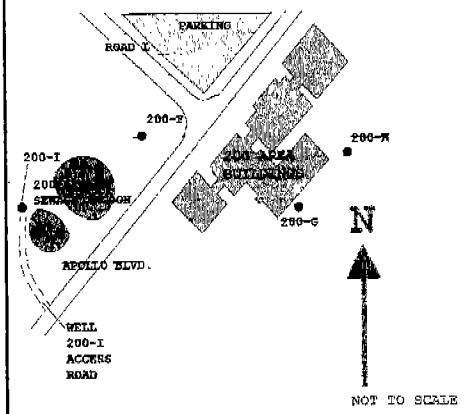
WSTF BOREHOLE LITHOLOGIC LOG

LOCATION MAP:



SITE ID: NASA-JSC WSTF

LOCATION ID: Well 200-I

SITE COORDINATES: N227439.06, E416552.58

GROUND ELEVATION: 4837.79 (Brass Cap)

COUNTY AND STATE: Dona Ana County, New Mexico

DRILLING CONTRACTOR: Stewart Brothers Drilling Co.

DRILLING METHOD(S): Mud rotary/air foam rotary

DATES STARTED AND COMPLETED: May 20, 1997-June 23, 1997

ATSC FIELD REPRESENTATIVES: Russell/Giles/Pearson/Egan

DEPTH TO BEDROCK AND TYPE: 130 Feet - Limestone

DEPTH TO GROUNDWATER: 170 Feet

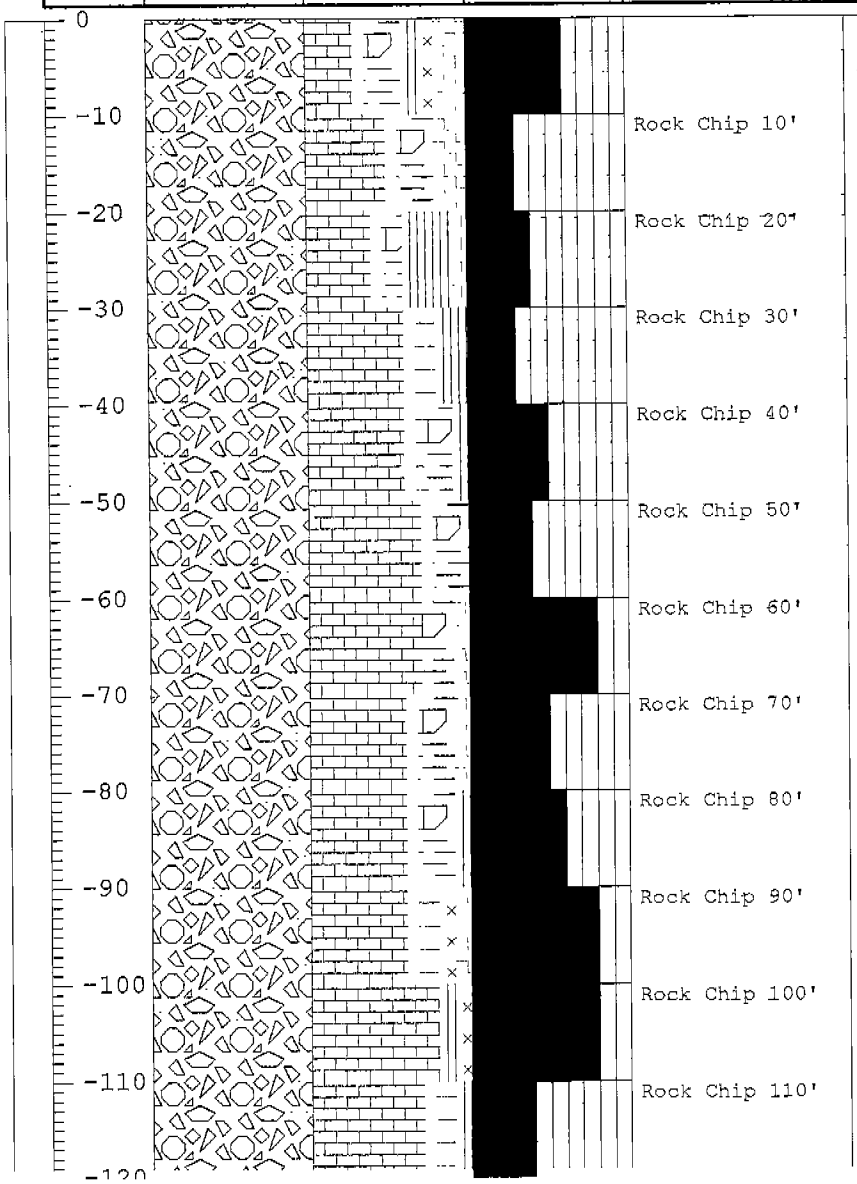
TOTAL DEPTH OF BOREHOLE: 845 Feet

COMMENTS: - Mud rotary 8 3/4-inch tricone to 130 feet
- Set 5 1/2-inch surface casing to 130 feet
- Air foam 4 1/2-inch tricone 130 to 845 feet

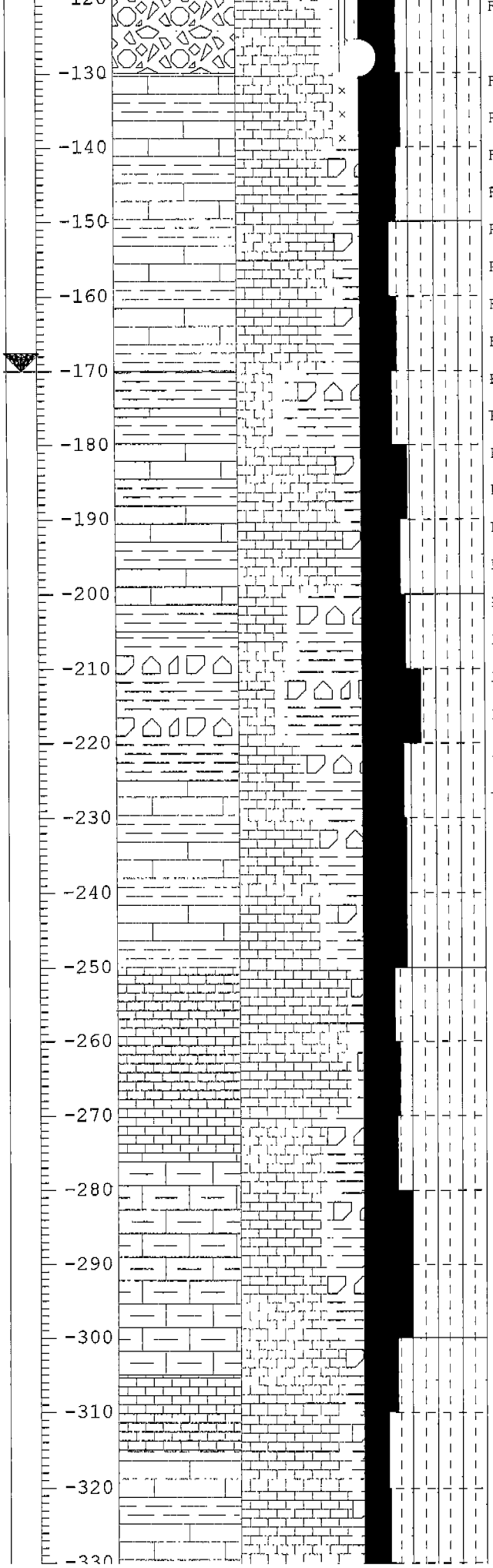
LOCATION DESCRIPTION:

Quarter 1	NW1/4	Section	2
Quarter 2	NW1/4	Township	T21S
Quarter 3	NE1/4	Range	R3E

DEPTH (Feet)	LITHOLOGY	VISUAL PERCENT 0 100	DRILLING RATE (Feet/Hr) 0 100	SAMPLE TYPE	LITHOLOGIC DESCRIPTION



ALLUVIUM: Santa Fe Group: Cuttings samples consist of polygenetic multi-colored clasts with localized clay-rich intervals. Color is variable between clast types depending on composition, and predominantly light brown (5YR 6/4) to moderate brown (5YR 4/4). Cuttings range in size from 2mm to 2.0 cm, and are fine gravel sized. Individual clasts are generally subangular, and angular where broken. The alluvium is an unconsolidated to poorly consolidated, non-sorted, poorly graded polygenetic pebble to boulder conglomerate. Intermittent clay-rich zones are noted in the log where present. Lithologies occurring in the alluvium are: limestone (medium dark grey (N4)); shale (grayish black (N2)); silty limestone and siltstone (dark yellowish orange (10YR 6/6)); rhyolite (pinkish grey (5YR 8/1)), and; granite (moderate pink (5R 7/4)).



