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 Production
WELL	FRU197-28A6
FIELD	FREEDOM RANCH UNIT
REGION	ROCKIES
COORDINATES	LAT: 39.934490000
	LON: 108.295893000
ELEVATION	GL = 6,082'
	KB = 6,109'
COUNTY, STATE	RIO BLANCO, COLORADO
API INDEX	051031163400
SPUD DATE	07/10/2010
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	RICKY T. OWENS
RIG/TYPE	215 / FLEX 3
LOGGING UNIT	MLU 051
GEOLOGISTS	GEORGE BAKER
	DEVIN CLAAR
ADD. PERSONS	BILL JOHANNING
	PATRICIA ORTIZ
CO. GEOLOGIST	MELANIE A. BIGGS

LOG INTERVAL

DEPTHS:	3,600'	**TO**	12,191'
DATES:	07/10/2010	**TO**	7/30/2010
SCALE:	5" = 100'		

MUD TYPES

LSND	**TO**	12,191'
	TO	
	TO	
	TO	

CASING DATA

16.0"	**AT**	120'
10.75"	**AT**	3,603'
4.50"	**AT**	12,191'
	AT	

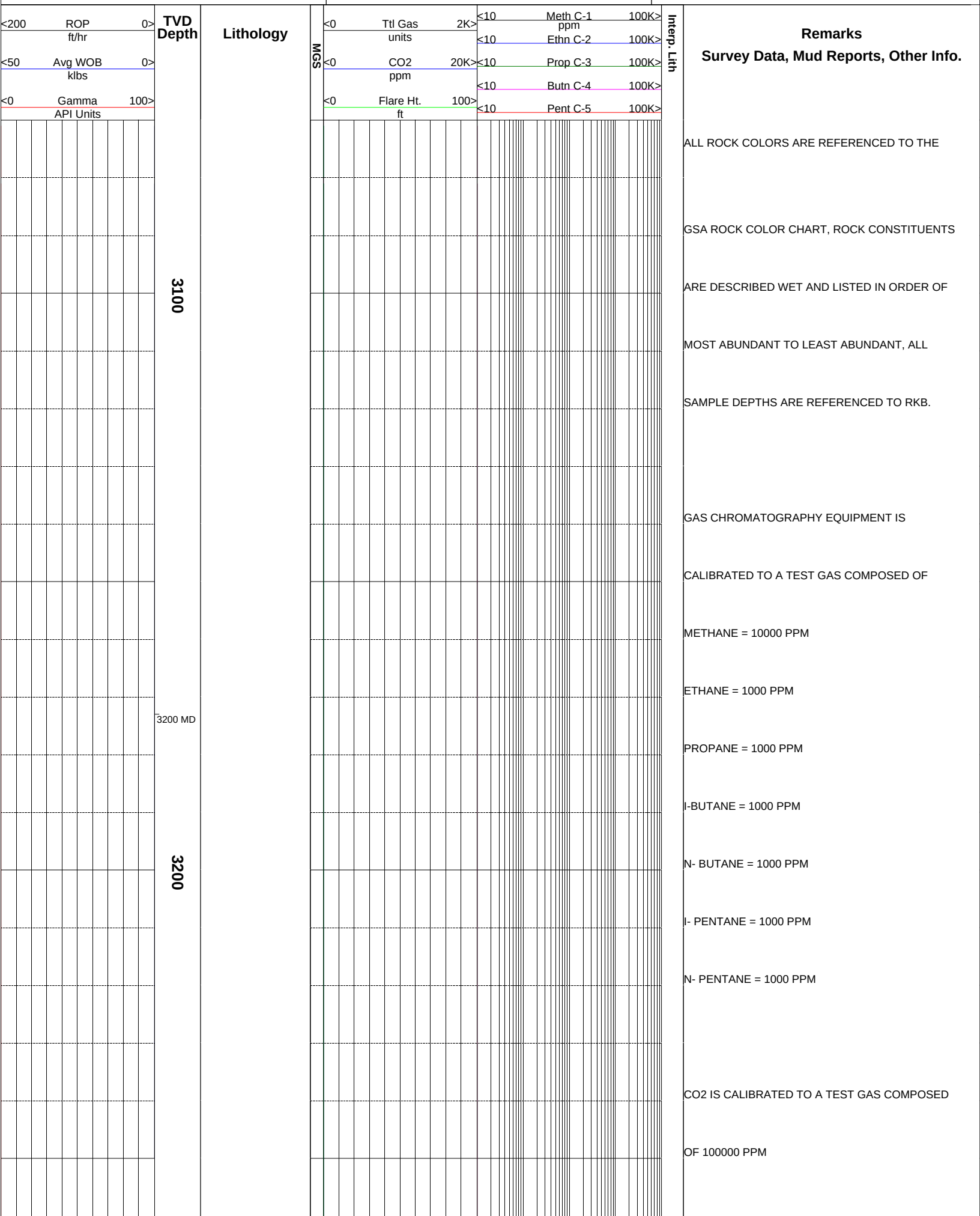
HOLE SIZE

14.75"	**TO**	3,603'
8.75"	**TO**	12,191'
	TO	
	TO	

ABBREVIATIONS

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



Remarks
Survey Data, Mud Reports, Other Info.

ALL ROCK COLORS ARE REFERENCED TO THE GSA ROCK COLOR CHART, ROCK CONSTITUENTS ARE DESCRIBED WET AND LISTED IN ORDER OF MOST ABUNDANT TO LEAST ABUNDANT, ALL SAMPLE DEPTHS ARE REFERENCED TO RKB.

GAS CHROMATOGRAPHY EQUIPMENT IS CALIBRATED TO A TEST GAS COMPOSED OF

METHANE = 10000 PPM

ETHANE = 1000 PPM

PROPANE = 1000 PPM

I-BUTANE = 1000 PPM

N- BUTANE = 1000 PPM

I- PENTANE = 1000 PPM

N- PENTANE = 1000 PPM

CO2 IS CALIBRATED TO A TEST GAS COMPOSED OF 100000 PPM

3300 MD

3300

3400 MD

3400

3500 MD

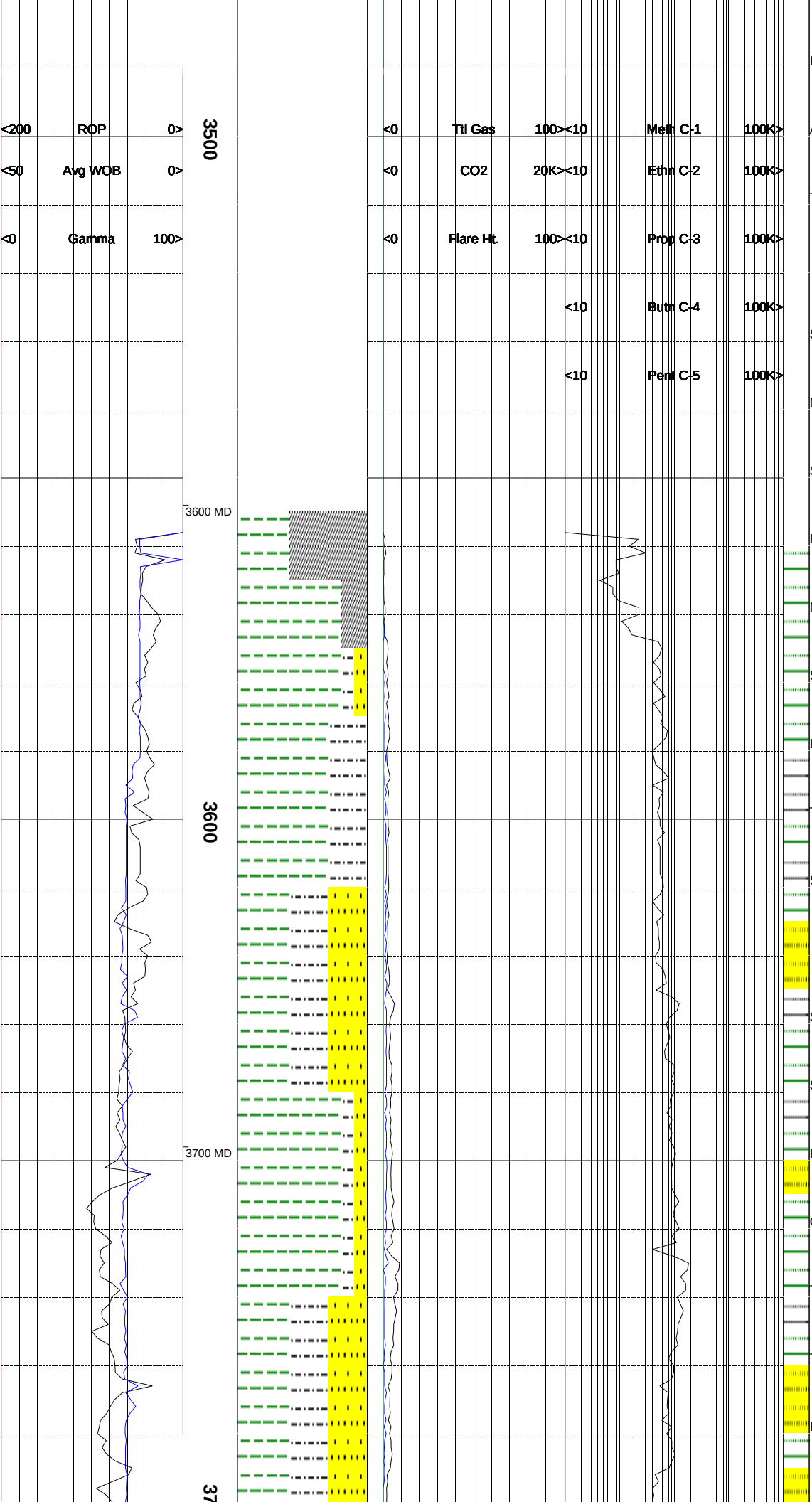
CONNECTION GAS, TRIP GAS, AND WIPER GAS ARE NOTED ON THE MUDLOG, FLARE HEIGHTS AND DEPTHS OF GAS BUSTER USAGE ARE ALSO NOTED.

EARLY CONNECTION GASES REPRESENTING UP HOLE GAS INTERVALS BLEEDING INTO THE BOREHOLE ARE COMMON IN THE PRODUCTION INTERVAL.

EVIDENCE OF FRACTURE FILL IS NOTED ON THE LOG USING THE LITHOLOGY SYMBOL FOR METAMORPHICS. THE 10% DOES NOT REPRESENT 10% FRACTURE FILL IN SAMPLE. IT ONLY INDICATES THAT FRACTURE FILL HAS BEEN OBSERVED OVER THE INTERVAL.

CANRIG WELL SERVICE COMMENCED FULL LOGGING OPERATIONS ON 07/17/2010 @ 13:00 HRS AT A DEPTH OF 3,605'

SURVEY DATA AT 6,794' MD



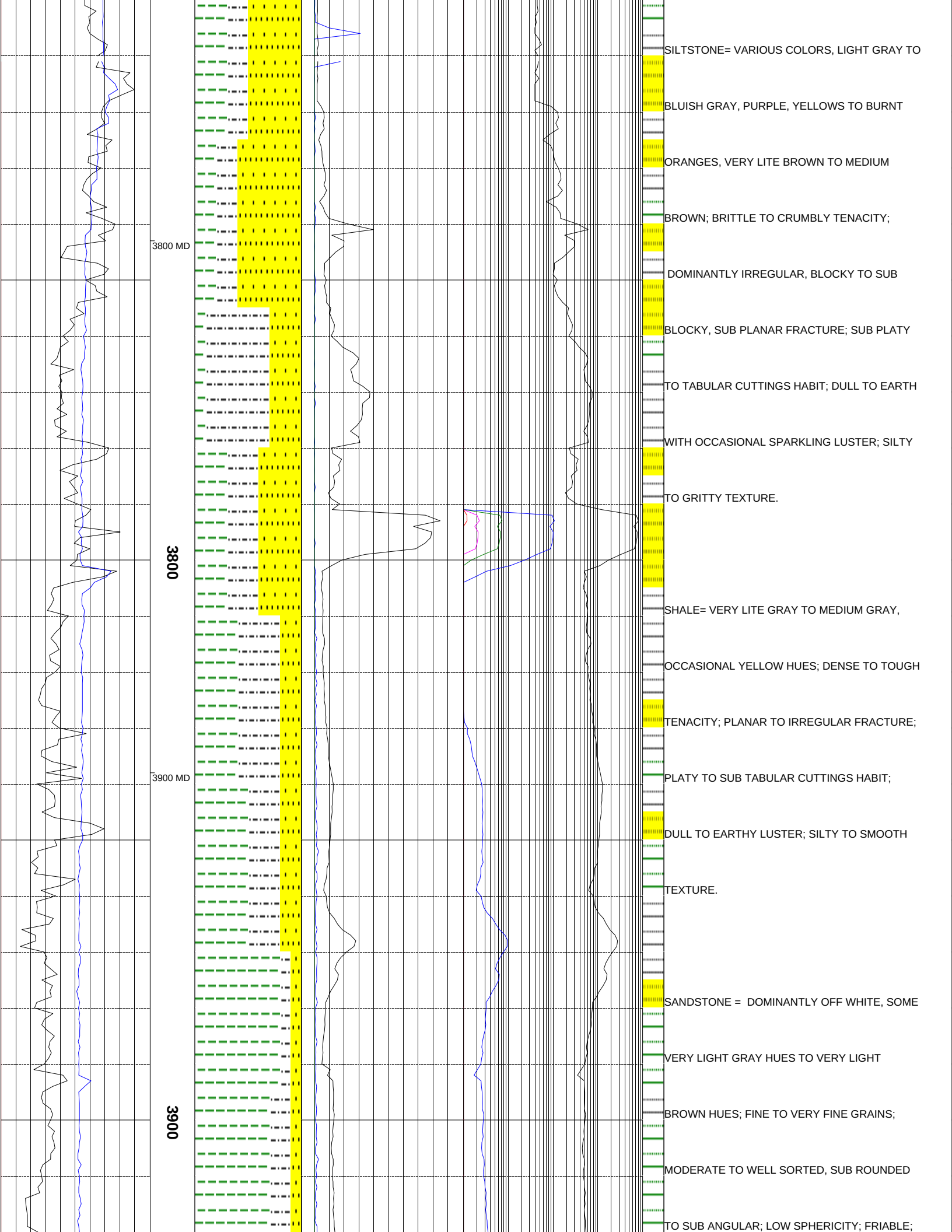
INCLINATION : 00.15

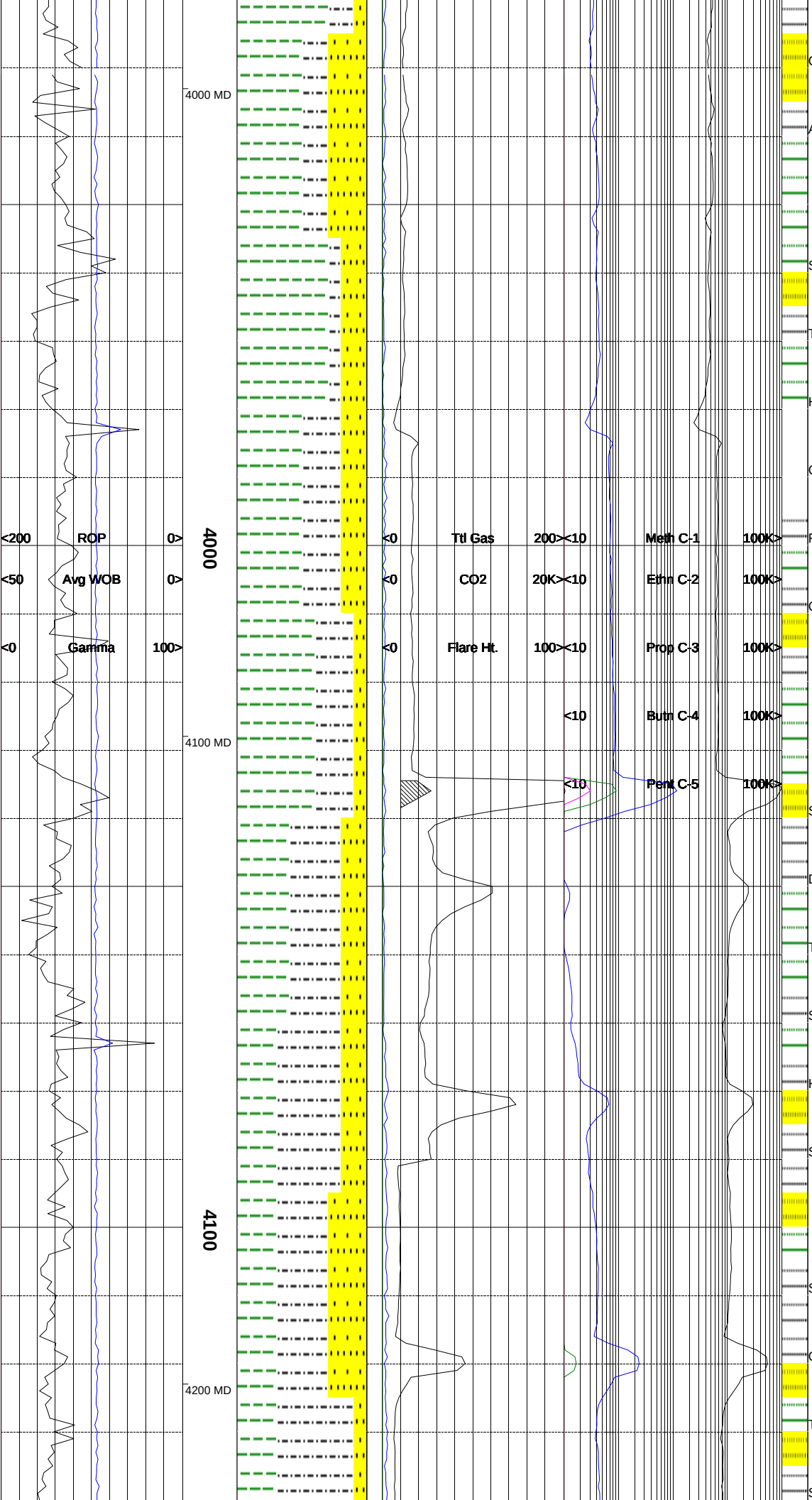
AZIM: 190.79

TVD: 6,638.22'

SHALE = VARICOLORED; MEDIUM GRAY TO MAROON; LT YELLOW TO LIGHT BROWN; FIRM; SLI PLATY CUTTINGS; IRREGULAR TO PLANAR FRACTURE; SLI CALCAREOUS; VERY FINELY MICACEOUS; SILTY IN PART; GRADING TO SILTSTONE; SME ISOLATED QUARTZ GRAINS; DULL TO WAXY LUSTER; SMOOTH TO ROUGH TEXTURE; TRACE AMTS OF FINE GRAINED SANDSTONE.

SANDSTONE = DOM LIGHT GRAY; SME REDBRN STAINED SPECIMENS; MOD HARD; FINE TO V FINE GRAINED; ANGULAR TO SUBROUNDED; GRAIN SUPPORTED; CALCITE CEMENT; LOW TO MOD SPHERICITY; 5% BLACK GRAINS; TIGHT TO POOR VISIBLE POROSITY; NO GAS INCREASES.


3800 MD
3800
3900 MD
3900
SILTSTONE= VARIOUS COLORS, LIGHT GRAY TO
BLUISH GRAY, PURPLE, YELLOWS TO BURNT
ORANGES, VERY LITE BROWN TO MEDIUM
BROWN; BRITTLE TO CRUMBLY TENACITY;
DOMINANTLY IRREGULAR, BLOCKY TO SUB
BLOCKY, SUB PLANAR FRACTURE; SUB PLATY
TO TABULAR CUTTINGS HABIT; DULL TO EARTH
WITH OCCASIONAL SPARKLING LUSTER; SILTY
TO GRITTY TEXTURE.
SHALE= VERY LITE GRAY TO MEDIUM GRAY,
OCCASIONAL YELLOW HUES; DENSE TO TOUGH
TENACITY; PLANAR TO IRREGULAR FRACTURE;
PLATY TO SUB TABULAR CUTTINGS HABIT;
DULL TO EARTHY LUSTER; SILTY TO SMOOTH
TEXTURE.
SANDSTONE = DOMINANTLY OFF WHITE, SOME
VERY LIGHT GRAY HUES TO VERY LIGHT
BROWN HUES; FINE TO VERY FINE GRAINS;
MODERATE TO WELL SORTED, SUB ROUNDED
TO SUB ANGULAR; LOW SPHERICITY; FRIABLE;



CALCITE SUPPORTED, WITH MODERATE RE

ACTION TO HCL.

SILTSTONE = VARICOLORED, MEDIUM BROWN

TO LIGHT BROWN, PURPLE AND YELLOW

HUES, OCCASIONAL GREENS; BRITTLE TO

CRUMBLY TENACITY; IRREGULAR TO BLOCKY

FRACTURE; SUB TABULAR TO SUB WEDGELIKE

CUTTINGS HABIT; EARTHY TO SLIGHTLY GRITT

SOME SPARKLING LUSTER THROUGHOUT.

SHALE - VERY LITE GRAY TO MEDIUM GRAY;

DOMINANTLY DENSE, OCCASIONAL BRITTLE

TENACITY; IRREGULAR TO BLOCKY FRACTURE;

SUB TABULAR TO SUB WEDGELIKE CUTTINGS

HABIT; DULL TO WAXY LUSTER; SILTY TO

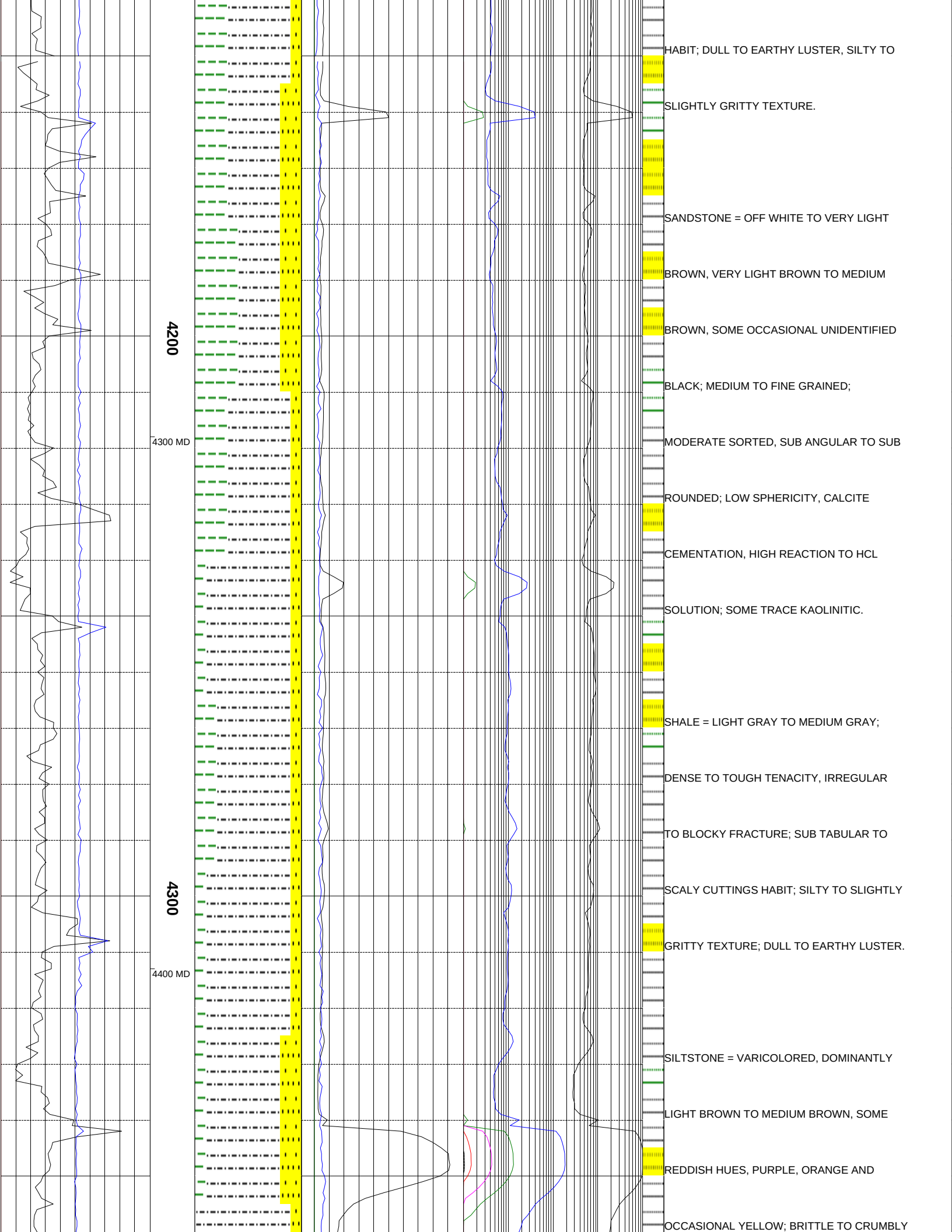
SLIGHTLY GRITTY TEXTURE.

