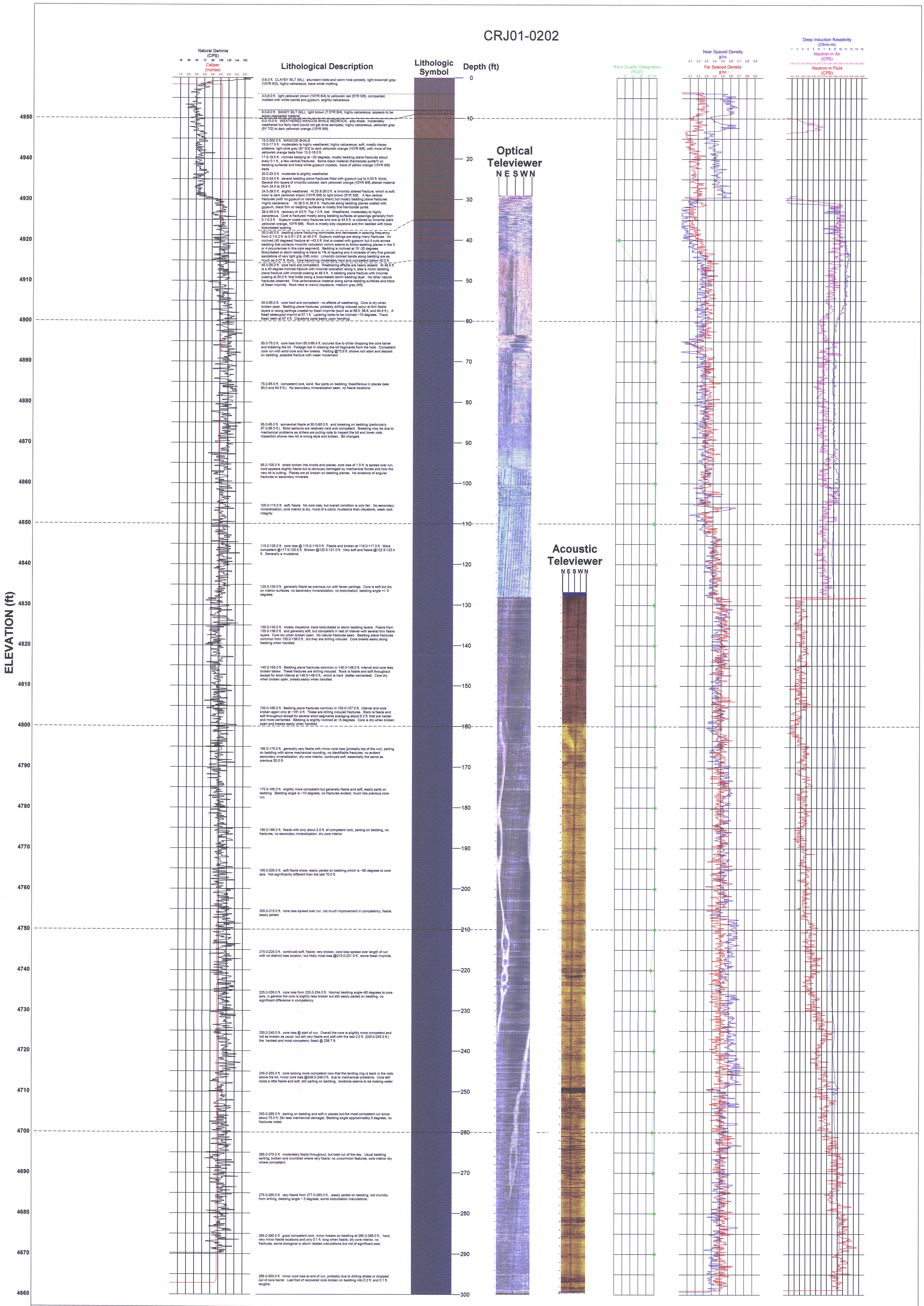
# CRJ01-0202




0-8.0 ft. CLAYEY SILT (ML); abundant roots and worm hole porosity, light brownish gray (10YR 6/2), highly calcareous, trace white mottling.

4.0-8.0 ft. light yellowish brown (10YR 6/4) to yellowish red (5YR 5/6), compacted, mottled with white calcite and gypsum, slightly calcareous.

8.0-9.0 ft. SANDY SILT (ML); light brown (7.5YR 6/4), highly calcareous, appears to be eolian-deposited material.

