard.  
                   10% Dolomite - tan, slightly mottled light grey, crypto-x-lline, argillaceous, no visible porosity.  
                   Tr. Sandstone - very glauconitic.

4530 - 4540      55% Shale - dark blackish-grey, some dark brown.  
                   40% Siltstone - whitish-grey, clean, quartzose, trace pyritic, very slightly micaceous, dolomitic, hard.  
                   5% Dolomite - as above.

4540 - 4550      60% Shale - dark grey to blackish-grey, micaceous in part, platy to splintery, hard.  
                   40% Siltstone - whitish-grey, clean, quartzose, slightly micaceous, hard.

4550 - 4560      80% Shale - blackish-grey, micaceous, platy, hard.  
                   20% Siltstone - light grey, quartzose, slightly micaceous.

SAMPLE DESCRIPTIONS (cont'd)

4560 - 4570 100% Shale - dark grey, occasionally brown, micaceous, platy to chunky, hard.  
Tr. Siltstone - as above.

4570 - 4580 90% Shale - blackish-grey, common dark brown, micaceous, platy, hard.  
10% Siltstone - as above.

4590 - 4600 100% Shale - dark grey, some blackish-grey, common dark brown, platy to splintery, hard.  
Tr. Siltstone.

4600 - 4610 100% Shale - dark grey, common dark brown, platy, hard.

4610 - 4620 90% Shale - dark grey, occasionally dark brown, platy, papery thin.  
10% Siltstone - light grey, very argillaceous, bentonitic.

4620 - 4630 100% Shale - dark brown, common dark grey, micaceous, platy, brittle, hard.

4630 - 4640 100% Shale - dark brown, common dark grey, micaceous, platy, brittle, hard.  
Tr. Siltstone.

4640 - 4650 90% Shale - dark grey, occasionally dark brown, some green, platy to splintery, hard.  
10% Siltstone - light grey, quartzose, slightly sandy, occasionally glauconitic, micaceous.

4650 - 4660 70% Shale - dark brownish-grey, sandy, micaceous, chunky, hard.  
20% Marl - light grey, very argillaceous, bentonitic, soft.  
10% Siltstone - light grey, quartzose, slightly micaceous.

4660 - 4670 90% Shale - dark brownish-grey, micaceous, silty, occasionally glauconitic, chunky, hard.  
10% Siltstone - light grey, quartzose, sandy in part, occasionally finely glauconitic, hard.

4670 - 4680 70% Shale - as above.  
30% Siltstone - medium grey, occasionally light grey, common medium grey, glauconitic, hard.

SAMPLE DESCRIPTIONS (cont'd)

4680 - 4690	90% Shale - dark brownish-grey, occasionally glauconitic, slightly micaceous, silty to very silty. 10% Siltstone - light grey, quartzose, slightly micaceous, occasionally sandy and glauconitic.
4690 - 4700	90% Shale - dark green, dark brown, micaceous, splintery to platy, hard. 10% Siltstone - light grey, quartzose, hard.
4700 - 4710	60% Shale - dark brownish-grey, micromicaceous, slightly sandy, platy, hard. 40% Sandstone - light grey, very fine grained, quartzose, slightly glauconitic, slightly dolomitic, well cemented, tight.
4710 - 4720	60% Siltstone - light to medium grey, quartzose, slightly glauconitic, hard. 40% Shale - dark greyish-brown, slightly sandy, platy, hard.
4720 - 4730	50% Siltstone - medium grey, quartzose, glauconitic, hard. 50% Shale - dark greyish-brown, slightly micaceous, platy, hard.
4730 - 4740	60% Siltstone - medium grey, slightly dirty, quartzose, slightly glauconitic, slightly micaceous, hard. 40% Shale - dark brownish-grey, micaceous, platy, hard.
4740 - 4750	70% Siltstone - medium grey, slightly dirty, quartzose, glauconitic, micaceous. 30% Shale - dark brownish-grey, micaceous, platy, common green and chunky, hard.
4750 - 4760	50% Siltstone - medium brownish-grey, micaceous, hard. 30% Shale - green, occasionally dark greyish-brown. 20% Dolomite - mottled buff and dark tan, medium crystalline, argillaceous, no visible porosity.
4760 - 4770	50% Dolomite - buff to dark tan, medium crystalline, argillaceous, no visible porosity. 30% Sandstone - light grey, very fine grained to silty, clean, quartzose, slightly glauconitic, well cemented, silt and dolomite, tight. 20% Shale - bright green.

SAMPLE DESCRIPTIONS (cont'd)

4770 - 4780    60% Shale - dark greyish-brown, micaceous, sandy in part, chunky to platy.  
                   30% Siltstone - light grey, clean, quartzose, sandy, trace pyrite and glauconite, hard.  
                   10% Dolomite - dark tan to dark blackish-tan, slightly mottled light buff, crypto-crystalline to micro-crystalline, argillaceous, no visible porosity.

4780 - 4790    60% Siltstone - light to medium grey to brownish-grey, quartzose, slightly glauconitic, slightly sandy.  
                   40% Shale - dark grey, some dark brown, common green, chunky to splintery, hard.

4790 - 4800    50% Sandstone - light to medium grey, very fine grained to silty, quartzose, glauconitic, well cemented, silt, tight.  
                   50% Shale - dark green, dark greenish-grey, some dark brown, platy to splintery, hard.  
                   Tr. Dolomite - as above.

4800 - 4810    70% Sandstone - light to medium grey, very fine grained to silt, quartzose, slightly glauconitic to very glauconitic, very well cemented, tight.  
                   30% Shale - dark grey, dark greenish-grey, occasionally dark brown.  
                   Tr. Feldspar, pink.

4810 - 4820    40% Sandstone - light grey, very fine to fine grained, quartzose, well cemented, silt, tight.  
                   30% Siltstone - medium greenish-grey, quartzose, glauconitic, sandy, hard.  
                   30% Shale - green, dark brown, platy to splintery.

4820 - 4830    40% Shale - dark grey to dark brownish-grey, some green, platy to splintery.  
                   30% Sandstone - white, very fine to fine grained, quartzose, trace glauconitic, very well cemented, silt, tight.  
                   30% Siltstone - light to medium grey, quartzose and glauconite, slightly sandy, hard.

4830 - 4840    70% Shale - dark grey, dark greenish-grey, platy to splintery.  
                   20% Siltstone - medium greenish-grey, quartzose and glauconitic, sandy, hard.  
                   10% Sandstone - white, very fine to fine grained, quartzose, well cemented, silt, tight.