LIMESTONE AND SHALE INTERBEDS: Light brownish gray (5YR 6/1) to brownish gray (5YR 4/1) fresh indurated limestone. Chips fine, broken and angular. Trace calcite veinlets (<5%), and trace fractures (<5%).

SHALE: Brown (5YR 3/3). Highly calcareous. Varved texture. Traces of localized calcite fracture fill. Relatively indurated.

LIMESTONE AND SHALE INTERBEDS: Limestone is brown (5YR 3/4) to brownish gray (5YR 4/1). Microcrystalline. Moderate iron oxide traces on fractures in 20-30% of the chips. Shales have brown iron oxidation, and are fissile. White calcite-filled fractures in 10% of the chips.

SHALE: Grayish black (N2) to greenish black (5GY 2/1). Calcareous. Localized grayish black limestone horizons with disseminated pyrite.

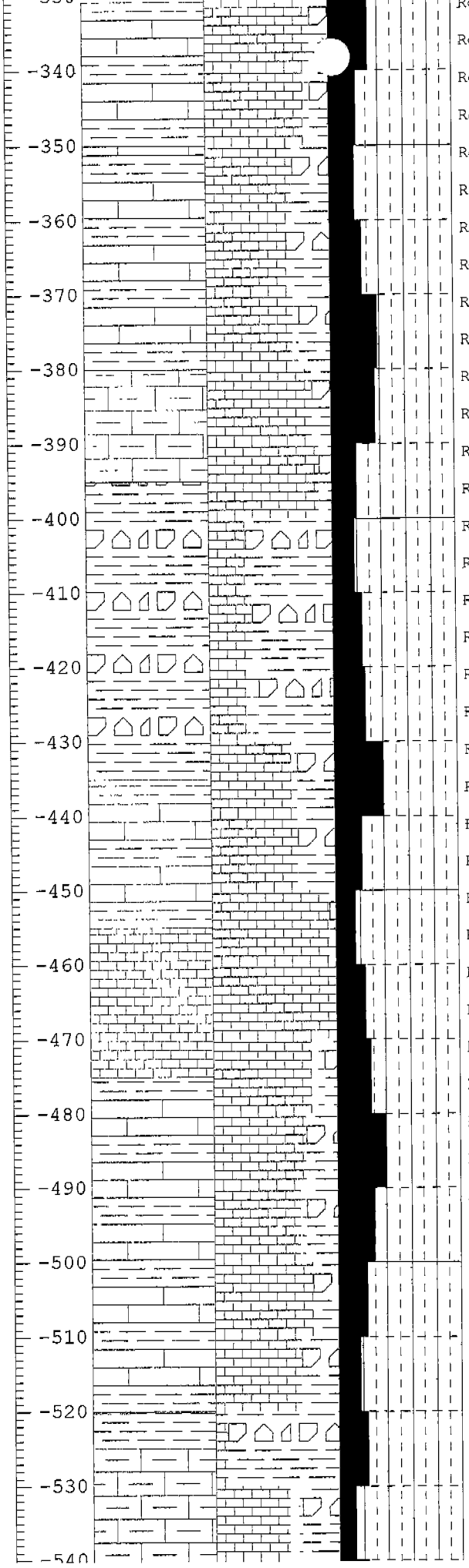
LIMESTONE AND SHALE INTERBEDS: Greyish black (N2). Microcrystalline. Highly calcareous. Fissile to hard. Traces of iron oxides on fractures (>2%).

LIMESTONE: Grayish black (N2). Relatively shaley with light brown (5YR 5/6) shaley partings.

SHALY LIMESTONE: Grayish black (N2) limestone with interbedded shales. Traces of calcite (<5% chips) filling fractures.

