



Copyright © 2003 by Epoch Well Services, Inc.

**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>	FRU197-33A2
<b>FIELD</b>	FREEDOM RANCH UNIT
<b>REGION</b>	ROCKIES
<b>COORDINATES</b>	39.915658 108.285631
<b>ELEVATION</b>	6390'
<b>COUNTY, STATE</b>	RIO BLANCO, CO
<b>API INDEX</b>	05-103-11098-00
<b>SPUD DATE</b>	2/1/2009
<b>CONTRACTOR</b>	HELMRICH AND PAYNE
<b>CO. REP.</b>	KEVIN GARDNER
<b>RIG/TYPE</b>	239 / Flex 3
<b>LOGGING UNIT</b>	MLU 033
<b>GEOLOGISTS</b>	LAYNE GOOD NICK BAUER
<b>ADD. PERSONS</b>	JASON REISENBICHLER
<b>CO. GEOLOGIST</b>	MELISSA SAURBORN

### LOG INTERVAL

<b>DEPTHS:</b>	4000'	<b>TO</b>	12297'
<b>DATES:</b>	6/26/2009	<b>TO</b>	7/10/2009
<b>SCALE:</b>	5" = 100'		

### CASING DATA

16"	<b>AT</b>	130'
10.75"	<b>AT</b>	3956'
7"	<b>AT</b>	8536'

**AT**

### HOLE SIZE

14.75"	<b>TO</b>	3983'
9.875"	<b>TO</b>	8555'
6.125"	<b>TO</b>	12297'
	<b>TO</b>	

### MUD TYPES

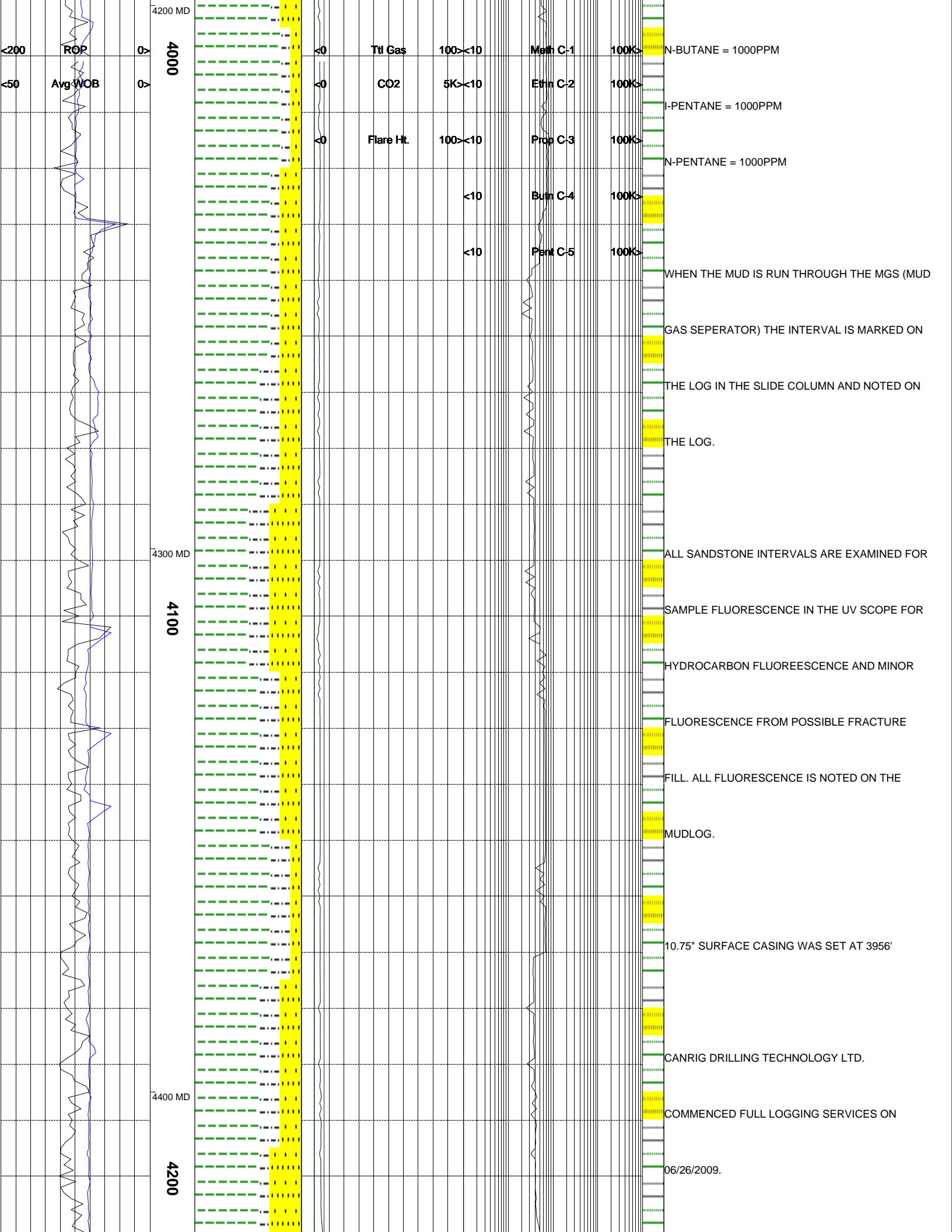
SPUD MUD	<b>TO</b>	3983'
LSND	<b>TO</b>	12297'
	<b>TO</b>	
	<b>TO</b>	

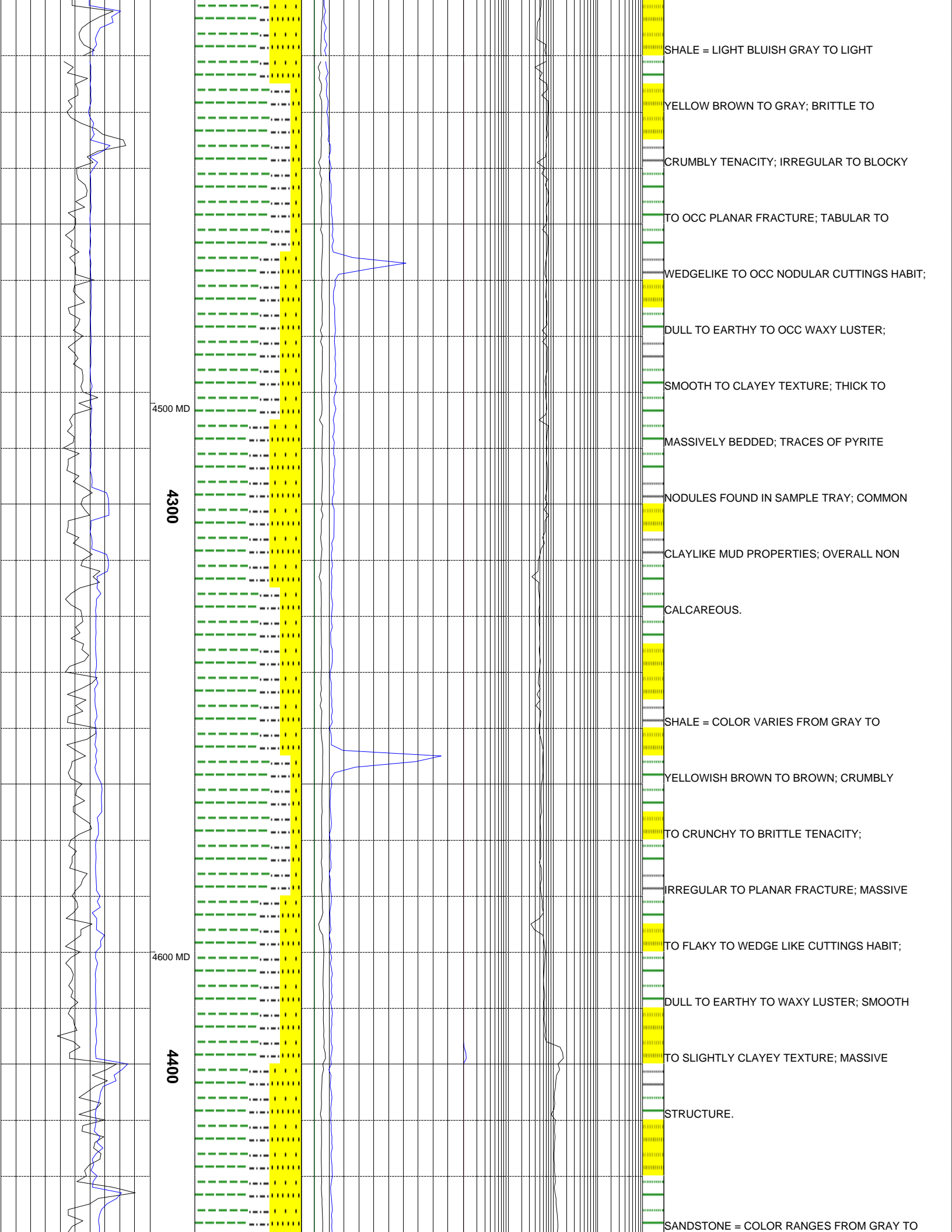
### ABBREVIATIONS

<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	

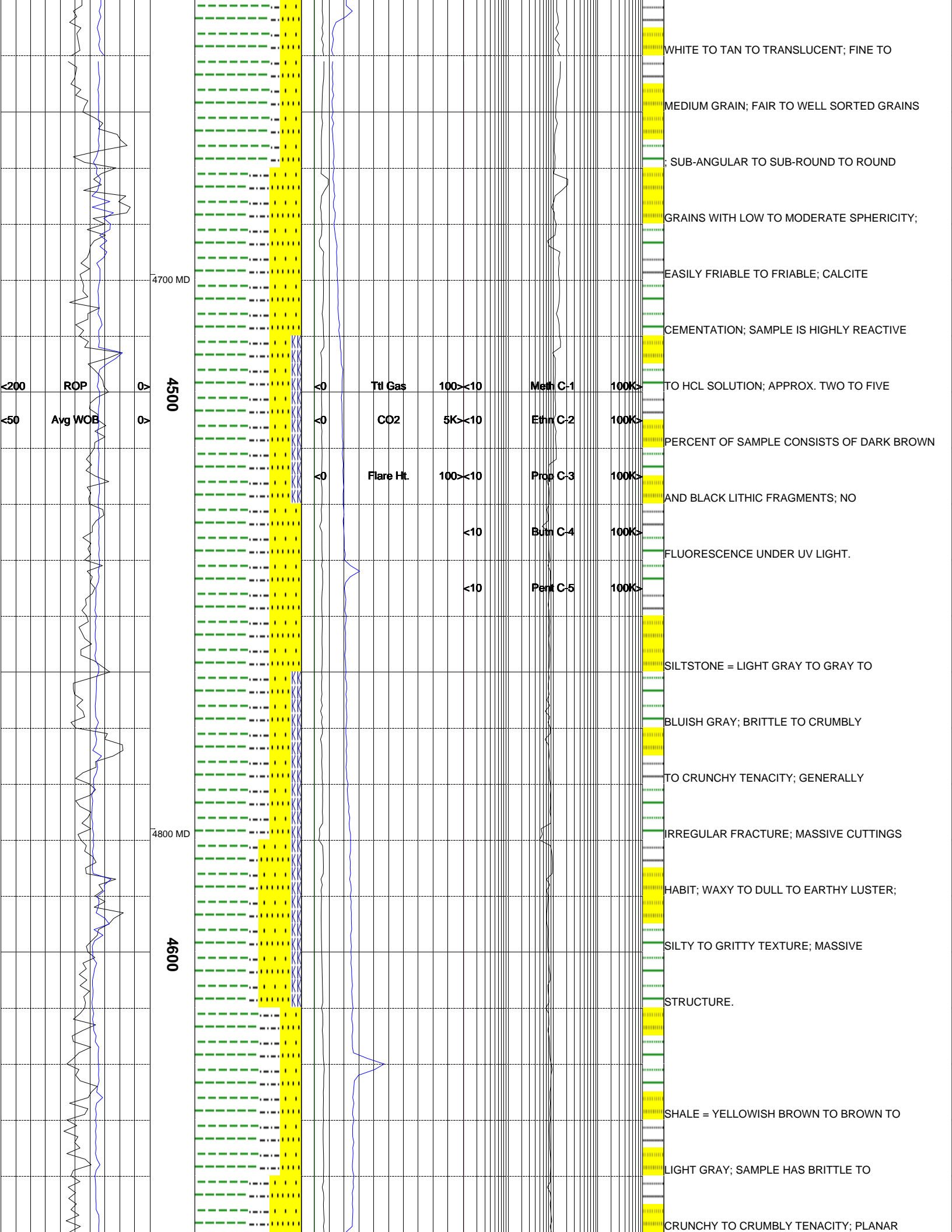


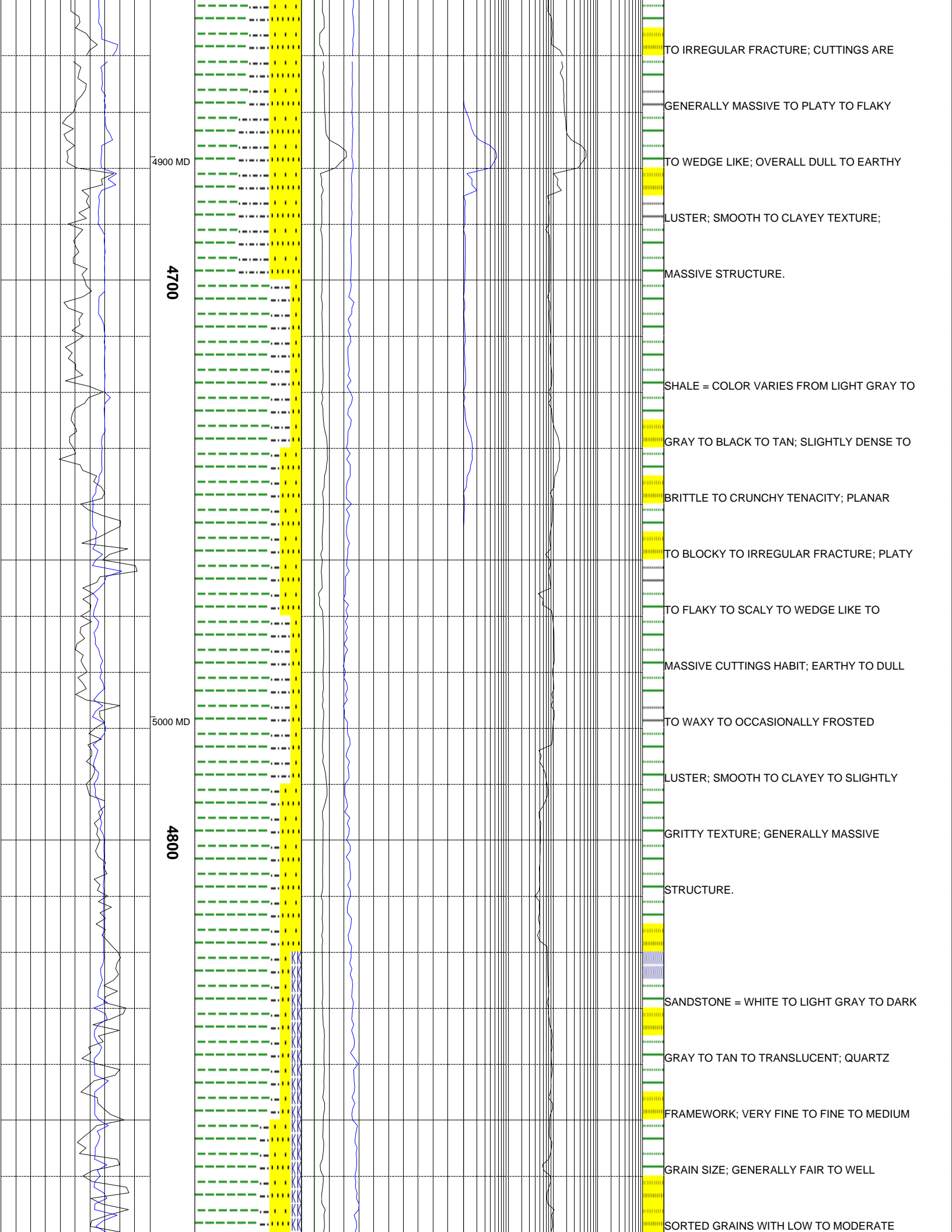
[illegible]

