LITHOLOGIC LOG

Project: McCoy 864-78

Hole: 26-8 Program #2

Elevation: 5759' Date Drilled: 9-6-83

Location: SWBW Sec. 8 T22N R30E Method: covered with mud

Geologist: Huntsman Gamma:

Depth Ft. (m)	Description
1002-1010 (305.5-307.9)	Shale - Black to Dark gray, layered beds with abundant marcasite along bedding plains. Small calcite fracture fillings, silt contains black organic matter (carbon).
1010-1020 (307.9-310.9)	As above, small slump and fracture features displayed in some beds, moderate amounts of calcite and pyrite along the fractures. Shale is very calcareous.
1020-1040 (310.9-317)	Bedded Shale - As above, abundant pyrite in shinny cubes along fracture zones. Rock very soft and highly fractured.
1040-1050 (317-320)	Bedded Shale - As above, but not as fractured.
1050-1080 (320-329.2)	As above, abundant sulfides and calcite along fractures and bedding plains.
1080-1090 (329.2-332.3)	As above, core shows signs of horizontal movement (calcite veins are out of alignment in the beds of shale).
1090-1100 (332.3-335.3)	As above, with more organic beds, very soft and brittle.
1100-1110 (35.3-338.4)	Black Shale - As above, brecciated, black carbon mineral is matrix in breccia zones, some beds are replaced with pyrite.
1110-1120 (338.4-341.4)	Layered Black Shale - Some beds shattered, others folded over, appears to be a zone of strong horizontal displacement. Rock is loaded with calcite veins, and totally replaces some shale fragments. Trace chalcedony along fractures.
1120-1130 (341.4-344.5)	Black Shale - Fractured but not brecciated, small fractures filled with calcite, minor pyrite.
1130-1140 (344.5-347.5)	Shale - As above, harder with large calcite veins and abundant disseminated pyrite, abundant calcite in dark matrix.

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1140-1145 (347.5-349)	As above, with abundant pyrite along bedding plains, dark shale contains abundant organic matter and less calcite, abundant calcite veins.
1145-1152 (349.0-351.2)	Slightly Silicified Shale Breccia - Harder, more competent formation, abundant marcasite, pyrite (cubes and disseminated), no calcite veins, vuggy.
1152-1170 (351.2-356.7)	Siliceous Shale (Argillite) - Very hard, abrassive rock, strong hematite staining at 1152 and 1154 in zones up to 3cm thick. Also, limonite. Abundant sulfides 2cm thick quartz vein with clear crystals. Rock is vuggy and hole circulation was lost completely at 1159.2'. Hematite staining along fractures but not in the vugs. Minor kaolinite along fractures.
1170-1175 (356.7-358.2)	Argillite as Above - Hematite and pyrite along fractures, rock is very hard, abrassive and vuggy, some bedding plains, also conglomeritic zones with abundant sulfides.
1175-1180 (358.2-359.7)	Silicified Shale - Hard, calcite in veins, minor hematite staining, abundant pyrite, very calcarious, almost like limestone except for thin beds, and small brecciated zones.
1180-1210 (359.7-368.9)	As above, minor disseminated pyrite.
1210-1230 (368.9-375)	As above, minor hematite staining at 1217', abundant pyrite, very calcareous but still scratches glass. Strong hematite and limonite stains in fractures at 1226'. Very siliceous and vuggy at 1229' with no calcite.
1230-1284 (375-391.4)	Silicified Siltstone and Breccia - Some zones show strong hematite staining, with abundant pyrite, minor quartz frosting, no calcite.

