

WELL HISTORY REPORT

CHEVRON SOBC WM E. PORCUPINE YT F-18

MAY 29, 1972



R. C. RICHARDSON, P. ENG.
PROJECT MANAGER

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SECTION I - SUMMARY OF WELL DATA

a) Well Name and Number

Chevron SOBC WM E. Porcupine YT F-18.

b) Permittee, Licensee or Lessee

Western Minerals Ltd.

c) Name of Operator

Chevron Standard Limited
400 Fifth Avenue S.W.
Calgary, Alberta
T2P 0L7

d) Location

Unit F, Section 18, Grid 66-10-137-45.

e) Coordinates

Latitude: $66^{\circ} 07' 25''$ N; Longitude: $137^{\circ} 48' 16''$ W

f) Permit or Lease Number

Permit No. 3362.

g) Drilling Contractor

GP Drilling Ltd., Rotary Rig #24.

h) Drilling Authority

No. 583 issued February 29, 1972.

i) Classification

Wildcat.

j) Elevations

Ground elevation: 1,701' K.B. elevation: 1,716'

k) Spudded

13:00 hours - March 6, 1972.

l) Completed Drilling

09:00 hours - April 21, 1972.

SECTION II - GEOLOGICAL SUMMARY

a) Formation Tops

<u>Formation</u>	<u>Depth</u> <u>Samples</u>	<u>Logs</u>	<u>Elevation</u> <u>K.B. 1716'</u>
Blackie Sandstone	3900'	3850'	-2134'
KL-4 Shale	4100'	4160'	-2444'
KL-3 Siltstone	5009'	4978'	-3262'
KL-2 Shale	-	5312'	-3596'
Basal Siltstone	-	5860'	-4144' <i>cut</i>
Chance Sandstone	6160'	6184'	-4468'
Upper Miss. Cherty Ls.	6620'	6630'	-4914'

TOTAL DEPTH - 6728'

b) Cored Interval

<u>Core No.</u>	<u>Interval</u>	<u>Formation</u>	<u>Recovery</u>
1	6214' - 6272'	Mississippian	55.1'

c) Core Description

Core #1 6214' - 6272' Cut 58' Rec. 55.1'

Coring Times: minutes per foot (left to right)

6214 - 17, 12, 18, 14, 17, 17, 18, 13, 16, 11,
 14, 18, 25, 29, 32, 40, 39, 32, 24, 21,
 25, 30, 23, 22, 23, 21, 24, 24, 25, 21,
 20, 19, 24, 23, 23, 26, 20, 23, 18, 20,
 24, 23, 21, 23, 23, 27, 27, 26, 28, 35,
 31, 28, 32, 31, 33, 36, 33, 33 - 6272'

6214 - 6215.8: Sandstone, brown, fine grained, slightly calcareous, kaolinitic. Fairly well sorted subround quartz and light grey chert grains. Poor intergranular porosity approximately 10%. Oil stain, fluorescence and cut.
 1.8

6215.8 - 6218.2: Sandstone, pale grey, fine grained, very calcareous, tight.
 2.4

6218.2 - 6218.9: Sandstone, brown, fine grained, calcareous, kaolinitic. Poor intergranular porosity approximately 8%. Poor permeability. Light oil stain, cut and fluorescence.
 0.7

6218.9 - 6221.4: Sandstone, pale grey, fine to medium grained, slightly S&P. Fairly well sorted subround quartz and chert grains, very calcareous matrix, siliceous cement. Tight.
 2.5

- 6221.4 - 6222.9: Sandstone, brown, fine to medium grained, calcareous, kaolinitic. Fairly well sorted subrounded quartz and chert grains, calcareous matrix. Trace to poor intergranular porosity approximately 6%. Light stain, cut, fluorescence.
1.5
- 6222.9 - 6225.4: Sandstone, brown, very fine to fine grained slightly calcareous, argillaceous. Fairly well sorted subangular quartz and chert grains, silty, calcareous matrix. Tight. Scattered silty, argillaceous partings, stylolitic breaks. Dip near horizontal. Streaks of oil bleeding at 6222-6223'.
2.5
- 6225.4 - 6227.6: Sandstone, brown, fine grained, scattered coarser chert grains, calcareous, lustre mottled in part. Fairly well sorted, subround to subangular quartz and chert grains in a silty, calcareous matrix. Trace of porosity, faint cut and fluorescence.
2.2
- 6227.6 - 6228.8: Siltstone, dark brown, calcareous, argillaceous, few argillaceous partings.
1.2
- 6228.8 - 6240.2: Shale, dark grey-brown, calcareous, slightly bituminous. Abundant fossil fragments - Brachiopods, Crinoids. Interbedded silty shale and grey, argillaceous calcareous siltstone.
11.4
- 6240.2 - 6241.2: Limestone, light grey, matrix to dark brown, well rounded and sorted bituminous shale "oolites." Matrix approximately 50%, pellets or oolites approximately 50%.
1.0
- 6241.2 - 6244.5: Limestone, brown-grey, very silty, argillaceous. Scattered dark grey shale partings, grades to interbedded dark grey, calcareous, fossiliferous shale.
3.3
- 6244.5 - 6244.8: Shale, dark grey, calcareous, slightly bituminous, fossiliferous. Scattered grey silty laminae.
0.3
- 6244.8 - 6247.2: Limestone, grey, microcrystalline, compact, faintly argillaceous, shaly partings. Scattered fine fossil remains.
2.4
- 6247.2 - 6254.0: Shale, dark grey, calcareous, fine silty laminae. Trace of pyrite. Pockets of abundant Brachiopods, Crinoids.
6.8
- 6254.0 - 6254.5: Limestone, grey, silty and sandy, grading to very calcareous, fine sandstone.
0.5

- 6254.5 - 6261.4: Sandstone, fine grained, grey, slightly S&P, very
6.9 calcareous. Fairly well sorted subangular quartz grains, silty, calcareous matrix, siliceous cement. Band of black chert nodules at 6256.5'. Oil bleeding, 6258-6259'.
- 6261.4 - 6263.7: Siltstone, grey, argillaceous, calcareous, siliceous
2.3 cement. Scattered shaly partings.
- 6263.7 - 6265.8: Sandstone, grey, fine grained, calcareous, tight.
2.1 Subround, fair sorted quartz grains, calcareous matrix, siliceous cement. Scattered streaks of brown oil bleeding.
- 6265.8 - 6269.1: Shale, dark grey, calcareous, grey silty streaks and
3.3 laminae. Bedding is near horizontal.
- 6269.1 - 6272: Core not recovered.
2.9

d) Sample Description

- 70 - 80: Sandstone, grey, S&P, fine grained, argillaceous, slightly calcareous, tight. Shale, dark grey, blocky, noncalcareous. Much grey, nodules shale with plant remains. Trace of coal.
- 80 - 90: Shale and sandstone, interbedded, as above.
- 90 - 100: Shale, as above. Minor sandstone, as above, grading in part to grey siltstone. Trace of ironstone.
- 100 - 110: Shale, as above. Much grey-green nodular, massive shale (clay).
- 110 - 120: Shale, as above. Much grey argillaceous siltstone.
- 120 - 130: As above.
- 130 - 150: Sandstone, grey, S&P, fine grained, argillaceous, noncalcareous. Streaks of medium to coarse sand. Much shale, as above.
- 150 - 160: Shale, dark grey, blocky, silty in part. Much grey green blocky shale. Minor sandstone, as above.
- 160 - 170: Sandstone, pale grey, S&P, fine to medium grained, silty, argillaceous, non-calcareous, tight. Much shale, as above.

- 170 - 180: Shale, grey and dark grey, blocky, silty in part, noncalcareous.
- 180 - 200: Shale, as above. Much grey-green blocky shale. Interbedded fine grained grey sandstone, slightly calcareous.
- 200 - 220: Shale, grey and grey-green, blocky, noncalcareous. Silty streaks.
- 220 - 230: Shale, as above. Much grey argillaceous siltstone interbedded.
- 230 - 240: Shale, as above. Sandstone, pale grey S&P, argillaceous, slightly calcareous. Subangular, poor to fair sorted quartz and chert grains. Tight.
- 240 - 250: Shale, grey and dark grey, minor grey-green nodular massive shale, blocky, noncalcareous. Much very fine grained grey, argillaceous sandstone, grading to siltstone, interbedded.
- 250 - 260: As above. Much grey, S&P fine to medium grained slightly calcareous, argillaceous quartz-chert sandstone.
- 260 - 290: Shale, grey, green-grey and dark grey, blocky, silty in part. Trace of plant remains.
- 290 - 320: Shale, as above. Minor grey, S&P, fine grained, slightly calcareous sandstone, grading in part to silty shale and siltstone.
- 320 - 340: Shale, as above - 70%. Sandstone - 30%, pale grey S&P, medium grained, silty, slightly calcareous, argillaceous - 30%.
- 340 - 360: Siltstone, grey, argillaceous, noncalcareous. Much shale, sandstone, as above.
- 360 - 380: Shale, grey, green-grey and brown-grey, nodular, massive, blocky, noncalcareous, silty in part.
- 380 - 420: Shale, as above. Traces of ironstone. Minor interbedded grey, argillaceous sandstone.
- 420 - 430: Sandstone, pale grey, S&P, fine grained, argillaceous, grading in part to argillaceous siltstone, faintly calcareous.

