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**Houston, TX**  
(281) 784-5500  
**Bakersfield, CA**  
(661) 328-1595  
**New Iberia, LA**  
(337) 364-2322  
**Anchorage, AK**  
(907) 561-2465

## MUDLOG TVD

<b>COMPANY</b>	EXXONMOBIL
<b>WELL</b>	PCU 296-6B2 ST1
<b>FIELD</b>	PICEANCE CREEK UNIT
<b>REGION</b>	ROCKY MOUNTAIN
<b>COORDINATES</b>	LAT 39.905269000 LON 108.205030000
<b>ELEVATION</b>	GL = 7363.8' KB = 7390.8'
<b>COUNTY, STATE</b>	RIO BLANCO, CO
<b>API INDEX</b>	051031154501
<b>SPUD DATE</b>	04/25/2011
<b>CONTRACTOR</b>	HELMRICH AND PAYNE
<b>CO. REP.</b>	SCOTT ARENBURG
<b>RIG/TYPE</b>	215/FLEX 3
<b>LOGGING UNIT</b>	ML051
<b>GEOLOGISTS</b>	B.MARSH, B.JOHANNING G.BAKER, D.CLAAR
<b>ADD. PERSONS</b>	K.WALLANDER I. FAROOQUI
<b>CO. GEOLOGIST</b>	CHRIS ALBA, WILL HOFFMAN

### LOG INTERVAL

### CASING DATA

**DEPTHS:** 4,622' **TO** 10,280'  
**DATES:** 04/25/2011 **TO** 05/12/2011  
**SCALE:** 1" = 100'

16" **AT** 145'  
10.75" **AT** 4,622'  
7.00" **AT** 8,665'

**AT**

### MUD TYPES

### HOLE SIZE

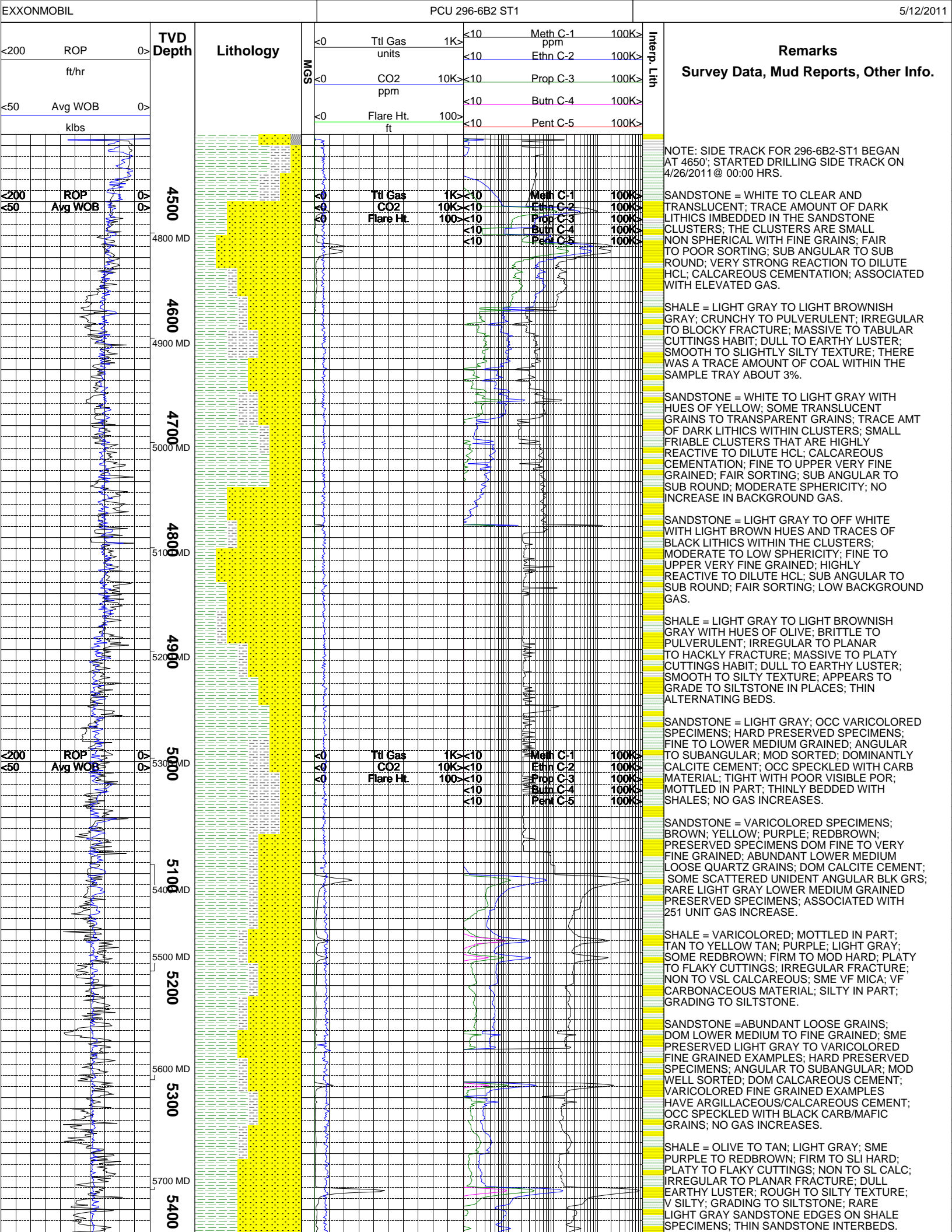
LSND **TO** 10,280'  
**TO**  
**TO**  
**TO**