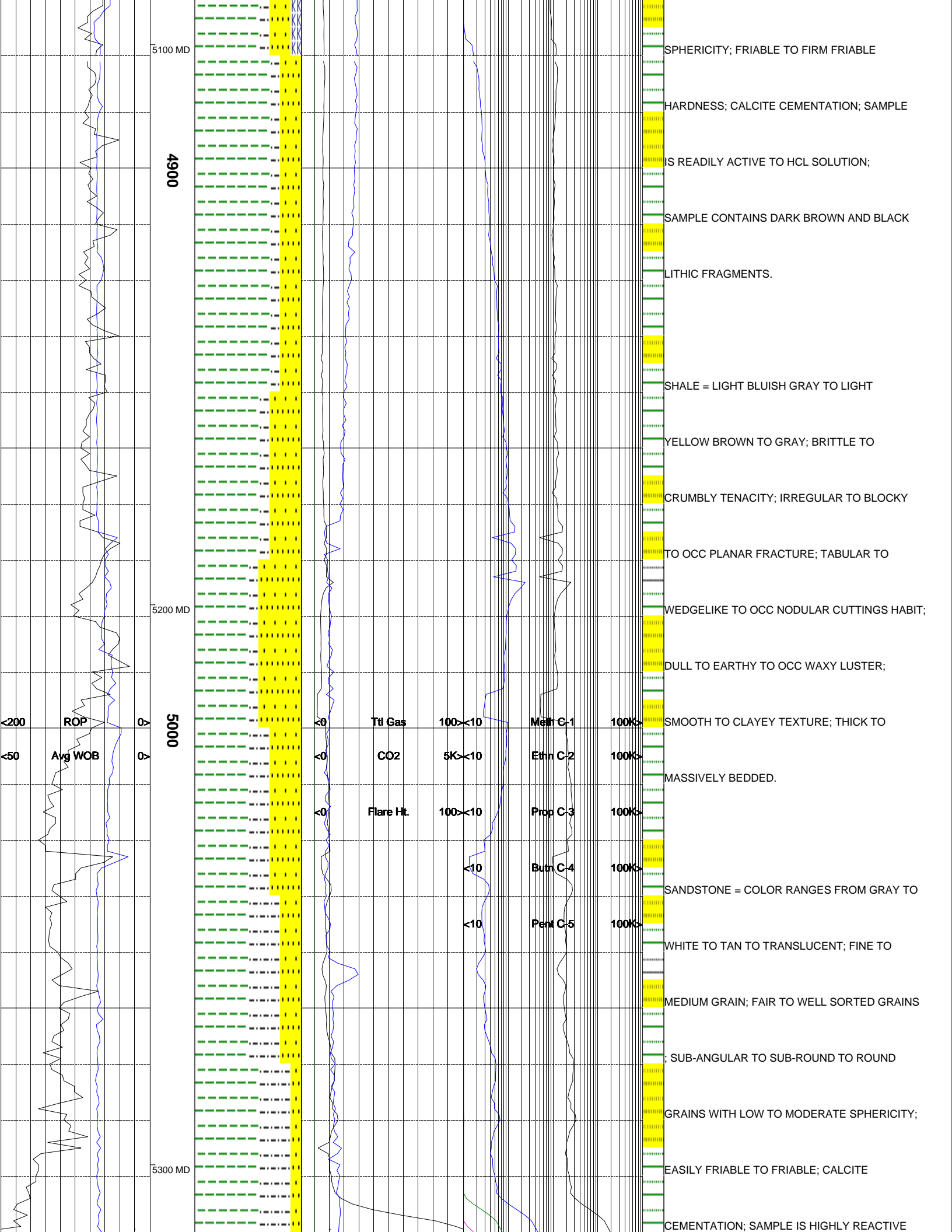


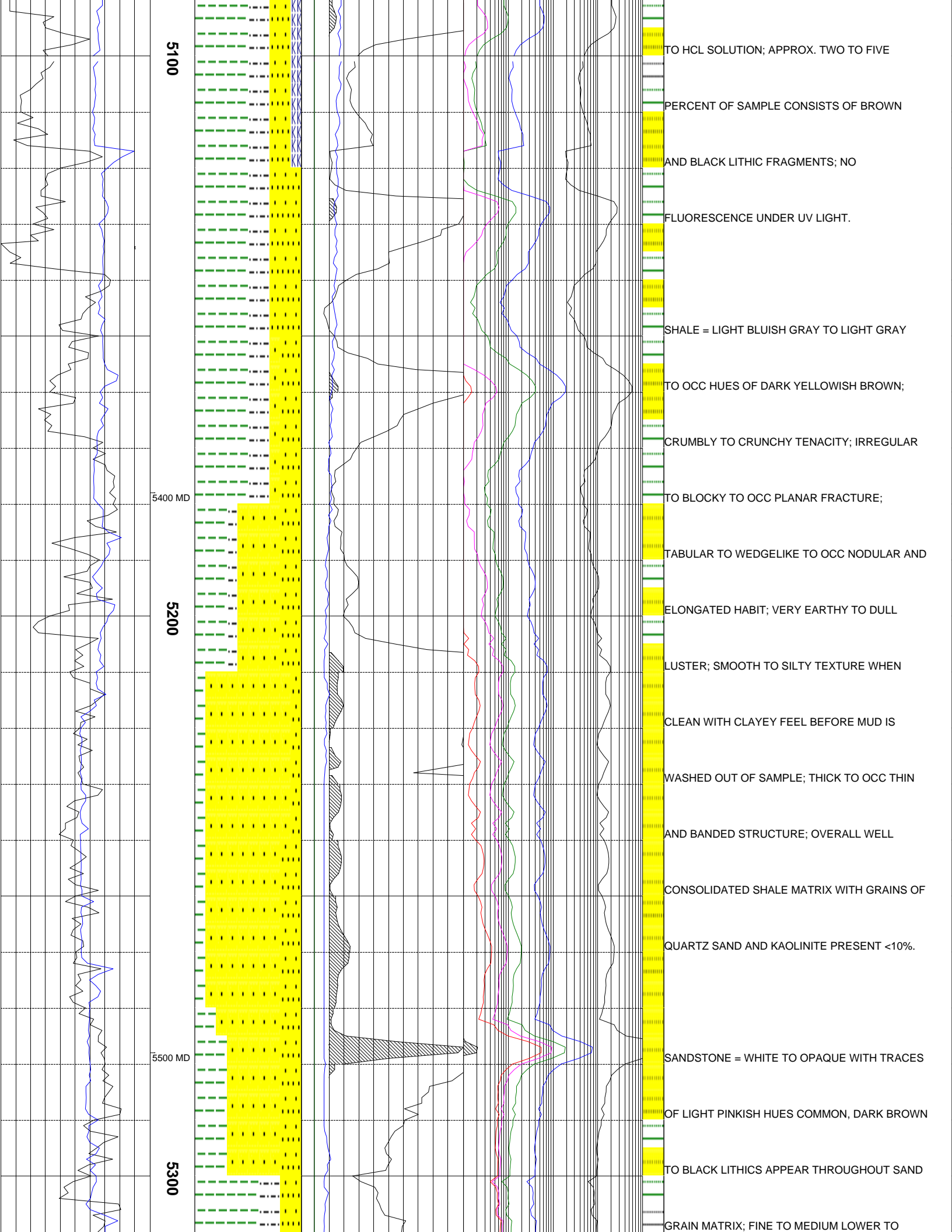


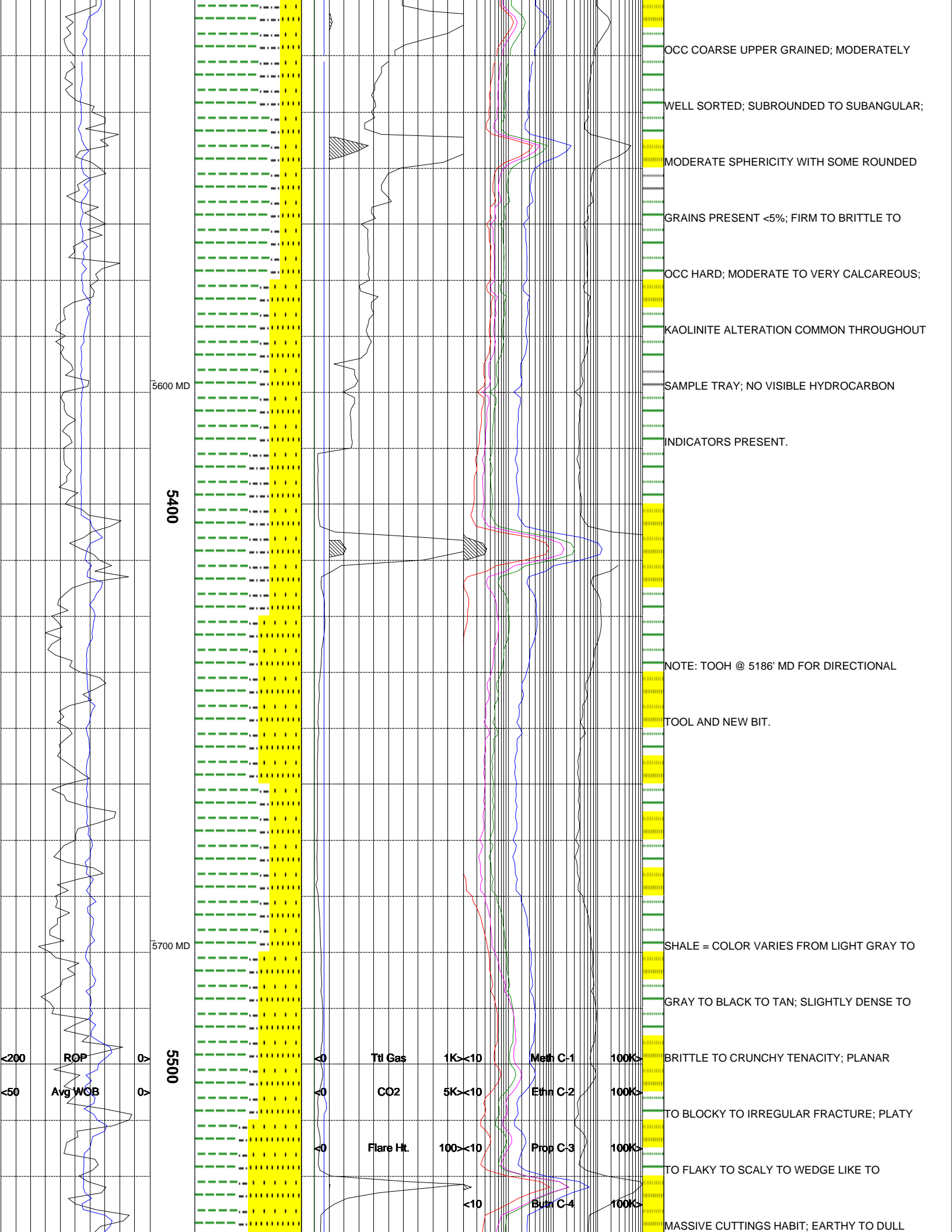


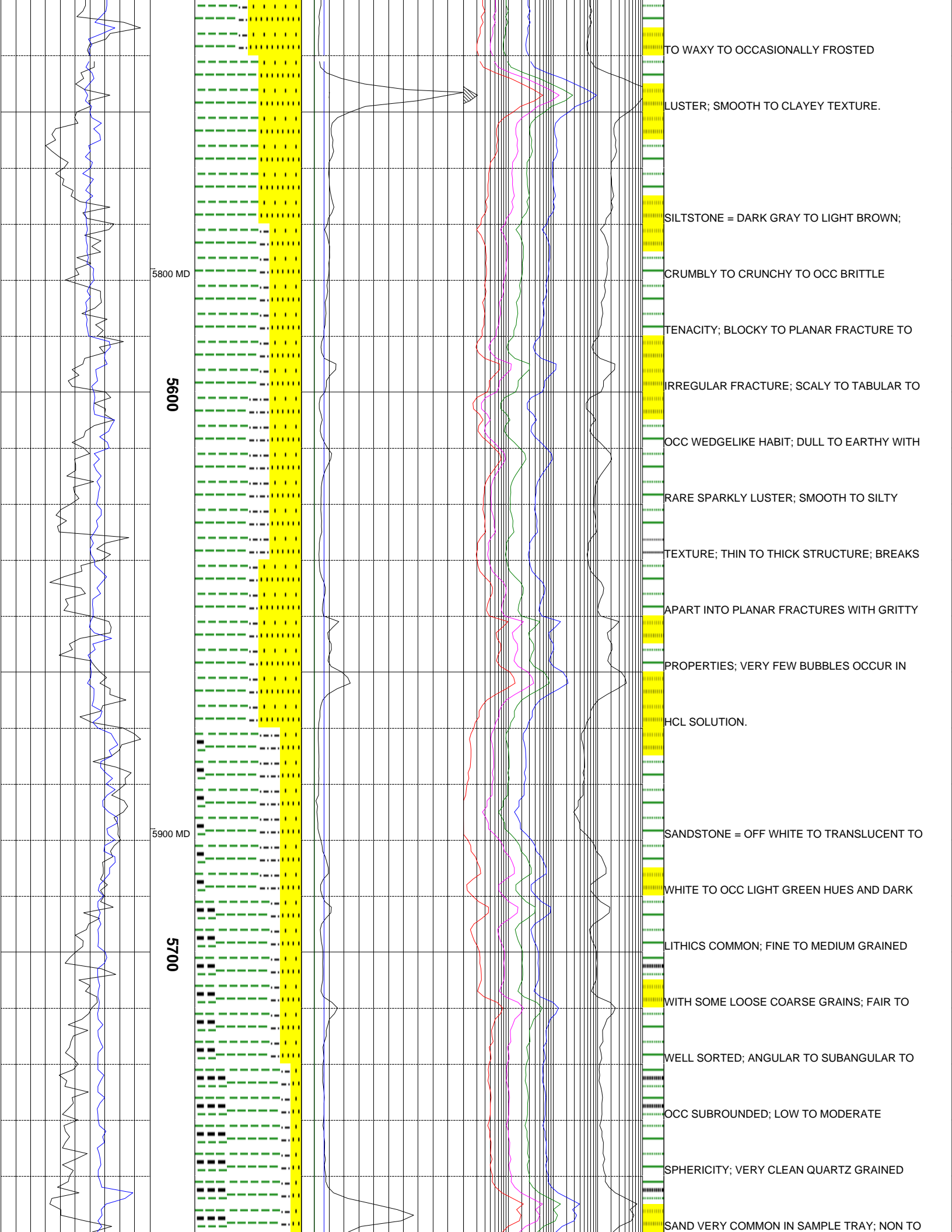


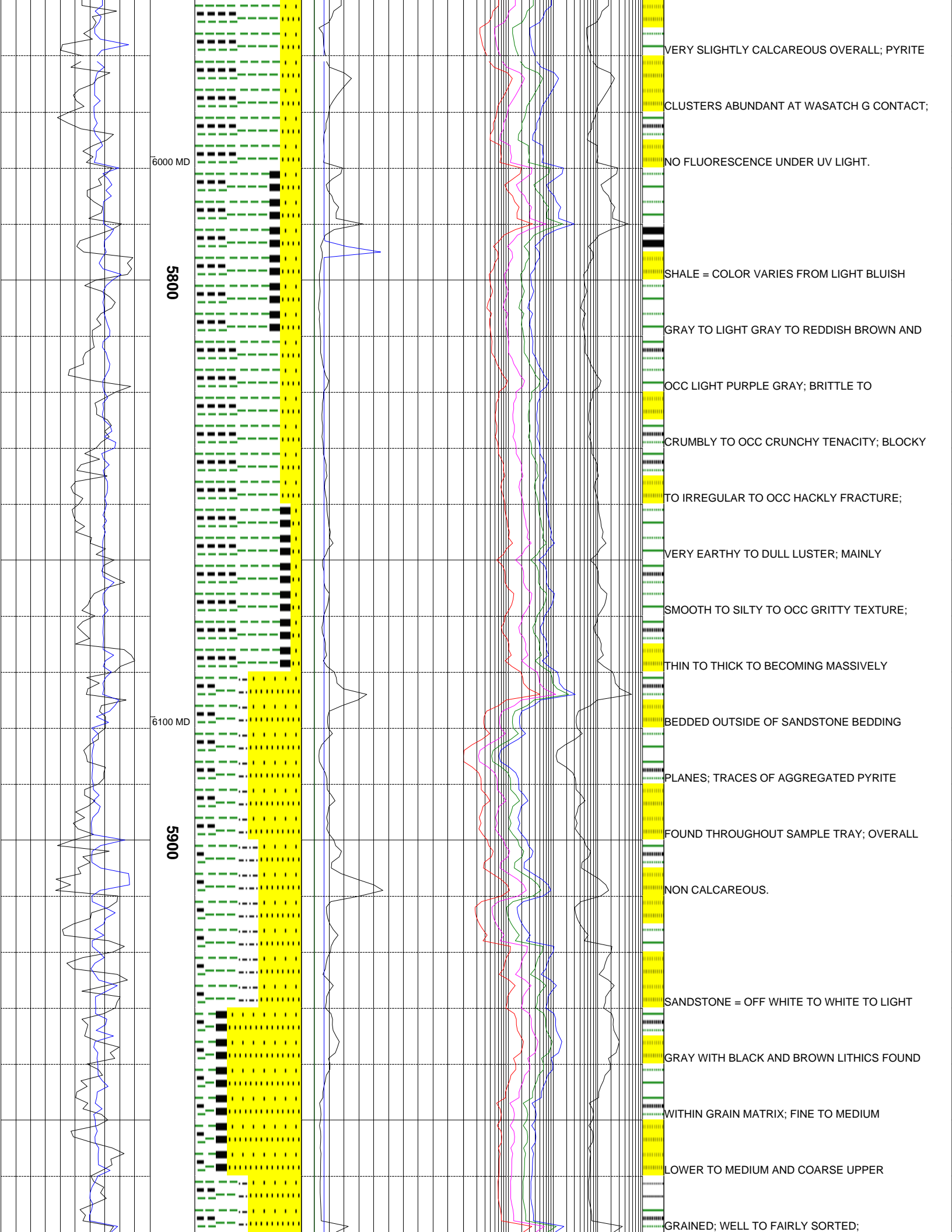


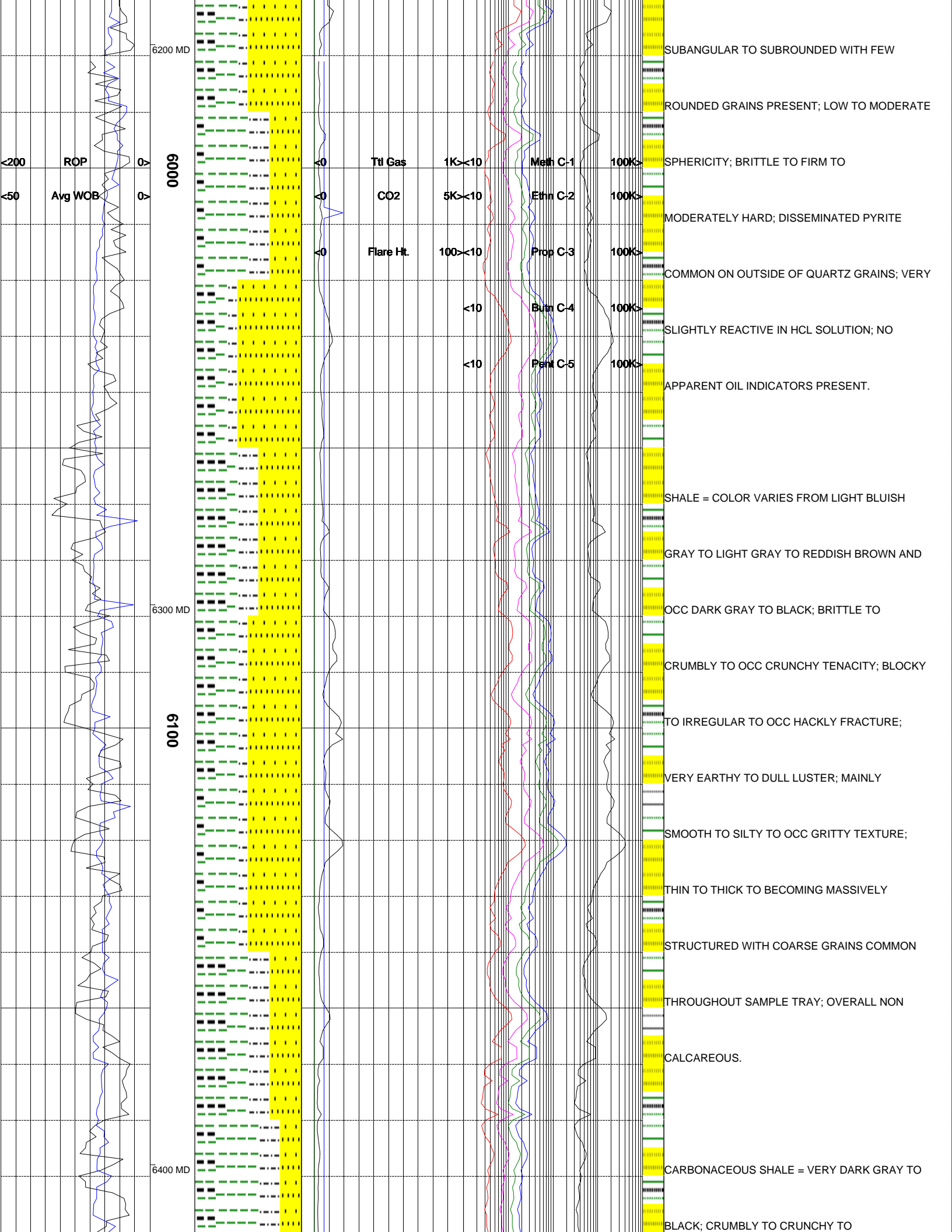




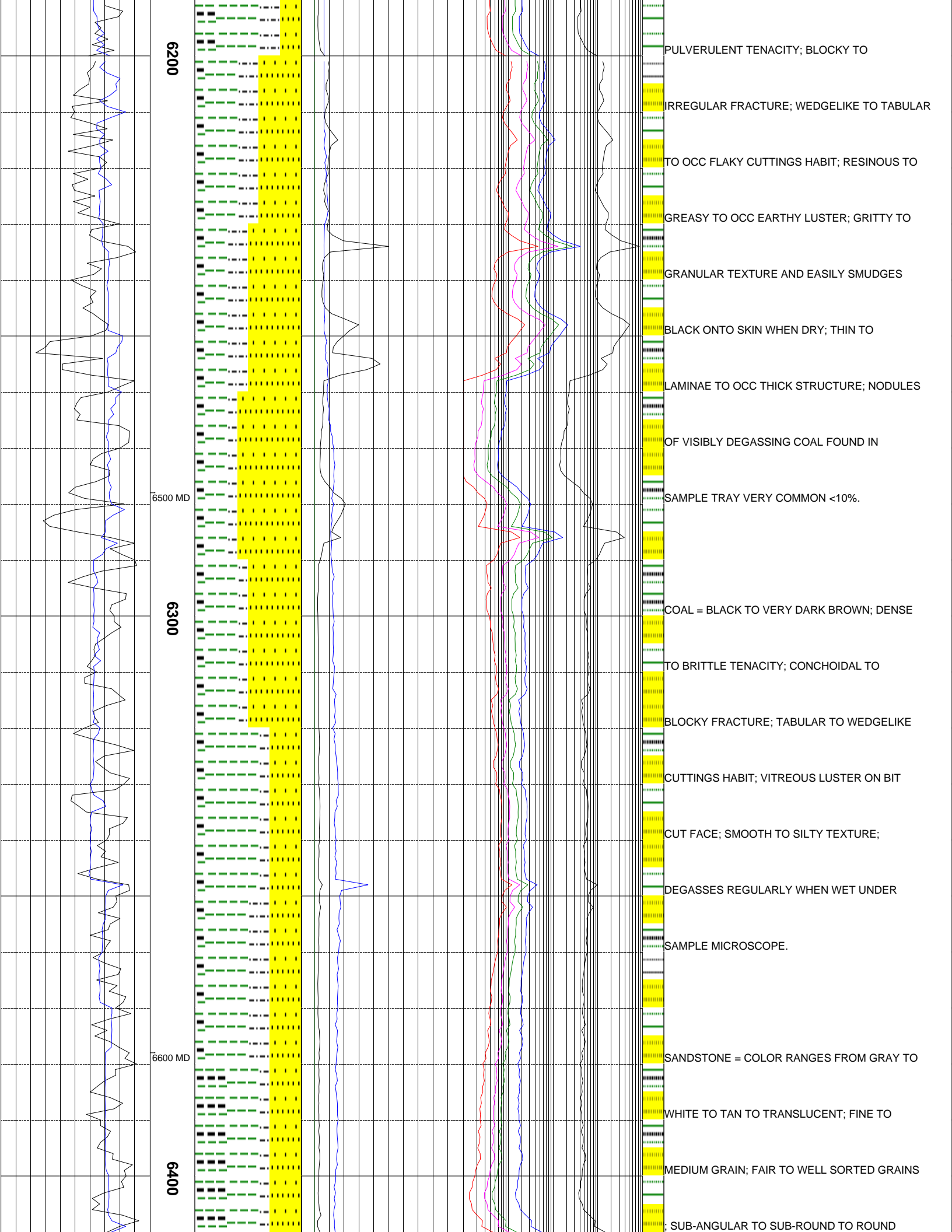


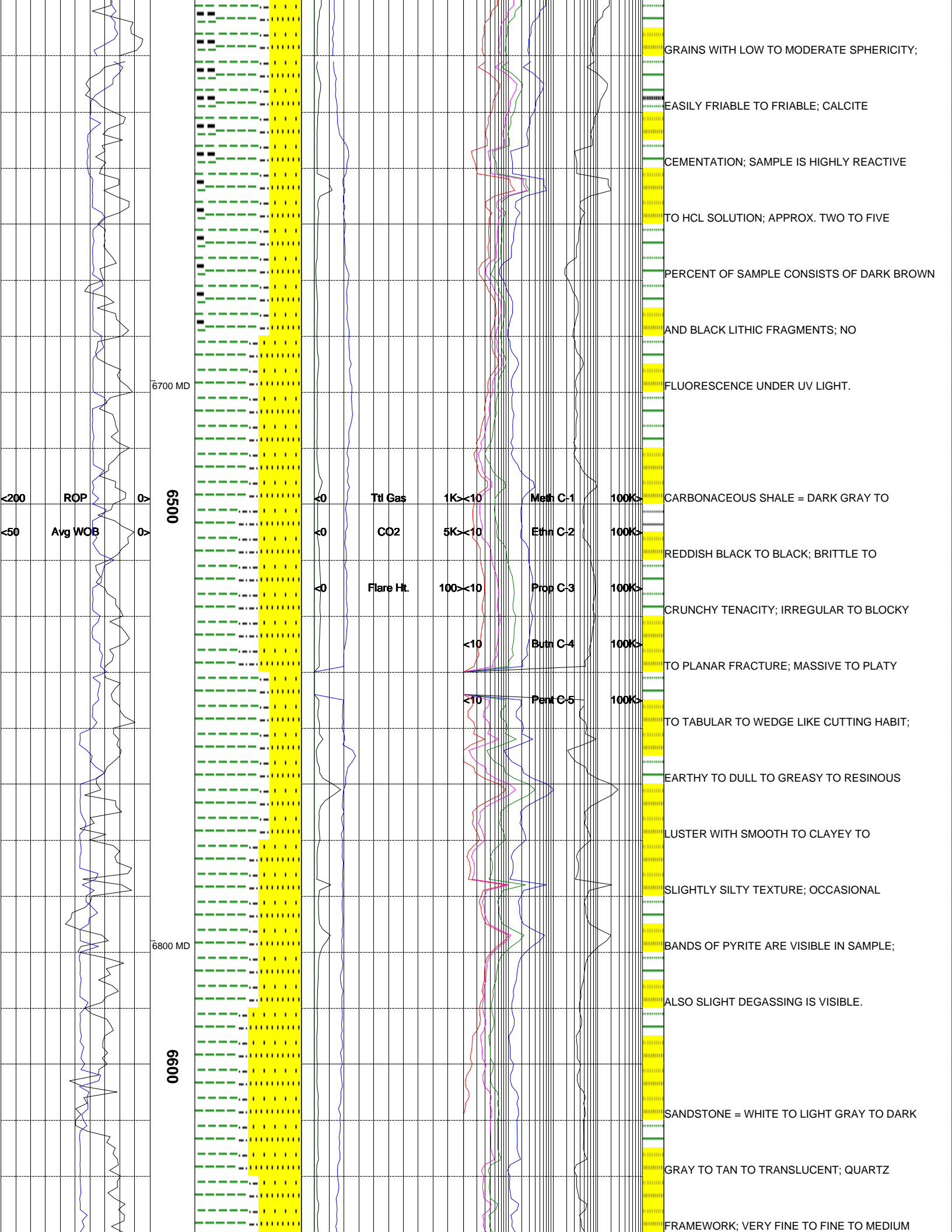


