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## MUDLOG MD

<b>COMPANY</b>	ExxonMobil Production
<b>WELL</b>	PCU-297-11B8
<b>FIELD</b>	PICEANCE CREEK
<b>REGION</b>	ROCKY MT
<b>COORDINATES</b>	LAT 39.885354000 LON 108.239363000
<b>ELEVATION</b>	GL = 7127' KB = 7154'
<b>COUNTY, STATE</b>	RIO BLANCO CO. CO
<b>API INDEX</b>	051031137100
<b>SPUD DATE</b>	4/21/2009
<b>CONTRACTOR</b>	HELMERICH_PAYNE
<b>CO. REP.</b>	RICKY T. OWENS
<b>RIG/TYPE</b>	FLEX 3
<b>LOGGING UNIT</b>	MLU051
<b>GEOLOGISTS</b>	GEORGE BAKER BRENDA MARSH
<b>ADD. PERSONS</b>	DEVIN CLAAR BILL JOHANNING
<b>CO. GEOLOGIST</b>	MICHAEL HOWELL

### LOG INTERVAL

<b>DEPTHS:</b>	3,717'	<b>TO</b>	12,715'
<b>DATES:</b>	11/23/2009	<b>TO</b>	12/04/2009
<b>SCALE:</b>	1" = 100'		

### CASING DATA

16.00"	<b>AT</b>	130'
10.75"	<b>AT</b>	3,717'
7.00"	<b>AT</b>	8,622'

**AT**

### HOLE SIZE

9.875"	<b>TO</b>	8,641'
6.125"	<b>TO</b>	12,715'
	<b>TO</b>	
	<b>TO</b>	

### MUD TYPES

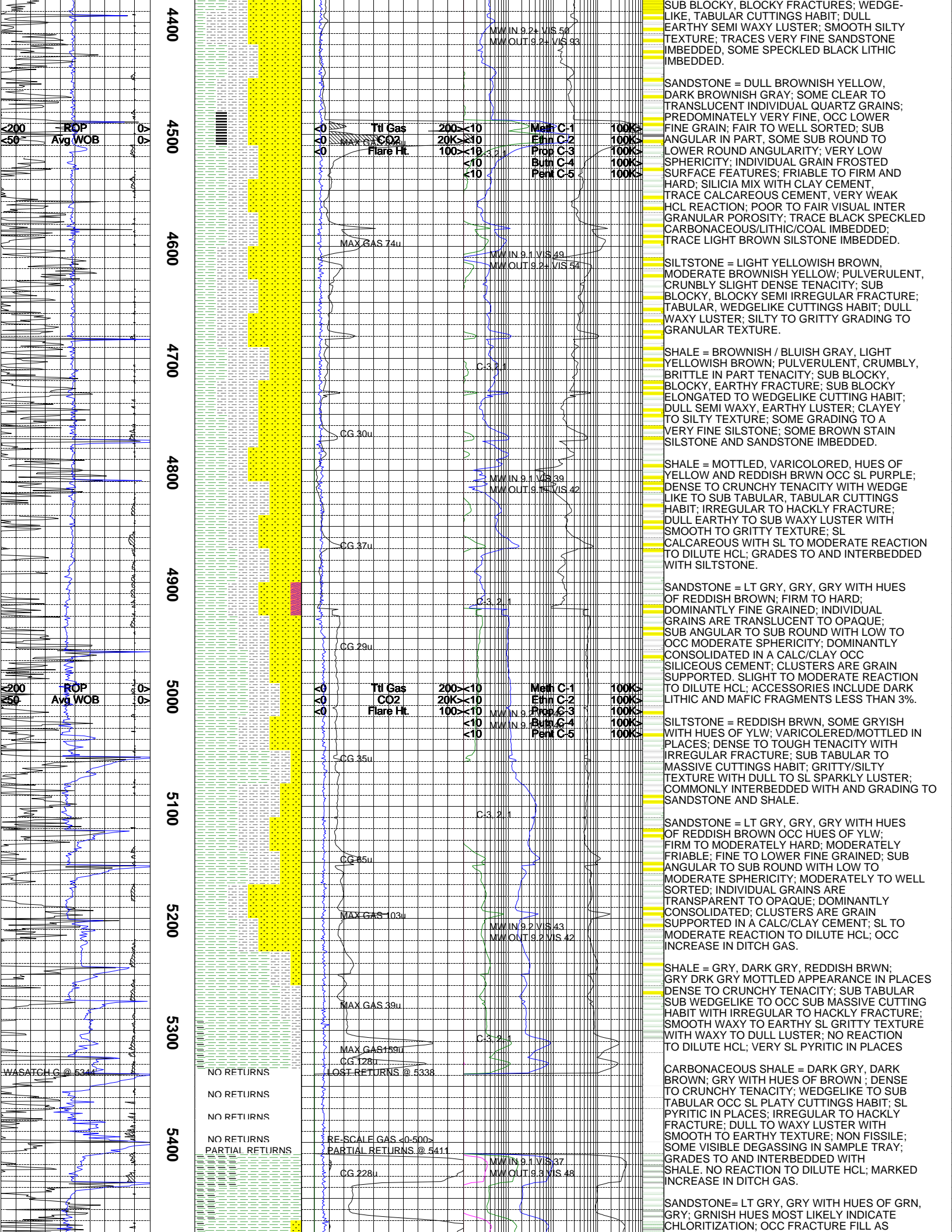
SPUD MUD	<b>TO</b>	3,717'
LSND	<b>TO</b>	12,175'
	<b>TO</b>	
	<b>TO</b>	

