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MUDLOG TVD

COMPANY ExxonMobil Production

WELL FRU197-33B3

FIELD Piceance Creek

REGION Rockies

COORDINATES 39.921374000
05108282504000

ELEVATION G.L.:6549.8'
RKB: 30.2'

COUNTY, STATE Rio Blanco, CO

API INDEX 051031143300

SPUD DATE 05/24/2010

CONTRACTOR HE

CO. REP. Chad Jarvis

RIG/TYPE HP321

LOGGING UNIT MLU#31

GEOLOGISTS Barbara Delaney
Chad Record

ADD. PERSONS Mike Franco
Mark Gross

CO. GEOLOGIST Chris Alba

LOG INTERVAL

CASING DATA

DEPTHS: 4550' TO 12720'

DATES: 05/25/2010 TO 06/03/2010

SCALE: 1" = 100'

16" AT 150'

10.75" AT 4537'

4.5" AT 12701'

AT

MUD TYPES

HOLE SIZE

WATER-BASED TO 4550'

LSND TO 12720'

TO

TO

14.75" TO 4550'

9.5" TO 9855'

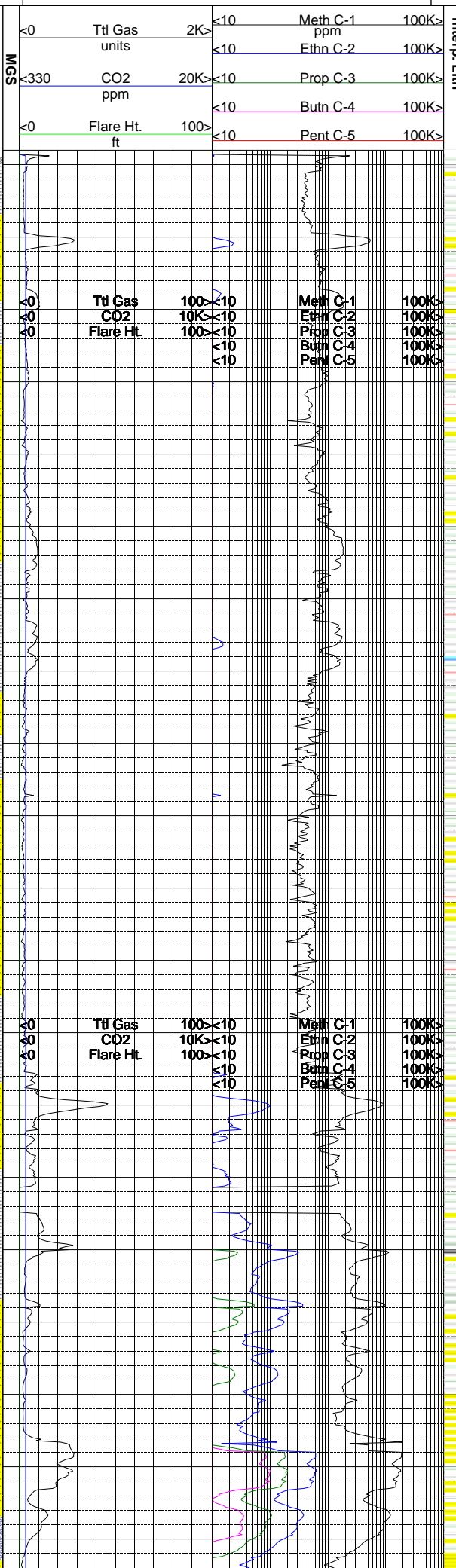
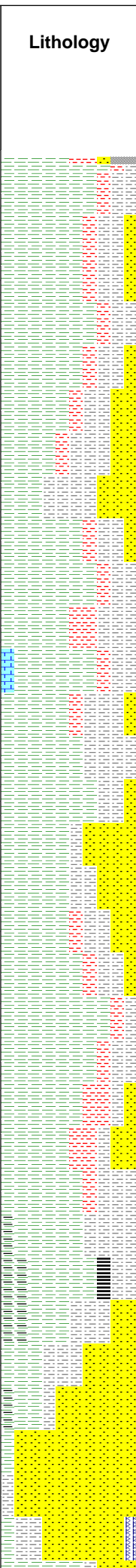
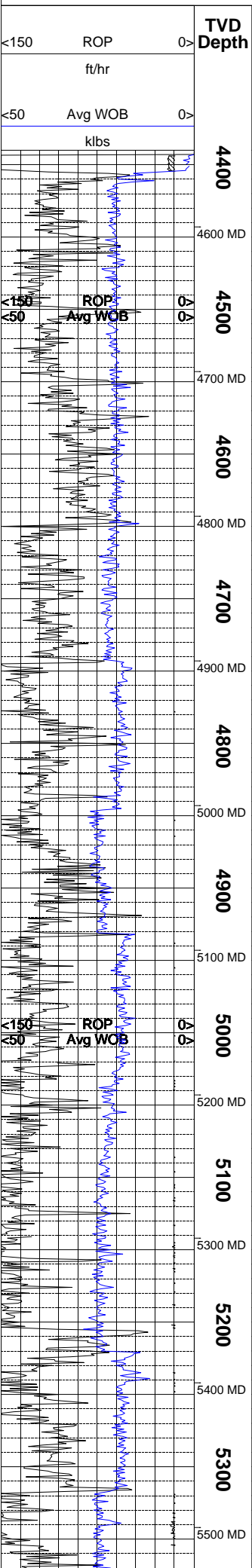
7.875" TO 12720'

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	KAOLINIC	RECRYSTALLIZED CALCITE	VOLCANICS
CHALK	DIATOMITE	LIMESTONE	RHYOLITE	
CRYSTALLINE TUFF	DIORITE	LITHIC TUFF	SALT	
CHERT - ARGILL	DOLOSTONE	MARL - DOLO	SAND	



Interp. Lith

Remarks
Survey Data, Mud Reports, Other Info.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM GRAY; PLATY TO SCALY TO TABULAR CUTTINGS HABIT; CLAYEY TO MATTE TEXTURE; EARTHY TO WAXY LUSTER; GRADES TO LIGHT GRAY SILTSTONE; NO VISIBLE STRUCTURE.

