



Copyright © 2011 by Canrig Drilling Technology, Ltd.

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

MUDLOG TVD

COMPANY	EXXONMOBIL
WELL	PCU 296-5A9
FIELD	PICEANCE CREEK
REGION	ROCKIES
COORDINATES	LAT: 39.911922 LONG:-108.198686
ELEVATION	G.L.: 7294.1' RKB: 30.2
COUNTY, STATE	RIO BLANCO, CO
API INDEX	051031124100
SPUD DATE	12/05/2009
CONTRACTOR	HELMERICH_PAYNE
CO. REP.	C. CURTIS
RIG/TYPE	FLEX 4S / HP 321
LOGGING UNIT	ML031
GEOLOGISTS	B. SMELSER, M. GROSS C. RECORD
ADD. PERSONS	
CO. GEOLOGIST	C. ALBA

LOG INTERVAL

CASING DATA

DEPTHS: 4779' **TO** 13772'

DATES: 01/27/2011 **TO** 04/15/2011

SCALE: 1" = 100'

16" **AT** 150'

10.75" **AT** 4764'

7.00" **AT** 10032'

AT

MUD TYPES

HOLE SIZE

SPUD MUD **TO** 4779'

LSND **TO** 13772'

TO

TO

14.75" **TO** 4779'

9.875" **TO** 10051'

6.125" **TO** 13772'