### 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	

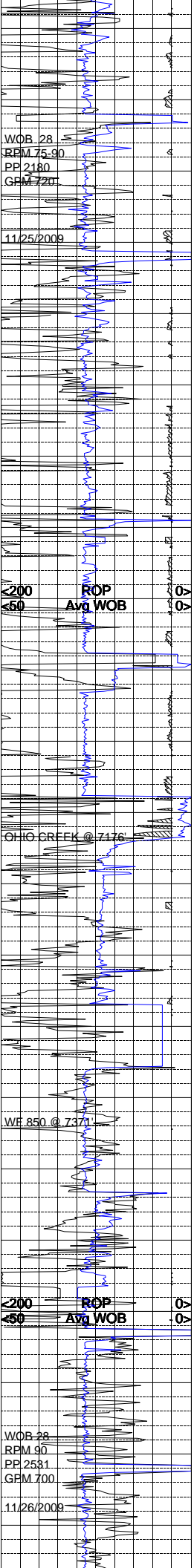


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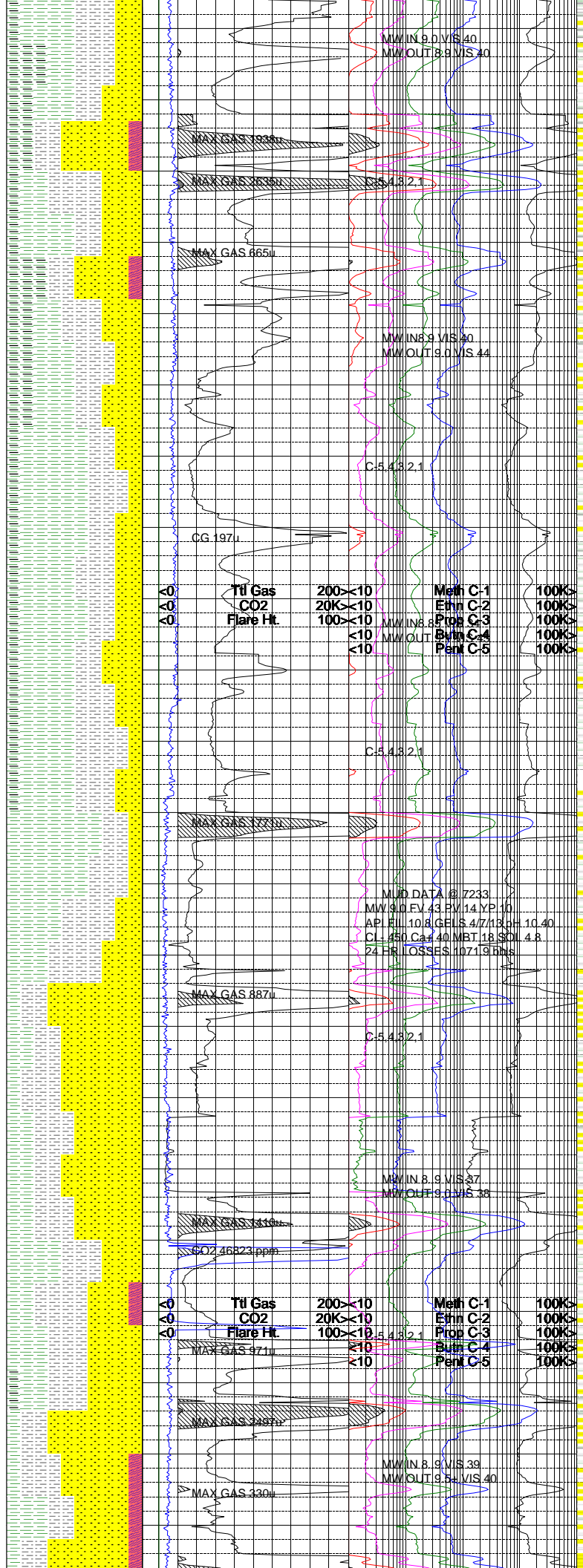