SHALE = LIGHT YELLOWISH BROWN TO MOD YELLOWISH BROWN WITH PALE BROWNISH GRAY; IRREGULAR TO PLANAR TO HACKLY FRACTURE; PLATY TO FLAKY TO WEDGELIKE CUTTINGS HABIT; MATTE TO CLAYEY TEXTURE; EARTHY LUSTER.

SILTSTONE = VERY LIGHT GRAY TO LIGHT BLUISH GRAY TO LIGHT GREENISH GRAY; CRUMBLY TO BRITTLE TENACITY; PREDOMINATE HACKLY TO IRREGULAR FRACTURING; PLATY TO FLAKY TO OCCASIONALLY NODULAR CUTTING HABIT; DULL EARTHY TO SEMI FROSTED TO SLIGHT GREASY LUSTER; GRITTY TO SILTY LUSTER; VISIBLE NACHOLITE CRYSTALS IN THE SAMPLE.

SANDSTONE = LIGHT BROWNISH GRAY TO LIGHT GRAY TO SLIGHT YELLOWISH GRAY; MOSTLY QUARTZ FRAMEWORK WITH 5-6% DARK LITHICS VISIBLE IN SAMPLE; VERY COARSE TO SLIGHT GRANULAR TO SEMI MEDIUM GRAIN SIZE; FAIR TO POOR SORTED; ANGULAR TO SUBANGULAR GRAINS; MODERATE TO LOW SPHERICITY; GRAINS HAVE A SLIGHT PITTED APPEARANCE; FIRM FRIABLE TO FRIABLE; CALCITE CEMENTATION DUE TO HIGH REACTION IN DILUTE HCl; GRAIN SUPPORTED; 1-3% NACHOLITE CRYSTALS VISIBLE IN SAMPLE; 1% CALCITE FRACTURES VISIBLE; 5-6% VISIBLE PALESOLS VISIBLE IN SAMPLE.

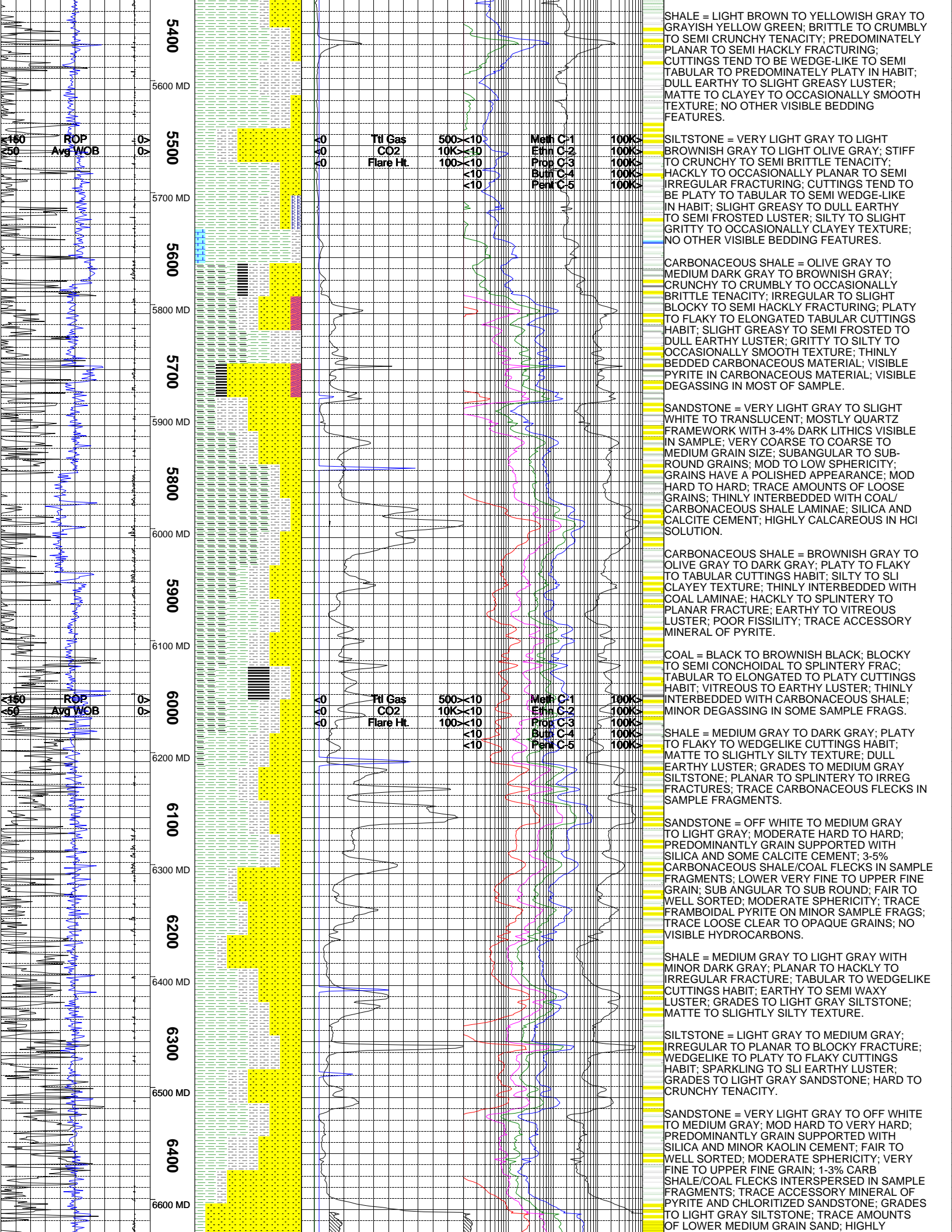
SHALE = VERY LIGHT GRAY TO PALE BLUE TO YELLOWISH GRAY; SAMPLE HAS A MOTTLED APPEARANCE; BRITTLE TO CRUMBLY TENACITY; PLANAR TO SLIGHT BLOCKY TO SEMI SPLINTER-Y FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO SEMI BLADED IN HABIT; SLIGHT GREASY TO SEMI DULL EARTHY LUSTER; SEMI SILTY TO PREDOMINATELY CLAYEY TO SMOOTH TEXTURE; 7-8% PALESOLS STILL VISIBLE IN SAMPLE.