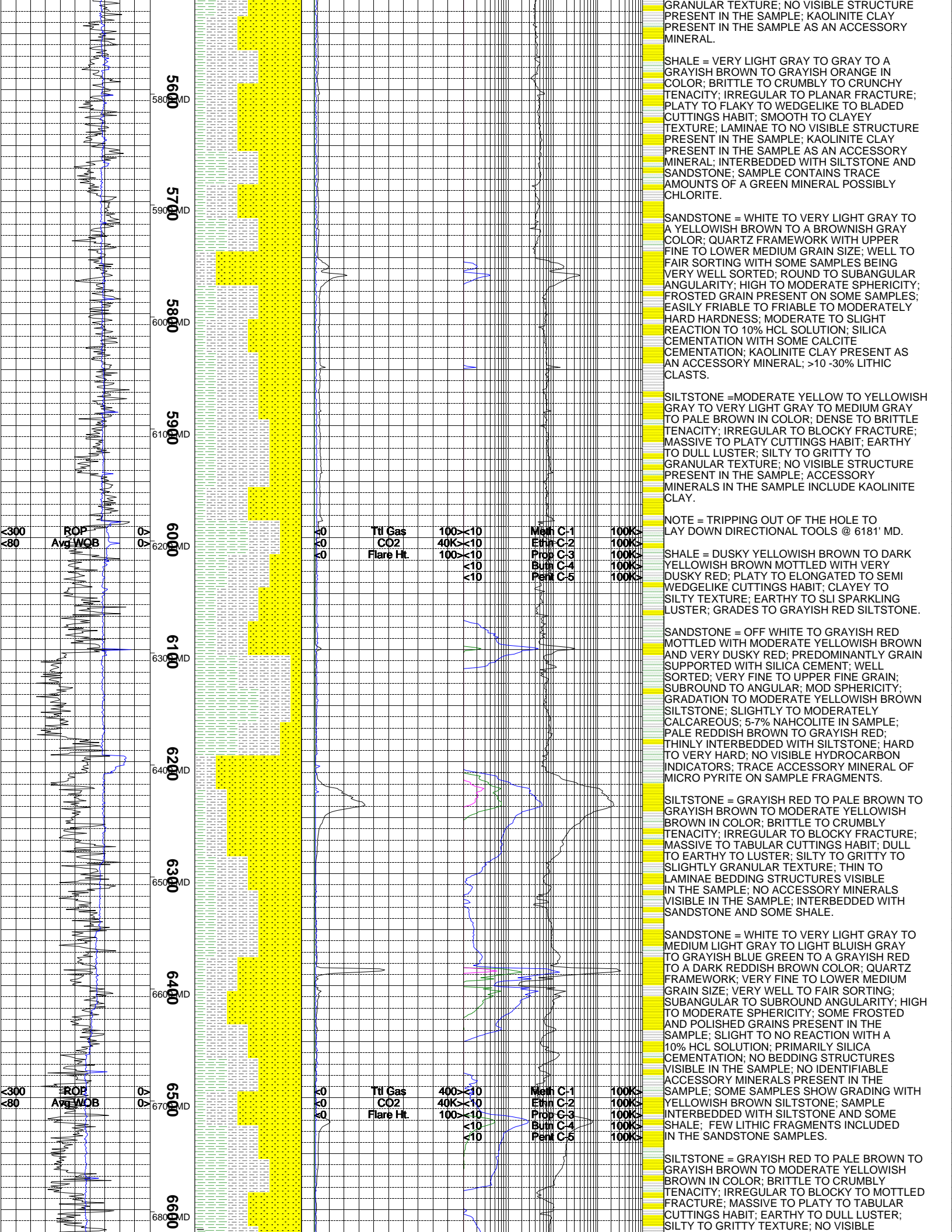
TO

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	



ROP			TVD Depth	Lithology	MGS	Ttl Gas units	Flare Ht. ft	Meth C-1 ppm	Ethn C-2 ppm	Prop C-3 ppm	Butn C-4 ppm	Pent C-5 ppm	Interp. Lith	Remarks
<100	ft/hr	>			<0	<1K	<100	<10	<10K	<100K	<10	<100K		Survey Data, Mud Reports, Other Info.
Avg WOB	klbs	0			<0	CO2 ppm	40K	<10	<10K	<100K	<10	<100K		
					<0	Flare Ht. ft	100	<10	<10K	<100K	<10	<100K		
<p>EPOCH WELL SERVICES COMMENCED LOGGING THE PCU 296-5A 09 WELL ON 1/27/2011 @ 4779' MD.</p> <p>SHALE = DARK YELLOWISH BROWN TO GRAYISH BROWN TO MODERATE YELLOWISH BROWN; PLATY TO FLAKY CUTTINGS HABIT; PLANAR TO SPLINTERY FRACTURE; EARTHY LUSTER; MINOR AMOUNTS OF CLAY WASHED OUT DURING CLEANING; THINLY INTERBEDDED WITH SILTSTONE.</p> <p>SHALE = DARK YELLOWISH BROWN TO VERY DUSKY RED TO MEDIUM GRAY; PLATY TO SCALY TO TABULAR CUTTINGS HABIT; CLAYEY TO SLIGHTLY SILTY TEXTURE; DULL TO EARTHY LUSTER; THINLY INTERBEDDED W/ SILTSTONE AND PALE YELLOWISH BROWN SANDSTONE; CRUMBLY TO STIFF TENACITY.</p> <p>SHALE = DARK YELLOWISH BROWN TO MOD YELLOWISH BROWN TO VERY DUSKY RED; PLANAR TO SPLINTERY TO HACKLY FRACTURE; DULL EARTHY TO TRACE SPARKLING LUSTER; GRADES TO PALE YELLOWISH BROWN SILTSTONE; TR FRAGMENTS OF PALE BROWN LIMESTONE.</p> <p>SANDSTONE = VERY DUSKY RED TO PALE YELLOWISH BROWN TO LIGHT GRAY; HARD TO VERY HARD; PREDOMINANTLY GRAIN SUPPORTED WITH SILICA AND MINOR CALCITE CEMENT; MODERATELY CALCAREOUS; VERY FINE TO UPPER FINE GRAIN; GRADATION TO SILTSTONE; 2-4% LITHIC FLECKS IN SAMPLE FRAGMENTS; INTERBEDDED WITH SILTSTONE AND SHALE; FAIRLY SORTED; LOW TO MOD SPHERICITY; ANGULAR TO SUBROUND; NO VISIBLE HYDROCARBON INDICATORS.</p> <p>SHALE = DARK YELLOWISH BROWN TO VERY DUSKY RED TO MODERATE YELLOWISH BROWN; SCALY TO WEDGE LIKE TO PLATY CUTTINGS HABIT; CLAYEY TO SILTY TEXTURE; GRADES TO SILTSTONE; CRUMBLY TO STIFF TENACITY; EARTHY LUSTER; MASSIVE STRUCTURE WITH MOTTLED COLORS.</p> <p>SHALE = MODERATE YELLOWISH BROWN TO DARK YELLOWISH BROWN TO VERY DUSKY RED; CLAYEY TO SILTY TEXTURE; PLANAR TO SPLINTERY TO ANGULAR FRACTURE; SCALY TO WEDGE LIKE TO FLAKY CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRADES TO PALE YELLOWISH BROWN SILTSTONE.</p> <p>SHALE = DARK YELLOWISH BROWN TO PALE YELLOWISH BROWN MOTTLED WITH VERY DUSKY RED; CLAYEY TO SILTY TEXTURE; SOFT TO CRUMBLY TENACITY; DULL EARTHY LUSTER; IRREGULAR TO ANGULAR TO PLANAR FRACTURE; WEDGE LIKE TO TABULAR TO PLATY CUTTINGS HABIT; GRADATION TO SILTSTONE; MINOR TO MODERATE REACTION TO HCI; TRACE AMOUNTS OF LIMESTONE FRAGS IN SAMPLE.</p> <p>SILTSTONE = MODERATE YELLOWISH BROWN TO GRAYISH RED MOTTLED WITH MEDIUM GRAY; SEMI NODULAR TO ELONGATED TO PLATY CUTTINGS HABIT; SILTY TO GRITTY TEXTURE; SPARKLING LUSTER; MINOR LOOSE FINE GRAIN SAND IN SAMPLE FRAGMENTS; GRADATION TO SANDSTONE.</p> <p>SANDSTONE = WHITE TO LIGHT GRAY TO MEDIUM GRAY TO BROWNISH GRAY TO A PALE YELLOWISH BROWN COLOR; QUARTZ FRAMEWORK WITH A MODERATE REACTION TO A 10% HCL SOLUTION INDICATING SILICA AND SLIGHT CALCITE CEMENTATION; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; FAIR TO WELL SORTING; SUBANGULAR TO SUBROUND ANGULARITY; MODERATE TO HIGH SPHERICITY; EASILY FRIABLE TO MODERATELY HARD HARDNESS; 10 - 30% LITHIC CLASTS IN THE SAMPLES; INTERBEDDED WITH SILTSTONE AND SHALE; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE.</p> <p>SILTSTONE =MODERATE YELLOW TO YELLOWISH GRAY TO LIGHT OLIVE GRAY TO LIGHT GRAY TO PALE BROWN IN COLOR; DENSE TO BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; EARTHY TO DULL LUSTER; SILTY TO GRITTY TO</p>														



GRANULAR TEXTURE; NO VISIBLE STRUCTURE PRESENT IN THE SAMPLE; KAOLINITE CLAY PRESENT IN THE SAMPLE AS AN ACCESSORY MINERAL.

SHALE = VERY LIGHT GRAY TO GRAY TO A GRAYISH BROWN TO GRAYISH ORANGE IN COLOR; BRITTLE TO CRUMBLY TO CRUNCHY TENACITY; IRREGULAR TO PLANAR FRACTURE; PLATY TO FLAKY TO WEDGELIKE TO BLADED CUTTINGS HABIT; SMOOTH TO CLAYEY TEXTURE; LAMINAE TO NO VISIBLE STRUCTURE PRESENT IN THE SAMPLE; KAOLINITE CLAY PRESENT IN THE SAMPLE AS AN ACCESSORY MINERAL; INTERBEDDED WITH SILTSTONE AND SANDSTONE; SAMPLE CONTAINS TRACE AMOUNTS OF A GREEN MINERAL POSSIBLY CHLORITE.

SANDSTONE = WHITE TO VERY LIGHT GRAY TO A YELLOWISH BROWN TO A BROWNISH GRAY COLOR; QUARTZ FRAMEWORK WITH UPPER FINE TO LOWER MEDIUM GRAIN SIZE; WELL TO FAIR SORTING WITH SOME SAMPLES BEING VERY WELL SORTED; ROUND TO SUBANGULAR ANGULARITY; HIGH TO MODERATE SPHERICITY; FROSTED GRAIN PRESENT ON SOME SAMPLES; EASILY FRIABLE TO FRIABLE TO MODERATELY HARD HARDNESS; MODERATE TO SLIGHT REACTION TO 10% HCL SOLUTION; SILICA CEMENTATION WITH SOME CALCITE CEMENTATION; KAOLINITE CLAY PRESENT AS AN ACCESSORY MINERAL; >10 -30% LITHIC CLASTS.

SILTSTONE =MODERATE YELLOW TO YELLOWISH GRAY TO VERY LIGHT GRAY TO MEDIUM GRAY TO PALE BROWN IN COLOR; DENSE TO BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO PLATY CUTTINGS HABIT; EARTHY TO DULL LUSTER; SILTY TO GRITTY TO GRANULAR TEXTURE; NO VISIBLE STRUCTURE PRESENT IN THE SAMPLE; ACCESSORY MINERALS IN THE SAMPLE INCLUDE KAOLINITE CLAY.

NOTE = TRIPPING OUT OF THE HOLE TO LAY DOWN DIRECTIONAL TOOLS @ 6181' MD.