- 430 - 470: Shale, grey, grey-green and brown-grey, nodular, massive, noncalcareous. Much grey-brown shaly siltstone.
- 470 - 490: Shale and silty shale, as above. Minor pale grey, S&P medium grained, trace glauconitic sandstone.
- 490 - 510: Shale, grey, brown-grey and green-grey, blocky, nodular, massive, noncalcareous, silty streaks.
- 510 - 520: Shale, dark grey, silty, sub-fissile, noncalcareous, much grey and brown-grey, greenish-grey shale, as above.
- 520 - 540: Shale, grey-green, grey, brown-grey, massive, nodular, noncalcareous. Minor dark grey shale. Silty streaks.
- 540 - 550: Siltstone, grading to fine sandstone, grey, argillaceous, noncalcareous. Much shale, as above. Trace of ironstone.
- 550 - 570: Sandstone, grey, very fine to fine grained, S&P in part, argillaceous, noncalcareous, trace micaceous. Carbon flecks or bitumen. Much shale, as above.
- 570 - 590: Shale, grey-green, grey and brown-grey, blocky nodular, noncalcareous. Minor silty streaks.
- 590 - 610: Sandstone, grey S&P, fine grained, argillaceous, silty, noncalcareous, grading to argillaceous siltstone. Much shale, as above. Trace of red shale. Trace of plant remains.
- 610 - 620: Shale, dark grey, blocky, silty in part, noncalcareous.
- 620 - 640: Shale, grey and dark grey, minor brown-grey shale, silty in part, noncalcareous, blocky - 70%. Sandstone, grey, S&P, fine grained, argillaceous, noncalcareous. Trace of coaly plant remains.
- 640 - 650: Shale, grey, brown grey and dark grey, traces grey-green shale, massive, blocky, noncalcareous. Silty streaks, fine sandy streaks.
- 650 - 680: Shale, as above. Minor rusty brown shale - nodular. Trace of plant remains. Trace of ironstone.
- 680 - 690: Shale, grey, waxy, massive, nodular, noncalcareous. Traces of rusty brown shale, ironstone.
- 690 - 710: Shale, as above. Much light grey shale. Much rusty red nodular shales, silty streaks.
- 710 - 720: No sample.

- 720 - 740: Shale, grey, light green-grey, waxy, nodular, dark grey, blocky, noncalcareous shale. Grey silty streaks.
- 740 - 760: Shale, as above. Much grey-brown shale. Silty streaks.
- 760 - 770: Shale, grey, minor light grey shale, trace of reddish brown shale.
- 770 - 780: Sandstone, grey S&P, fine to medium grained, sub-angular quartz and chert grains, fair sorting, black chert and shale grains, silty, noncalcareous. Tight. Much shale, as above.
- 780 - 800: Shale, dark grey, sub-fissile, noncalcareous. Traces of grey silt, traces of plant remains. Trace of sandstone, as above. Much grey and green-grey nodular shale.
- 800 - 810: Shale, dark grey, blocky, noncalcareous.
- 810 - 820: Casing cement.
- 820 - 830: Shale, dark grey, blocky, noncalcareous, silty streaks.
- 830 - 870: Shale, grey, blocky, silty, sandy, grading to very argillaceous grey sandstone, noncalcareous.
- 870 - 880: Shale, grey, dark grey, blocky, noncalcareous. Trace of green shale.
- 880 - 920: Shale, dark grey, noncalcareous, blocky to sub-fissile. Much grey, waxy shale, trace of pyrite. Trace of grey, sandstone streaks.
- 920 - 940: Sandstone, grey, fine grained, argillaceous, kaolinitic. Much loose sand.
- 940 - 960: Sandstone, as above. Much grey and dark grey shale, as above.
- 960 - 970: Sandstone, grey, fine to medium, subangular to sub-round quartz and chert grains, fairly well sorted, argillaceous, kaolinitic matrix, friable, noncalcareous.
- 970 - 1000: Shale, grey and dark grey, noncalcareous, minor green, blocky shale.
- 1000 - 1020: Shale, grey, waxy, traces of plant remains, brown silty shale streaks, trace of red and grey mottled shale, trace of grey-green shale, brown shale, trace of ironstone. Minor dark grey, sub-fissile, micaceous shale.

- 1020 - 1030: Shale, dark grey, blocky, noncalcareous, silty in part.
- 1030 - 1050: Sandstone, grey, S&P, argillaceous, silty, noncalcareous, trace micaceous, tight. Subround to subangular chert and quartz grains fairly well sorted. Trace of medium sandstone streaks. Much dark grey, grey and brown shale, trace of green shale.
- 1050 - 1060: Shale, grey, silty, dark grey, sub-fissile, noncalcareous. Minor sandstone, as above.
- 1060 - 1070: Shale, grey, blocky, nodular, and brown-grey, blocky, nodular shale, trace of grey-green shale.
- 1070 - 1090: Shale, grey, blocky, waxy to nodular, grey-brown in part.
- 1090 - 1100: Shale, grey and grey-brown, nodular, blocky, noncalcareous.
- 1100 - 1120: Siltstone, grey, argillaceous, noncalcareous, micaceous.
- 1120 - 1130: Shale, grey, waxy, blocky, noncalcareous. Traces of brown-grey shale. Trace of ironstone.
- 1130 - 1140: Shale, dark grey and grey, sub-fissile, interbedded grey micaceous, argillaceous siltstone.
- 1140 - 1180: Shale, grey, nodular, blocky, noncalcareous, trace of brown-grey shale, grey-green shale. Much dark grey, sub-fissile shale.
- 1180 - 1190: Sandstone, grey S&P, fine grained, calcareous. Subround to subangular, fair sorted, chert, quartz grains, carbon flecks, in silty, argillaceous matrix. Trace of carbon partings. Much shale, as above.
- 1190 - 1270: Shale, rusty red, dark brown-red, blocky, waxy to hard, noncalcareous. Minor maroon silty shale. Minor interbedded rusty red, fine grained sandstone and siltstone.
- 1270 - 1280: Siltstones grey, S&P, noncalcareous, argillaceous, micaceous. Shale, grey, nodular, noncalcareous, trace of green blocky shale.
- 1280 - 1310: Shale, grey, blocky, micromicaceous, noncalcareous, much grey, silty, micromicaceous shale, grey, blocky, to nodular shale.

- 1310 - 1320: Shale, grey, nodular to blocky, minor brown-grey blocky, silty shale.
- 1320 - 1330: Sandstone, grey, S&P, argillaceous, silty, calcareous. Few medium grained streaks. Interbedded grey silty shale.
- 1330 - 1340: Siltstone, grey, argillaceous, grading to very silty shale, noncalcareous.
- 1340 - 1350: Siltstone, as above, grading in part to fine grained grey S&P calcareous sandstone. Traces of grey-brown silty shale, grey nodular shale.
- 1350 - 1360: Shale, grey, nodular, noncalcareous, interbedded dark grey sub-fissile, micaceous, to smooth, blocky shale.
- 1360 - 1370: Shale, as above, minor interbedded grey, S&P fine to medium grained noncalcareous sandstone.
- 1370 - 1380: Sandstone, grey, S&P, faintly calcareous, fine grained, grading to siltstone, argillaceous, silty. Much shale, as above.
- 1380 - 1390: Sandstone, grey, S&P, fine grained, noncalcareous, argillaceous, silty, minor brown-grey sandstone. Much grey shale, brown shale, as above.
- 1390 - 1410: Siltstone, grey, S&P, grading to fine sandstone, argillaceous, noncalcareous. Much dark grey, silty shale and grey nodular shale.
- 1410 - 1420: Siltstone, as above. Shale, grey, nodular, waxy. Trace of green silty shale.
- 1420 - 1430: As above. Trace of medium sandstone.
- 1430 - 1450: Siltstone, grey, argillaceous, noncalcareous, interbedded grey and dark grey, micaceous shale.
- 1450 - 1470: Shale, dark grey, silty, minor non-silty shale, grading to argillaceous siltstone, micaceous, noncalcareous. Trace of pyrite.
- 1470 - 1490: Shale, dark grey, sub-fissile, noncalcareous. Few silty streaks.
- 1490 - 1500: Shale, as above. Traces coaly fragments.
- 1500 - 1510: Siltstone, grey, fine S&P, argillaceous, noncalcareous, traces micaceous. Trace of fine sandy streaks. Much interbedded grey and dark grey shale. Trace of ironstone.