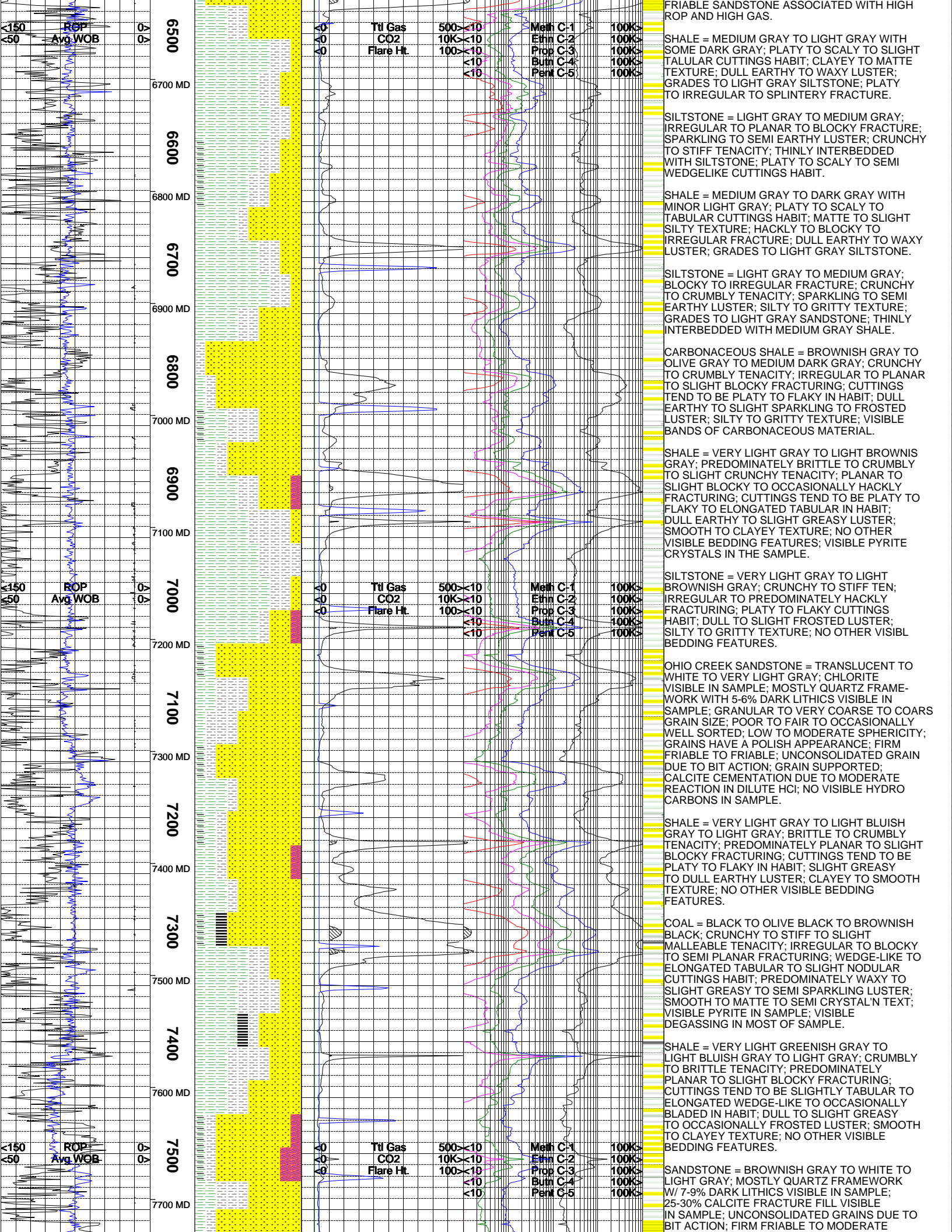
PALESOL = LIGHT BROWNISH GRAY TO MODERATE REDDISH BROWN TO PALE REDDISH BROWN; CRUNCHY TO CRUMBLY TO SEMI BRITTLE TENACITY; PLANAR TO HACKLY TO OCCASIONALLY SPLINTER Y FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO PREDOMINATELY NODULAR IN HABIT; SEMI DULL TO SPARKLING TO SEMI FROSTED LUSTER; GRANULAR TO GRITTY TO OCCASIONALLY SILTY IN TEXTURE; VISIBLE NACHOLITE IN SAMPLE.

