

Revised Oct 5
BYCLAREITO PROSPECT
NAYAJO TRIBAL #1, TRACT 11

Section 25, T. 30N., R. 20W.

1980' OIL & 600' MCL

SAN JUAN COUNTY, UTAH



SPUDDED APRIL 7, 1959

COMPLETED MAY 22, 1959

SAMPLE ANALYSIS BY CHARLES E. CLARK AND DONALD W. HOSLAND



- 250 - 260 Fine grained, calcareous, cemented, light gray, well sorted sandstone; green, red, black, and gray shale; disk shaped gypsiferous crystals.
- 260 - 270 Sandstone as above; dark gray, green, black shale; bentonite.
- 270 - 280 Dark to medium gray, silty shale, some green shale and fine grained sandstone.
- 280 - 290 Green and gray shale; some stringers of fine grained sandstone; disk shaped gypsiferous crystals.
- 290 - 300 Green, silty shale, some calcareous fine grained sandstone.
- 300 - 310 Green shale, soft; red siltstone; light gray, fine grained sandstone; disk shaped gypsiferous crystals.
- 310 - 320 Green and white, calcareous, sandy shale, red sandy siltstone, white, light gray, fine grained sandstone, interbedded.
- 320 - 330 Green, sandy shale, red, sandy siltstone, white, light gray, fine grained sandstone, interbedded; bentonite.
- 330 - 340 Green shale (sandy); cut, slightly calcareous bentonite, few & medium to coarse argillaceous sandstone.
- 340 - 350 Same as above; a trace of clear quartzite sandstone, fine to medium grained, angular; disk shaped gypsiferous crystals.
- 350 - 360 Gray and green shale; some silty; fine grained sandstone with green inclusions; a few stringers of coarse to medium grained, poor to fair sorted sandstone.
- 360 - 370 Green, dark gray, white and red shale; trace of purple shale; sandstone as above; disk shaped gypsiferous crystals.
- 370 - 380 Green, red, brown and white shale, some sandstone; trace of lavender limestone and olive green, waxy shale.
- 380 - 390 Green, white, light gray shale; red, very fine grained sandstone; white, fine grained argillaceous cemented sandstone; gypsiferous crystals.
- 390 - 400 Green, gray shale; sandy bentonite (?); white, very fine grained sandstone, trace cherty or "quartzite"
- 400 - 410 Red shale; green, sandy shale, black, gray, silty shale; red siltstone; trace of limestone; medium grain, calcareous cemented sandstone w/green inclusions (10%).
- 410 - 420 Green, red, dark gray, light gray shale; red siltstone (15%); white, sandy shale; fine grained sandstone, gypsiferous crystals.
- 420 - 430 Green, red, purple, gray, and white shale; very fine grained red sandstone (15%), fine grained, argillaceous, cemented sandstone (5%), quartzite granulars, trace lavender limestone.

- 430 - 440 Green, red, and purple shale, white, sandy shale (5%); red siltstone and very fine grained sandstone; well rounded, frosted quartzite particles (approximately $\frac{1}{2}$ mm); greenish white, fine grained sandstone (5%).
- 440 - 450 Green, red, gray shale; coarse sub-angular, calcareous cemented quartzite sandstone (10%); fragments amorphous silica (petrified wood?) rounded quartzite particles (medium and coarse).
- 450 - 460 Green, white, purple and gray shale; red siltstone (10%); white to gray, very fine grained, well sorted quartzite sandstone; amorphous silica; well rounded, medium to coarse grained quartzite particles.
- 460 - 470 Red, green, gray, purple shale (some bentonite?); red siltstone (5%); gray, fine grained sandstone (15%); amorphous silica; gypsiferous crystals; well rounded, medium to coarse grained, quartzite particles.
- 470 - 480 White, gray, green, black, red shale; gray, calcareous and argillaceous cemented fine grained sandstone (10%); gypsiferous crystals, amorphous silica; well rounded, frosted, medium to coarse quartzite particles.
- 480 - 490 Red, purple, green, gray, black shale; red siltstone; fine grained sandstone; gypsiferous crystals; amorphous silica, well rounded, frosted, medium to coarse quartzite particles.
- 490 - 500 Red, white, green, gray, and black shale; red siltstone (5%); very fine grained sandstone, white to light gray; gypsiferous crystals; amorphous silica; well rounded, frosted, medium to coarse quartzite particles (20%).
- 500 - 510 Green, red, purple, black, and gray shale; red siltstone (5%); white, fine grained, well rounded, fair to well sorted sandstone, calcareous, cemented; amorphous silica; gypsiferous crystals; coarse to medium grained quartzite particles.
- 510 - 520 Green, red, gray, shale; red siltstone; medium to coarse, well rounded, frosted, sandstone (30%); gypsiferous crystals.
- 520 - 530 Medium to coarse, well rounded, sandstone, poorly cemented; white, green, red and gray shale (15%); amorphous silica.
- 530 - 540 Sandstone as above and frosted; red, green, gray shale (10%); amorphous silica.
- 540 - 550 Fine to medium and coarse grained sandstone, poorly cemented; red, green, gray shale (25%); amorphous silica.
- 550 - 560 Medium to coarse grained, frosted, rounded to sub-rounded sandstone; green, red sandstone (10%); amorphous silica.
- 560 - 570 Sandstone as above; green, red, gray, purple shale (15%); amorphous silica.
- 570 - 580 Sandstone as above; green, red, pink and white shale (25%); amorphous silica.
- 580 - 590 White, red, green, sandy shale, minor amounts of gray and black shale; sandstone - 10%; trace amorphous silica.
- 590 - 600 Green, gray, red, brown and white shale, some sandy; about 10% medium to coarse grained sandstone; trace amorphous silica.

- 600 - 610 Red, green, brown and black, sandy shale; 10% sandstone as above.
- 610 - 630 Green, gray, red, and white shale; gray, fine grained, well sorted sandstone (25%).
- 630 - 640 Gray, green, red, and white, sandy shale; (5%) coarse to medium grained sandstone, poorly cemented; (5%) fine grained calcareous cemented sandstone.
- 640 - 650 Shale as above; gray, fine grained, well cemented sandstone (40%); coarse to medium grained sandstone, poorly cemented (5%).
- 650 - 660 Green, white and gray shale, some pyritic inclusions; red siltstone (2%); medium grained, well rounded, frosted sandstone (30%).
- 660 - 670 Green and white sandy shale; sandstone as above (45%).
- 670 - 680 Medium grained, well rounded, frosted sandstone (20%); very fine to fine-grained, poorly cemented sandstone; green, white, red shale (30%).
- 680 - 690 Green, red, white and brown shale, sandy; fine grained, well cemented, calcareous, rounded, well sorted sandstone (10%); very fine to fine grained, poorly cemented sandstone (20%); medium to coarse grained sandstone, poorly cemented (25%).
- 690 - 700 Green, red and white shale, sandy; gray, fine grained, calcareous, cemented sandstone (15%); medium to coarse grained, poorly cemented sandstone (40%).
- 700 - 710 Green, red, brown shale, sandy (15%); medium to coarse grained, frosted, well rounded sandstone; fine grained sandstone (5%).
- 710 - 720 Green, sandy shale; fine grained, calcareous, cemented, well rounded, well sorted sandstone (15%); loose, well rounded, med to coarse grained, sand particles (40%).
- 720 - 730 Green, sandy shale (25%); red shale (5%); calcareous, cemented, fine grained sandstone; loose, well rounded, medium to coarse grained sand.
- 730 - 740 Green, red, gray shale (25%), sandy; sandstone as above.
- 740 - 750 White, green, red shale, sandy (30%); sandstone as above.
- 750 - 760 Green, black, red shale, sandy; also white sandy shale; fine to very fine grained sandstone (20%).
- 760 - 770 Red, green, brown, white shale, some inclusions pyritic (20%); white, fine grained, calcareous, cemented, sandstone (10%); loose, coarse to medium grained sand.
- 770 - 780 Green, red, brown, white, gray shale; sandstone as above.
- 780 - 790 Green, gray and brown, sandy shale, also red shale; loose, coarse to medium grained, well rounded, frosted sand (30-40%).
- 790 - 800 Green, brown, white, sandy shale (25%); white, fine grained sandstone, well cemented.

800 - 810	Green, black, gray, red, brown, sandy shale; fine to coarse grained, calcareous, cemented sandstone (50-60%).
810 - 820	Green, sandy shale, brown, gray shale; loose fine grained sand (5%).
820 - 830	Green, sandy shale, red, white, brown shale; fine grained, white, well cemented, calcareous sandstone (5%).
830 - 840	Green, white, gray, red shale, some sandy; sandstone as above (50%); loose, fine to coarse grained, well rounded sandstone (55%).
840 - 850	White, green, red, sandy shale; fine grained, well cemented sandstone (10%); loose, fine to coarse grained, well rounded sandstone (10%).
850 - 860	Green, white, red, and gray shale, some sandy; fine grained, calcareous, cemented sandstone, gray (50%).
860 - 870	Green, brown, red shale; fine to medium grained, calcareous, cemented, well rounded sandstone.
870 - 880	Green, red, black, gray shale; fine grained, calcareous, cemented sandstone (50%).
880 - 890	Green, red, white, black and gray shale, sandy; sandstone as above; fine to coarse, loose sand.
890 - 900	Shale as above; fine grained, calcareous, cemented sandstone, (25%) some loose.
900 - 910	Red, green, white, gray shale, some sandy; sandstone as above (10%).
910 - 920	As above.
920 - 970	Shale as above; fine grained, calcareous, cemented sandstone (40%), light pink to white.
970 - 980	Shale as above, also some black shale; sandstone as above.
980 - 1000	Shale as above (40%); fine grained, calcareous, cemented sandstone (80%), light pink to white.
1000-1020	Reddish brown, green, white, gray shale, soft, some sandy; white, fine grained, calcareous, cemented, well sorted sandstone - 20%.
1020-1030	Shale as above; green, white, and gray, fine grained, calcareous and argillaceous, cemented, well sorted sandstone - 15%.
1030-1040	Brownish red, green, white, and gray shale, soft, some sandy; sandstone as in interval between 1000-1010 - 20%.
1040-1070	Shale as above; sandstone as above.
1070-1090	As above plus some purple shale.

- 1090-1100 Shale as above plus some purple shale; sandstone as above - 10%; coarse to medium grained, calcareous, cemented sandstone - 5%.
- 1100-1130 Shale as above; white, fine grained, calcareous, cemented, well sorted sandstone - 5%; coarse to medium grained, calcareous, cemented sandstone - 10%; loose, fine to medium grained sand, well rounded - 10%.
- 1130-1140 Shale and sandstone as above.
- 1140-1150 Shale and sandstone as above; few cuttings of limestone.
- 1150-1160 Red-brown, green, gray-purple shale, most sandy, soft; fine grained, calcareous, cemented, well sorted sandstone - 10%.
- 1160-1170 Shale as above plus white shale; sandstone as above; loose, coarse to medium grained, well rounded, frosted sand - 10%.
- 1170-1180 Shale and sandstone as above; disk shaped gypsiferous crystals, trace pink limestone.
- 1180-1190 Shale as above; fine grained, calcareous, cemented, well sorted sandstone - 5%; loose, very fine to coarse grained sand - 5%; amorphous silica (petrified wood?).
- 1190-1200 Red, green, white, gray shale (red shale predominates); fine grained, calcareous, cemented, well sorted, sub angular to sub rounded sandstone, containing green inclusions - 10%; trace limestone; amorphous silica.
- 1200-1210 Shale as above (red shale not sandy) also purple shale; sandstone as above, plus loose, very fine to coarse grained, well rounded sand; gypsiferous crystals; trace of light brown limestone.
- 1210-1220 Shale as above; fine grained, calcareous, cemented, well sorted, sub angular to sub rounded sandstone - 5%; loose, very fine to fine to coarse grained, well rounded (larger grains) sand - 5%; amorphous silica; trace of light brown limestone.
- 1220-1230 Shale as above plus black and purple shale; fine grained calcareous, cemented, well sorted sandstone - 5%; trace of greenish white limestone.
- 1230-1250 Shale as above plus black and purple shale; sandstone as above; trace of limestone.
- 1250-1260 Red, green, gray, black, white, purple shale, some sandy, soft; fine grained, calcareous, cemented, well sorted, sub angular to sub rounded sandstone - 5%; increase in limestone, white to light brown, dense - 10-15%.
- 1260-1270 Missing Sample.
- 1270-1280 Shale and sandstone as above; limestone, light gray to pink, dense - 5%.
- 1280-1290 Shale as above; sandstone as above plus medium grained, calcareous, cemented, rounded sandstone - 5%; light gray, pink, brown, dense limestone - 5%.

