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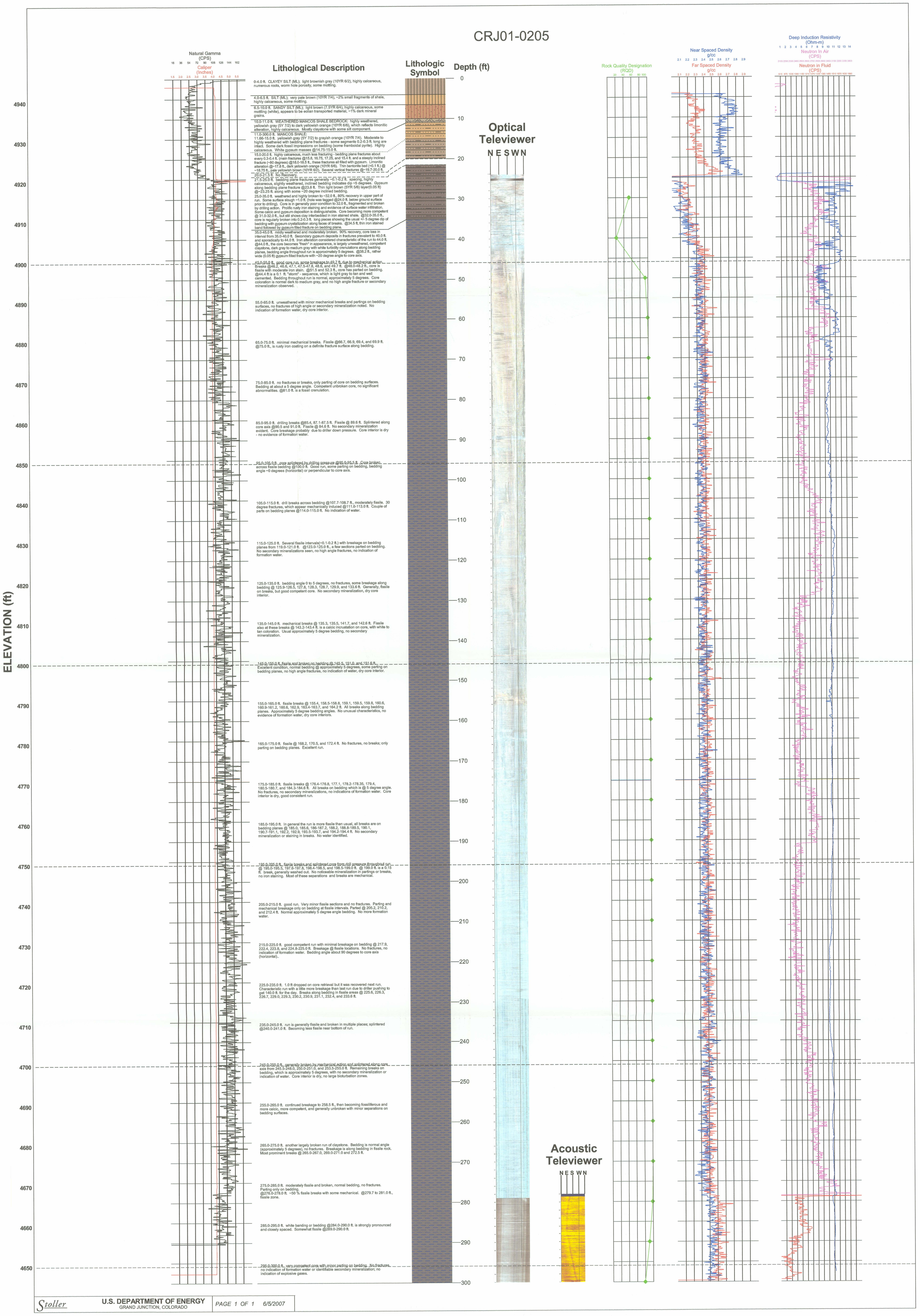

0-4.0 ft. CLAYEY SILT (ML); light brownish gray (10YR 6/2), highly calcareous, numerous roots, worm hole porosity, some mottling.

4.0-6.5 ft. SILT (ML); very pale brown (10YR 7/4), ~2% small fragments of shale, highly calcareous, some mottling.

6.5-10.0 ft. SANDY SILT (ML); light brown (7.5YR 6/4), highly calcareous, some mottling (white), appears to be eolian transported material, ~1% dark mineral grains.

10.0-11.0 ft. WEATHERED MANCOS SHALE BEDROCK: highly weathered, yellowish gray (5Y 7/2) to dark yellowish orange (10YR 6/6), which reflects limonitic alteration, highly calcareous. Mostly claystone with some silt component.

