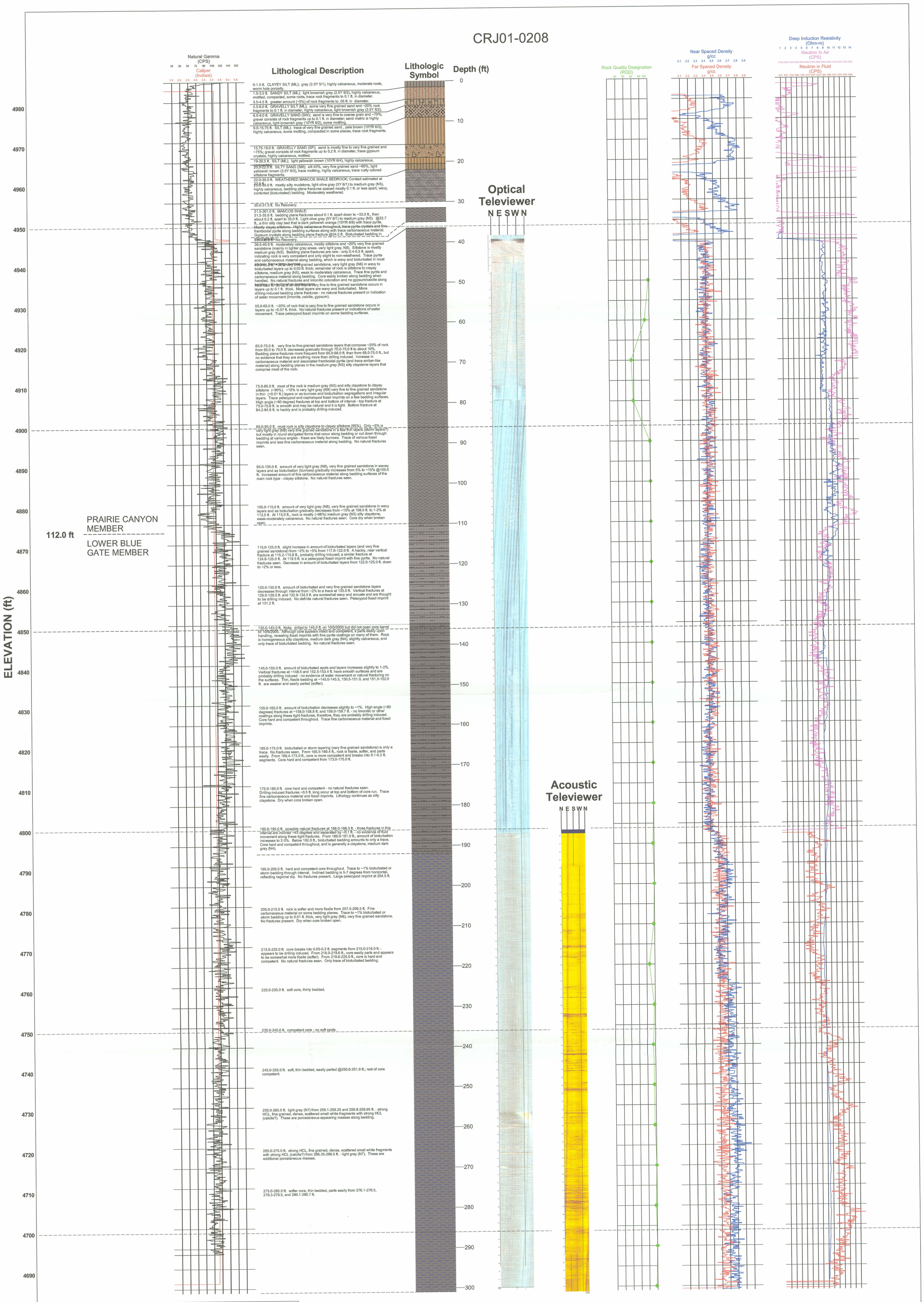
CRJ01-0208



0-1.5 ft. CLAYEY SILT (ML); gray (2.5Y 5/1), highly calcareous, moderate roots, worm hole porosity.

1.5-3.5 ft. SANDY SILT (ML); light brownish gray (2.5Y 6/2), highly calcareous, mottled, compacted, some roots, trace rock fragments to 0.1 ft. in diameter.

3.5-4.5 ft. greater amount (~5%) of rock fragments to .05 ft. in diameter.

4.5-6.0 ft. GRAVELLY SILT (ML); some very fine grained sand and ~20% rock fragments to 0.1 ft. in diameter, highly calcareous, light brownish gray (2.5Y 6/2).

6.0-9.0 ft. GRAVELLY SAND (SW); sand is very fine to coarse grain and ~70%; gravel consists of rock fragments up to 0.1 ft. in diameter; sand matrix is highly calcareous, light brownish gray (10YR 6/2), some mottling.

9.0-15.75 ft. SILT (ML); trace of very fine grained sand , pale brown (10YR 6/3), highly calcareous, some mottling, compacted in some places, trace rock fragments.