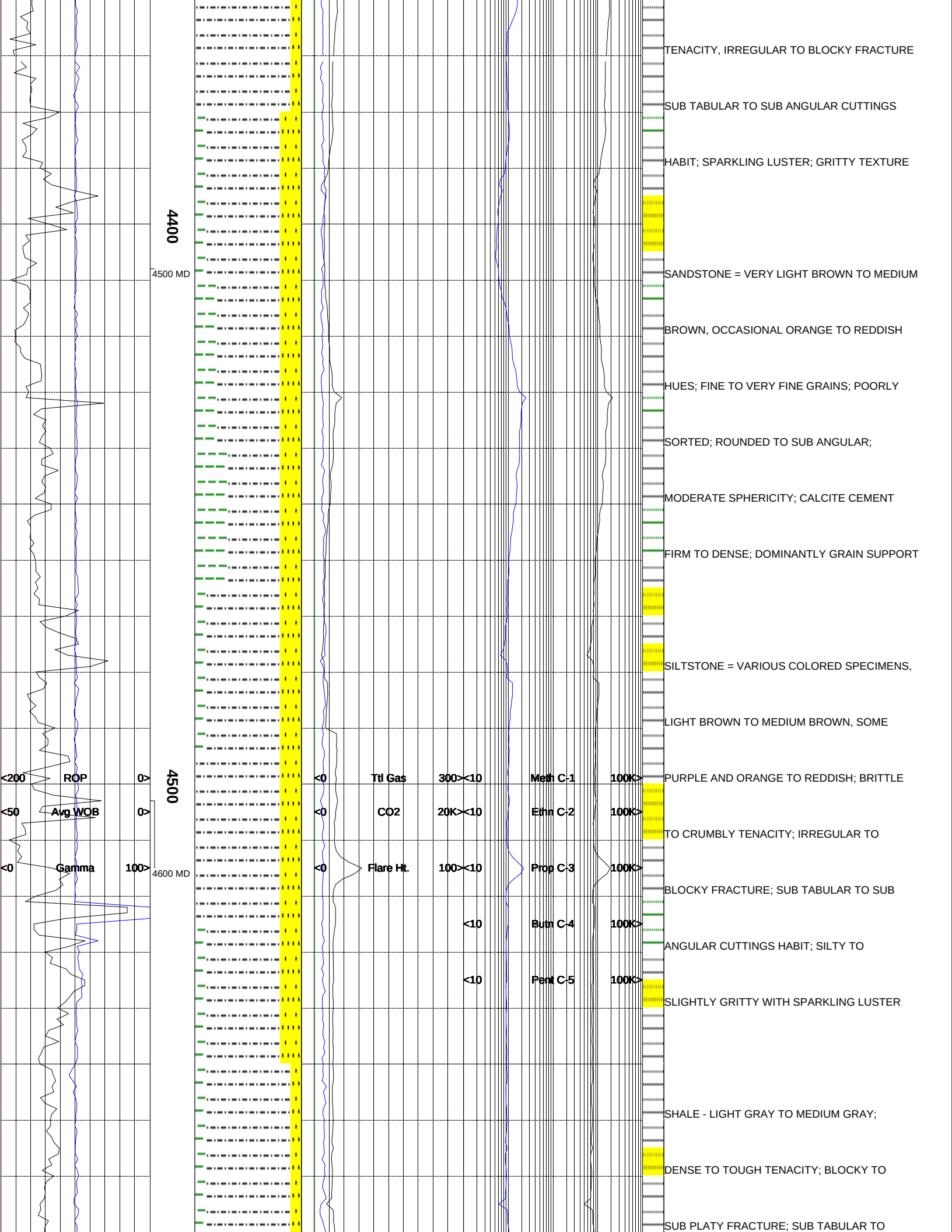
SILTSTONE = LITE BROWN TO MEDIUM BROWN

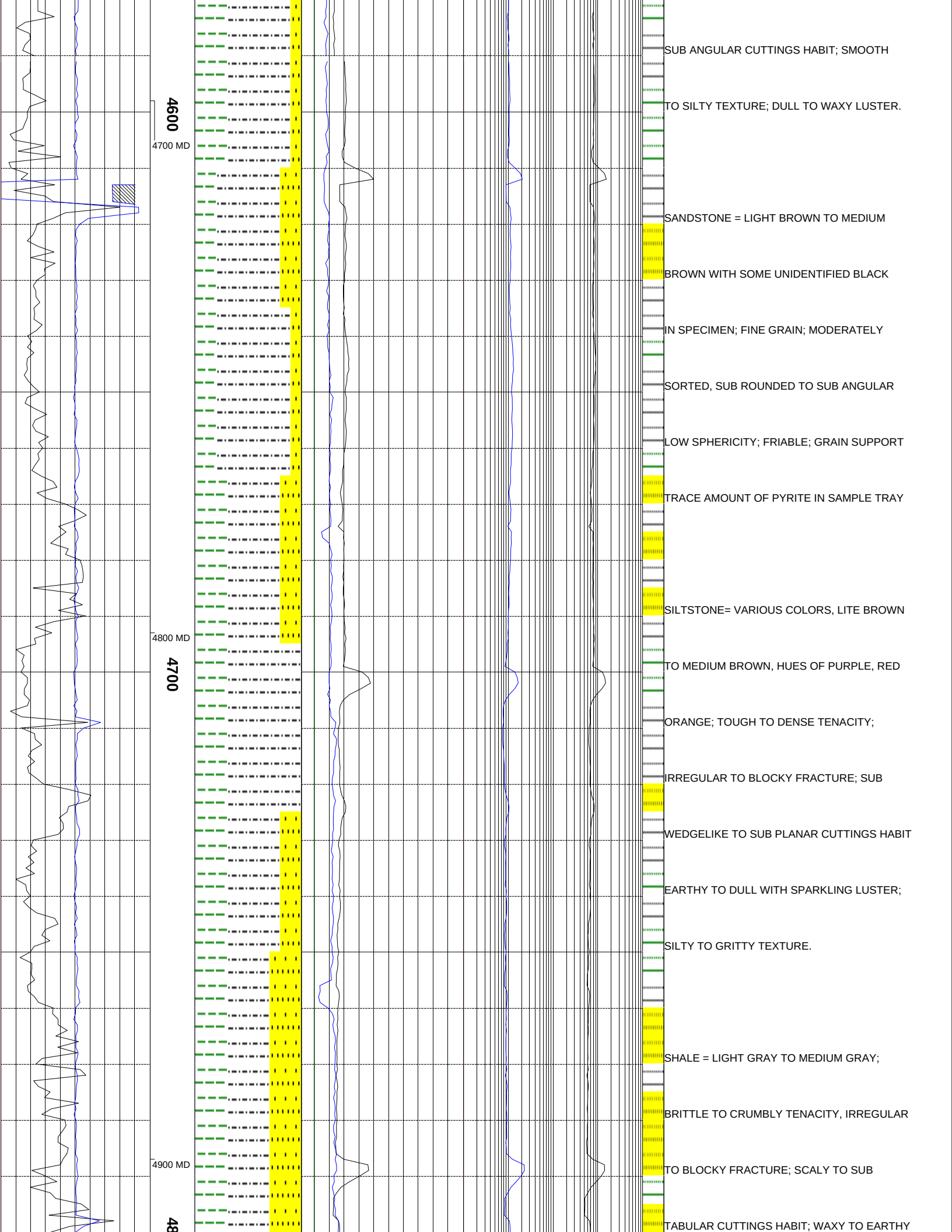
OCCASIONAL PURPLE, REDDISH HUES; DENSE

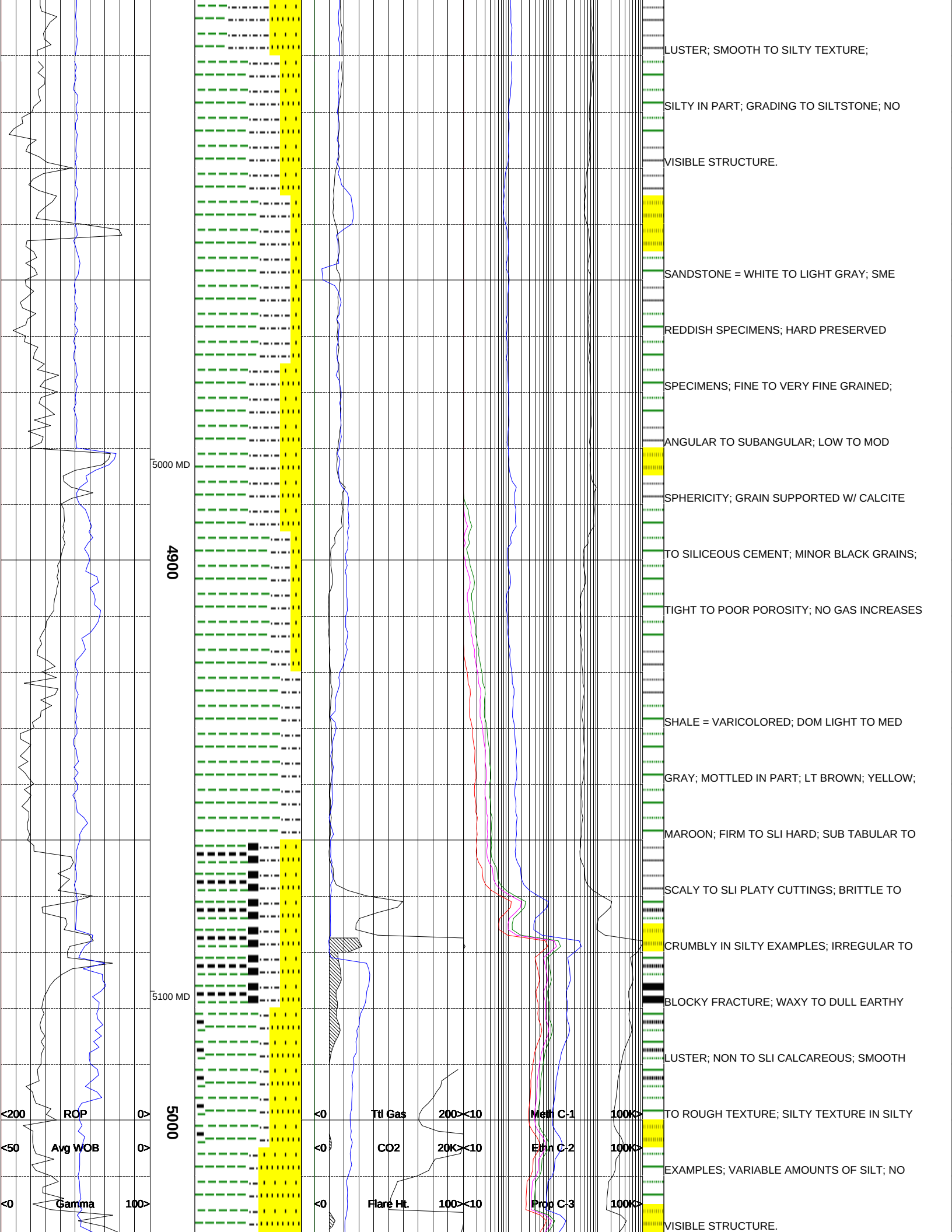
TENACITYD, BLOCKY TO IRREGULAR FRACTURE;

SUB TABULAR TO SUB WEDGELIKE CUTTINGS


4200
4300 MD
4300
4400 MD
HABIT; DULL TO EARTHY LUSTER, SILTY TO
SLIGHTLY GRITTY TEXTURE.
SANDSTONE = OFF WHITE TO VERY LIGHT
BROWN, VERY LIGHT BROWN TO MEDIUM
BROWN, SOME OCCASIONAL UNIDENTIFIED
BLACK; MEDIUM TO FINE GRAINED;
MODERATE SORTED, SUB ANGULAR TO SUB
ROUNDED; LOW SPHERICITY, CALCITE
CEMENTATION, HIGH REACTION TO HCL
SOLUTION; SOME TRACE KAOLINITIC.
SHALE = LIGHT GRAY TO MEDIUM GRAY;
DENSE TO TOUGH TENACITY, IRREGULAR
TO BLOCKY FRACTURE; SUB TABULAR TO
SCALY CUTTINGS HABIT; SILTY TO SLIGHTLY
GRITTY TEXTURE; DULL TO EARTHY LUSTER.
SILTSTONE = VARICOLORED, DOMINANTLY
LIGHT BROWN TO MEDIUM BROWN, SOME
REDDISH HUES, PURPLE, ORANGE AND
OCCASIONAL YELLOW; BRITTLE TO CRUMBLY


4400
4500 MD
4500
4600 MD
<200 ROP 0>
<50 Avg WOB 0>
<0 Gamma 100>
<0 Ttl Gas 300><10 Meth C-1 100K>
<0 CO2 20K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
TENACITY, IRREGULAR TO BLOCKY FRACTURE
SUB TABULAR TO SUB ANGULAR CUTTINGS
HABIT; SPARKLING LUSTER; GRITTY TEXTURE
SANDSTONE = VERY LIGHT BROWN TO MEDIUM
BROWN, OCCASIONAL ORANGE TO REDDISH
HUES; FINE TO VERY FINE GRAINS; POORLY
SORTED; ROUNDED TO SUB ANGULAR;
MODERATE SPHERICITY; CALCITE CEMENT
FIRM TO DENSE; DOMINANTLY GRAIN SUPPORT
SILTSTONE = VARIOUS COLORED SPECIMENS,
LIGHT BROWN TO MEDIUM BROWN, SOME
PURPLE AND ORANGE TO REDDISH; BRITTLE
TO CRUMBLY TENACITY; IRREGULAR TO
BLOCKY FRACTURE; SUB TABULAR TO SUB
ANGULAR CUTTINGS HABIT; SILTY TO
SLIGHTLY GRITTY WITH SPARKLING LUSTER
SHALE - LIGHT GRAY TO MEDIUM GRAY;
DENSE TO TOUGH TENACITY; BLOCKY TO
SUB PLATY FRACTURE; SUB TABULAR TO


4600
4700 MD
4800 MD
4700
4900 MD
SUB ANGULAR CUTTINGS HABIT; SMOOTH
TO SILTY TEXTURE; DULL TO WAXY LUSTER.
SANDSTONE = LIGHT BROWN TO MEDIUM
BROWN WITH SOME UNIDENTIFIED BLACK
IN SPECIMEN; FINE GRAIN; MODERATELY
SORTED, SUB ROUNDED TO SUB ANGULAR
LOW SPHERICITY; FRIABLE; GRAIN SUPPORT
TRACE AMOUNT OF PYRITE IN SAMPLE TRAY
SILTSTONE= VARIOUS COLORS, LITE BROWN
TO MEDIUM BROWN, HUES OF PURPLE, RED
ORANGE; TOUGH TO DENSE TENACITY;
IRREGULAR TO BLOCKY FRACTURE; SUB
WEDGELIKE TO SUB PLANAR CUTTINGS HABIT
EARTHY TO DULL WITH SPARKLING LUSTER;
SILTY TO GRITTY TEXTURE.
SHALE = LIGHT GRAY TO MEDIUM GRAY;
BRITTLE TO CRUMBLY TENACITY, IRREGULAR
TO BLOCKY FRACTURE; SCALY TO SUB
TABULAR CUTTINGS HABIT; WAXY TO EARTHY



LUSTER; SMOOTH TO SILTY TEXTURE;

SILTY IN PART; GRADING TO SILTSTONE; NO

VISIBLE STRUCTURE.

SANDSTONE = WHITE TO LIGHT GRAY; SME

REDDISH SPECIMENS; HARD PRESERVED

SPECIMENS; FINE TO VERY FINE GRAINED;

ANGULAR TO SUBANGULAR; LOW TO MOD

SPHERICITY; GRAIN SUPPORTED W/ CALCITE

TO SILICEOUS CEMENT; MINOR BLACK GRAINS;

TIGHT TO POOR POROSITY; NO GAS INCREASES

SHALE = VARICOLORED; DOM LIGHT TO MED

GRAY; MOTTLED IN PART; LT BROWN; YELLOW;

MAROON; FIRM TO SLI HARD; SUB TABULAR TO

SCALY TO SLI PLATY CUTTINGS; BRITTLE TO

CRUMBLY IN SILTY EXAMPLES; IRREGULAR TO

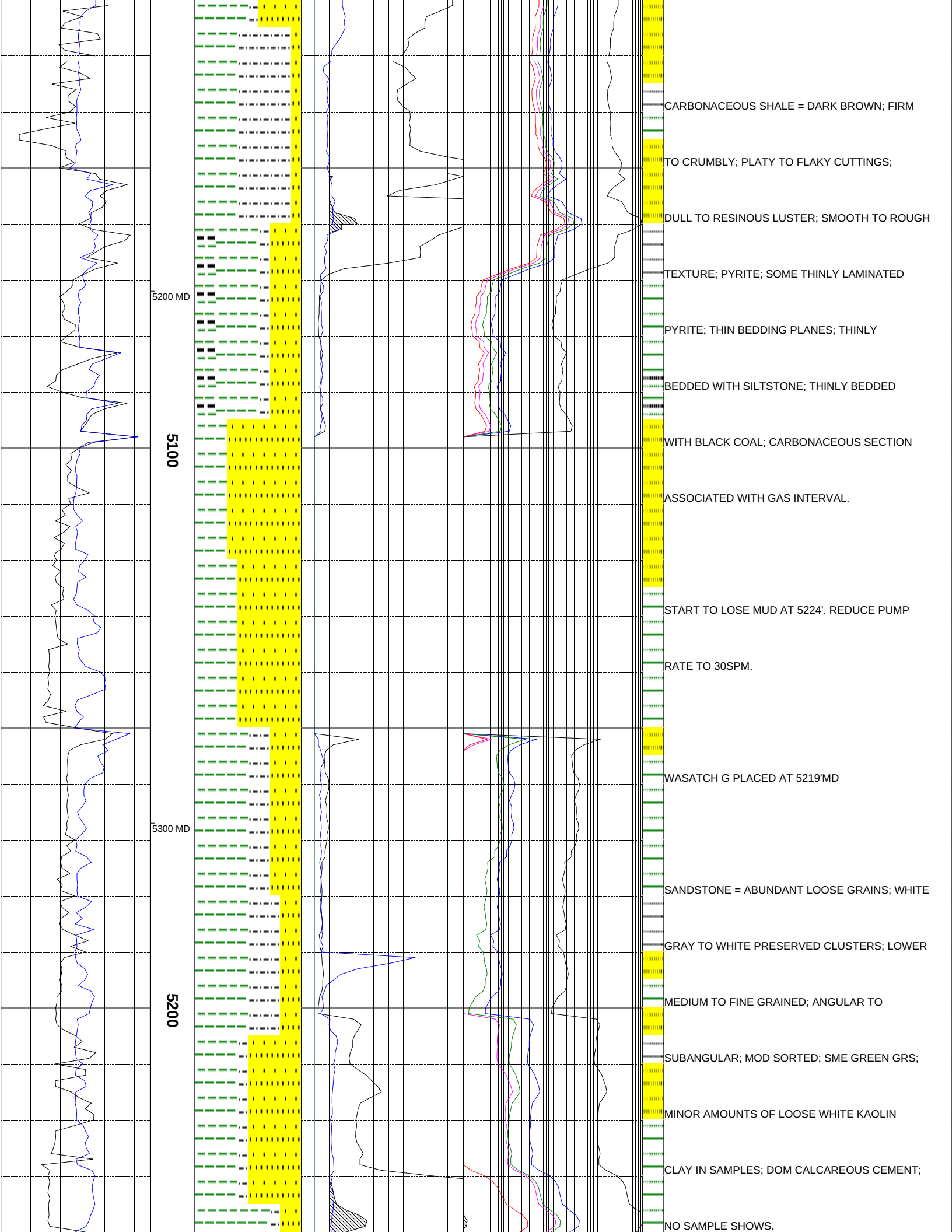
BLOCKY FRACTURE; WAXY TO DULL EARTHY

LUSTER; NON TO SLI CALCAREOUS; SMOOTH

TO ROUGH TEXTURE; SILTY TEXTURE IN SILTY

EXAMPLES; VARIABLE AMOUNTS OF SILT; NO

VISIBLE STRUCTURE.


5200 MD
5100
5300 MD
5200
CARBONACEOUS SHALE = DARK BROWN; FIRM
TO CRUMBLY; PLATY TO FLAKY CUTTINGS;
DULL TO RESINOUS LUSTER; SMOOTH TO ROUGH
TEXTURE; PYRITE; SOME THINLY LAMINATED
PYRITE; THIN BEDDING PLANES; THINLY
BEDDED WITH SILTSTONE; THINLY BEDDED
WITH BLACK COAL; CARBONACEOUS SECTION
ASSOCIATED WITH GAS INTERVAL.
START TO LOSE MUD AT 5224'. REDUCE PUMP
RATE TO 30SPM.
WASATCH G PLACED AT 5219'MD
SANDSTONE = ABUNDANT LOOSE GRAINS; WHITE
GRAY TO WHITE PRESERVED CLUSTERS; LOWER
MEDIUM TO FINE GRAINED; ANGULAR TO
SUBANGULAR; MOD SORTED; SME GREEN GRS;
MINOR AMOUNTS OF LOOSE WHITE KAOLIN
CLAY IN SAMPLES; DOM CALCAREOUS CEMENT;
NO SAMPLE SHOWS.

SHALE = VARICOLORED; LT TO MEDIUM GRAY;

SME GREENISH GRAY; LT BROWN TO YELLOW;

SOME DARK BROWN TO DARK GRAY CARB

EXAMPLES; CRUNCHY TO MOD HARD; SLI

PLATY CUTTINGS; HABIT; SLI TO MODERATELY

CALCAREOUS; SILTY IN PART; ROUGH TO

SILTY TEXTURE; NO VISIBLE STRUCTURE.