LIMESTONE: Dark gray (N3). Microcrystalline.

LIMESTONE AND SHALE INTERBEDS: Medium gray (N5). Microcrystalline. Some shell hash visible.



LIMESTONE AND SHALE INTERBEDS: Medium gray (N5) limestone with localized interbedded calcareous shale horizons. Traces of calcite veining (<5% chips)

SHALY LIMESTONE: Medium gray (N5). Locally shaly within approximately 30% of chips

SHALE: Dark gray (N3). Fissile. Trace (<5%) calcite veinlets between 400'-425'.

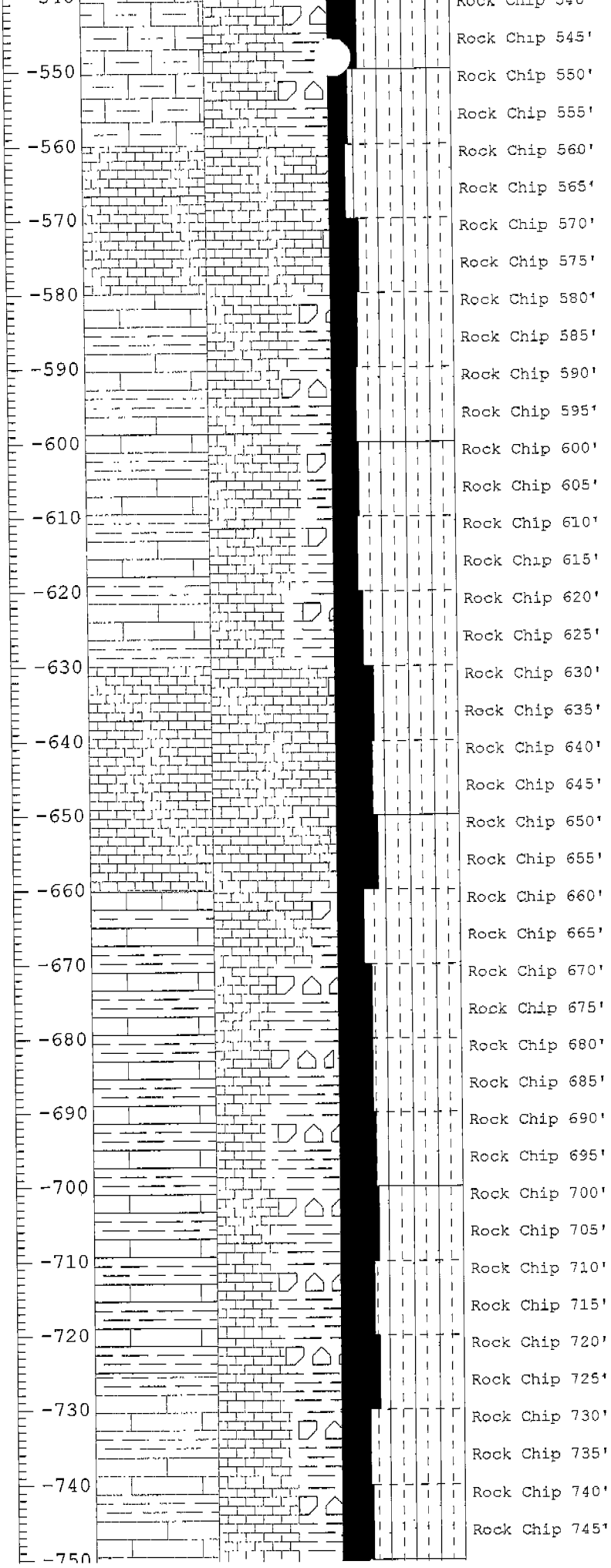
LIMESTONE AND SHALE INTERBEDS: Medium gray (N5) limestone interbedded with dark gray (N3) shales. Microcrystalline limestone. Variably soft to indurated shales.

LIMESTONE: Medium gray (N5). Microcrystalline.

LIMESTONE AND SHALE INTERBEDS: Dark gray (N3) limestones and shales . Abundant moderate reddish brown (10R 4/6) iron oxide staining between 490' to 505'.