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1284-1293 (391.4-394.2)	Black Calcareous Shale
1293-1300 (394.2-396.3)	Silicified Breccia - Of shale fragments, abundant calcite crystals along large fractures and vugs, moderate selective hematite staining, abundant pyrite, calcite cementing of fragments, rock scratches glass.
1300-1338 (396.3-407.9)	Black Calcareous Shale - Very thing bedding, minor pyrite, trace hematite, calcite in fractures, rock is soft, almost a claystone and contains abundant carbon materials.
1338-1420 (497.9-432.9)	Black Calcareous Shale - With minor white quartz veins along fractures and abundant calcite. Rock is hard and effervesces rapidly, minor pyrite and abundant black carbon.
1420-1475 (432.9-449.6)	Black Shale as above - With some small zones with very soft black carbon clay like mineral. Trace pyrite at 1450', good clear calcite crystals.
1475-1490 (449.6-454.2)	As above, highly fractured and broken up, some soft zones with organic matter, moderate sulfides, calcite and carbon along fractures.
1490-1500 (454.2-457.3)	Black Shales as above, highly fractured and crumbled, very soft black carbon mineral, moderate pyrite, rock is softer than above.
1500-1510 (457.3-)	Black Shale - Folded, shattered, faulted and twisted, 30% calcite veins and fillings, minor carbon throughout.
1510-1540 (460.3-)	Black Shale Breccia - Angular fragments of the above in a soft black carbon clay type matrix. Trace pyrite, very soft formation, start of poor core recovery, hydrostatic pressure may cause fragments to float in matrix and cave into hole, using playmers but cement job may be needed.
1540-1580 (469.5-)	As above, abundant calcite throughout, giving the rock its only stable properties.

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1580-1610 (481.7-)	As above, unconsolidated black shale breccia in a dark gray to black carbon clay matrix, cave over 60% soft black clay, hole tight and caving.
1610-1614 (490.8)	Shale - Bedded with thin intermittent beds of black carbon. Shale displays horizontal bedding plains, minor calcite fillings, disseminated pyrite.
1614-1630 (492.0-)	Shale - Broken up, abundant black carbon clay, very soft, brittle and caving into hole, abundant calcite veins still minor sulfides.
1630-1640 (496.9-500)	Shale - Black, completely broken up and unconsolidated, no clay in core; it may have been washed away.
1640-1650 (500-503.0)	As above, abundant carbon.
1650-1660 (503-506)	As above, fine chips are only samples recovered, unit completely broken up and unconsolidated, abundant black carbon.
1660-1680 (506-512.1)	Black Shale - Slightly firm (poor to fairly competent) formation, still abundant but less than the above in carbon content. Minor pyrite, abundant calcite.
1680-1720 (512.1-524.3)	Black Shale - Fairly competent, minor to moderate black carbon seams, trace sulfides, abundant clear calcite crystals.
1720-1730 (524.3-527.4)	Black Shale - Hard, firm competent formation, still calcareous but has alot of silica in matrix, rock scratches glass.
1730-1742 (527.4-531)	Black Shale - As above, abundant calcite, very few fractures minor black carbon, hard competent rock.

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Depth Ft. (m)	Description
1864-1880 (568.2-573.1)	Sandstone - Gray, very course, moderate sorting, silica cement, very porous, minor pyrite.
1880-1910 (573.1-582.3)	Conglomerate - Medium gray conglomeratic quartzite, fine sand to small pebbles in a very hard quartzite, minor dissiminated pyrite.
1910-1920 (582.3-585.3)	Quartzite Conglomerate - Medium gray, minor fractures with calcite and quartz holding conglomerate firmly. Very hard and abrasive, minor disseminated pyrite. No caving problems, good competent formation.
1920-1940 (585.3-591.4)	As above, with large vugs filled with calcite.
1940-1980 (591.4-603.6)	Quartzite - Medium gray, fine-grained, firm, hard and abrasive formation, very slow drilling. Calcite and pyrite along fractures.
1980-1990 (603.6-606.7)	Quartzite - Medium gray, minor argillic alteration, formation slightly broken up and fractured. Abundant calcite in fractures.
1990-2000 (606.7-609.7)	As above, more vugs and fractures, abundant pyrite.
2000-2015 (609.7-614.3)	Quartzite - Hard, solid formation.
2015-2030 (614.3-618.9)	Conglomerate - Light gray, moderate argillic alteration, slightly soft, fractured rock (only able to pull short core runs). Trace carbon.
2030-2050 (618.9-625)	As above, calcite cementing, some fragments together, minor pyrite, no argillic alteration, firmer rock formation.
2050-2060 (625-628)	Conglomerate - Dark gray, crumbly, moderate argillic alteration.

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Depth	Description
2060-2070 (628-631)	As above, more competent formation, weak argillic alteration. Moderate calcite.
2070-2090 (631-637.1)	Conglomeritic Quartzite - Medium gray, minor fractures filled with calcite and clear calcite crystals. Moderate to abundant pyrite, trace argillic alteration.
2090-2094(TD) (637.1-638.4)	Conglomerate - As above, hard siliceous, minor calcite, rounded fragments up 2 cm, abundant pyrite, good firm competent formation.

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