SILTSTONE = LT GRAY TO LT GREENISH GRAY;

SME VARICOLORED EXAMPLES FROM RED BRN

TO MAROON; HARD TO CRUNCHY; MASSIVE TO

PLATY CUTTINGS; SILTY TO OCC GRITTY TEXT

SL CALCAREOUS; CALCITE CEMENT; IRREGULAR

FRACTURE; VF MICA; OCC SPECKLED WITH

CARBONACEOUS MATERIAL; NO VISIBLE

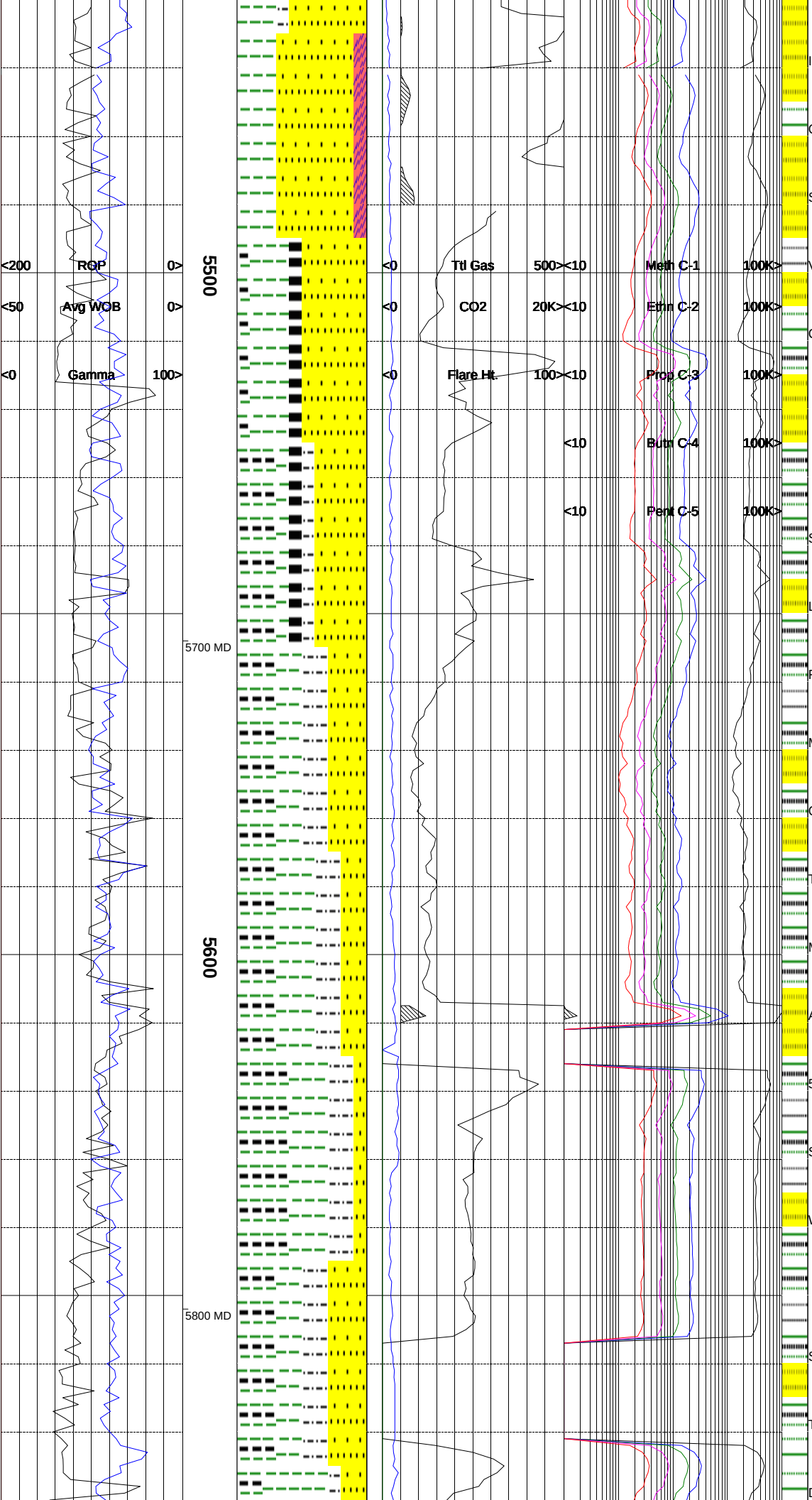
STRUCTURE.

SHALE = BECOMING LIGHT TO MEDIUM GRAY;

DECREASE IN MOTTLED SPECIMENS;

FIRM TO MODERATELY HARD TO CRUNCHY;

PLATY TO WEDGELIKE CUTTINGS; PLANAR TO



IRREGULAR FRACTURE; SLI CALCAREOUS;

OCC CARBONACEOUS MATERIAL; ROUGH TO

SILTY TEXTURE; DECREASE IN AMT OF SILT;

VERY FINE MICACEOUS; VERY FINE PYRITE;

CLAY; NO VISIBLE STRUCTURE.

SANDSTONE = MINOR AMT OF LOOSE GRAINS;

LIGHT GRAY TO LIGHT BROWN; FINE TO VERY

FINE GRAINED; ANGULAR TO SUBANGULAR;

MOD WELL SORTED; LOW TO MOD SPHERICITY;

GRAIN SUPPORTED; DOM CALCITE CEMENT;

TRACE GREEN GRAINS; SME ELONGATED CARB

MATERIAL IN MATRIX; SME COARSE CALCITE

ADHERING TO SPECIMENS IN THE 5610' TO

5649' SAMPLE- PROBABLE FRACTURE FILL;

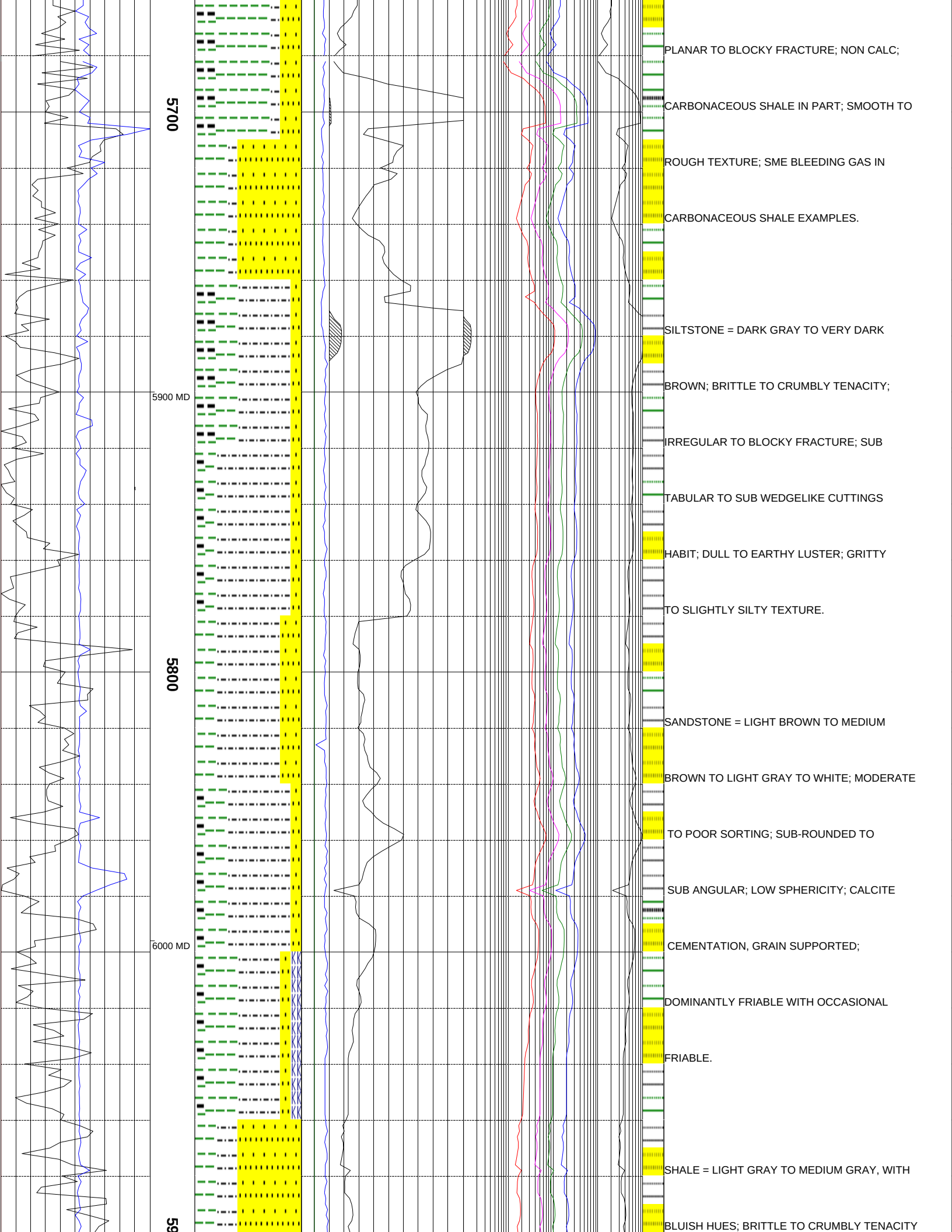
SOME COAL ADHERING TO CLUSTERS; ASSOC

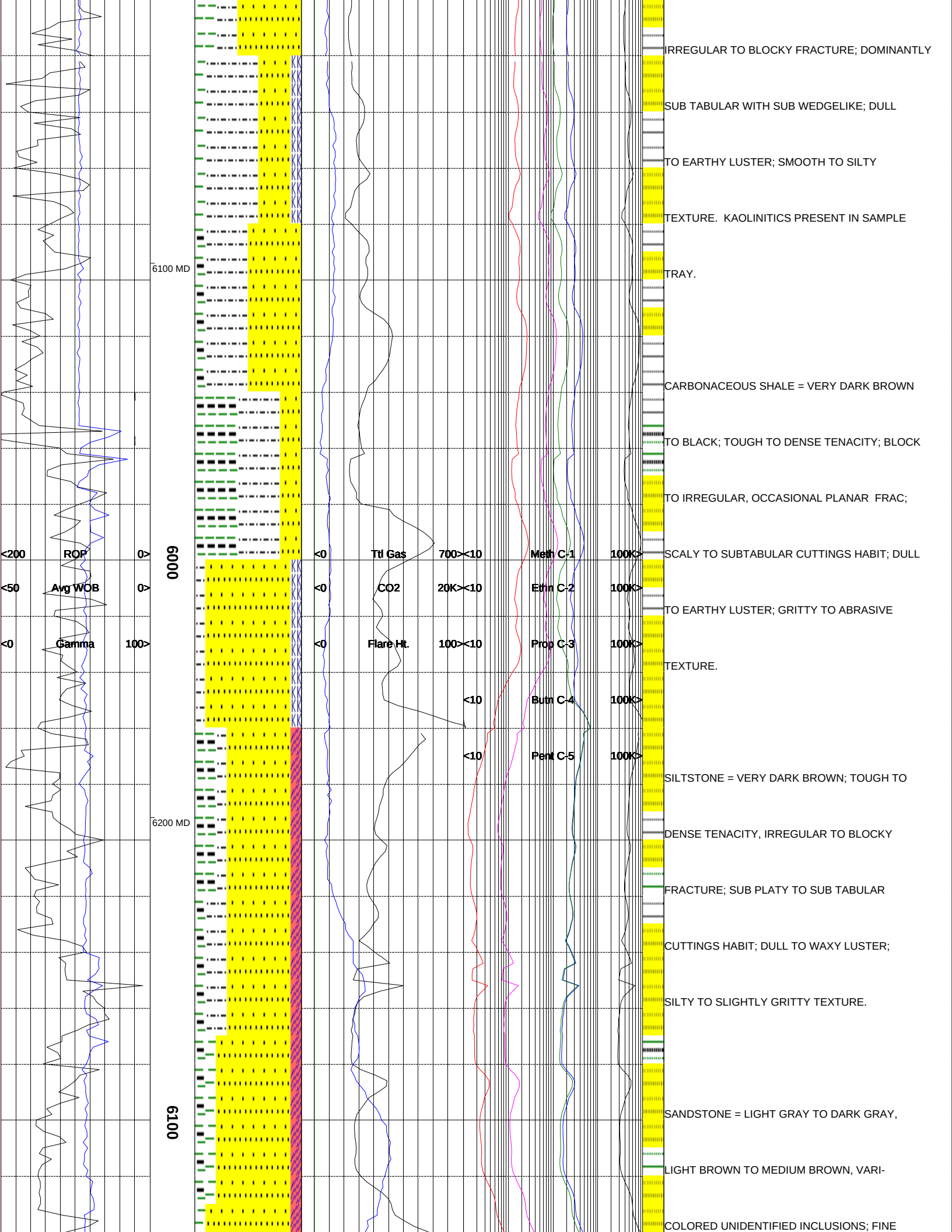
WITH GAS SHOWS.

SHALE = DARK GRAY TO DARK BROWN; FIRM

TO BRITTLE; PLATY TO FLAKY CUTTINGS;

DULL EARTHY TO SLI RESINOUS LUSTER;


5700
5900 MD
5800
6000 MD
PLANAR TO BLOCKY FRACTURE; NON CALC;
CARBONACEOUS SHALE IN PART; SMOOTH TO
ROUGH TEXTURE; SME BLEEDING GAS IN
CARBONACEOUS SHALE EXAMPLES.
SILTSTONE = DARK GRAY TO VERY DARK
BROWN; BRITTLE TO CRUMBLY TENACITY;
IRREGULAR TO BLOCKY FRACTURE; SUB
TABULAR TO SUB WEDGELIKE CUTTINGS
HABIT; DULL TO EARTHY LUSTER; GRITTY
TO SLIGHTLY SILTY TEXTURE.
SANDSTONE = LIGHT BROWN TO MEDIUM
BROWN TO LIGHT GRAY TO WHITE; MODERATE
TO POOR SORTING; SUB-ROUNDED TO
SUB ANGULAR; LOW SPHERICITY; CALCITE
CEMENTATION, GRAIN SUPPORTED;
DOMINANTLY FRIABLE WITH OCCASIONAL
FRIABLE.
SHALE = LIGHT GRAY TO MEDIUM GRAY, WITH
BLUISH HUES; BRITTLE TO CRUMBLY TENACITY


<200
ROP
0>
<50
Avg WOB
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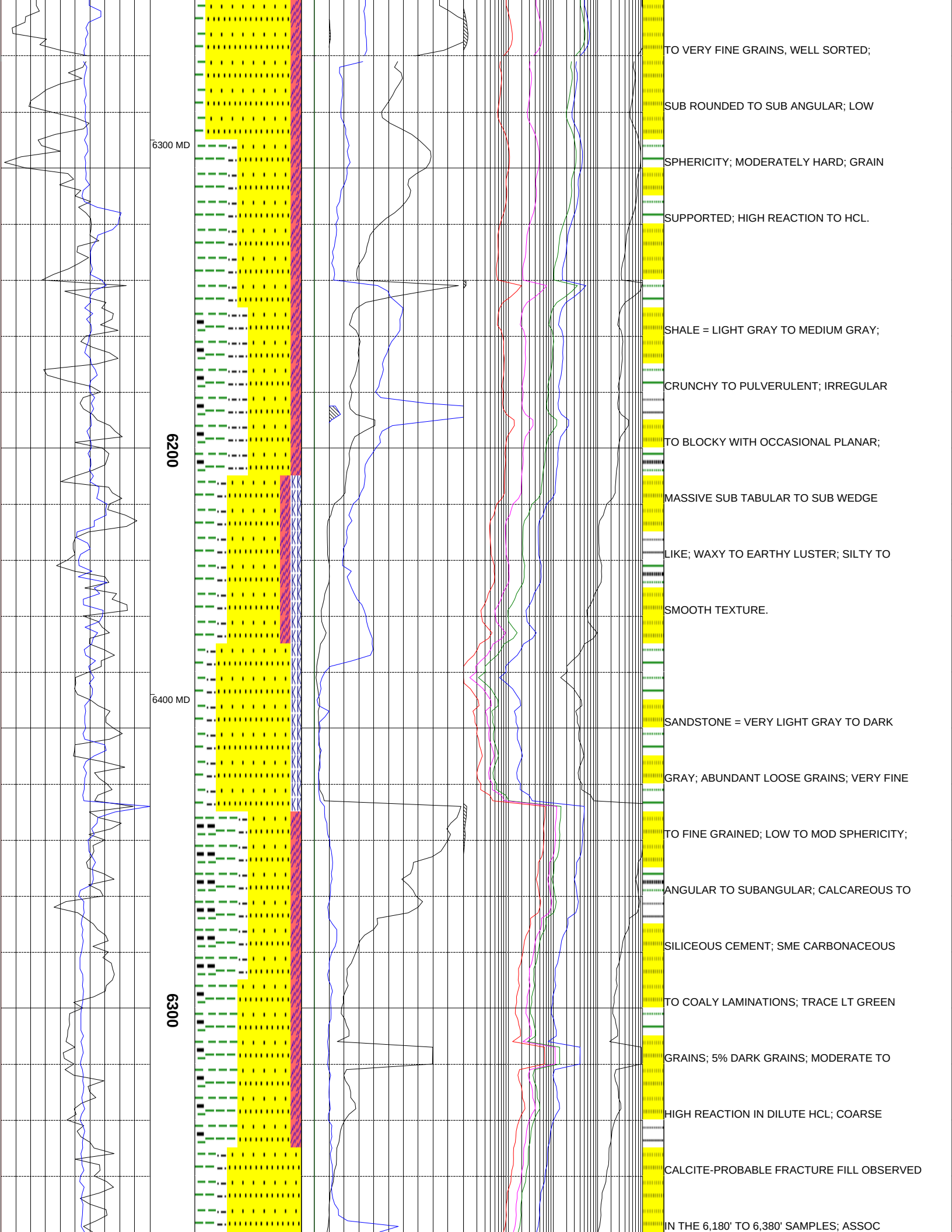
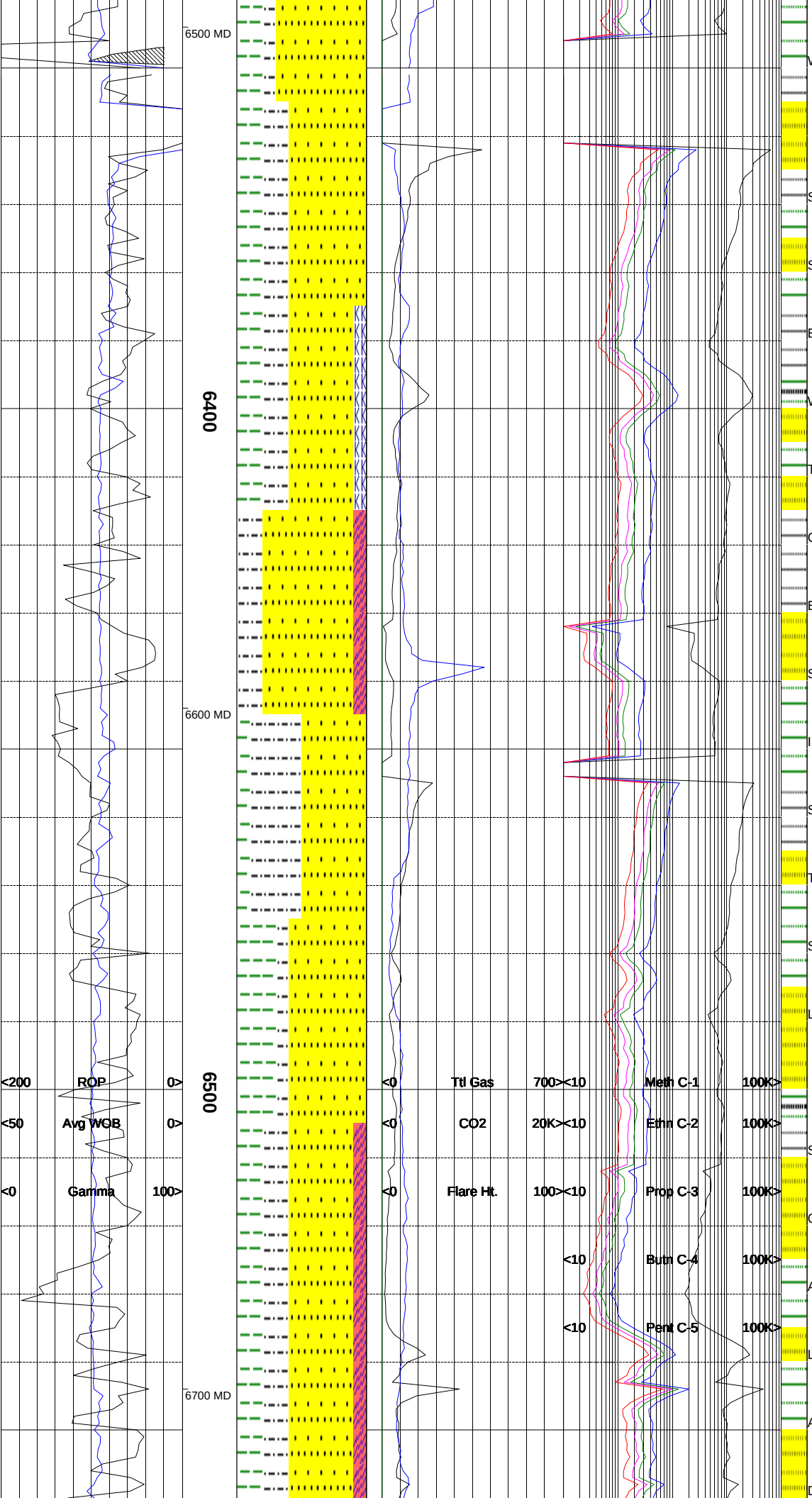
<0
Gamma
100>
6100 MD
6000
<0
Ttl Gas
700><10
Meth C-1
100K>
<0
CO2
20K><10
Etha C-2
100K>
<0
Flare Ht.
100><10
Prop C-3
100K>
<10
Butn C-4
100K>
<10
Pent C-5
100K>
6200 MD
6100
IRREGULAR TO BLOCKY FRACTURE; DOMINANTLY
SUB TABULAR WITH SUB WEDGELIKE; DULL
TO EARTHY LUSTER; SMOOTH TO SILTY
TEXTURE. KAOLINITICS PRESENT IN SAMPLE
TRAY.
CARBONACEOUS SHALE = VERY DARK BROWN
TO BLACK; TOUGH TO DENSE TENACITY; BLOCK
TO IRREGULAR, OCCASIONAL PLANAR FRAC;
SCALY TO SUBTABULAR CUTTINGS HABIT; DULL
TO EARTHY LUSTER; GRITTY TO ABRASIVE
TEXTURE.
SILTSTONE = VERY DARK BROWN; TOUGH TO
DENSE TENACITY, IRREGULAR TO BLOCKY
FRACTURE; SUB PLATY TO SUB TABULAR
CUTTINGS HABIT; DULL TO WAXY LUSTER;
SILTY TO SLIGHTLY GRITTY TEXTURE.
SANDSTONE = LIGHT GRAY TO DARK GRAY,
LIGHT BROWN TO MEDIUM BROWN, VARI-
COLORED UNIDENTIFIED INCLUSIONS; FINE


6300 MD
6200
6400 MD
6300
TO VERY FINE GRAINS, WELL SORTED;
SUB ROUNDED TO SUB ANGULAR; LOW
SPHERICITY; MODERATELY HARD; GRAIN
SUPPORTED; HIGH REACTION TO HCL.
SHALE = LIGHT GRAY TO MEDIUM GRAY;
CRUNCHY TO PULVERULENT; IRREGULAR
TO BLOCKY WITH OCCASIONAL PLANAR;
MASSIVE SUB TABULAR TO SUB WEDGE
LIKE; WAXY TO EARTHY LUSTER; SILTY TO
SMOOTH TEXTURE.
SANDSTONE = VERY LIGHT GRAY TO DARK
GRAY; ABUNDANT LOOSE GRAINS; VERY FINE
TO FINE GRAINED; LOW TO MOD SPHERICITY;
ANGULAR TO SUBANGULAR; CALCAREOUS TO
SILICEOUS CEMENT; SME CARBONACEOUS
TO COALY LAMINATIONS; TRACE LT GREEN
GRAINS; 5% DARK GRAINS; MODERATE TO
HIGH REACTION IN DILUTE HCL; COARSE
CALCITE-PROBABLE FRACTURE FILL OBSERVED
IN THE 6,180' TO 6,380' SAMPLES; ASSOC



WITH MINOR GAS SHOWS.

SHALE = LIGHT GRAY TO LT GREENISH GRAY;

SOME DARK GRAY TO DARK BROWN CARB

EXAMPLES; SLI TO VERY HARD; PLATY TO

WEDGELIKE TO ELONGATED CUTTINGS; PLANAR

TO IRREGULAR FRACTURE; SLI TO MODERATELY

CALCAREOUS IN SILTY SPECIMENS; DULL

EARTHY TO WAXY LUSTER IN LIGHT GRAY

SPECIMENS; BCMG DULL EARTHY TO RESINOUS

IN CARBONACEOUS EXAMPLES; ROUGH TO

SILTY TEXTURE; VERY FINE MICA; VERY FINE

TO THIN CARBONACEOUS LAMINATIONS; SME

SILTSTONE TO VERY FINE GRAINED SANDSTONE

LAMINATIONS; THINLY BEDDED W/SILTSTONE.