- 1300-1320 Red, green, gray, black, white, purple shale, soft, some sandy; medium to fine grained, calcareous, cemented, well sorted, sub rounded to rounded sandstone - 5%; light reddish brown, dense limestone - 5%.
- 1320-1340 Shale as above, gray shale very sandy; very fine grained, reddish sandstone - 2%; medium to fine grained, calcareous, cemented, sub rounded to rounded sandstone - 5%; amorphous chert; trace of limestone; trace of orange chert.
- 1340-1350 Shale as above; brick red, very fine grained sandstone - 4%; medium grained, calcareous, cemented, sub rounded to rounded sandstone - 5%; gray-brown limestone - 2%.
- 1350-1360 Missing Sample.
- 1360-1370 Shale and sandstone as above; white to light gray, dense limestone.
- 1370-1380 Green, brownish red, dark gray shale; sandstone as above; white, dense limestone - 10%; amorphous chert.
- 1380-1390 Shale as above plus purple shale; white, very fine grained, calcareous, cemented sandstone - 5%; white, dense limestone - 5%.
- 1390-1410 Shale as above; medium grained, calcareous, cemented, sub rounded to rounded sandstone - 5%; very fine grained, brick red, sandstone 4%; light gray dense limestone 4%.
- 1410-1420 Green, reddish brown, gray, purple shale, soft, some sandy; fine to medium grained, calcareous, cemented, fair sorting, sandstone w/green inclusions - 5%; white to gray dense limestone.
- 1420-1430 Shale as above plus maroon shale; sandstone and limestone as above.
- 1430-1440 Shale as above; brick red, very fine grained sandstone - 2%; fine to medium grained, calcareous, cemented, fair sorting sandstone - 2%; white to gray, dense limestone - 2%.
- 1440-1450 Green, sandy shale, brownish red shale, brown, purple, white shale; medium grained, calcareous, cemented, sub rounded to rounded sandstone - 2%; disk shaped gypsumiferous crystals; white, dense limestone - 2%.
- 1450-1470 Red, green, gray, white shale; fine to medium grained, sub rounded to rounded, well sorted, calcareous, cemented sandstone - 5%; gray, brownish red, dense limestone - 2-3%.
- 1470-1480 Shale as above plus dark gray to black shale; very fine grained, red-orange sandstone - 1%; sandstone and limestone as above.
- 1480-1490 Gray, brown, red, green, purple, white shale, some sandy, soft; white to light gray, dense limestone; white, medium grained, rounded, well sorted, poorly cemented sandstone; white, fine grained, rounded, well sorted, calcareous, cemented sandstone; very fine grained red-orange sandstone.
- 1490-1500 Sample Missing.

- 1500-1520 Shale as above; reddish-orange, very fine grained sandstone; fine grained, white, rounded, well sorted, calcareous, cemented sandstone; trace of light gray, dense, limestone; trace of orange, dense limestone.
- 1520-1530 Green, red, gray, purple shale; fine grained, white, rounded, well sorted, calcareous, cemented sandstone - 10%; reddish-orange, very fine grained sandstone - 10%; limestone as above.
- 1530-1540 Shale as above plus white shale; white sandstone as above; reddish-orange sandstone and limestone as above.
- 1540-1550 Shale and sandstone as above; white to light gray, dense limestone.
- 1550-1570 Red, green, purple, white, gray, and black shale, soft, some sandy; sandstone as above; trace of light gray and orange, dense limestone.
- 1570-1580 Shale and sandstone as above; slight increase in limestone.
- 1580-1590 Shale and sandstone as above; trace of white, medium gray, calcareous, cemented sandstone; increase in orange limestone.
- 1590-1600 Shale as above; orange, dense limestone - 8%; trace of white, medium grained, calcareous, cemented sandstone; white and reddish-orange sandstone as above.
- 1600-1610
1. Green, brownish red, white, gray, purple, black shale, soft, some sandy, calcareous.
 2. Limestone, pink, dense (trace).
 3. Limestone, brown, dense, trace.
 4. Very fine to fine grained, red-orange, well sorted, calcareous, cemented sandstone - 2%.
 5. White, fine grained, calcareous, cemented, well sorted sandstone - 3%.
- Trace of white chert.
- 1610-1620
1. Shale as above
 2. Pink, dense limestone, trace.
 3. Brown, dense limestone, trace.
 4. Reddish-orange, very fine to fine grained, well sorted, calcareous cemented sandstone - 1%.
 5. White, fine grained, calcareous, cemented, well sorted sandstone 2%.
- Trace of white chert.
- 1620-1630
1. As above
 2. As above
 3. Brown, white, and gray, dense limestone
 4. As above - 1%.
 5. As above - 1%.
- Very coarse quartzite grains, rounded, frosted.
- 1630-1640
1. As above, predominantly brownish-red and green.
 2. As above, salmon colored.
 3. Gray and white, dense limestone.
 4. As above, trace
 5. As above, trace.

- 1640-1650 1. As above
2. As above - 1%
3. As above - 1%
4. As above - 1%
5. As above - 1%
Disk shaped gypsiferous crystals; green shale.
- 1650-1660 1. As above
2. ---
3. White, brown, dense limestone, trace.
4. As above, trace.
5. As above - 2%
6. White, medium grained, calcareous, cemented sub rounded to rounded sandstone, trace.
- 1660-1670 Shale as above plus brick red shale.
3. White, light brown, dense limestone, trace.
4. As above - 1%
5. As above - 1%.
- 1670-1680 1. Shale as above plus turquoise colored shale, sandy.
2. Limestone as above, trace
3. Limestone as above, trace
4. Sandstone as above - 1%
5. Sandstone as above - 1%
- 1680-1690 1-5 As above.
6. As above (interval 1650-60) 1%.
- 1690-1700 1-5 As above.
- 1700-1710 1,3,4, and 5 As above.
Disked shaped gypsiferous crystals.
- 1710-1720 1. Shale as above plus turquoise-chocolate brown shale.
2-5 As above.
Very coarse sub angular, frosted, quartzite grains.
- 1720-1730 1. Shale as above plus brick red shale.
2 and 3 As above.
4. Sandstone as above, trace.
5. Sandstone as above, trace.
6. As above (interval 1650-60), trace;
Disk shaped gypsiferous crystals, some oolitic crystals.
- 1730-1740 As above, some shale very sandy.
2. ---
3, 4, and 5. As above.
Disk shaped gypsiferous crystals.
- 1740-1750 1-4. As above.
5. Sandstone as above - 1-2%.

- 1750-1760 1. Reddish-brown, green, brown, gray, white, purple shale, soft, some sandy.
2. Light orange, dense limestone, trace.
3. White, dense limestone
4. Fine grained, reddish-orange, well sorted, calcareous, cemented sandstone - 1%.
5. White, fine grained, well sorted, calcareous, cemented sandstone - 1%.
6. Medium grained, white, well sorted, rounded, calcareous, cemented sandstone - 1%.
- 1760-1770 1. As above.
2. ---
3. Limestone, white, brown, dense, trace
4, 5, and 6. As above.
- 1770-1780 As above.
- 1780-1790 Shale as above (turquoise colored shale).
2-6. As above.
Disk shaped gypsiferous crystals.
- 1790-1800 2. ---
1, 3, 4, 5, and 6. As above.
- 1800-1810 1. As above.
2. As above - 1%.
3. As above - 1%.
4, 5, and 6. As above.
- 1810-1820 1. As above.
2, 3, and 4. As above except trace.
5 and 6. As above.
Very coarse large, angular, quartzite grains.
- 1820-1830 1 and 2. As above.
3. As above, except trace.
4 and 5. As above.
Trace of green chert.
Trace of very coarse, angular-rounded, loose, quartzite grains.
- 1830-1840 1. As above.
2. ---
3. As above except 1%.
4 and 5. As above except 1-2%.
6. Trace sandstone as above, white and green.
- 1840-1850 1-3. As above.
4. As above except trace.
5. As above except 1%.
6. As above.
- 1850-1860 1. Brownish-red, green, turquoise, gray, and purple shale, soft, some sandy.
2. Orange-red, dense limestone, trace.
3. Light reddish-brown, gray, white, dense limestone.
4. Very fine to fine grained, reddish orange, well sorted, calcareous, cemented sandstone - 2%.
5. White, fine grained, well sorted, calcareous, cemented sandstone - 2%.
6. White, medium grained, well sorted, rounded, calcareous, cemented sandstone, trace.

- 1880-1870
1. Shale as above - brick red shale.
 2. Limestone as above, 1-2%.
 3. Limestone as above, 1%.
 4. Sandstone as above, trace.
 5. Sandstone as above, trace.
 6. Sandstone as above, trace.
- 1870-1880
1. Shale as above.
 2. Limestone as above, 1%.
 3. Limestone as above, also green, dense limestone, 1%.
 4. Sandstone as above, 1%.
 5. Sandstone as above, 1%.
 6. Sandstone as above, 1%.
- Very coarse grained, angular scattered, quartzite grains.
- 1880-1890
1. Shale as above.
 2. Limestone as above, 1-2%.
 3. Sandstone as above, sandy, trace.
 4. Sandstone as above, 1-2%.
 5. Sandstone as above, trace.
 6. Sandstone as above, some green and coarse grained, calcareous, cemented.
- 1890-1900
1. Shale as above
 2. Limestone as above, trace.
 3. Limestone as above, trace.
 4. Sandstone as above, trace
 5. Sandstone as above, 1%.
 6. Sandstone as above, trace.
- 1900-1910
1. Green, brownish red, brown, gray, purple and brick red shale, soft, some sandy.
 2. Reddish orange, dense limestone, trace
 3. Brown, white and gray, dense limestone, 1%.
 4. Very fine grained to fine grained, reddish orange, calcareous, cemented, well sorted, sandstone, 1-2%.
 5. Fine grained, white, calcareous, cemented, well sorted sandstone, trace.
- 1910-1920
1. Shale as above
 2. Limestone as above, trace.
 3. Limestone as above, 1%
 4. Sandstone as above, 1%
 5. Sandstone as above, 1%.
 6. Medium grain, white, sub angular to sub rounded, calcareous, cemented sandstone, trace.
 7. Fine to very fine grain, dirty, greenish-gray, sub angular to sub rounded, well sorted sandstone, trace.
- 1920-1930
1. Shale as above, red sandy shale predominates.
 2. Limestone as above
 3. Limestone as above plus green, dense limestone, 1%
 4. Sandstone as above, 1%
 5. Sandstone as above, trace.
 6. Sandstone as above, trace.
- Very coarse grain, loose, round, frosted, quartzite grains.