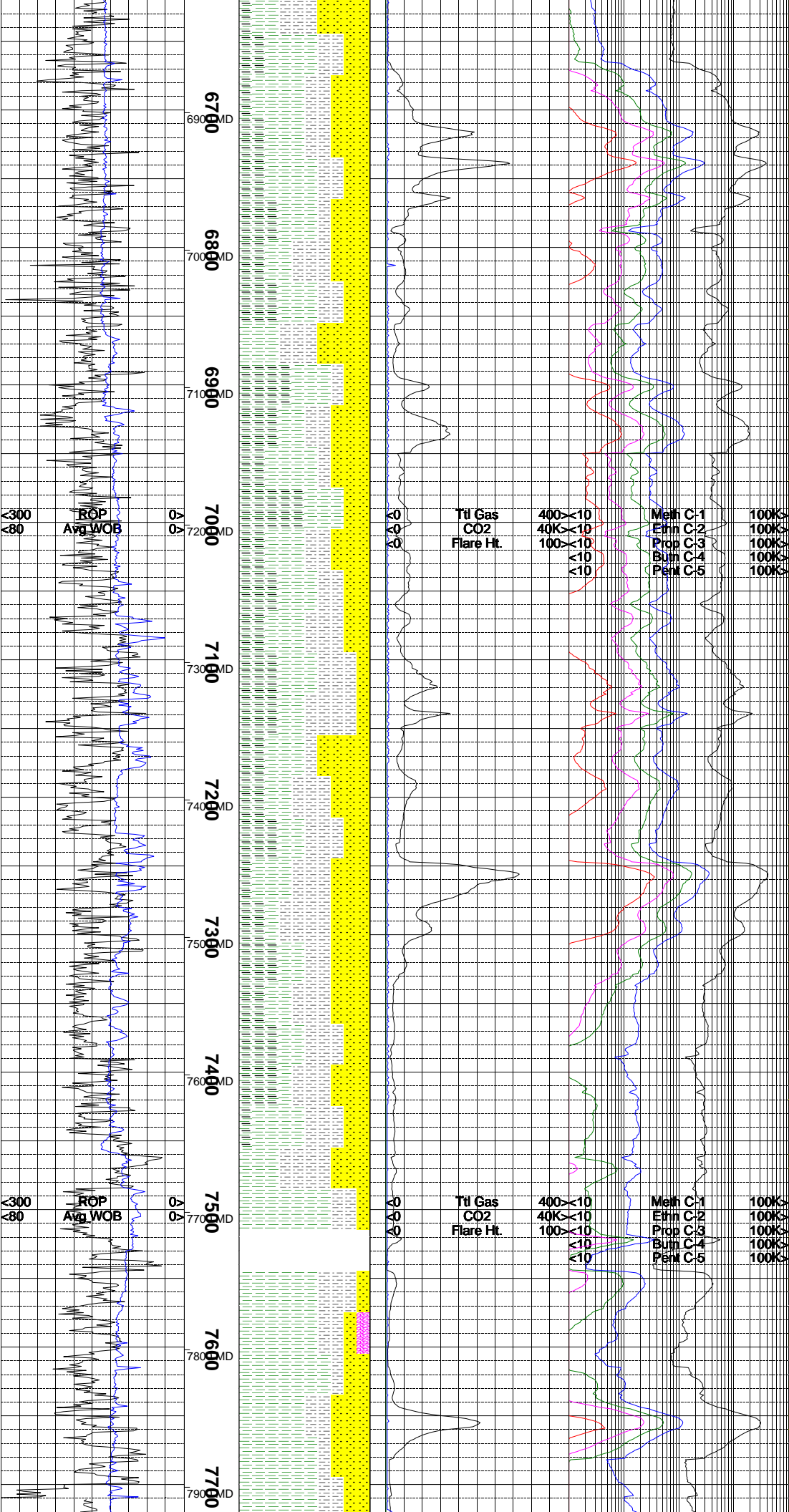
SHALE = DUSKY YELLOWISH BROWN TO DARK YELLOWISH BROWN MOTTLED WITH VERY DUSKY RED; PLATY TO ELONGATED TO SEMI WEDGELIKE CUTTINGS HABIT; CLAYEY TO SILTY TEXTURE; EARTHY TO SLI SPARKLING LUSTER; GRADES TO GRAYISH RED SILTSTONE.

SANDSTONE = OFF WHITE TO GRAYISH RED MOTTLED WITH MODERATE YELLOWISH BROWN AND VERY DUSKY RED; PREDOMINANTLY GRAIN SUPPORTED WITH SILICA CEMENT; WELL SORTED; VERY FINE TO UPPER FINE GRAIN; SUBROUND TO ANGULAR; MOD SPHERICITY; GRADATION TO MODERATE YELLOWISH BROWN SILTSTONE; SLIGHTLY TO MODERATELY CALCAREOUS; 5-7% NAHCOLITE IN SAMPLE; PALE REDDISH BROWN TO GRAYISH RED; THINLY INTERBEDDED WITH SILTSTONE; HARD TO VERY HARD; NO VISIBLE HYDROCARBON INDICATORS; TRACE ACCESSORY MINERAL OF MICRO PYRITE ON SAMPLE FRAGMENTS.

SILTSTONE = GRAYISH RED TO PALE BROWN TO GRAYISH BROWN TO MODERATE YELLOWISH BROWN IN COLOR; BRITTLE TO CRUMBLY TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR CUTTINGS HABIT; DULL TO EARTHY TO LUSTER; SILTY TO GRITTY TO SLIGHTLY GRANULAR TEXTURE; THIN TO LAMINAE BEDDING STRUCTURES VISIBLE IN THE SAMPLE; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE; INTERBEDDED WITH SANDSTONE AND SOME SHALE.

SANDSTONE = WHITE TO VERY LIGHT GRAY TO MEDIUM LIGHT GRAY TO LIGHT BLUISH GRAY TO GRAYISH BLUE GREEN TO A GRAYISH RED TO A DARK REDDISH BROWN COLOR; QUARTZ FRAMEWORK; VERY FINE TO LOWER MEDIUM GRAIN SIZE; VERY WELL TO FAIR SORTING; SUBANGULAR TO SUBROUND ANGULARITY; HIGH TO MODERATE SPHERICITY; SOME FROSTED AND POLISHED GRAINS PRESENT IN THE SAMPLE; SLIGHT TO NO REACTION WITH A 10% HCL SOLUTION; PRIMARILY SILICA CEMENTATION; NO BEDDING STRUCTURES VISIBLE IN THE SAMPLE; NO IDENTIFIABLE ACCESSORY MINERALS PRESENT IN THE SAMPLE; SOME SAMPLES SHOW GRADING WITH YELLOWISH BROWN SILTSTONE; SAMPLE INTERBEDDED WITH SILTSTONE AND SOME SHALE; FEW LITHIC FRAGMENTS INCLUDED IN THE SANDSTONE SAMPLES.

SILTSTONE = GRAYISH RED TO PALE BROWN TO GRAYISH BROWN TO MODERATE YELLOWISH BROWN IN COLOR; BRITTLE TO CRUMBLY TENACITY; IRREGULAR TO BLOCKY TO MOTTLED FRACTURE; MASSIVE TO PLATY TO TABULAR CUTTINGS HABIT; EARTHY TO DULL LUSTER; SILTY TO GRITTY TEXTURE; NO VISIBLE



BEDDING STRUCTURES PRESENT.