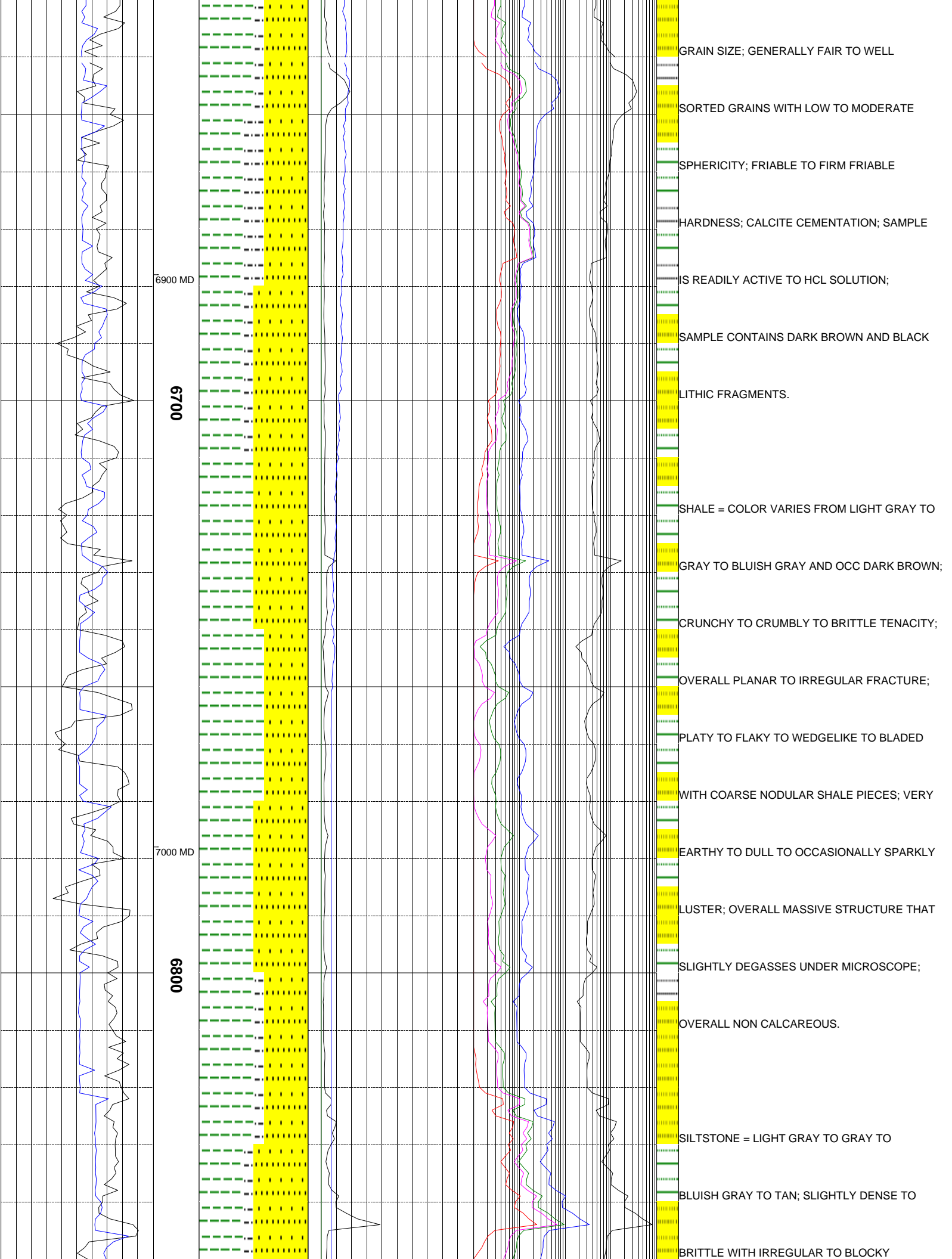


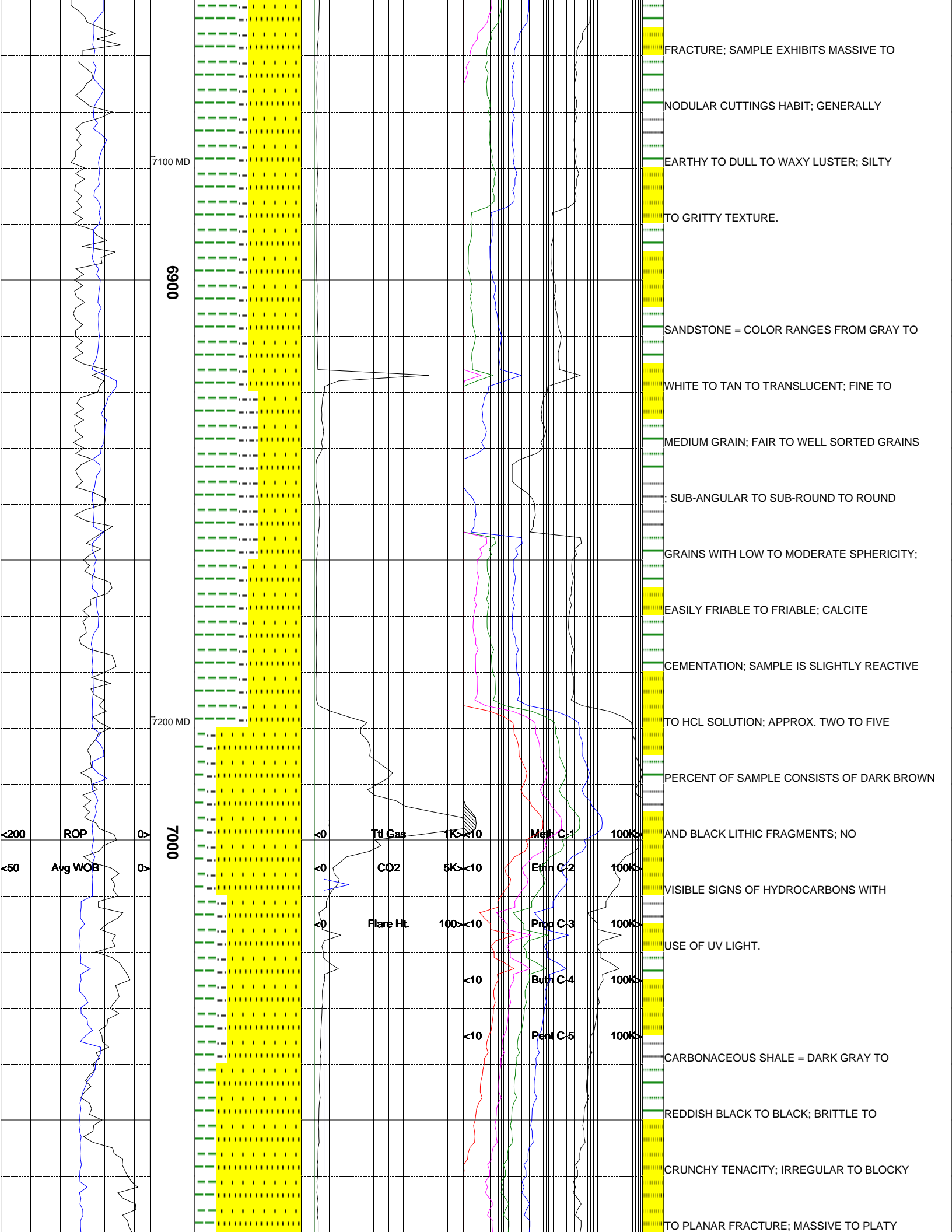


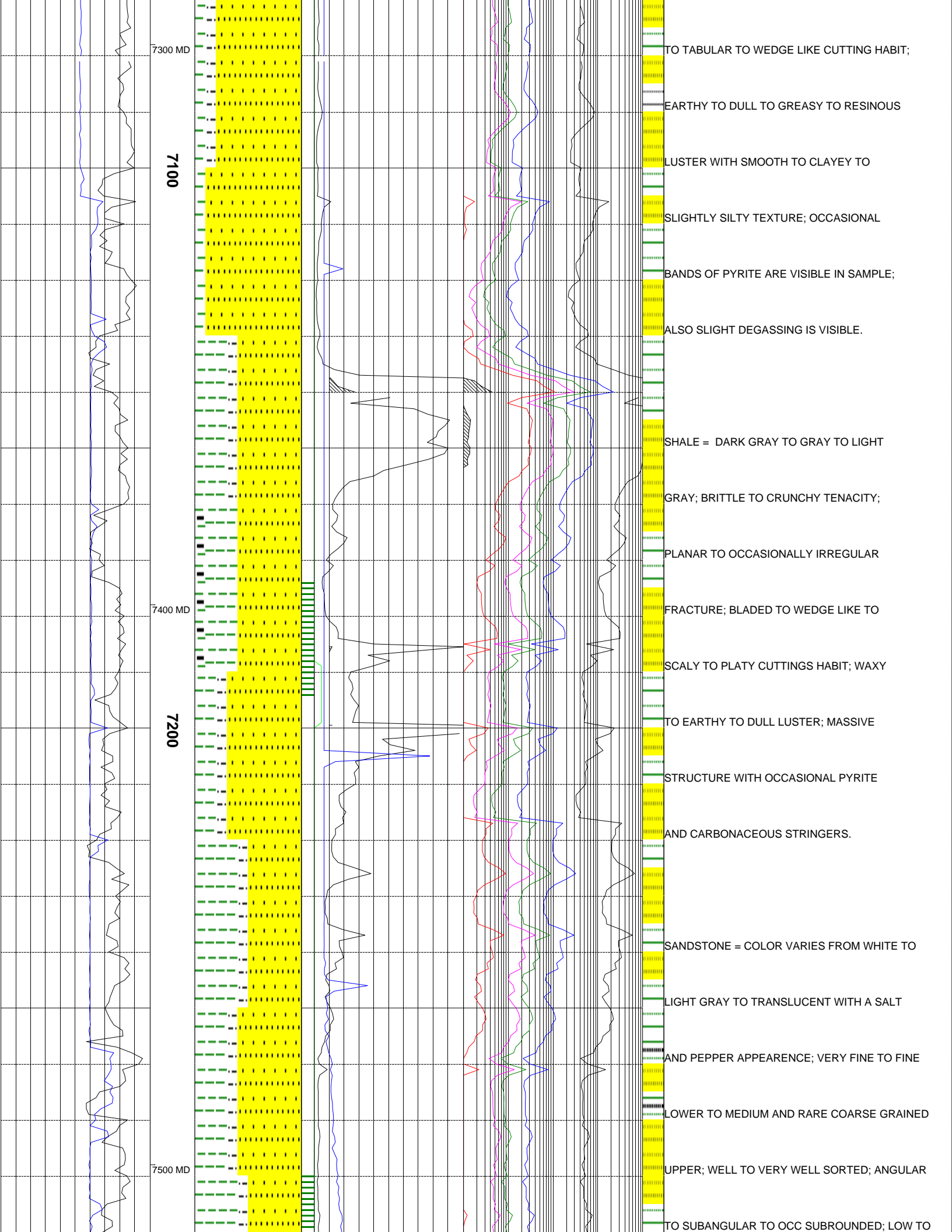


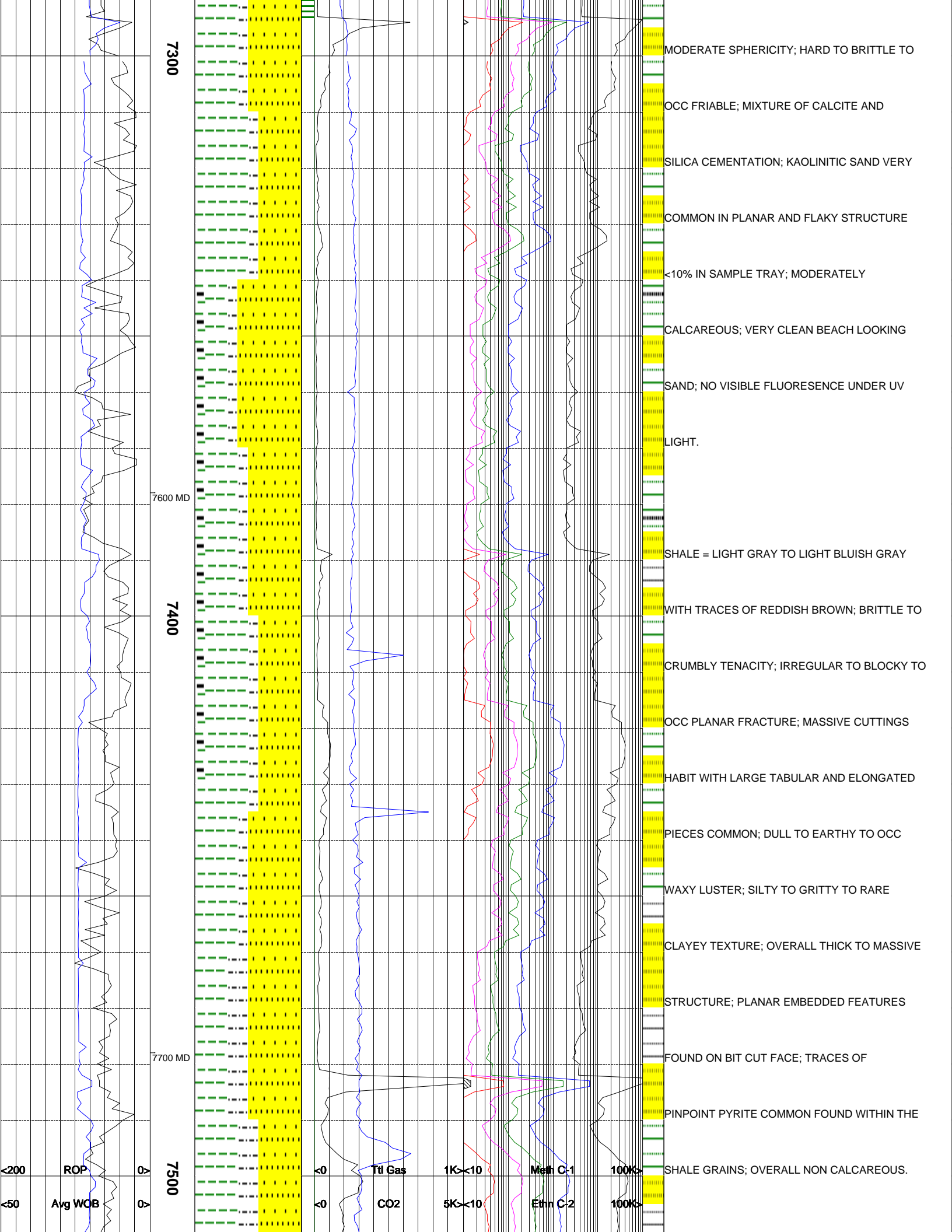


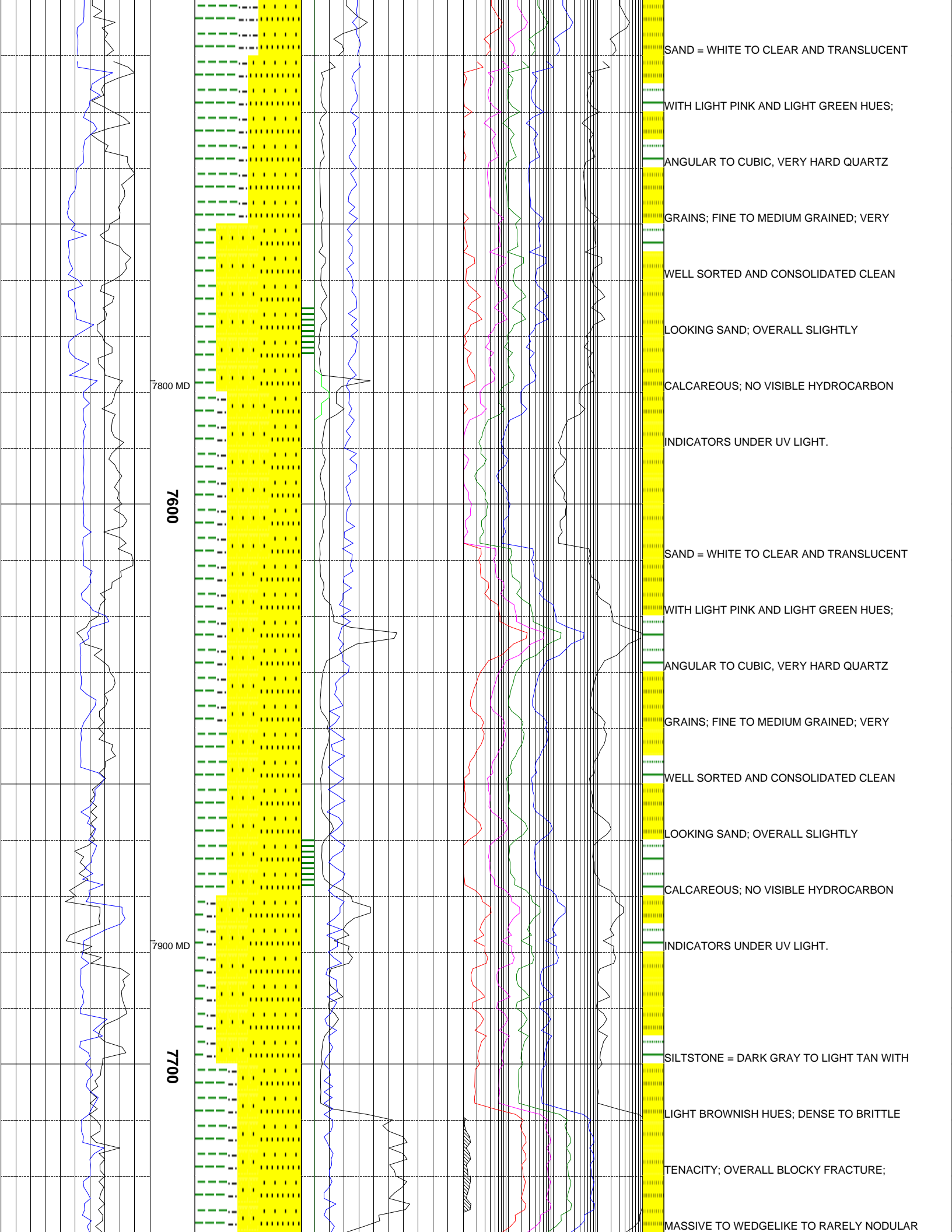


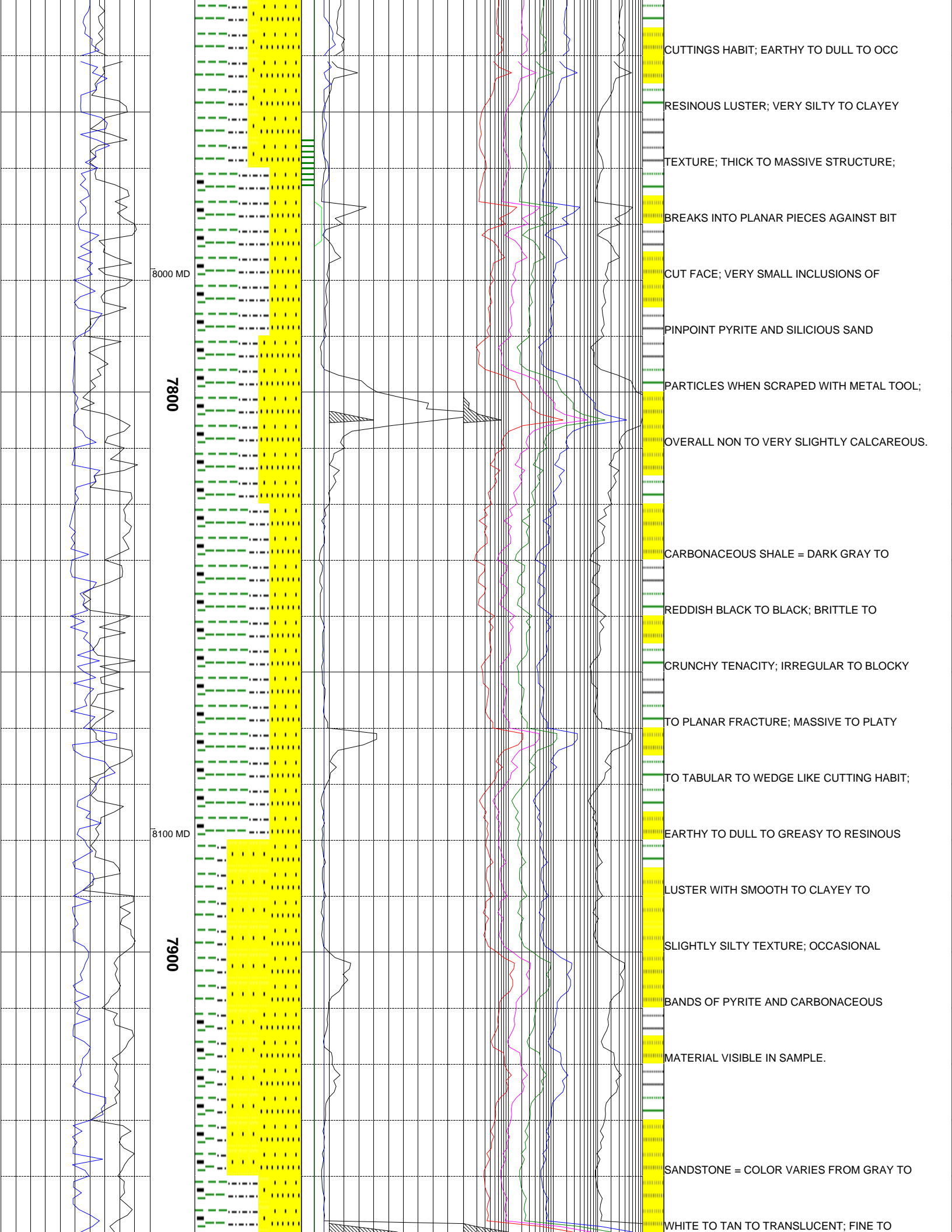




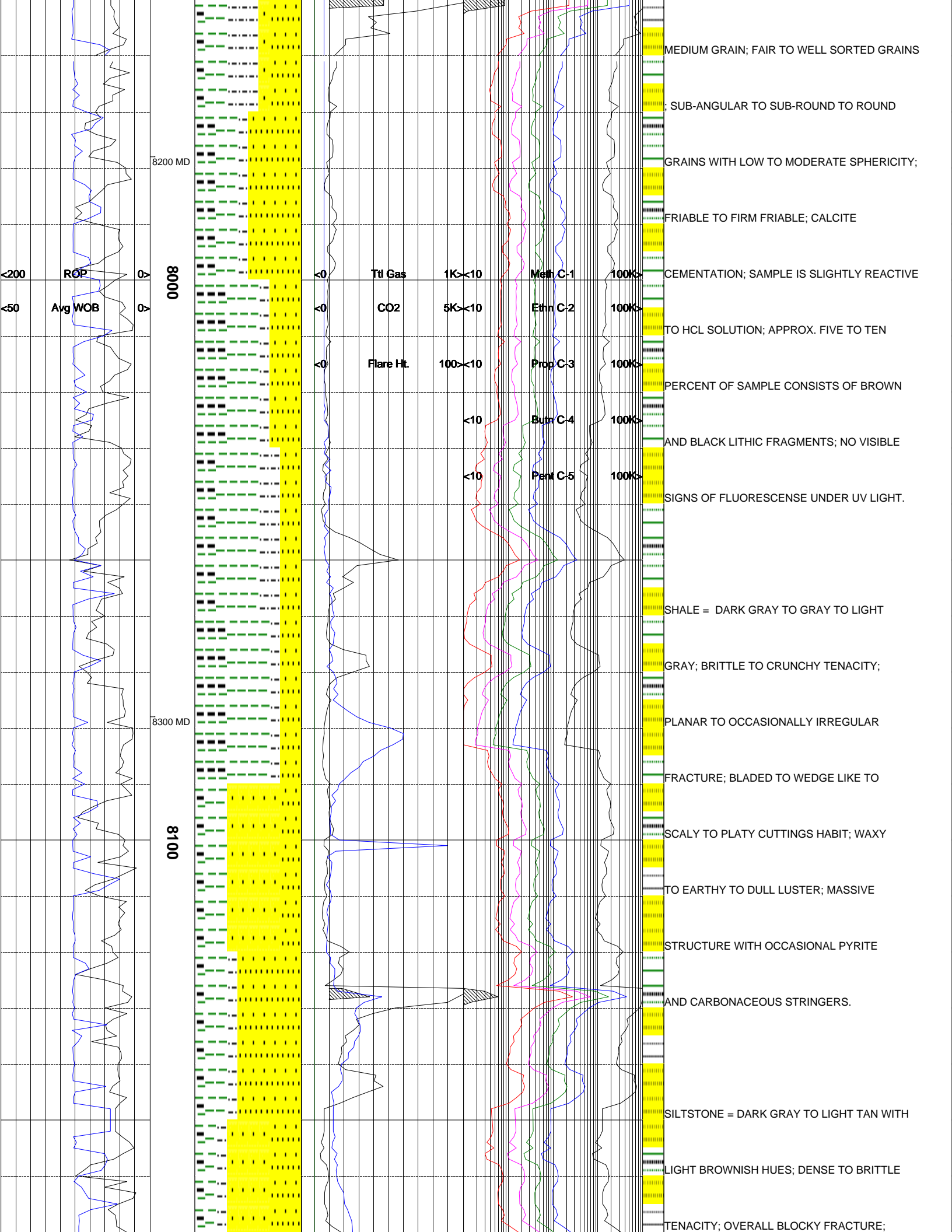












8200 MD

8000

8300 MD

8100

MEDIUM GRAIN; FAIR TO WELL SORTED GRAINS

; SUB-ANGULAR TO SUB-ROUND TO ROUND

GRAINS WITH LOW TO MODERATE SPHERICITY;

FRIABLE TO FIRM FRIABLE; CALCITE

CEMENTATION; SAMPLE IS SLIGHTLY REACTIVE

TO HCL SOLUTION; APPROX. FIVE TO TEN

PERCENT OF SAMPLE CONSISTS OF BROWN

AND BLACK LITHIC FRAGMENTS; NO VISIBLE

SIGNS OF FLUORESCENCE UNDER UV LIGHT.