SAMPLE DESCRIPTIONS (cont'd)

4840 - 4850    50% Sandstone - light grey, very fine grained to silt, quartzose, very glauconitic, very well cemented, silt, tight.  
                   30% Siltstone - medium grey, quartz and glauconite, sandy, hard.  
                   20% Shale - dark grey, as above.

4850 - 4860    50% Shale - medium green to brown, chunky to splintery, hard.  
                   30% Siltstone - brownish-grey to greenish-grey, sandy, slightly micaceous, hard.  
                   20% Sandstone - medium greyish-green, very fine grained, silty, quartzose and glauconitic, very well cemented, silt, tight.

4860 - 4870    70% Siltstone - medium grey, sandy, common black specks, hard.  
                   20% Sandstone - light grey to light buff, very fine grained, clean, quartzose, slightly glauconitic, very well cemented, silt, tight.  
                   10% Shale - dark greenish-grey, dolomitic, occasional black (glauconite?) spots, chunky to platy, hard.

4870 - 4880    30% Sandstone - medium to light grey, very fine grained to silty, quartzose, glauconitic, very well cemented, silt, tight.  
                   30% Siltstone - as above.  
                   20% Dolomite - buff to tan, fine to ill-formed medium crystalline, sandy and silty, no visible porosity.  
                   20% Shale - dark greenish-grey, some dark brown, platy to splintery, hard.

4880 - 4890    50% Sandstone - clear to white, very fine to coarse grained, quartzose, subrounded to rounded, frosted in part, poorly sorted, abundant loose grains, weak siliceous and silt cement, estimate no porosity.  
                   40% Shale - medium to dark green, some brown, chunky to splintery.  
                   10% Dolomite - buff to tan, crypto-x-line to micro-x-line, sandy, no visible porosity.

4890 - 4895    80% Sandstone - clear to white, very fine to coarse grained, quartzose, subrounded to rounded, some frosted, abundant loose grains, weak siliceous and silt cement, tight.  
                   20% Shale - dark green, occasionally dark grey, as above.

SAMPLE DESCRIPTIONS (cont'd)

4895 - 4900      70% Sandstone - clear to white, fine grained, common fine to coarse grained, quartzose, subrounded to rounded, fair sorting, well cemented, siliceous, tight.  
                   30% Shale - dark green, occasionally dark brown, trace slickensides, blocky to occasionally splintery, hard.

4900 - 4905      70% Sandstone - clear to white, fine to coarse grained, clean, quartzose, rounded, fair sorting, many loose grains (air drilling) to some well cemented, silt to occasionally siliceous, estimate no porosity.  
                   30% Shale - dark greenish-grey, platy to splintery.

4905 - 4910      80% Sandstone - clear to white, fine to coarse grained, clean, quartzose, rounded, fair sorting, mostly loose grains, weak cement, silt, estimate very poor porosity.  
                   20% Shale - dark grey to dark greenish-grey, platy to splintery, papery thin.

4910 - 4915      60% Sandstone - white, very fine to fine grained, some medium to coarse grained, quartzose, rounded, very well sorted in part, some poorly sorted, loose to very well cemented, silt cement, tight.  
                   40% Shale - dark grey to dark greenish-grey, platy to splintery.

4915 - 4920      50% Sandstone - white to light buff, very fine to coarse grained, quartzose, rounded, poorly sorted, well cemented, silt, tight.  
                   50% Shale - dark greenish-grey to bright green, platy to splintery.

4920 - 4925      50% Sandstone - white to light buff, very fine to coarse grained, quartzose, round, poorly sorted, well cemented, silt, tight, trace dead brown oil stain.  
                   50% Shale - dark greenish-grey, some dark brown, splintery.

4925 - 4930      80% Shale - dark greenish-grey, chunky to platy.  
                   20% Sandstone - whitish-buff, very fine to coarse grained, quartzose, round, poorly sorted, well cemented, silt, tight.

4930 - 4935      90% Shale - medium to dark green, occasionally brown, chunky to platy to splintery.  
                   10% Sandstone - as above.

NOTE: Very poor sample - 3 hr. 20 min. cleaning hole on connection.

SAMPLE DESCRIPTIONS (cont'd)

4935 - 4940      95% Shale - dark greenish-grey, occasionally dark brown, chunky to platy.  
                   5% Sandstone - light buff, very fine and coarse grained (bi-modal) quartzose, round, poorly sorted, very well cemented, silt, tight.

4940 - 4945      90% Shale - dark greenish-grey, as above.  
                   10% Sandstone - light grey, slightly pink, very fine to medium grained, quartzose (clear with some rose), some red siltstone fragments, round to subround, fair sorting, many loose grains (air drilling), some well cemented, silt, tight.

4945 - 4950      80% Shale - green to dark grey, chunky to splintery.  
                   20% Sandstone - white, very fine to fine grained, clean, quartzose, trace pink quartz, subrounded, well sorted, well cemented, silt, tight.  
                   Tr. Sandstone - red, very fine to fine grained, quartzose, highly stained with iron oxide, well cemented, silt, tight.  
                   Tr. Feldspar - pink.

4950 - 4955      50% Shale - dark greenish-grey, platy, hard.  
                   40% Sandstone - pink to red, very fine to medium grained, trace coarse, quartzose, iron oxide stain (red coated), trace feldspar, subrounded, fair sorting, mostly loose grains, estimate silt cement with very poor porosity.  
                   10% Sandstone - white, very fine to fine grained, trace medium grained, quartzose, trace pink quartz, well cemented, silt, tight, very hard.  
                   Tr. Shale - red.

4955 - 4960      70% Sandstone - pink to red, very fine to medium grained, trace coarse, quartzose, red coated with occasional clear quartz, well sorted in part, rounded to subrounded, mostly loose grains (air drilling), some well cemented, silt, estimate very poor porosity.  
                   30% Shale - dark green, blocky to splintery, hard.  
                   Tr. Shale - red.

4960 - 4965      75% Shale - dark green, some dark grey, occasionally dark brown, platy to splintery.  
                   15% Sandstone - light buffish-white, very fine to fine grained, quartzose, trace glauconitic, well cemented, siliceous, tight, very hard.  
                   10% Marl - light grey, very argillaceous, soft.  
                   5% Sandstone - pink to red, as above, trace pink feldspar.