SHALE = VERY LIGHT GRAY TO GRAY TO MEDIUM GRAY TO GRAYISH BROWN IN COLOR; BRITTLE TO CRUMBLY TO CRUNCHY AND OCCASIONALLY PULVERULENT; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO WEDGELIKE TO BLADED CUTTINGS HABIT; SMOOTH TO CLAYEY TEXTURE WITH SOME SAMPLES BEING ALMOST SILTY; LAMINAE TO THIN STRUCTURES VISIBLE IN THE SAMPLES; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE.

CARBONACEOUS SHALE = BLACK TO VERY DARK GRAY IN COLOR; BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO PLANAR FRACTURE; PLATY TO WEDGELIKE TO BLADED CUTTINGS HABIT; EARTHY TO DULL TO WAXY OR GREASY LUSTER; SMOOTH TO CLAYEY TEXTURE WITH SOME SAMPLES BEING SLIGHTLY SILTY; LAMINAE TO THIN STRUCTURE VISIBLE IN THE SAMPLE; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE; INTERBEDDED WITH SHALE, SILTSTONE AND SANDSTONE.

SHALE = VERY LIGHT GRAY TO GRAY TO MEDIUM GRAY TO GRAYISH BROWN IN COLOR; BRITTLE TO CRUMBLY TO CRUNCHY AND OCCASIONALLY PULVERULENT; IRREGULAR TO BLOCKY TO PLANAR FRACTURE; MASSIVE TO PLATY TO WEDGELIKE TO BLADED CUTTINGS HABIT; SMOOTH TO CLAYEY TEXTURE WITH SOME SAMPLES BEING ALMOST SILTY; LAMINAE TO THIN STRUCTURES VISIBLE IN THE SAMPLES; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE.

CARBONACEOUS SHALE = BLACK TO VERY DARK GRAY IN COLOR; DENSE TO BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO PLANAR FRACTURE; PLATY TO FLAKY TO WEDGELIKE TO BLADED CUTTINGS HABIT; EARTHY TO DULL TO GREASY TO WAXY LUSTER; SMOOTH TO CLAYEY TO SLIGHTLY SILTY TEXTURE; VERY THIN TO LAMINAE BEDDING STRUCTURES VISIBLE ON THE SAMPLES; INTERBEDDED WITH SANDSTONE, SHALE AND SILTSTONE; TRACE AMOUNTS OF PYRITE VISIBLE IN THE SAMPLE AS AN ACCESSORY MINERAL.

NOTE: LOSE RETURNS @ 7312'. REGAIN PARTIAL RETURNS @ 7316'. FULL RETURNS @ 7330'.

SANDSTONE = WHITE TO VERY LIGHT GRAY TO GRAY TO MEDIUM DARK GRAY TO BROWNISH GRAY TO A GRAYISH RED COLOR; QUARTZ FRAMEWORK; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; WELL TO FAIR SORTING WITH 10 - 30% LITHIC FRAGMENTS INCLUDED; SUBANGULAR TO SUBROUND ANGULARITY; HIGH TO MODERATE SPHERICITY; FROSTED GRAINS DUE TO MECHANICAL ABRASION; MANY LOOSE GRAINS IN SAMPLE; FRIABLE TO FIRMLY FRIABLE TO MODERATELY HARD; GRAIN SUPPORTED; MODERATE REACTION WITH A 10% HCL SOLUTION; NO BEDDING STRUCTURES VISIBLE IN THE SAMPLE; TRACE AMOUNTS OF PYRITE VISIBLE IN THE SAMPLE AS AN ACCESSORY MINERAL; SOME TRACE CARBONACEOUS MATERIAL IN THE FORM OF COAL PRESENT IN THE SAMPLE.

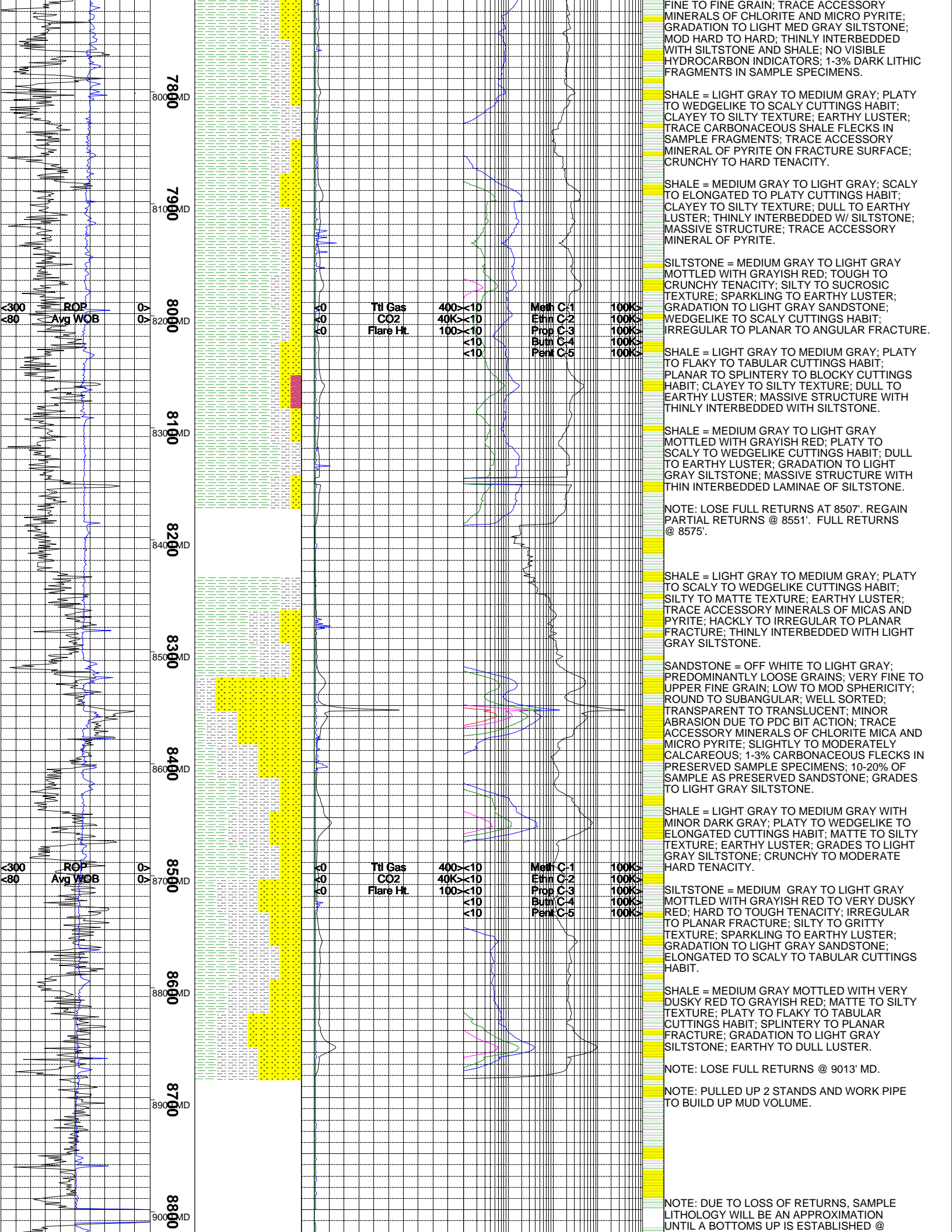
SILTSTONE = GRAY TO MEDIUM GRAY TO A REDDISH BROWN COLOR; DENSE TO BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR CUTTINGS HABIT; EARTHY TO DULL LUSTER; SLITY TO GRITTY TO GRANULAR TEXTURE; NO VISIBLE BEDDING STRUCTURES; PYRITE VISIBLE IN SMALL VEINS AND INCLUSIONS IN SOME OF THE SAMPLES; SOME COAL DEGASSING IN THE SAMPLE.