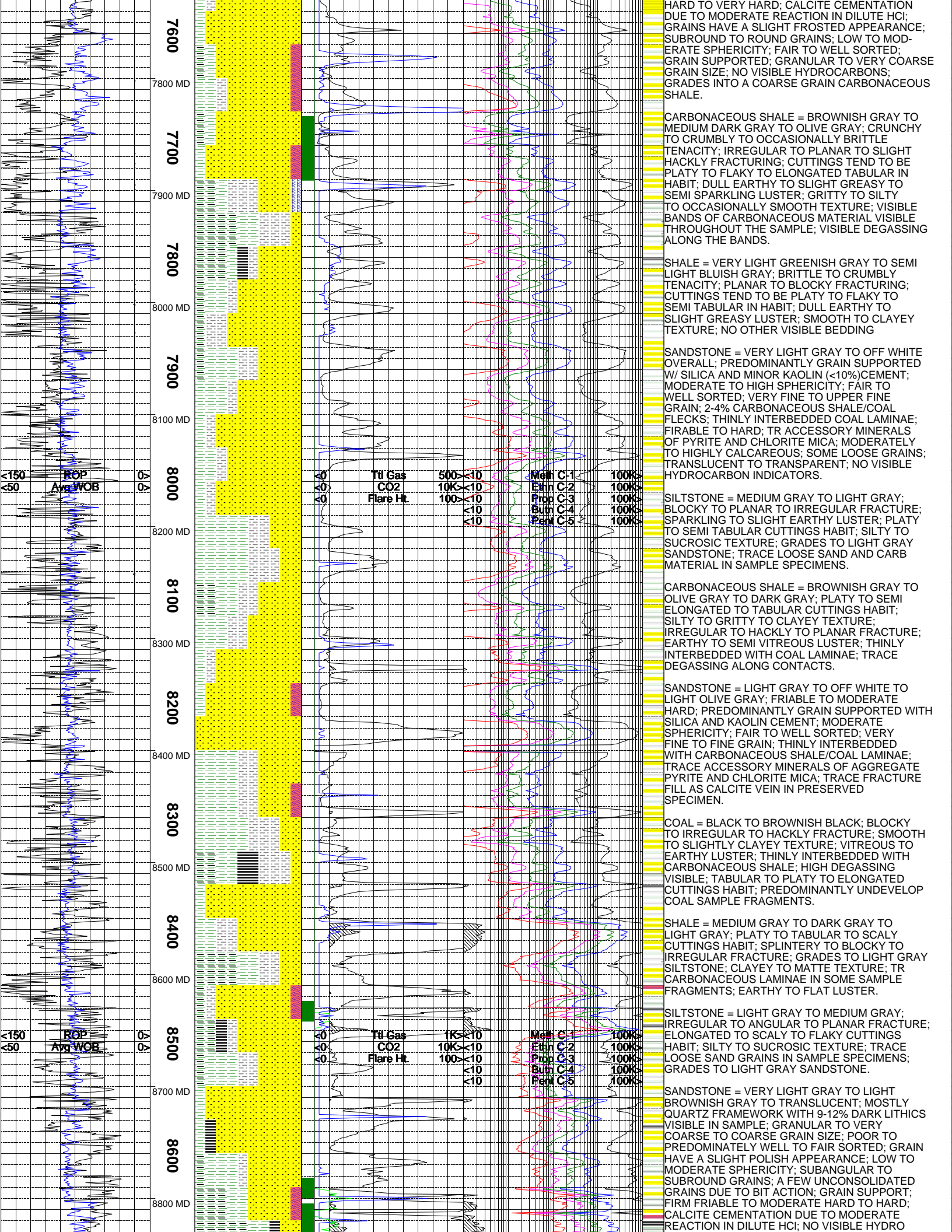
SILTSTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO SEMI YELLOWISH GRAY; CRUMBLY TO CRUNCHY TO OCCASIONALLY STIFF TENACITY; PREDOMINATELY HACKLY TO SEMI PLANAR TO OCCASIONALLY SPLINTER Y FRACTURING; CUTTINGS TEND TO BE PLATY TO WEDGELIKE TO ELONGATED TABULAR IN HABIT; FROSTED TO SLIGHT SPARKLING TO SEMI DULL LUSTER; SILTY TO OCCASIONALLY CLAYEY TO GRITTY TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

COAL = MEDIUM DARK GRAY TO DARK GRAY TO GREENISH BLACK; MOSTLY BITUMINOUS COAL; STIFF TO CRUNCHY TENACITY; IRREGULAR TO CONCHOIDAL TO OCCASIONALLY SPLINTER Y FRACTURING; CUTTINGS TEND TO BE BLADED TO SEMI WEDGE-LIKE TO OCCASIONALLY NODULAR IN HABIT; DULL EARTHY TO SEMI SPARKLING TO GREASY TO PREDOMINATELY WAXY LUSTER; SMOOTH TO OCCASIONALLY GRITTY TO MATTE TEXTURE; VISIBLE DEGASSING IN MOST OF SAMPLE.

WASATCH G SANDSTONE = TRANSLUCENT TO WHITE TO VERY LIGHT GRAY; MOSTLY QUARTZ FRAMEWORK WITH 1-3% DARK LITHICS VISIBLE; GRANULAR TO VERY COARSE TO COARSE GRAIN SIZE; FAIR TO WELL SORTED; SUB-ANGULAR TO SUB ROUND GRAINS; GRAIN SUPPORTED; UNCONSOLIDATED GRAINS DUE TO BIT ACTION; FIRM FRIABLE TO FRIABLE; CALCITE CEMENTATION DUE TO MODERATE TO HIGH REACTION IN DILUTE HCl; NO VISIBLE HYDROCARBONS IN SAMPLE; GRAINS HAVE A SLIGHT POLISH APPEARANCE; NO VISIBLE ACCESSORY MINERALS IN THE SAMPLE.