SANDSTONE = MODERATE AMOUNT OF LOOSE

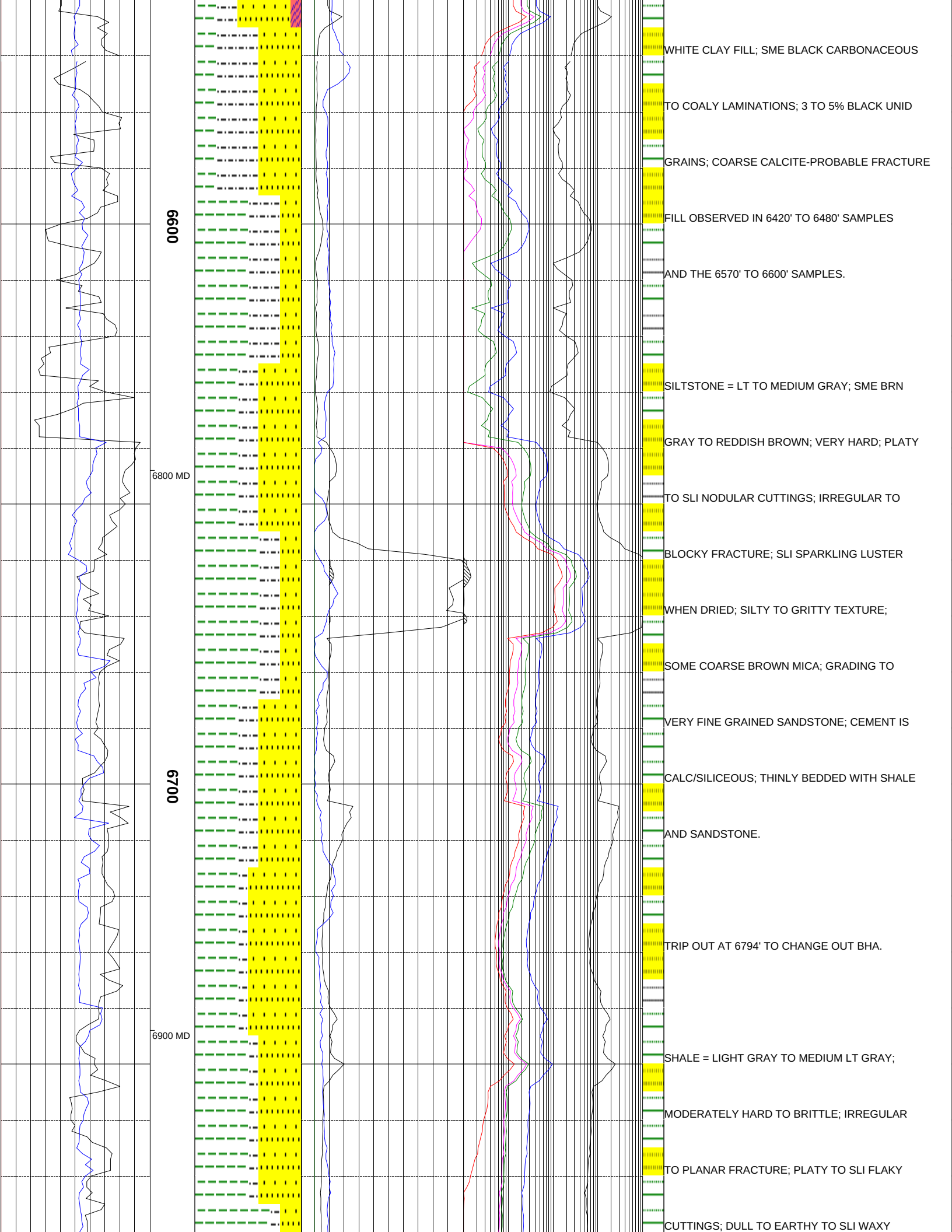
GRAINS; WHITE TO OFF WHITE TO LIGHT GRAY

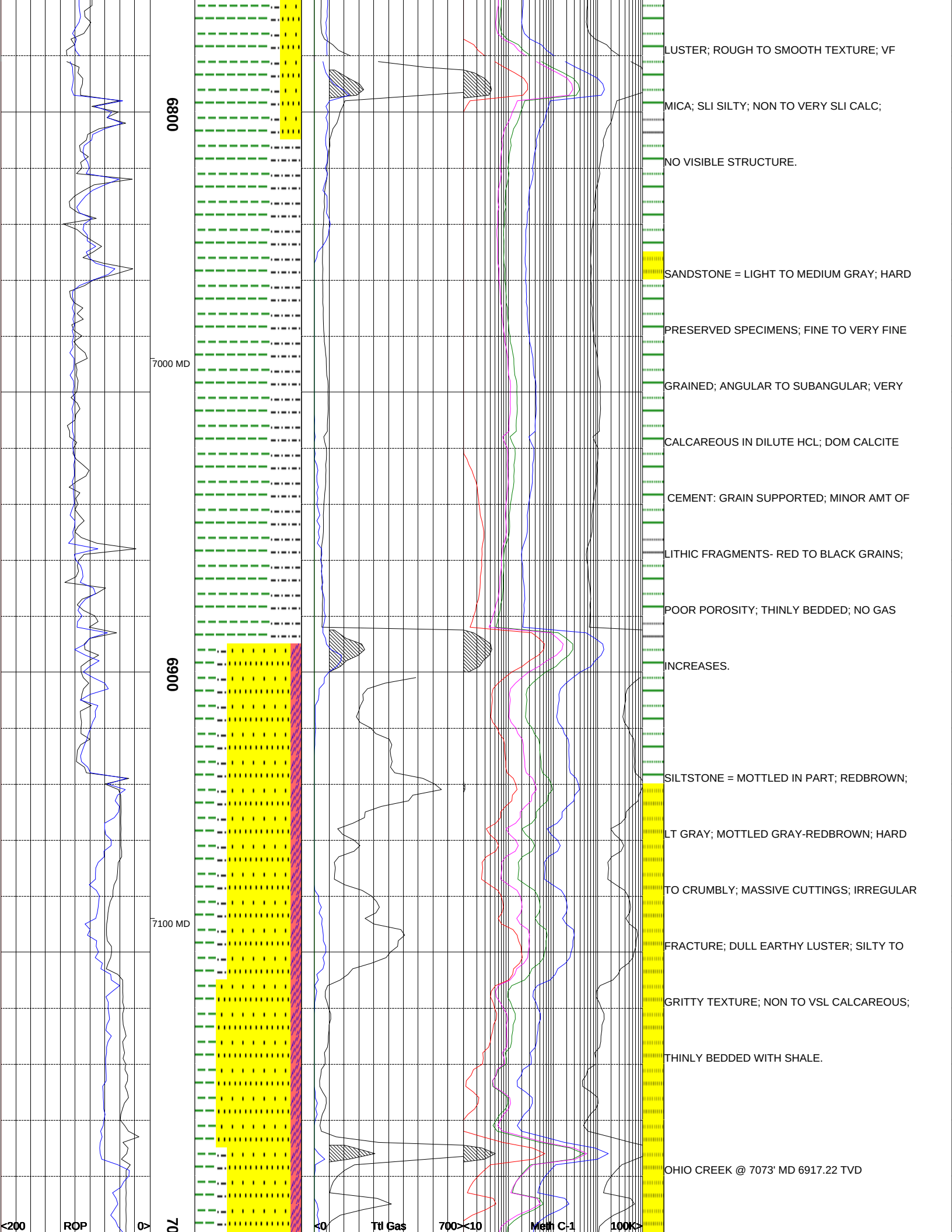
ABUNDANT HARD PRESERVED SPECIMENS;

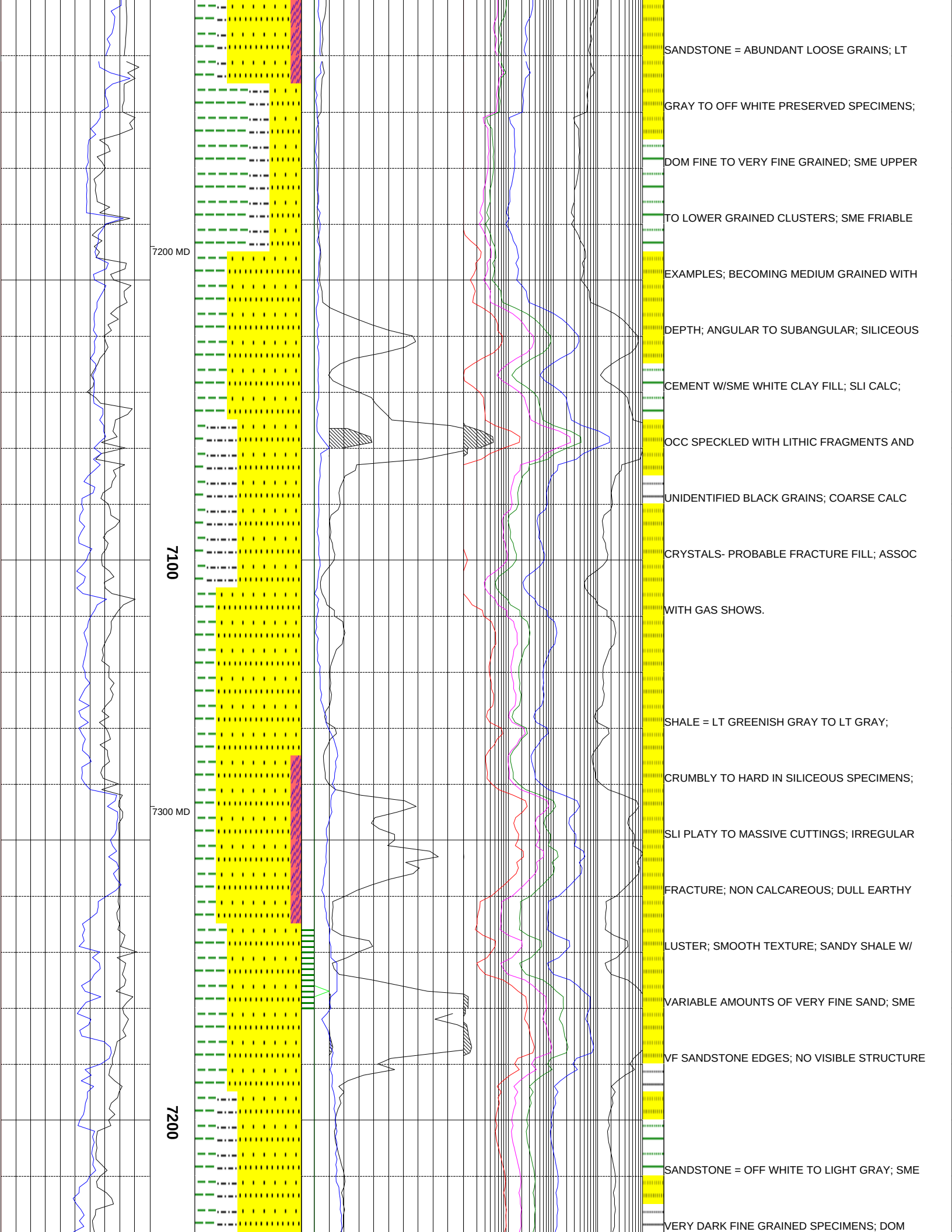
LOWER MEDIUM TO FINE GRAINED; MOD SRTD;

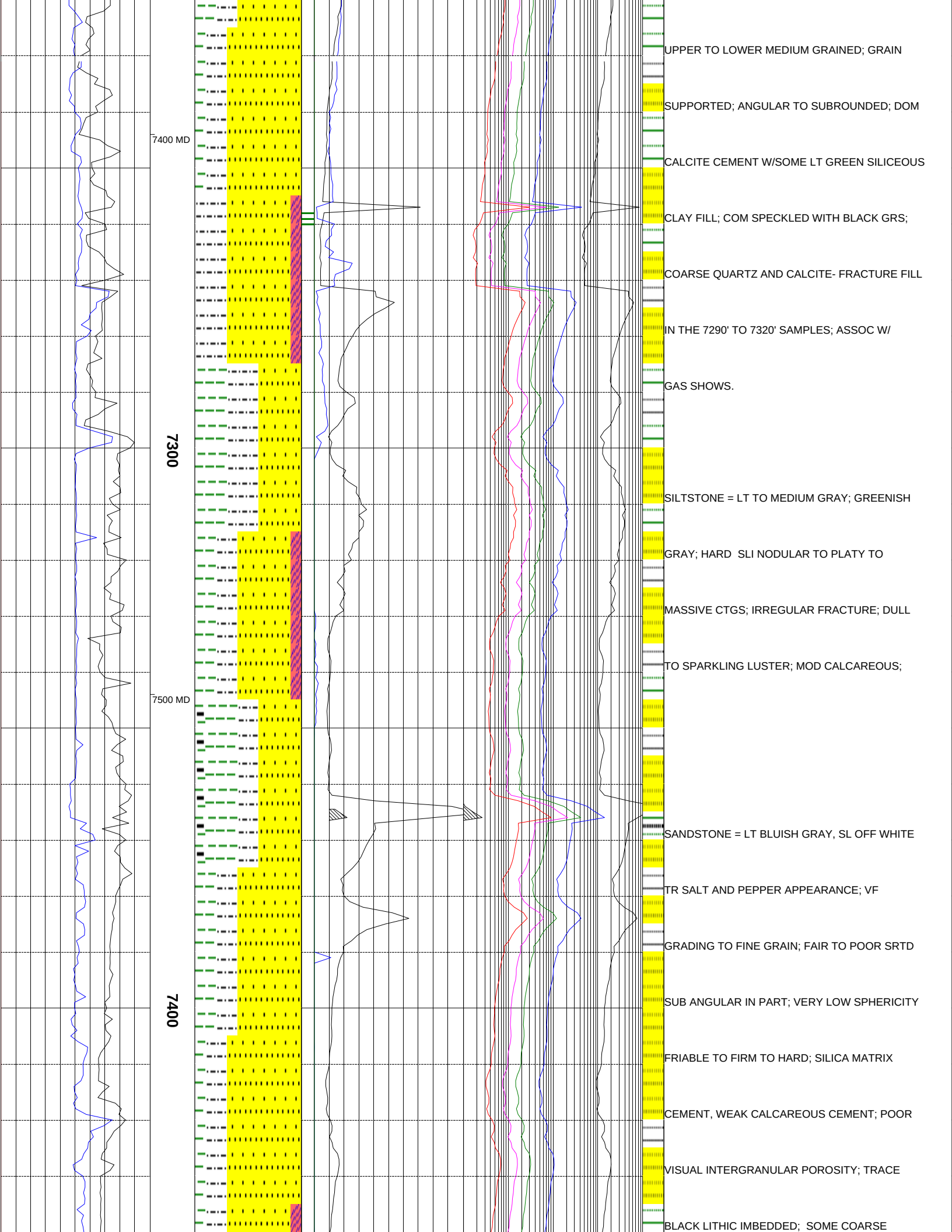
ANGULAR TO SUBANGULAR; GRAIN SUPPORTED;

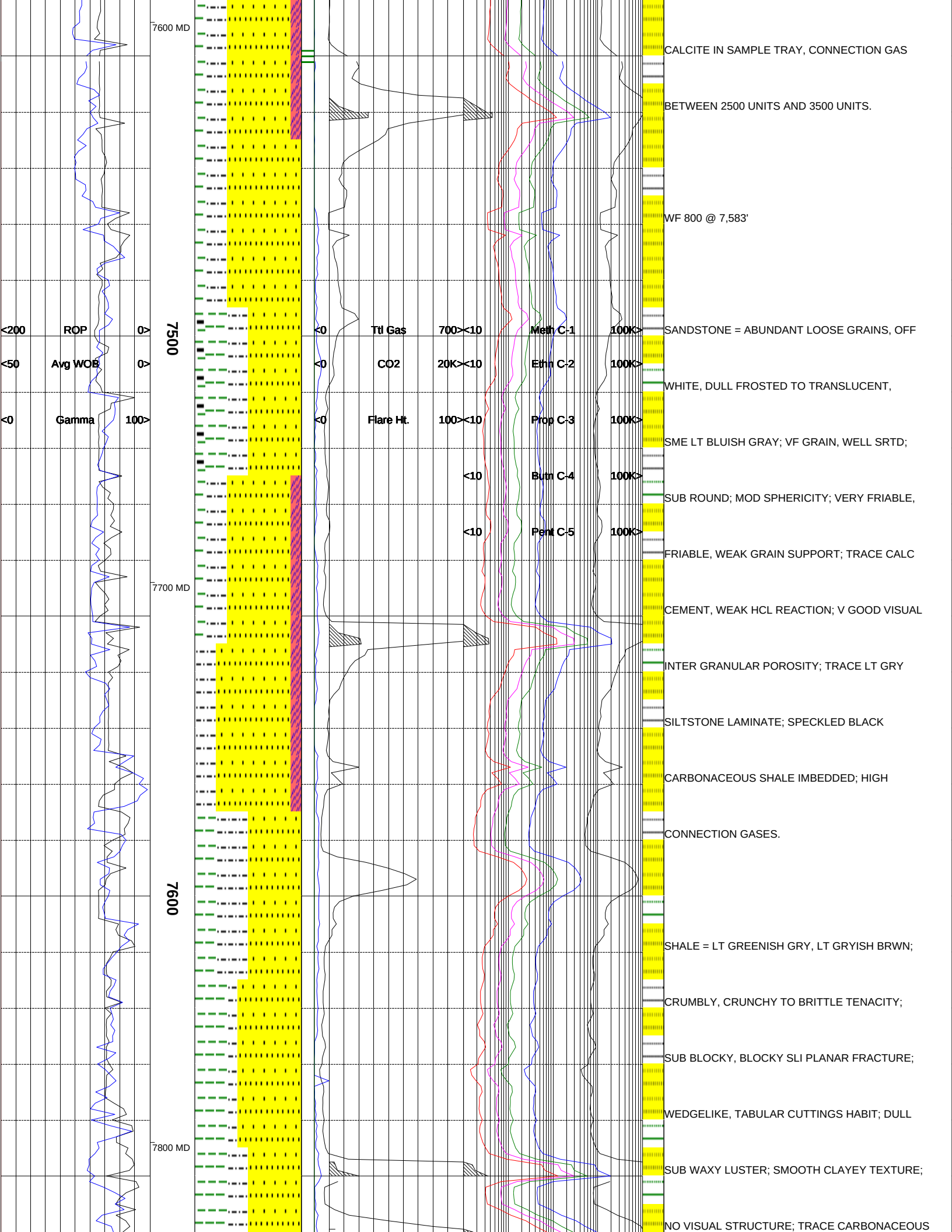
DOM CALCITE CEMENT WITH MINOR SILICEOUS


6600
6800 MD
6700
6900 MD
WHITE CLAY FILL; SME BLACK CARBONACEOUS
TO COALY LAMINATIONS; 3 TO 5% BLACK UNID
GRAINS; COARSE CALCITE-PROBABLE FRACTURE
FILL OBSERVED IN 6420' TO 6480' SAMPLES
AND THE 6570' TO 6600' SAMPLES.
SILTSTONE = LT TO MEDIUM GRAY; SME BRN
GRAY TO REDDISH BROWN; VERY HARD; PLATY
TO SLI NODULAR CUTTINGS; IRREGULAR TO
BLOCKY FRACTURE; SLI SPARKLING LUSTER
WHEN DRIED; SILTY TO GRITTY TEXTURE;
SOME COARSE BROWN MICA; GRADING TO
VERY FINE GRAINED SANDSTONE; CEMENT IS
CALC/SILICEOUS; THINLY BEDDED WITH SHALE
AND SANDSTONE.
TRIP OUT AT 6794' TO CHANGE OUT BHA.
SHALE = LIGHT GRAY TO MEDIUM LT GRAY;
MODERATELY HARD TO BRITTLE; IRREGULAR
TO PLANAR FRACTURE; PLATY TO SLI FLAKY
CUTTINGS; DULL TO EARTHY TO SLI WAXY


6800
7000 MD
6900
7100 MD
7200
<200
ROP
0>
<0
Ttl Gas
700><10
Meth C-1
100K>
LUSTER; ROUGH TO SMOOTH TEXTURE; VF
MICA; SLI SILTY; NON TO VERY SLI CALC;
NO VISIBLE STRUCTURE.
SANDSTONE = LIGHT TO MEDIUM GRAY; HARD
PRESERVED SPECIMENS; FINE TO VERY FINE
GRAINED; ANGULAR TO SUBANGULAR; VERY
CALCAREOUS IN DILUTE HCL; DOM CALCITE
CEMENT: GRAIN SUPPORTED; MINOR AMT OF
LITHIC FRAGMENTS- RED TO BLACK GRAINS;
POOR POROSITY; THINLY BEDDED; NO GAS
INCREASES.
SILTSTONE = MOTTLED IN PART; REDBROWN;
LT GRAY; MOTTLED GRAY-REDBROWN; HARD
TO CRUMBLY; MASSIVE CUTTINGS; IRREGULAR
FRACTURE; DULL EARTHY LUSTER; SILTY TO
GRITTY TEXTURE; NON TO VSL CALCAREOUS;
THINLY BEDDED WITH SHALE.
OHIO CREEK @ 7073' MD 6917.22 TVD


7200 MD
7100
7300 MD
7200
SANDSTONE = ABUNDANT LOOSE GRAINS; LT
GRAY TO OFF WHITE PRESERVED SPECIMENS;
DOM FINE TO VERY FINE GRAINED; SME UPPER
TO LOWER GRAINED CLUSTERS; SME FRIABLE
EXAMPLES; BECOMING MEDIUM GRAINED WITH
DEPTH; ANGULAR TO SUBANGULAR; SILICEOUS
CEMENT W/SME WHITE CLAY FILL; SLI CALC;
OCC SPECKLED WITH LITHIC FRAGMENTS AND
UNIDENTIFIED BLACK GRAINS; COARSE CALC
CRYSTALS- PROBABLE FRACTURE FILL; ASSOC
WITH GAS SHOWS.
SHALE = LT GREENISH GRAY TO LT GRAY;
CRUMBLY TO HARD IN SILICEOUS SPECIMENS;
SLI PLATY TO MASSIVE CUTTINGS; IRREGULAR
FRACTURE; NON CALCAREOUS; DULL EARTHY
LUSTER; SMOOTH TEXTURE; SANDY SHALE W/
VARIABLE AMOUNTS OF VERY FINE SAND; SME
VF SANDSTONE EDGES; NO VISIBLE STRUCTURE
SANDSTONE = OFF WHITE TO LIGHT GRAY; SME
VERY DARK FINE GRAINED SPECIMENS; DOM


7400 MD
7300
7500 MD
7400
UPPER TO LOWER MEDIUM GRAINED; GRAIN
SUPPORTED; ANGULAR TO SUBROUNDED; DOM
CALCITE CEMENT W/SOME LT GREEN SILICEOUS
CLAY FILL; COM SPECKLED WITH BLACK GRS;
COARSE QUARTZ AND CALCITE- FRACTURE FILL
IN THE 7290' TO 7320' SAMPLES; ASSOC W/
GAS SHOWS.
SILTSTONE = LT TO MEDIUM GRAY; GREENISH
GRAY; HARD SLI NODULAR TO PLATY TO
MASSIVE CTGS; IRREGULAR FRACTURE; DULL
TO SPARKLING LUSTER; MOD CALCAREOUS;
SANDSTONE = LT BLUISH GRAY, SL OFF WHITE
TR SALT AND PEPPER APPEARANCE; VF
GRADING TO FINE GRAIN; FAIR TO POOR SRTD
SUB ANGULAR IN PART; VERY LOW SPHERICITY
FRIABLE TO FIRM TO HARD; SILICA MATRIX
CEMENT, WEAK CALCAREOUS CEMENT; POOR
VISUAL INTERGRANULAR POROSITY; TRACE
BLACK LITHIC IMBEDDED; SOME COARSE


