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MUDLOG TVD

COMPANY	EXXONMOBIL
WELL	PCU 296-5A07
FIELD	PICEANCE CREEK
REGION	ROCKIES
COORDINATES	LAT: 39.912003 LONG: -108.198668
ELEVATION	G.L.: 7294' R.K.B: 30.2'
COUNTY, STATE	RIO BLANCE, CO
API INDEX	051031124300
SPUD DATE	11/24/2010
CONTRACTOR	HELMERICH_PAYNE
CO. REP.	M. HUDON
RIG/TYPE	HP 321 / FLEX 4S
LOGGING UNIT	ML031
GEOLOGISTS	C. RECORD, B. SMELSER
ADD. PERSONS	M. GROSS
CO. GEOLOGIST	C. ALBA

LOG INTERVAL

DEPTHS: 4681' **TO** 13785'

DATES: 02/17/2011 **TO** 04/02/2011

SCALE: 1" = 100'

CASING DATA

10.75" **AT** 4652'

7.0" **AT** 9878'

4.5" **AT**

AT

MUD TYPES

SPUD MUD **TO** 4681'

LSND **TO** 13785'

TO

TO

HOLE SIZE

14.75" **TO** 4681'

9.875" **TO** 9894'

6.125" **TO** 13785'

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	

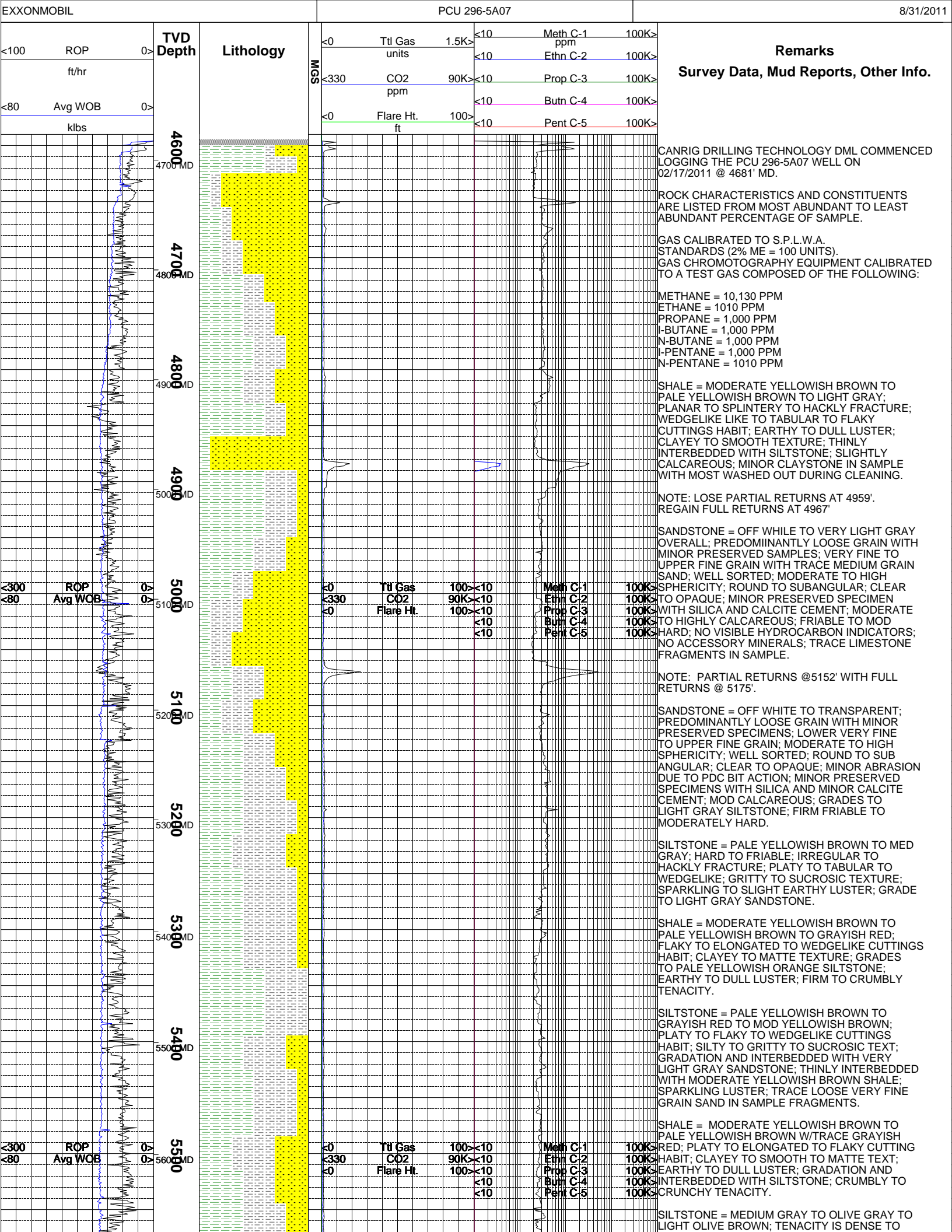
	ALTERED ZONE
	ANDESITE
	ANHYDRITE
	BASALT
	BENTONITE
	BIOTITIZATION
	BRECCIA
	CALCARENITE
	CALCAREOUS TUFF
	CALCILUTITE
	CARBONATES
	CARBONACEOUS MAT
	CARBONACEOUS SH
	CEMENT CONTAM.
	CHALK
	CRYSTALLINE TUFF
	CHERT - ARGILL