HARD TO VERY HARD; CALCITE CEMENTATION DUE TO MODERATE REACTION IN DILUTE HCl; GRAINS HAVE A SLIGHT FROSTED APPEARANCE; SUBROUND TO ROUND GRAINS; LOW TO MODERATE SPHERICITY; FAIR TO WELL SORTED; GRAIN SUPPORTED; GRANULAR TO VERY COARSE GRAIN SIZE; NO VISIBLE HYDROCARBONS; GRADES INTO A COARSE GRAIN CARBONACEOUS SHALE.

CARBONACEOUS SHALE = BROWNISH GRAY TO MEDIUM DARK GRAY TO OLIVE GRAY; CRUNCHY TO CRUMBLY TO OCCASIONALLY BRITTLE TENACITY; IRREGULAR TO PLANAR TO SLIGHT HACKLY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO ELONGATED TABULAR IN HABIT; DULL EARTHY TO SLIGHT GREASY TO SEMI SPARKLING LUSTER; GRITTY TO SILTY TO OCCASIONALLY SMOOTH TEXTURE; VISIBLE BANDS OF CARBONACEOUS MATERIAL VISIBLE THROUGHOUT THE SAMPLE; VISIBLE DEGASSING ALONG THE BANDS.

SHALE = VERY LIGHT GREENISH GRAY TO SEMI LIGHT BLUISH GRAY; BRITTLE TO CRUMBLY TENACITY; PLANAR TO BLOCKY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO SEMI TABULAR IN HABIT; DULL EARTHY TO SLIGHT GREASY LUSTER; SMOOTH TO CLAYEY TEXTURE; NO OTHER VISIBLE BEDDING

SANDSTONE = VERY LIGHT GRAY TO OFF WHITE OVERALL; PREDOMINANTLY GRAIN SUPPORTED W/ SILICA AND MINOR KAOLIN (<10%) CEMENT; MODERATE TO HIGH SPHERICITY; FAIR TO WELL SORTED; VERY FINE TO UPPER FINE GRAIN; 2-4% CARBONACEOUS SHALE/COAL FLECKS; THINLY INTERBEDDED COAL LAMINAE; FIRABLE TO HARD; TR ACCESSORY MINERALS OF PYRITE AND CHLORITE MICA; MODERATELY TO HIGHLY CALCAREOUS; SOME LOOSE GRAINS; TRANSLUCENT TO TRANSPARENT; NO VISIBLE HYDROCARBON INDICATORS.

SILTSTONE = MEDIUM GRAY TO LIGHT GRAY; BLOCKY TO PLANAR TO IRREGULAR FRACTURE; SPARKLING TO SLIGHT EARTHY LUSTER; PLATY TO SEMI TABULAR CUTTINGS HABIT; SILTY TO SUCROSIC TEXTURE; GRADES TO LIGHT GRAY SANDSTONE; TRACE LOOSE SAND AND CARB MATERIAL IN SAMPLE SPECIMENS.

CARBONACEOUS SHALE = BROWNISH GRAY TO OLIVE GRAY TO DARK GRAY; PLATY TO SEMI ELONGATED TO TABULAR CUTTINGS HABIT; SILTY TO GRITTY TO CLAYEY TEXTURE; IRREGULAR TO HACKLY TO PLANAR FRACTURE; EARTHY TO SEMI VITREOUS LUSTER; THINLY INTERBEDDED WITH COAL LAMINAE; TRACE DEGASSING ALONG CONTACTS.

SANDSTONE = LIGHT GRAY TO OFF WHITE TO LIGHT OLIVE GRAY; FRIABLE TO MODERATE HARD; PREDOMINANTLY GRAIN SUPPORTED WITH SILICA AND KAOLIN CEMENT; MODERATE SPHERICITY; FAIR TO WELL SORTED; VERY FINE TO FINE GRAIN; THINLY INTERBEDDED WITH CARBONACEOUS SHALE/COAL LAMINAE; TRACE ACCESSORY MINERALS OF AGGREGATE PYRITE AND CHLORITE MICA; TRACE FRACTURE FILL AS CALCITE VEIN IN PRESERVED SPECIMEN.

COAL = BLACK TO BROWNISH BLACK; BLOCKY TO IRREGULAR TO HACKLY FRACTURE; SMOOTH TO SLIGHTLY CLAYEY TEXTURE; VITREOUS TO EARTHY LUSTER; THINLY INTERBEDDED WITH CARBONACEOUS SHALE; HIGH DEGASSING VISIBLE; TABULAR TO PLATY TO ELONGATED CUTTINGS HABIT; PREDOMINANTLY UNDEVELOP COAL SAMPLE FRAGMENTS.