9.0-15.0 ft. WEATHERED MANCOS SHALE BEDROCK: silty shale, moderately weathered but fairly hard (could not get drive samples), highly calcareous, yellowish gray (5Y 7/2) to dark yellowish orange (10YR 6/6).

15.0-300.0 ft. MANCOS SHALE:
15.0-17.5 ft. moderately to highly weathered, highly calcareous, soft, mostly clayey siltstone, light olive gray (5Y 5/2) to dark yellowish orange (10YR 6/6), with more of the yellowish orange beds from 15.0-16.0 ft.
17.5-19.5 ft. inclined bedding at ~20 degrees, mostly bedding plane fractures about every 0.1 ft., a few vertical fractures. Some black material (framboidal pyrite?) on bedding surfaces and trace white gypsum crystals, trace of yellow orange (10YR 6/6) beds.
20.0-23.0 ft. moderate to slightly weathered.
23.0-24.0 ft. several bedding plane fractures filled with gypsum (up to 0.03 ft. thick). Several thin layers of limonitic-colored, dark yellowish orange (10YR 6/6) altered material from 24.0 to 24.5 ft.
24.5-29.5 ft. slighty weathered. At 25.8-26.0 ft. is limonitic altered fracture, which is soft; color is dark yellowish brown (10YR 6/6) to light brown (5YR 5/6). A few vertical fractures (with no gypsum or calcite along them) but mostly bedding plane fractures. Highly calcareous. At 28.5 to 29.0 ft. fractures along bedding planes coated with gypsum, black film on bedding surfaces is mostly fine framboidal pyrite.
29.5-35.0 ft. recovery of 4.5 ft. Top 1.0 ft. lost. Weathered, moderately to highly calcareous. Core is fractured mostly along bedding surfaces at spacings generally from 0.1-0.3 ft. Gypsum coats many fractures and one at 34.5 ft. is colored by limonite (dark yellowish orange, 10YR 6/6). Rock is mostly silty claystone and thin bedded with trace bioturbated layering.
35.0-45.0 ft. bedding plane fracturing dominates and decreases in spacing frequency from 0.1-0.2 ft. to 0.5-1.0 ft. at 45.0 ft. Gypsum coatings are along many fractures. An inclined (45 degrees) fracture at ~43.5 ft. that is coated with gypsum but it cuts across bedding that contains limonitic coloration (which seems to follow bedding planes in the 3 or 4 occurrences in this core segment). Bedding is inclined at 15 -20 degrees. Bioturbated or storm bedding is trace to 1% of layering and it consists of very fine grained sandstone of very light gray (N8) color. Limonitic colored bands along bedding are as much as 0.07 ft. thick. Core becoming moderately hard and competent below 40.0 ft.
45.0-55.0 ft. core hard and competent. Weathering effects are nearly absent. At 49.5 ft. is a 40 degree inclined fracture with limonite coloration along it, also a minor bedding plane fracture with limonite coating at 49.3 ft. A bedding plane fracture with limonite coating at 50.0 ft. that broke along a bioturbated/ storm bedding layer. No other natural fractures observed. Fine carbonaceous material along some bedding surfaces and trace of fossil imprints. Rock here is mainly claystone, medium gray (N5).

55.0-65.0 ft. core hard and competent - no effects of weathering. Core is dry when broken open. Bedding plane fractures, probably drilling induced occur at thin fissile layers or along partings created by fossil imprints (such as at 56.0, 59.8, and 64.6 ft.). A fossil pelecypod imprint at 57.1 ft. Layering looks to be inclined ~10 degrees. Trace fossil resin at 57.4 ft. Claystone parts easily upon handling.

65.0-75.0 ft. core loss from 65.0-66.4 ft. occured due to driller dropping the core barrel and breaking the bit. Footage lost in clearing the bit fragments from the hole. Competent core run with solid core and few breaks. Parting @73.8 ft. shows iron stain and deposit on bedding, possible fracture with water movement.

75.0-85.0 ft. competent core, solid, few parts on bedding, fossiliferous in places (see 80.0 and 84.5 ft.). No secondary mineralization seen, no fissile locations.

85.0-95.0 ft. somewhat fissile at 85.0-90.0 ft. and breaking on bedding (particularly 87.0-88.5 ft.). Solid sections are relatively hard and competent. Breaking may be due to mechanical problems as drillers are pulling rods to inspect the bit and lower rods. Inspection shows new bit is wrong style and broken. Bit changed.