CARBONACEOUS SHALE = BROWNISH BLACK TO OLIVE GRAY TO DARK GRAY; SCALY TO PLATY TO ELONGATED CUTTINGS HABIT; CLAYEY TO SLIGHTLY SILTY TEXTURE; EARTHY TO SEMI VITREOUS LUSTER; SPLINTERY TO PLANAR TO ANGULAR FRACTURE; GRADATION TO OLIVE GRAY SILTSTONE; THINLY INTERBEDDED WITH COAL LAMINAE; TRACE ACCESSORY MINERAL OF FRAMBOIDAL PYRITE AND PYRITIC VEINING.

NOTE: LOSE FULL RETURNS AT 7808'. GAIN PARTIAL RETURNS AT 7820'.

SHALE = MEDIUM GRAY TO LIGHT GRAY; PLATY TO ELONGATED TO TABULAR CUTTINGS HABIT; CLAYEY TEXTURE; EARTHY TO DULL LUSTER; MINOR FLECKS OF CARBONACEOUS SHALE IN SAMPLE FRAGMENTS; TRACE ACCESSORY MINERAL OF PYRITE ON FRACTURED SURFACE.

SANDSTONE = OFF WHITE TO VERY LIGHT GRAY MOTTLED WITH OLIVE GRAY; PREDOMINANTLY GRAIN SUPPORTED WITH SILICA CEMENT; SUBANGULAR TO SUBROUND; MODERATE SPHERICITY; FAIR TO WELL SORTED; VERY



NOTE: REGAIN RETURNS @ 9060' MD.

SANDSTONE = WHITE TO VERY LIGHT GRAY TO MEDIUM GRAY IN COLOR; QUARTZ FRAMEWORK; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; VERY WELL TO FAIR SORTING; ANGULAR TO SUBROUND ANGULARITY; HIGH TO MODERATE SPHERICITY; FROSTED TO POLISHED GRAINS VISIBLE IN THE SAMPLE; FRIABLE TO MODERATELY HARD HARDNESS; VERY LITTLE TO NO REACTION WITH A 10% HCL SOLUTION; SILICA CEMENTATION; GRAIN SUPPORTED WITH FEW LITHIC FRAGMENTS; INTERBEDDED WITH SILTSTONE, SHALE AND CARBONACEOUS SHALE; NO BEDDING STRUCTURES VISIBLE IN THE SAMPLE; PYRITE VISIBLE IN THE SAMPLE AS AN ACCESSORY MINERAL.

SHALE = LIGHT GRAY TO GRAY TO MEDIUM GRAY IN COLOR; BRITTLE TO CRUNCHY TO SLIGHTLY PULVERULENT IN TENACITY; PLANAR TO SPLINTERY FRACTURE; PLATY TO FLAKY TO WEDGELIKE TO BLADED CUTTINGS HABIT; DULL TO EARTHY LUSTER; SMOOTH TO CLAYEY TEXTURE; LAMINAE BEDDING SURFACES VISIBLE IN SOME SAMPLES; PYRITE VISIBLE IN THE SAMPLE AS AN ACCESSORY MINERAL; EVIDENCE OF FRACTURE FILL VISIBLE IN THE SAMPLE.

SILTSTONE = DARK GRAY TO MEDIUM GRAY TO A GRAYISH ORANGE COLOR; TOUGH TO DENSE TO BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURE; MASSIVE TO TABULAR CUTTINGS HABIT; DULL TO EARTHY LUSTER; SILTY TO GRITTY TO SLIGHTLY GRANULAR TEXTURE; NO VISIBLE BEDDING STRUCTURE; NO VISIBLE ACCESSORY MINERALS.

SANDSTONE = WHITE TO LIGHT GRAY TO MEDIUM GRAY IN COLOR; QUARTZ FRAMEWORK; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; MANY LOOSE GRAIN IN SAMPLE; WELL TO SLIGHTLY POOR SORTING; ANGULAR TO ROUNDED GRAINS; HIGH TO MODERATE SPHERICITY; EASILY FRIABLE TO MODERATELY HARD; MODERATE REACTION TO HCL; GRAIN SUPPORTED; LITHIC FRAGMENTS RANGE FROM FEW 10% TO MODERATE <30%; NO VISIBLE ACCESSORY MINERALS PRESENT IN THE SAMPLE; INTERBEDDED WITH SILTSTONE, SHALE AND CARBONACEOUS SHALE.

SHALE = LIGHT GRAY TO GRAY TO MEDIUM GRAY IN COLOR; BRITTLE TO CRUNCHY TO SLIGHTLY PULVERULENT IN TENACITY;
PLANAR TO SPLINTERY FRACTURE; PLATY TO FLAKY TO WEDGE LIKE TO BLADED CUTTINGS HABIT; DULL TO EARTHY LUSTER; SMOOTH TO CLAYEY TEXTURE; LAMINAE BEDDING SURFACES VISIBLE IN SOME SAMPLES; PYRITE VISIBLE IN THE SAMPLE AS AN ACCESSORY MINERAL;
EVIDENCE OF FRACTURE FILL VISIBLE IN THE SAMPLE.

CARBONACEOUS SHALE = BLACK TO VERY DARK GRAY IN COLOR; DENSE TO BRITTLE TO CRUNCHY TENACITY; IRREGULAR TO PLANAR FRACTURE; PLATY TO FLAKY TO WEDGELIKE TO BLADED CUTTINGS HABIT; EARTHY TO DULL TO GREASY TO WAXY LUSTER; SMOOTH TO CLAYEY TO SLIGHTLY SILTY TEXTURE; VERY THIN TO LAMINAE BEDDING STRUCTURES VISIBLE ON THE SAMPLES; INTERBEDDED WITH SANDSTONE, SHALE AND SILTSTONE.