15.75-19.0 ft. GRAVELLY SAND (SP); sand is mostly fine to very fine grained and ~75%; gravel consists of rock fragments up to 0.2 ft. in diameter, trace gypsum crystals, highly calcareous, mottled.

19-20.5 ft. SILT (ML); light yellowish brown (10YR 6/4), highly calcareous, compacted.

20.5-22.0 ft. SILTY SAND (SM); silt 40%, very fine grained sand ~60%, light yellowish brown (2.5Y 6/3), trace mottling, highly calcareous, trace rusty colored siltstone fragments.

22.0-30.0 ft. WEATHERED MANCOS SHALE BEDROCK; Contact estimated at 22.0-30.0 ft. mostly silty mudstone, light olive gray (5Y 6/1) to medium gray (N5), highly calcareous, bedding plane fractures spaced mostly 0.1 ft. or less apart, wavy, contorted (bioturbated) bedding. Moderately weathered.

30.0-31.5 ft. No Recovery.

31.5-301.0 ft. MANCOS SHALE:
31.5-35.0 ft. bedding plane fractures about 0.1 ft. apart down to ~33.0 ft., then about 0.2 ft. apart to 35.0 ft. Light olive gray (5Y 6/1) to medium gray (N5). @32.7 ft., a thin silty clay bed that is dark yellowish orange (10YR 6/6) with trace pyrite. Mostly clayey siltstone. Highly calcareous throughout, trace pyrite crystals and fine framboidal pyrite along bedding surfaces along with trace carbonaceous material. Gypsum crystals along bedding plane fracture @34.5 ft. Bioturbated bedding in 35.0-36.5 ft.

35.0-36.5 ft. No Recovery.

36.5-40.0 ft. moderately calcareous, mostly siltstone and ~20% very fine grained sandstone (mainly in lighter gray areas -very light gray, N8). Siltstone is mostly medium gray (N5). Bedding plane fractures are rare - only 0.4-0.5 ft. apart, indicating rock is very competent and only slight to non-weathered. Trace pyrite and carbonaceous material along bedding, which is wavy and bioturbated in most areas. Some very fine grained sandstone, very light gray (N8) in wavy to bioturbated layers up to 0.03 ft. thick; remainder of rock is siltstone to clayey siltstone, medium gray (N5), weak to moderately calcareous. Trace fine pyrite and carbonaceous material along bedding. Core easily broken along bedding when handled. No natural fractures and limonitic coloration and no gypsum/calcite along bedding. 40.0-55.0 ft. ~20% or less of very fine to fine grained sandstone occurs in layers up to 0.1 ft. thick. Most layers are wavy and bioturbated. More drilling-induced bedding plane fractures - no natural fractures present or indication of water movement (limonite, calcite, gypsum).

55.0-65.0 ft. ~20% of rock that is very fine to fine grained sandstone occurs in layers up to ~0.07 ft. thick. No natural fractures present or indications of water movement. Trace pelecypod fossil imprints on some bedding surfaces.

65.0-75.0 ft. very fine to fine grained sandstone layers that compose ~20% of rock from 65.0 to 70.0 ft. decreases gradually through 70.0-75.0 ft to about 10%. Bedding plane fractures more frequent from 65.0-68.0 ft. than from 68.0-75.0 ft., but no evidence that they are anything more than drilling induced. Increase in carbonaceous material and associated framboidal pyrite (and trace amber-like material) along bedding planes in the medium gray (N5) silty claystone layers that comprise most of the rock.

75.0-85.0 ft. most of the rock is medium gray (N5) and silty claystone to clayey siltstone (~90%). ~10% is very light gray (N8) very fine to fine grained sandstone in thin (<0.01 ft.) layers or as burrows and bioturbation segregations and irregular layers. Trace pelecypod and cephalopod fossil imprints on a few bedding surfaces. High angle (~80 degree) fractures at top and bottom of interval - top fracture at 75.0-75.8 ft. is smooth and may be natural and it is tight. Bottom fracture at 84.2-84.6 ft. is hackly and is probably drilling-induced.

85.0-95.0 ft. most rock is silty claystone to clayey siltstone (95%). Only ~5% is very light gray (N8) very fine grained sandstone in a few thin layers (storm layers?) but mostly in round elongated forms that occur along bedding or cut down through bedding at various angles - these are likely burrows. Trace of various fossil imprints and less fine carbonaceous material along bedding. No natural fractures seen.

95.0-105.0 ft. amount of very light gray (N8), very fine grained sandstone in wavey layers and as bioturbation (burrows) gradually increases from 5% to ~15% @105.0 ft. Increased amount of fine carbonaceous material along bedding surfaces of the main rock type - clayey siltstone. No natural fractures seen.