SAMPLE DESCRIPTIONS (cont'd)

4965 - 4970    95% Shale - dark green, occasionally dark brown, platy, hard.  
                   5% Sandstone - red, fine to very coarse grained, quartzose, red coated with iron oxide, occasional clear quartz, round, poorly sorted, mostly loose grains, estimate very poor porosity, trace red feldspar.

4970 - 4975    85% Shale - dark green, some dark brown, splintery to blocky.  
                   10% Sandstone - whitish-to pink, very fine to medium grained, quartzose, mostly clear quartz, some red coated, trace glauconite, round to subrounded, fair sorting, mostly loose grains (air drilling), silt cement, tight.  
                   Tr. Shale - red.

4975 - 4980    80% Shale - dark green, chunky to occasionally splintery.  
                   5% Sandstone - white, very fine to medium grained, quartzose, trace red coated, well cemented, silt, tight, with occasional granule of light pink feldspar and quartzite.  
                   5% Siltstone - white, quartzose.  
                   5% Marl - light grey, very argillaceous, soft.  
                   5% Dolomite - buffish-grey, micro-crystalline, argillaceous, no visible porosity.

4980 - 4985    95% Shale - dark greenish-grey, some brown, chunky to platy.  
                   5% Sandstone - light buff, very fine to fine grained, occasionally medium grained, clean, quartzose, very well cemented, silt, tight.

4985 - 4990    50% Sandstone - white, trace pink, very fine to medium grained, trace coarse, quartzose, trace red coated, trace feldspar, rounded, fair sorting, mostly loose grains, some very well cemented, silt, estimate no porosity.  
                   50% Shale - dark green to greenish-grey, platy to splintery.  
                   Tr. Sandstone - red.

4990 - 4995    70% Sandstone - clear to white, very fine to medium grained, quartzose, subrounded, fair sorting, loose grains, friable, estimate silt cement with no porosity.  
                   30% Shale - dark grey, dark greenish-grey, platy, hard.

SAMPLE DESCRIPTIONS (cont'd)

4995 - 5000	70%	Shale - dark green, greenish-grey, platy to splintery.
	30%	Sandstone - white, very fine to fine grained, occasional coarse, quartzose, very well cemented, silt, tight.
5000 - 5005	70%	Shale - dark greenish-grey to green, splintery, hard.
	30%	Sandstone - white, very fine to fine grained, some coarse, quartzose, round, poorly sorted, very well cemented, silt, tight.
5005 - 5010	50%	Sandstone - white, very fine to coarse grained, quartzose, round, poorly sorted, very well cemented to friable, common loose grains, silt cement, tight.
	50%	Shale - dark green, some dark brown, blocky to splintery.
5010 - 5015	80%	Sandstone - white, fine to medium grained, occasionally coarse, quartzose, round, well sorted, friable to occasionally well cemented, silt, estimate very poor porosity.
	20%	Shale - dark greenish-grey to green, platy to splintery.
5015 - 5020	60%	Sandstone - white, trace pink, fine to coarse grained, quartzose, mostly white to clear quartz, occasionally red coated, round, friable to commonly well cemented, silt, tight.
	40%	Shale - dark greenish-grey to dark green, chunky to splintery.
5020 - 5025	80%	Sandstone - red, fine to medium grained, quartzose, red coated with iron oxide, round, well sorted, friable, mostly loose grains, washed out red clay cement, estimate no porosity.
	20%	Shale - dark green, platy to splintery, hard.
5025 - 5030	70%	Shale - dark greyish-green, hard.
	30%	Sandstone - mostly red, some white, very fine to fine grained, trace coarse, quartzose, red coated, round, well sorted in part, very well cemented, silt, tight.
	Tr.	Granite fragment.
5030 - 5035	90%	Sandstone - red, very fine to coarse grained, quartzose, red coated, round, poorly sorted, loose grains, washed out red clay cement, estimate no porosity.
	10%	Shale - dark grey to dark greenish-grey, splintery.

SAMPLE DESCRIPTIONS (cont'd)

5035 - 5040 80% Sandstone - red, very fine to coarse grained, quartzose, mostly red coated with iron oxide, some clear, round to subround, poorly sorted, loose grains, estimated washed out red clay, no porosity.  
20% Shale - dark green, splintery, hard.

5040 - 5045 70% Sandstone - pink, very fine to very coarse grained, trace conglomeratic, quartzose, some red coated, mostly clear, subrounded, very poorly sorted, mostly loose grains, estimate weak silt cement with fair porosity. Pebble fragments of feldspar, quartz, and granite.  
10% Siltstone - red, hard.  
20% Shale - dark grey to green, platy to splintery.

NOTE: Salt water gas kick (8 units) at 5045 feet.

5045 - 5050 60% Shale - dark greyish-green, platy.  
40% Sandstone - pink, very fine to coarse grained, commonly conglomeratic, quartzose, clear to some red coated, subrounded, very poorly sorted, loose grains, estimate weak silt cement with poor to fair porosity. Granules of clear to opaque quartz, pitted in part, slight bitumin stain.

5050 - 5055 70% Sandstone - pink, very fine to very coarse grained, slightly conglomeratic, quartzose, some red coated with iron oxide, round to subrounded, very poorly sorted, loose grains, estimate silt cement with poor porosity, some quartz granules and small pebble fragments.  
30% Shale - dark greenish-grey to green, platy to splintery.

5055 - 5060 85% Shale - dark green, blocky to platy, hard.  
10% Sandstone - red, coarse grained, some very fine grained, conglomeratic, quartzose, red coated, occasionally clear quartz, subrounded, loose grains, estimate very poor porosity.  
5% Marl - light grey, very argillaceous, soft.

5060 - 5065 75% Shale - dark green, occasionally dark grey, platy.  
20% Dolomite - reddish-brown to red, sublithographic to lithographic, argillaceous, no visible porosity.  
5% Conglomerate - pebbles and granules of quartz, pitted in part.

SAMPLE DESCRIPTIONS (cont'd)

5065 - 5070      80% Shale - dark green, platy to chunky, hard.  
                   10% Siltstone - light greenish-grey, quartzose, sandy, dolomitic.  
                   10% Dolomite - reddish-brown, sublithographic, argillaceous, no visible porosity.  
                   Tr. Conglomerate - as above.

5070 - 5075      60% Shale - dark green, occasionally dark grey, trace slickensides, chunky to splintery, hard.  
                   10% Siltstone - medium greyish-green, dolomitic.  
                   30% Dolomite - reddish-brown, sublithographic, argillaceous, no visible porosity, with trace of buff chert.