7600 MD
7500
7700 MD
7600
7800 MD
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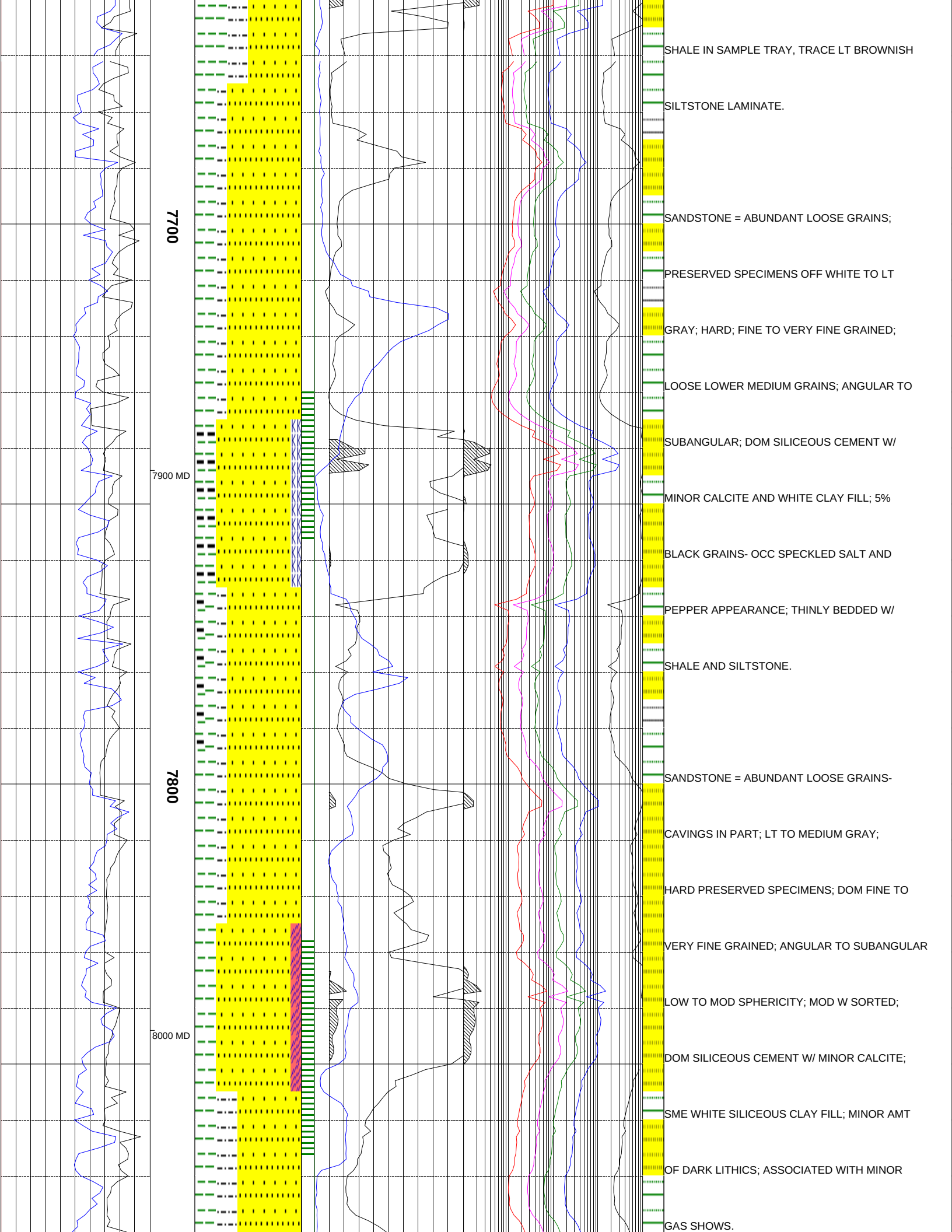
<0 Gamma 100>
<0 Ttl Gas 700><10 Meth C-1 100K>
<0 CO2 20K><10 Eth C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buta C-4 100K>
<10 Pent C-5 100K>
CALCITE IN SAMPLE TRAY, CONNECTION GAS
BETWEEN 2500 UNITS AND 3500 UNITS.
WF 800 @ 7,583'
SANDSTONE = ABUNDANT LOOSE GRAINS, OFF
WHITE, DULL FROSTED TO TRANSLUCENT,
SME LT BLUISH GRAY; VF GRAIN, WELL SRTD;
SUB ROUND; MOD SPHERICITY; VERY FRIABLE,
FRIABLE, WEAK GRAIN SUPPORT; TRACE CALC
CEMENT, WEAK HCL REACTION; V GOOD VISUAL
INTER GRANULAR POROSITY; TRACE LT GRY
SILTSTONE LAMINATE; SPECKLED BLACK
CARBONACEOUS SHALE IMBEDDED; HIGH
CONNECTION GASES.
SHALE = LT GREENISH GRY, LT GRYISH BRWN;
CRUMBLY, CRUNCHY TO BRITTLE TENACITY;
SUB BLOCKY, BLOCKY SLI PLANAR FRACTURE;
WEDGELIKE, TABULAR CUTTINGS HABIT; DULL
SUB WAXY LUSTER; SMOOTH CLAYEY TEXTURE;
NO VISUAL STRUCTURE; TRACE CARBONACEOUS



SHALE IN SAMPLE TRAY, TRACE LT BROWNISH

SILTSTONE LAMINATE.

SANDSTONE = ABUNDANT LOOSE GRAINS;

PRESERVED SPECIMENS OFF WHITE TO LT

GRAY; HARD; FINE TO VERY FINE GRAINED;

LOOSE LOWER MEDIUM GRAINS; ANGULAR TO

SUBANGULAR; DOM SILICEOUS CEMENT W/

MINOR CALCITE AND WHITE CLAY FILL; 5%

BLACK GRAINS- OCC SPECKLED SALT AND

PEPPER APPEARANCE; THINLY BEDDED W/

SHALE AND SILTSTONE.

SANDSTONE = ABUNDANT LOOSE GRAINS-

CAVINGS IN PART; LT TO MEDIUM GRAY;

HARD PRESERVED SPECIMENS; DOM FINE TO

VERY FINE GRAINED; ANGULAR TO SUBANGULAR

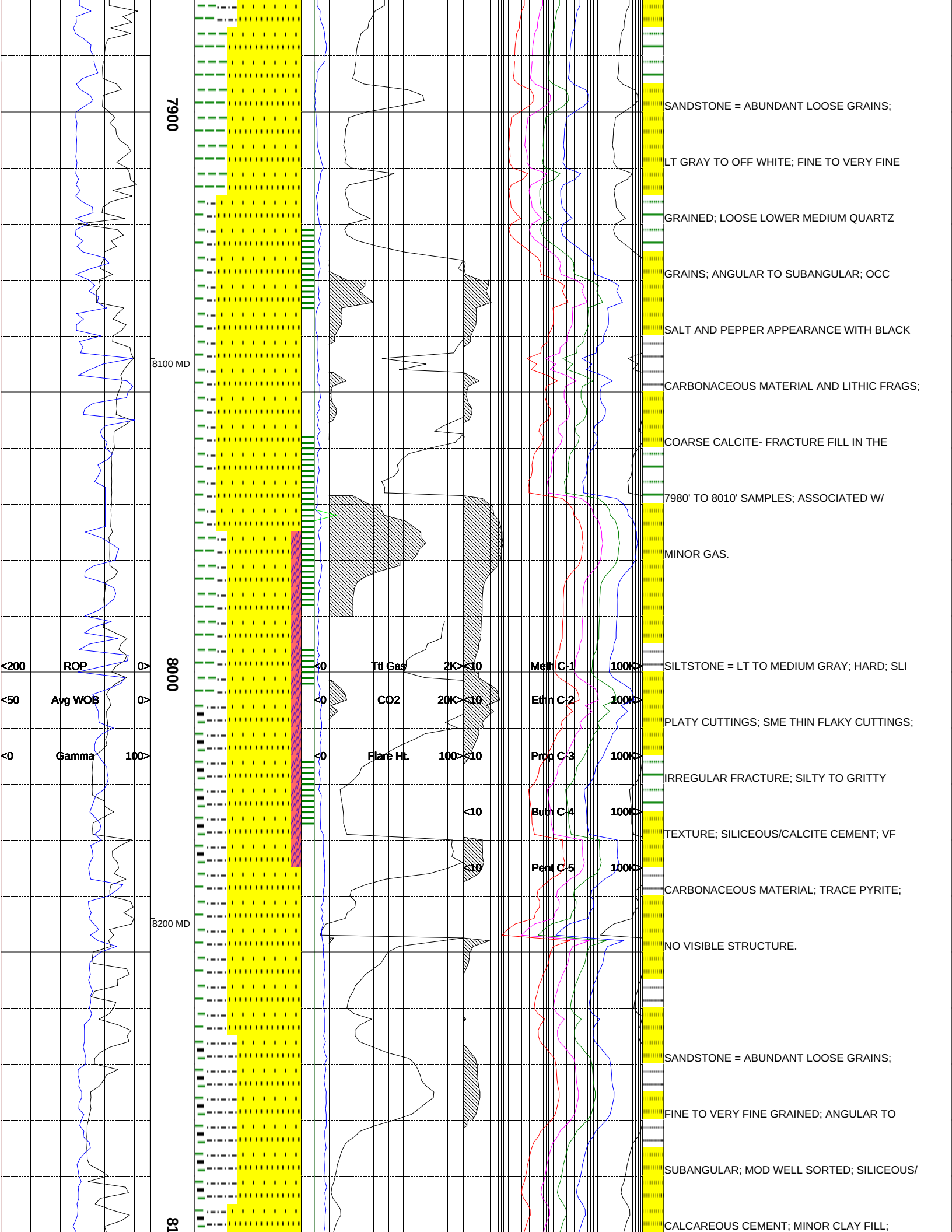
LOW TO MOD SPHERICITY; MOD W SORTED;

DOM SILICEOUS CEMENT W/ MINOR CALCITE;

SME WHITE SILICEOUS CLAY FILL; MINOR AMT

OF DARK LITHICS; ASSOCIATED WITH MINOR

GAS SHOWS.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8100 MD
8000
8200 MD
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<0 CO2 20K>
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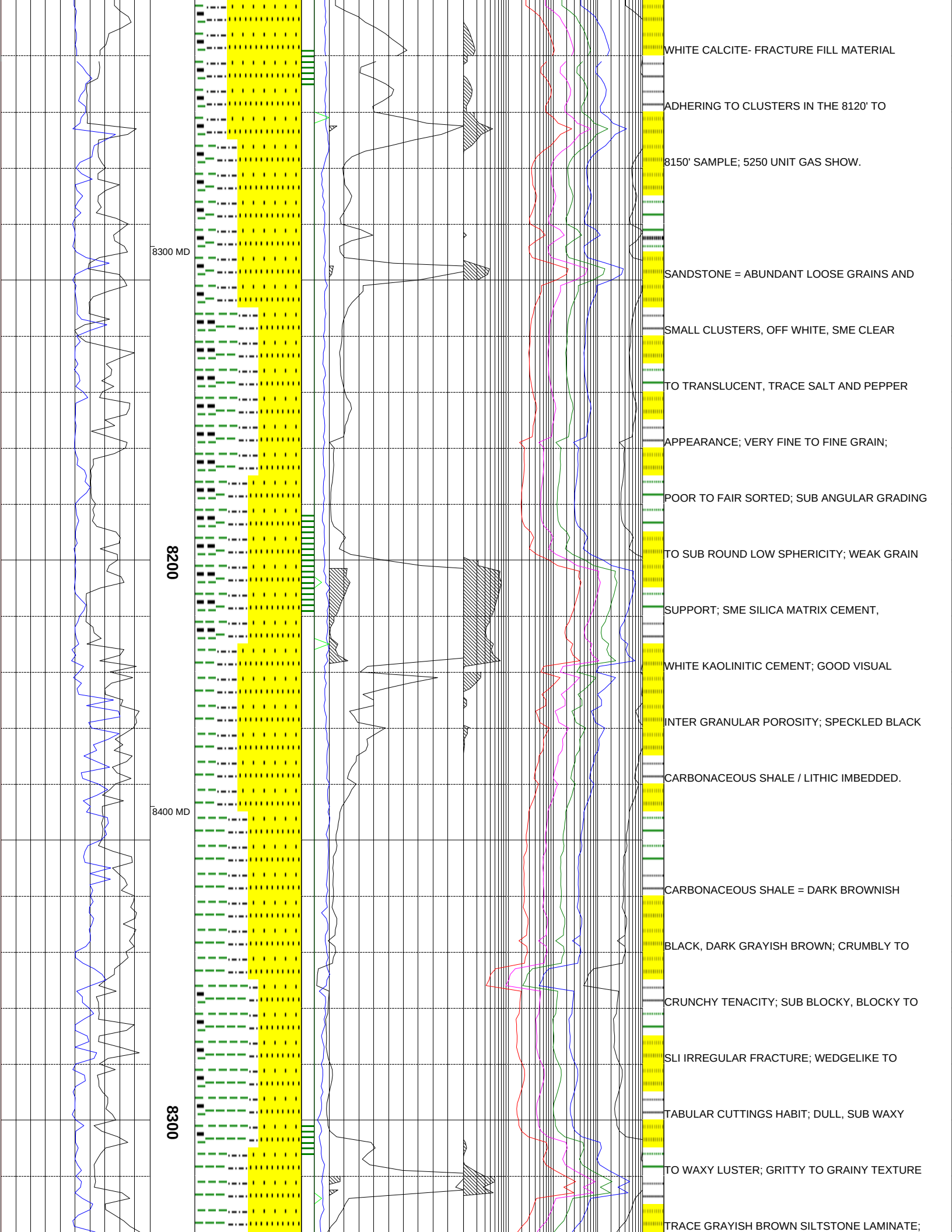
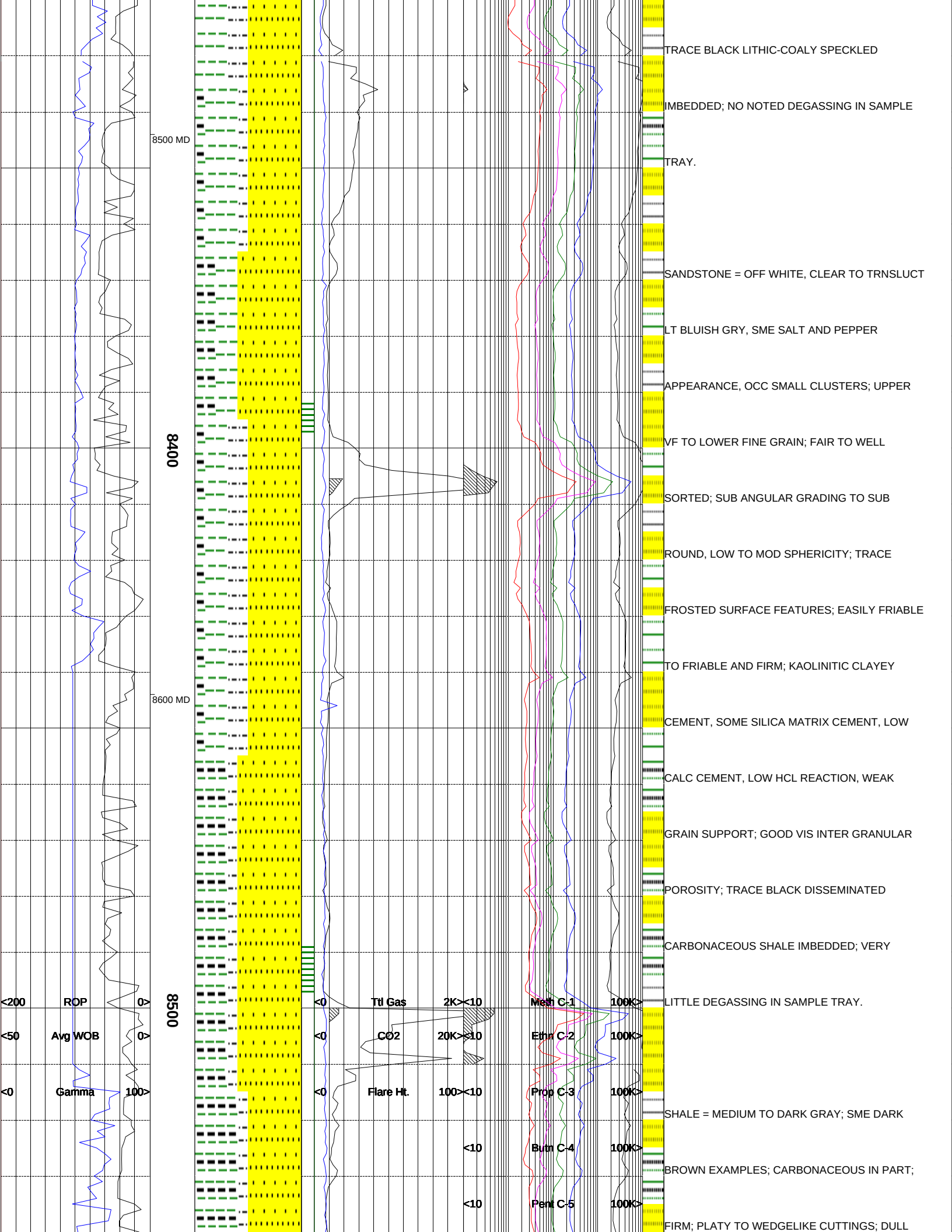
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
SANDSTONE = ABUNDANT LOOSE GRAINS;
LT GRAY TO OFF WHITE; FINE TO VERY FINE
GRAINED; LOOSE LOWER MEDIUM QUARTZ
GRAINS; ANGULAR TO SUBANGULAR; OCC
SALT AND PEPPER APPEARANCE WITH BLACK
CARBONACEOUS MATERIAL AND LITHIC FRAGS;
COARSE CALCITE- FRACTURE FILL IN THE
7980' TO 8010' SAMPLES; ASSOCIATED W/
MINOR GAS.
SILTSTONE = LT TO MEDIUM GRAY; HARD; SLI
PLATY CUTTINGS; SME THIN FLAKY CUTTINGS;
IRREGULAR FRACTURE; SILTY TO GRITTY
TEXTURE; SILICEOUS/CALCITE CEMENT; VF
CARBONACEOUS MATERIAL; TRACE PYRITE;
NO VISIBLE STRUCTURE.
SANDSTONE = ABUNDANT LOOSE GRAINS;
FINE TO VERY FINE GRAINED; ANGULAR TO
SUBANGULAR; MOD WELL SORTED; SILICEOUS/
CALCAREOUS CEMENT; MINOR CLAY FILL;