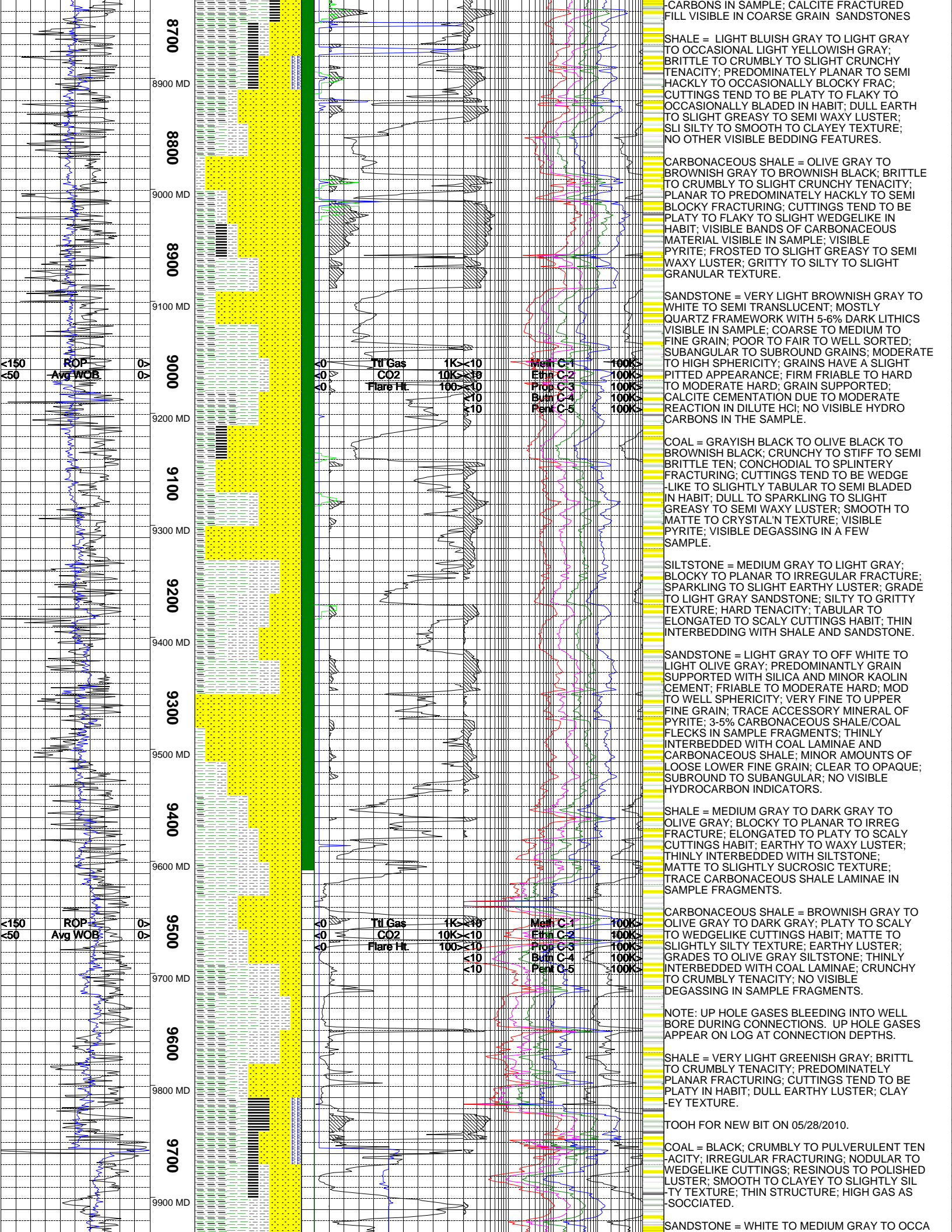
SHALE = MEDIUM GRAY TO DARK GRAY TO LIGHT GRAY; PLATY TO TABULAR TO SCALY CUTTINGS HABIT; SPLINTERY TO BLOCKY TO IRREGULAR FRACTURE; GRADES TO LIGHT GRAY SILTSTONE; CLAYEY TO MATTE TEXTURE; TR CARBONACEOUS LAMINAE IN SOME SAMPLE FRAGMENTS; EARTHY TO FLAT LUSTER.