5075 - 5080      70% Dolomite - light reddish-brown to pink, sublithographic, argillaceous, no visible porosity, with common pink chert.  
                   30% Shale - dark green, chunky to platy, some splintery.

5080 - 5085      80% Dolomite - reddish-brown, sublithographic to lithographic, argillaceous, no visible porosity, with common pink to light grey chert.  
                   20% Shale - dark green, chunky to platy, hard.

5085 - 5090      85% Shale - dark grey to blackish-grey, chunky, hard.  
                   15% Dolomite - reddish-brown, as above.

5090 - 5095      80% Shale - dark green, common dark grey, platy to chunky, hard.  
                   10% Dolomite - reddish-brown, as above.  
                   10% Marl - light grey, very argillaceous, soft.

5095 - 5100      70% Shale - dark green to black, chunky, hard.  
                   30% Dolomite - red, some light buff, lithographic to crypto-x-line, argillaceous, no visible porosity, some pink chert.

5100 - 5105      50% Dolomite - reddish-brown, pink, common buff, crypto-x-line, argillaceous, no visible porosity, some chert as above.  
                   50% Shale - blackish-grey, splintery, hard.

5105 - 5110      60% Dolomite - light grey to buff, some pink, lithographic to crypto-x-line, argillaceous, no visible porosity, with common chert (oolitic).  
                   40% Shale - dark green, splintery, hard.

SAMPLE DESCRIPTIONS (cont'd)

5110 - 5115      50% Dolomite - light buff, some reddish-brown, some mottled buff and light brown, crypto-x-line, argillaceous, no visible porosity, common light buff chert (oolitic).  
                   50% Shale - as above.  
                   Tr. Marl.

5115 - 5120      60% Shale - dark green to dark grey, platy, some splintery.  
                   40% Dolomite - buff, some reddish-brown, as above, with common oolitic chert.

5120 - 5125      50% Dolomite - vari-coloured, light buff to dark tan, some reddish-brown, some mottled, crypto-x-line, argillaceous, no visible porosity, with some oolitic chert.  
                   50% Shale - as above.

5125 - 5130      80% Dolomite - light buff, some reddish-brown, crypto-x-line, argillaceous, no visible porosity, with common oolitic chert.  
                   20% Shale - dark green.

5130 - 5135      90% Dolomite - light buff, mottled buff and light grey, common pinkish-brown, some reddish-brown, crypto-x-line, argillaceous, no visible porosity, with some oolitic chert.  
                   10% Shale - dark green, some dark grey, chunky to splintery, hard.

5135 - 5140      80% Dolomite - pinkish-white to reddish-brown, crypto-x-line, argillaceous, trace oolitic, with some oolitic chert, occasional secondary crystals of white to clear dolomite, estimate very poor vuggy porosity or fractures.  
                   20% Shale - dark green, platy to splintery, hard.

5140 - 5145      80% Dolomite - white to pink, some reddish-brown, crypto-x-line, argillaceous, no visible porosity, common oolitic, some oolitic chert, some white dolomite fracture fill material.  
                   20% Shale - dark green, platy to splintery, dolomitic, hard.

5145 - 5150      60% Dolomite - reddish-brown to buff, crypto-x-line, occasionally oolitic, slightly argillaceous, no visible porosity.  
                   40% Shale - dark green, platy to blocky, hard.

SAMPLE DESCRIPTIONS (cont'd)

5150 - 5155      70% Dolomite - pinkish-buff, crypto-x-line to micro-x-line, trace iron oxide stain, slightly argillaceous, some oolitic chert, no visible porosity.  
                   30% Shale - dark green, blocky to platy, hard.

5155 - 5160      80% Dolomite - pink to buff, crypto-x-line to lithographic, (50% of sample is oolitic chert), slightly argillaceous, no visible porosity.  
                   20% Shale - dark green, blocky to platy to splintery, hard.

5160 - 5165      90% Dolomite - pink, common mottled buff and light grey, (30% of sample is oolitic chert, slightly argillaceous, crypto-x-line to micro-x-line, no visible porosity.  
                   10% Shale - dark green, as above, trace fish scale type fossil.

5165 - 5170      90% Dolomite - pink, some mottled buff and light grey, crypto-x-line (60% of sample is oolitic chert), slightly argillaceous, no visible porosity.  
                   10% Shale - dark green, blocky to splintery, hard.

5170 - 5175      80% Dolomite - reddish-brown, pink, light tan, crypto-x-line to lithographic (30% of sample is oolitic chert), slightly argillaceous, no visible porosity.  
                   20% Shale - dark green, blocky, some splintery, hard.

5175 - 5180      70% Dolomite - pink, reddish-brown to light tan, crypto-x-line, occasionally oolitic chert fragments, slightly argillaceous, no visible porosity.  
                   30% Shale - dark green, blocky to splintery, hard.

5180 - 5185      60% Dolomite - pink, reddish-brown to light tan, some whitish-grey, crypto-x-line to sublithographic, occasionally micro-x-line, trace oolitic chert, slightly argillaceous, no visible porosity.  
                   40% Shale - dark green, some dark grey, platy, hard.

5185 - 5190      80% Dolomite - pink, reddish-brown to light tan, slightly mottled sublithographic to crypto-x-line, trace oolitic chert, slightly argillaceous, no visible porosity.  
                   20% Shale - dark green, platy, hard.

SAMPLE DESCRIPTIONS (cont'd)

5190 - 5195      80% Dolomite - pinkish-grey, occasionally light tan, some stained red with iron oxide, crypto-x-lime, trace oolitic, no visible porosity.  
                   20% Shale - dark green, chunky to splintery, hard.

5195 - 5200      70% Dolomite - pink, reddish-buff to reddish-brown, crypto-x-lime, trace oolitic chert, no visible porosity.  
                   30% Shale - dark green, occasional fish scale type fossil, chunky to splintery, hard.

5200 - 5205      90% Dolomite - pinkish-buff, trace reddish-buff, crypto-x-lime, some white oolitic chert, no visible porosity.  
                   10% Shale - dark green, occasional dark grey, platy to splintery, hard.

5205 - 5210      No sample - trip.

5210 - 5215      90% Trip sample - shale - dark green, platy to splintery.  
                   10% Dolomite - as above.

5215 - 5220      70% Shale - dark green, blocky to platy to splintery, hard.  
                   30% Dolomite - pink, reddish-brown, trace light grey, crypto-x-lime to micro-x-lime, occasionally sandy, slightly argillaceous, no visible porosity.