SHALE: Dark gray (N3). Calcareous.

SHALY LIMESTONE: Dark gray (N3). Shaly partings. Increased fracturing between 525' to 535'.



LIMESTONE: Medium gray (N5) to greenish gray (5G 6/1). Microcrystalline. Trace fractures (5% cuttings) which are coated with some iron oxides and some sulfides.

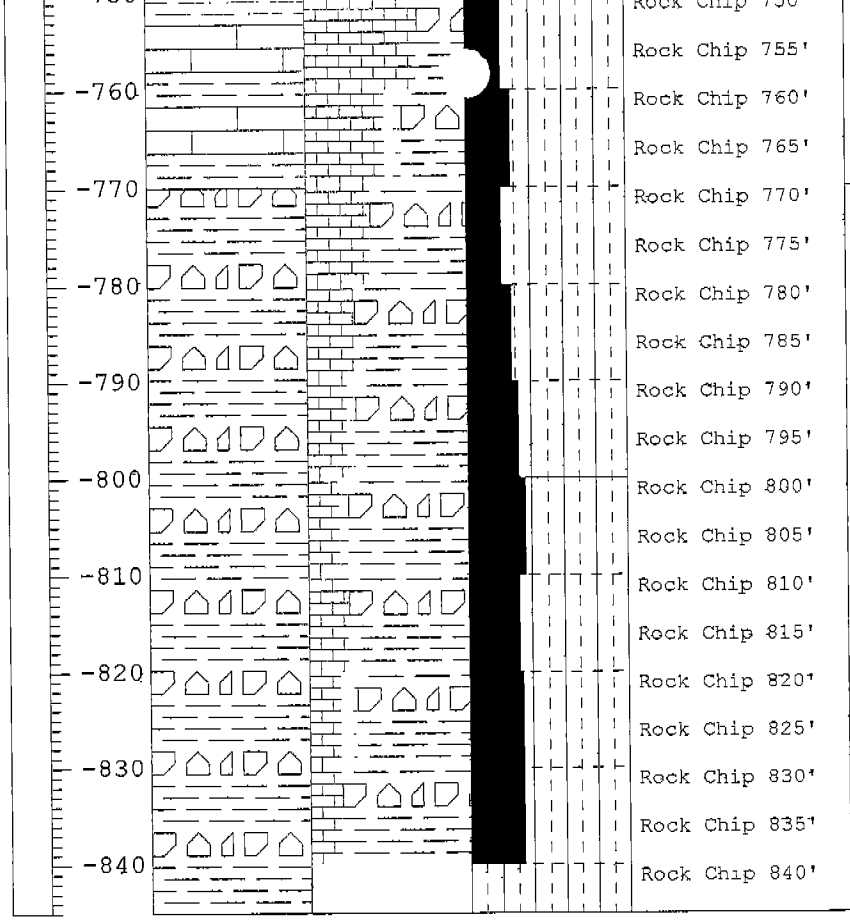
LIMESTONE AND SHALE INTERBEDS: Dark gray (N3). Shaly partings within shale interbeds with traces of iron oxides and sulfides on partings. Traces (<5%) of calcite veinlets between 625' to 630'.

LIMESTONE: Medium gray (N5) to dark gray (N3). Microcrystalline to crystalline wackestone. Locally fossiliferous with fragments of shell hash, crinoids, echinoid spines and solitary corals. Shell hash promotes localized grainy textures in the unit.

LIMESTONE WITH SHALE INTERBEDS: Medium gray (N5) limestone with 20% dark gray (N3) shale.

SHALE WITH LIMESTONE INTERBEDS: Dark gray (N3) to grayish black (N2) shale with abundant shaley partings. Locally fissile. Shale interbedded with medium gray (N5) microcrystalline limestone. Trace (<5%) dark yellowish orange (10YR 6/6) oxidation between 700' to 715'.

LIMESTONE AND SHALE INTERBEDS: Dark gray (N3). Calcareous and relatively competent shale interbeds.



SHALE: Grayish black (N2). Highly calcareous. Generally competent, locally fissile. Trace (<5%) light brown (5YR 5/6) shaly partings with iron oxides. Trace (<5%) healed calcite fractures.