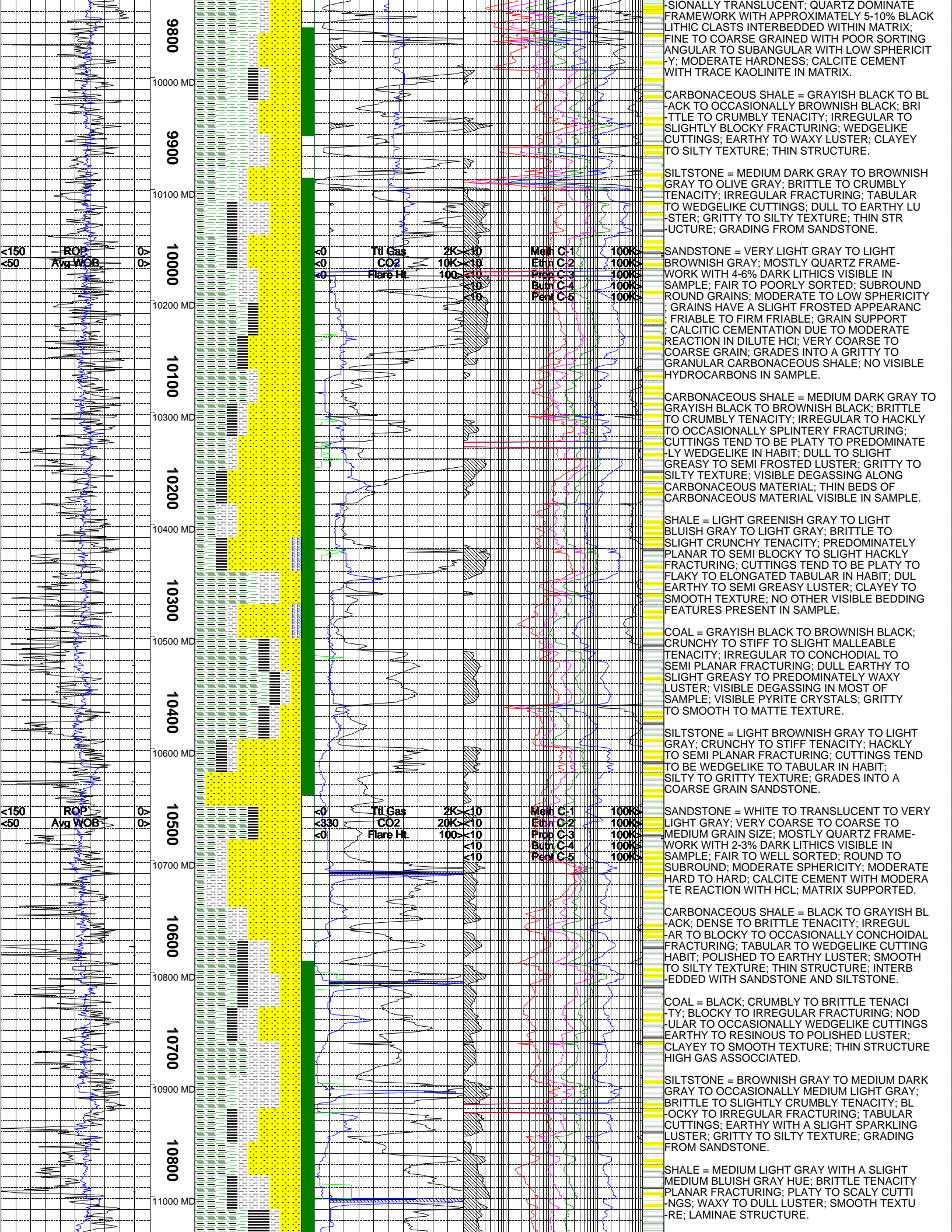
SILTSTONE = LIGHT GRAY TO MEDIUM GRAY; IRREGULAR TO ANGULAR TO PLANAR FRACTURE; ELONGATED TO SCALY TO FLAKY CUTTINGS HABIT; SILTY TO SUCROSIC TEXTURE; TRACE LOOSE SAND GRAINS IN SAMPLE SPECIMENS; GRADES TO LIGHT GRAY SANDSTONE.

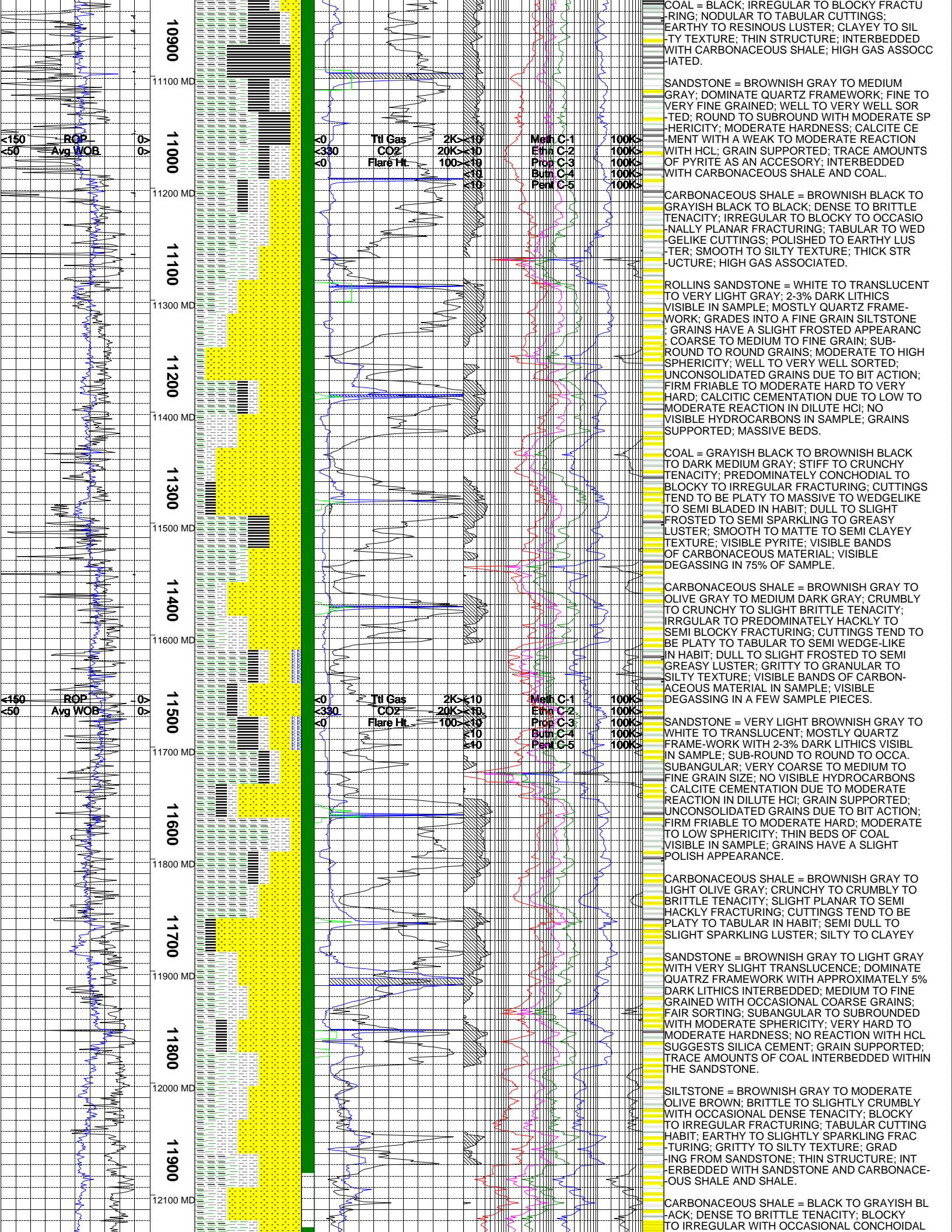
SANDSTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO TRANSLUCENT; MOSTLY QUARTZ FRAMEWORK WITH 9-12% DARK LITHICS VISIBLE IN SAMPLE; GRANULAR TO VERY COARSE TO COARSE GRAIN SIZE; POOR TO PREDOMINATELY WELL TO FAIR SORTED; GRAIN HAVE A SLIGHT POLISH APPEARANCE; LOW TO MODERATE SPHERICITY; SUBANGULAR TO SUBROUND GRAINS; A FEW UNCONSOLIDATED GRAINS DUE TO BIT ACTION; GRAIN SUPPORT; FIRM FRIABLE TO MODERATE HARD TO HARD; CALCITE CEMENTATION DUE TO MODERATE REACTION IN DILUTE HCl; NO VISIBLE HYDRO