- 1510 - 1530: Sandstone, grey, S&P, fine grained, argillaceous, noncalcareous. Subangular chert and quartz grains, dark grey chert grains, fairly well sorted, trace of glauconite.
- 1530 - 1540: Shale, grey, silty, trace micaceous, blocky, much grey, smooth, sub-fissile to blocky shale. Sandstone streaks, as above.
- 1540 - 1550: V.P.S.
- 1550 - 1560: Shale, dark grey, blocky, noncalcareous, few silty, sandy streaks.
- 1560 - 1570: Siltstone, grey, finely S&P, argillaceous. Trace of fine grey kaolinitic sandstone. Much shale, as above.
- 1570 - 1580: Shale, grey, blocky, dark grey, sub-fissile, micaceous in part, noncalcareous.
- 1580 - 1590: Sandstone, grey S&P, fine grained, slightly calcareous, argillaceous. Subangular to subround chert and quartz grains, black chert or shale grains, trace glauconite, trace of mica.
- 1590 - 1600: Shale, grey, brown grey, waxy, nodular, minor dark grey sub-fissile shale. Trace of plant remains, ironstone.
- 1600 - 1610: Shale, grey, waxy, nodular, minor dark grey shale.
- 1610 - 1620: Shale, as above, silty.
- 1620 - 1630: Shale, grey, silty, blocky, noncalcareous. Much grey-brown shale, silty in part. Minor dark grey sub-fissile shale.
- 1630 - 1640: Sandstone, grey, S&P, fine grained, noncalcareous, argillaceous, trace of mica. Subangular quartz and chert grains, fair sorting, tight.
- 1640 - 1650: Shale, dark grey, micromicaceous, sub-fissile, noncalcareous. Much grey, finely S&P siltstone and fine sandstone.
- 1650 - 1670: Shale, grey and green-grey, massive, silty in part. Interbedded grey siltstone, dark grey shale.
- 1670 - 1680: Siltstone, grey, argillaceous, noncalcareous, grading to silty grey shale.

- 1680 - 1690: Shale, green-grey, and grey, waxy, nodular. Traces of pale grey shale. Much dark grey, micromicaceous, sub-fissile and fissile shale.
- 1690 - 1710: Sandstone, grey, S&P, fine grained, grading to siltstone, argillaceous, noncalcareous. Trace of plant remains. Much shale, as above. Trace of ironstone.
- 1710 - 1720: Sandstone, grey, S&P, fine to medium grained, calcareous, argillaceous. Subround to subangular quartz and chert grains, black chert grains, in silty, argillaceous matrix, traces of plant remains.
- 1720 - 1730: Shale, dark grey, sub-fissile, noncalcareous. Traces of plant remains.
- 1730 - 1740: Sandstone, grey, S&P, medium to fine grained, calcareous, subround to subangular quartz and chert grains, silty, argillaceous matrix.
- 1740 - 1750: Shale, dark grey, sub-fissile, noncalcareous. Traces of micromicaceous shale, trace of plant remains.
- 1750 - 1780: Sandstone, grey, S&P, fine to medium grained, slightly calcareous, argillaceous. Trace of mica, plant remains, trace of ironstone.
- 1780 - 1790: Siltstone, pale grey, very calcareous, grading to silty limestone.
- 1790 - 1800: Siltstone, grey, argillaceous, noncalcareous, grading in part to grey, silty shale.
- 1800 - 1820: Shale, dark grey, sub-fissile, noncalcareous. Trace of plant remains and coaly partings. Trace of silty streaks.
- 1820 - 1830: Shale, as above. Trace to minor grey fine sandstone. Trace of ironstone.
- 1830 - 1840: Siltstone, grey, finely S&P, argillaceous, noncalcareous, grading in part to fine, argillaceous sandstone.
- 1840 - 1850: Shale, dark grey, sub-fissile, noncalcareous. Trace of ironstone, minor silty shale.
- 1850 - 1860: Shale, dark grey and grey, sub-fissile to blocky. Trace of coaly plant remains, trace of ironstone.
- 1860 - 1880: Shale, as above. Traces of light grey silty shale.

- 1880 - 1890: Sandstone, grey, S&P, very fine to fine grained, faint to slightly calcareous, argillaceous, tight subangular to subround quartz, chert grains, black chert or carbon flecks, silty, siliceous matrix, traces calcareous cement. Trace of glauconite.
- 1890 - 1900: Sandstone, as above, grey, S&P, medium grained, calcareous.
- 1900 - 1910: Shale, grey and dark grey, minor brown shale, silty in part, noncalcareous. Minor dark grey micaceous, sub-fissile shale.
- 1910 - 1920: Siltstone, grey, S&P, argillaceous, noncalcareous. Much shale, as above.
- 1920 - 1940: Sandstone, grey, S&P, fine grained, slightly calcareous, argillaceous, trace micaceous. Much shale, as above. Trace of coaly plant remains.
- 1940 - 1950: Sandstone, grey, S&P, fine to medium grained, argillaceous, noncalcareous, 50%. Shale, 50%, grey, grey-brown and dark grey, blocky to sub-fissile, noncalcareous. Trace grey-green shale.
- 1950 - 1980: Sandstone, grey, S&P, fine grained, argillaceous, noncalcareous. Much shale, as above. Trace of coaly plant remains.
- 1980 - 1990: Sandstone, grey, fine grained, S&P, faintly calcareous, argillaceous, trace plant remains and coaly flecks. Much grey, grey-green massive shale, dark grey subfissile shale. Trace ironstone.
- 1990 - 2000: V.P.S.
- 2000 - 2010: Shale, dark grey, sub-fissile to blocky, noncalcareous. Trace of ironstone.
- 2010 - 2020: Siltstone, grey, finelty S&P, argillaceous, noncalcareous, micaceous. Trace of pyrite.
- 2020 - 2060: Shale, dark grey, sub-fissile, noncalcareous. Much grey, nodular, waxy shale. Interbedded grey, S&P fine grained slightly calcareous sandstone and siltstone. Trace of ironstone.
- 2060 - 2070: Shale, dark grey, sub-fissile, noncalcareous, micaceous, minor grey massive, nodular shale. Siltstone, grey, finely S&P, noncalcareous, argillaceous. Trace of ironstone.

- 2070 - 2080: Shale, as above. Siltstone, as above, argillaceous, slightly calcareous. Trace of ironstone.
- 2080 - 2090: Shale, as above. Sandstone, grey, S&P, fine grained, argillaceous, noncalcareous, trace glauconitic.
- 2090 - 2100: Shale, dark medium grey, silty in part, micaceous, noncalcareous. Much dark grey nodular shale, trace of green silty shale. Traces of interbedded grey micaceous sandstone.
- 2100 - 2120: Shale, grey and dark grey, massive, nodular, non-calcareous. Trace of light grey and brown-grey shale.
- 2120 - 2130: Siltstone, grey, finely S&P, much brown siltstone, argillaceous, noncalcareous.
- 2130 - 2140: Shale, grey and dark grey, nodular to sub-fissile, micaceous, interbedded grey siltstone, very fine argillaceous sandstone.
- 2140 - 2150: Shale, as above. Minor grey, S&P fine grained faintly calcareous sandstone. Trace of brown and pale grey shale.
- 2150 - 2160: Shale, grey, nodular, massive, and dark grey, sub-fissile, micaceous in part. Much hard brown shale, brown nodular shale. Trace of ironstone.
- 2160 - 2170: Shale, grey and dark grey, nodular, massive to sub-fissile, micaceous, noncalcareous. Interbedded grey, argillaceous micaceous siltstone.
- 2170 - 2180: Siltstone, grey, micaceous, argillaceous, noncalcareous, grading in part to very fine, grey S&P sandstone.
- 2180 - 2190: Sandstone, grey S&P, argillaceous, noncalcareous, micaceous. Subangular to subrounded quartz and chert grains, silty, argillaceous matrix, trace of coaly flecks.
- 2190 - 2200: Sandstone, grey, S&P, medium grained, silty, noncalcareous, trace micaceous. Subrounded chert and quartz grains, fair sorting, silty matrix.
- 2200 - 2220: Sandstone, as above, faintly calcareous, friable.
- 2220 - 2240: Shale, dark medium grey, blocky, non-calcareous, much silty shale, dark grey micaceous, noncalcareous, sub-fissile shale. Trace of ironstone.