SHALE = DARK GRAY TO GRAY TO LIGHT

GRAY; BRITTLE TO CRUNCHY TENACITY;

PLANAR TO OCCASIONALLY IRREGULAR

FRACTURE; BLADED TO WEDGE LIKE TO

SCALY TO PLATY CUTTINGS HABIT; WAXY

TO EARTHY TO DULL LUSTER; MASSIVE

STRUCTURE WITH OCCASIONAL PYRITE

AND CARBONACEOUS STRINGERS.

SILTSTONE = DARK GRAY TO LIGHT TAN WITH

LIGHT BROWNISH HUES; DENSE TO BRITTLE

TENACITY; OVERALL BLOCKY FRACTURE;

<200 ROP

<50 Avg WOB

Ttl Gas

1K<10

Meth C-1

100K>

CO2

5K<10

Ethn C-2

100K>

Flare Ht.

100>10

Prop C-3

100K>

<10

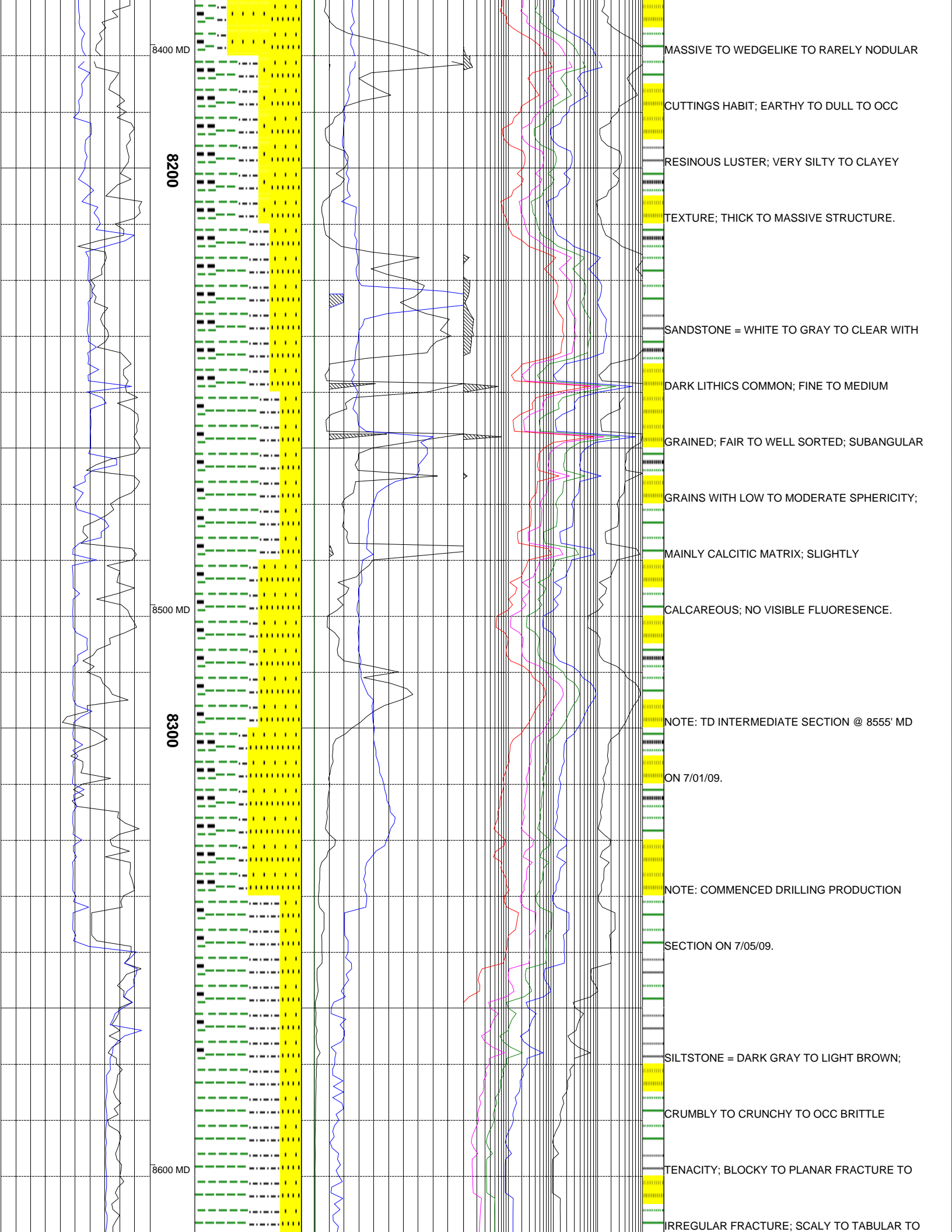
Butn C-4

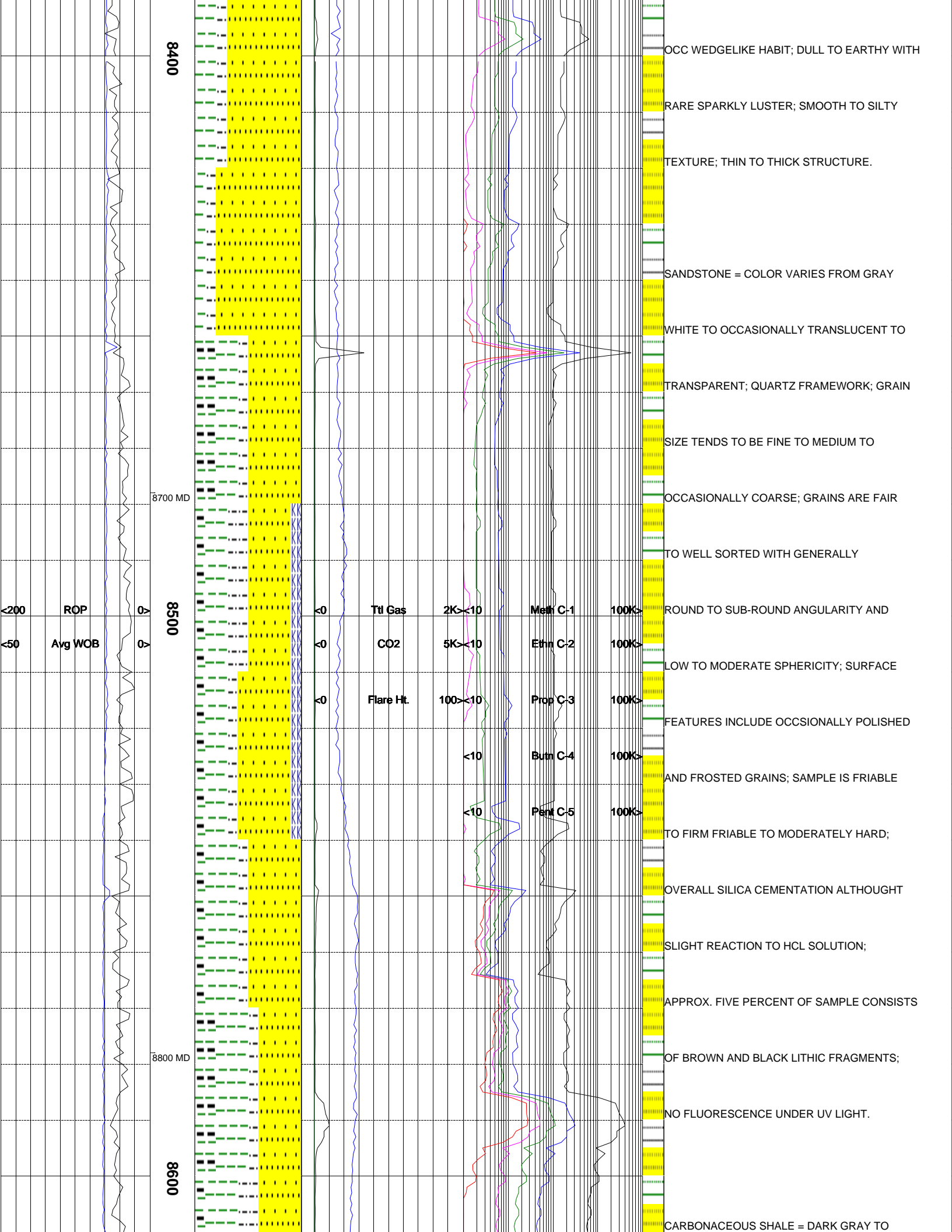
100K>

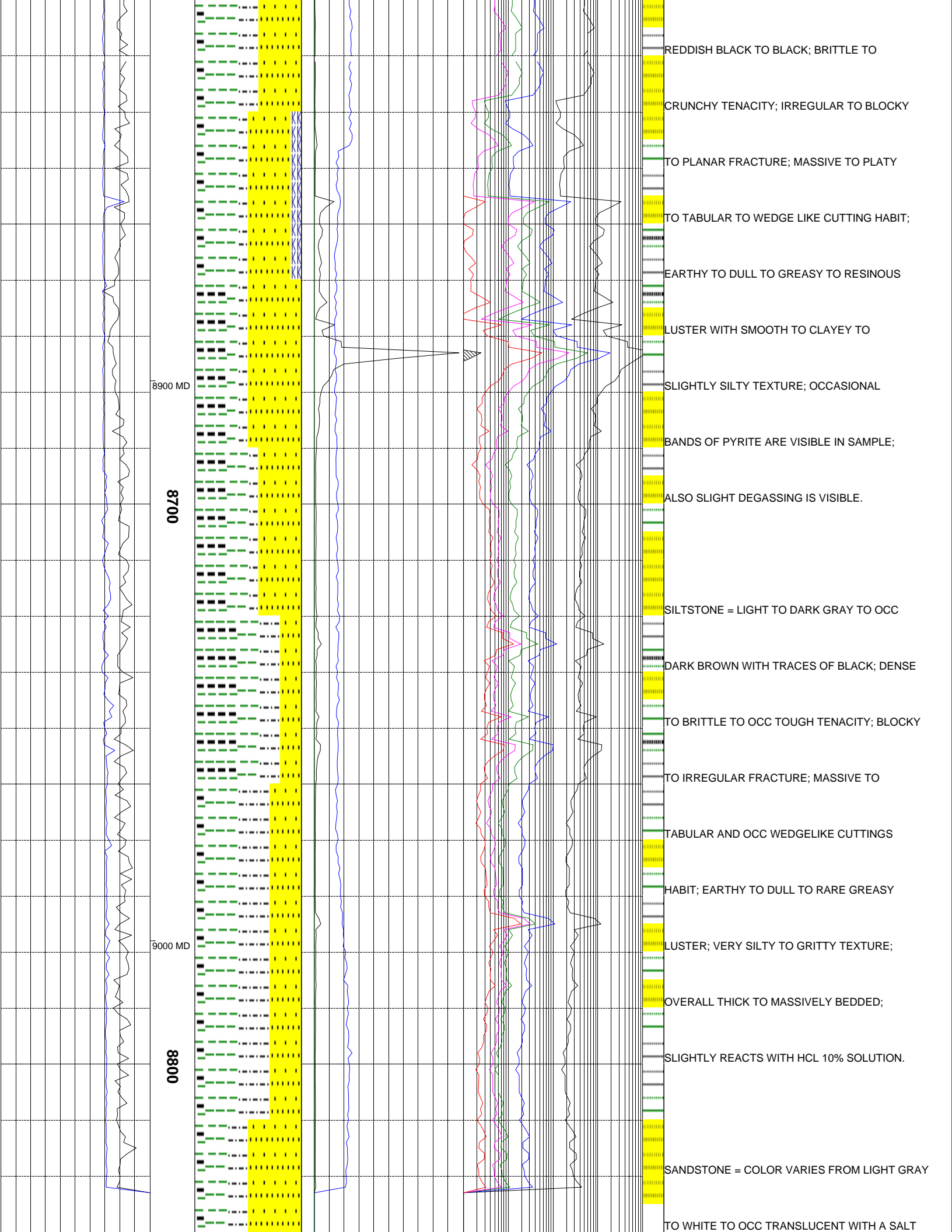
<10