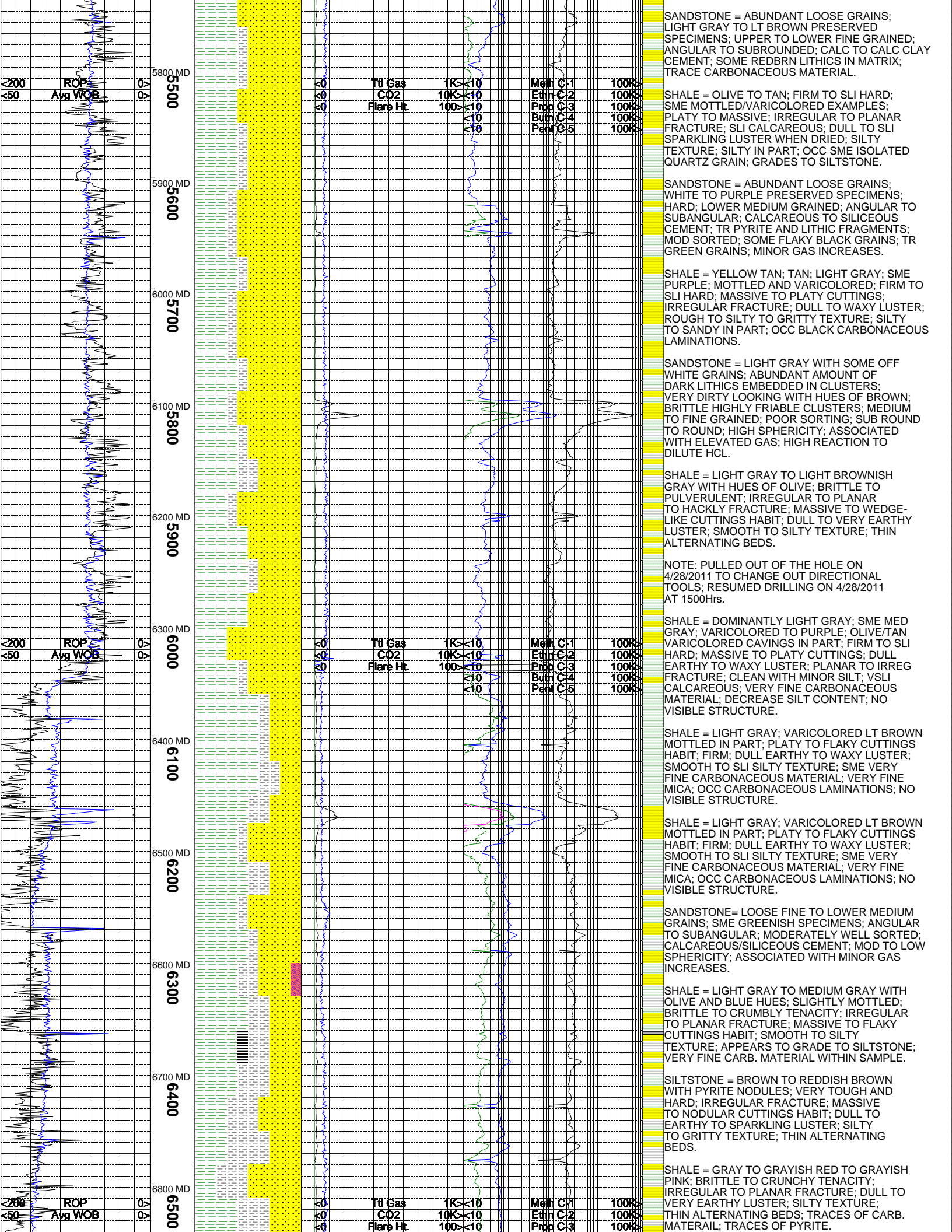
20.0" **TO** 145'  
14.75" **TO** 4,622'  
9.875" **TO** 10,280'  
**TO**