- 2240 - 2260: Shale, as above. Much silty shale. Interbedded sandstone, grey, S&P, fine to medium grained, non-calcareous, argillaceous, silty, carbonaceous flecks. Tight.
- 2260 - 2270: Sandstone, grey, S&P, fine grained, noncalcareous, argillaceous, silty, trace of glauconite. Sub-angular quartz, grey and black chert grains, fair sorting, tight.
- 2270 - 2280: Shale, grey-green, silty in part, nodular to massive, noncalcareous, minor dark grey fissile shale, trace of brown shale.
- 2280 - 2290: Sandstone, grey, S&P, very fine grained, grading in part to siltstone, argillaceous, noncalcareous, trace micaceous. Minor dark grey nodular shale, trace of plant remains.
- 2290 - 2300: Shale, grey-green and grey, massive, nodular, non-calcareous, silty in part, grading to argillaceous siltstone. Minor brown silty shale.
- 2300 - 2310: Shale, dark grey, blocky, silty in part, noncalcareous, micromicaceous.
- 2310 - 2320: Sandstone, grey, S&P, fine grained, argillaceous, silty, noncalcareous, trace glauconite, mica. Subangular grey, quartz and grey and black chert grains. Trace of bitumen on partings. Tight.
- 2320 - 2360: Shale, grey and dark grey, minor brown shale, massive, nodular, silty in part, green-grey, nodular shale. Trace of coaly fragments, plant remains, ironstone.
- 2360 - 2380: Siltstone, grey, argillaceous, slightly micaceous, grading in part to very fine grained sandstone.
- 2380 - 2420: Shale, grey and dark grey, nodular, massive, micaceous, noncalcareous, silty in part. Trace of ironstone.
- 2420 - 2430: Shale, light brown grey, grey, waxy, nodular, non-calcareous, much grey green waxy, nodular shale.
- 2430 - 2440: Siltstone, grey, finely S&P, argillaceous, noncalcareous, grading to silty grey shale and very fine grained grey sandstone.
- 2440 - 2450: Shale, grey, nodular, micaceous in part. Much dark grey sub-fissile shale, trace of ironstone.

- 2450 - 2460: Sandstone, grey, S&P, fine grained, noncalcareous, argillaceous. Tight, trace of carbon flecks.
- 2460 - 2470: Sandstone, grey, S&P, very fine grained, grading to argillaceous siltstone, noncalcareous.
- 2470 - 2480: Sandstone, grey, S&P, medium grained, silty, non-calcareous to faintly calcareous. Subangular quartz and chert grains, minor black chert grains, coaly flecks. Tight.
- 2480 - 2490: Shale, grey, greenish grey, nodular, noncalcareous, silty in part. Minor dark grey subfissile to blocky, noncalcareous shale. Traces of sandstone, as above.
- 2490 - 2530: Sandstone, grey, S&P, medium grained, subangular quartz and chert grains, carbon flecks, argillaceous, silty matrix. Much shale, as above. Trace of mica, plant remains.
- 2530 - 2540: Siltstone, grey, argillaceous, grading in part to silty shale, noncalcareous.
- 2540 - 2550: Shale, dark medium grey, silty, micromicaceous, blocky, Minor dark grey shale, trace of plant remains.
- 2550 - 2570: Sandstone, grey, S&P, fine to medium grained, non-calcareous, slightly argillaceous, silty. Trace micaceous. Much dark grey, grey and trace of brown shale.
- 2570 - 2590: Shale, dark grey, very silty, blocky, noncalcareous. Minor interbedded dark grey sub-fissile shale with plant remains.
- 2590 - 2600: Siltstone, pale grey and grey, very argillaceous, noncalcareous, trace micaceous, grading in part to light medium grey silty shale.
- 2600 - 2640: Sandstone, grey, S&P, medium grained, subangular fair sorted quartz, chert, black chert and carbon flecks in argillaceous, silty matrix. Tight.
- 2640 - 2650: Sandstone, as above. Trace of coarse streaks, trace of intergranular porosity, no fluorescence. Shale, dark grey, sub-fissile to blocky, micromicaceous, much dark grey, blocky, silty shale, brown shale. Minor grey, brown massive nodular shale.
- 2650 - 2670: Sandstone, grey, S&P, medium to coarse grained sub-angular quartz, chert grains, silty matrix, non-calcareous. Trace of intergranular porosity, no cut or fluorescence.

- 2670 - 2680: Sandstone, grey, S&P, medium grained, subround to subangular quartz and chert grains, silty, argillaceous matrix, noncalcareous, tight.
- 2680 - 2690: Sandstone, as above. Much grey and dark grey massive to sub-fissile shale.
- 2690 - 2710: Shale, dark grey, sub-fissile to blocky, noncalcareous. Minor grey silty streaks.
- 2710 - 2720: Shale, as above. Minor dark grey micaceous shale, trace rusty maroon shale, trace of ironstone.
- 2720 - 2730: Shale, dark grey, sub-fissile to blocky, noncalcareous, minor micaceous shale.
- 2730 - 2740: Quartzite, pale grey, scattered fine sand grains in siliceous, dense, silty matrix, hard, vitreous.
- 2740 - 2750: Shale, dark grey, sub-fissile to blocky, micaceous, silty streaks, grey-green nodular shale. Traces of quartzite, as above.
- 2750 - 2810: Shale, dark grey, blocky, silty, noncalcareous. Interbedded grey siltstone and very fine sandstone, argillaceous. Traces coal fragments.
- 2810 - 2820: Shale, as above - cvg. in part. Sandstone, grey, S&P, fine grained, subangular quartz, chert grains, black chert grains, in silty, argillaceous matrix, trace mica. Siltstone, pale grey, argillaceous, siliceous.
- 2820 - 2830: Siltstone, pale grey, traces of brown siltstone, argillaceous, siliceous, hard.
- 2830 - 2840: Siltstone, grey, argillaceous, noncalcareous, micaceous, grading to darker grey very argillaceous siltstone, and to light grey, finely S&P, very fine grained sandstone.
- 2840 - 2850: Shale, grey and dark grey, silty, micaceous in part, dark grey shale is sub-fissile, micaceous, to smooth, trace of plant remains. Trace of pyrite.
- 2850 - 2900: Siltstone, dark grey, argillaceous, finely S&P, grading to very fine grained argillaceous sandstone, noncalcareous.
- 2900 - 2910: Sandstone, grey, S&P, very fine to fine grained, noncalcareous. Subangular quartz and grey and black chert grains, silty, argillaceous matrix, trace of laminated siltstone.

- 2910 - 2920: Sandstone, grey, S&P, fine grained to medium grained, subround to subangular quartz and chert grains, silty, shaly matrix. Traces coaly partings and plant remains.
- 2920 - 2940: Sandstone, grey-brown, S&P, medium grained, non-calcareous. Coaly partings. Much dark grey, micaceous, fissile shale, dark grey smooth, nodular shale.
- 2940 - 2950: Shale, dark grey, nodular, to dark grey, micaceous, sub-fissile. Minor silty streaks and silty shale.
- 2950 - 2980: Shale, dark grey, blocky, silty, noncalcareous. Scattered argillaceous, fine sandy streaks.
- 2980 - 2990: Shale, dark grey, blocky to sub-fissile, non-calcareous. Trace of coal, trace of pyrite.
- 2990 - 3000: Shale, dark grey, sub-fissile to blocky, noncalcareous, traces of dark brown, blocky shale, traces of interbedded silty shale.
- 3000 - 3010: Shale, as above. Trace of coal.
- 3010 - 3030: Shale, as above. Sandstone, very fine grained, grey, S&P, argillaceous grading in part to very fine argillaceous sandstone. Trace of coal, coaly partings.
- 3030 - 3050: Shale and sandstone, as above. Trace of grey-brown fine grained sandstone, trace of porosity, cut and fluorescence.
- 3050 - 3070: Shale, dark grey, sub-fissile to blocky, noncalcareous, minor green-grey, nodular waxy shale. Scattered grey silty streaks.
- 3070 - 3080: Shale, nodular, massive, grey, brown grey, silty in part, minor grey-green nodular, waxy shale, dark grey sub-fissile shale, trace of coaly shale.
- 3080 - 3090: Shale, as above. Traces coaly shale and coal. Sandstone, pale grey and brown, S&P, fine to medium grained, noncalcareous, silty, argillaceous, trace micaceous. Subangular and subrounded quartz and chert grains, poor to fair sorting.
- 3090 - 3100: Shale, as above. Interbedded brown-grey argillaceous siltstone and silty shale.