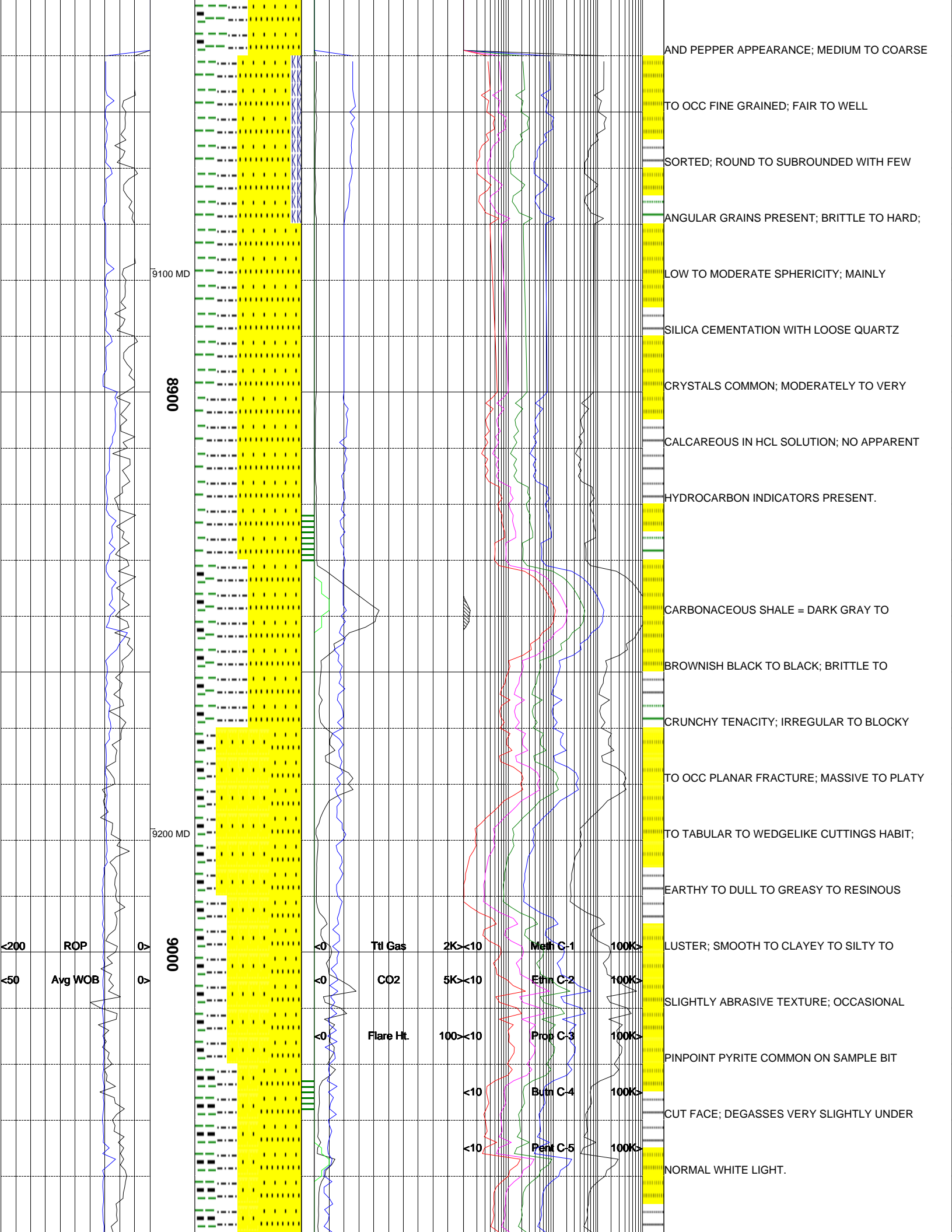
Pent C-5

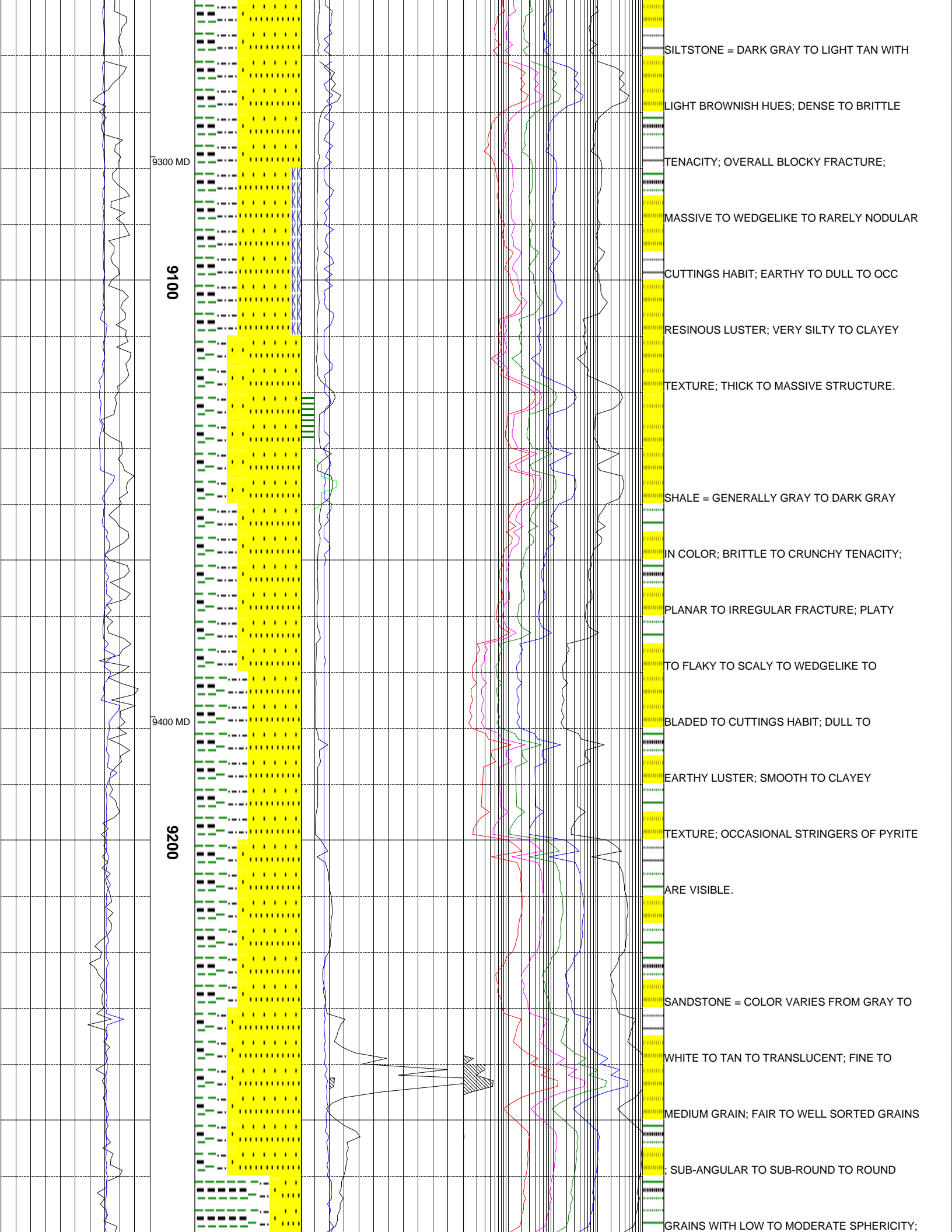
100K>

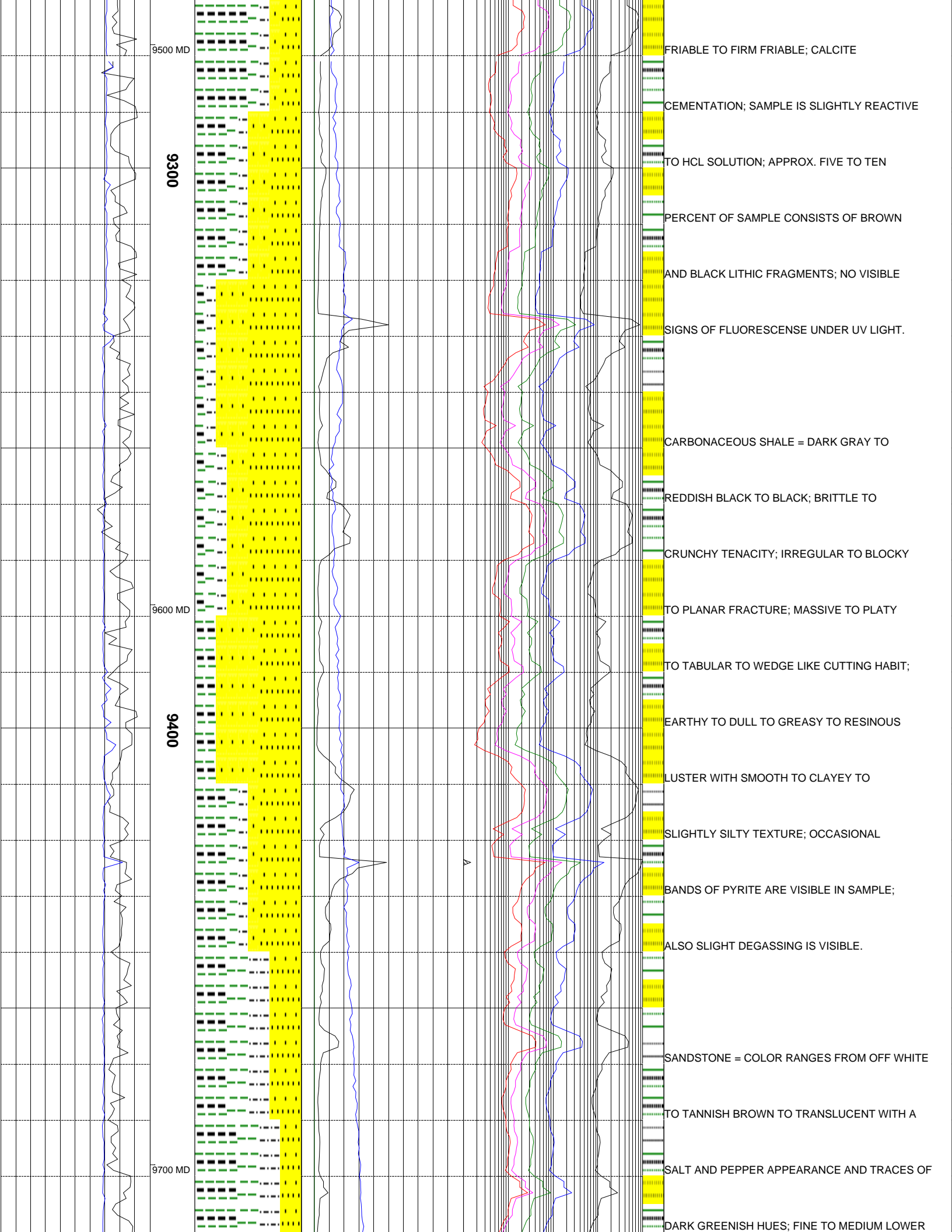


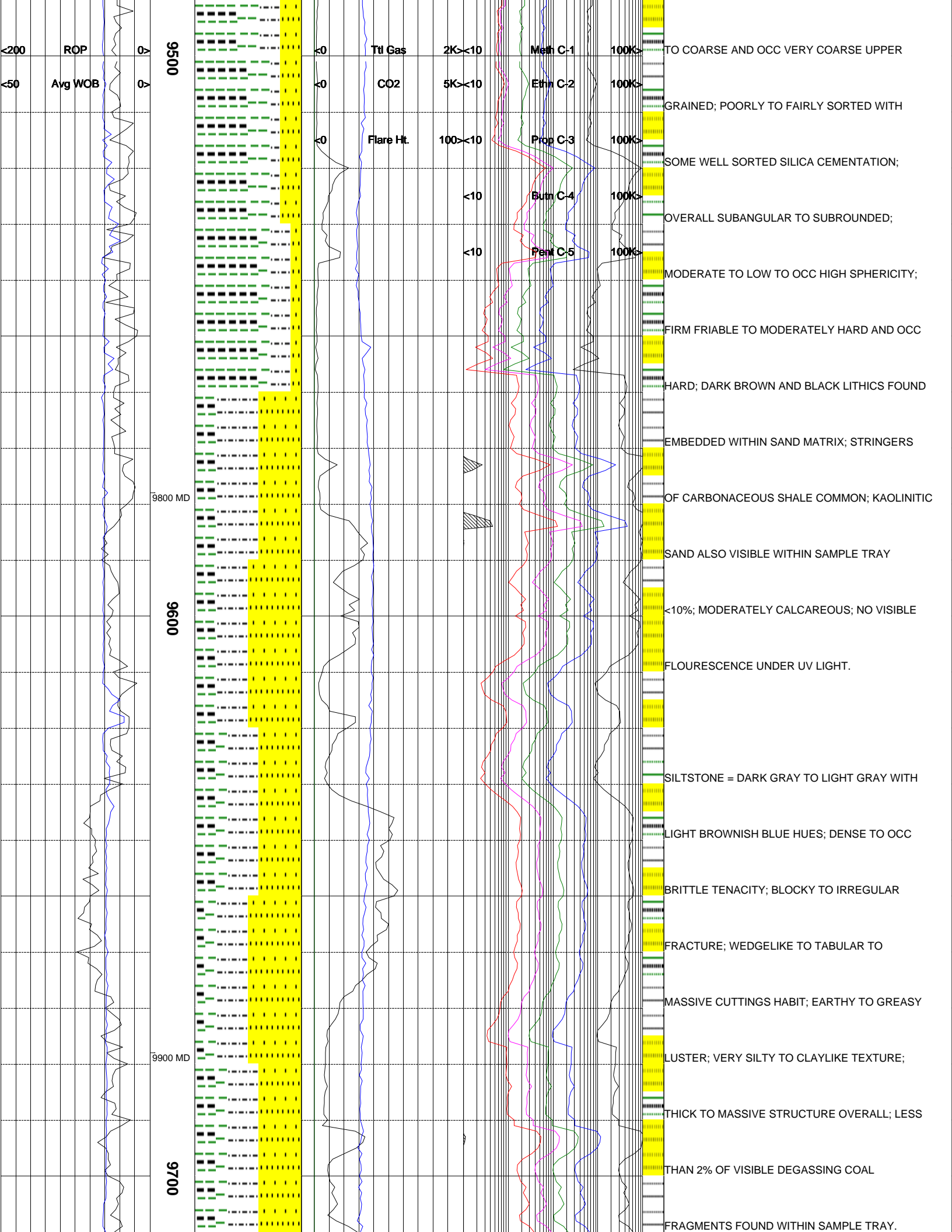




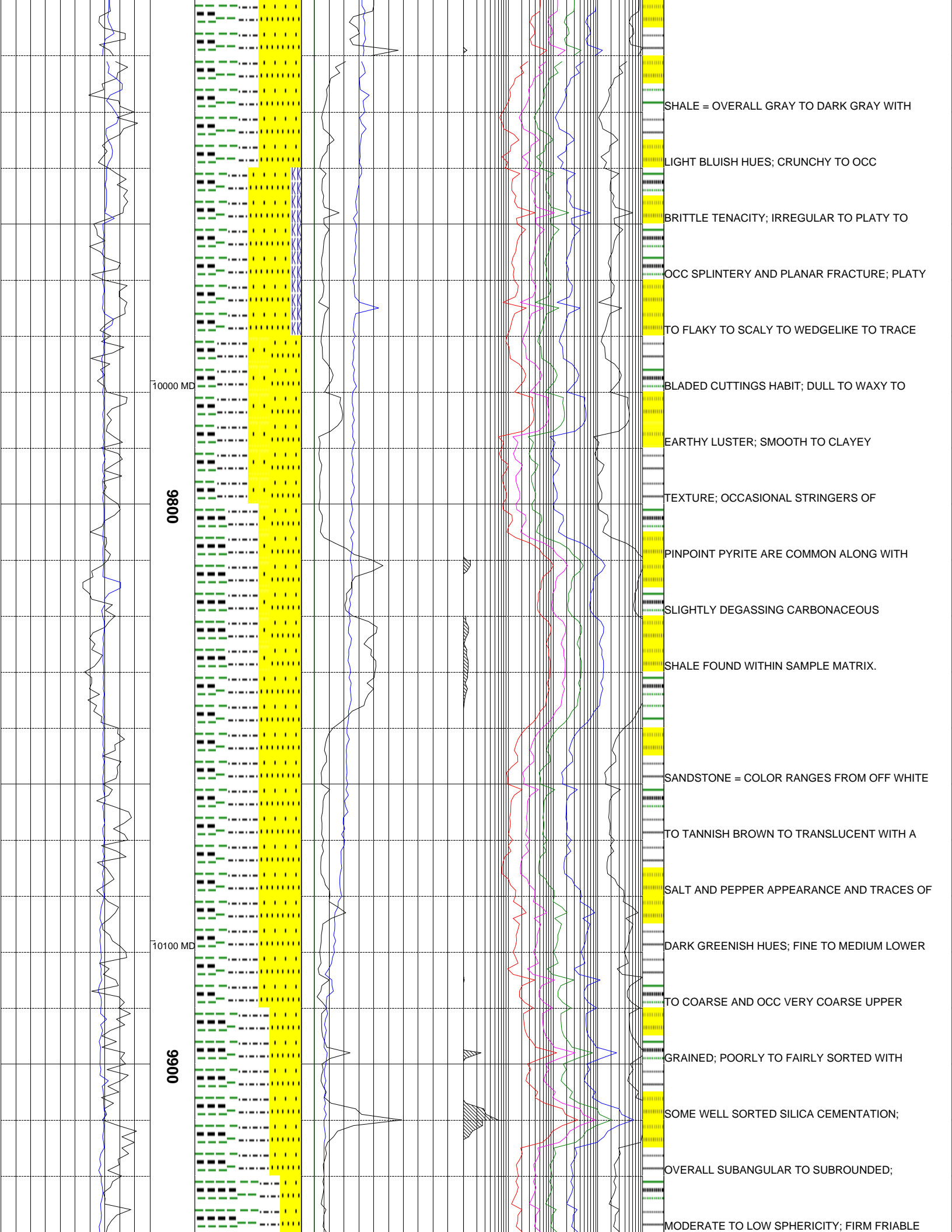


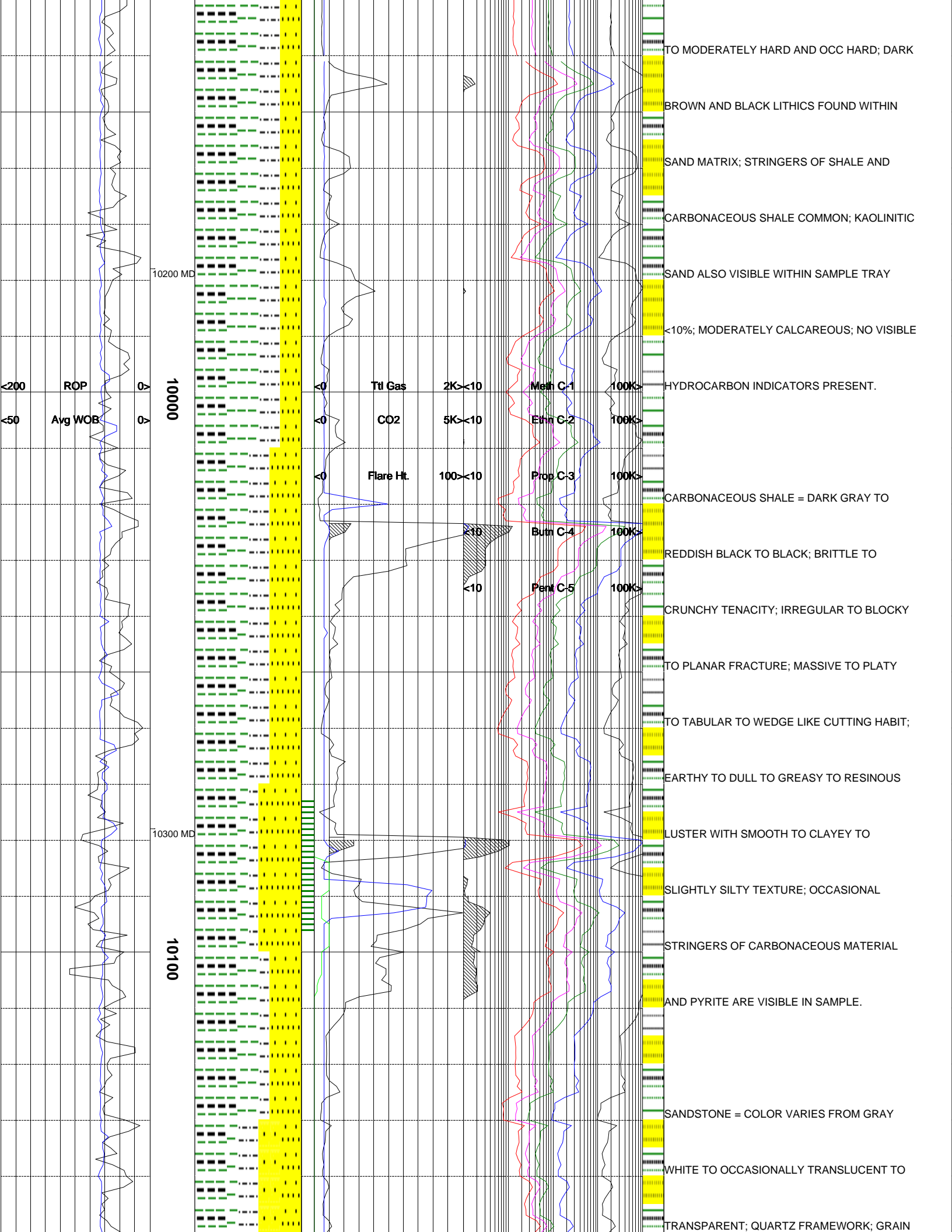


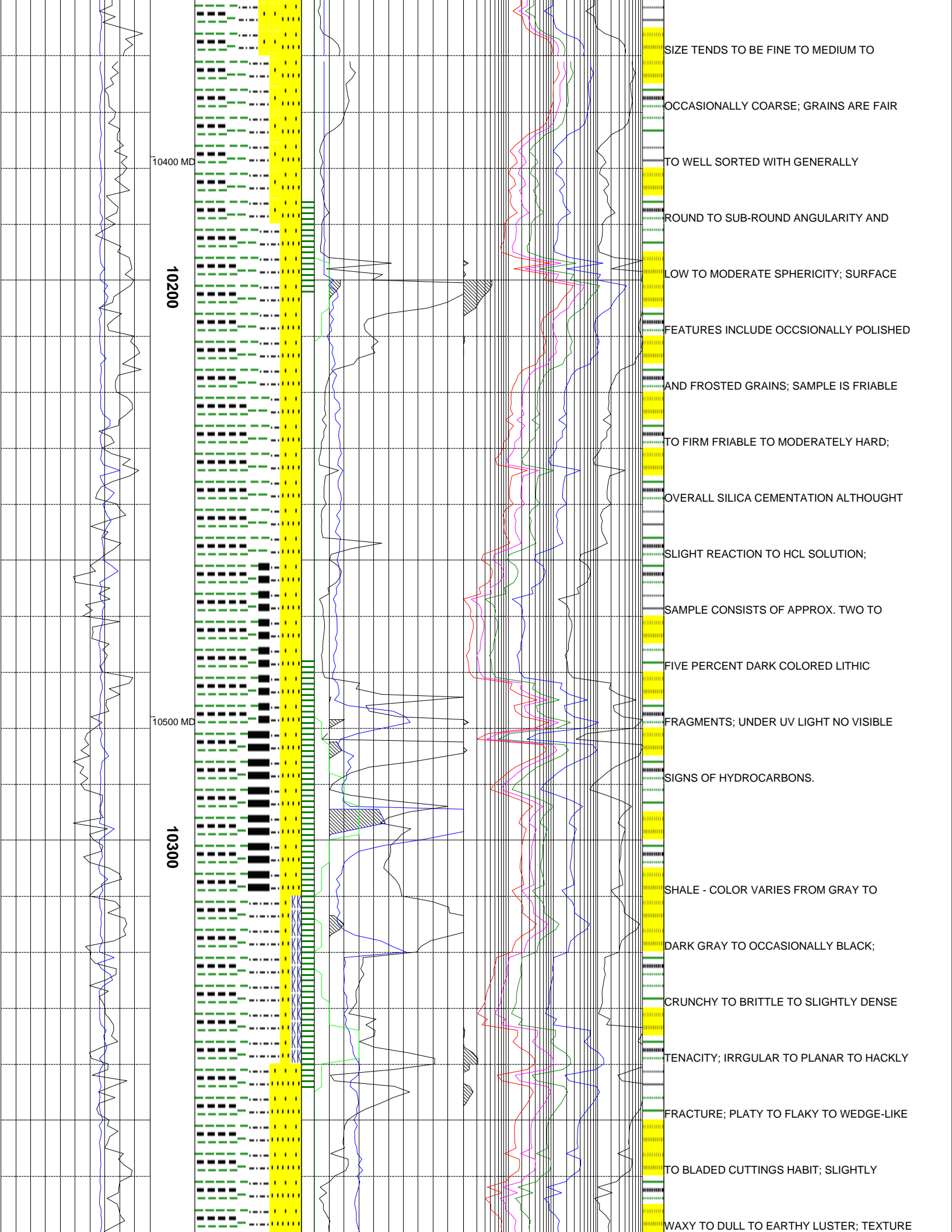


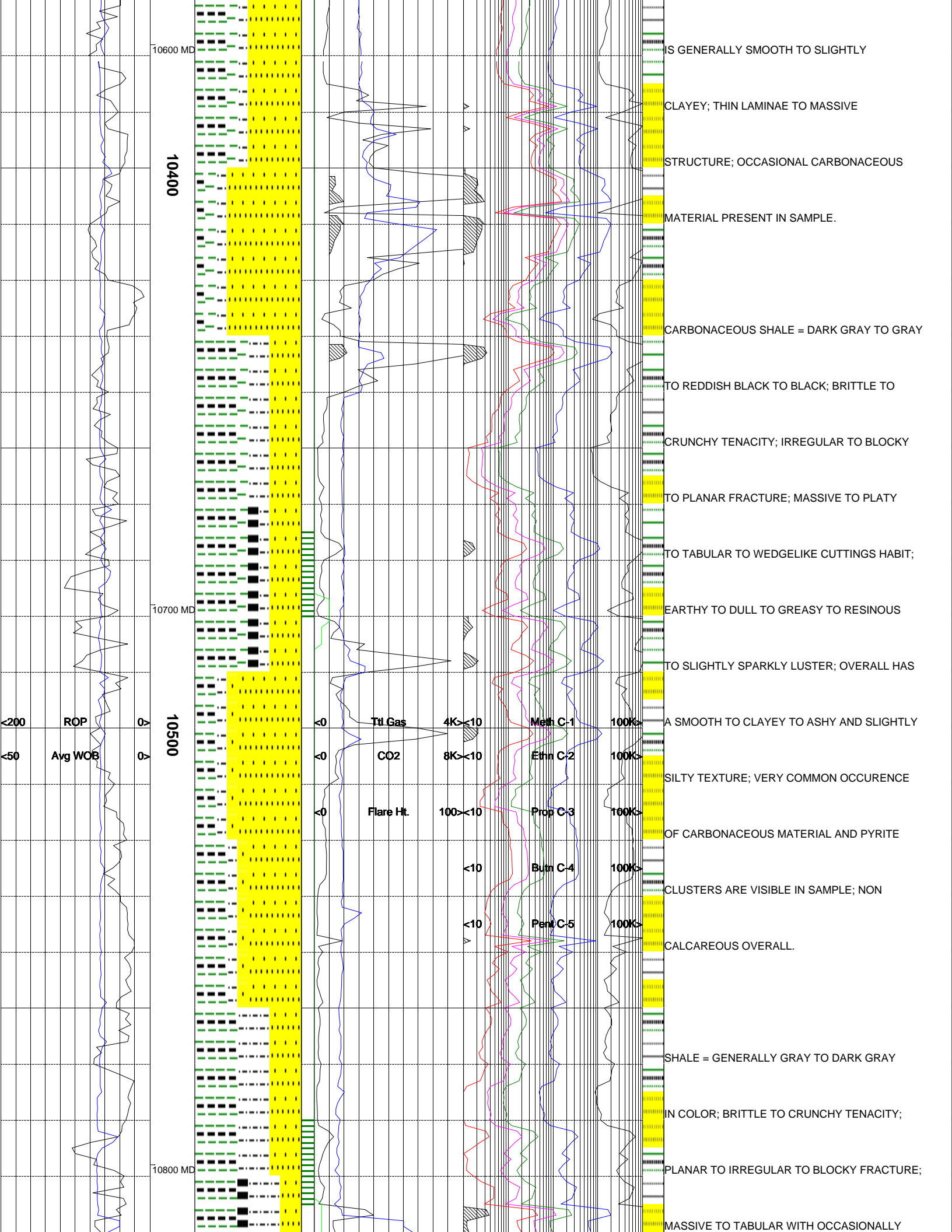


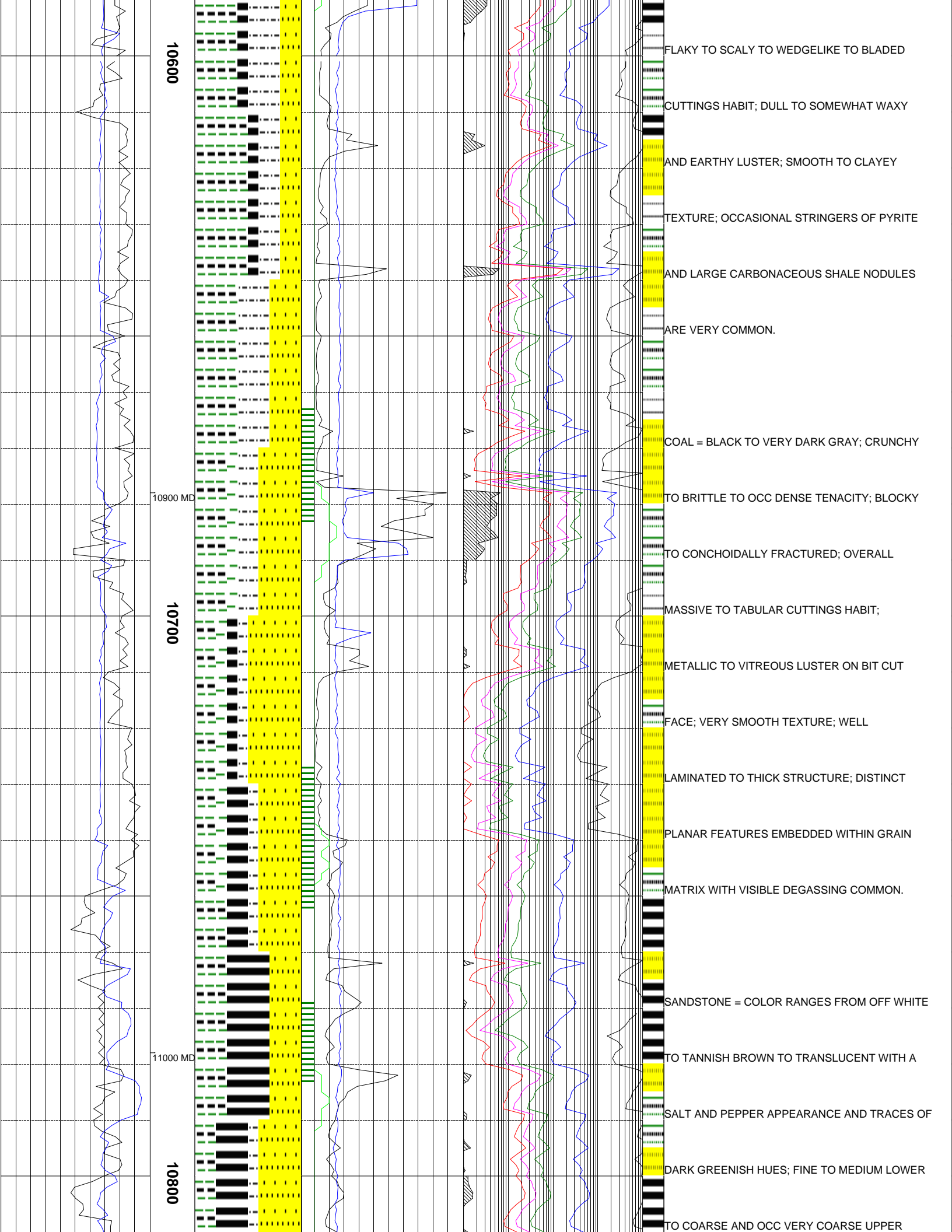


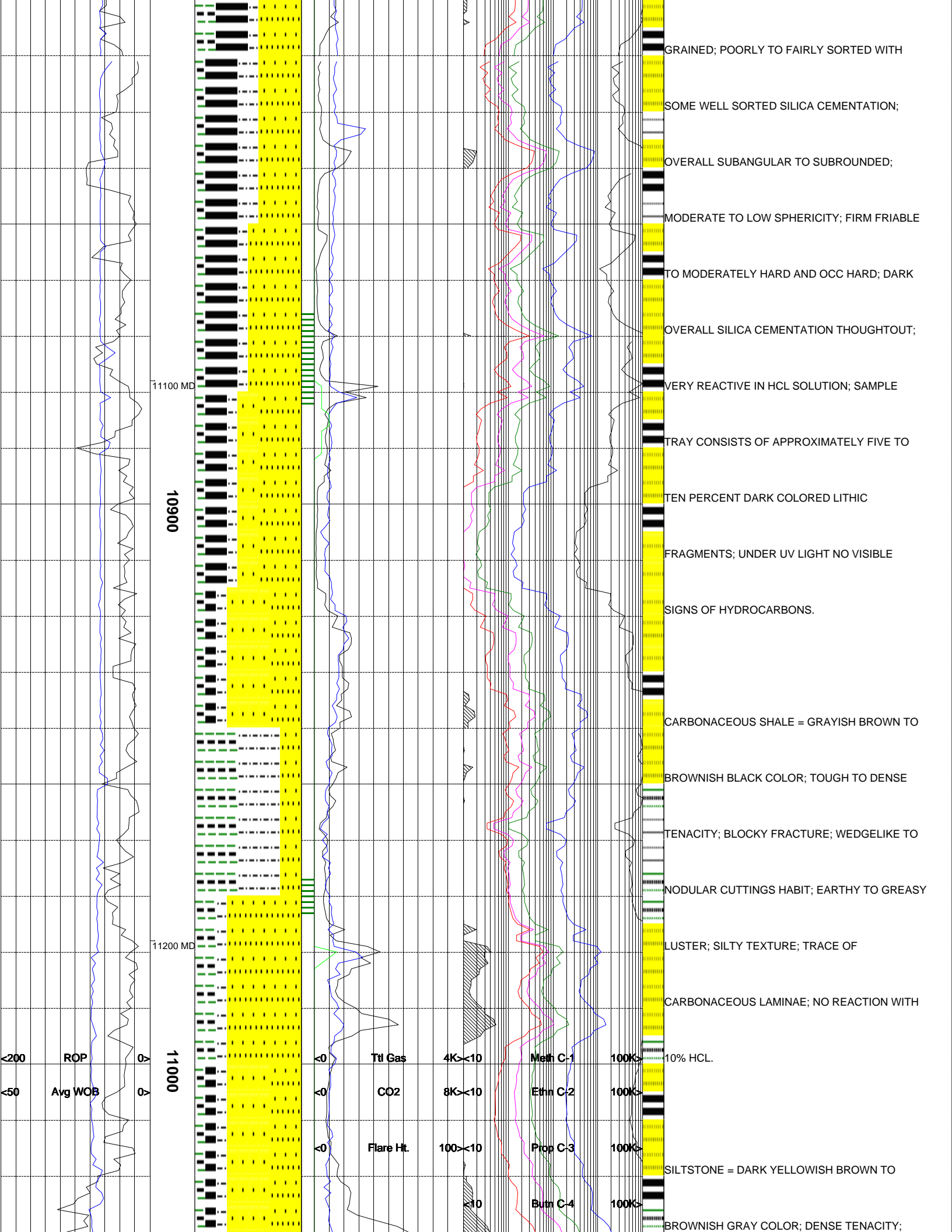


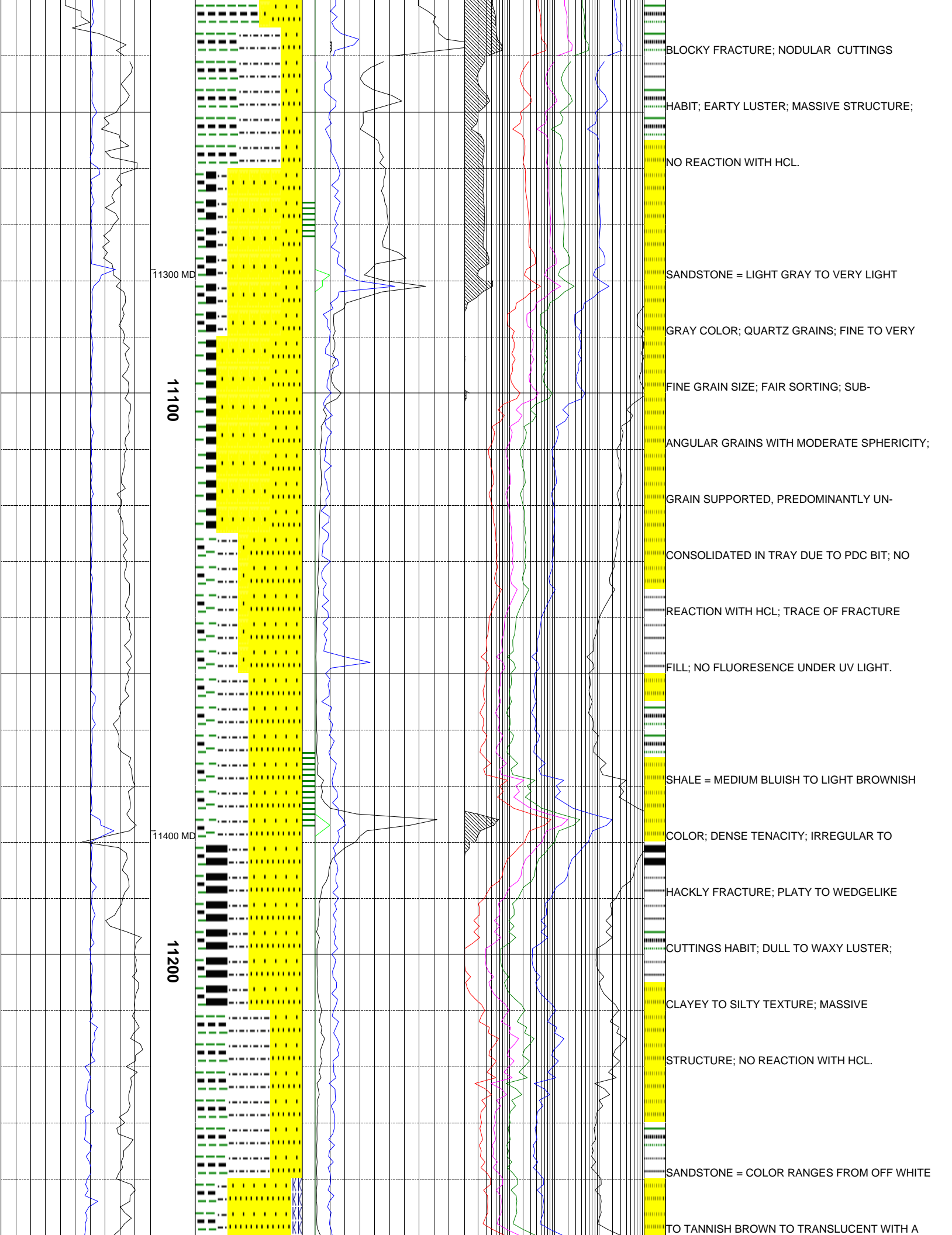




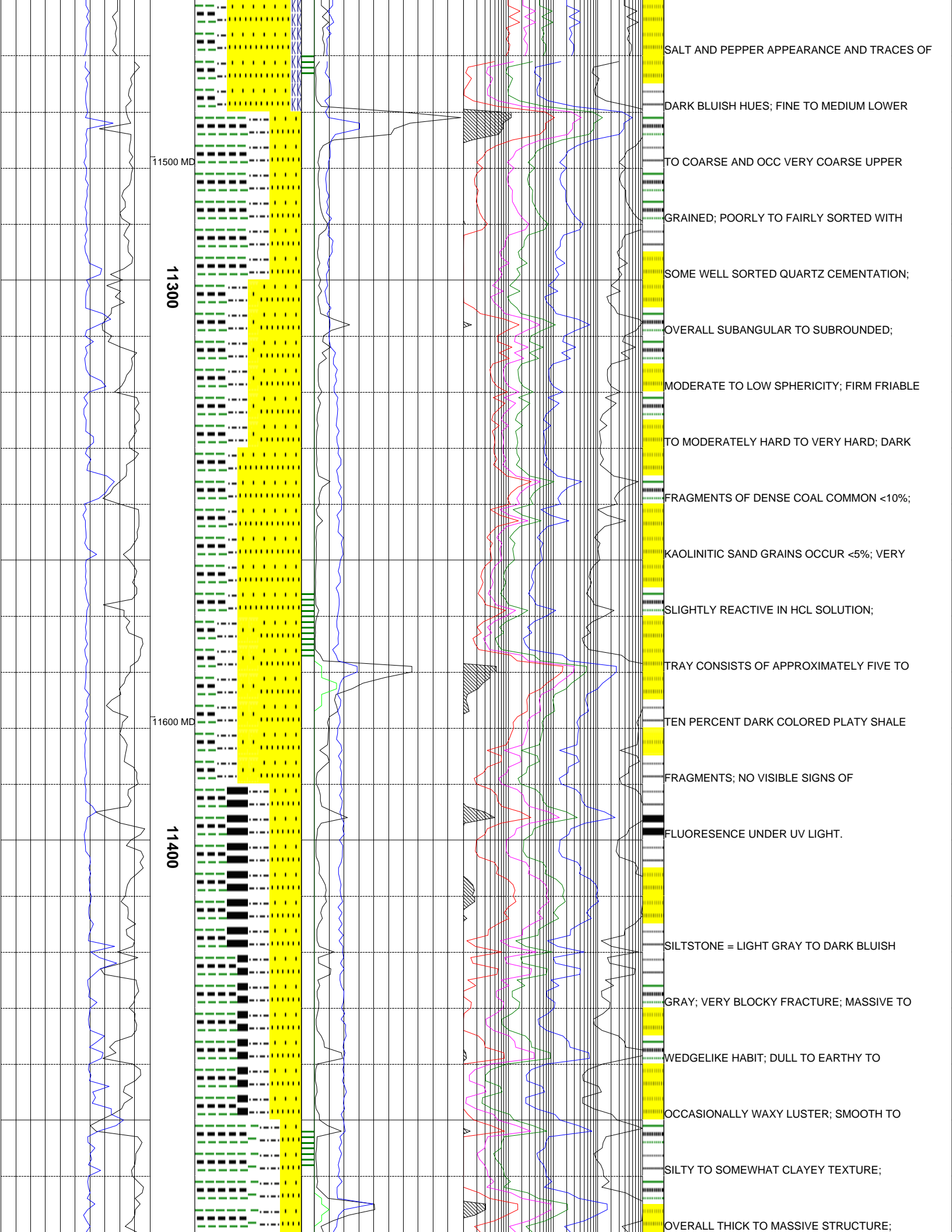




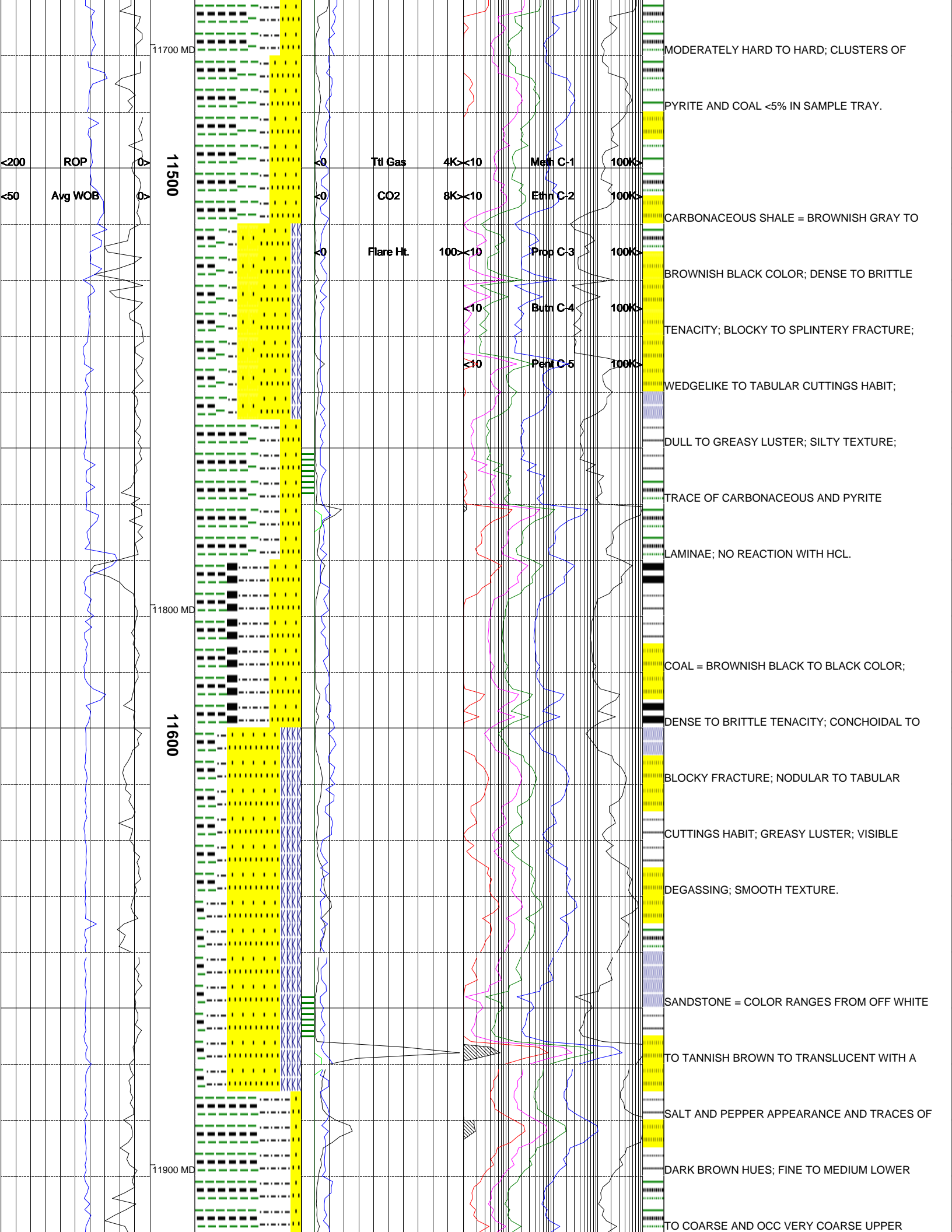


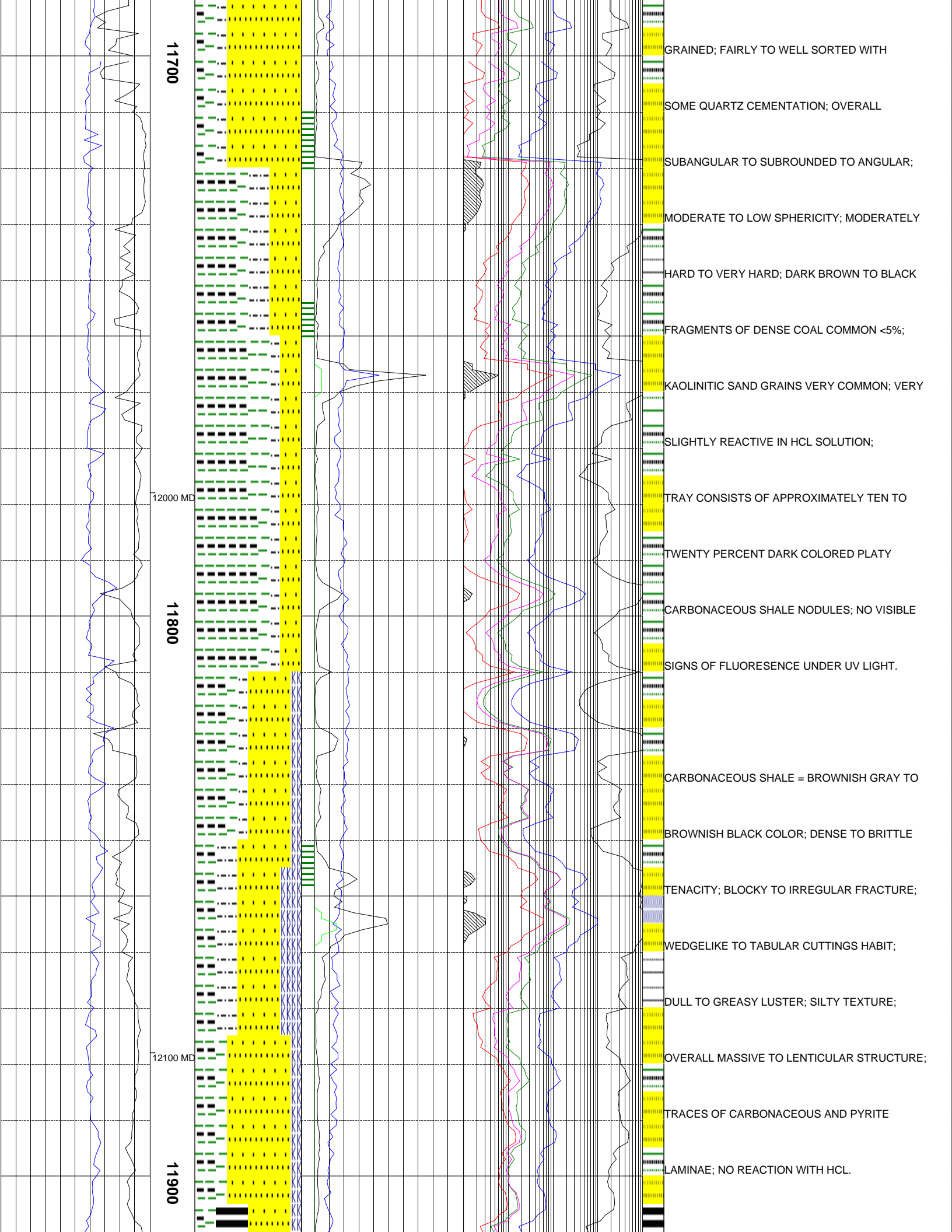












11700

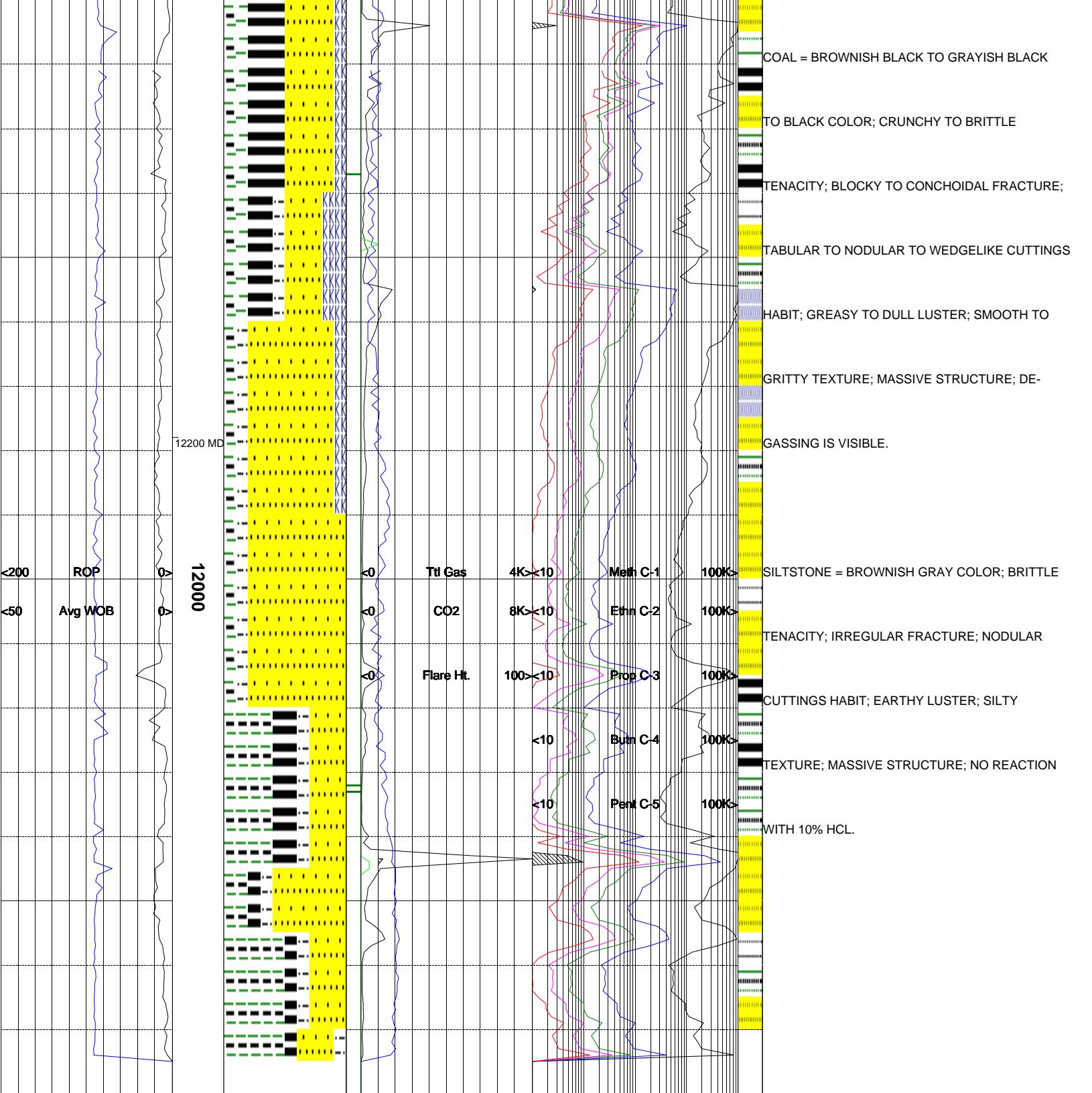