### ABBREVIATIONS

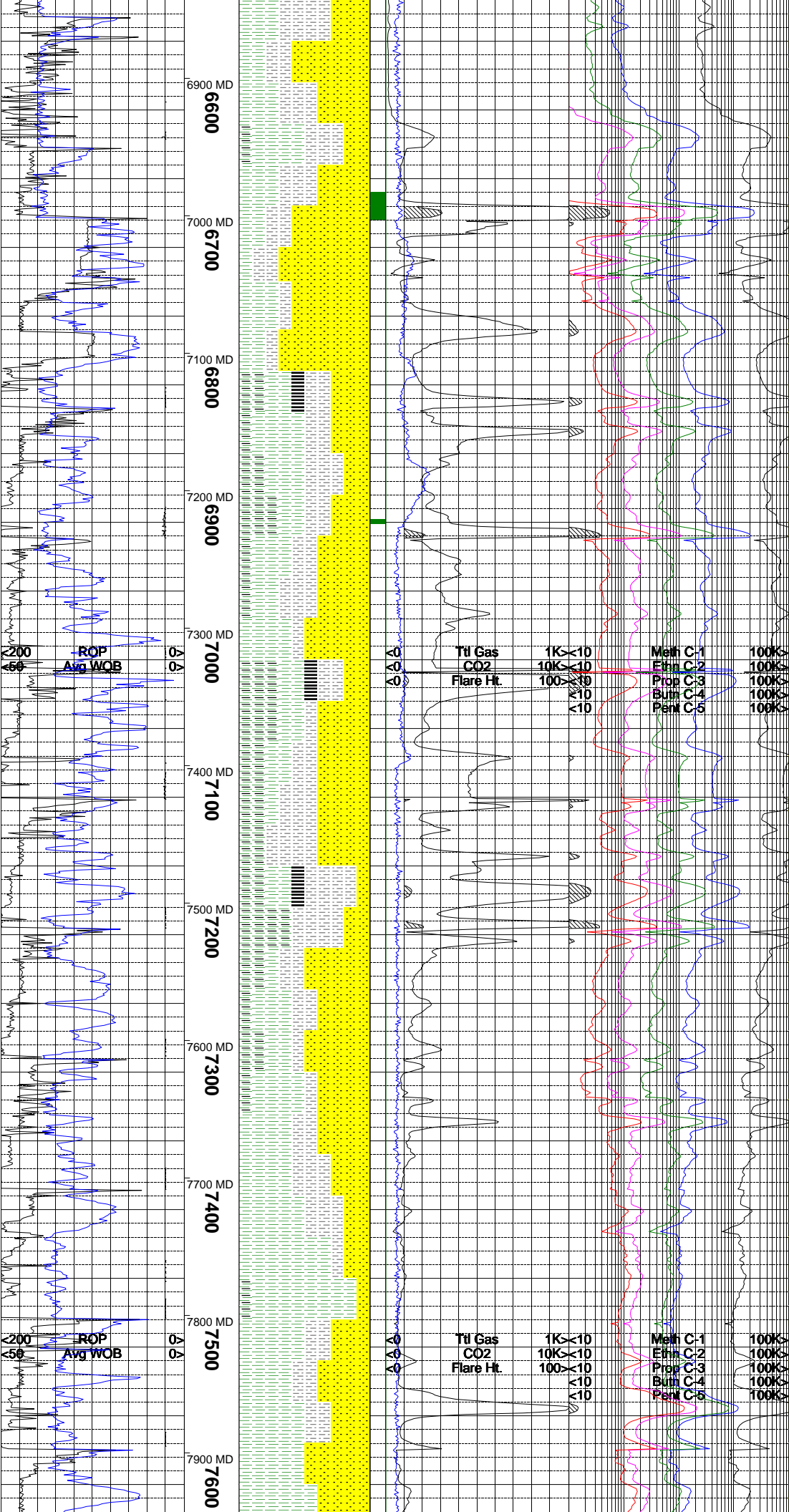
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</i> MUD RESISTIVITY	<i>SG</i> SURVEY GAS
<i>PP</i> PUMP PRESSURE	<i>Rmf</i> FILTRATE RESISTIVITY	<i>WG</i> WIPER GAS
<i>SPM</i> STROKES/MIN	<i>PR</i> POOR RETURNS	<i>CG</i> CONNECTION GAS
<i>MW</i> MUD WEIGHT	<i>LAT</i> LOGGED AFTER TRIP	
<i>VIS</i> FUNNEL VISCOSITY	<i>LAS</i> LOGGED AFTER SURVEY	

ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION	CLAY-MUDSTONE	GRANITE WASH	PHOSPHATE	SHALE TUFFACEOUS
BRECCIA	CLYST-TUFFACEOUS	GRANODIORITE	PORCELANITE	SHELL FRAGMENTS
CALCARENITE	CHLORITIZATION	GYPSUM	PORCELANEOUS CLYST	SIDERITE
CALCAREOUS TUFF	COAL	HALITE	PYRITE	SILICIFICATION
CALCILUTITE	CONGLOMERATE	HORNBL-QTZ-DIO	PYROCLASTICS	SILTSTONE
CARBONATES	CONGL. SAND	IGNEOUS (ACIDIC)	QUARTZ DIORITE	SILTST-TUFFACEOUS
CARBONACEOUS MAT	CONGL. SANDSTONE	IGNEOUS (BASIC)	QUARTZ LATITE	TUFF
CARBONACEOUS SH	COQUINA	INTRUSIVES	QUARTZ MONZONITE	VOLCANICLASTICS SEDS
CEMENT CONTAM.	DACITE	KAOLINITIC	RECRYSTALLIZED CALCITE	VOLCANICS
CHALK	DIATOMITE	LIMESTONE	RHYOLITE	
CRYSTALLINE TUFF	DIORITE	LITHIC TUFF	SALT	
CHERT - ARGILL	DOLOSTONE	MARL - DOLO	SAND	









SANDSTONE = WHITE TO CLEAR AND TRANSLUCENT; SMALL TIGHT NON-FRIABLE CLUSTERS WITH DARK LITHICS THROUGHOUT; MEDIUM TO VERY FINE GRAINED; FAIR TO WELL SORTED; SUB ANGULAR TO SUB ROUND; MODERATE TO HIGH SPHERICITY; CALCAREOUS CEMENT; HIGH REACTION TO DILUTE HCL; TRACES OF PYRITE AND VERY FINE MICA PARTICLES WERE WITHIN THE SAMPLE; NO GAS INCREASES.

SILTSTONE = DARK BROWN TO REDDISH BROWN TO DARK GRAYISH BROWN; TOUGH TO DENSE VERY HARD; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR CUTTINGS HABIT; DULL TO SPARKLING LUSTER; SILTY TO GRITTY TO SLIGHTLY ABRASIVE TEXTURE; THINLY INTERBEDDED; MOTTLED TO NODULAR WITH PYRITE AND TRACES OF VERY FINE MICA MADE IT VERY SPARKLING AT TIMES;

NOTE: REDUCED FLOW AT 6990' AND VERY BRIEFLY LOST FLOW AT 7000'.