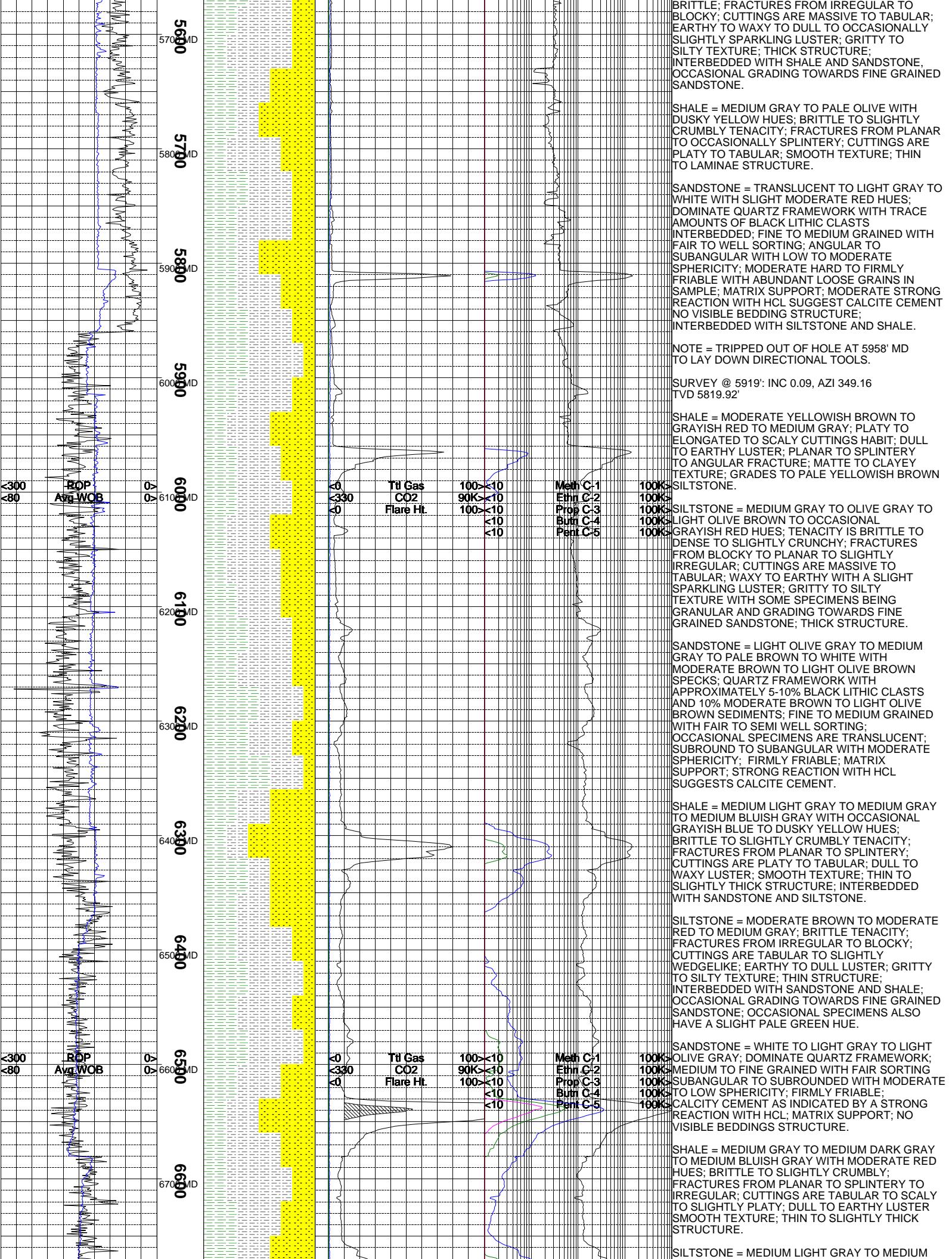
	CHERT - GLASSY
	CHERT - PORCEL
	CHERT - TIGER STRIPE
	CHERT - UNDIFF
	CLAY
	CLAY-MUDSTONE
	CLYST-TUFFACEOUS
	CHLORITIZATION
	COAL
	CONGLOMERATE
	CONGL. SAND
	CONGL. SANDSTONE
	COQUINA
	DACITE
	DIATOMITE
	DIORITE
	DOLOSTONE