5220 - 5225      70% Shale - dark green, as above.  
                   30% Dolomite - pink, reddish-brown, crypto-x-lime to micro-x-lime, some sandy, slightly argillaceous, no visible porosity.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATION</u>	<u>REMARKS</u>
Dec. 21/74	547	0	Fishing	7 Wait on fishing tools 7 hrs. RIH with 9 $\frac{1}{4}$ " Hollier basket. Mill on iron for 2 $\frac{1}{2}$ hrs. POH. Basket skirt worn off. RIH w/9 $\frac{1}{2}$ " flat bottom mill. Mill for 6 $\frac{1}{2}$ hrs. POH. Mill worn off. RIH w/magnet. Work magnet. POH. Recovered iron cutting. Clean magnet.
Dec. 22/74	547	0	Fishing	8 Fishing 24 hrs. Made 2nd run w/magnet. Recovered iron cuttings. RIH w/9 $\frac{1}{2}$ " Klustrite Head. Milled 5 hrs. POH. RIH w/10 $\frac{1}{2}$ " Wilson junk basket. POH. RIH w/ Servco Flat bottom mill. RIH w/magnet and recovered 2 small pieces of iron and iron cutting. No foam returns to surface.
Dec. 23/74	547	0	Fishing	9 RIH w/9 $\frac{1}{2}$ " Hollier basket. Work on iron. Recovered one cone. RIH w/Wilson junk basket. Recovered a boulder of dolomite. RIH w/9 $\frac{5}{8}$ " Homco flat bottom mill. Work on iron for 4 hrs. POH. RIH w/3 point reamer. Ream to 120 feet.
Dec. 24/74	547	0	Fishing	10 Ream hole from 120 to 547 ft. Circ. POH. RIH w/11 $\frac{1}{4}$ " Hollier basket. Work for 2 $\frac{1}{2}$ hrs. POH. No recovery. RIH w/9" magnet and oversized skirt.
Dec. 25/74	547	0	Fishing	11 Work magnet. POH. No recovery. RIH w/8 $\frac{1}{2}$ " Hollier basket. Cut on iron for 2 hrs. POH. RIH w/11 $\frac{1}{2}$ " magnet. Work on iron. Recovered 1 shank and many bearing. Re-Run 11 $\frac{1}{2}$ " magnet.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATION</u>	<u>DAY</u>	<u>REMARKS</u>
Dec. 25/74 (cont'd)	547	0	Fishing	11	(cont'd) Recovered 2nd cone. Re-run magnet. Rec $\frac{1}{2}$ of 2nd shank. Made 2 more runs w/magnet. No recovery. RIH w/11 $\frac{1}{2}$ " Hollier basket. Drld. 10". POH. No recovery. RIH w/12 $\frac{1}{4}$ " bit.
Dec. 26/74	623	76	Wait on fishing tools	12	Drld w/bit No. 4A for 3 ft. w/indication of iron still in hole. POH. RIH w/11 $\frac{1}{2}$ " magnet. Recovered 2 pieces of bearings from cone. RIH w/bit No. 5A. Drld ahead. Twisted off at 623 ft. POH. Jars parted. Left in hole bit, hammer, 1 DC, stab, 1 DC, stab & jars. Total length 289 ft. Wait on fishing tools 7 hrs.
Dec. 27/74	700	77	Heading to cement	13	Make up overshot. RIH. Latch on fish. POH. Make up drlg string. RIH. Trouble w/iced hole 70 ft. below conductor pipe. Drld ahead to 700 feet. Rig to run casing. Ran 18 jts of 9 $\frac{5}{8}$ "; 36#; K-55 casing, w/ DV tool. Total casing 703.24 feet. Landed at 688.24 feet K.B. Head up to cement.
Dec. 28/74	700	0	Wait on cement	14	Pumped 90 bbls of water ahead. Cemented w/425 sxs Oilwell plus 1% CaCl <sub>2</sub> on first stage. Plug down 10:23 A.M. Dec. 27th. Dropped dart to open DV tool. Pumped 90 bbls of water ahead w/no returns. Mix 300 bbls drlg mud w/ 5# per bbl loss circ material. Pumped 150 bbls of mud down 9 $\frac{5}{8}$ " casing w/ no returns. Wait 1 hr.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPFRATION</u>	<u> DAYS</u>	<u>REMARKS</u>
Dec. 28/74 (cont'd)	700	0	Wait on cement	14	(cont'd) Pumped remaining 150 bbls of mud, in two stages with mud returns to surface. Cemented 2nd stage w/200 sxs of Oilwell plus 1% CaCl <sub>2</sub> . Partial returns. Plug down at 11:00 P.M. Cement slowly dropped in annulus. Let set. Cemented from surface in two stages w/90 sxs and 60 sxs. Cement returns on both. Cut conductor pipe. Digging cellar.
Dec. 29/74	700	0	Nipple up BOP's	15	Cut off 9 <sup>5</sup> / <sub>8</sub> " casing. Weld on bowl. Nipple up BOP's.
Dec. 30/74	700	0	Nipple up BOP's	16	Finish nippling up BOP's. Install air head, blowie line, BOP Minifold & SWACO choke. Drilled mouse hole. Wait on ring gasket for pipe rams.
Dec. 31/74	728	28	Drilling	17	Wait on ring gasket. Press test blind rams to 1500 psi. Held okay. RIH w/bit No. 1 to 145 feet. Press test 4 <sup>1</sup> / <sub>2</sub> " pipe rams & hydrill to 1500 psi for 15 min. Held okay. Drilled out cement at 184 ft. & DV tool. Top of cement above float collar at 645 ft. Drilled out float collar. Found 10 ft. cement in shoe jt. Drld out shoe. Drld ahead.
Jan. 1/75	1026	298	Tripping	18	Drld to 731 feet. POH. RIH w/bit No. 2. Drld ahead. Returns below 840 feet spasmodic. Drld to 1026 ft. POH.
Jan. 2/75	1221	195	Drilling	19	RIH w/bit No. 3. Cleaned 30 ft. to bottom. Drld ahead.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATION</u>	<u>DAY</u>	<u>REMARKS</u>
Jan. 3/75	1373	152	Drilling	20	Cont'd drlg ahead. POH. RIH w/bit No. 4. Worked from 1050 to bottom (hanging up on stab.). Drld ahead.
Jan. 4/75	1577	204	Drilling	21	Cont'd drlg w/bit No. 4. Hole conditions good on connections. No returns to surface.
Jan. 5/75	1758	181	Drilling	22	Cont'd drlg w/bit No. 4. Hole good on connections- no returns to surface.
Jan. 6/75	1935	177	Drilling	23	Cont'd drlg w/bit No. 4 to 1850 feet. POH. RIH w/bit No. 5. Ream tight hole from 1025 to 1215. Run to 1620. Work stuck pipe. Ream to bottom.
Jan. 7/75	2298	363	Drilling	24	Cont'd drlg w/bit No. 5. Hole good on connections- no returns to surface.
Jan. 8/75	2548	250	Tripping	25	Cont'd drlg w/bit No. 5 to 2548 feet. POH to log. Ran Schlumberger BHC Sonic. Unable to get below 995 feet. POH. RIH open ended to log through drill pipe.
Jan. 9/75	2548	0	Tripping	26	Cont'd RIH w/open end pipe. Unable to get below 1039 ft. POH. RIH w/bit to 1039 ft. Cleaned from 1039 to 1287 ft. Run to bottom. Circ. POH. Lay down air hammer and stab. RIH with bit, jars & 7 DC's. Clean from 1039 to 1287 ft. Run to bottom. Clean 20 ft of fill. Run GRN inside drill pipe. POH. RIH w/drill string & wipe hole at 1039 to 1285 feet. Drill ahead.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATION</u>	<u>DAY</u>	<u>REMARKS</u>
Jan. 10/75	2840	292	Drilling	27	Cont'd drlg w/bit No. 6. No returns to surface.
Jan. 11/75	3148	308	Drilling	28	Cont'd drlg w/bit No. 6. No returns to surface.
Jan. 12/75	3325	157	Repairing	29	Drld to 3168. Ran CRN log through drill pipe, from 3168 to 1 <sup>4</sup> 00 ft. Drld ahead to 3231. Survey. Drld ahead to 3325 ft. POH. 30 stands out when pin came out of brake band resulting in blocks piling on drill floor.
Jan. 13/75	3325	0	Circ. Casing	30	Repaired brakes. Cut and slip drlg line. Finished POH. RIH w/bit. Circ and clean to bottom. POH laying down drill pipe. Ran 7" casing. Circ 150 ft. off bottom.
Jan. 14/75	3325	0	W.O.C.	31	Cont'd running 7" casing. Total 82 jts; 23#; J-55 & N-80; w/2 Howco cement baskets at 590 & 600 ft. from surface. Cemented w/270 sacks of oilwell cement. Casing cemented at 3325 feet K.B. Set slips & cut casing. Heading up BOP's & change pipe rams.
Jan. 15/75	3325	0	Picking up drill pipe.	32	Finish heading up BOP's. Pick up D.C.'s & D.P. Pressure tested BOP's & casing to 1000 psi for 15 min. Held okay.
Jan. 16/75	3855	530	Drilling	33	Finished picking up D.P. Drld out cement, plug & shoe. Shoe at 3325 feet. Drld ahead.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATIONS</u>	<u>DAY</u>	<u>REMARKS</u>
Jan. 17/75	4310	455	Drilling	34	Drld ahead to 3920 feet. Start control drlg. Circ samples and drld ahead.
Jan. 18/75	4763	553	Drilling	35	Drld ahead.
Jan. 19/75	4900	137	Tripping	36	Drld ahead to 4900 feet. Circ samples. Start out of hole. Shut down for repairs. Stuck pipe at 4841 feet. Work pipe for 4 hrs & gained 25 feet. Unable to break circ. Hook up Dowell & pressure up w/ deisel to 2400 psi. Work pipe loose after pumping deisel. Total deisel 60 bbls. Cont'd POH.
Jan. 20/75	4946	46	Drilling	37	POH. Lay down stabilizers. RIH w/bit No. 7. Unload hole in stages from casing shoe to T.D. Hole caving badly. Drld from 4900 to 4930. 3 hr. connection. Drld ahead.
Jan. 21/75	5058	112	Tripping	38	Drld to 5058. Trip for bit. RIH w/bit No. 8. Hole bridged 150 ft. above bottom. Clean hole and unload water. Picked up salt water gas at 5045 ft. Well bore sample 36,300 ppm chloride.
Jan. 22/75	5148	90	Drilling	39	Reamed 150 feet to bottom. Unload approximately 800 ft. water. Hole caving badly. Drld ahead.
Jan. 23/75	5215	67	Tripping	40	Drld to 5215. POH. Cut & slip line. Change swivel packing. RIH w/bit No. 9. Hole bridged 600 ft. from bottom. Unload hole & clean to bottom.