SANDSTONE = LIGHT GRAY TO OFF WHITE WITH CLEAR AND TRANSLUCENT GRAINS; TRACES OF DARK LITHICS THROUGHOUT GIVE A SLIGHT SALT AND PEPPER APPEARANCE; TOUGH NON-FRIABLE CLUSTERS; LITTLE TO NO REACTION TO DILUTE HCL; GRAIN SUPPORTED TO SILICEOUS CEMENTATION; ASSOCIATED WITH HIGH ELEVATION IN BACKGROUND GAS; VERY FINE GRAINED; SUB ROUND TO ROUND; HIGH SPHERICITY;

CARBONACEOUS SHALE = DARK GRAY TO GRAYISH BLACK; WITH TRACES OF BLACK COAL LAMINATIONS THROUGHOUT; TOUGH TO DENSE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR TO WEDGELIKE AND ELONGATED CUTTINGS HABITS; DULL TO WAXY TO RESINOUS LUSTER SILTY TO GRITTY TO SMOOTH LUSTER; THINLY INTERBEDDED; GRADES TO COAL IN PLACES.

SANDSTONE = LIGHT GRAY TO WHITE WITH BLUE AND BROWN HUES; SOME CLEAR AND TRANSLUCENT GRAINS AND DARK LITHICS THROUGHOUT; MIXTURE OF SMALL TIGHT NON-FRIABLE CLUSTERS TO SMALL LOOSE FRIABLE CLUSTERS; MODERATE REACTION TO DILUTE HCL; BOTH CALCAREOUS AND SILICEOUS CEMENTATION TO GRAIN SUPPORTED LARGE INCREASE IN BACKGROUND GAS ASSOCIATED WITH SANDSTONE.

CARBONACEOUS SHALE = DARK GRAY WITH BLACK COAL LAMINATIONS; TOUGH TO BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO WEDGELIKE CUTTINGS HABIT; SMOOTH TO SILTY TEXTURE; WAXY TO DULL LUSTER.

SILTSTONE = DARK BROWN TO DARK GRAYISH BROWN; LAMINATED WITH PYRITE; TOUGH TO DENSE TENACITY; IRREGULAR FRACTURE; MASSIVE CUTTINGS HABIT; DULL TO SPARKLING LUSTER; SILTY TO GRITTY TEXTURE.

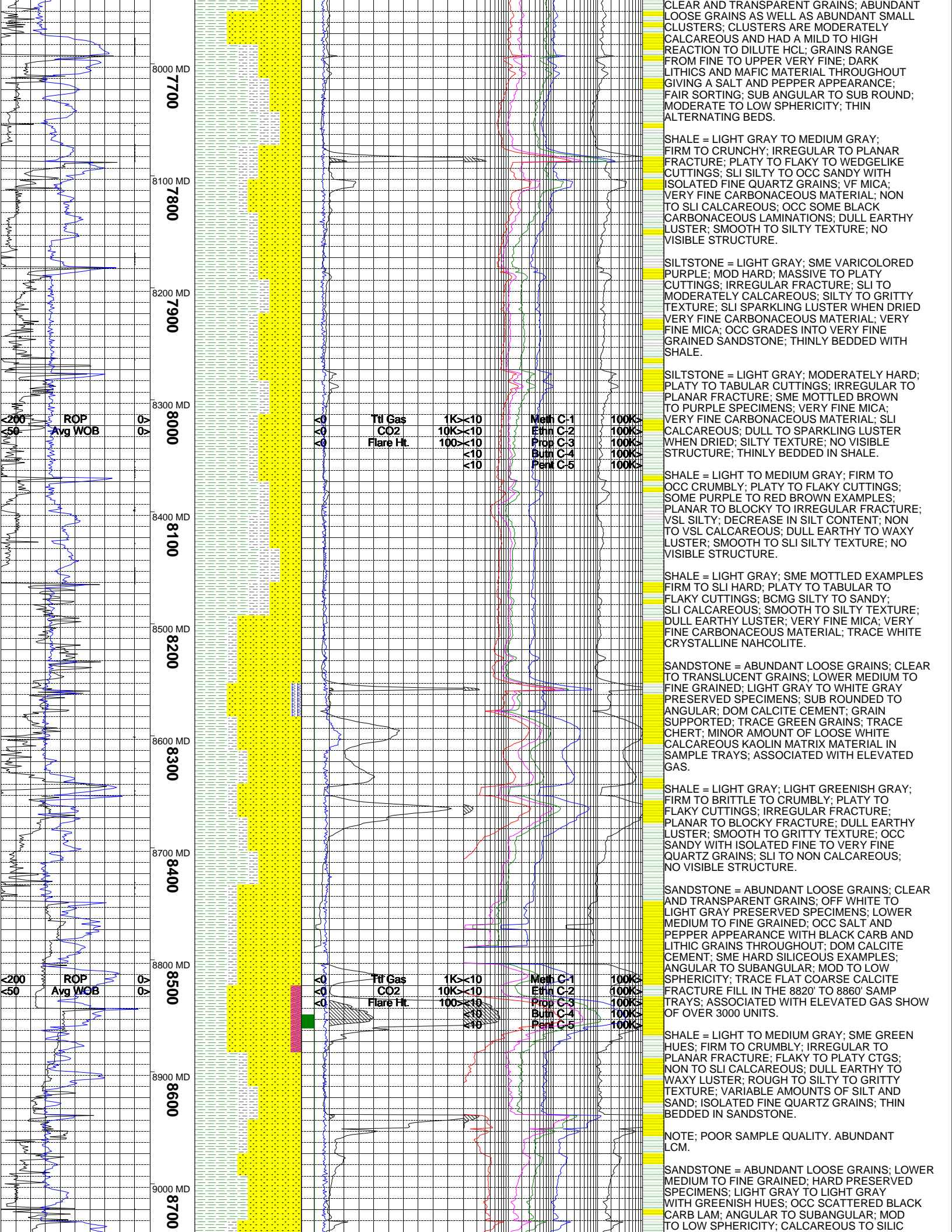
SANDSTONE = LIGHT GRAY TO WHITE WITH A LOT OF DARK LITHICS THROUGHOUT; TRACES OF KAOLINIC SANDSTONE WITHIN SAMPLE TRAY; MIXTURE OF SMALL FRIABLE CLUSTERS AND VERY FINE LOOSE GRAINS; GRAINS IN CLUSTERS RANGE FROM FINE TO VERY FINE GRAINED; SUB ROUND TO SUB ANGULAR; MODERATE TO HIGH SPHERICITY; FAIR SORTING; CALCAREOUS TO SILICEOUS CEMENT; MODERATE REACTION TO DILUTE HCL; TRACES OF LOOSE PYRITE AND PYRITE ATTACHED TO SILTSTONE WITHIN THIS SAMPLE.