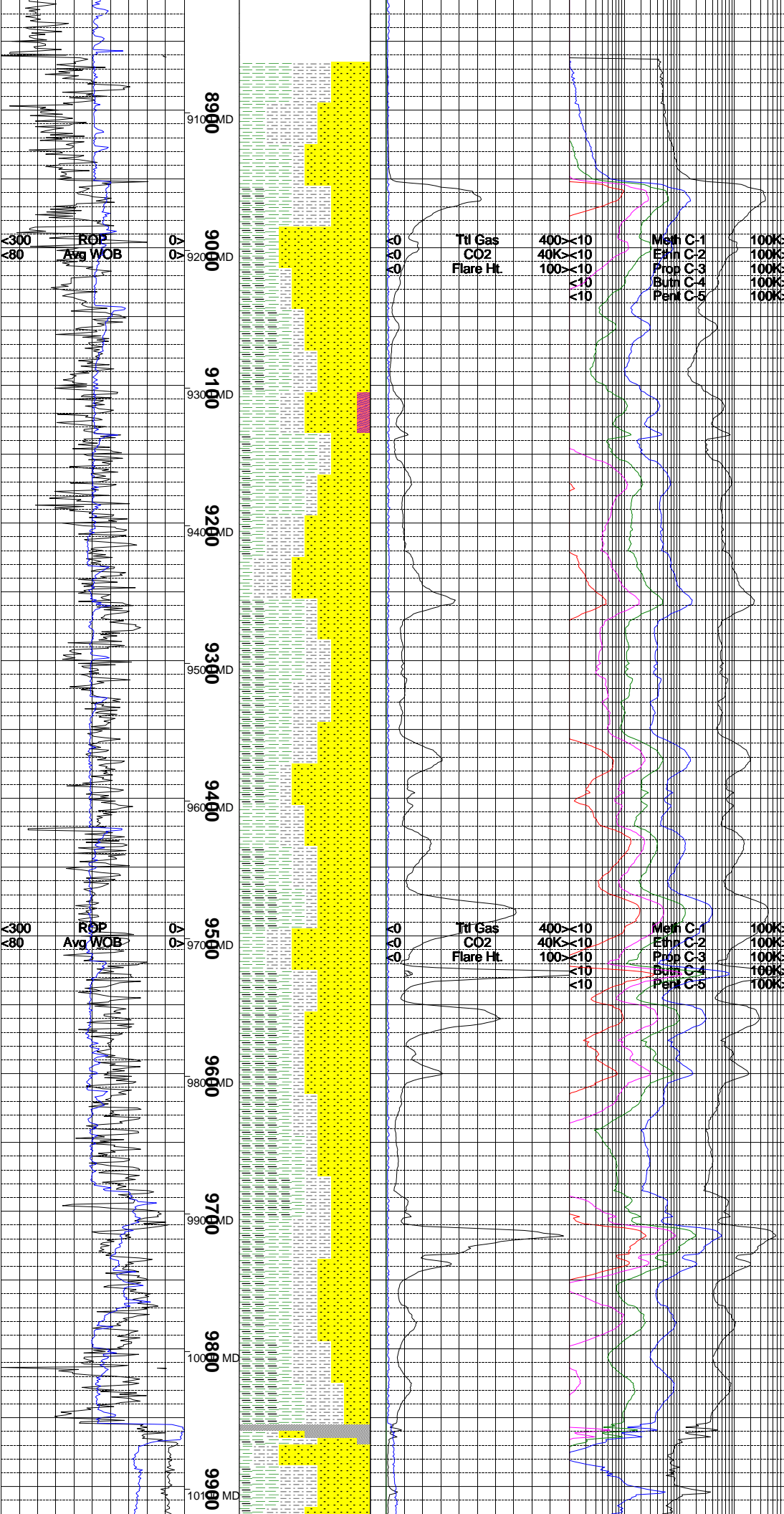
SANDSTONE = WHITE TO LIGHT GRAY TO MEDIUM GRAY IN COLOR; QUARTZ FRAMEWORK; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; MANY LOOSE GRAIN IN SAMPLE; WELL TO SLIGHTLY POOR SORTING; ANGULAR TO ROUNDED GRAINS; HIGH TO MODERATE SPHERICITY; EASILY FRIABLE TO MODERATELY HARD; MODERATE REACTION TO HCL; GRAIN SUPPORTED; 10 - 40% LITHIC FRAGMENTS INCLUDED IN THE SAMPLES; NO ACCESSORY MINERALS VISIBLE IN THE SAMPLE.

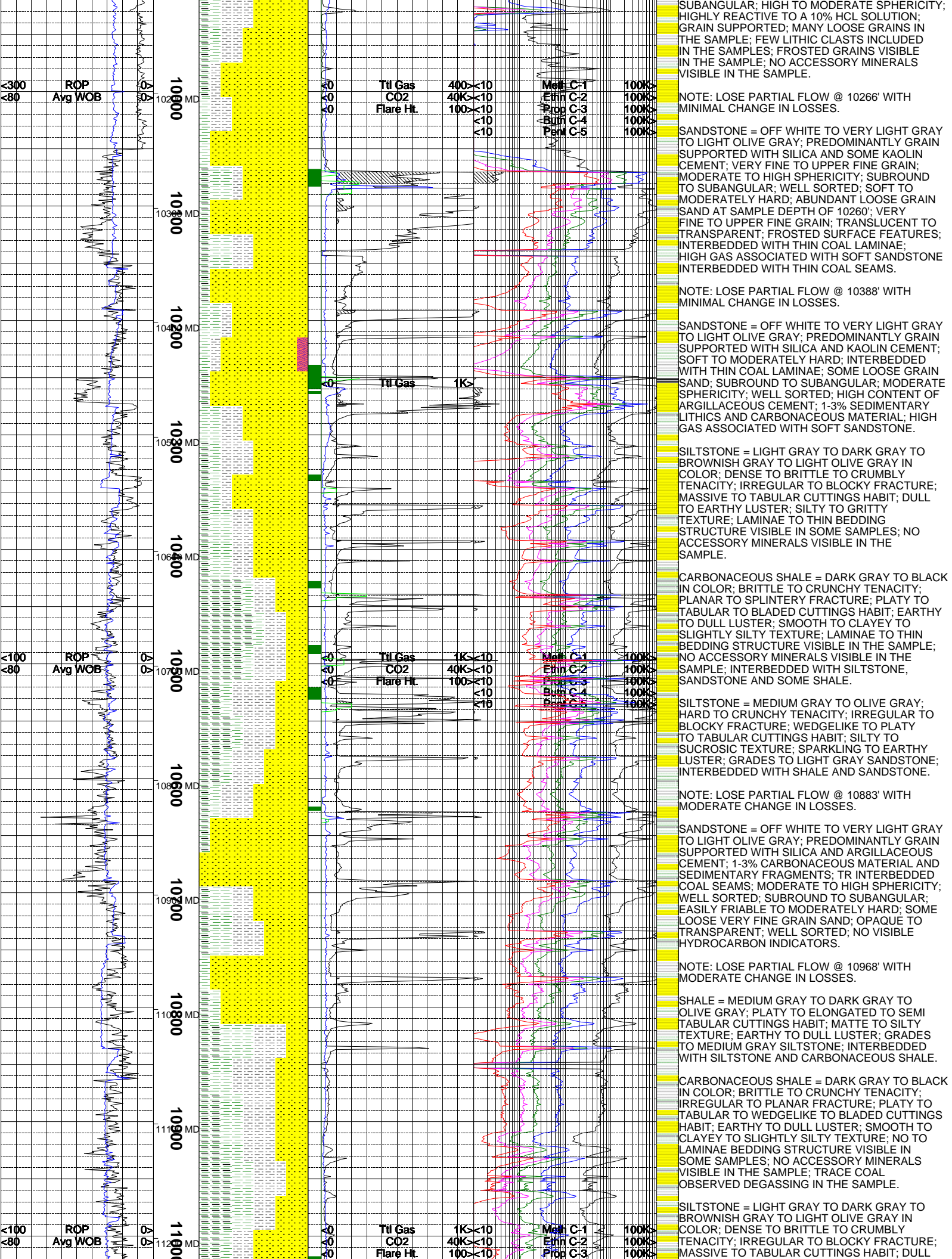
SILTSTONE = MEDIUM GRAY TO OLIVE GRAY;
PLATY TO SCALY TO WEDGE LIKE CUTTINGS
HABIT; SILTY TO GRITTY TEXTURE; THINLY
INTERBEDDED WITH SANDSTONE AND
CARBONACEOUS SHALE; SPARKLING TO SEMI
EARTHY LUSTER; HARD TO CRUNCHY TENACITY;
IRREGULAR TO BLOCKY TO HACKLY FRACTURE;
TRACE LOOSE UPPER VERY FINE GRAIN SAND
IN SAMPLE FRAGMENTS.