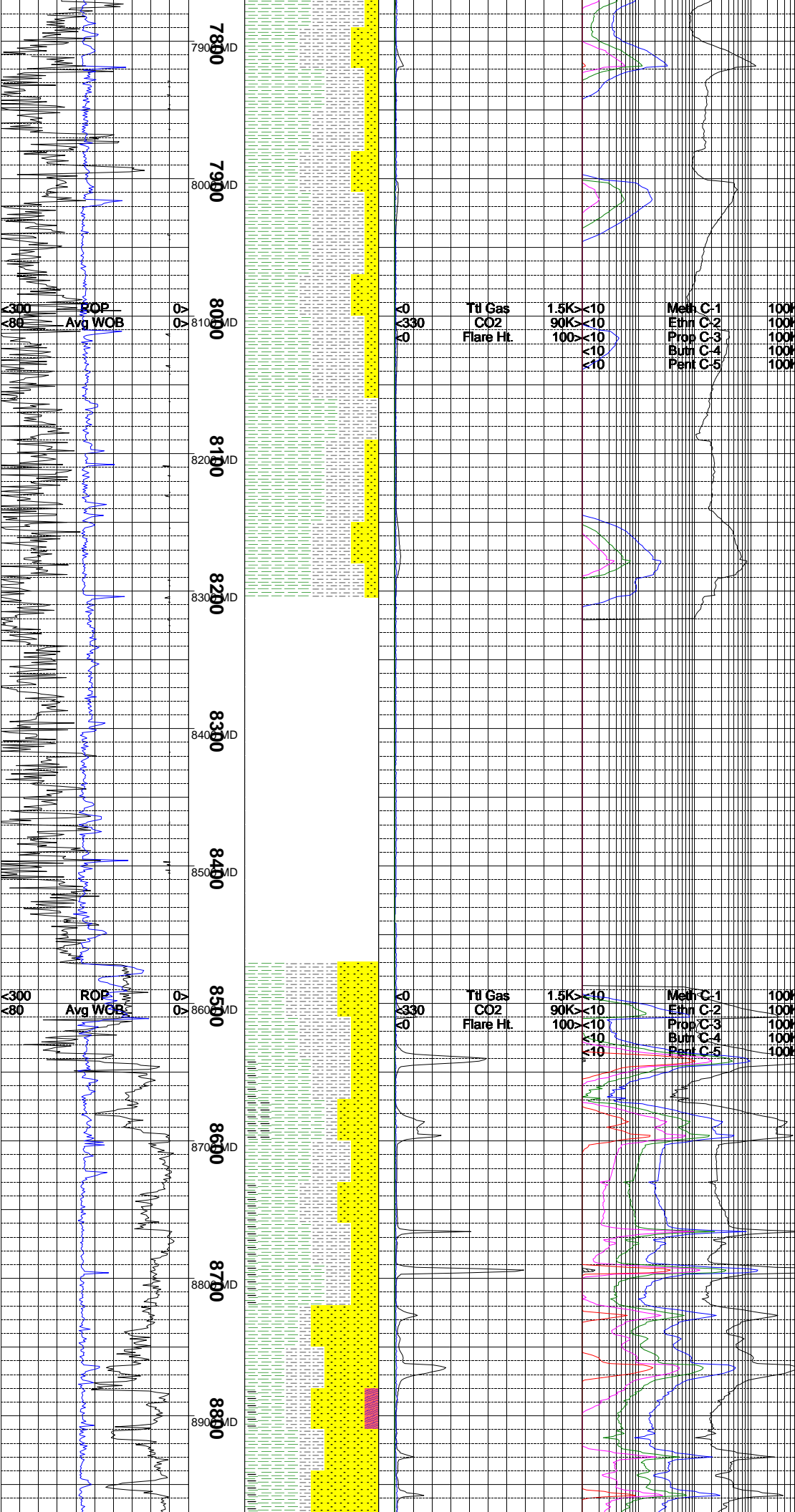
	FELSIC SILIC DIKE
	FOSSIL
	GABBRO
	GLASSY TUFF
	GRANITE
	GRANITE WASH
	GRANODIORITE
	GYPSUM
	HALITE
	HORNBL-QTZ-DIO
	IGNEOUS (ACIDIC)
	IGNEOUS (BASIC)
	INTRUSIVES
	KAOLINITIC
	LIMESTONE
	LITHIC TUFF
	MARL - DOLO

	MARL - CALC
	METAMORPHICS
	MUDSTONE
	OBSIDIAN
	PALEOSOL
	PHOSPHATE
	PORCELANITE
	PORCELANEOUS CLYST
	PYRITE
	PYROCLASTICS
	QUARTZ DIORITE
	QUARTZ LATITE
	QUARTZ MONZONITE
	RECRYSTALLIZED CALCITE
	RHYOLITE
	SALT
	SAND

	SANDSTONE
	SANDSTONE-TUFFACEOUS
	SERICITIZATION
	SERPENTINE
	SHALE
	SHALE TUFFACEOUS
	SHELL FRAGMENTS
	SIDERITE
	SILICIFICATION
	SILTSTONE
	SILTST-TUFFACEOUS
	TUFF
	VOLCANICLASTICS SEDS
	VOLCANICS







SILTSTONE.

SILTSTONE = MEDIUM GRAY TO GRAYISH RED TO LIGHT GRAY; GRADATION AND INTERBEDDED WITH SANDSTONE; IRREGULAR TO HACKLY TO PLANAR FRACTURE; WEDGELIKE TO SCALY CUTTINGS HABIT; GRITTY TO SUCROSIC TEXT; THINLY INTERBEDDED WITH SHALE.

SHALE = LIGHT GRAY TO MEDIUM GRAY TO MINOR OLIVE GRAY; ELONGATED TO PLATY TO WEDGELIKE CUTTINGS HABIT; CLAYEY TO MATTE TEXTURE; SPLINTERY TO PLANAR TO HACKLY FRACTURE; THINLY INTERBEDDED WITH LIGHT GRAY SILTSTONE; TRACE CARBONACEOUS FLECKS IN SAMPLE FRAGMENTS.

SHALE = MEDIUM GRAY TO LIGHT GRAY TO DARK GRAY; PLANAR TO SPLINTERY TO BLOCKY FRACTURE; PLATY TO TABULAR TO ELONGATED CUTTINGS HABIT; DULL TO EARTHY LUSTER; MATTE TO SLIGHTLY SILTY TEXTURE; GRADES TO LIGHT GRAY SILTSTONE.

SILTSTONE = LIGHT GRAY TO MEDIUM GRAY HARD TO CRUNCHY TENACITY; PLATY TO SCALY TO WEDGELIKE CUTTINGS HABIT; SILTY TO GRITTY TO SUCROSIC; SPARKLING LUSTER THINLY INTERBEDDED WITH SHALE AND LIGHT GRAY SANDSTONE.