DAILY DRILLING RECORD (cont'd)

<u>DATE</u>	<u>DEPTH</u>	<u>PROG.</u>	<u>OPERATIONS</u>	<u> DAYS</u>	<u>REMARKS</u>
Jan. 24/75	5225	10	Cleaning hole	41	Finish clean to bottom w/bit no. 9. Drld to 5225. Blow hole. Trip 15 stands. Fill hole to 4500 ft. w/mud. Pull to casing and fill hole w/mud. Run in and clean bridge from 4190 to 4900. Run to bottom and clean 90 ft. fill. Circ. Pull out to 4000 ft. Run to bottom and clean 12 ft. fill.
Jan. 25/75	5225	0	Attempt to log	42	Circ. POH. Attempt to log w/Combination DIL & BHC Sonic. Unable to get below 4190. RIH w/bit. Clean 15 ft. to bottom. Circ. Make 20 stand dummy trip. Small bridge at 4450. No fill on bottom. Circ. POH. Attempt to log DIL. Unable to get below 4200 ft.
Jan. 26/75	5225	0	Tripping	43	RIH w/bit and clean bridges from 4390-4440, 4520-4690 and 4840-4980. POH and check for twist off. Twist off. Left 18 DC's, 1 set jars, 2 stds D.P. plus twist off nubbin 8 ft.
Jan. 27/75	5225	0	Fishing	44	RIH w/overshot. Latch on. Pull 100,000 psi and overshot let go. Change grapple and run and latch on. Ran Gamma log to 4268 ft. Logged to 4268-2692 ft.
Jan. 28/75	5225	0	Abandoning	45	RIH open end. Ran plug No. 1, 4280-4180 w/30 sxs Oilwell cement. Plug down @ 5:30 P.M. Ran plug No. 2, 3375-3275 w/50 sxs Oilwell cement. Plug down @ 7:45 PM. W.O.C. Tagged plug No. 2 @ 3:00 A.M. @ 3215 ft. Lay down pipe.
Jan. 29/75			Rig released	46	Finish laying down pipe. Dig cellar. Cut off casing. Top w/5 sxs cement. Weld on plate. Rig released 4:00 PM Jan. 28/75.