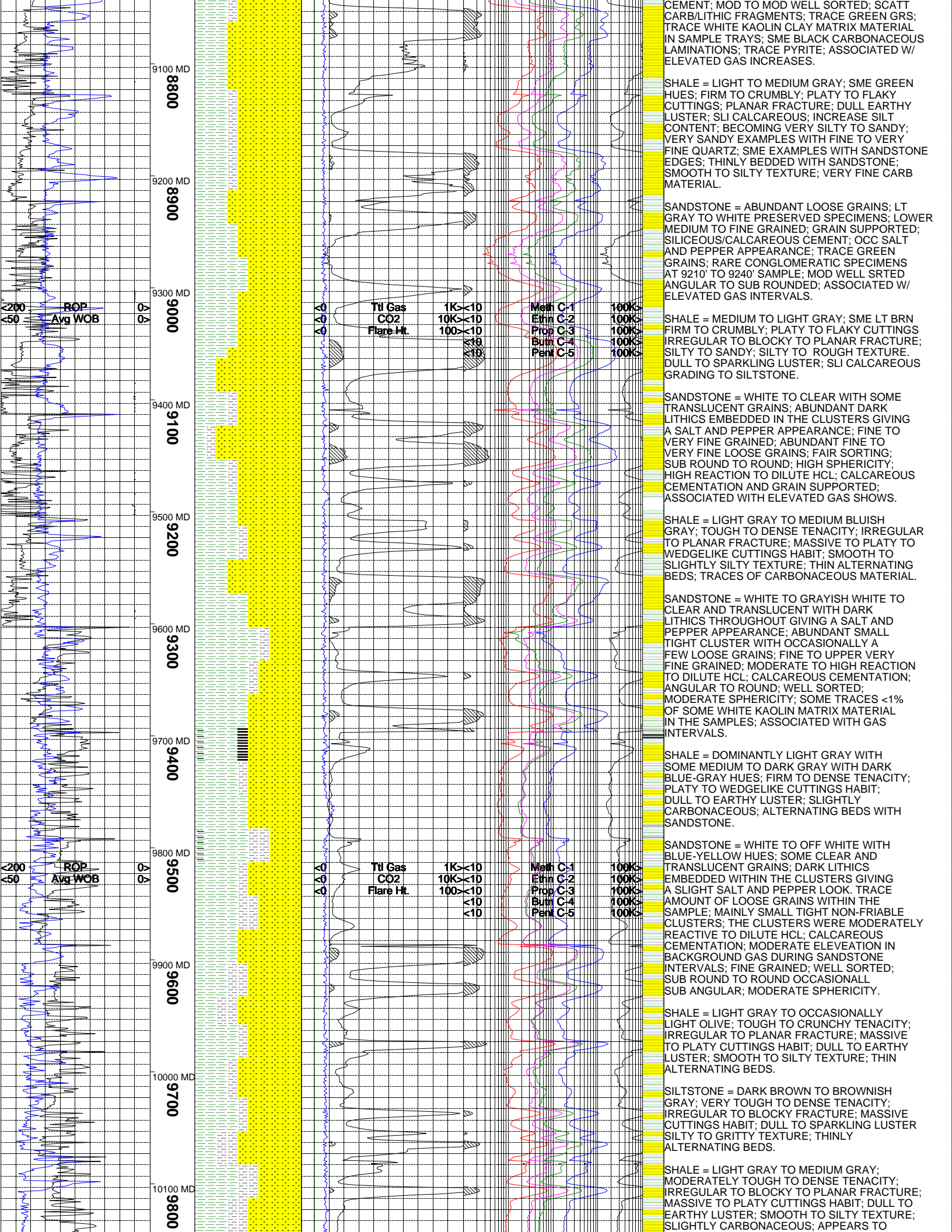
SHALE = LIGHT GRAY TO MEDIUM GRAY; TOUGH TO BRITTLE TENACITY; IRREGULAR TO PLANAR FRACTURE; PLATY TO FLAKY CUTTINGS HABIT; DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE; GRADES INTO SILTSTONE IN PLACES; TRACES OF PYRITE IN SAMPLE TRAY AND EMBEDDED IN SANDSTONE