- 1930-1940
1. Shale as above.
 2. Limestone as above, trace.
 3. Limestone as above, trace.
 4. Sandstone as above, trace.
 5. Sandstone as above, trace.
 6. Sandstone as above, trace.
- 1940-1950
1. Shale as above plus yellow-brown shale.
 2. Limestone as above, 1%.
 3. Limestone as above, 1%.
 4. Sandstone as above, 2%.
 5. Sandstone as above, 1%.
 6. Sandstone as above, trace.
 7. Sandstone as above, trace.
- 1950-1960
1. Shale as above.
 2. Limestone as above, 2% (silty, hard, may be fracture-or fault filling).
 3. Limestone as above, 1%.
 4. Sandstone as above, 1%.
 5. Sandstone as above, 1%.
- 1960-1970
1. Shale as above plus white shale.
 2. Limestone as above, 1%.
 4. Sandstone as above, 1%.
 5. Sandstone as above, trace.
- 1970-1980
- As above.
- 1980-1990
- 1-5. As above.
 6. Sandstone as above, 1%.
- 1990-2000
- Sample Missing.
- 2000-2010
1. Brownish red, green, purple, gray, and white shale, some sandy.
 2. Brown, gray and green, dense limestone, 1%.
 4. Fine grained, reddish-orange, well sorted, calcareous, cemented sandstone, 2%.
 6. White, medium grained, sub angular to sub rounded, calcareous, cemented sandstone, 1%.
- 2010-2020
1. Shale as above.
 2. May be sandstone below pulverized by drill (?) show abrasion marks.
 3. As above, trace.
 4. Reddish-orange, very fine grain to fine grain, calcareous, cemented, well sorted sandstone (shaly: 20-25%, increase).
 5. Sandstone as above, 1%.
- 2020-2030
1. Shale as above, decrease.
 - 2 and 3. As above.
 4. Sandstone as above, 50-60%.
- Disk shaped gypsumiferous crystals.
- 2030-2040
1. Shale as above.
 3. Limestone as above, 1%.
 4. Sandstone as above, 80%.
 5. Sandstone as above, trace.

- 2040-2050
1. Shale as above plus turquoise colored shale.
 2. Limestone as above, trace
 4. Sandstone as above, 20-30%.
- 2050-2060
- Sample missing.
- 2060-2070
1. Green, brick-red, brown, gray, predominantly brick-red, some silty, some sandy.
 2. Brown, light gray, dense limestone, 1%.
 3. Very fine grain, brick red, reddish-orange, calcareous, cemented, well sorted sandstone, 5-10%.
 4. Fine grain, white, calcareous, cemented, well sorted sandstone, 1%.
 5. Medium grain, white, calcareous, cemented, well sorted sandstone, 1%.
- 2070-2080
1. Shale as above and white shale.
 2. Limestone as above, 1%.
 3. Reddish-orange sandstone as above, 5-10%.
 5. As above, 1%.
- 2080-2090
1. Shale as above, brick-red shale predominates
 3. Sandstone as above, 5%
 4. Sandstone as above, trace.
 5. Sandstone as above, trace.
 6. Brick-red, reddish-orange, calcareous cemented siltstone, 3%.
- Disk shaped gypsumiferous crystals.
- 2090-2100
1. Shale as above.
 2. Limestone, brown, dense, trace
 3. Sandstone as above, 5%
 4. Sandstone as above, trace.
 5. Sandstone as above, trace
- Very coarse, round, loose quartz grains.
- 2100-2110
1. Shale as above.
 2. Green, light brown, white, gray, dense limestone, some slightly sandy, 1%.
 3. Reddish orange, fine to very fine grained, calcareous, cemented, well sorted sandstone, 5%.
- 2110-2120
1. Shale as above.
 2. Limestone as above, 1%.
 3. Sandstone as above, 5%.
 4. Medium grained, white, calcareous, cemented, well sorted sandstone, trace.
- Very coarse, round, frosted, quartzite grains, trace.
- 2120-2130
1. Shale as above.
 2. Limestone as above, 1%.
 3. Sandstone as above, 5%.
 4. Sandstone as above, trace.
 5. White, fine grained, calcareous, cemented, well sorted sandstone, 1%.
- 2130-2140
1. Shale as above.
 2. Limestone as above, 1%.
 3. Sandstone as above, 1%.
 4. Sandstone as above, trace
 5. Sandstone as above, trace.

- 2140-2150 As above.
- 2150-2160 1. Shale as above plus black shale (reddish-orange, calcareous, silty shale predominates).
2. Limestone as above.
3. Sandstone as above, 1%.
- 2160-2170 1. Shale as above.
2. Limestone as above, 1%.
3. Sandstone as above.
4. Sandstone as above, trace.
5. Sandstone as above, 1%.
- 2170-2180 1. Shale as above.
2. Limestone as above, trace.
3. Sandstone as above, trace.
- 2180-2190 1. Shale as above (reddish-orange, calcareous, silty shale, predominates - increases in this sample - approximately 70%).
2. Limestone as above, trace.
3. Sandstone as above.
- 2190-2200 1. Shale as above.
2. Limestone as above, trace.
3. Sandstone as above, 1%.
5. Sandstone as above, trace.
- 2200-2210 1. Brick-red, brownish-red, green, gray, and purple shale (white, silty, some sandy), brick-red shale comprised about 60% of total shale, green and brownish-red shale make up most of remaining shale.
2. White, light brown, dense limestone, 1%.
3. Brick-red, calcareous, siltstone, 10%. In the proceeding 50', this lithology has been included as a silty shale.
4. White and brick-red, calcareous, cemented, fine grained, sandstone, 2%.
- 2210-2220 1. Shale as above.
2. Limestone as above plus light green limestone, 1%.
3. Brick-red, calcareous siltstone, 50%.
4. Brick-red, fine grain to very fine grain, calcareous, cemented, well sorted sandstone, 2%.
5. White to light gray, fine grain, calcareous, cemented, well sorted, sandstone, 1%.
- 2220-2230 1. Brick-red, brownish-red, green, gray, and purple shale, calcareous, silty, some sandy.
2. Limestone as above, 1%.
3. Brick-red, siltstone, 20-30%.
4. Sandstone as above, trace.
5. Sandstone as above, trace.
6. White, medium gray, sub rounded to rounded, well sorted sandstone, 1%.
- 2230-2240 1, 2, and 3 as above.
4. Sandstone as above, 2%.
5. As above, trace.

- 2240-2250
1. Shale as above.
 2. Limestone as above plus green, dense limestone.
 3. Siltstone as above, 20-30%.
 4. Sandstone as above, 2%.
- 2250-2260
1. Shale as above.
 2. Brown, white, dense limestone, trace.
 3. Siltstone, 25-35%, as above.
 4. Sandstone as above, 2%.
- 2260-2270
1. Shale as above plus white, sandy shale.
 2. Green, brown, white limestone, trace.
 3. Siltstone as above, 30-40%.
 4. Sandstone as above, 2%.
 5. Sandstone as above, trace.
- 2270-2280
1. Shale as above.
 2. Limestone as above, trace.
 3. Siltstone as above, almost borders on being very fine grain sandstone.
 4. Sandstone as above, 3%.
- Very coarse, angular quartzite grains, trace.
- 2280-2290
1. Shale as above.
 2. Limestone as above, 1%.
 3. Siltstone as above, 25-35%.
 4. Sandstone as above, trace.
- Green, medium grained, well sorted, sandstone, 1%.
- 2290-2300
- 1, 2, 3, and 4. As above.
- 2300-2310
1. Brick-red, brown, gray, green, purple shale, calcareous, sandy, silty.
 2. White, pink, light brown, dense limestone, 1%.
 3. Siltstone, brick-red, calcareous, 20-30%.
 4. Brick-red, fine grain to very fine grain, calcareous, cemented, well sorted sandstone.
 5. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 2310-2320
1. Shale as above plus black shale.
 2. and 3. As above.
 4. Sandstone as above, 1%.
- 2320-2330
1. and 2. As above.
 3. Siltstone as above, 25-35%.
 4. Sandstone as above, trace.
- Trace of green, medium grained, well sorted sandstone.
- 2330-2340
1. and 2. As above.
 3. Siltstone as above, 20-40%.
 5. Sandstone as above, trace.
- 2340-2350
1. Shale as above plus white shale.
 2. Limestone as above, trace.
 3. Siltstone as above, 20-30%.
 4. Sandstone as above, 4%.
 5. Sandstone as above, 1%.
- 1% green, medium grained, well sorted sandstone.

- 2350-2360 1. Brick-red, brown, green, gray shale, some sandy, silty, calcareous; pre-
dominantly brick-red, silty shale.
2. White, brown, dense limestone, trace
3. Brick-red, calcareous siltstone, 20-30%.
4. White, medium grained, calcareous, cemented, well sorted, sub rounded to
round sandstone, 1%.
5. Brick-red, fine grained, calcareous, cemented, well sorted sandstone, 1%.
Trace of white chert.
- 2360-2370 1, 2, and 3. As above.
4. Sandstone as above, trace
5. Sandstone as above, trace.
6. White, fine grained, calcareous, cemented, well sorted sandstone, trace.
- 2370-2380 1. Shale as above and turquoise colored shale.
2, 3, and 5. As above.
- 2380-2390 1. Shale as above and purple and white shale.
2. Limestone as above.
3. Siltstone as above (30-40%).
4, 5, and 6. As above.
- 2390-2400 1. Shale as above and trace of black shale.
2. Limestone as above.
3. Siltstone as above, 20-30%
5. Sandstone as above, 5%.
- 2400-2410 1. Shale as above.
2. Limestone as above plus green, 1%.
3. Siltstone as above, 20-25%.
4 and 5. As above.
- 2410-2420 1. Shale as above, predominantly brick-red.
2. White, brown, dense limestone, 1%.
3. Siltstone as above, 30-40%.
5. Brick-red, fine and very fine grained, calcareous, cemented, well sorted
sandstone, trace.
- 2420-2430 1, 2, and 5. As above.
3. Siltstone as above, 25-35%.
- 2430-2440 1, 2, and 3. As above.
5. Sandstone as above, 1%.
- 2440-2450 1. Shale as above.
2. Limestone as above, 1%.
3. Siltstone as above, 20-30%.
4. Sandstone as above, trace.
5. Sandstone as above, trace.
6. Sandstone as above, trace.
- 2450-2460 1, 2, and 3. As above.
4. Sandstone as above, 1%.
5. Sandstone as above, 1%.

- 2460-2470 Shale as above, brick-red shale predominates.
 2. Limestone as above plus green, dense limestone, 1%.
 3. Siltstone as above, 30-40%.
 4. Sandstone as above, 1%.
 5. Sandstone as above, trace.
 6. Sandstone as above, 1%.
- 2470-2480 1. Shale as above, green shale very sandy.
 2. Limestone as above, trace.
 3. Siltstone as above, 30-40%.
 4. Sandstone as above, trace.
 5. Sandstone as above, trace.
- 2480-2490 As above.
- 2490-2500 1. Shale as above.
 2. Limestone as above, 1%.
 3. Siltstone as above, 30-40%.
 4. Sandstone as above, trace.
- 2500-2510 Sample missing.
- 2510-2520 1. Brick-red, reddish-brown, green, gray, pink, brown shale, some sandy, calcareous.
 2. White, dense limestone, trace.
 3. Brick-red, calcareous siltstone, 30-40%.
 4. Very fine and fine grained, brick-red, well sorted, calcareous sandstone, 5%.
 5. White, medium grained, calcareous, cemented, sub angular to sub rounded, well sorted sandstone, trace.
 6. White, fine grained, calcareous, cemented, sub rounded to rounded, well sorted sandstone, trace.
- 2520-2530 1. Shale as above.
 2. Limestone as above plus brown, dense limestone, 1%.
 3. Brick-red, siltstone as above, 30-40%.
 4. Sandstone as above, 5%.
 5 and 6. As above.
- 2530-2540 1. Shale as above, predominantly brick red.
 2, 3, 4, 5, and 6. As above.
 7. Green, medium grained, calcareous, cemented, rounded, well sorted, sandstone.
 Disk shaped gypsumiferous crystals.
- 2540-2550 1. Shale as above plus white shale.
 2. Limestone as above, 1%.
 3. Siltstone as above, 30-40%.
 4. Sandstone as above, 2%.
 5. Sandstone as above, 1%.
- 2550-2560 1. Shale as above, predominantly brick-red shale.
 2. Limestone as above, plus green, dense limestone, trace.
 3. Siltstone as above, 40-50%.
 4. Sandstone as above, 1%.
 5. Sandstone as above, trace.