12000 MD

11800

12100 MD

11900

GRAINED; FAIRLY TO WELL SORTED WITH  
SOME QUARTZ CEMENTATION; OVERALL  
SUBANGULAR TO SUBROUNDED TO ANGULAR;  
MODERATE TO LOW SPHERICITY; MODERATELY  
HARD TO VERY HARD; DARK BROWN TO BLACK  
FRAGMENTS OF DENSE COAL COMMON <5%;  
KAOLINITIC SAND GRAINS VERY COMMON; VERY  
SLIGHTLY REACTIVE IN HCL SOLUTION;  
TRAY CONSISTS OF APPROXIMATELY TEN TO  
TWENTY PERCENT DARK COLORED PLATY  
CARBONACEOUS SHALE NODULES; NO VISIBLE  
SIGNS OF FLUORESENCE UNDER UV LIGHT.  
CARBONACEOUS SHALE = BROWNISH GRAY TO  
BROWNISH BLACK COLOR; DENSE TO BRITTLE  
TENACITY; BLOCKY TO IRREGULAR FRACTURE;  
WEDGELIKE TO TABULAR CUTTINGS HABIT;  
DULL TO GREASY LUSTER; SILTY TEXTURE;  
OVERALL MASSIVE TO LENTICULAR STRUCTURE;  
TRACES OF CARBONACEOUS AND PYRITE  
LAMINAE; NO REACTION WITH HCL.



The log data, interpretations and recommendation provided by Epoch are inferences and assumptions based on measurements of drilling fluids. Such inferences and assumptions are not infallible and reasonable professionals may differ. Epoch does not represent or warrant the accuracy, correctness or completeness of any log data, interpretations, recommendations or information provided by Epoch, its officers, agents or employees. Epoch 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.