- 3100 - 3110: Shale, grey and dark grey, sub-fissile, traces coaly shale, silty streaks. Pyrite.
- 3110 - 3120: Sandstone, grey, very fine to fine grained, grading to grey siltstone, argillaceous, noncalcareous, much shale and coaly shale.
- 3120 - 3130: Shale, grey and dark grey, as above. Much brown, blocky shale. Silty streaks, much grey green nodular shale.
- 3130 - 3140: Sandstone, grey-brown, very fine grained, grading to siltstone, noncalcareous, argillaceous. Much dark grey, micromicaceous, sub-fissile shale, silty grey shale, trace brown-grey shale and green nodular shale.
- 3140 - 3150: Shale, brown grey and dark grey, sub-fissile, noncalcareous. Trace of coaly shale.
- 3150 - 3160: Sandstone, grey, S&P, very fine grained, argillaceous, noncalcareous.
- 3160 - 3190: Shale, grey, silty, blocky, noncalcareous. Much grey, blocky, and dark grey sub-fissile shale. Trace of ironstone, trace to minor dark brown blocky to splintery shale.
- 3190 - 3210: Shale, as above.
Minor grey, very fine grained, S&P, argillaceous sandstone.
- 3210 - 3220: Shale, brown-grey, red, grey, massive, nodular, waxy in part. Much light brown and brown siltstone, interbedded. Trace of ironstone.
- 3220 - 3240: Shale, grey, nodular to waxy, and shale - dark grey, fissile, noncalcareous. Trace of dark brown shale, silty streaks. Trace of plant remains, ironstone.
- 3240 - 3260: Shale, dark grey, blocky, silty texture in part, noncalcareous. Minor grey, sub-fissile to waxy shale, trace of plant remains.
- 3260 - 3270: Siltstone, grey, S&P, finely micaceous, argillaceous, grading in part to very fine grained sandstone. Much shale, as above. Trace of ironstone.
- 3270 - 3290: Interbedded shale and siltstone, as above. Shale, pale green-grey, finely silty, nodular, waxy, noncalcareous - approximately 20%.

- 3290 - 3300: As above. Trace of grey, coarse, S&P, quartz - chert sandstone - cvg?
- 3300 - 3310: Shale, dark grey, blocky to sub-fissile, micromicaceous in part. Few silty streaks.
- 3310 - 3320: Shale, as above. Minor grey silty shale and siltstone.
- 3320 - 3330: Shale, dark grey and brown-grey, blocky, noncalcareous. Much grey, blocky shale, calcareous in part.
- 3330 - 3340: Shale, grey, blocky, noncalcareous to very calcareous streaks.
- 3340 - 3360: Shale, dark medium grey, sub-fissile, noncalcareous.
- 3360 - 3370: Sandstone, grey, S&P, very fine grained, argillaceous, noncalcareous, grading to grey, argillaceous siltstone. Much shale, as above, traces of grey shale and dark grey sub-fissile shale.
- 3370 - 3380: Shale, dark grey, sub-fissile, noncalcareous. Traces of silty streaks.
- 3380 - 3390: Shale, as above. Traces of coal. Trace of grey, very fine grained argillaceous sandstone.
- 3390 - 3420: Shale, dark grey and grey, sub-fissile, noncalcareous.
- 3420 - 3430: Shale, dark grey, micromicaceous, sub-fissile, noncalcareous. Minor grey, blocky shale, trace of coaly plant remains. Micaceous silty streaks. Trace of ironstone.
- 3430 - 3450: Shale, as above. Trace of pyrite, ironstone. Sandstone grey, very fine grained, grading to argillaceous siltstone, noncalcareous, trace glauconitic.
- 3450 - 3460: Limestone, grey, very argillaceous, grading to very calcareous shale. Much shale, as above.
- 3460 - 3470: Limestone, grey and dark grey, very argillaceous, grading to very calcareous shale. Much interbedded dark grey micaceous shale, silty, blocky shale, minor grey siltstone streaks.
- 3470 - 3480: Shale, black, micaceous, fissile, noncalcareous. Siltstone, grey and dark grey, argillaceous, noncalcareous. Traces of dark red, blocky shale, brown shale.

- 3480 - 3490: Shale, grey and dark grey, nodular to sub-fissile, traces of coaly plant remains, noncalcareous.
- 3490 - 3500: Shale, as above. Minor faintly calcareous grey and brown-grey silty streaks.
- 3500 - 3520: Shale, grey, nodular to waxy, dark grey, sub-fissile noncalcareous. Minor grey, S&P very fine sandstone streaks, grading to siltstone, noncalcareous, argillaceous.
- 3520 - 3560: Shale, grey and dark grey, blocky, waxy to sub-fissile, noncalcareous, traces micaceous, silty shale. Scattered grey siltstone, argillaceous, noncalcareous.
- 3560 - 3570: Sandstone, grey, S&P, fine grained, silty, argillaceous, faintly calcareous. Subround to subangular, poor to fair sorted, light grey quartz and chert grains, minor dark grey shale and carbon flecks. Vitreous in part. Tight. Trace of very fine glauconite.
- 3570 - 3580: Shale, grey and dark grey, nodular, traces of coaly plant remains.
- 3580 - 3600: Shale, as above. Trace of brown-grey shale. Trace of ironstone, plant remains.
- 3600 - 3620: Shale, as above. Trace of brown-grey noncalcareous siltstone.
- 3620 - 3630: Shale, as above, with interbedded brown siltstone. Traces to minor pale grey fine grained, slightly S&P, faintly calcareous sandstone, trace of glauconite.
- 3630 - 3640: Shale, light medium grey, grey and dark grey, noncalcareous, massive, few silty streaks. Trace of very pale grey shale. Interbedded brown-grey noncalcareous siltstone. Trace of pale grey sandstone, as above.
- 3640 - 3650: Shale, grey and dark grey, blocky, traces silty shale and siltstone.
- 3650 - 3660: Shale, as above. Trace of pale grey and brown, very fine grained sandstone, silty, and siltstone. Trace of glauconitic, faintly calcareous.
- 3660 - 3670: Siltstone, light brown and grey, argillaceous, noncalcareous, grading in part to silty shale. Trace of pale grey slightly calcareous, very fine grained sst.

- 3670 - 3680: Siltstone, as above.
- 3680 - 3700: Shale, grey, dark grey, blocky to sub-fissile, noncalcareous. Minor siltstone, as above.
- 3700 - 3710: Shale and siltstone, as above. Trace of pale grey, slightly S&P, and brown, very fine siliceous sandstone, trace glauconite.
- 3710 - 3740: Siltstone, brown-grey, argillaceous, noncalcareous, grading in part to dark grey-brown silty shale.
- 3740 - 3760: Shale, grey-brown, very silty, noncalcareous, grading to brown, argillaceous siltstone. Much dark grey, sub-fissile shale, trace of coaly partings.
- 3760 - 3780: Siltstone, brown-grey, argillaceous, faintly calcareous, trace finely glauconitic, grading in part to very fine grained pale brown sandstone.
- 3780 - 3790: Siltstone, as above, grading to darker grey-brown silty shale, noncalcareous. Trace of lamination.
- 3790 - 3800: Siltstone, as above, much grey and dark grey coaly shale. Traces of ironstone.
- 3800 - 3820: Siltstone, light brown, argillaceous, very faintly calcareous. Much grey and dark grey, blocky to sub-fissile shale.
- 3820 - 3840: Sandstone, pale grey, slightly S&P, vitreous, faintly calcareous, fine grained. Subangular, fairly well sorted quartz grains, silty matrix. Trace of glauconite.
- 3840 - 3850: Sandstone, as above, brown grey and pale grey, becoming more argillaceous. Much grey silty shale, dark grey fissile shale.
- 3850 - 3860: Sandstone, pale grey, S&P, vitreous, fine grained, very faintly calcareous, fair sorting of subangular quartz grains, trace of glauconite.
- 3860 - 3870: Shale, dark grey, sub-fissile, noncalcareous. Much dark brown-grey silty, blocky shale, brown-grey argillaceous siltstone.
- 3870 - 3880: Sandstone, pale grey, slightly S&P, vitreous, fine grained, very faintly calcareous, fairly well sorted subangular quartz grains, silty, siliceous matrix. Much dark grey sub-fissile shale.