SHALE = MEDIUM GRAY TO LIGHT GRAY TO GRAYISH RED; CRUNCHY TO CRUMBLY TEN; MATTE TO SILTY TEXTURE; WEDGELIKE TO TABULAR TO ELONGATED CUTTINGS HABIT; EARTHY LUSTER; TRACE FLECKS OF CARBONACEOUS SHALE IN SAMPLE FRAGMENTS.

SHALE = MEDIUM GRAY TO LIGHT GRAY WITH MINOR OLIVE GRAY; PLANAR TO SPLINTERY TO BLOCKY FRACTURE; MATTE TO CLAYEY TEXTURE; NO REACTION TO HCL; PLATY TO SCALY TO WEDGELIKE CUTTINGS HABIT; GRADE TO LIGHT GRAY SILTSTONE.

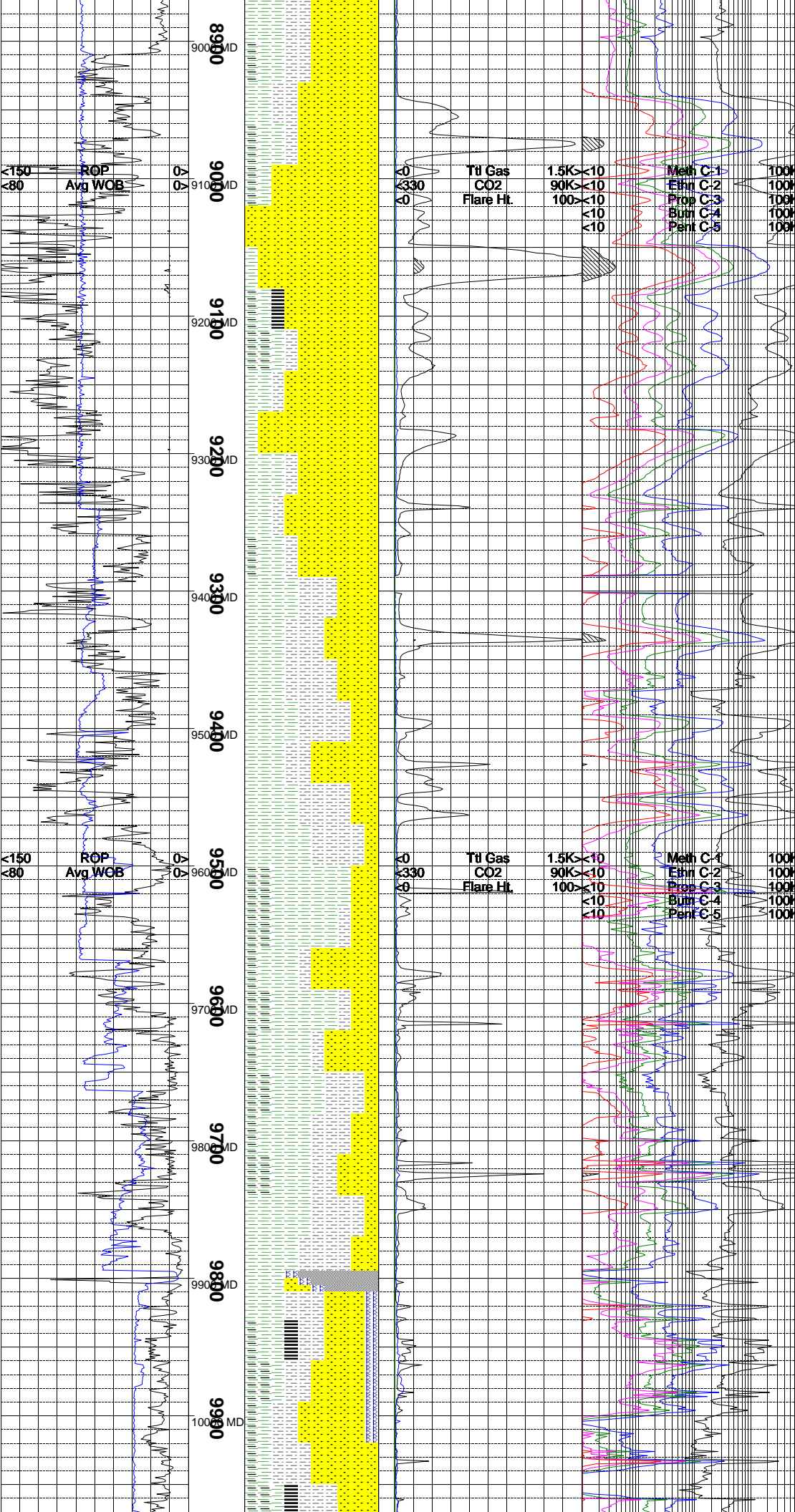
NOTE: LOST RETURNS @ 8527'.

NOTE: REGAIN PARTIAL RETURNS @ 8587' SAMPLE DEPTH.

SHALE = MEDIUM LIGHT GRAY TO MEDIUM BLuish GRAY TO OCCASIONALLY GRAYISH BLUE AND MODERATE RED; BRITTLE TO CRUNCHY TENACITY; FRACTURES FROM PLANAR TO SPLINTERY; CUTTINGS ARE PLATY TO SCALY TO TABULAR; WAXY TO DULL LUSTER SMOOTH TEXTURE; THIN STRUCTURE; INTERBEDDED WITH SILTSTONE AND SANDSTONE TRACE AMOUNTS OF CARBONACEOUS SHALE.