11.0-300.0 ft. MANCOS SHALE:
11.66-15.0 ft. yellowish gray (5Y 7/2) to grayish orange (10YR 7/4). Moderate to highly weathered with bedding plane fractures - some segments 0.2-0.3 ft. long are intact. Some dark fossil impressions on bedding (some framboidal pyrite). Highly calcareous. White gypsum masses @14.75-15.0 ft.

15.0-20.0 ft. highly calcareous, much less fracturing - bedding plane fractures about every 0.3-0.4 ft. (main fractures @15.8, 16.75, 17.25, and 15.4 ft. and a steeply inclined fracture (~80 degrees) @18.0-18.5 ft., these fractures all filled with gypsum. Limonitic alteration @~17.8 ft., dark yellowish orange (10YR 6/6). Thin bentonite bed (<0.1 ft.) @ ~18.75 ft., pale yellowish brown (10YR 6/2). Several vertical fractures @~19.7-20.0 ft.

20.0-21.5 ft. No Recovery.

21.5-25.0 ft. bedding plane fractures generally ~0.1-0.2 ft. spacing, highly calcareous, slightly weathered, inclined bedding indicates dip ~5 degrees. Gypsum along bedding plane fracture @23.8 ft. Thin light brown (5YR 5/6) layer(0.05 ft) @~23.25 ft. along with some ~20 degree inclined bedding.

25.0-35.0 ft. weathered and highly broken to ~32.0 ft., 80% recovery in upper part of run. Some surface slough ~1.0 ft. (hole was tagged @24.0 ft. below ground surface prior to drilling). Core is in generally poor condition to 32.0 ft., fragmented and broken by drilling action. Prolific rusty iron staining and evidence of surface water infiltration. Some calcic and gypsum deposition is distinguishable. Core becoming more competent @ 31.0-32.0 ft., but still shows clay interbedded in iron stained shale. @32.0-35.0 ft., core is regularly broken into 0.2-0.3 ft. long pieces showing the usual +/- 5 degree dip of bedding with gypsum crystallization along faces of breaks. @34.5 ft, thin iron stained band followed by gypsum filled fracture on bedding plane.

35.0-45.0 ft. mildly weathered and moderately broken. 90% recovery, core loss in interval from 35.0-40.0 ft. Secondary gypsum deposits in fractures prevalent to 40.0 ft. and sporadically to 44.0 ft. Iron alteration considered characteristic of the run to 44.0 ft. @44.0 ft., the core becomes "fresh" in appearance, is largely unweathered, competent claystone, dark gray to medium gray with white turbidity crenulations along bedding planes, bedding angle throughout run is approximately 5 degrees. @38.2 ft., rather wide (0.05 ft) gypsum filled fracture with ~20 degree angle to core axis.

45.0-55.0 ft. good core run, some breakage to 49.7 ft. due to mechanical action. Breaks @46.2, 46.6, 47.1, 47.5-47.8, 48.6, and 49.7 ft. @48.0-48.2 ft., core is fissile with moderate iron stain. @51.5 and 52.3 ft., core has parted on bedding. @44.4 ft is a 0.1 ft. "storm" - sequence, which is light gray to tan and well cemented. Bedding throughout run is normal, approximately 5 degrees. Core coloration is normal dark to medium gray, and no high angle fracture or secondary mineralization observed.

55.0-65.0 ft. unweathered with minor mechanical breaks and partings on bedding surfaces, no fractures of high angle or secondary mineralization noted. No indication of formation water, dry core interior.

65.0-75.0 ft. minimal mechanical breaks. Fissile @66.7, 66.9, 69.4, and 69.9 ft. @75.0 ft., is rusty iron coating on a definite fracture surface along bedding.

75.0-85.0 ft. no fractures or breaks, only parting of core on bedding surfaces. Bedding at about a 5 degree angle. Competent unbroken core, no significant abnormalities. @81.0 ft. is a fossil crenulation.

85.0-95.0 ft. drilling breaks @85.4, 87.1-87.5 ft. Fissile @ 89.6 ft. Splintered along core axis @90.5 and 91.0 ft. Fissile @ 84.6 ft. No secondary mineralization evident. Core breakage probably due to driller down pressure. Core interior is dry - no evidence of formation water.

95.0-105.0 ft. core splintered by drilling pressure @95.0-95.5 ft. Core broken across fissile bedding @100.0 ft. Good run, some parting on bedding, bedding angle ~0 degrees (horizontal) or perpendicular to core axis.

105.0-115.0 ft. drill breaks across bedding @107.7-108.7 ft., moderately fissile. 30 degree fractures, which appear mechanically induced @111.0-113.0 ft. Couple of parts on bedding planes @114.0-115.0 ft. No indication of water.

115.0-125.0 ft. Several fissile intervals(~0.1-0.2 ft.) with breakage on bedding planes from 119.0-121.0 ft. @123.0-125.0 ft., a few sections parted on bedding. No secondary mineralizations seen, no high angle fractures, no indication of formation water.