- 3880 - 3900: Sandstone, pale grey, very fine grained, vitreous, slightly S&P, very faintly calcareous, trace glauconite, grading to light grey-brown argillaceous siltstone.
- 3900 - 3920: Sandstone, pale grey, vitreous, fine grained, faintly calcareous, subangular quartz grains, well sorted, trace glauconite.
- 3920 - 3950: Sandstone, as above. Slight gas kick. No stain, trace of very fine intergranular porosity, faint cut, fluorescence in wet sample.
- 3950 - 3960: Sandstone, as above. Trace of very fine intergranular porosity. No stain or fluorescence. Slight gas kick.
- 3960 - 3970: Shale, dark grey and black, sub-fissile and splintery, trace of plant remains, noncalcareous. Trace of brown-grey silty shale. Much sandstone (40%) as above.
- 3970 - 3980: Sandstone, brown-grey, S&P, noncalcareous, very fine grained, grading to siltstone. Trace of plant remains.
- 3980 - 4000: Shale, dark grey, sub-fissile to splintery, noncalcareous, trace brown silty streaks. Much pale grey sandstone, as above.
- 4000 - 4015: Shale, dark grey, micromicaceous streaks, sub-fissile to blocky, noncalcareous. Trace of dark brown shale, silty streaks.
- 4015 - 4030: Sandstone, pale grey, slightly S&P, vitreous, trace of glauconite, fine grained. Subangular to subround, well sorted quartz grains, faintly calcareous, siliceous cement. Trace of fine intergranular porosity, no stain, cut or fluorescence.
- 4030 - 4050: Sandstone, grey, very fine to fine grained, argillaceous, grading to dark medium grey very argillaceous sandstone. Much dark grey sandy shale. Noncalcareous.
- 4050 - 4060: Shale, dark grey, blocky to sub-fissile, traces of carbonized plant remains, noncalcareous. Minor grey-brown siltstone, trace of sandstone - cvg?
- 4060 - 4070: Shale, as above. Trace of pale grey, fine grained, well sorted quartz sandstone.
- 4070 - 4080: Siltstone, grey-brown, argillaceous, noncalcareous, trace of lamination.
- 4080 - 4100: Sandstone, pale grey, slightly S&P, fine grained, vitreous well sorted subangular quartz grains, silty matrix, trace of argillaceous partings.

- 4100 - 4110: Siltstone, grey, finely S&P, vitreous, argillaceous, grading in part to silty shale. Shale, dark grey, micaceous in part, sub-fissile, noncalcareous.
- 4110 - 4120: Shale, dark brown-grey, silty, grading to very argillaceous siltstone, micaceous, noncalcareous.
- 4120 - 4130: Siltstone, pale grey and grey, argillaceous, non-calcareous. Much dark grey, interbedded, micaceous, silty shale.
- 4130 - 4150: Shale, dark grey, micaceous, sub-fissile, much dark brown silty shale and brown siltstone, trace of lamination.
- 4150 - 4180: Shale, dark grey, micaceous, sub-fissile to fissile. Trace of ironstone. Much brown and dark brown silty shale.
- 4180 - 4200: Shale, dark grey and dark brown, blocky to sub-fissile, micromicaceous, noncalcareous, much silty shale. Trace of ironstone.
- 4200 - 4240: Shale, dark grey, blocky to sub-fissile, noncalcareous. Minor brown-grey argillaceous, siltstone.
- 4240 - 4250: Shale, as above. Much brown shale, siltstone.
- 4250 - 4300: Shale, dark grey, noncalcareous, micaceous in part, subfissile. Minor pale grey and brown siltstone.
- 4300 - 4310: Shale, as above. Traces of dark brown shale and siltstone.
- 4310 - 4330: Shale, dark grey, noncalcareous, sub-fissile, micaceous in part. Traces to minor brown-grey silty shale, silty streaks. Trace of coaly laminae.
- 4330 - 4370: Shale, dark grey, noncalcareous, blocky to sub-fissile, micaceous in part. Trace to minor brown, argillaceous siltstone, trace glauconitic. Trace of sandstone streaks.
- 4370 - 4390: As above. Trace of ironstone.
- 4390 - 4540: Shale, as above. Trace of pyrite, ironstone.
- 4540 - 4720: Shale, dark grey, micromicaceous, blocky, splintery to sub-fissile, noncalcareous. Trace of pyrite, ironstone.
- 4720 - 4940: Shale, dark grey, micromicaceous, blocky, splintery to fissile, noncalcareous. Trace of pyrite.

- 4940 - 4990: Shale, as above. Trace of dark green fissile shale.
- 4990 - 5050: Shale, as above. Much dark grey, blocky, silty shale.
- 5050 - 5070: Shale, dark grey, blocky, sub-fissile, noncalcareous. Minor silty streaks.
- 5070 - 5100: Shale, dark grey, sub-fissile to blocky, noncalcareous, trace of glauconite, ironstone.
- 5100 - 5130: Shale, dark grey, blocky, non-calcareous. Minor silty shale. Trace of ironstone.
- 5130 - 5140: Shale, dark grey, fissile, noncalcareous. Much grey argillaceous, very glauconitic siltstone and silty shale, minor brown argillaceous siltstone. Trace of grey-green, soft, fissile shale. Ironstone. Trace of chert pebbles.
- 5140 - 5150: Siltstone, grey, argillaceous, noncalcareous, glauconitic, grading in part to silty shale.
- 5150 - 5160: Siltstone, as above. Minor brown siltstone, trace of brown shale.
- 5160 - 5180: Siltstone, grey, argillaceous, noncalcareous, trace glauconitic. Much dark grey fissile shale.
- 5180 - 5210: As above, interbedded siltstone and dark grey shale. Traces of fossiliferous limestone and grey, argillaceous limestone.
- 5210 - 5220: Shale, dark grey and dark brown-grey, sub-fissile, noncalcareous, minor silty shale. Trace of ironstone, pyrite.
- 5220 - 5230: Shale and silty shale, as above. Minor brown shale. Pyrite.
- 5230 - 5240: Shale, grey and dark grey, sub-fissile, noncalcareous. Minor interbedded grey, argillaceous siltstone, faintly calcareous. Trace of pyrite. Trace of calcite-lined fractures.
- 5240 - 5250: As above, siltstone grades in part to very fine grained, faintly calcareous, S&P sandstone. Trace of pyrite. Traces of lamination of siltstone.
- 5250 - 5260: Shale, brown-grey, brown, dark grey, blocky to fissile, silty in part, noncalcareous.

- 5260 - 5270: Shale, grey, sub-fissile and blocky, noncalcareous, micromicaceous sheen. Minor dark grey, fissile shale, noncalcareous. Much interbedded grey siltstone, noncalcareous.
- 5270 - 5290: Shale, dark grey and black, blocky to sub-fissile, noncalcareous, micromicaceous. Trace of pyrite.
- 5290 - 5390: Shale, grey and dark grey, blocky, noncalcareous. Trace of silty streaks.
- 5390 - 5400: Siltstone, light grey, finely S&P, grading to fine grained, pale grey sandstone, very faintly calcareous. Much shale, as above. Trace of chert pebbles.
- 5400 - 5410: Shale, dark grey, micromicaceous, blocky to sub-fissile, noncalcareous. Minor brown-grey silty, argillaceous streaks, trace of ironstone.
- 5410 - 5420: Shale, grey and dark grey, blocky, noncalcareous, minor grey silty streaks, brown siltstone. Trace of pyrite, ironstone.
- 5420 - 5530: Shale, dark grey, noncalcareous, sub-fissile to blocky. Trace of pyrite, ironstone.
- 5530 - 5540: Shale, dark medium grey, blocky, noncalcareous. Much dark grey, fissile, splintery shale. Trace of pyrite. Trace of dark brown shale.
- 5540 - 5570: Shale, dark medium grey and dark grey, sub-fissile to blocky, noncalcareous. Trace of pyrite.
- 5570 - 5590: Shale, as above. Trace of pyritized coaly fragments. Trace of ironstone.
- 5590 - 5670: Shale, dark grey, noncalcareous, fissile to sub-fissile. Trace of silty streaks. Trace of ironstone, pyrite.
- 5670 - 5680: Shale, dark grey and grey, as above, sub-fissile to fissile, noncalcareous. Trace of ironstone, pyrite. Trace of grey, argillaceous limestone.
- 5680 - 5690: Shale, grey and dark grey, as above. Trace of ironstone, pyrite.
- 5690 - 5780: Shale, grey and dark grey, blocky to sub-fissile, noncalcareous. Few silty streaks. Trace of chert pebbles, pyrite, ironstone.
- 5780 - 5790: Shale, as above. Much ironstone. Trace of pyrite, chert pebbles.