- 2560-2570 1. Shale as above.
2. Limestone as above, plus red, dense limestone, trace.
3. Siltstone as above, 40-50%.
4. Sandstone as above, trace.
5. Sandstone as above, trace.
- 2570-2580 1. Shale as above.
2. Limestone as above, 1%.
3 and 4. As above.
- 2580-2590 Almost completely brick-red, calcareous, silty shale and brick-red, calcareous siltstone; trace of green, reddish-brown, white, dense limestone and green shale.
- 2590-2600 Brick-red, reddish-purple shale, silty, calcareous and brick-red and purple siltstone; trace of green, reddish-brown, white, dense limestone - trace green and white shale.
- 2600-2630 Approximately 55% reddish-purple siltstone; 30% brick-red, calcareous shale and siltstone; limestone as above, 1%.
- 2630-2640 Approximately 55% reddish-purple, calcareous siltstone; 30% brick-red, calcareous shale and siltstone; trace white and green shale; trace of light brown, white, green, dense limestone; 1% white mottled, fine to medium grained, calcareous, cemented sandstone w/red, black, green, and white inclusions.
- 2640-2650 Brick-red, calcareous shale and siltstone; reddish-purple, calcareous siltstone; white, green, brown shale, some sandy; white, light reddish-brown, dense limestone; white to light green, fine to medium grained, calcareous, cemented, well sorted sandstone, 2-5%.
- 2650-2660 Sample missing.
- 2660-2670 Brick-red, purple, calcareous shale, trace green shale, sandy and silty; green, white, brown limestone, dense, 1%; brick-red and purple siltstone, calcareous; white, fine grained, calcareous, cemented, rounded, well sorted sandstone, trace.
- 2670-2680 Sample as above, predominantly brick-red and purple, calcareous siltstone and shale; trace of turquoise colored shale.
- 2680-2690 Sample as above except green, dense limestone increases to about 1%.
- 2690-2700 Sample as above except green, white, brown, dense limestone, 5%.
- 2700-2710 Reddish-purple, calcareous siltstone predominates, 75%; brick-red shale and siltstone, 20%; trace of green shale; white, gray, brown, dense limestone, 1%.
- 2710-2720 Sample missing.
- 2720-2730 Reddish-purple, calcareous siltstone, 40%; brick-red shale and siltstone, 40%; white, mottled, medium grain, calcareous, cemented, rounded to sub rounded, well sorted, contains dark brown, red, and green inclusions, 20%; white, gray, brown, dense limestone.

- 2750-2760 Sample missing.
- 2760-2770 Brick-red shale and siltstone, 60%; reddish-purple, calcareous, siltstone, 25%; trace of white, brown, purple, dense limestone; green, fine to medium grain, calcareous, well sorted sandstone, sub rounded to rounded, 20%.
- 2770-2780 1. Brick-red, calcareous shale and siltstone, predominantly, also white, sandy shale, reddish-brown shale, purple shale.
2. Light green, calcareous, cemented, sub-rounded to rounded, sandstone, 25-35%.
3. Brown and white, dense limestone, trace.
- 2780-2790 1. Shale and siltstone as above.
2. Limestone as above plus green, dense limestone.
3. Sandstone as above, 10%.
- 2790-2800 1. Shale and siltstone as above plus black shale.
3. Sandstone as above, 10%.
- 2800-2810 1. Shale and siltstone as above plus black shale.
2. Pink, dense limestone, trace.
3. Sandstone as above, 15%.
- 2810-2820 1. Brick-red, reddish-brown, light green and gray shale, increases in light green shale.
2. White, light green, dense limestone, trace.
3. White, fine to medium grain, calcareous, cemented, well sorted sandstone, 5%.
- 2820-2830 1. Brick-red, calcareous, shale and siltstone predominant, also green, white shale, calcareous, silty, some sandy, purple siltstone, shaly.
2. Brown, green, white, dense limestone, trace.
3. White, fine to medium grain, calcareous, cemented, well sorted sandstone, 4%.
- 2830-2840 1. As above.
2. Limestone as above plus gray limestone, trace.
3. Sandstone as above, 11%.
- 2840-2850 1 and 3. As above.
2. Limestone as above, 1%.
- 2850-2860 As above.
- 2860-2870 1. Shale as above and trace of black shale.
2. Limestone as above, trace.
3. Sandstone as above, 2%.
- 2870-2880 1. Brick-red, purple, and light green, calcareous shale and siltstone (light green shale predominates) also trace of white shale, brown siltstone, trace of pink siltstone.
2. Limestone as above, trace.
3. Sandstone as above, trace.
- 2880-2890 1. Shale, siltstone as above, increase in brown siltstone.
2. and 3. As above.

- 2870-2880 1. Shale and siltstone as above.
2. and 3. As above.
- 2880-2890 1. Shale and siltstone as above, light green siltstone still predominates.
2. and 3. As above.
(Some of siltstone in this sample borders on being very fine grained.)
- 2890-2900 1. Shale and siltstone as above plus trace of yellow shale (brick-red and greenish-gray shale and siltstone about equal in amount).
2. and 3. As above.
Decrease in green siltstone and first occurrence of yellow shale.
- 2900-2920 1. Shale as above.
2. Limestone as above plus yellow limestone, trace.
3. Sandstone as above, trace.
Sample predominantly varied colors of shale and siltstone.
- 2920-2940 1. Shale as above plus turquoise shale, increase in gray, calcareous shale, yellow shale still present.
2. Limestone as above and yellow, dense limestone, trace.
3. Sandstone as above, trace.
- 2940-2950 Sample predominantly varied colors, shale and siltstone (brick-red shale and green siltstone are most abundant) trace of limestone and sandstone as above.
- 2950-2960 1. Brick-red, light green, gray, white, purple and yellow shale, calcareous, some slightly sandy, and purple, brown, and brick-red siltstone.
2. Green, pink, yellow, dense limestone.
3. Green, fine grain to medium grained, calcareous, cemented, well sorted sandstone.
- 2960-2970 1 and 2. Limestone, shale and siltstone as above.
4. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
5. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 2970-2980 1. Shale and siltstone as above (brick-red shale and siltstone and light green, sandy shale about equal in sample: together they make up 90% of sample).
2. and 3. As above.
- 2980-2990 1. Varicolored shales as above, increase in purple shale, siltstone as above.
2. Limestone as above, trace, and brown limestone.
3. Sandstone as above, trace.
- 2990-3000 1. Shale and siltstone as above.
2. Limestone as above.
50% of sample greenish-gray and green, calcareous, sandy and silty shale.
- 3000-3010 Sample missing.
- 3010-3020 Sample consists almost entirely of varicolored shales and siltstones.
2. and 3. As above.

- 3020-3040 1. Shale and siltstone as above.
4. Sandstone as above, 1%
5. Sandstone as above, 1% Very slight increase.
- 3040-3050 1. Shale and siltstone as above.
2. Limestone as above.
4. Sandstone as above, 4%, increase in white, medium grain, calcareous, cemented, well sorted sandstone.
5. Sandstone as above, trace.
- 3050-3060 As above.
- 3060-3070 1. and 2. As above.
3. Sandstone as above, 5%.
- 3070-3090 1. Shale as above plus turquoise colored shale.
2. and 3. As above.
- 3090-3100 As above except sandstone increases to about 5%.
- 3100-3120 1. Brick-red, greenish-gray, gray, black, purple, white and brown, calcareous, silty shale and calcareous siltstone.
2. White, pink, yellow, dense limestone.
3. White, medium grain, calcareous, cemented, well sorted sandstone, 1%.
- 3120-3130 As above, brick-red shale and siltstone most abundant followed by gray shale.
- 3130-3160 As above, very coarse grain, loose, sub-angular to sub-rounded, frosted, quartzite grains, trace.
- 3160-3170 1. and 2. As above.
- 3170-3180 1. and 2. As above.
3. Sandstone as above, trace.
- 3180-3190 1. Shale and siltstone as above.
3. Brown, large grain, calcareous, cemented, well sorted, shaly sandstone, trace.
- 3190-3200 1. and 2. As above.
- 3200-3210 1. and 3. As above.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 3210-3230 1. 2. 3. and 4. As above.
Very coarse grain, loose, sub-angular to sub-rounded, frosted, quartzite grains, trace.
- 3230-3250 As above. Sample consists predominantly of varicolored shales and siltstones.
- 3250-3260 1. Brick-red, gray, purple, white, yellow, calcareous, some sandy, shale and siltstone.
2. White, yellow, dense limestone.
3. White, medium grain, calcareous, cemented, well sorted, rounded, sandstone, trace.
4. Very coarse grain, loose, rounded, frosted, quartzite grains, trace.

- 3250-3270 1. 2. and 3. As above.
- 3270-3290 1. 3. and 4. As above.
2. Brown, dense limestone, trace.
- 3290-3320 1. and 3. As above.
4. As above, 1%.
- 3320-3350 1. and 4. As above.
3. As above, except slight increase, 1%.
- 3350-3380 1. Shale and siltstone as above plus black shale.
3. As above, trace.
4. As above, 1%.
- 3380-3420 As above.
- 3420-3450 As above.
5. Red-orange, fine to medium grain, calcareous, cemented sandstone, trace.
- 3450-3480 1. and 3. As above.
2. Green, dense limestone, trace.
4. As above, trace.
- 3480-3520 1. 3. and 4. As above.
2. Purple, dense limestone.
Trace of chert (?) granular, well rounded.
- 3520-3570 1. 3. and 4. As above.
- 3570-3600 1. Shale, siltstone as above plus turquoise colored shale, trace.
2. White, dense limestone.
4. As above, trace.
- 3600-3630 1. and 4. As above.
2. Yellow, dense limestone, trace.
- 3630-3660 1. 3. and 4. As above.
- 3660-3720 1. Brick-red, brown, gray, white, yellow, purple, greenish grey, calcareous, sandy shale and siltstone.
2. Light green, dense limestone, trace.
3. White, medium grain, calcareous, cemented, well sorted, rounded sandstone, trace.
4. Loose, very coarse, rounded, quartzite grains, trace.
5. Loose, granular, fine, trace.
- 3720-3750 1. 3. 4. and 5. As above.
2. Gray, green, dense limestone.
3. Very fine grain, brick-red, calcareous, cemented, well sorted sandstone, trace.
- 3750-3780 1. 2. 4. and 5. As above.
6. Brick-red sandstone as above, 2%.