8300 MD
8200
8400 MD
8300
WHITE CALCITE- FRACTURE FILL MATERIAL
ADHERING TO CLUSTERS IN THE 8120' TO
8150' SAMPLE; 5250 UNIT GAS SHOW.
SANDSTONE = ABUNDANT LOOSE GRAINS AND
SMALL CLUSTERS, OFF WHITE, SME CLEAR
TO TRANSLUCENT, TRACE SALT AND PEPPER
APPEARANCE; VERY FINE TO FINE GRAIN;
POOR TO FAIR SORTED; SUB ANGULAR GRADING
TO SUB ROUND LOW SPHERICITY; WEAK GRAIN
SUPPORT; SME SILICA MATRIX CEMENT,
WHITE KAOLINITIC CEMENT; GOOD VISUAL
INTER GRANULAR POROSITY; SPECKLED BLACK
CARBONACEOUS SHALE / LITHIC IMBEDDED.
CARBONACEOUS SHALE = DARK BROWNISH
BLACK, DARK GRAYISH BROWN; CRUMBLY TO
CRUNCHY TENACITY; SUB BLOCKY, BLOCKY TO
SLI IRREGULAR FRACTURE; WEDGELIKE TO
TABULAR CUTTINGS HABIT; DULL, SUB WAXY
TO WAXY LUSTER; GRITTY TO GRAINY TEXTURE
TRACE GRAYISH BROWN SILTSTONE LAMINATE;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8400
8600 MD
8500
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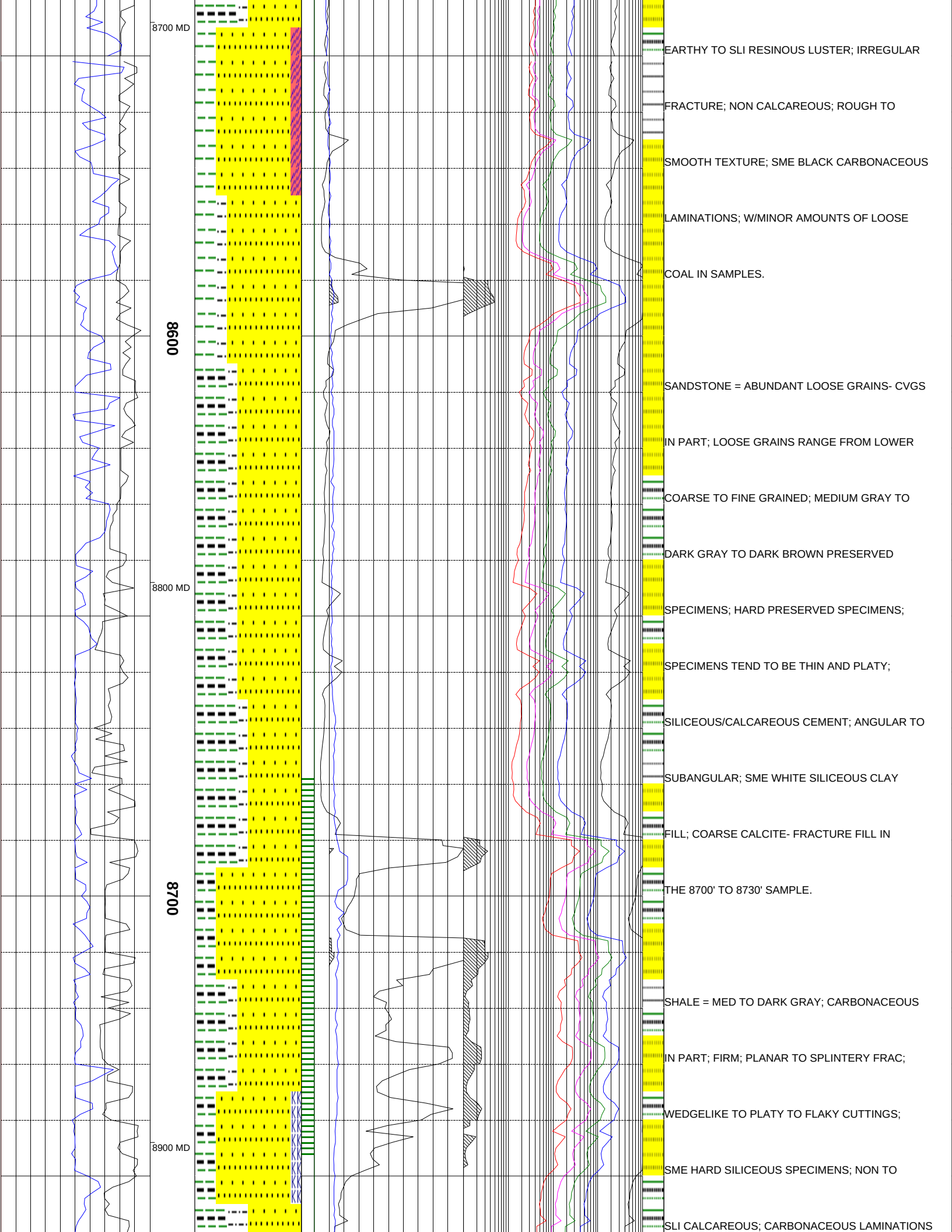
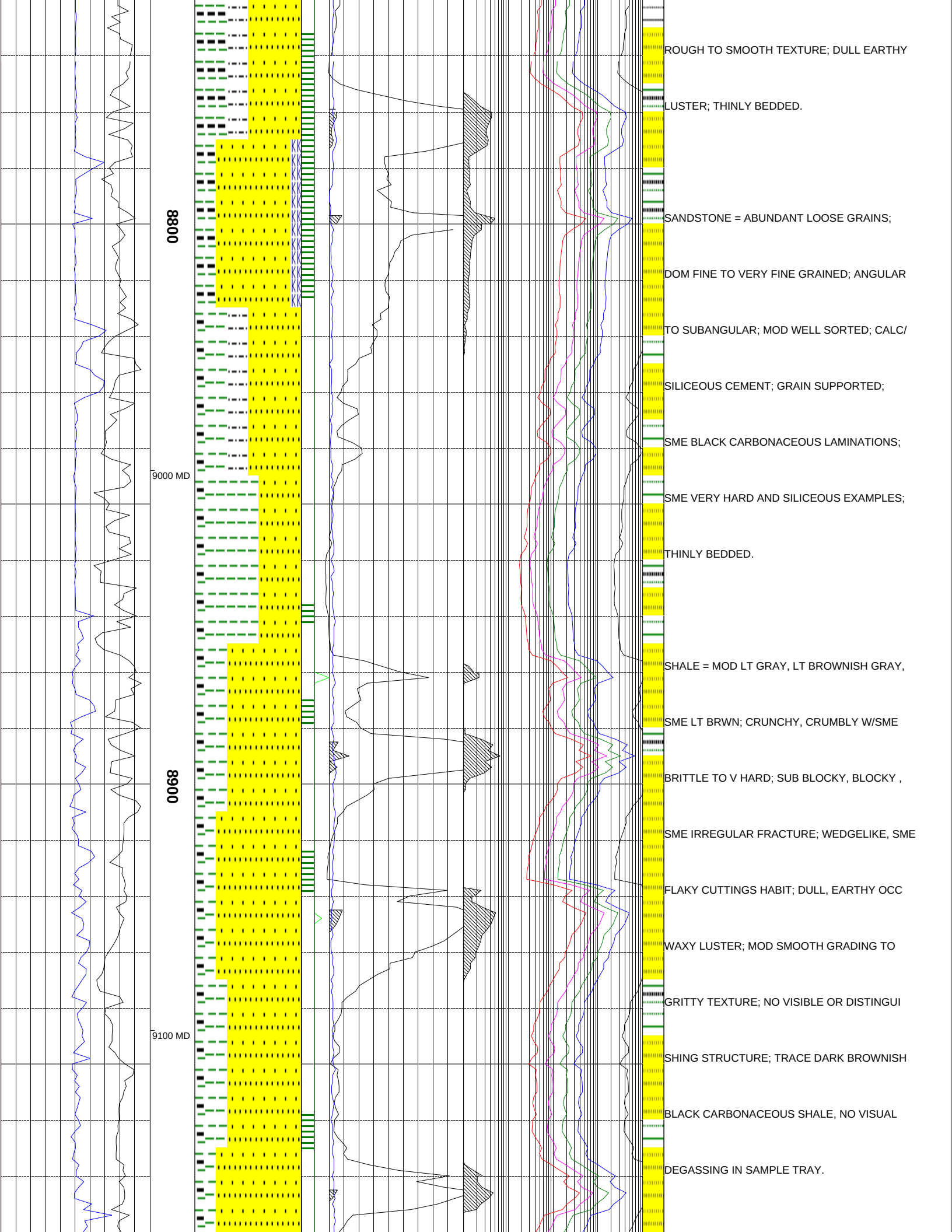
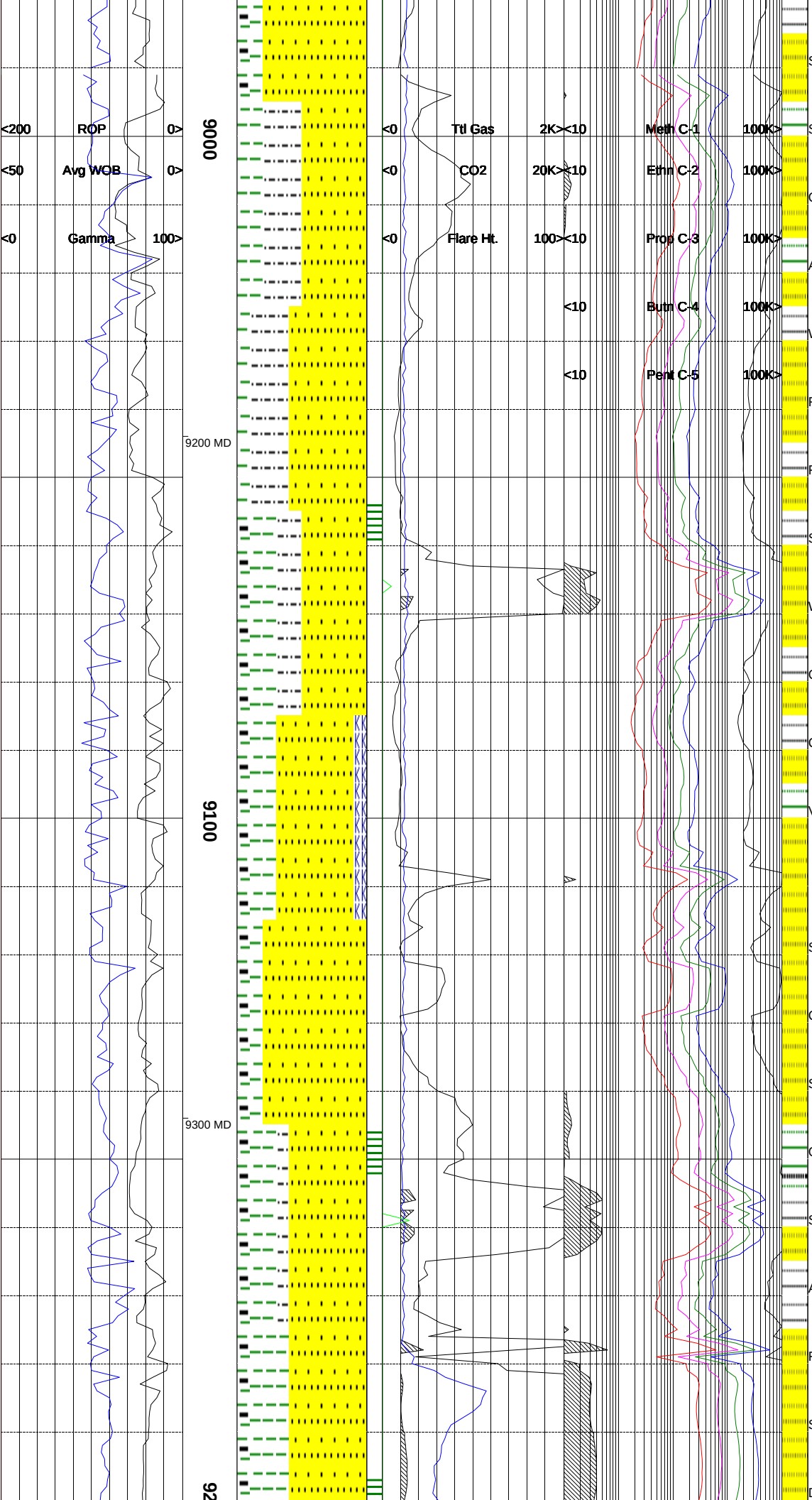
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buta C-4 100K>
<10 Pent C-5 100K>
TRACE BLACK LITHIC-COALY SPECKLED
IMBEDDED; NO NOTED DEGASSING IN SAMPLE
TRAY.
SANDSTONE = OFF WHITE, CLEAR TO TRNSLUCT
LT BLUISH GRY, SME SALT AND PEPPER
APPEARANCE, OCC SMALL CLUSTERS; UPPER
VF TO LOWER FINE GRAIN; FAIR TO WELL
SORTED; SUB ANGULAR GRADING TO SUB
ROUND, LOW TO MOD SPHERICITY; TRACE
FROSTED SURFACE FEATURES; EASILY FRIABLE
TO FRIABLE AND FIRM; KAOLINITIC CLAYEY
CEMENT, SOME SILICA MATRIX CEMENT, LOW
CALC CEMENT, LOW HCL REACTION, WEAK
GRAIN SUPPORT; GOOD VIS INTER GRANULAR
POROSITY; TRACE BLACK DISSEMINATED
CARBONACEOUS SHALE IMBEDDED; VERY
LITTLE DEGASSING IN SAMPLE TRAY.
SHALE = MEDIUM TO DARK GRAY; SME DARK
BROWN EXAMPLES; CARBONACEOUS IN PART;
FIRM; PLATY TO WEDGELIKE CUTTINGS; DULL


8700 MD
8600
8800 MD
8700
8900 MD
EARTHY TO SLI RESINOUS LUSTER; IRREGULAR
FRACTURE; NON CALCAREOUS; ROUGH TO
SMOOTH TEXTURE; SME BLACK CARBONACEOUS
LAMINATIONS; W/MINOR AMOUNTS OF LOOSE
COAL IN SAMPLES.
SANDSTONE = ABUNDANT LOOSE GRAINS- CVGS
IN PART; LOOSE GRAINS RANGE FROM LOWER
COARSE TO FINE GRAINED; MEDIUM GRAY TO
DARK GRAY TO DARK BROWN PRESERVED
SPECIMENS; HARD PRESERVED SPECIMENS;
SPECIMENS TEND TO BE THIN AND PLATY;
SILICEOUS/CALCAREOUS CEMENT; ANGULAR TO
SUBANGULAR; SME WHITE SILICEOUS CLAY
FILL; COARSE CALCITE- FRACTURE FILL IN
THE 8700' TO 8730' SAMPLE.
SHALE = MED TO DARK GRAY; CARBONACEOUS
IN PART; FIRM; PLANAR TO SPLINTERY FRAC;
WEDGELIKE TO PLATY TO FLAKY CUTTINGS;
SME HARD SILICEOUS SPECIMENS; NON TO
SLI CALCAREOUS; CARBONACEOUS LAMINATIONS


8800
9000 MD
8900
9100 MD
ROUGH TO SMOOTH TEXTURE; DULL EARTHY
LUSTER; THINLY BEDDED.
SANDSTONE = ABUNDANT LOOSE GRAINS;
DOM FINE TO VERY FINE GRAINED; ANGULAR
TO SUBANGULAR; MOD WELL SORTED; CALC/
SILICEOUS CEMENT; GRAIN SUPPORTED;
SME BLACK CARBONACEOUS LAMINATIONS;
SME VERY HARD AND SILICEOUS EXAMPLES;
THINLY BEDDED.
SHALE = MOD LT GRAY, LT BROWNISH GRAY,
SME LT BRWN; CRUNCHY, CRUMBLY W/SME
BRITTLE TO V HARD; SUB BLOCKY, BLOCKY ,
SME IRREGULAR FRACTURE; WEDGELIKE, SME
FLAKY CUTTINGS HABIT; DULL, EARTHY OCC
WAXY LUSTER; MOD SMOOTH GRADING TO
GRITTY TEXTURE; NO VISIBLE OR DISTINGUI
SHING STRUCTURE; TRACE DARK BROWNISH
BLACK CARBONACEOUS SHALE, NO VISUAL
DEGASSING IN SAMPLE TRAY.



SANDSTONE = ABUNDANT LOOSE GRAINS, SOME

SMALL CLUSTERS, CLEAR TO TRANSLUCENT,

OFF WHITE, LT BLUISH GRAY, TRACE SALT

AND PEPPER APPEARANCE; VF TO FINE GRAIN;

WELL SORTED; SUB ANGULAR GRADING TO SUB

ROUND; MODERATE SPHERICITY; EASILY

FRIABLE, FRIABLE; WEAK GRAIN SUPPORT;

SILICA MATRIX TO CALCAREOUS CEMENT; TR

WEAK HCL REACTION; GOOD VISUAL INTER

GRANULAR POROSITY; SME BLACK DISSEMINATE

CARBONACEOUS SHALE/LITHIC IMBEDDED, NO

VISUAL DEGASSING IN SAMPLE TRAY.

SANDSTONE = ABUNDANT LOOSE GRAINS, SMALL

CLUSTERS, CLEAR TO TRANSLUCENT, TRACE

SALT AND PEPPER APPEARANCE, LT BLUISH

GRAY; UPPER VERY FINE TO FINE GRAIN; W

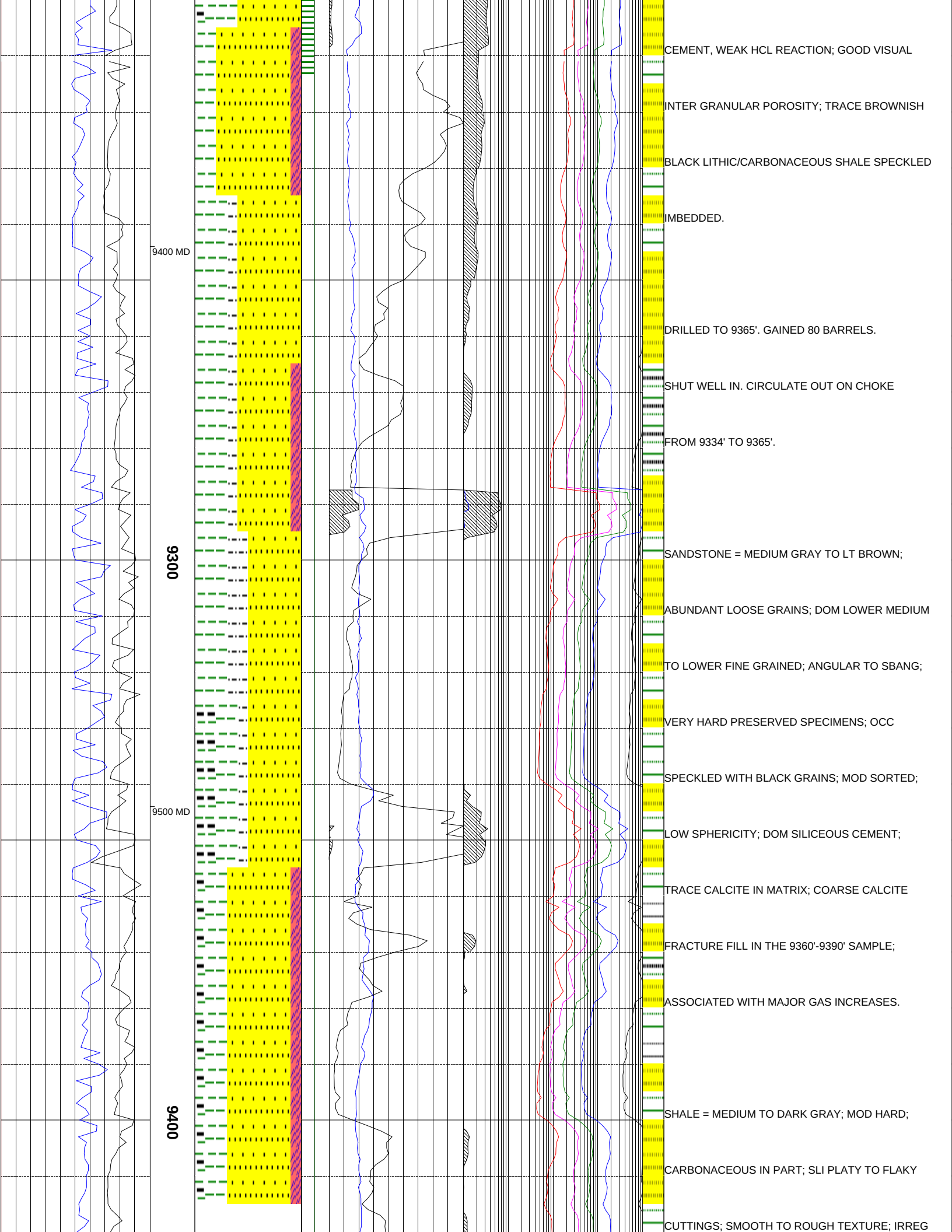
SORTED; SUB ROUND IN PART, SOME SUB

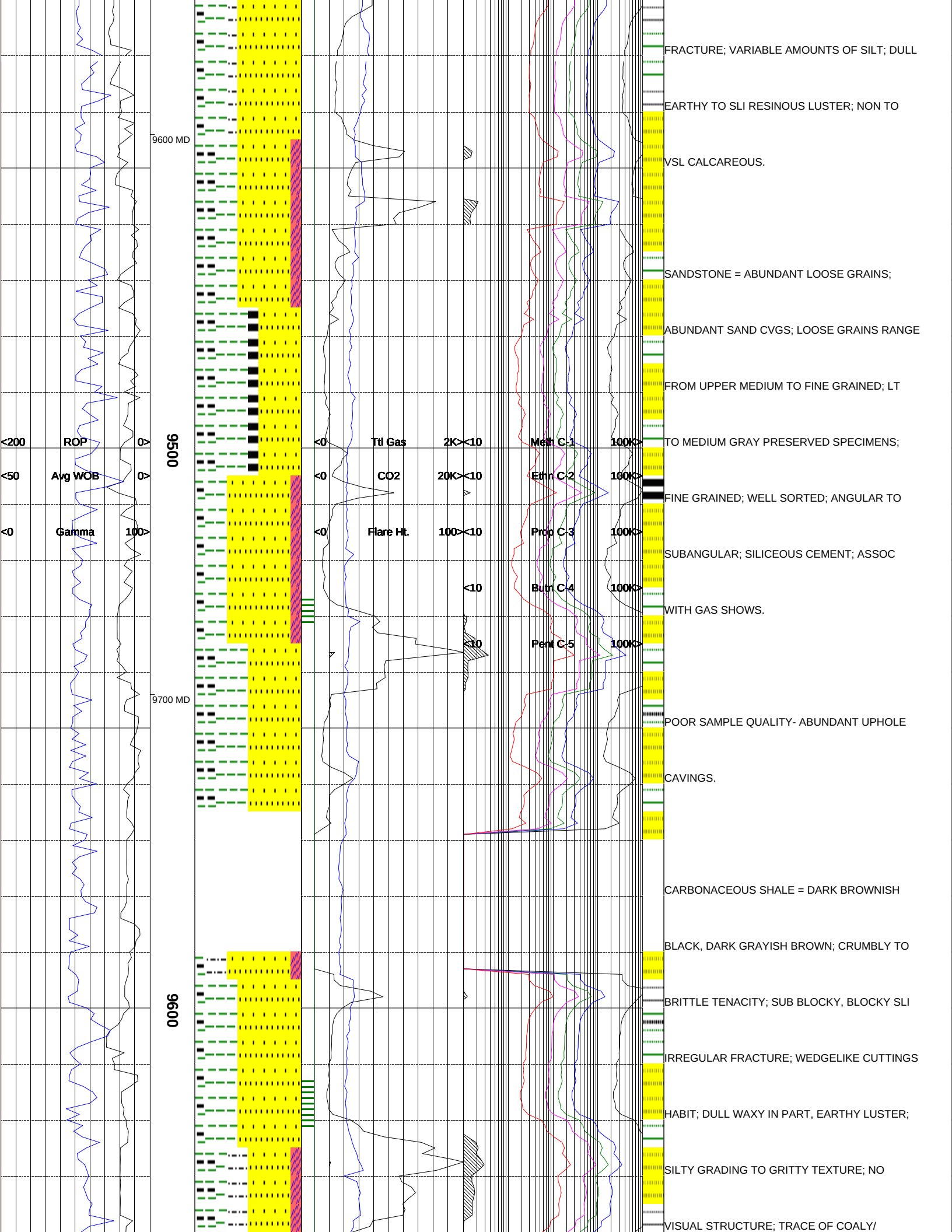
ANGULAR; MOD SPHERICITY; TRACE FROSTED

FEATURES; EASILY FRIABLE TO FRIABLE;

SMALL CLUSTERS POSSIBLE DUE TO PDC BIT;

DOM SILICA MATRIX CEMENT, TRACE CALC


9400 MD
9300
9500 MD
9400
CEMENT, WEAK HCL REACTION; GOOD VISUAL
INTER GRANULAR POROSITY; TRACE BROWNISH
BLACK LITHIC/CARBONACEOUS SHALE SPECKLED
IMBEDDED.
DRILLED TO 9365'. GAINED 80 BARRELS.
SHUT WELL IN. CIRCULATE OUT ON CHOKE
FROM 9334' TO 9365'.
SANDSTONE = MEDIUM GRAY TO LT BROWN;
ABUNDANT LOOSE GRAINS; DOM LOWER MEDIUM
TO LOWER FINE GRAINED; ANGULAR TO SBANG;
VERY HARD PRESERVED SPECIMENS; OCC
SPECKLED WITH BLACK GRAINS; MOD SORTED;
LOW SPHERICITY; DOM SILICEOUS CEMENT;
TRACE CALCITE IN MATRIX; COARSE CALCITE
FRACTURE FILL IN THE 9360'-9390' SAMPLE;
ASSOCIATED WITH MAJOR GAS INCREASES.
SHALE = MEDIUM TO DARK GRAY; MOD HARD;
CARBONACEOUS IN PART; SLI PLATY TO FLAKY
CUTTINGS; SMOOTH TO ROUGH TEXTURE; IRREG