95.0-105.0 ft. shale broken into knobs and pieces; core loss of 1.5 ft. is spread over run, core appears slightly fissile but is obviously damaged by mechanical forces and how the new bit is cutting. Pieces are all broken on bedding planes. No evidence of angular fractures or secondary minerals.

105.0-115.0 ft. soft, fissile. No core loss, but overall condition is only fair. No secondary mineralization, core interior is dry, more of a calcic mudstone than claystone, weak rock integrity.

115.0-125.0 ft. core loss @ 115.0-118.0 ft. Fissile and broken at 118.0-117.5 ft. More competent @117.5-120.5 ft. Broken @120.5-121.0 ft. Very soft and fissile @122.5-123.4 ft. Generally a mudstone.

125.0-135.0 ft. generally fissile as previous run with fewer partings. Core is soft but dry on interior surfaces, no secondary mineralization, no bioturbation, bedding angle +/- 5 degrees.

135.0-145.0 ft. mostly claystone, trace bioturbated or storm bedding layers. Fissile from 135.0-139.0 ft. and generally soft, but competent in rest of interval with several thin fissile layers. Core dry when broken open. No natural fractures seen. Bedding plane fractures common from 135.0-139.0 ft., but they are drilling induced. Core breaks easily along bedding when handled.

145.0-155.0 ft. Bedding plane fractures common in 145.0-148.0 ft. interval and core less broken below. These fractures are drilling induced. Rock is fissile and soft throughout except for short interval at 148.3-148.5 ft., which is hard (better cemented). Core dry when broken open, breaks easily when handled.

155.0-165.0 ft. bedding plane fractures common in 155.0-157.0 ft. interval and core broken again only at ~161.0 ft. These are drilling induced fractures. Rock is fissile and soft throughout except for several short segments averaging about 0.2 ft. that are harder and more cemented. Bedding is slightly inclined at ~5 degrees. Core is dry when broken open and breaks easily when handled.

165.0-175.0 ft. generally very fissile with minor core loss (probably top of the run), parting on bedding with some mechanical rounding, no identifiable fractures, no evident secondary mineralization, dry core interior, continued soft, essentially the same as previous 30.0 ft.

175.0-185.0 ft. slightly more competent but generally fissile and soft, easily parts on bedding. Bedding angle is ~10 degrees, no fractures evident, much like previous core run.

185.0-195.0 ft. fissile with only about 2.0 ft. of competent rock, parting on bedding, no fractures, no secondary mineralization, dry core interior.

195.0-205.0 ft. soft fissile shale, easily parted on bedding,which is ~90 degrees to core axis. Not significantly different than the last 70.0 ft.

205.0-215.0 ft. core loss spread over run, not much improvement in competency, fissile, easily parted.

215.0-225.0 ft. continued soft, fissile, very broken, core loss spread over length of run with no distinct loss location, but likely most loss @215.0-221.0 ft., some fossil imprints.

225.0-235.0 ft. core loss from 233.0-234.0 ft. Normal bedding angle~90 degrees to core axis, in general the core is slightly less broken but still easily parted on bedding, no significant difference in competency.

235.0-245.0 ft. core loss @ start of run. Overall the core is slightly more competent and not as broken as usual, but still very fissile and soft with the last 2.0 ft. (243.0-245.0 ft.) the hardest and most competent, fossil @ 239.7 ft.

245.0-255.0 ft. core looking more competent now that the landing ring is back in the rods above the bit, minor core loss @248.0-249.0 ft. due to mechanical problems. Core still looks a little fissile and soft, still parting on bedding, borehole seems to be making water.

255.0-265.0 ft. parting on bedding and soft in places but the most competent run since about 75.0 ft. (far less mechanical damage). Bedding angle approximately 5 degrees, no fractures noted.

265.0-275.0 ft. moderately fissile throughout, but best run of the day. Usual bedding parting, broken and crumbled where very fissile, no uncommon features, core interior dry where competent.

275.0-285.0 ft. very fissile from 277.0-283.0 ft., easily parted on bedding, not crumbly from drilling, bedding angle ~ 5 degrees, some bioturbation crenulations.

285.0-295.0 ft. good competent rock, minor breaks on bedding at 285.0-286.0 ft., hard, very minor fissile locations and only 0.1 ft. long when fissile, dry core interior, no fractures, some biological or storm related crenulations but not of significant size.

295.0-300.0 ft. minor core loss at end of run, probably due to drilling stress or dropped out of core barrel. Last foot of recovered core broken on bedding into 0.2 ft. and 0.1 ft. lengths.

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