CARBONACEOUS SHALE = GRAYISH BLACK TO BROWNISH BLACK; BRITTLE TO SLIGHTLY DENSE TENACITY; FRACTURES FROM PLANAR TO SPLINTERY TO SEMI BLOCKY; CUTTINGS ARE WEDGELIKE TO PLATY; EARTHY TO RESINOUS LUSTER; SMOOTH TO CLAYEY TEXTURE; THIN STRUCTURE; TRACE AMOUNTS OF PYRITE PRESENT AS AN ACCESSORY MINERAL.

SANDSTONE = WHITE TO LIGHT GRAY; DOMINATE QUARTZ FRAMEWORK WITH SOME SPECIMENS CONTAINING APPROXIMATELY 10% BLACK LITHIC CLASTS GIVING THE SAMPLE A SALT AND PEPPER LOOK; SOME SPECIMENS DISPLAY A LIGHT GREEN HUE; FINE TO COARSE GRAIN SIZE WITH POOR SORTING; ANGULAR TO SUBANGULAR WITH LOW SPHERICITY; MODERATE HARDNESS; GRAIN SUPPORT; LOW REACTION WITH HCL SUGGESTS



SILICEOUS CEMENT.

SILTSTONE = MEDIUM GRAY TO MODERATE BROWN; TENACITY IS DENSE TO BRITTLE TO SLIGHTLY CRUMBLY; IRREGULAR FRACTURING; CUTTINGS ARE TABULAR TO WEDGELIKE; EARTHY TO WAXY TO SPARKLING LUSTER; SILTY TO GRITTY TEXTURE; OCCASIONAL SPECIMENS GRADING TOWARDS FINE GRAINED SANDSTONE; THIN STRUCTURE.

SHALE = MEDIUM GRAY TO MEDIUM BLUISH GRAY TO MODERATE RED TO GREENISH GRAY; BRITTLE TO CRUNCHY TENACITY; PLANAR TO SLIGHTLY SPLINTERED FRACTURING; CUTTINGS ARE PLATY TO SCALY; WAXY LUSTER; SMOOTH TO MATTE TEXTURE.

SANDSTONE = OFF WHITE TO VERY LIGHT GRAY OVERALL; PREDOMINANTLY LOOSE GRAIN WITH TRACE PRESERVED SPECIMENS; VERY FINE TO UPPER FINE GRAIN WITH MINOR MEDIUM GRAIN; TRANSLUCENT TO TRANSPARENT; WELL SORTED; HIGH TO MODERATE SPHERICITY; ROUND TO SUBANGULAR; TRACE ACCESSORY MINERAL OF CHLORITE AND MICRO PYRITE; PRESERVED SPECIMENS SHOW PREDOMINANTLY GRAIN SUPPORTED WITH SILICA AND TRACE KAOLIN CEMENT; HARD TO FIRM FRIABLE; 1-3% CARBONACEOUS SHALE/COAL FLECKS IN SAMPLE FRAGMENTS; HIGH GAS ASSOCIATED WITH EASILY FRIABLE SANDSTONE

NOTE: PARTIAL DROP IN FLOW @ 9205'. REGAINED FULL RETURNS @ 9225'.

SANDSTONE = OFF WHITE TO TRANSPARENT; PREDOMINANTLY LOOSE GRAIN; VERY FINE TO UPPER FINE GRAIN WITH SOME MEDIUM GRAIN; TRANSPARENT TO TRANSLUCENT; ROUND TO SUBANGULAR; WELL SORTED; MODERATE TO HIGH SPHERICITY; SOME FROSTING ON SAMPLE FRAGMENTS; PRESERVED SAMPLES SHOW FRIABLE TO MOD HARD; 1-3% CARBONACEOUS MATERIAL IN SAMPLE FRAGMENTS; TRACE ACCESSORY MINERAL OF CHLORITE MICA; TRACE SPECIMENS OF CRYSTALLINE QUARTZ WITH ONE END TERMINATED IN SAMPLE.

SHALE = MEDIUM GRAY TO LIGHT GRAY TO OLIVE GRAY; PLANAR TO SPLINTERED TO BLOCKY FRACTURE; ELONGATED TO PLATY TO WEDGELIKE CUTTINGS HABIT; MATTE TO CLAY FLECKS IN SAMPLE FRAGMENTS; GRADES TO LIGHT GRAY SILTSTONE; TRACE ACCESSORY MINERAL OF PYRITE.

NOTE: UPHOLE GASES BLEEDING INTO WELL BORE DURING CONNECTION.

SILTSTONE = LIGHT GRAY TO MEDIUM GRAY MOTTLED WITH OLIVE GRAY; HARD TO DENSE TENACITY; PLANAR TO ANGULAR TO IRREGULAR FRACTURE; PLATY TO SCALY TO WEDGELIKE CUTTINGS HABIT; SILTY TO SUCROSIC TEXT; SPARKLING TO EARTHY LUSTER; THINLY INTERBEDDED WITH SANDSTONE AND SHALE.

SHALE = MEDIUM GRAY TO MEDIUM DARK GRAY TO DUSKY YELLOW WITH OCCASIONAL GRAYISH RED PURPLE HUES; CRUNCHY TO BRITTLE TENACITY; FRACTURES FROM SPLINTERED TO PLANAR; CUTTINGS ARE PLATY TO SCALY; WAXY TO DULL LUSTER; SMOOTH TEXTURE; THICK STRUCT; SOME CARBONACEOUS SHALE INTERBEDDED.

NOTE = TRIPPED OUT OF HOLE AT 9762' MD FOR A NEW BIT.