- 3450-3460 1. Purple, green, white, gray, brick-red, yellow shale and siltstone, calcareous and silty, some sandy.
2. Green, dense limestone, trace.
4. and 5. As above.
6. Black to red sandstone as above, 20%.
- 3460-3470 1. and 5. As above.
2. Green, brown, gray limestone, dense, trace.
3. Sandstone as above, 15%.
- 3470-3480 1. 2. and 5. As above.
6. Sandstone as above, 20%.
- 3490-3500 1. 3. and 5. As above.
2. Yellow, purple, dense limestone, trace.
6. Sandstone as above, 15%.
- 3500-3510 1. Shale, siltstone as above.
White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 3510-3520 1. Shale, siltstone as above.
2. White, dense limestone, trace.
Red-orange, medium grain, calcareous, cemented, sub-rounded to rounded, well sorted sandstone, trace.
Red-orange, fine grain, calcareous, cemented, sub-rounded to rounded, well sorted sandstone, 5%.
- 3520-3540 1. Shale and siltstone as above.
2. Yellow, white, brown, dense limestone, trace.
Red-orange, fine grain, calcareous, shaly, angular to sub-angular, fair sorted sandstone, 25%.
- 3540-3550 1. Shale, siltstone as above.
2. Pink, white, dense limestone.
Red-orange, fine to medium grain, calcareous sandstone, 5%.
White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 3550-3560 Sample missing.
- 3560-3570 1. Brick-red, light green, gray, purple, white and brown, calcareous shale and siltstone, some sandy.
2. Yellowish-brown, dense limestone.
3. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
4. Brick-red, fine grain, calcareous, cemented, sub-angular to sub-rounded, well sorted sandstone, trace.
5. Loose, very coarse grain, frosted, very quartzite grains, trace.
- 3570-3580 1. Shale and siltstone as above.
2. Yellow and white, dense limestone, trace.
4. Sandstone as above, 10%.
5. Loose, coarse and very coarse grain, frosted, rounded, quartzite grains.
- 3580-3590 1. 2. and 3. As above.
4. Sandstone as above, 15% (sandstone borders on being very fine grained).

- 3590-3600 1. 2. and 3. As above.
4. Sandstone as above, 5%.
- 3600-3620 1. 2. and 3. As above.
4. Brick-red, very fine to fine grained, calcareous, cemented, well sorted sandstone, 30%.
- 3620-3640 1. Shale and siltstone as above.
2. Limestone as above, trace, plus yellow, dense limestone.
4. Sandstone as above, 20-25%.
- 3640-3650 1. Shale and siltstone as above.
2. Yellow, purple, white, dense limestone.
3. Sandstone as above, trace.
4. Sandstone as above, 5%.
5. Loose, very coarse grained, frosted, rounded, quartzite grains, trace.
- 3650-3660 1. Shale and siltstone as above.
2. Limestone as above, trace.
4. Sandstone as above, 10%.
- 3660-3680 1. Shale and siltstone as above.
2. Yellow, white, dense limestone.
- 3680-3690 1. and 2. As above.
White, fine grain, calcareous, cemented, well sorted sandstone, trace.
Brick-red, medium grain, calcareous, cemented sandstone, trace.
- 3690-3700 1. Shale and siltstone as above plus black shale.
2. Yellow, white, and black, dense limestone, 2%.
- 3700-3710 1. Brick-red, green, purple, black, and gray, calcareous shale and siltstone, some sandy.
2. White, brown, gray, dense limestone, 1%.
3. White, fine grain, calcareous, well sorted sandstone, trace.
4. White, medium grain, calcareous, well sorted sandstone, trace.
5. Brick-red, fine grain to very fine grain, calcareous, cemented, well sorted sandstone.
6. Quartzite granules, trace.
- 3710-3720 1. 4. and 5. As above.
2. Limestone as above plus yellow, dense limestone, 1%.
3. Sandstone as above, 1%.
- 3720-3730 1. and 6. As above.
2. Limestone as above, trace.
4. Sandstone as above, 1%.
5. Sandstone as above, 1%.
7. Medium to coarse grained, calcareous, sub-angular to rounded, well sorted sandstone, trace.
- 3730-3740 1. 2. and 6. As above.
4. Sandstone as above, trace.
5. Sandstone as above, 4%.

- 5740-5750 1. 2. 4. and 5. As above.
5. Sandstone as above, 4x (grain size borders on being siltstone).
- 5750-5760 1. Brick-red, green, purple, gray, calcareous, some sandy shale and brick-red, calcareous siltstone, also purple siltstone.
2. Yellow, green, gray, dense limestone, 1x.
3. White, medium grain, calcareous, cemented, well sorted, sub-rounded to rounded, sandstone, trace.
Very coarse, rounded, frosted, loose, quartzite grains, trace.
- 5760-5770 1. 2. and 3. As above.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
5. Very coarse, quartzite grains, as above, trace.
- 5770-5780 1. 3. and 4. As above.
2. Limestone as above, trace.
5. Loose, quartzite grains as above, trace.
- 5780-5790 1. 2. 3. and 5. As above.
- 5790-5800 1. and 3. As above.
2. White, pink, dense limestone.
- 5800-5810 1. 3. and 4. As above.
2. White, yellow, gray, dense limestone, 1x.
Brown, quartzite (?) sub-rounded, granular.
- 5810-5820 1. Brick-red, shale and siltstone as above, plus shale and siltstone as above in minor amounts.
2. Green, white, yellow, dense limestone, 1x.
3. and 4. As above.
5. Loose quartzite grains as above, trace.
- 5820-5830 1. Shale and siltstone as above plus white, calcareous shale.
2. White, yellow, green, dense limestone.
- 5830-5850 1. Shale and siltstone as above (some of brick-red siltstone borders on being a very fine grained sandstone).
2. Limestone as above, trace.
3. Sandstone as above, trace.
- 5850-5880 Sample consists predominantly of brick-red siltstone and shale and greenish-gray, sandy, calcareous shale, also purple and white shale; yellow, brown, dense limestone, trace; very coarse grain, sub rounded to rounded, quartzite grains.
- 5880-5890 1. Brick-red, calcareous shale and siltstone; pink shale; green, calcareous shale, purple, gray, white, calcareous shale.
2. Green, dense limestone.
3. White, fine grain, calcareous, cemented, well sorted sandstone, 1x.
- 5890-5900 As above, some of siltstone borders on being a very fine grain sandstone.
- 5900-5910 As above, sample predominantly brick-red shale and siltstone.
- 5910-5920 As above, much of siltstone borders on being a very fine grained sandstone.

- 3900-3910 As above.
- 3910-3920 As above plus brown siltstone, trace.
- 3920-3940 As above, much of siltstone borders on being a very fine grain sandstone.
- 3940-3960 Shale and siltstone as above plus black sandy shale; white, sandy limestone, 10%; white, fine grain, calcareous, cemented, well sorted sandstone; light green, medium grain, well sorted sandstone, sub-rounded to rounded, trace.
- 3960-3970 Sample consists predominantly of brick-red, calcareous siltstone; also brick-red shale; green, purple, gray, white, calcareous shale; white, sandy limestone (limestone sample contains 3-4% sandy grains), 10%.
- 3970-3980 As above, some of shale sandy.
- 3980-3990
1. Shale, siltstone as above plus pink, calcareous shale.
 2. White, sandy limestone as above, 10%.
 3. Gray, dense limestone, trace.
 4. Coarse, loose, frosted, quartzite granules, trace.
- 3990-4000
1. Shale and siltstone as above (brick-red, calcareous siltstone predominant) plus white shale, sandy, calcareous.
 2. Greenish-gray, dense limestone.
 3. White, sandy limestone as above, 5%.
- 4000-4010
1. Brick-red, calcareous siltstone, 95%.
 2. Light green, pink, light red, brick-red, purple, white, calcareous shale, some sandy.
 3. Green, medium grain, calcareous, cemented, well sorted sandstone, trace.
 4. Gray, dense limestone, trace.
 5. White, sandy limestone, trace (sand grains very fine to fine).
- 4010-4020
1. Siltstone as above, 90%.
 2. Shale as above plus yellow shale.
 4. Greenish-gray, dense limestone, trace.
 5. White, sandy limestone, trace.
- 4020-4050
1. Siltstone as above, red-orange, 90%.
 2. Shale as above plus yellow, calcareous shale.
 4. Limestone as above, trace, plus white, dense limestone
 5. Limestone as above, trace.
 6. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 4050-4060
1. Siltstone as above, 60%.
 2. Shale as above.
 4. White, dense limestone.
 5. White, sandy limestone, 2%.
 6. Sandstone as above, trace.
- Disk shaped gypsiferous crystals.
- 4060-4070
1. and 2. As above.
 4. Greenish-gray, dense limestone, 2%.
 5. White, sandy limestone as above, sand grains very fine to fine, 1%.
- 4070-4080
1. Brick red siltstone as above.
 2. Shale as above.
 3. and 5. As above.

- 4080-4090 1. Siltstone as above.
2. Shale as above.
3. Light brownish-gray, dense limestone, 20%.
6. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 4090-4100 1. Siltstone as above.
2. Shale as above plus gray, calcareous shale.
3. Limestone as above, 25%.
- 4100-4110 1. Brick-red, calcareous siltstone.
2. Brick-red, white, gray, purple, gray, yellow, calcareous shale.
3. Light brownish-gray, dense limestone, 25%.
5. White, sandy limestone, sand grains very fine, trace.
- 4110-4120 1. Siltstone as above.
2. Shale as above.
3. Light brown, dense limestone, 25%, some white, dense limestone.
Trace of pink amorphous silica (petrified wood?).
- 4120-4130 1. and 2. As above.
3. Light brown, yellow, white, dense limestone, 20%.
- 4130-4140 1. Siltstone as above.
2. Brick-red, purple, white, gray, pink, calcareous shale.
3. White, light brown, dense limestone, 10%.
- 4140-4150 1. and 2. As above.
3. Limestone as above, 5%.
White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 4150-4160 1. Brick-red, calcareous siltstone.
2. Brick-red, green, gray, yellow, purple, white, calcareous shale.
3. Grayish-brown, white, dense limestone, 1%.
- 4160-4180 1. and 2. As above.
3. Limestone as above, trace.
4. White, sandy limestone, very fine to fine grained.
- 4180-4190 1. 2. and 4. As above.
3. Limestone as above, 2%.
trace of quartzite granules.
- 4190-4200 1. and 2. As above.
3. Limestone as above, 5%.
- 4200-4210 1. Siltstone as above.
2. Brick-red, gray, white, yellow, purple, green, calcareous shale, some sandy, plus white shale.
3. Brown, white, gray, dense limestone, 5%.
- 4210-4220 1. and 2. As above.
3. Brown, dense limestone, 5-10%.
Disk shaped gypsumiferous crystals.
- 4220-4250 1. and 2. As above.
3. Limestone as above, 5%.
4. White, fine grained, calcareous, cemented, well sorted, sandstone, trace.

- 4250-4260 1. Siltstone as above
2. Shale as above, increase in greenish-gray, calcareous shale.
3. Brown, dense limestone, 3%.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
5. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 4260-4280 1. 2. and 5. As above.
3. Limestone as above, 1-2%.
- 4280-4290 1. Brick-red, calcareous siltstone as above.
2. Brick-red, gray, purple, white, yellow, calcareous shale.
3. Light gray shale-brown, dense limestone, 1-2%.
4. and 5. As above.
- 4290-4300 1. 2. and 4. As above.
3. Limestone as above, 1-2%.
- 4300-4310 1. Brick-red, calcareous siltstone.
2. Brick-red, white, purple, green, pink, and gray, calcareous shale.
3. Grayish-brown, dense limestone, trace.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
Disk shaped gypsiferous crystals.
- 4310-4320 1. and 2. As above.
3. Limestone as above, 1%.
5. Green, medium grain, calcareous, cemented, well sorted sandstone.
- 4320-4330 As above plus white, fine grain, calcareous, cemented, well sorted sandstone.
- 4330-4340 1. Siltstone as above.
2. Shale as above plus yellow, calcareous shale.
3. Light brown, dense limestone, trace.
4. Sandstone as above, trace.
5. Sandstone as above, trace.
Disk shaped gypsiferous crystals.
- 4340-4350 1. and 4. As above.
2. Shale as above, gray shale sandy.
3. Brown and yellow, dense limestone, trace.
- 4350-4360 1. Siltstone as above (grain size just about very fine grain)
2. and 3. As above.
Disk shaped gypsiferous crystals.
- 4360-4370 1. and 2. As above.
3. Yellow, dense limestone.
Disk shaped gypsiferous crystals.
- 4370-4380 1. Siltstone as above.
2. Shale as above plus gray shale.
3. Light gray, dense limestone, 40%.
- 4380-4390 1. and 2. As above.
3. Light gray to brown, dense limestone, 10-15%.
Disk shaped gypsiferous crystals.