9600 MD
9700 MD
9500
9600
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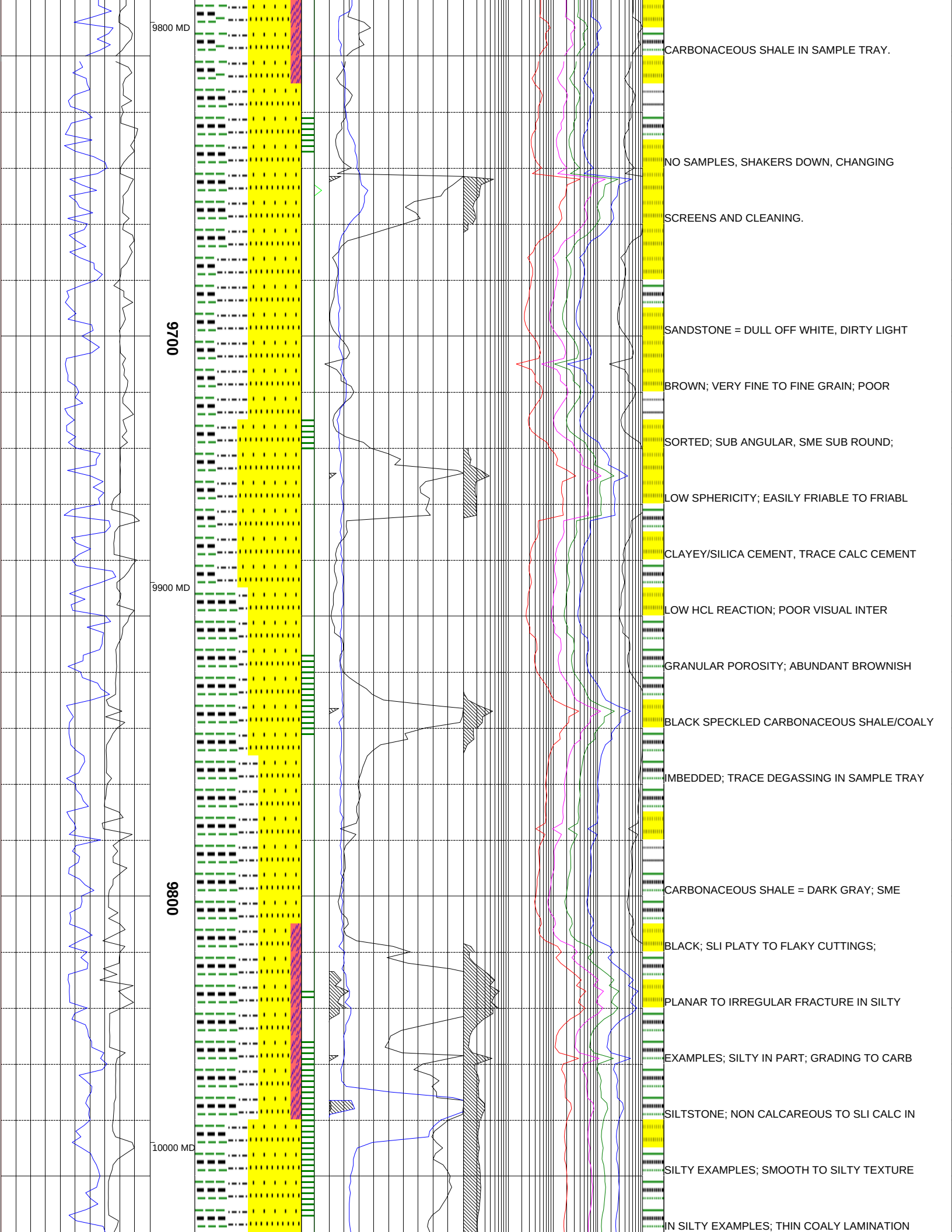
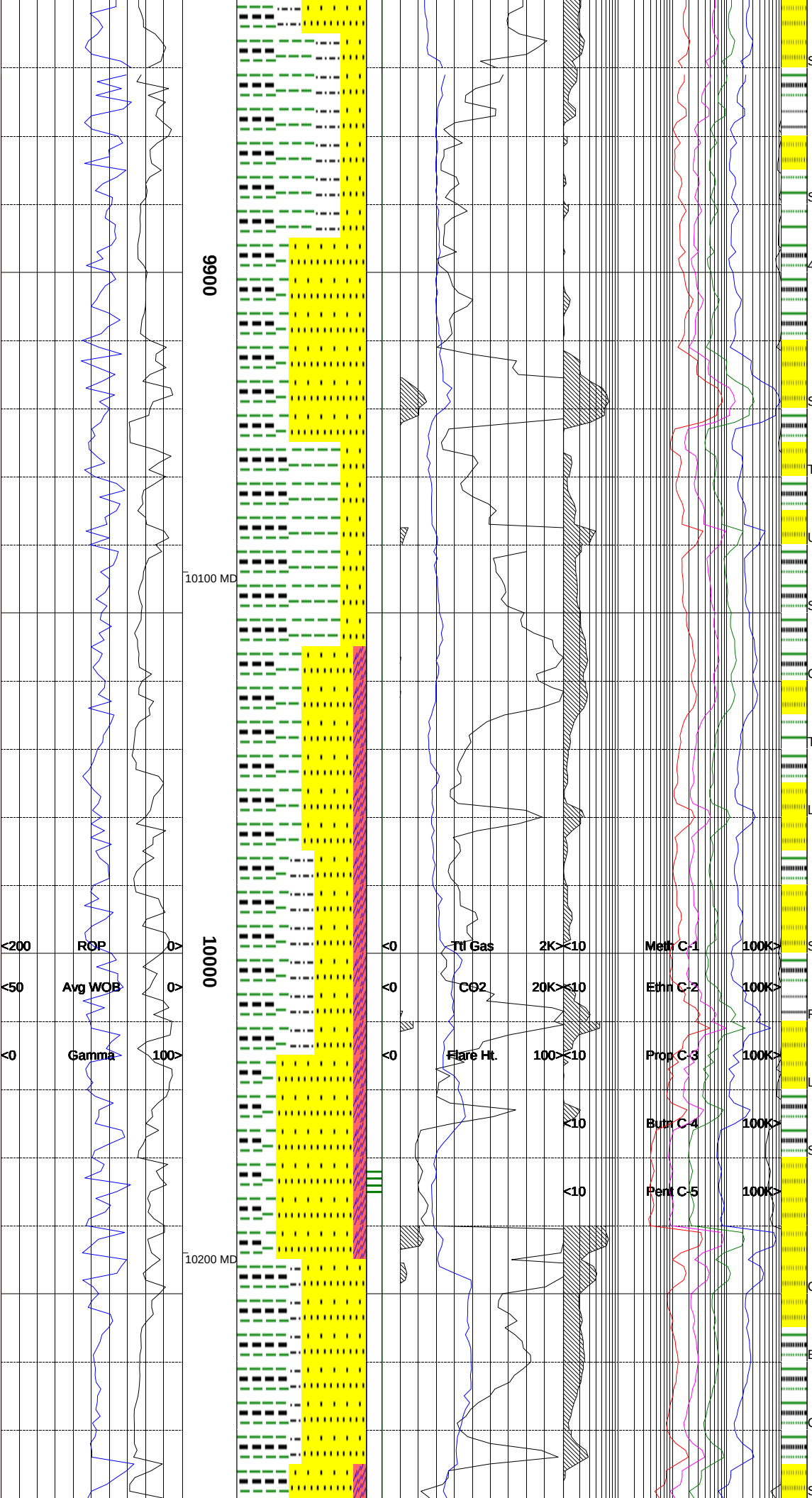
<0 CO2 20K><10 Eth C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
FRACTURE; VARIABLE AMOUNTS OF SILT; DULL
EARTHY TO SLI RESINOUS LUSTER; NON TO
VSL CALCAREOUS.
SANDSTONE = ABUNDANT LOOSE GRAINS;
ABUNDANT SAND CVGS; LOOSE GRAINS RANGE
FROM UPPER MEDIUM TO FINE GRAINED; LT
TO MEDIUM GRAY PRESERVED SPECIMENS;
FINE GRAINED; WELL SORTED; ANGULAR TO
SUBANGULAR; SILICEOUS CEMENT; ASSOC
WITH GAS SHOWS.
POOR SAMPLE QUALITY- ABUNDANT UPHOLE
CAVINGS.
CARBONACEOUS SHALE = DARK BROWNISH
BLACK, DARK GRAYISH BROWN; CRUMBLY TO
BRITTLE TENACITY; SUB BLOCKY, BLOCKY SLI
IRREGULAR FRACTURE; WEDGELIKE CUTTINGS
HABIT; DULL WAXY IN PART, EARTHY LUSTER;
SILTY GRADING TO GRITTY TEXTURE; NO
VISUAL STRUCTURE; TRACE OF COALY/


9800 MD
CARBONACEOUS SHALE IN SAMPLE TRAY.
NO SAMPLES, SHAKERS DOWN, CHANGING
SCREENS AND CLEANING.
9700
SANDSTONE = DULL OFF WHITE, DIRTY LIGHT
BROWN; VERY FINE TO FINE GRAIN; POOR
SORTED; SUB ANGULAR, SME SUB ROUND;
LOW SPHERICITY; EASILY FRIABLE TO FRIABL
CLAYEY/SILICA CEMENT, TRACE CALC CEMENT
9900 MD
LOW HCL REACTION; POOR VISUAL INTER
GRANULAR POROSITY; ABUNDANT BROWNISH
BLACK SPECKLED CARBONACEOUS SHALE/COALY
IMBEDDED; TRACE DEGASSING IN SAMPLE TRAY
9800
CARBONACEOUS SHALE = DARK GRAY; SME
BLACK; SLI PLATY TO FLAKY CUTTINGS;
PLANAR TO IRREGULAR FRACTURE IN SILTY
EXAMPLES; SILTY IN PART; GRADING TO CARB
SILTSTONE; NON CALCAREOUS TO SLI CALC IN
10000 MD
SILTY EXAMPLES; SMOOTH TO SILTY TEXTURE
IN SILTY EXAMPLES; THIN COALY LAMINATION



SOME LOOSE COAL; NO VISIBLE STRUCTURE.

SHUT THE WELL IN @ 10023' AFTER A

40 BARREL GAIN.

SANDSTONE = MEDIUM BROWN; SME MED

TO DARK GRAY; HARD PRESERVED SPECIMENS;

UPPER TO LOWER FINE GRAINED; MOD WELL

SORTED; GRAIN SUPPORTED; DOM SILICEOUS

CEMENT WITH MINOR CALCITE FILL; ANGULAR

TO SUBANGULAR; OCC THIN CARBONACEOUS

LAMINATIONS; THINLY BEDDED.

SHALE = LT BROWN TO TAN; VERY HARD;

FLAKY CUTTINGS; BLOCKY FRACTURE; DULL

LUSTER; SMOOTH TEXTURE; MOD CALCAREOUS;

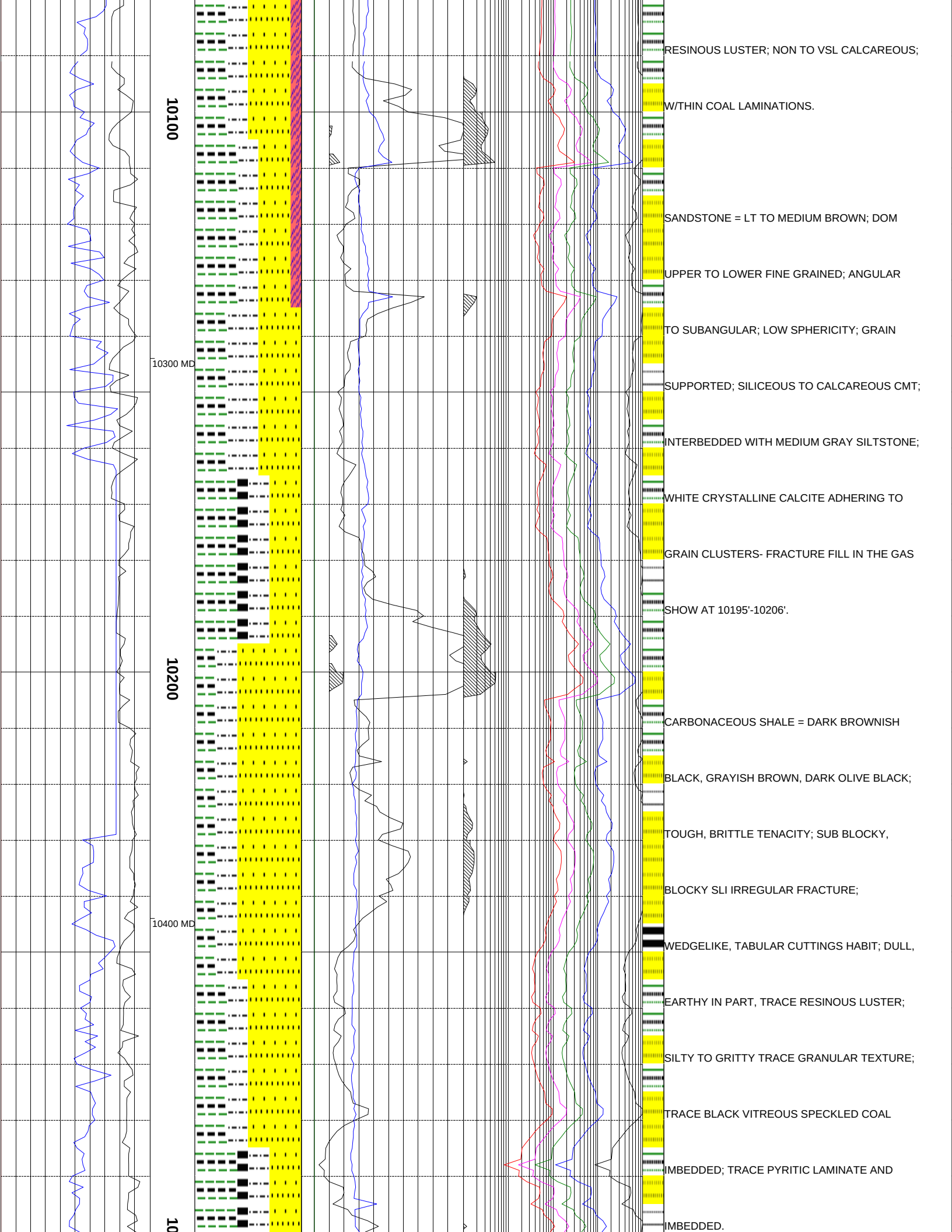
SLI SILTY; THINLY BEDDED.

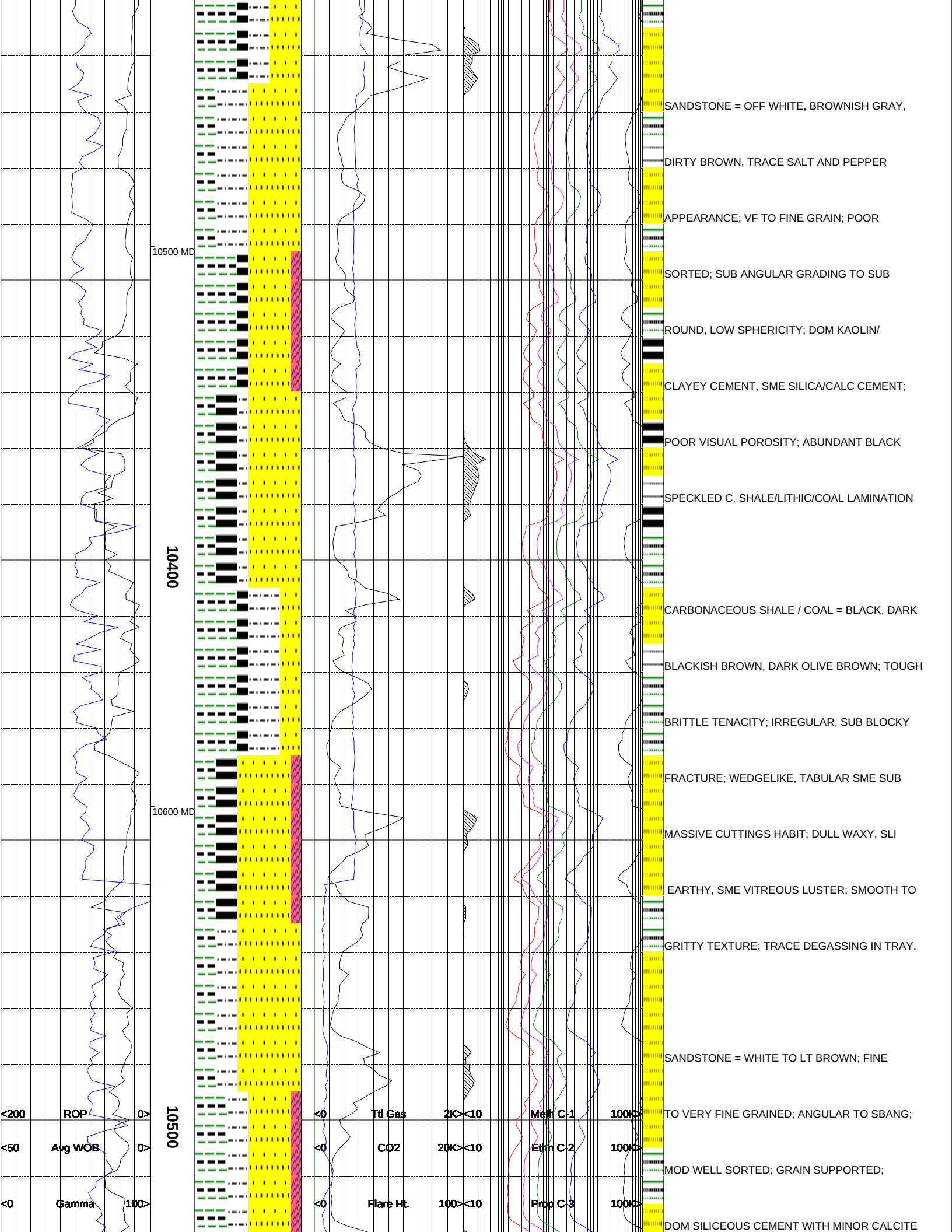
CARBONACEOUS SHALE = DARK GRAY; DARK

BROWN; FIRM TO MOD HARD; PLATY TO FLAKY

CUTTINGS; PLANAR TO SPLINTERY FRACTURE;

SMOOTH TO ROUGH TEXTURE; DULL EARTHY TO


10100
10300 MD
10200
10400 MD
RESINOUS LUSTER; NON TO VSL CALCAREOUS;
W/THIN COAL LAMINATIONS.
SANDSTONE = LT TO MEDIUM BROWN; DOM
UPPER TO LOWER FINE GRAINED; ANGULAR
TO SUBANGULAR; LOW SPHERICITY; GRAIN
SUPPORTED; SILICEOUS TO CALCAREOUS CMT;
INTERBEDDED WITH MEDIUM GRAY SILTSTONE;
WHITE CRYSTALLINE CALCITE ADHERING TO
GRAIN CLUSTERS- FRACTURE FILL IN THE GAS
SHOW AT 10195'-10206'.
CARBONACEOUS SHALE = DARK BROWNISH
BLACK, GRAYISH BROWN, DARK OLIVE BLACK;
TOUGH, BRITTLE TENACITY; SUB BLOCKY,
BLOCKY SLI IRREGULAR FRACTURE;
WEDGELIKE, TABULAR CUTTINGS HABIT; DULL,
EARTHY IN PART, TRACE RESINOUS LUSTER;
SILTY TO GRITTY TRACE GRANULAR TEXTURE;
TRACE BLACK VITREOUS SPECKLED COAL
IMBEDDED; TRACE PYRITIC LAMINATE AND
IMBEDDED.


10500 MD
10400
10600 MD
10500
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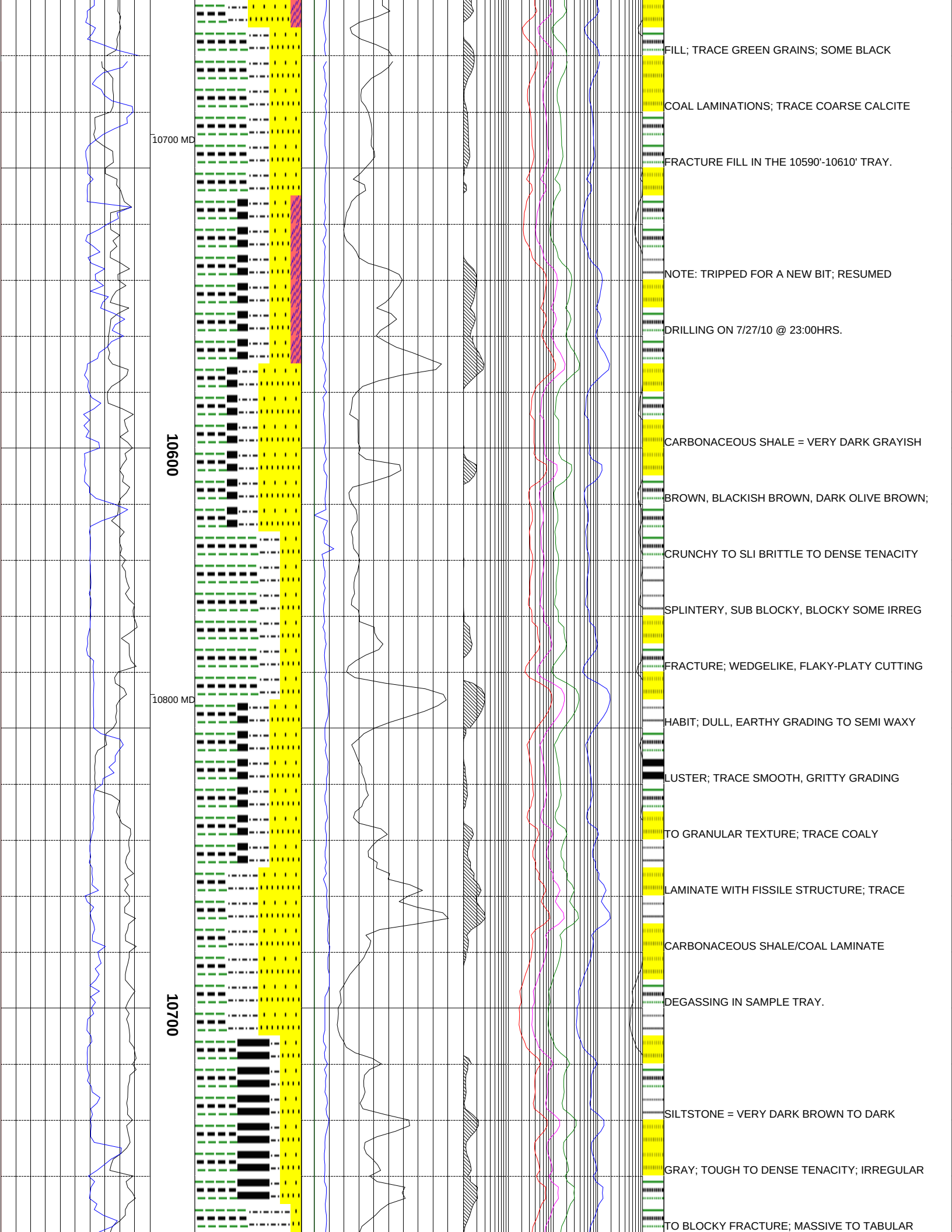
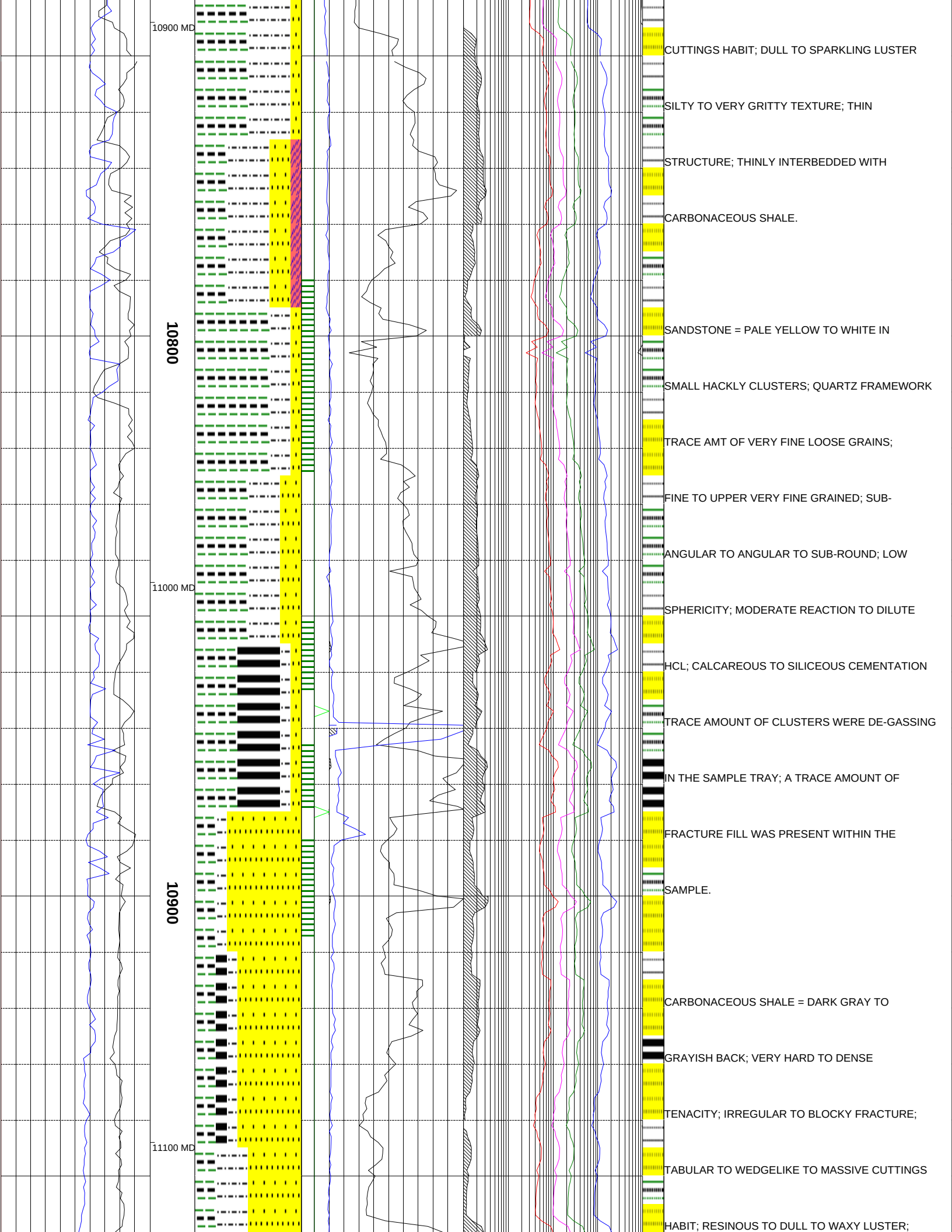
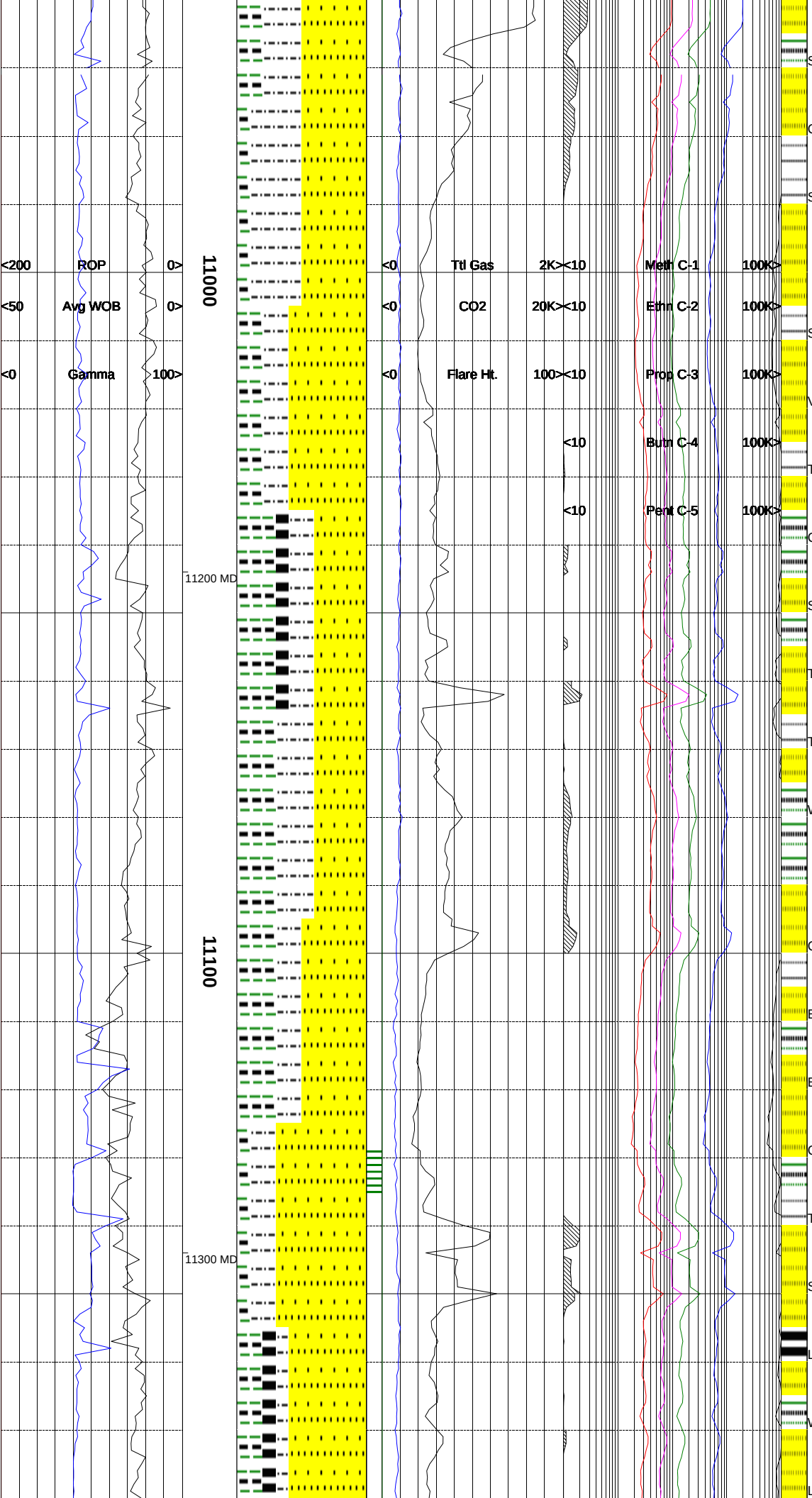
<0 Gamma 100>
<0 Ttl Gas 2K><10
<0 CO2 20K><10
<0 Flare Ht. 100><10
Meth C-1 100K>
Eth'n C-2 100K>
Prop C-3 100K>
SANDSTONE = OFF WHITE, BROWNISH GRAY,
DIRTY BROWN, TRACE SALT AND PEPPER
APPEARANCE; VF TO FINE GRAIN; POOR
SORTED; SUB ANGULAR GRADING TO SUB
ROUND, LOW SPHERICITY; DOM KAOLIN/
CLAYEY CEMENT, SME SILICA/CALC CEMENT;
POOR VISUAL POROSITY; ABUNDANT BLACK
SPECKLED C. SHALE/LITHIC/COAL LAMINATION
CARBONACEOUS SHALE / COAL = BLACK, DARK
BLACKISH BROWN, DARK OLIVE BROWN; TOUGH
BRITTLE TENACITY; IRREGULAR, SUB BLOCKY
FRACTURE; WEDGELIKE, TABULAR SME SUB
MASSIVE CUTTINGS HABIT; DULL WAXY, SLI
EARTHY, SME VITREOUS LUSTER; SMOOTH TO
GRITTY TEXTURE; TRACE DEGASSING IN TRAY.
SANDSTONE = WHITE TO LT BROWN; FINE
TO VERY FINE GRAINED; ANGULAR TO SBANG;
MOD WELL SORTED; GRAIN SUPPORTED;
DOM SILICEOUS CEMENT WITH MINOR CALCITE