SHALE = MEDIUM GRAY TO MEDIUM DARK GRAY TO GRAYISH PURPLE, OCCASIONAL SPECIMENS DISPLAY A PALE GREEN HUE; DENSE TO BRITTLE TENACITY; IRREGULAR TO PLANAR TO SPLINTERED FRACTURING; CUTTINGS ARE PLANAR TO PLATY TO TABULAR; WAXY TO DULL LUSTER; SMOOTH TO SILTY TEXTURE; THICK STRUCTURE.

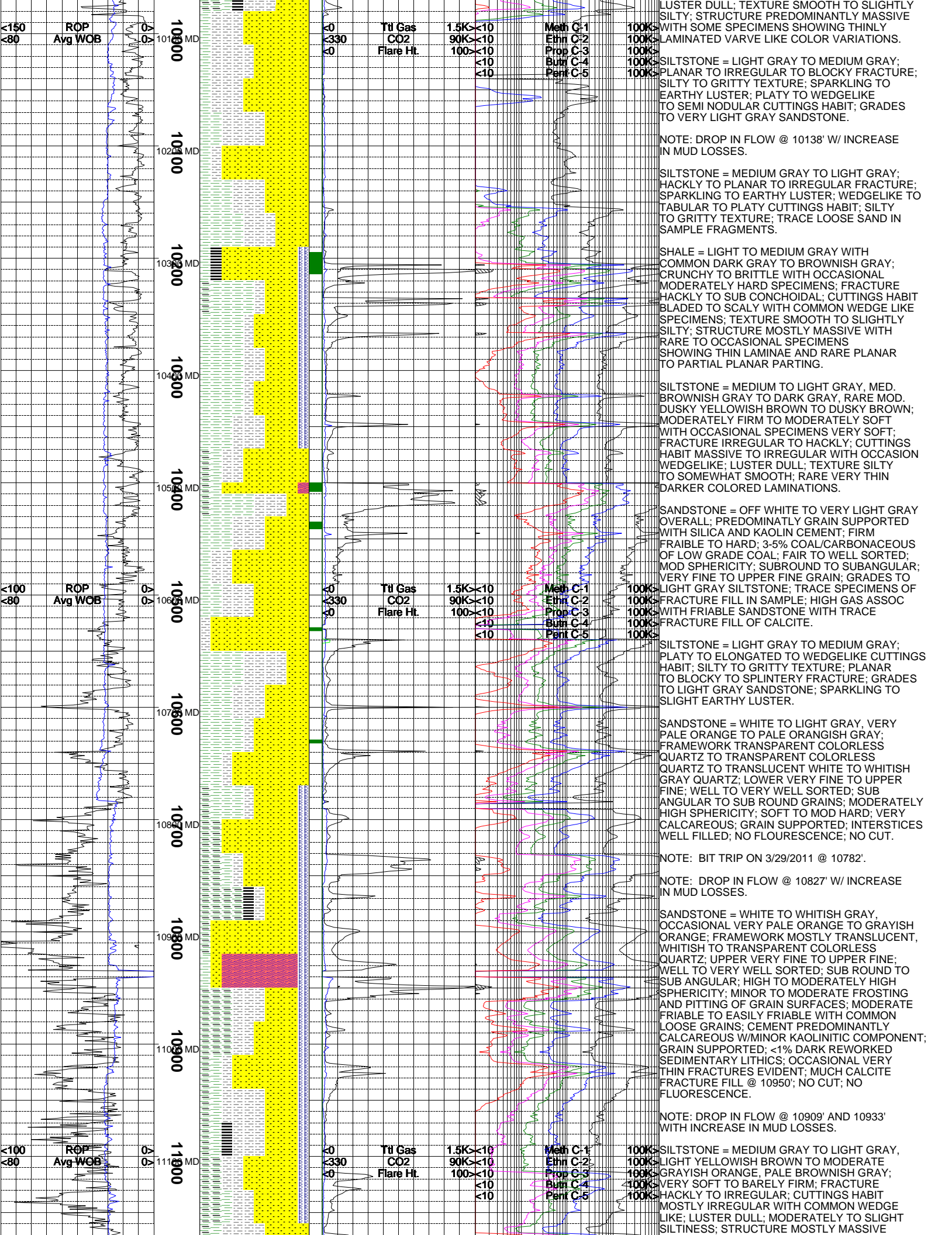
SHALE = MEDIUM GRAY TO LIGHT GRAY TO DARK GRAY; PLATY TO WEDGELIKE TO SEMI ELONGATED CUTTINGS HABIT; MATTE TO SEMI CLAYEY TEXTURE; GRADES TO LIGHT GRAY SILTSTONE; SPLINTERED TO PLANAR TO HACKLY FRACTURE; DULL EARTHY LUSTER.