105.0-115.0 ft. amount of very light gray (N8), very fine grained sandstone in wavy layers and as bioturbation gradually decreases from ~15% at 108.0 ft. to 1-2% at 112.0 ft. At 115.0 ft., rock is mostly (~98%) medium gray (N5) silty claystone, weak-moderately calcareous. No natural fractures seen. Core dry when broken open.

115.0-125.0 ft. slight increase in amount of bioturbated layers (and very fine grained sandstone) from ~2% to ~5% from 117.0-122.0 ft. A hackly, near vertical fracture at 115.2-115.8 ft., probably drilling induced; a similar fracture at 124.6-125.0 ft. At 119.5 ft. is a pelecypod fossil imprint with fine pyrite. No natural fractures seen. Decrease in amount of bioturbated layers from 122.0-125.0 ft. down to ~2% or less.

125.0-135.0 ft. amount of bioturbated and very fine grained sandstone layers decreases through interval from ~2% to a trace at 135.0 ft. Vertical fractures at 129.0-129.5 ft. and 132.8-134.5 ft. are somewhat wavy and arcuate and are thought to be drilling induced. No definite natural fractures seen. Pelecypod fossil imprint at 131.2 ft.

135.0-145.0 ft. Note: drilled to 145.0 ft. on 10/5/2005 but did not open core barrel till 10/6/2005. Although core appears intact and competent, it parts easily upon handling, revealing fossil imprints with fine pyrite coatings on many of them. Rock is homogeneous silty claystone, medium dark gray (N4), slightly calcareous, and only trace of bioturbated bedding. No natural fractures seen.

145.0-155.0 ft. amount of bioturbated spots and layers increases slightly to 1-2%. Vertical fractures at ~148.5 and 152.5-153.4 ft. have smooth surfaces and are probably drilling induced - no evidence of water movement or natural fracturing on the surfaces. Thin, fissile bedding at ~145.0-145.5, 150.5-151.0, and 151.5-152.0 ft. are weaker and easily parted (softer).

155.0-165.0 ft. amount of bioturbation decreases slightly to ~1%. High angle (~80 degrees) fractures at ~158.0-158.8 ft. and 159.0-159.7 ft. - no limonitic or other coatings along these tight fractures, therefore, they are probably drilling induced. Core hard and competent throughout. Trace fine carbonaceous material and fossil imprints.

165.0-175.0 ft. bioturbated or storm layering (very fine grained sandstone) is only a trace. No fractures seen. From 165.5-169.4 ft., rock is fissile, softer, and parts easily. From 169.4-173.0 ft., core is more competent and breaks into 0.1-0.2 ft. segments. Core hard and competent from 173.0-175.0 ft.

175.0-185.0 ft. core hard and competent - no natural fractures seen. Drilling-induced fractures ~0.5 ft. long occur at top and bottom of core run. Trace fine carbonaceous material and fossil imprints. Lithology continues as silty claystone. Dry when core broken open.

185.0-195.0 ft. possible natural fractures at 188.0-188.3 ft. - three fractures in this interval are inclined ~45 degrees and separated by ~0.1 ft. - no evidence of fluid movement along these tight fractures. From 189.0-191.0 ft., amount of bioturbation increases to 2-3%. Below 192.0 ft., bioturbated bedding amounts to only a trace. Core hard and competent throughout, and is generally a claystone, medium dark gray (N4).

195.0-205.0 ft. hard and competent core throughout. Trace to ~1% bioturbated or storm bedding through interval. Inclined bedding is 5-7 degrees from horizontal, reflecting regional dip. No fractures present. Large pelecypod imprint at 204.5 ft.

205.0-215.0 ft. rock is softer and more fissile from 207.5-208.5 ft. Fine carbonaceous material on some bedding planes. Trace to ~1% bioturbated or storm bedding up to 0.01 ft. thick, very light gray (N8), very fine grained sandstone. No fractures present. Dry when core broken open.

215.0-225.0 ft. core breaks into 0.05-0.3 ft. segments from 215.0-218.0 ft. - appears to be drilling induced. From 218.0-219.6 ft., core easily parts and appears to be somewhat more fissile (softer). From 219.6-225.0 ft., core is hard and competent. No natural fractures seen. Only trace of bioturbated bedding.

225.0-235.0 ft. soft core, thinly bedded.

235.0-245.0 ft. competent core - no soft spots.

245.0-255.0 ft. soft, thin bedded, easily parted @250.8-251.6 ft.; rest of core competent.

255.0-265.0 ft. light gray (N7) from 259.1-259.25 and 259.8-259.95 ft. - strong HCL, fine grained, dense, scattered small white fragments with strong HCL (calcite?). These are porcelaneous-appearing masses along bedding.

265.0-275.0 ft. strong HCL, fine grained, dense, scattered small white fragments with strong HCL (calcite?) from 266.35-266.5 ft. - light gray (N7). These are additional porcelaneous masses.

275.0-285.0 ft. softer core, thin bedded, parts easily from 276.1-276.5, 278.3-279.5, and 280.1-280.7 ft.

D-08