10700 MD
10600
10800 MD
10700
FILL; TRACE GREEN GRAINS; SOME BLACK
COAL LAMINATIONS; TRACE COARSE CALCITE
FRACTURE FILL IN THE 10590'-10610' TRAY.
NOTE: TRIPPED FOR A NEW BIT; RESUMED
DRILLING ON 7/27/10 @ 23:00HRS.
CARBONACEOUS SHALE = VERY DARK GRAYISH
BROWN, BLACKISH BROWN, DARK OLIVE BROWN;
CRUNCHY TO SLI BRITTLE TO DENSE TENACITY
SPLINTERY, SUB BLOCKY, BLOCKY SOME IRREG
FRACTURE; WEDGELIKE, FLAKY-PLATY CUTTING
HABIT; DULL, EARTHY GRADING TO SEMI WAXY
LUSTER; TRACE SMOOTH, GRITTY GRADING
TO GRANULAR TEXTURE; TRACE COALY
LAMINATE WITH FISSILE STRUCTURE; TRACE
CARBONACEOUS SHALE/COAL LAMINATE
DEGASSING IN SAMPLE TRAY.
SILTSTONE = VERY DARK BROWN TO DARK
GRAY; TOUGH TO DENSE TENACITY; IRREGULAR
TO BLOCKY FRACTURE; MASSIVE TO TABULAR


10900 MD
10800
11000 MD
10900
11100 MD
CUTTINGS HABIT; DULL TO SPARKLING LUSTER
SILTY TO VERY GRITTY TEXTURE; THIN
STRUCTURE; THINLY INTERBEDDED WITH
CARBONACEOUS SHALE.
SANDSTONE = PALE YELLOW TO WHITE IN
SMALL HACKLY CLUSTERS; QUARTZ FRAMEWORK
TRACE AMT OF VERY FINE LOOSE GRAINS;
FINE TO UPPER VERY FINE GRAINED; SUB-
ANGULAR TO ANGULAR TO SUB-ROUND; LOW
SPHERICITY; MODERATE REACTION TO DILUTE
HCL; CALCAREOUS TO SILICEOUS CEMENTATION
TRACE AMOUNT OF CLUSTERS WERE DE-GASSING
IN THE SAMPLE TRAY; A TRACE AMOUNT OF
FRACTURE FILL WAS PRESENT WITHIN THE
SAMPLE.
CARBONACEOUS SHALE = DARK GRAY TO
GRAYISH BACK; VERY HARD TO DENSE
TENACITY; IRREGULAR TO BLOCKY FRACTURE;
TABULAR TO WEDGELIKE TO MASSIVE CUTTINGS
HABIT; RESINOUS TO DULL TO WAXY LUSTER;



SMOOTH TO SILTY TEXTURE; APPEARED TO HAV

COAL LAMINATIONS ON SOME SPECIMENS; THIN

STRUCTURE; APPEARED TO GRADE TO COAL.

SILTSTONE = DARK GRAYISH BROWN TO BROWN;

VERY TOUGH TO DENSE TENACITY; IRREGULAR

TO BLOCKY FRACTURE; MASSIVE TO TABULAR

CUTTINGS HABIT; WAXY TO SPARKLING TO

SLIGHTLY SPARKLING; SILTY TO GRITTY

TEXTURE; THIN STRUCTURE; SLIGHT REACTION

TO DILUTED HCL; TRACE AMOUNT OF COAL

WITHIN SAMPLE.

CARBONACEOUS SHALE = VERY DARK OLIVE

BROWNISH GRAY, BLACKISH BROWN, GRAYISH

BROWN W/ BLACKISH SPECKS; OCC CRUNCHY,

CRUMBLY, SOME GRADING TO BRITTLE

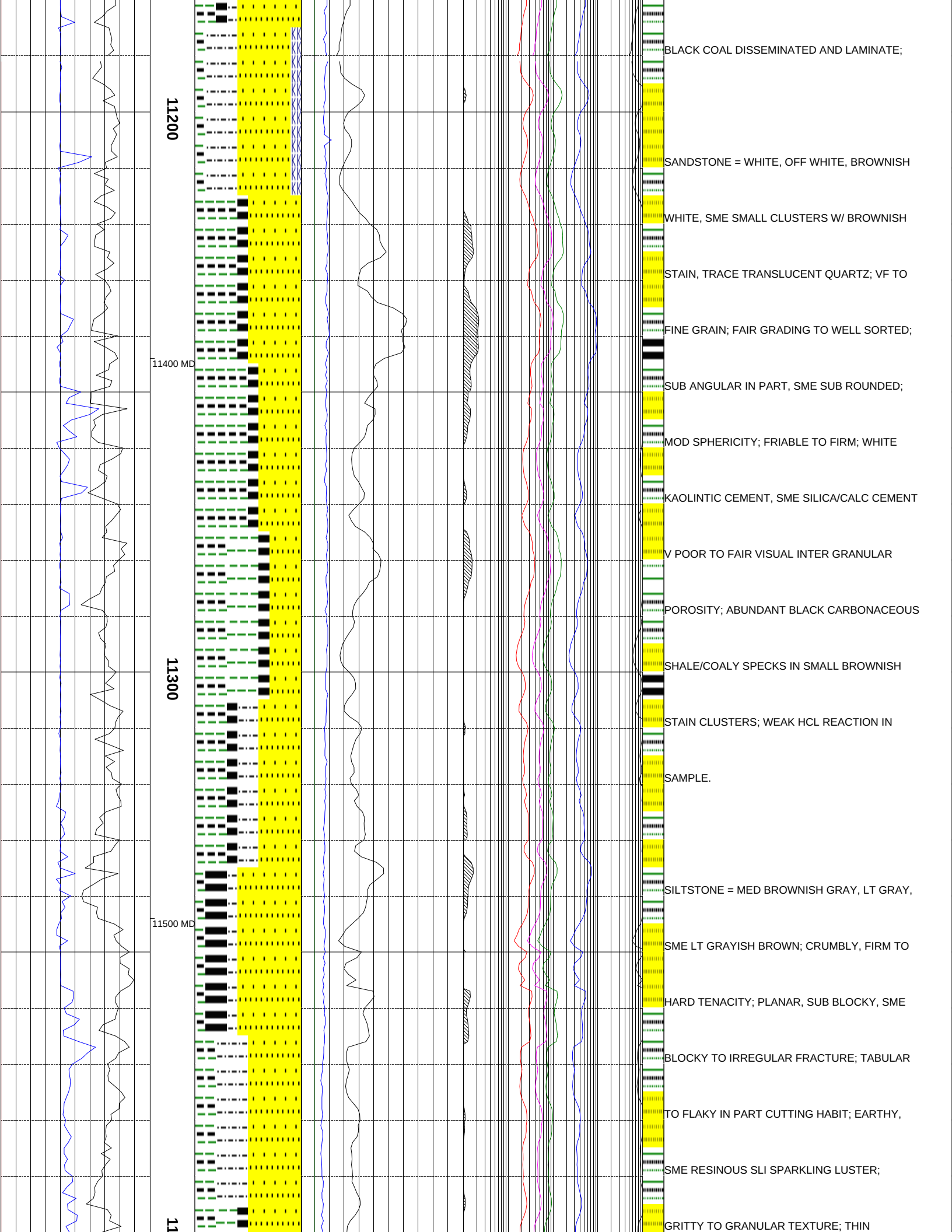
TENACITY; SPLINTERY, SUB BLOCKY / BLOCKY

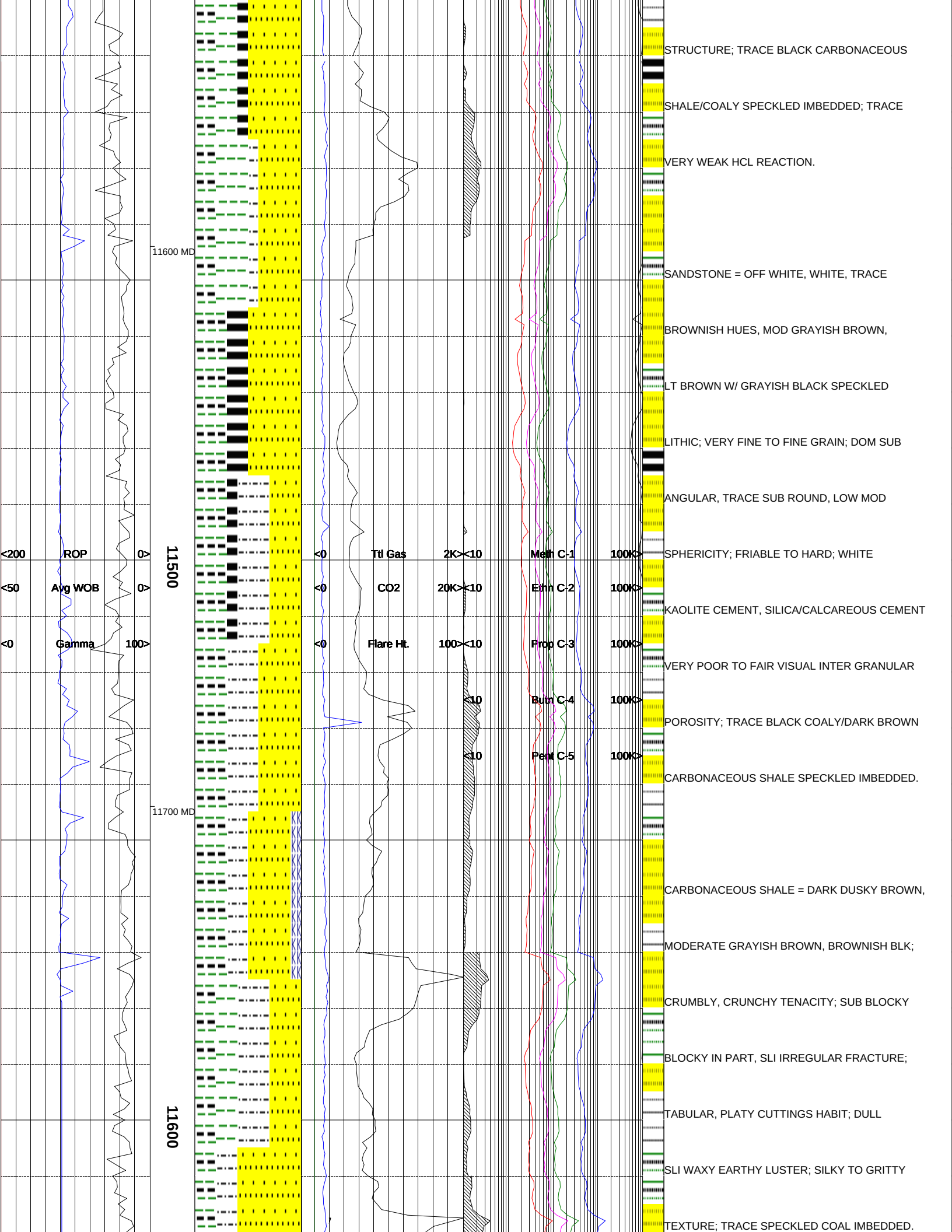
SME IRREGULAR FRACTURE; TABULAR, WEDGE-

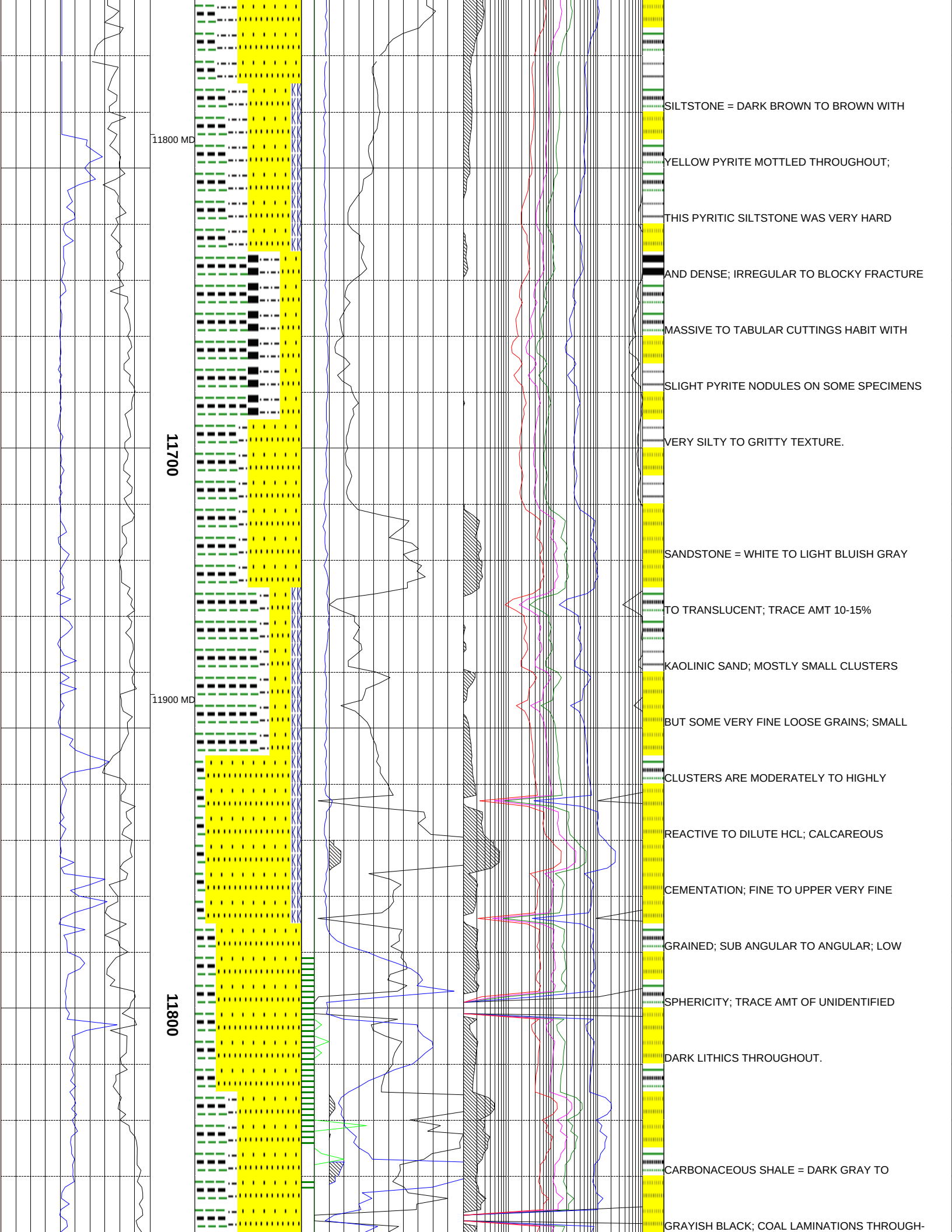
LIKE, SLI PLATY CUTTINGS HABIT; DULL,

WAXY IN PART, BLACK SPECKLED VITREOUS

LUSTER; SILTY TO GRITTY TEXTURE; TRACE


11200
11400 MD
11300
11500 MD
BLACK COAL DISSEMINATED AND LAMINATE;
SANDSTONE = WHITE, OFF WHITE, BROWNISH
WHITE, SME SMALL CLUSTERS W/ BROWNISH
STAIN, TRACE TRANSLUCENT QUARTZ; VF TO
FINE GRAIN; FAIR GRADING TO WELL SORTED;
SUB ANGULAR IN PART, SME SUB ROUNDED;
MOD SPHERICITY; FRIABLE TO FIRM; WHITE
KAOLINTIC CEMENT, SME SILICA/CALC CEMENT
V POOR TO FAIR VISUAL INTER GRANULAR
POROSITY; ABUNDANT BLACK CARBONACEOUS
SHALE/COALY SPECKS IN SMALL BROWNISH
STAIN CLUSTERS; WEAK HCL REACTION IN
SAMPLE.
SILTSTONE = MED BROWNISH GRAY, LT GRAY,
SME LT GRAYISH BROWN; CRUMBLY, FIRM TO
HARD TENACITY; PLANAR, SUB BLOCKY, SME
BLOCKY TO IRREGULAR FRACTURE; TABULAR
TO FLAKY IN PART CUTTING HABIT; EARTHY,
SME RESINOUS SLI SPARKLING LUSTER;
GRITTY TO GRANULAR TEXTURE; THIN


<200 ROP 0>
<50 Avg WOB 0>
<0 Gamma 100>
11600 MD
11500
11700 MD
11600
<0 Ttl Gas 2K><10 Meth C-1 100K>
<0 CO2 20K><10 Etha C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
STRUCTURE; TRACE BLACK CARBONACEOUS
SHALE/COALY SPECKLED IMBEDDED; TRACE
VERY WEAK HCL REACTION.
SANDSTONE = OFF WHITE, WHITE, TRACE
BROWNISH HUES, MOD GRAYISH BROWN,
LT BROWN W/ GRAYISH BLACK SPECKLED
LITHIC; VERY FINE TO FINE GRAIN; DOM SUB
ANGULAR, TRACE SUB ROUND, LOW MOD
SPHERICITY; FRIABLE TO HARD; WHITE
KAOLITE CEMENT, SILICA/CALCAREOUS CEMENT
VERY POOR TO FAIR VISUAL INTER GRANULAR
POROSITY; TRACE BLACK COALY/DARK BROWN
CARBONACEOUS SHALE SPECKLED IMBEDDED.
CARBONACEOUS SHALE = DARK DUSKY BROWN,
MODERATE GRAYISH BROWN, BROWNISH BLK;
CRUMBLY, CRUNCHY TENACITY; SUB BLOCKY
BLOCKY IN PART, SLI IRREGULAR FRACTURE;
TABULAR, PLATY CUTTINGS HABIT; DULL
SLI WAXY EARTHY LUSTER; SILKY TO GRITTY
TEXTURE; TRACE SPECKLED COAL IMBEDDED.


11800 MD
11700
11900 MD
11800
SILTSTONE = DARK BROWN TO BROWN WITH
YELLOW PYRITE MOTTLED THROUGHOUT;
THIS PYRITIC SILTSTONE WAS VERY HARD
AND DENSE; IRREGULAR TO BLOCKY FRACTURE
MASSIVE TO TABULAR CUTTINGS HABIT WITH
SLIGHT PYRITE NODULES ON SOME SPECIMENS
VERY SILTY TO GRITTY TEXTURE.
SANDSTONE = WHITE TO LIGHT BLUISH GRAY
TO TRANSLUCENT; TRACE AMT 10-15%
KAOLINIC SAND; MOSTLY SMALL CLUSTERS
BUT SOME VERY FINE LOOSE GRAINS; SMALL
CLUSTERS ARE MODERATELY TO HIGHLY
REACTIVE TO DILUTE HCL; CALCAREOUS
CEMENTATION; FINE TO UPPER VERY FINE
GRAINED; SUB ANGULAR TO ANGULAR; LOW
SPHERICITY; TRACE AMT OF UNIDENTIFIED
DARK LITHICS THROUGHOUT.
CARBONACEOUS SHALE = DARK GRAY TO
GRAYISH BLACK; COAL LAMINATIONS THROUGH-