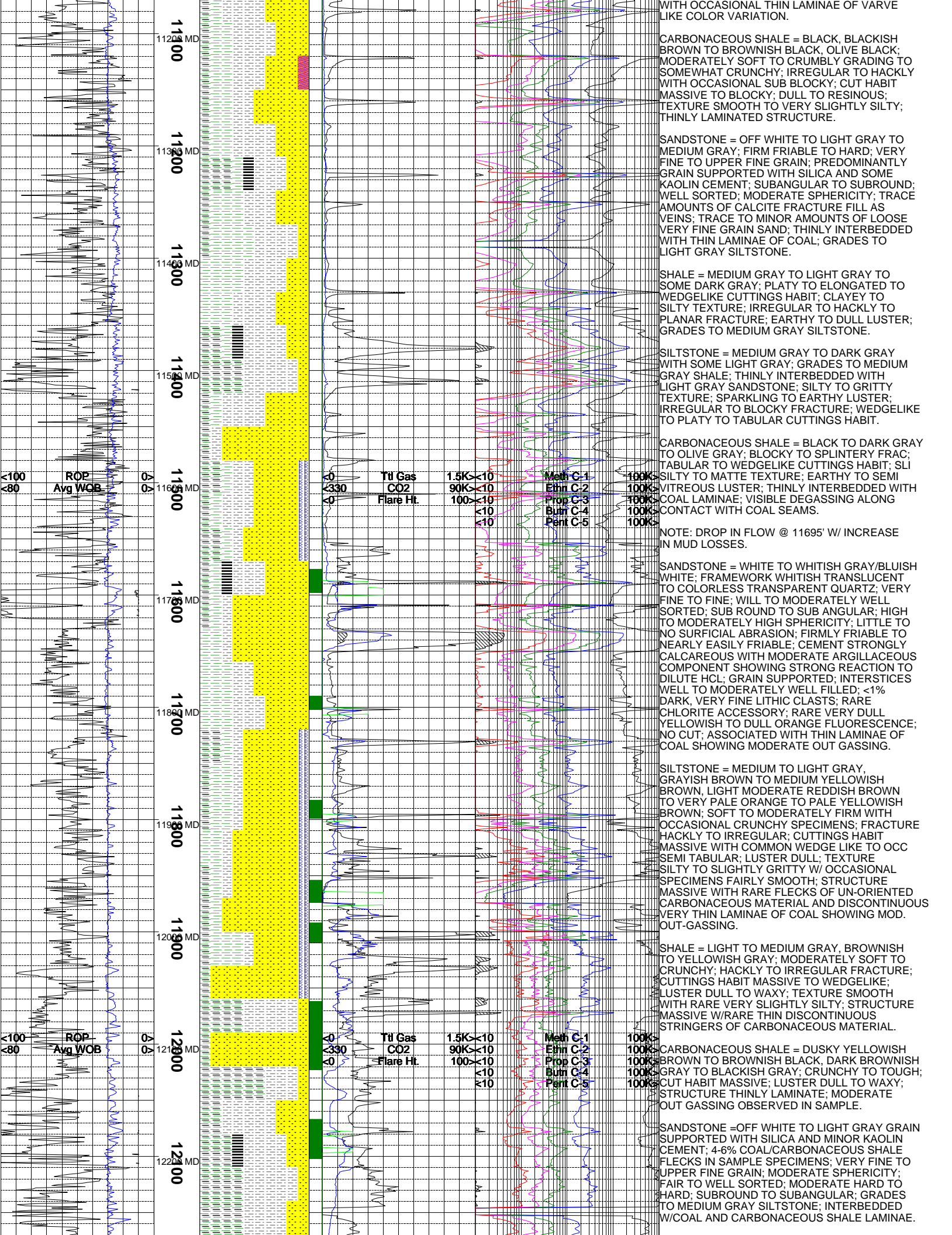
NOTE: TD INTERMEDIATE SECTION @ 9894' MD (9795' TVD) ON 02/26/2011.

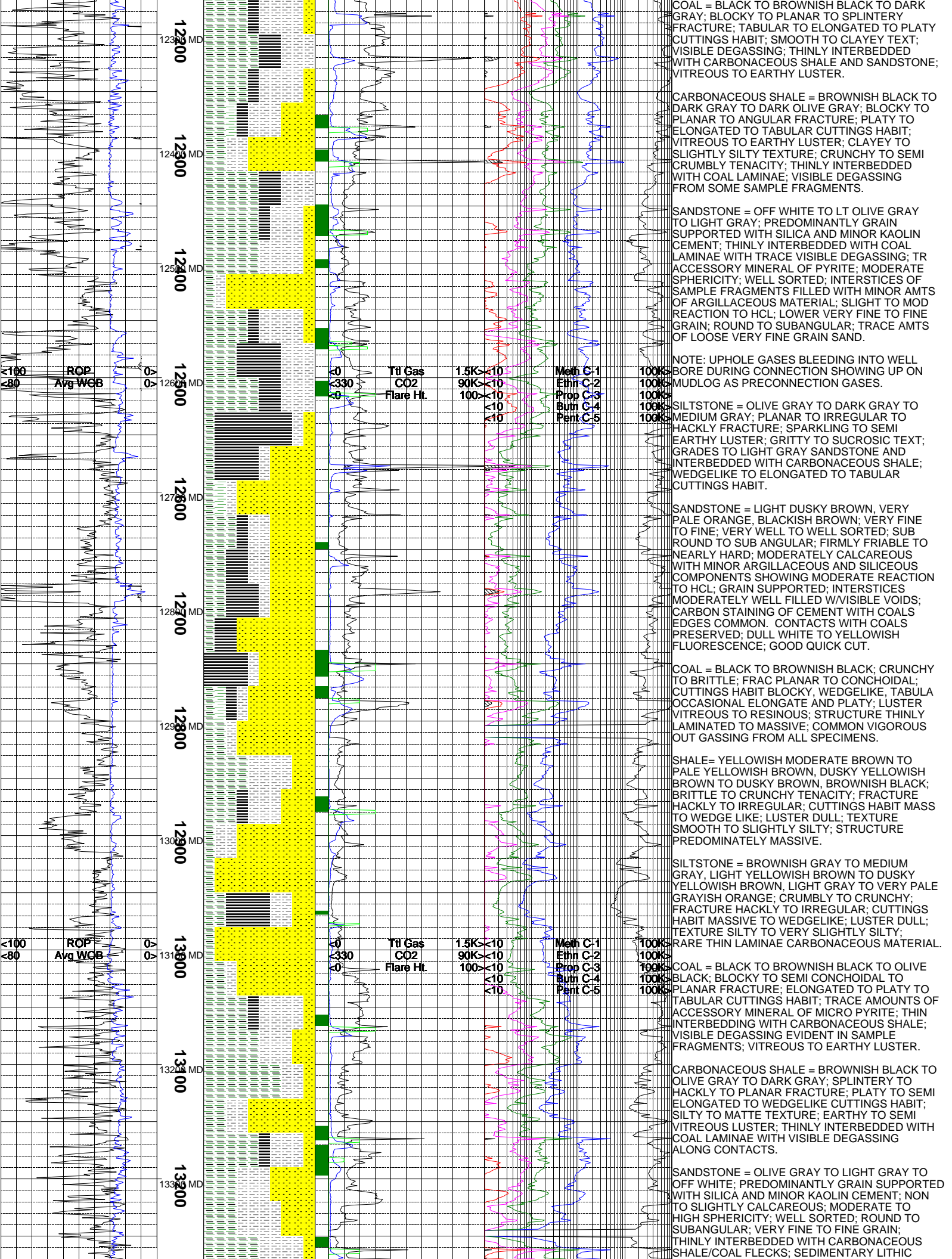
NOTE: RETURN TO DRILLING - PRODUCTION SECTION - ON 03/27/2011.