125.0-135.0 ft. bedding angle 0 to 5 degrees, no fractures, some breakage along bedding @ 125.9-126.5, 127.8, 128.3, 128.7, 129.9, and 133.6 ft. Generally, fissile on breaks, but good competent core. No secondary mineralization, dry core interior.

135.0-145.0 ft. mechanical breaks @ 135.3, 135.5, 141.7, and 142.6 ft. Fissile also at these breaks @ 143.2-143.4 ft. is a calcic incrustation on core, with white to tan coloration. Usual approximately 5 degree bedding, no secondary mineralization.

145.0-155.0 ft. fissile and broken on bedding @ 145.5, 151.0, and 151.6 ft. Excellent condition, normal bedding @ approximately 5 degrees, some parting on bedding planes, no high angle fractures, no indication of water, dry core interior.

155.0-165.0 ft. fissile breaks @ 155.4, 158.5-158.8, 159.1, 159.5, 159.8, 160.6, 160.9-161.2, 160.6, 162.9, 163.4-163.7, and 164.2 ft. All breaks along bedding planes. Approximately 5 degree bedding angles. No unusual characteristics, no evidence of formation water, dry core interiors.

165.0-175.0 ft. fissile @ 168.2, 170.5, and 172.4 ft. No fractures, no breaks; only parting on bedding planes. Excellent run.

175.0-185.0 ft. fissile breaks @ 176.4-176.8, 177.1, 178.2-178.35, 179.4, 180.5-180.7, and 184.3-184.6 ft. All breaks on bedding which is @ 5 degree angle. No fractures, no secondary mineralizations, no indications of formation water. Core interior is dry, good consistent run.

185.0-195.0 ft. In general the run is more fissile than usual, all breaks are on bedding planes @ 185.0, 185.6, 186-187.2, 188.2, 188.8-189.5, 190.1, 190.7-191.1, 192.2, 192.9, 193.5-193.7, and 194.2-194.4 ft. No secondary mineralization or staining in breaks. No water identified.

195.0-205.0 ft. fissile breaks and splintered core from drill pressure throughout run @ 195.0-195.5, 197.6-197.8, 198.4-198.5, and 198.5-199.0 ft. @ 199.0 ft. is a 0.15 ft. break, generally washed out. No noticeable mineralization in partings or breaks, no iron staining. Most of these separations and breaks are mechanical.

205.0-215.0 ft. good run. Very minor fissile sections and no fractures. Parting and mechanical breakage only on bedding at fissile intervals. Parted @ 205.2, 210.2, and 212.4 ft. Normal approximately 5 degree angle bedding. No more formation water.

215.0-225.0 ft. good competent run with minimal breakage on bedding @ 217.9, 222.4, 223.8, and 224.8-225.0 ft. Breakage @ fissile locations. No fractures, no indication of formation water. Bedding angle about 90 degrees to core axis (horizontal)..

225.0-235.0 ft. 1.0 ft dropped on core retrieval but it was recovered next run. Characteristic run with a little more breakage than last run due to driller pushing to get 140.0 ft. for the day. Breaks along bedding in fissile areas @ 225.6, 226.3, 226.7, 229.0, 229.3, 230.2, 230.9, 231.1, 232.4, and 233.6 ft.

235.0-245.0 ft. run is generally fissile and broken in multiple places; splintered @240.0-241.0 ft. Becoming less fissile near bottom of run.

245.0-255.0 ft. generally broken by mechanical action and splintered along core axis from 245.5-248.0, 250.0-251.0, and 253.5-255.0 ft. Remaining breaks on bedding, which is approximately 5 degrees, with no secondary mineralization or indication of water. Core interior is dry, no large bioturbation zones.

255.0-265.0 ft. continued breakage to 258.5 ft., then becoming fossiliferous and more calcic, more competent, and generally unbroken with minor separations on bedding surfaces.

265.0-275.0 ft. another largely broken run of claystone. Bedding is normal angle (approximately 5 degrees), no fractures. Breakage is along bedding in fissile rock. Most prominent breaks @ 265.0-267.0, 269.0-271.0 and 272.5 ft.

275.0-285.0 ft. moderately fissile and broken, normal bedding, no fractures. Parting only on bedding.
@276.0-278.0 ft. ~50 % fissile breaks with some mechanical. @279.7 to 281.0 ft., fissile zone.

285.0-295.0 ft. white banding or bedding @284.0-290.0 ft. is strongly pronounced and closely spaced. Somewhat fissile @289.0-290.0 ft.

295.0-300.0 ft. very competent core with minor parting on bedding. No fractures, no indication of formation water or identifiable secondary mineralization; no indication of explosive gases.

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