- 4390-4400 Shale and siltstone as above; white, light brown, dense limestone, 10-20%.
- 4400-4430
 1. Brick-red, calcareous siltstone.
 2. Brick-red, green, pink, gray, purple, calcareous shale.
 3. Gray, white, dense limestone plus brown dense limestone, 15%.
- 4430-4440 Shale and siltstone as above; brown, dense limestone (10-20%) plus trace of yellow dense limestone.
- 4440-4450 Shale and siltstone as above plus white, sandy shale; limestone as above, 10%; white, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 4450-4460
 1. Light red, calcareous siltstone;
 2. Red, purple, green, gray, calcareous shale;
 3. White, gray, brown, dense limestone, 5%;
 4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 4460-4470
 1. Siltstone as above.
 2. Shale as above plus white, sandy, calcareous shale plus yellow, calcareous shale.
 3. Limestone as above, 2-5%.
- 4470-4480
 1. and 2. As above.
 3. Limestone as above, 5%.
- 4480-4500
 1. and 2. As above.
 3. Limestone as above, 2-5%.
- 4500-4510
 1. Siltstone as above;
 2. Shale as above;
 3. Brown, dense limestone, 5%.
 4. White, fine grain, calcareous, cemented, well sorted sandstone, containing chlorite (?), trace.
- 4510-4530
 1. Siltstone as above, some micaceous.
 2. Shale as above.
 3. Purple, yellow, brown, dense limestone.
 4. Sandstone as above, micaceous.
- 4530-4540
 1. and 2. As above;
 3. Light gray, light brown, dense limestone, 5-15%.
- 4540-4550
 1. and 2. As above;
 3. Limestone as above, 5%.
 4. Sandstone as above, trace.
 5. Red, shaly to very coarse grain, calcareous, cemented, poorly sorted sandstone, trace.
- 4550-4560
 1. and 4. As above;
 2. Gray, purple, red, green, calcareous shale;
 3. Brown, dense limestone, some sandy, 5-10%.
- 4560-4570
 1. and 2. As above;
 3. White to light brown, dense limestone, trace;
 4. Sandstone as above, some contains flakes of chlorite (?), trace.

- 4570-4580 1. Siltstone as above, makes up approximately 90% of sample).
2. Shale as above plus white shale.
3. Limestone as above, trace.
- 4580-4590 1. Siltstone as above.
2. Brick-red, purple, green, gray shale (increase in brick-red shale).
3. Limestone as above, some sandy, trace.
- 4590-4600 1. Siltstone as above.
2. Brown, white, purple, green, gray shale plus pink shale.
3. and 4. As above.
- 4600-4610 1. Reddish-brown, calcareous siltstone.
2. Reddish-brown, dense, green, purple, gray, white shale.
3. Light brown, dense limestone, trace.
- 4610-4620 1. and 2. As above.
3. Limestone as above, 1-2%.
- 4620-4630 1. and 2. As above.
3. Limestone as above, trace.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 4630-4650 As above.
5. White, medium grain, calcareous, cemented, well sorted sandstone, trace.
- 4650-4660 1. Reddish-brown, calcareous siltstone.
2. Reddish-brown, green, gray, purple, calcareous shale.
3. Gray, light brown, dense limestone.
- 4660-4700 Siltstone and shale as above plus pink shale.
3. White to light brown, dense limestone, some sandy, trace.
- 4700-4710 1. Reddish-brown, calcareous siltstone.
2. Brick-red, green, brown, purple, gray, calcareous shale.
3. White and gray, dense limestone, some sandy, trace.
- 4710-4730 As above, some cuttings of siltstone contain well rounded quartzite grains.
- 4730-4740 As above, some shale cuttings micaceous.
- 4740-4750 As above, plus white, calcareous shale.
- 4750-4760 1. Reddish-brown, calcareous siltstone
2. Brick-red, green, white, pink, white, calcareous shale.
3. Brown, dense limestone, trace.
- 4760-4770 1. Reddish-brown, calcareous siltstone.
2. Shale as above.
3. White, brown, dense limestone, 3%.
4. White, fine grain, calcareous, cemented, well sorted sandstone, trace.
- 4770-4780 As above, green, dense limestone.
- 4780-4790 Sample missing.
- 4790-4794 1. Reddish-brown, calcareous siltstone. 2. White, purple, brick-red, calcareous shale, micaceous; 3. White, light brown, dense limestone, 10%.

- 4794-4800 Limestone, white, dense, chalky; reddish-maroon siltstone.
- 4800-4810 As above, some red shale.
- 4810-4820 Limestone, white, dense, less chalky; red siltstone; some red shale.
- 4820-4840 Siltstone as above, trace of white sandstone, limy, tight-white, dense, limestone.
- 4840-4850 Limestone and siltstone as above w/streaks of white, limy sandstone as above-fossiliferous fragments?
- 4850-4870 Sandstone and limestone as above, limestone shaly; considerable siltstone as above.
- 4870-4880 Limestone, medium gray, dense, fossiliferous; crinoid columnal.
- 4880-4890 Limestone, white-light gray plus limestone as above; trace of silty limestone.
- 4890-4900 Limestone, white-light gray; trace of chert, white-angular; green, gray, shaly siltstone; red shale.
- 4900-4910 Limestone white as above; trace of medium gray limestone w/fine, calcareous, fractured fillings?, trace chert; chert increased.
- 4910-4920 Limestone and siltstone as above; calcareous chert.
- 4920-4930 Limestone and siltstone as above; trace of green and gray, well cemented sandstone; calcareous chert.
- BIT #1, 4940-4950'. Open 1:55 A.M., 4/28/59, 2 hours. Opened with fair blow for 5", then decreased to very weak and remained so throughout remainder of test. Recovered 50' drilling mud. IHP 2635, FHP 2635, LPP 30, RPP 45, ISLP/50" 140, FSLP/50" 60, BRT 144. Preparing to drill ahead.
- 4930-4940 Shale and siltstone, red to red brown; some white-gray, dense limestone.
- 4940-4960 Shale and siltstone as above, siltstone limy; some limestone as above; trace of chert (siltstone is micaceous in part).
- 4960-4970 Shale and siltstone as above; trace of white, fine grain, limy sandstone, well cemented, very tight; trace of chert, white.
- 4970-4980 Shale and siltstone as above; some increase in green, silty shale; trace fine to coarse grain sandstone, tight.
- 4980-5000 Sandstone, fine grain, white, limy, possibly grading to sandy limestone, well cemented, tight.
- 5000-5010 Sandstone as above, hard sharp limy; trace of orange chert; trace white-gray, fossiliferous limestone.
- 5010-5020 Sandstone as above; shale, red, brown, silty; trace of gray-green shale.
- 5020-5030 Shale, gray-green and red-brown; trace of gray limestone; abundant orange chert; siltstone, red.

- 5030-5040 Limestone, white-medium gray; white-orange chert-prominent.
- 5040-5050 Limestone as above, sandy; chert is 2-5% of sample.
- 5050-5060 Limestone as above, sandy; chert is 5% of sample.
- 5060-5070 Limestone, medium gray-greenish, tight; orange chert; some red and gray-green, silty shale.
- 5070-5080 Limestone as above; some increase in red-brown, silty shale; trace purple limestone; trace of chert.
- 5080-5090 Good limestone sample, medium gray-greenish gray limestone, tight; trace chert, pyritized.
- 5090-5100 Limestone as above; white crystalline fracture fillings, chert as above.
- 5100-5110 Limestone as above, (slight increase? red-silt); white crystalline fracture fillings; orange chert, pyritized.
- 5110-5120 Limestone as above; trace of purple limestone and shale; chert very minor.
- 5120-5130 Limestone, gray, very finely crystalline, tight, dense (trace dark purple, red limestone, slightly mottled); minor trace of chert; trace of anhydrite.
- 5130-5140 Limestone as above, fair amount of residue in limestone sample; slightly calcareous (fracture fillings), good example of interbedded chert in limestone.
- 5140-5150 Limestone as above, some with chalky appearance on exterior - calcareous filled fractured, tight.
- 5150-5160 Limestone as above, filled fractures; trace of purple shale w/floating quartzite grains.
- 5160-5170 Limestone as above (minor indications of fracture); orange-white chert, pyritized.
- 5170-5180 Limestone as above, fossiliferous (black ventrals, some are spiculed); trace of chert.
- 5180-5190 Limestone, light-dark gray, dense, tight; trace of red-brown shale, in part siltstone.
- 5190-5200 Limestone as above; some carbonaceous inclusions in chert; purple limestone may be fossiliferous?; trace of poorly sorted quartzitic sandstone; trace dark gray-black, carbonaceous shale; orinoid fragments.
- 5200-5210 Limestone as above; trace of purple shale; trace of orange chert, fossils have specks.
- 5210-5220 As above.

- 5220-5230 Limestone, medium dark gray, dense, tight, some sucrosia, trace fracture filled, mottled; trace white-orange chert, some dark gray forming very cherty limestone stringers; small percent black, stylolite, calcareous shale; small percent red, micaceous siltstone-sandstone; limestone is argillaceous and possibly dolomitic in part; trace of red-purple (mottled) shale.
- 5230-5240 Limestone as above; some increase in a chalky, argillaceous limestone; red shale has cherty-limy shale pellets included; crinoid fragments; crinoid columns in many cases are replaced by coarse chert - where they are interbedded in the limestone and unidentifiable fossiliferous cherty limestone is the call.
- 5240-5250 Limestone as above, possibly some increase in dark limestone occurs in crinoid fragments; shale, red and green (laminated?), trace pyritized; considerable amount of orange chert in small fragments.
- 5250-5260 Limestone as above, chalky streaks; crinoid stems; chert, white-gray.
- 5260-5270 Limestone as above, cherty; abundant white-orange chert (bedded?).
- 5270-5280 Trace of green, waxy shale, pyrite, some increase in red-brown, silty, calcareous shale.
- 5280-5290 Both as above; some limestone gray-green, some chalky; trace of black shale w/colored veinlets.
- 5290-5300 Limestone as above, trace of green shale; crinoid columns.
- 5300-5310 Limestone as above, some red-brown, cherty streaks; fair amount of red-purple and gray green shale (sandy, anhydritic blebs in red shale), mottled red-green.
- 5310-5320 Shale and limestone as above, limestone more chalky; fossiliferous shale in chalky limestone.
- 5320-5330- Shale, red-silty, calcareous, some green, silty, micaceous; limestone as above, gray, dense, buff, cherty; trace of soft, very micaceous, gray silt.
- 5330-5340 Shale, red-brown, silty and micaceous in part, interbedded, clay, red, some gray-green, silty, calcareous; limestone, light-dark gray, dense, buff, chalky; trace of chert.
- 5340-5350 Shale and limestone as above; trace of very hard, green, limestone (hard); crinoid columns; orange chert.
- 5350-5360 Limestone, increase in hard granulars, some greenish, some tan; still considerable shale, red.
- 5360-5370 Limestone as above, some gray-buff, dense, hard.
- 5370-5380 Limestone, light-medium gray, tan, buff, some granulars hard (hard) tight, in part calcareous; trace of chert; still carrying fair amount of red, silty shale - trace of red sandstone.