DEVIATION RECORD

<u>DEPTH</u>	<u>ANGLE</u>	<u>DEPTH</u>	<u>ANGLE</u>
83	$\frac{3}{4}$	2852	$\frac{3}{4}$
140	$\frac{1}{2}$	2978	$\frac{3}{4}$
197	$\frac{3}{4}$	3230	1
257	Misrun	4011	$\frac{1}{4}$
257	$1\frac{3}{4}$	4567	2
288	$2\frac{3}{4}$	5086	$5\frac{3}{4}$
308	2		
338	2		
400	$1\frac{1}{2}$		
464	$1\frac{1}{4}$		
528	3		
591	$1\frac{3}{4}$		
611	$1\frac{1}{2}$		
870	2		
1026	$\frac{7}{8}$		
1153	$1\frac{1}{4}$		
1498	$1\frac{3}{4}$		
1715	$1\frac{1}{2}$		
2010	$\frac{1}{4}$		
2320	$\frac{3}{4}$		
2600	$\frac{1}{4}$		
2690	$\frac{1}{2}$		

BIT RECORD

NO.	SIZE	TYPE	DEPTH OUT	FOOT- AGE	HOURS	BIT T.	COND. B.	W.O.B. G.	RPM
1B	17 1/2	S-88	39	39	15 3/4	2	I	4,000	40
1A	12 1/4	3JS	48	9	3	4	I	6,000	70
2A	12 1/4	3JS	547	499	45 1/2	8	8	0	8,000
3A	12 1/4	3JS	---	---		6	8	I	
4A	12 1/4	3J	550	3	1/2	6	5	I	4,000
5A	12 1/4	H-88	623	73	8 3/4	8	6	I	6,000
6A	12 1/4	3JS	700	77					
1	8 3/4	H-77	731	31	4 1/4	6	I	10,000	60
2	8 3/4	M-88	1026	295	18	7	I	8,000	50
3	8 3/4	SS7P	1323	297	28	2	I	10,000	55
4	8 3/4	4JSP	1850	527	59 1/2	1	I	12,000	55
5	8 3/4	3JSP (Re-run)	2548	698	40	2	I	15,000	60
1RR	8 3/4	H-77	2548	-0-	7	(Clear hole)			
6	8 3/4	M88P	3325	777	51 1/4	1	I	10,000	60
7	6 1/4	S88F	5058	1731	86	8	8	0 1/4	10,000
8	6 1/4	S88F	5215	157	20	8	4	I	10,000
9	6 1/4	F-4	5225	10	1 1/4	Good		10,000	65

REPORT  
ON THE  
DRILLING AND ABANDONMENT  
OF  
UNION DECALTA GOOD HOPE A-40  
N.T.S. 96-K-7, GRID CORNER  
UNIT A, SECTION 40

April 1, 1975

Reported By:  
K. A. Jasinski  
Drilling Foreman

WELL HISTORY REPORTS

SECTION I - SUMMARY OF WELL DATA

(a) Well name and number: Union Decalta Good Hope A-40

(b) Permittee: Western Decalta Petroleum Ltd., Petrol Oil and Gas, Petrorep, Corexcal

(c) Operator: Union Oil Company of Canada Limited  
P.O. Box 999, Calgary, Alberta

(d) Location: A-40 - 66-30-124-30

(e) Co-ordinated: Latitude - 66° 29' 10" N  
Longitude - 124° 35' 52" W  
Unique Well Identifier - 300A406630124300  
Universal Well Location Reference - 66.48611°  
124.59778°

(f) Permit No. - 6421

(g) Drilling Contractor: Tri-City Drilling Rig #2, Unit - U34  
Trailer Rig - 97'

(h) Drilling Authority No. 786 October 16, 1974

(i) Classification: N.F.W. (New Field Wildcat)

(j) Elevation: Kelly Bushings - 1456'  
Ground - 1444'

(k) Date Spudded: December 14, 1974 @ 6:00 P.M.

(l) Date Completed Drilling: January 23, 1975

(m) Total Depth and Plugged Back Total Depth: 5225': Surface

(n) Well Status: Dry hole - Abandoned

(o) Rig Release Date: January 28, 1975 @ 4:00 P.M.

(p) Hole Sizes to Total Depth: 17 1/2" - Surface to 39'  
12 1/4" - 39' - 700'  
8 3/4 - 700' - 3325'  
6 1/4" - 3325' - 5225'

(q) Casing Sizes and Setting Depths:  
13 3/8: - 54.5# K-55 Landed @ 38'  
9 5/8 - 36# Landed @ 700'  
7" - 23# J-55 and N-80 - Landed @ 3325'

(r) Land Use Permit: #N74A870

(s) Water Authorization: (1) N2A3-0244  
Lat 66°29'10" N Long 124°35'52" W,  
Amendment to Lat 66°29'0"N Long 124°30'48" W

(t) Water Source Analysis: Attachment #1 and #2

## SECTION II - GEOLOGICAL SUMMARY

(a) Formation Tops

<u>Marker</u>	<u>Top</u>	<u>Subsea</u>
<u>Lower Ordovician:</u>		
Cherty Unit	Surface	+1444
Rhythmic Unit	1383	- 73
Cyclic Unit	1950	- 494
<u>Cambrian:</u>		
Saline River	2342	- 886
Salt	2742	-1286
Mount Cap	4000	-2544
Old Fort Island	4880	-3424
<u>Proterozoic</u>	5060	-3604

(b) Cored Intervals: NONE

(c) Core Descriptions: NONE

### SECTION III - ENGINEERING SUMMARY

(a) Report of Drill Stem Tests: NONE

(b) Casing Record:

(3) Intermediate: Ran 82 jts 7" csg set @ 3325'  
 23 jts 7" O.D. 23# 8RJ-55 Class A 1046.02'  
 59 jts 7" O.D. 23# 8RTW-80 Class A 2284.32  
 TOTAL TALLY 3330.34  
 NET TALLY 3317.34

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### SECTION III - ENGINEERING SUMMARY

(3) Ground - 1444, KB Elevation - 1456  
Cemented by Dowell w/60 sx Oilwell + 6% Gel and tailed  
in w/210 sx Oilwell cement neat.  
Plug down 7:15 PM January 13, 1975.