- 5790 - 5840: Shale, grey, blocky, noncalcareous, and dark grey, sub-fissile, noncalcareous. Scattered brown silty streaks. Trace of pyrite, ironstone.
- 5840 - 5860: Shale, as above. Trace of light grey, smooth, waxy shale. Trace of chert pebbles, ironstone, pyrite.
- 5860 - 5870: Shale, grey and dark grey, silty in part, grading to grey, argillaceous siltstone, noncalcareous. Trace of pale grey and green waxy shale - bentonite. Trace of pyrite.
- 5870 - 5880: Limestone, dark grey brown, argillaceous, silty in part. Trace of fossiliferous limestone. Trace of pyrite, glauconite.
- 5880 - 5890: Siltstone, grey and dark grey, argillaceous, blocky, very faintly calcareous, grading in part to silty shale, trace micaceous, trace glauconite. Minor brown-grey limestone, as above.
- 5890 - 5950: Siltstone, as above, interbedded dark grey fissile, noncalcareous shale. Traces of bentonite. Trace of glauconite.
- 5950 - 5960: Siltstone, dark brown grey, faintly calcareous to noncalcareous, argillaceous, grading to silty shale, glauconitic streaks. Shale, dark grey, sub-fissile to soft, fissile, noncalcareous. Trace of ironstone.
- 5960 - 5970: Interbedded shale and silty shale, siltstone, as above.
- 5970 - 6000: Siltstone, grey, noncalcareous, argillaceous, trace glauconite, pyrite, trace of ironstone. Much shale, as above.
- 6000 - 6010: Siltstone, grey and dark grey, argillaceous, non-calcareous, much grey-brown siltstone.
- 6010 - 6020: Shale, dark grey, sub-fissile, micromicaceous, non-calcareous. Trace of silty streaks.
- 6020 - 6030: Shale as above. Much pyrite. Trace of ironstone. Siltstone, grey and dark grey, argillaceous, non-calcareous.
- 6030 - 6040: Shale, dark grey, sub-fissile, noncalcareous, minor grey and brown-grey partly calcareous siltstone. Trace of glauconite.
- 6040 - 6060: Shale, as above. Interbedded and interlaminated grey argillaceous siltstone. Trace of pyrite, ironstone.

- 6060 - 6090: Shale, dark grey, sub-fissile and fissile, non-calcareous, micromicaceous in part. Traces of silty streaks. Trace of pyrite, ironstone. Trace of dark grey to pale grey well rounded chert grit grains.
- 6090 - 6150: Shale, grey and dark grey, blocky, to sub-fissile, noncalcareous, silty in part. Trace of pyrite, glauconite, trace of bentonite. Streaks of dark grey-brown argillaceous siltstone.
- 6150 - 6160: Sandstone, grey, very fine grained, argillaceous, slightly to noncalcareous. Very pyritic, very glauconitic.
- 6160 - 6170: Limestone, brown-grey, S&P, sandy, vitreous in part, grading to pale grey sandy, argillaceous, sub-earthly limestone. Trace of calcite infilled fractures.
- 6170 - 6180: Limestone, dark brown, argillaceous, micritic, matrix to scattered fossil fragments. Much interbedded dark brown calcareous shale.
- 6180 - 6190: Sandstone, pale grey, S&P, fine to medium grained, scattered streaks of coarse chert grit, rounded to subrounded quartz, chert grains, limestone matrix, trace of siliceous cement. Poor to fair sorting of clastics. Tight.
- 6190 - 6200: Sandstone, fine to medium grained, calcareous, siliceous cement, light brown, silty in part. Much pale grey, coarse sandstone, as above. Subround to sub-angular, fairly well to poorly sorted quartz and chert grains. Trace of porosity, bitumen infilling. Faint cut in CCl_4 .
- 6200 - 6214: Sandstone, light brown, fine grained, calcareous, trace of coarse sandstone streaks. Subround to sub-angular, fair sorted quartz and chert grains, siliceous cement, calcareous matrix. Poor intergranular porosity, very faint cut.
- 6214 - 6272: Core #1, Rec. 55.1'
- 6272 - 6280: Siltstone, pale grey, very calcareous, and dark grey, argillaceous, calcareous, grading to silty, calcareous shale.
- 6280 - 6290: Shale, dark grey, silty, calcareous, grading in part to shaly calcareous siltstone. Trace of black, slightly bituminous, sub-fissile shale.

- 6290 - 6300: Siltstone, pale grey to brown-grey, very calcareous, grading to silty, dense limestone. Minor dark brown, argillaceous, calcareous siltstone and silty shale. Trace of Brachiopods. Trace of dark brown chert.
- 6300 - 6310: Siltstone, brown-grey and dark brown-grey, very calcareous, grading to silty, brown limestone, argillaceous. Trace of dark brown chert. Much interbedded black, fissile noncalcareous shale, and dark brown calcareous shale.
- 6310 - 6320: Limestone, dark brown-grey, silty, argillaceous.
- 6320 - 6330: As above - silty, dark brown limestone. Much limestone, dark brown grey and brown, sandy, grading to very calcareous sandstone.
- 6330 - 6350: Siltstone, grey brown, argillaceous, calcareous. Much interbedded dark brown very calcareous silty shale.
- 6350 - 6360: Siltstone, grey, very calcareous, grading in part to silty limestone. Much grey and dark brown-grey, argillaceous, calcareous siltstone. Trace of pale grey chert.
- 6360 - 6380: Shale, dark brown-grey, calcareous, blocky, silty in part, grading to argillaceous, silty limestone. Much grey, argillaceous, very calcareous siltstone, as above.
- 6380 - 6390: Shale, dark grey-brown to black, calcareous, fossiliferous - Brachiopods. Minor interbedded streaks of brown fossil fragmental limestone.
- 6390 - 6400: Shale, dark grey-brown, very calcareous, grading to dark brown argillaceous limestone. Trace of grey, silty limestone. Brachiopods, streaks of fossil fragmental limestone.
- 6400 - 6410: Shale, dark grey-brown, very calcareous, siliceous, grading in part to dark brown argillaceous, siliceous limestone. Trace of Brachiopods, fossil fragments.
- 6410 - 6430: Limestone, dark brown, argillaceous, siliceous in part. Minor interbedded dark brown-grey calcareous shale. Traces of Brachiopods.
- 6430 - 6440: Limestone, dark brown, argillaceous, siliceous in part. Much fine fossil fragments, interbedded brown-grey finely fragmental, argillaceous limestone. Trace of crinoids.

- 6440 - 6450: Limestone, brown, dark brown, micritic, argillaceous, siliceous, in part grading to brown chert. Interbedded dark grey fossiliferous, calcareous shale, crinoid, brachiopod fragments.
- 6450 - 6460: Limestone and calcareous shale, as above, matrix to crinoidal, fragmental limestone streaks. Trace of dark brown chert, as above.
- 6460 - 6470: Limestone, brown-grey and light grey, crinoidal-bioclastic, matrix of micritic dark brown limestone and dark grey calcareous shale.
- 6470 - 6480: Limestone, brown-grey, micritic, argillaceous, dense. Limestone, pale brown, silty in part, microcrystalline, compact. Much brown and dark brown chert. Minor fossiliferous shale and fragmental limestone, as above.
- 6480 - 6500: Limestone, grey-brown, argillaceous, siliceous in part, dense - 40%. Limestone, pale brown-grey and brown, microcrystalline, faintly argillaceous - 40%. Chert, brown and dark brown, splintery - 10%. Trace of crinoidal shale - cvg?
- 6500 - 6520: Limestone, brown, dense to microcrystalline, faintly argillaceous, grading to dark brown argillaceous limestone, trace siliceous. Minor brown and dark brown chert.
- 6520 - 6530: Limestone, grey - crinoid and fragmental limestone in a black shale matrix - matrix approximately 30%, devoid approximately 70%. Much dense to microcrystalline limestone, as above. Dark brown and grey chert. Trace of Brachiopods. Minor interbedded dark grey calcareous shale.
- 6530 - 6540: Limestone, grey - crinoidal-bioclastic fragments, dark grey shale matrix. Minor interbedded dark grey shale. Trace of brown-grey chert. Trace of Brachiopods.
- 6540 - 6560: Limestone, brown, microcrystalline, slightly argillaceous, and dark brown, micritic, faintly argillaceous, siliceous. Much dark brown splintery chert.
- 6560 - 6600: Limestone, brown and dark brown, micritic to microcrystalline, siliceous in part. Traces of dark brown chert. Minor dark grey, calcareous shale.

- 6600 - 6620: Limestone, dark brown and brown, micritic to microcrystalline, dense, siliceous, argillaceous. Traces of dark brown chert. Much pale grey, slightly argillaceous limestone.
- 6620 - 6630: Limestone, pale grey and grey, microcrystalline, silty, siliceous, faintly argillaceous. Much light grey 'speckled' chert - silicified limestone. Trace of Brachiopod fragments, sponge spicules.
- 6630 - 6640: Limestone, pale grey, as above. Much chert, as above. Interbedded dark brown siliceous limestone, dark brown chert.
- 6640 - 6650: Limestone, pale grey, S&P, microcrystalline to subearthy, silty, siliceous, grading to very calcareous siliceous siltstone. Much pale grey and smoky grey 'speckled' chert.
- 6650 - 6690: Chert, pale grey and pale brown-grey, minor dark brown chert, splintery, speckled in part. Minor pale grey and brown limestone, as above. Traces of dark grey, calcareous shale.
- 6690 - 6700: Limestone, pale grey and brown, slightly speckled, micritic to microcrystalline, trace silty, siliceous - 60%. Chert, pale grey, grey and brown, minor dark brown chert - 40%. Trace of black, noncalcareous shale.
- 6700 - 6710: Chert, grey, brown and dark brown, speckled in part. Minor pale grey and grey limestone, dark brown siliceous limestone.
- 6710 - 6720: Limestone, dark brown and brown-grey, micritic, dense, siliceous. Minor pale grey microcrystalline limestone. Chert, dark brown, splintery, and grey, slightly speckled, grading in part to siliceous limestone.
- 6720 - 6728: Limestone, brown and light brown, dense to microcrystalline, siliceous, silty in part. Chert, grey, speckled in part, and dark brown, splintery.