- 5380-5390 Limestone as above; some increase in chert; slight increase in chalky limestone; arinoid fragments; pyritic.
- 5390-5400 Limestone, light gray-tan, some fairly dark, coarse crystalline? (brecciated? fragmented) coarse grain? trace gray-orange chert.
- 5400-5410 Limestone as above, medium-dark gray, granular, hard, tight; trace dark gray shale, trace anhydrite.
- 5410-5450 Limestone and shale as above, shale is black, calcareous, micaceous, crinoid, trace of anhydrite.
- Drilling break 5454-57', 5"/ft. No show in samples, 2 unit gas kick.
- 5450-5460 Limestone, light-medium gray, granular; trace chalky, mottled; one piece coarse sandstone grains, very angular, poorly sorted, well cemented, slightly calcareous.
- 5460-5480 Limestone, tan, buff, fragmental pin point vugs (fair-good), trace of anhydrite in a few vugs, believe above lithology related to above drilling break. Remainder of sample is limestone as above, dense, granular, tight.
- 5480-5490 Limestone, medium gray-buff, some greenish granular; some green shale w/ carbonaceous inclusions; trace of fine grain sandstone, calcareous, poorly sorted, sub-angular.
- 5490-5470 Limestone, medium-dark gray, dense, tight, some chalky, some brownish-black; trace of buff chert, minor.
- 5470-5480 Trace of pin point porosity in tan-buff limestone; limestone as above, increase in brownish-black, dense, hard limestone; trace black, silty shale; trace of tan chert.
- 5480-5490 Limestone, gray-buff as above, fragmental and dense; trace anhydrite; trace fine-medium sandstone, tight (greenish?).
- 5490-5500 Limestone as above; abundant buff chert.
- 5500-5510 Limestone as above, chert, trace anhydrite.
- 5510-5520 Medium gray-buff, dense limestone; pinkish-red, brown shale (anhydrite?); fossiliferous fragments in dark limestone; trace gray chert.
- 5520-5530 Limestone as above, chert.
- 5530-5540 Limestone as above; trace of pinkish anhydrite shale; gray chert; fossiliferous fragments.
- 5540-5550 Limestone as above; arinoid columns; gray chert.
- 5550-5560 Limestone, medium-dark gray, some chalky, tight; trace black carbonaceous, mottled shale; trace of pink shale; considerable red shale? - silty, micaceous.
- 5560-5570 Limestone as above; trace anhydrite.
- 5570-5580 Limestone as above, some increase in chalky, occasional piece fragmented.

- 5580-5590 Limestone as above, trace calcite (fractured?); trace of gray chert, (sample very fine).
- 5590-5600 Limestone as above, abundant chalky; trace dark gray chert; trace white chert; pyrite.
- 5600-5610 Limestone as above, trace fragment limestone; trace of brown-black shale; trace of light brown chert.
- 5610-5620 Limestone and shale, both gray-black, dense, possibly dolomitic.
- 5620-5630 Limestone, dark gray, dense; trace tan, dark gray chert; trace anhydrite; trace of red-green, mottled limestone.
- 5630-5640 Limestone as above, some buff; sudden increase in brick red-brown, silty shale; trace pink, anhydritic shale; trace anhydritic to orange cherty limestone; some chalky limestone w/trace of porosity, some anhydrite inclusions.

Slight drilling break 5634- 7', 2 foot at 5"/ft. 1 foot at 3"/ft.
No significant show on gas unit or in samples.

Slight drilling break 5625-26', black, shaly limestone, 265 unit gas kick, recirculated gas kick in 145 minutes, kick lasted from inception to peak approximately 10 minutes. Fastest drilling foot was approximately 9 min. Therefore, believe gas show to be coming from approximately 1' in top, Not Significant.

- 5640-5650 Limestone, dark gray-black orange, some shaly? Possibility of some fracture filling; (trace conglomerate limestone?? pellets well cemented); trace anhydrite; trace gray chert; trace shale fragment.

Considerable contamination from trip at 45.

- 5650-5670 Limestone as above.
- 5670-5680 Limestone as above; trace of pin point regular porosity; trace anhydrite, gray chert, fracture?
- 5680-5690 Limestone, medium-dark gray, trace of black; trace gray-green silty shale; gray chert; (increase in red, silty shale and anhydriteavings?).
- 5690-5700 Limestone as above, some tan; trace of red-purple mottled (limy dolomite?, shaly).
- 5700-5710 Limestone as above; trace of green-gray shale.
- 5710-5720 Limestone as above; trace of pin point vugs, some partially filled; trace fracture filling.

Zone from 5645 has had several drilling breaks of 1 to 3' and associated gas shows on gas analyzer, however, have been unable to associate reservoir rock with the drilling breaks.

Circulating cut break 5696-5700, No Show in samples. Gas reading is 95/28.

- 5720-5730 Limestone, medium-dark gray, dense, tight some organic, some tan, oolitic, tight, trace white-tan granular w/trace porosity, pin point; trace chert; possibly some fracture filling; trace pyrite.
- 5730-5740 Limestone as above, increase in chalky w/trace pin point porosity; trace chert; considerable savings.
- 5740-5750 Limestone as above, some oolitic, slight increase in gray-tan, dense; trace of crystalline calcite, crinoid column, trace chert, pyrite.
- 5750-5760 Limestone, gray-tan, dense, fossiliferous? oolitic, trace white, pin point vugular finely crystalline, vugs partially to wholly filled; trace anhydrite.
- 5760-5770 Limestone as above, tan, pin point vugs-white-permeability??; trace calcite; gray chert.
- 5770-5780 Limestone, light-dark gray, dense, tight; trace brown granular, dolomitic shale; trace black shale and black, organic limestone; trace pin point vugs in light gray anhydrite; fracture filling; trace purplish limestone.
- Trip at 5755' for new bit W-7 #32, drilled exceptionally well from 5735 to 5755' (20'). Drilling Time average 7-8 min./ft.
Samples indicate increase in chalky limestone with trace of pin point porosity. No show in samples, no significant gas shows.
- 5780-5790 Limestone, medium-dark gray, some organic, some oolitic, dense-granular, tight; trace chalky; trace gray chert; trace dull yellow minor fluorescent, no cut; trace veining color.
- 5790-5800 Limestone as above.
- 5800-5810 Limestone as above; trace of black, carbonaceous shale.
- 5812 - Circulating Samples. Trace pin point vugular porosity in chalky limestone, also some increase in brown-black, carbonaceous-organic limestone and (shale?).
- 5810-5820 Limestone as above, definite trace of black shale; increase in tan limestone; trace of porosity.
- 5820-5830 Limestone as above, gray-tan, dense limestone; very definite yellow minor fluorescent.
- 5830-5840 Limestone and fluorescent as above; trace gray chert; trace anhydrite.
- 5840-5850 Limestone and fluorescent as above; trace of porosity.
- 5850-5860 Limestone and fluorescent as above; gray chert.
- 5860-5880 Limestone as above, some increase in tan.
- Circulating samples at 5712. No show. Small gas kick.
- 5880-5890 Limestone, light-medium gray-buff-tan, dense, some granular, tight. Varying amount of minor fluorescent

5890-5900 Limestone and fluorescent as above; trace of white chert.

5900-5910 Limestone and fluorescent as above; slight increase in dark gray-black limestone; trace gray chert.

5910-5920 Limestone and fluorescent as above; fair percent dark limestone.

5920-5930 Limestone and fluorescent as above; trace black shale (very minor); trace of black limestone.

5930-5940 Limestone and fluorescent as above; very definite increase in black limestone, dense, tight.

5940-5950 Limestone and fluorescent as above; trace black-dark gray; trace gray chert.

5950-5960 Limestone and fluorescent as above; white, waxy gray chert.

Section seems to be extremely uniform with the exception of the black organic limestone, 5920-50'.
Gas curve has been fairly steady with a gradual decrease in magnitude.

5960-5970 Limestone, light gray-buff, dense, tight, trace dark gray-black limestone; trace white-gray chert; trace honey comb coral?.

5970-5980 Limestone and coral as above; some increase in medium-gray, black limestone; trace of black shale; trace of orange chert.

5980-5990 Limestone as above, decrease in dark.

5990-6000 Limestone as above, trace of porosity.

6000-6010 Limestone as above.

6010-6020 Limestone as above; trace purple dolomite-dolomitic shale; increase in chalky limestone.

6020-6030 Limestone as above; trace pelletaloid-collitic; trace of porosity; fair amount of chalky limestone.

6030-6040 Limestone as above.

Drilling break 6035-41', Circulating out at 6040'.

Circulating Samples at 50, 60, and 90 minutes - Limestone as above, No show in samples. No gas anomaly on analyzer. Lithology - chalky limestone.

6040-6050 Limestone as above, considerable chalky.

6050-6060 Limestone as above; trace pin point vugular limestone; trace of green sandstone?.

6060-6070 Limestone, gray-buff, some chalky; trace pin point vugular porosity, some vugular filled anhydrite; trace white-gray chert.

- 6070-6080 Limestone as above; trace fair-good fine point vugular porosity; some increase in white-gray chert.
- 6080-6090 Limestone and porosity as above; trace of dark shale and limestone.
- 6090-6100 Limestone as above; trace gray-greenish dolomite, shaly; trace of white-gray chert; trace fine grain, white sandstone, tight; trace of porosity.
- 6100-6110 Limestone as above.
- 6110-6120 Limestone, white-light gray, some chalky; crinoid; white-light gray chert.
- 6120-6130 Limestone as above, increase in chalky; trace porosity; trace of filled vugs; chert.
- 6130-6140 Limestone as above, chert.
- 6140-6150 Limestone as above; trace of very black limestone; stylolite.
- 6150-6160 Limestone, light gray to buff, cryptocrystalline; limestone, white, chalky (15%); limestone, dark gray, cryptocrystalline (5%); trace pyrite in limestone; trace of white, vugular limestone; foraminifera fragments (?); trace stylolite limestone; trace of white chert, trace of gray chert.
- 6160-6170 Limestone as above; trace vugular limestone, probably foraminifera fragments (fossiliferous?).
- 6170-6180 Limestone, light gray to buff, cryptocrystalline, many of limestone fragments bladed in shape; limestone, white, chalky; limestone, dark gray, cryptocrystalline; foraminifera (fusulinid) fragments (?); black, white, chert.
- 6180-6190 Limestone, light gray to buff, crypto- and micro-crystalline, some fragments vugular; limestone, white, chalky (a trace stylolitic), limy-dolomitic, dark gray, cryptocrystalline; fusulinid fragments (?); dark gray-black, white chert; dark gray to black, silty shale.
- 6190-6200 Limestone, light gray to buff, cryptocrystalline; limestone, white, chalky (25%); limestone, dark gray to black, cryptocrystalline; trace pyritized green shale; black, gray, white chert, trace orange chert; light green shale (savings?), (some porosity within skeletal structure of fossils).
- 6200-6210 Limestone as above; crinoid; fusulinid replaced by chert; fusulinid fragments (?); gray, brown, and white chert.
- 6210-6220 Limestone, light, medium, and dark gray, micro- to cryptocrystalline, some stylolitic, essentially. No porosity. Limestone, white, chalky; dark gray and brown chert, 15%; trace white, fossiliferous chert; fusulinid fragments (?).

6155 to 6215'

Wt. 60,000

RM 62

P.P. 450

@ 6191'

End Wt.
10.5

End Vol.
52

@ 6202'

10.5

54

@ 6214'

10.5

53

- 6220-6230 Limestone, white, gray, and buff, crypto- to micro-crystalline, some fossil fragments; trace vugular porosity; white, chalky limestone; white, gray, and brown chert, trace orange chert; crinoid; shale, dark and medium gray, silty, trace.
- 6230-6240 Limestone as above; trace light gray, stylolite limestone; white and brown chert; trace reddish-brown, semi-metallic luster, platy shale; shale, dark and medium gray, silty, trace.
- 6240-6250 Limestone, white, light to dark gray, buff, crypto- to micro-crystalline, some fossiliferous fragments, trace vugular porosity; white, chalky limestone; chert as above plus trace of orange chert, coral (?); approximately 4% red shale (probably savings); black, gray, silty shale.
- 6250-6260 Limestone as above; chert, white, light and dark gray and orange; fusulinid fragments; purple calcareous shale (first occurrence); black, gray, and grayish-green, silty shale.
- 6260-6270 Limestone, white, buff, black, light and dark gray; crypto- to micro-crystalline, trace stylolite, trace of white, intercrystalline porosity; white, chalky limestone; translucent brown chert; gray, white, and orange chert; shale, red, pink, green, gray, and purple, 30%.
- 6270-6280 Limestone as above; trace fossiliferous; shale, purple, red, gray, black, green, some silty; white, orange, dark brown chert.
- 6280-6290 Limestone, white, dark gray, light gray, crypto- to micro-crystalline, trace stylolite, trace vugular porosity; shale, brown, reddish-brown, red, medium and dark gray, purple, green, some silty; chert, white, orange, gray; crinoid (?); limestone, white, chalky.