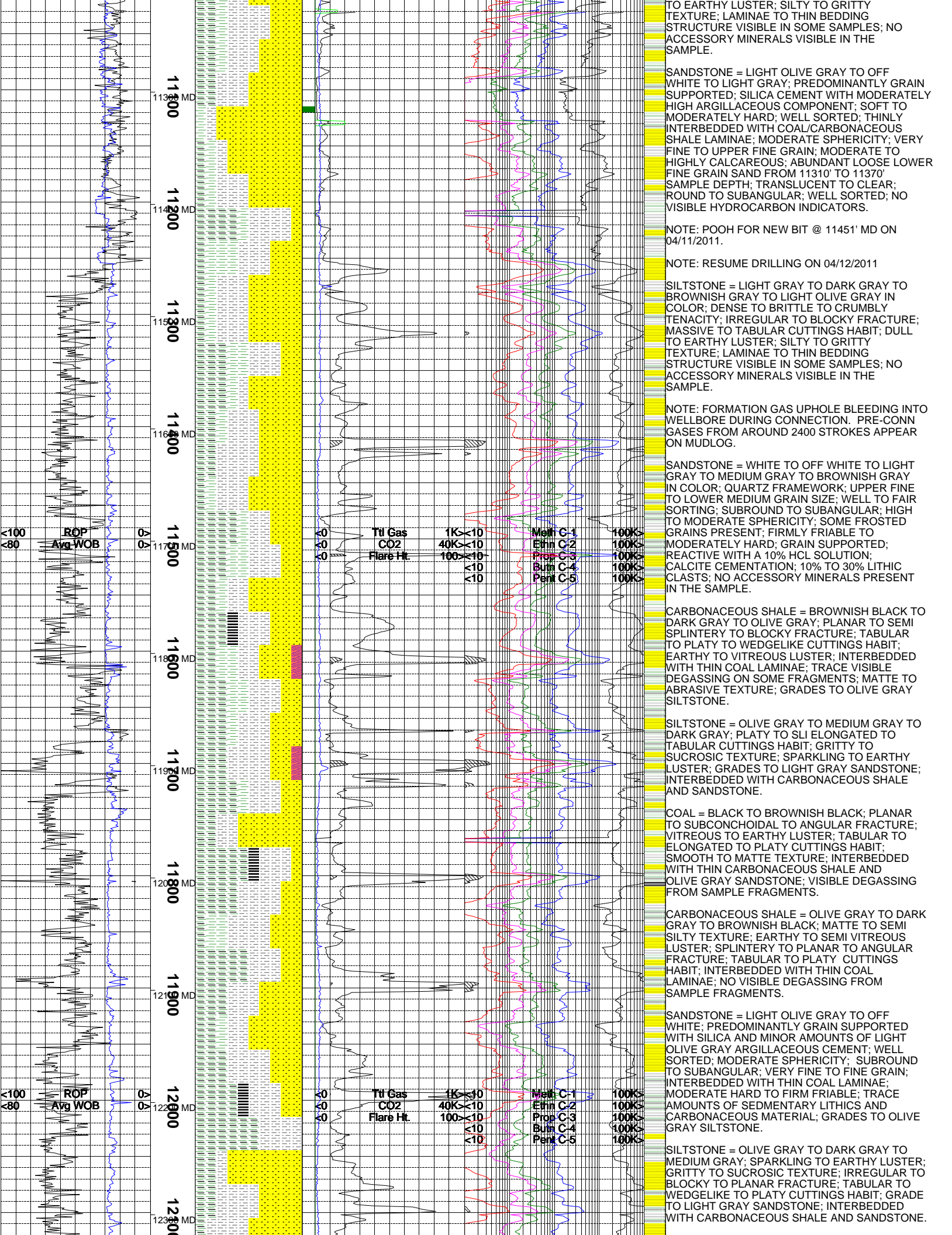
NOTE: TD INTERMEDIATE SECT @ 10051' MD
(9854' TVD) ON 01/30/2011.