T.D. - 6728'

e) Paleontological Determination

Surface to 4950' : Upper Albian

4998' to 5492' : ?Upper Barremian to Middle Albian

6227' to 6272' : Late Mississippian to Early Pennsylvanian

Note: Due to lack of continuous sample control it is not possible to pick the age boundaries exactly. Therefore, the sampled intervals only are mentioned. For closer picks see the geologists.

SECTION III - ENGINEERING SUMMARY

a) Reports of Drillstem Tests (service reports in attached envelope)

DST #1 (6,187' - 6,272') Dual Straddle

Zone: Chance Sandstone

Times: Preflow 5 mins. VO 90 mins.
 ISI 30 mins. FSI 180 mins.

Pressures: IHP 3,608 psi FHP 3,604 psi
 ISIP 1,647 psi FSIP 2,618 psi
 IFP 29 psi FFP 61 psi
 Preflow 75 psi

Recovery: 100' Drilling Fluid
 GTS in 8 mins. TSTM 4' flare

Remarks: No BHT
 Test Satisfactory

DST #2 (3,852' - 3,932') Dual Straddle Bypass

Zone: Blackie Sandstone

Times: Preflow 5 mins. VO 90 mins.
 ISI 30 mins. FSI 150 mins.

Pressures: IHP 2,278 psi FHP 2,223 psi
 ISIP 1,557 psi FSIP 1,625 psi
 IFP 330 psi FFP 1,098 psi
 Preflow 912 psi

Recovery: 600' Gas Cut Drilling Fluid
 GTS in 10 mins. at 70 MCFD

Remarks: No BHT
 Test conclusive but not entirely satisfactory

DST #3 (3,970' - 4,074') Dual Straddle Bypass

Zone: Blackie Sandstone

Times: Preflow 5 mins. VO 90 mins.
 ISI 30 mins. FSI 180 mins.

Pressures: IHP 2,444 psi FHP 2,416 psi
 ISIP FSIP 1,566 psi
 IFP 279 psi FFP 812 psi
 Preflow 210 psi

Recovery: 834' Drilling Fluid
30' Gas Cut Drilling Fluid
No GTS

Remarks: BHT - 118⁰F
Test Satisfactory

DST #4 (930' - 1,036') Straddle, Selective Zone

Zone: Eagle Plain

Remarks: Misrun

b) Casing Record

Conductor Pipe: 25' of 23" OD, 18-1/2" ID insulated double walled conductor pipe with 3/4" OD.
Cooling coils.
20' of 19" OD, 18-1/2" ID conductor pipe set at 60.30' KB.
Conductor pipe cemented with 150 sax BJ cold set cement.

Surface Casing: Ran 25 joints (785.03') of 9-5/8", 36#, K-55 8 rd, new seamless ST&C casing landed at 801.98' KB.
Cemented casing with 425 sax of Type I cement plus 3% CaCl₂. Cement in place 4:30 P.M. March 10, 1972.

c) Bit Record

See attached Bit Record Sheet.

d) Mud Report

Surface Hole: The 12-1/4" surface hole was drilled from 60' KB to 806' KB using stable foam. The hole was then displaced to mud. The following materials were used on surface:

Sulfotex Sal (stable foam)	4 drums
Gel	69 sax
Fiberseal	8 sax
Sawdust (on rig floor)	55 sax

Main Hole: The 8-3/4" main hole was drilled to 6,728' KB using a gel-water-rapidril system. The following materials were used on the main hole:

Gel	521 sax
Wt. Material	1749 sax
Fiberseal	40 sax
Ammonium Nitrate	2 sax
CMC	22 sax
Caustic	39 sax
Bicarbonate of Soda	5 sax

Sawdust (rig floor only)	151 sax
Rapidril	84 bags
Soda Ash	24 sax
Spersene	5 sax
Aluminum Stearate	100 lbs.

e) Deviation Record

202-0°	1030-1/2°	2106-7/8°	3084-7/8°	4190-1-3/4°	5053-2°
263-1/8°	1161-1/2°	2137-?	3209-1°	4253-1-1/8°	5168-1-1/4°
315-1/8°	1288-1/4°	2169-7/8°	3365-1°	4410-2-1/4°	5290-1-1/2°
417-1/8°	1382-1/2°	2200-7/8°	3458-1-1/2°	4442-2-1/2°	5387-2-1/4°
510-1/8°	1477-3/4°	2327-7/8°	3522-1-1/2°	4505-2°	5410-1-1/2°
600-1/2°	1520-3/4°	2452-7/8°	3617-1-1/2°	4568-1-7/8°	5513-1-1/2°
630-1/2°	1560-3/4°	2546-7/8°	3743-1-1/4°	4663-2-3/4°	5600-1-1/4°
690-1/2°	1665-1/4°	2641-1/2°	3846-1°	4726-1-3/4°	5890-1-3/4°
790-1/2°	1790-1/4°	2767-1/2°	3969-1-1/2°	4788-2-1/2°	5948-1-7/8°
876-1/2°	1910-1/2°	2832-1/8°	4032-1°	4883-2°	6519-1-1/4°
940-1/2°	2010-1/2°	2989-7/8°	4074-1°	4977-2°	6725-4-1/4°

f) Abandonment Plugs

Plug #1 (6,728'-6,628') 55 sax Type I cement.
Plug #2 (6,270'-6,130') 80 sax Type I cement.
Plug #3 (4,070'-3,800') 160 sax Type I cement.
Plug #4 (2,250'-2,150') 60 sax Type I cement plus 2% CaCl₂.
Plug #5 (870'-750') 75 sax Type I cement plus 3% CaCl₂.
Plug #6 surface casing plug, 5 sax Type I cement.

g) Lost Circulation Zones

No lost circulation.

h) Report of Blowouts

No kicks or blowouts on this well.

SECTION IV - LOGS

The following Schlumberger logs were run on April 22-23, 1972.

BHC Sonic/Gamma Ray/Caliper (6,724'-800').
Formation Density Compensated (6,725'-800').
Dual Induction Laterolog (6,725'-800').
Microlog (6,724'-6,140') (4,150'-800').
SNP (6,725'-5,860') (4,200'-800').

Ran sidewall core gun. Shot 20 as follows:

5,492'	4,930'
5,450'	4,825'
5,336'	4,753'
5,280'	4,696'
5,220'	4,675'
5,180'	4,612'
5,088'	4,598'
5,025'	4,568'
4,998'	4,410'
4,950'	4,302'

SECTION V - ANALYSIS

a) Core Analysis

Core analysis enclosed.

b) Water Analysis

No water analysis.

c) Gas Analysis

No gas analysis.

d) Oil Analysis

No oil analysis.

SECTION VI - COMPLETION SUMMARY

a) Tubing Record

No tubing run.

b) Perforation Record

No perforations.

c) Cementation Record

Abandonment Plug #1 (6,728'-6,628')

Cemented with 55 sax Type I cement. Cement in place at 10:15 P.M. April 28, 1972. No feel on Plug #1.

Abandonment Plug #2 (6,270'-6,130')

Cemented with 80 sax Type I cement. Cement in place at 11:20 P.M. April 28, 1972. Felt Plug #2 at 6,120' at 7:30 A.M. April 29, 1972.

Abandonment Plug #3 (4,070'-3,800')

Cemented with 160 sax Type I cement. Cement in place at 1:10 P.M. April 29, 1972. Felt Plug #3 at 3,780' at 9:10 P.M. April 29, 1972.

Abandonment Plug #4 (2,250'-2,150')

Cemented with 60 sax Type I cement plus 2% CaCl₂. Cement in place at 10:30 P.M. April 29, 1972. Felt Plug #4 at 2,135' at 6:30 A.M. April 30, 1972.

Abandonment Plug #5 (870'-750')

Cemented with 75 sax Type I cement plus 3% CaCl₂. Cement in place at 9:40 A.M. April 30, 1972. Felt Plug #5 at 745' at 8:00 P.M. April 30, 1972.

Abandonment Plug #6 (Top of Surface Casing)

Cemented with 5 sax Type I cement. Welded on steel plate and well sign.

d) Acidization and Fracturing Record

No acidizing or fracturing operations.

e) Back Pressure and Production Tests

No back pressure or production tests.