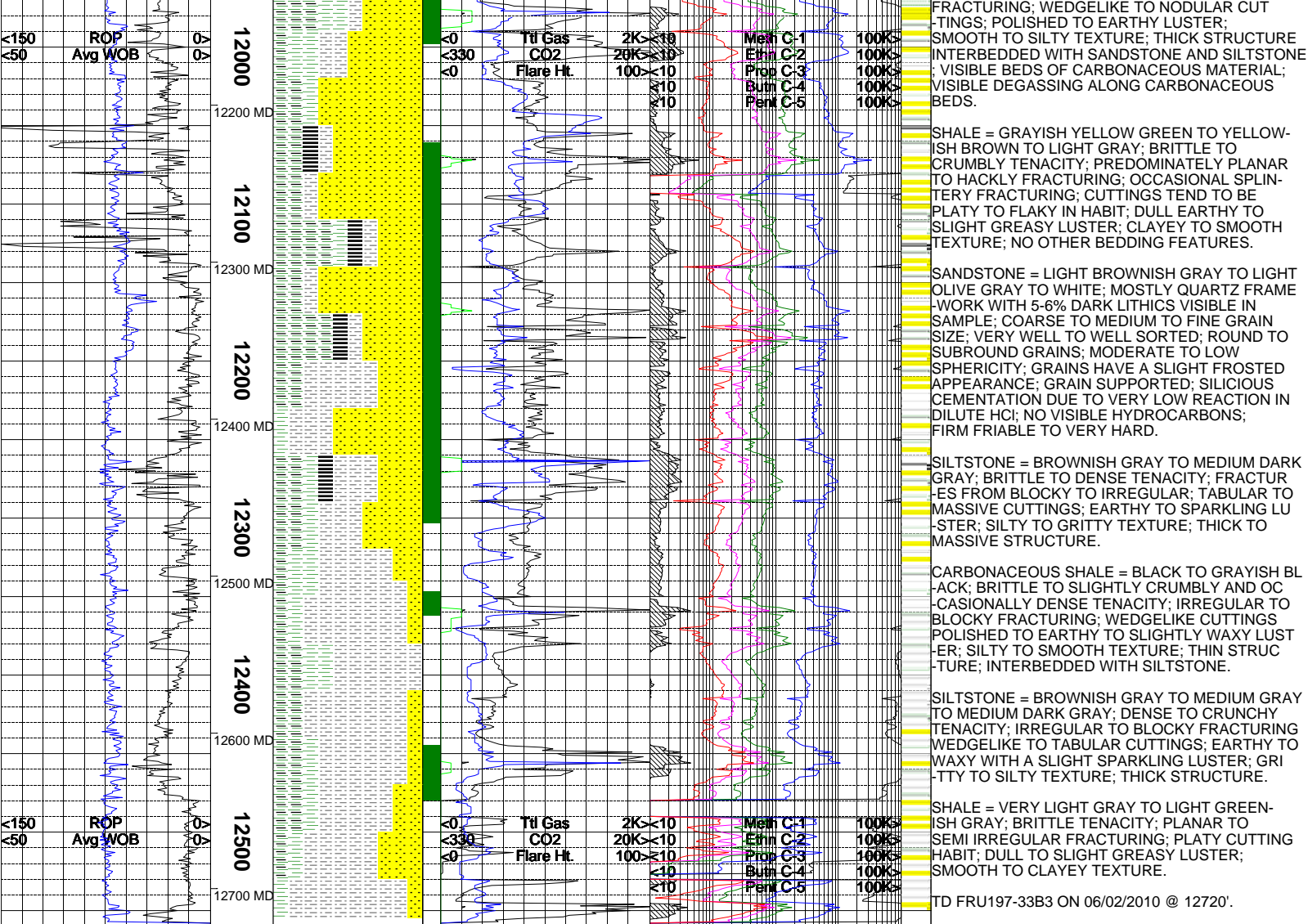
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CO2	10K < 10	Ethn C-2	100K <
Flare Ht	100 < 10	Prop C-3	100K <
	< 10	Bum C-4	100K <
	< 10	Perm C-5	100K <

Til Gas	1K < 10	Meth C-1	100K <
CO2	10K < 10	Ethn C-2	100K <
Flare Ht	100 < 10	Prop C-3	100K <
	< 10	Bum C-4	100K <
	< 10	Perm C-5	100K <









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