	<u>WT.</u>	<u>SPM</u>	<u>P.P.</u>
6234-6260	80,000	85	450
6260-6290	80,000	80	450

	<u>HEU WT.</u>	<u>MOI YLS.</u>
6236	10.5 lbs/gal.	52 sec.
6246	10.6	54
6257	10.5	52
6264	10.7	52
6276	10.5	60
6288	10.5	60

- 6290-6300 Limestone, white, light gray, some fossiliferous, crypto- to micro-crystalline, stylolite; limestone, white, chalky, trace; chert, brown, orange, white; shale, red, pink, green, gray, black, purple, 40%.
- 6300-6310 Limestone, white, light gray, brown, crypto- to micro-crystalline, some fossiliferous, stylolite; shale, brown, purple, red, black, gray, greenish-gray, some silty, 40%; chert, brown, orange, white, 4%.
- 6310-6320 Limestone as above; shale as above (predominantly purple); limestone concretions in green shale; chert as above plus black chert, trace.

- 6320-6330 Limestone as above plus trace of vugular porosity; limestone, white, fine grain, granular, trace; shale, purple, red, green, gray, pink, and black; chert, white, brown, orange.
- 6330-6340 Limestone, white, gray, buff, fossiliferous, crypto- to micro-crystalline; shale as above, 65%; chert, white, brown, orange; trace fibrous calcite (fracture filling); crinoid stem.
- 6340-6350 Limestone as above; limestone, white, fine grain, granular, trace; shale as above, 65%; chert, brown, orange, white, trace.
- 6350-6360 Limestone, white, light gray, crypto- to micro-crystalline, 5%; shale, purple, red, green, gray, black (light purple predominant shale color); chert, dark brown, orange, trace.
- 6360-6370 Limestone as above plus trace of yellow and green limestone; shale as above, 60%; chert as above.

	<u>WT.</u>	<u>RPM.</u>	<u>P.P.</u>
6320-6325	60,000	65	450
6325-6335	60,000	65	450

	<u>AUD WT.</u>	<u>MUL. VES.</u>
6301	10.5	57
6312	10.5	57
6326	10.6	55
6330	10.8	55
6348	10.5	58
6361	10.7	55

- 6370-6380 Limestone, white, buff, crypto- to micro-crystalline, fossiliferous, trace of dolomitic limestone, very fine grain, granular; trace black, fossiliferous, crypto-crystalline limestone; shale, purple, red, greenish gray, reddish brown, 70%; chert, orange, black, brown, trace; trace yellowish-milky opalescent, trace calcitic; purple shale predominates.
- 6380-6390 Limestone as above, 10%; trace dolomitic limestone with interbedded grains; shale as above plus black shale and green shale; fossiliferous replaced by orange chert (very little chert); trace very soft, sugary limestone.
- 6390-6400 Limestone, white, medium gray, crypto- to micro-crystalline; red, very fine grain, slightly calcareous sandstone, trace; shale as above, predominantly purple and green; chert, white, gray, orange, trace; trace very soft, sugary limestone.
- 6400-6410 Limestone, white, light gray, buff, crypto- to micro-crystalline; limestone, white, very fine grain, granular (4%) - first major occurrence; trace very good palleloid, orange, calcitic limestone; shale as above, 70%; chert, orange, white, trace; fusulinid; trace yellow, lithographic limestone.
- 6410-6420 Limestone, white, light gray, medium gray, crypto- to micro-crystalline; limestone, white, very fine to fine grain, granular (some inter-granular porosity); shale as above (slight increase in green shale) approximately 80%; chert, orange; crinoid (?); fusulinid.

- 6420-6430 Limestone, white, light gray, buff, crypto- to micro-crystalline, fossiliferous; limestone, white, sucrosic, dolomitc (15-10%), some inter-granular porosity; shale, purple, red, green, black, 40%; chert, milky white, brown; trace good oolitic.
- 6430-6440 Limestone, light gray, white, dark gray, crypto- to micro-crystalline, fossiliferous; limestone, white, very fine to fine and medium crystalline, inter-granular porosity; shale, purple, green, red, black; trace oolitic limestone shot through red stain; crinoid; chert, orange, gray, trace; sample approximately 50% limestone-50% shale, portion of shale probably cavings.
- 6440-6450 Limestone, white, sucrosic to medium crystalline; dolomite, white to light brown, sucrosic to medium crystalline; red "weathered" shale on and within dolomite and limestone, trace; shale, red, gray, green, black; limestone, gray, white, microcrystalline; chert, orange; intergranular and some vugular porosity.
- 6450-6460 Limestone, white, sucrosic to medium crystalline; dolomite, white to brown, sucrosic to medium crystalline (brown dolomite appears stained but doesn't cut with tetrachloride); intergranular and vugular porosity-calcite; crystalline approximately 6mm-fracture or vugular filling; dolomite and limestone in about equal proportions; chert, orange, brown; red "weathered" shale on and within limestone and dolomite, trace.

	<u>RPM</u>	<u>FT</u>	<u>WT</u>
6378-6418	65	450	60,000
6418-6434	65	450	60,000

	<u>MUD WT.</u>	<u>WLD VIS.</u>
6392	10.5	65
6399	10.5	65
6414	10.5	65
6423	10.6	65
6437	10.5	60

- 6460-6470 Dolomite, white to light green, sucrosic to medium crystalline, some good vugular porosity, inter-granular porosity; limestone, white, crypto-crystalline, dull (almost chalky looking), 5%; limestone, white, sucrosic; chert, white, orange, trace.
- 6470-6480 Dolomite, white to light brown, sucrosic to medium crystalline, some vug porosity, inter-crystalline porosity; limestone, white, brown, crypto- to micro-crystalline; shale, varicolored, purple and light green predominant; chert, brown; dolomite and limestone in about equal proportions.
- 6480-6490 Dolomite, white to brown, sucrosic to medium crystalline, some good vugular porosity, inter-crystalline porosity; limestone, white, brown, crypto- to micro-crystalline; shale, black, red, purple, green, brown, mostly cavings; chert, white, orange, trace; trace fibrous calcite (fracture filling); white, earthy, chalky limestone, no fluorescent.

- 6490-6500 Dolomite, white to brown, sugrosic to medium crystalline, some good vuggy porosity, crystalline porosity; limestone, white, brown, yellow, gray, crypto- to micro-crystalline, cavings; shale as above, cavings; chert, brown, orange, white, dark.
- 6500-6510 Dolomite, as above, some good vugular porosity, intercrystalline porosity, (some of dolomite appears stained, but doesn't cut with carbon tetrachloride); limestone and shale as above; chert, orange.

	<u>MT WT.</u>	<u>MT. FTS.</u>	
6491	10.8	60	
6508	10.5	59	
	<u>WT</u>	<u>MT</u>	<u>PS</u>
6491-6528	55	60,000	450

Circulated out samples - 6502. No Gas flow.

45 minutes, approximately 64 8-92, dolomite, white, brown, sugrosic to medium crystalline, good vuggy porosity, intercrystalline porosity; limestone, white, sugrosic; limestone, white, brown, dense (cavings); varicolored shale (cavings); chert, orange.

1 hour, approximately 6478-81. As above except increase in shale, purple and green predominant and increase in limestone, light brown, yellow, crypto-crystalline.

Circulated out samples at 6516'

45 minutes, approximately 6505'. Dolomite, light brown, dark brown, sugrosic to medium crystalline, some coarse crystalline, good vugular porosity, inter-crystalline porosity; limestone and shale.

- 6516-6520 Dolomite, light brown, sugrosic to medium crystalline, some coarse crystalline, vugs (.1m), intercrystalline porosity; limestone, white, light brown, sugrosic to crypto-crystalline, some chalky, some oolitic; chert, orange, gray, dull brown.
- 6520-6530 Dolomite as above, some dark brown; limestone, white, sugrosic, dense; shale as above (cavings); chert, white, orange, trace.
- 6530-6540 Dolomite, brown, sugrosic to coarse crystalline, vugular and intercrystalline porosity; limestone, white, yellow, dense, crypto-crystalline; chert, brown, trace.
- 6540-6550 Dolomite, brown as above; dolomite, white, coarse crystalline, vugular and intercrystalline porosity; limestone, white, sugrosic, crypto- to micro-crystalline; chert, brown, white, orange, trace.
- 6550-6560 Dolomite, brown, white, as above; limestone, brown, gray, yellow, crypto-crystalline; limestone, white, micro to fine crystalline, sugrosic; shale, varicolored, approximately 15% cavings; dolomite sandstone composed of dolomite rhombs; chert, orange, white, trace.

6560-6570 Dolomite, brown, white, sucrosic to coarse crystalline, vugular and inter-crystalline porosity; limestone, yellow, white, brown, crypto-crystalline, good portion savings; limestone, white, micro- to fine crystalline; shale, red, purple, gray, light green, white, savings; cherty limestone; chert, as above plus traces of dark gray chert.

6570-6580 Dolomite, dark brown, white, sucrosic to coarse crystalline; limestone, white, micro- to fine crystalline; limestone, white, crypto-crystalline; shale, light green; chert, white, orange.

	<u>RD NT.</u>	<u>MUE VIS.</u>
6528	11.0	72
6552	10.8	68
6567	10.8	70
6574	10.7	68

	<u>RFM</u>	<u>NT</u>	<u>PP</u>
6528-6568	65	60,000	450
6568-6586	65	60,000	450

6580-6590 Dolomite, white to light brown, sucrosic to coarse crystalline, vugular and intercrystalline porosity, some dark brown dolomite; limestone, white, crypto- to fine crystalline; pellicoidal, shale, green; chert, white, orange (replaced crinoid stem) slight increase in white chert.

6590-6600 Dolomite, white to light brown, sucrosic to very coarse crystalline, vugular and intercrystalline porosity; limestone, white, crypto- to micro-crystalline; white, chalky limestone; shale, green, trace; chert, white, orange, gray.

6600-6610 Dolomite as above; limestone, white, crypto-crystalline to sucrosic; limestone, white, chalky; shale, light green; chert, orange, white; limestone, yellow, lithographic, trace.

6610-6620 Dolomite, white, brown, sucrosic to coarse crystalline, vugular and intercrystalline porosity; limestone as above; shale, green; chert, orange, white; trace green limestone.

6620-6630 Dolomite as above; limestone, white, gray, light brown, yellow, crypto- to micro-crystalline; dolomite, white, gray, crypto- to micro-crystalline; shale, green; chert, white, orange.

6630-6640 Dolomite as above; limestone, white, light brown, crypto- to micro-crystalline; dolomite, light brown; chert, white, orange, brown, gray.

6640-6645 Dolomite as above; dolomite, gray, crypto-crystalline; limestone, white, chalky; limestone, yellow; green, dolomitic shale, black shale; chert, orange, white.

	<u>RFM</u>	<u>NT</u>	<u>PP</u>
6585-6612	65	60	450
6612-6640	64	60	450

	<u>MUR 60.</u>	<u>MU 613.</u>
8508	10.7	62
8602	10.7	63
8611	10.8	60
8615	10.6	61
8626	10.7	60
8640	10.7	59