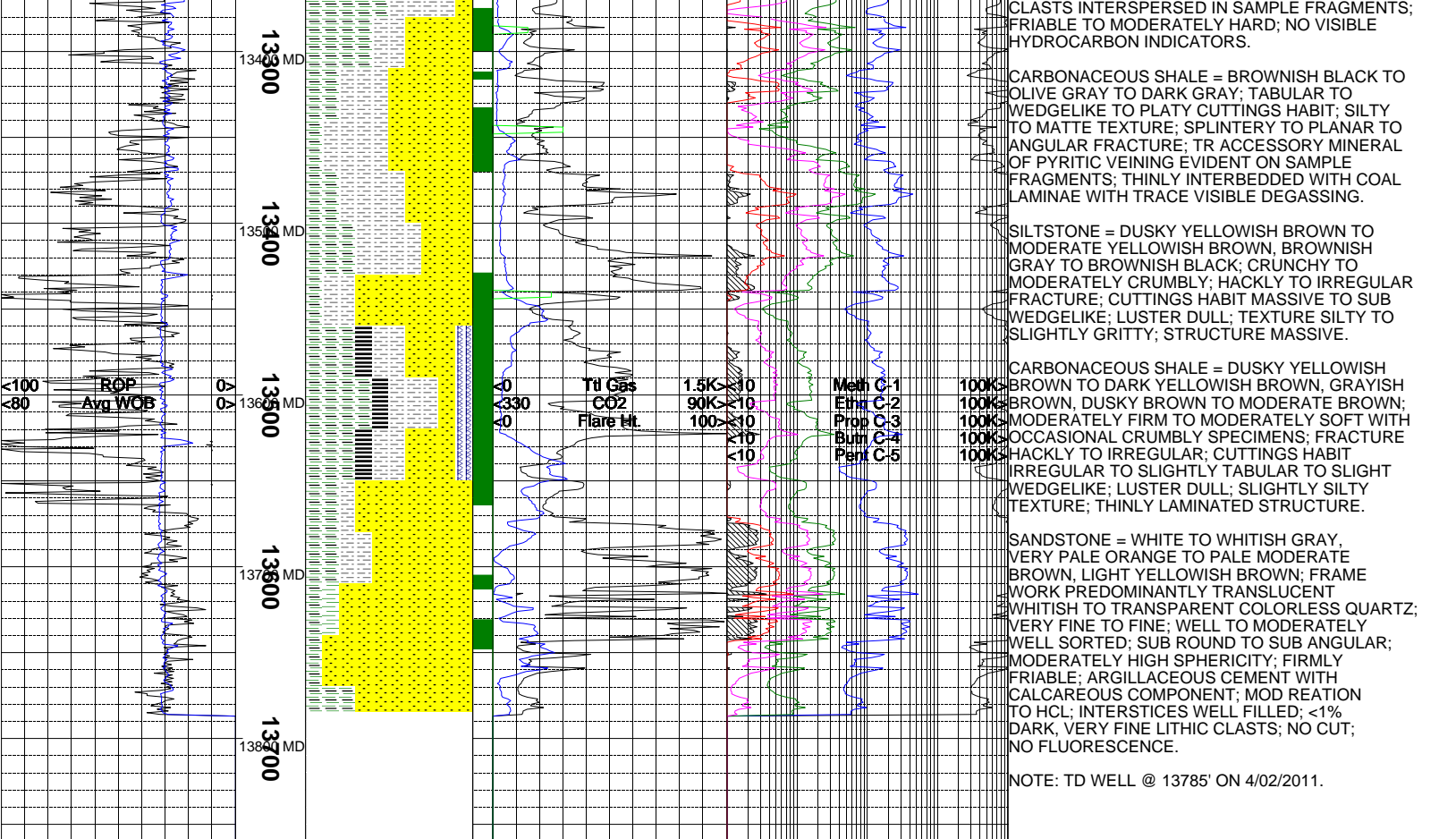
NOTE: DROP IN FLOW @ 9945' AND 9980' W/ MILD MUD LOSSES.

SHALE = MEDIUM GRAY TO LIGHT GRAY, DARK GRAY TO BROWNISH GRAY, THIN LAMINAE OF MODERATE REDDISH BROWN; BRITTLE TO CRUNCHY; BLOCKISH TO HACKLY FRACTURE; CUTTINGS HABIT SEMI TABULAR TO MASSIVE;









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