SECTION III - ENGINEERING SUMMARY - CONTINUED

✓ (c) Bit Record:

<u>NO.</u>	<u>SIZE</u>	<u>TYPE</u>	<u>DEPTH OUT</u>	<u>FOOTAGE</u>	<u>HRS.</u>	<u>BIT COND.</u>	<u>W.O.B. (M)</u>	<u>R.P.M.</u>
						<u>T.B.G.</u>		
1B	17½	S-88	39	39	15-3/4	211	4	40
1A	12½	3JS	48	9	3	431	6	70
2A	12½	3JS	547	499	45½	880	8	70
3A	12½	3JS	-	-	-	681	(clean out fish)	
4A	12½	3J	550	3	1/2	651	4	40
5A	12½	H-88	623	73	8-3/4	861	6	60
6A	12½	3JS	700	77	7-3/4	431	6	65
1	8-3/4 H-77		731	31	4½	611	10	60
2	8-3/4 M-88		1026	295	18	711	8	50
3	8-3/4 SS7P		1323	297	28	211	10	55
4	8-3/4 4JSP		1850	527	59½	111	12	55
5	8-3/4 3JSP		2548	698	40	211	15	60
IRR	8-3/4 H-77		2540	0	(clean hole)			
6	8-3/4 M-88F		3325	777	51½	111	10	60
7	6½	S-88F	5058	1731	86	880(½)	10	60
8	6½	S-88F	5215	157	20	941	10	65
9	6½	F-4	5225	10	1½	1-1-1	10	65

✓ (d) Mud Report:

Type and amount used: Gel Polymer

300 bbls drilling mud w/loss circ. material added and pumped away when D.V.T. opened on Surface casing. Prior to cementing @ 192' from surface. Gel - 14,100# Caustic - 200# Sawdust 600# Kwick Seal - 400# Lime - 100#, Kelzan 700#

NOTE: Full tank volume of mud held in storage while air drilling, in case of blow out.

✓ (e) Deviation Record:

<u>DEPTH</u>	<u>ANGLE°</u>	<u>DEPTH</u>	<u>ANGLE</u>
83	3/4	1153	1½
140	1/2	1498	1-3/4
197	3/4	1715	1-1/2
257	1-3/4	2010	1/4
288	2-3/4	2320	3/4
308	2	2600	1/4
338	2	2690	1/2
400	1-1/2	2852	3/4
464	1-1/4	2978	3/4
528	3	3230	1
591	1-3/4	4011	1/4
611	1-1/2	4567	2
870	2	5086	5-3/4
1026	7/8		

(f) Abandonment Plugs:

- ✓ P&A #1: 4280' - 4180' w/30 sx oilwell cement  
Plug in Place @ 5:30 PM January 27, 1975
- ✓ P&A #2: 3375' - 3275' w/50 sxs oilwell cement.  
Plug down @ 7:45 PM January 27, 1975  
W.O.C. - 7½ hours, run in and feel same @ 3215'.  
Cut off csg. 4' below ground and top w/5 sx oilwell  
Cement and weld on plate.  
Cement off mouse hole and rat hole w/3 sx cement each.

✓ (g) Lost Circulation Zones:

Surface Hole: Lower Ordovician:

Cherty Unit - 280' - 380' - No air or foam returns  
380' - 547' - Partial air return (no foam return)  
547' - on vacuum while fishing  
547' - 630' - Partial air return  
630' - 700' - Air and foam recovery to surface  
700' - 1560' - Partial air and foam returns

Rhythmic Unit - 1560' - 3320' - No returns

Cambrian - 3320' - 5225' - Good air and foam returns

Hole cleaning fair while drilling w/no returns and drilled ahead to  
7" casing point.

(h) Report of Well Kicks and Blowouts: NONE

KAJ/yb

## CORE LABORATORIES - CANADA LTD.

## WATER QUALITY STUDY

Company Union Oil Company of Canada Limited File No. 7044-54  
 Location Union Decalta Good Hope A-40 PAGE 1 of 1  
 Sampled From Source Water  
 Date Sampled Dec. 17/74 Date Received Jan. 2/75 Date Analyzed Jan. 7/75  
 Appearance Clear, few suspended solids

Analysis	Reading	Mg/liter	
pH	7.1		
Hydroxide Alkalinity			
Carbonate Alkalinity			
Bicarbonate Alkalinity			
Sulfate	4		
Chloride	19		
Total Hardness			
Calcium			
Magnesium			
Sodium			
Iron	0.37		
Ortho Phosphate	<0.01		
Hardness as CaCO <sub>3</sub>	119		
Nitrate	0.08		
Nitrite	<0.01		
Alkalinity as CaCO <sub>3</sub>	116		
Turbidity		20 Jackson Turbid Units	
Conductivity		256 micro/mhos/centimeter @ 70°F	
Color		35 to 40 Platinum Cobalt Color Units	
Total Sulfides			
Suspended Solids			
Total Solids			
Volatile Solids			
Oils & Greases			
BOD			
COD			
TON			
Specific Conductance			



CORE LABORATORIES - CANADA LTD.



## WATER QUALITY STUDY

其 2

Company Union Oil Company of Canada Ltd. File No. 7044-557  
Location Union Decalta Good Hope A-40 PAGE 1 of 1  
Sampled From Source Water After Drilling Completed  
Date Sampled \_\_\_\_\_ Date Received Jan. 29/75 Date Analyzed Jan. 31/75  
Appearance Clear, suspended solids

Analysis	Reading	Mg/liter	
pH	7.1		
Hydroxide Alkalinity			
Carbonate Alkalinity			
Bicarbonate Alkalinity			
Sulfate		16	
Chloride		10	
Total Hardness			
Calcium			
Magnesium			
Sodium			
Iron		0.41	
Phosphate		0.03	
Conductivity	252		umhos/centimeter
Nitrate		0.88	
Nitrite		<0.01	
Hardness as CaCO <sub>3</sub>		145	
Alkalinity as CaCO <sub>3</sub>		116	
Color	55 - 60		APHA Platinum Cobalt Color Units
Turbidity	4		Turbid Units
Total Sulfides			
Suspended Solids			
Total Solids			
Volatile Solids			
Oils & Greases			
BOD			
COD			
TON			
Specific Conductance			