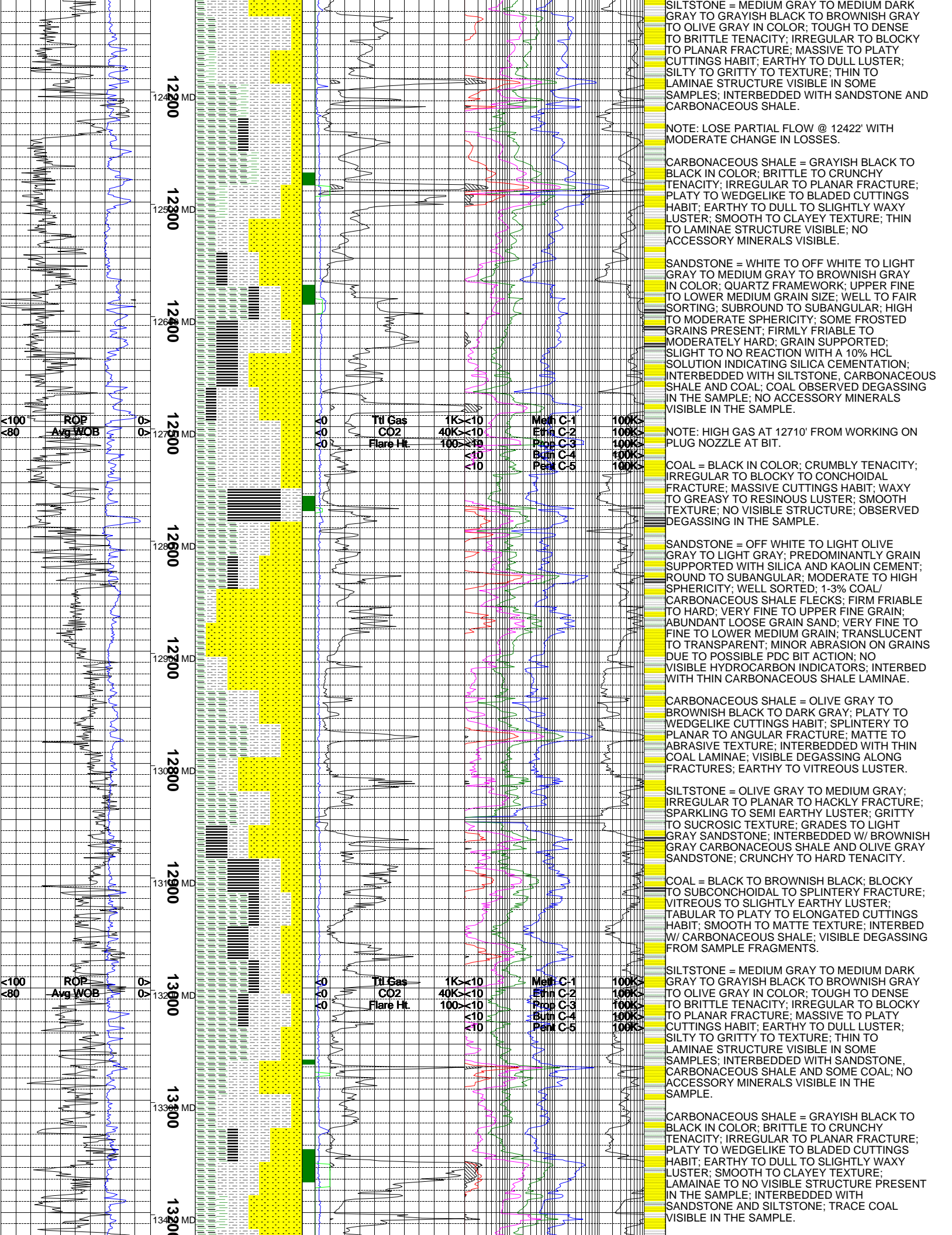
NOTE: RESUME DRILLING OF PRODUCTION SECTION ON 04/08/2011

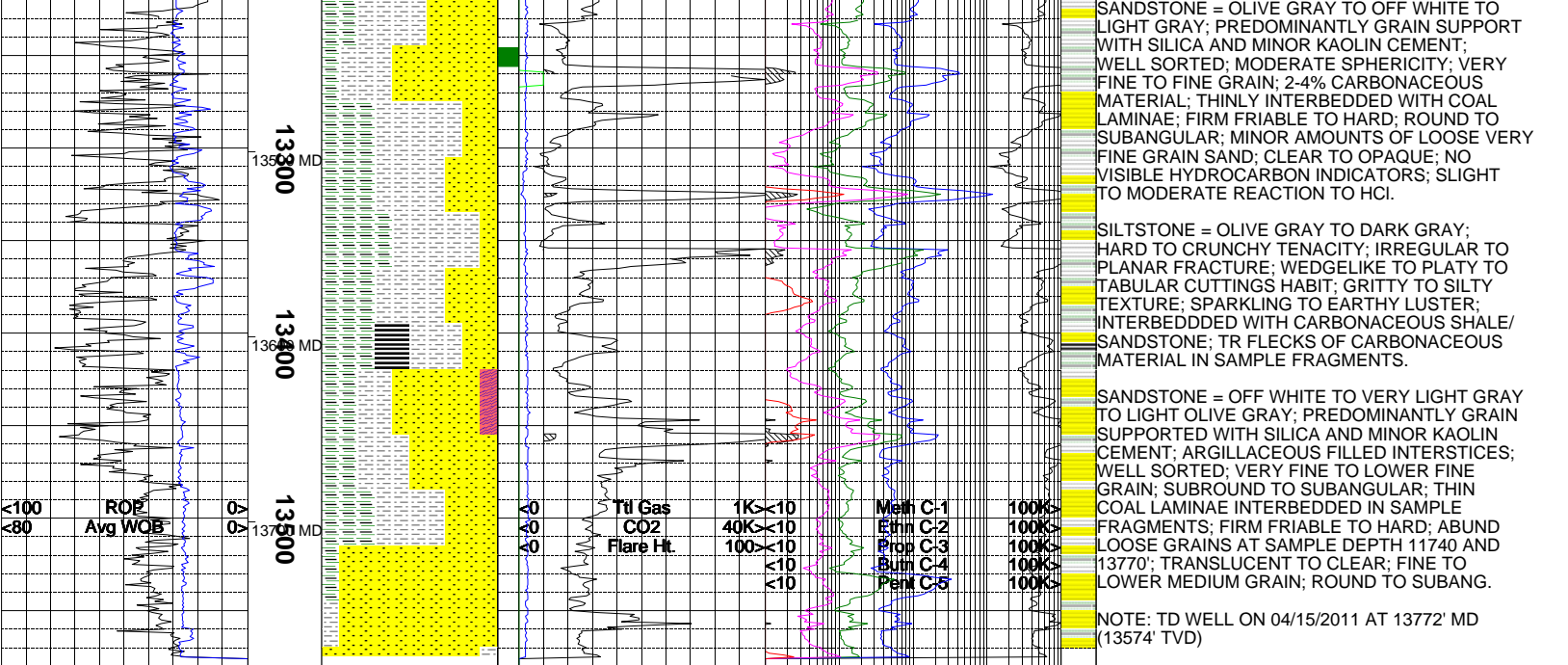
SANDSTONE = WHITE TO OFF WHITE TO LIGHT GRAY IN COLOR; QUARTZ FRAMEWORK; UPPER FINE TO LOWER MEDIUM GRAIN SIZE; VERY WELL TO WELL SORTING; SUBROUND TO











The log data, interpretations and recommendation provided by Canrig are inferences and assumptions based on measurements of drilling fluids. Such inferences and assumptions are not infallible and reasonable professionals may differ. Canrig does not represent or warrant the accuracy, correctness or completeness of any log data, interpretations, recommendations or information provided by Canrig, its officers, agents or employees. Canrig does not and cannot guarantee the accuracy of any such interpretation of the log data, interpretations or recommendations and Company is fully responsible for all decisions and actions it takes based on such log data, interpretations and recommendations.