SILTSTONE = BROWN TO BROWNISH GRAY; MOTTLED AND LAMINATED WITH PYRITE; TOUGH TO DENSE TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR TO MASSIVE CUTTINGS HABIT; DULL TO VERY SPARKLING LUSTER; SILTY TO GRITTY TEXTURE; THINLY BEDDED.

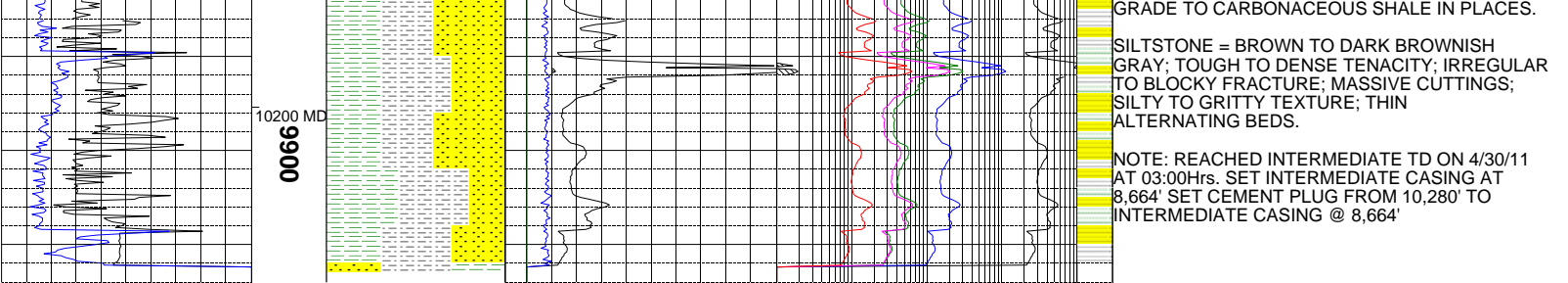
SHALE = LIGHT GRAY TO MEDIUM GRAY WITH BLUE HUES; DENSE TO BRITTLE TENACITY; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; DULL TO EARTHY LUSTER; SILTY TEXTURE; THICKLY BEDDED WITH OCCASIONAL THIN BEDS OF SANDSTONE OR SILTSTONE IN-BETWEEN.

SANDSTONE = LIGHT GRAY TO WHITE WITH









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