6600  
6700  
6800  
6900  
7000  
7100  
7200  
7300  
7400  
7500  
7600



CARBONACEOUS SHALE = BROWNISH BLACK, DUSKY BROWN, DARK OLIVE BLACK; CRUNCHY, SEMI FIRM TO HARD TENACITY; EARTHY, SUB BLOCKY, BLOCKY, SLIGHT IRREGULAR FRACTURE; ELONGATED, WEDGE LIKE, SUB PLATY CUTTINGS HABIT; EARTHY, SUB DULL, WAXY LUSTER; GRITTY TO SILTY SOME SMOOTH TEXTURE; TRACE BLACK COAL/LITHIC INTERBEDDED; SOME GASSOUS BUBBLES IN SAMPLE TRAY.

SANDSTONE = LIGHT GRAY, LIGHT BLUISH GRAY, SOME OFF WHITE, SALT AND PEPPER APPERANCE; UPPER VERY FINE TO FINE GRAIN POOR TO FAIR SORTED; PREDOMINATELY SUB ANGULAR, SOME SUB ROUND; VERY LOW SPHERICITY; TRACE DULL FROSTED SURFACE FEATURE; FRIABLE FIRM TO FIRM TO HARD; SILICA MATRIX CEMENT, TRACE KAOLIN CEMENT, TRACE CALCAREOUS CEMENT, VERY WEAK HCL REACTION; POOR TO FAIR VISUAL INTER GRANULAR POROSITY; ABUDANT BLACK SPECKLED CARBONACEOUS SHALE/LITHIC IMBEDDED; TRACE SHALE AND SILTSTONE IMBEDDED,

SHALE = DARK BROWNISH GRAY, DUSKY BROWN, DARK BLUISH GRAY; CRUNCHY TO SLIGHT BRITTLE TENACITY; EARTHY, SUB BLOCKY, BLOCKY, FRACTURE; ELONGATED WEDGE LIKE SUB MASSIVE CUTTING HABIT; DULL WAXY SLIGHT EARTHY LUSTER; SMOOTH TO SEMI SILTY TEXTURE; TRACE DARK BROWN BLACK CARBONACEOUS SHALE LAMINATE.

CARBONACEOUS SHALE = DARK BROWNISH BLACK, DUSKY BROWN, DARK OLIVE BROWN; CRUMBLY, SEMI BRITTLE TENACITY; EARTHY, HACKLY, SUB BLOCKY, SLIGHT IRREGULAR FRACTURE; WEDGE LIKE, TABULAR CUTTINGS HABIT; EARTHY, DULL, SLIGHT WAXY LUSTER; SMOOTH, CLAYEY GRADING TO SILTY TEXTURE; TRACE BLACK COAL LAMINATE; SOME GASSOUS BUBBLES IN SAMPLE TRAY.

SILTSTONE = LIGHT BROWNISH GRAY, LIGHT GRAY, TRACE DARK GRAY; CRUNCHY TO CRUMBLY TENACITY; SUB BLOCKY, SPLINTERY, SLIGHT IRREGULAR FRACTURE; TABULAR TO PLATY CUTTINGS HABIT; DULL, RESINOUS LUSTER; GRITTY GRADING TO A GRANULAR TEXTURE, TRACE SANDSTONE IMBEDDED.

SHALE = DARK BROWNISH GRAY, DARK BLUISH GRAY, DARK OLIVE GRAY; CRUNCHY, FIRM TO HARD TENACITY; EARTHY, SUB BLOCKY, BLOCKY FRACTURE; ELONGATED, SEMI PLATY SUB BLOCKY CUTTING HABIT; DULL, EARTHY, WAXY IN PART, LUSTER; SMOOTH TO CLAYEY, GRADING ON SILTY TEXTURE; TRACES BLACK CARBONACEOUS SHALE LAMINATE; NO GAS BUBBLES IN SAMPLE TRAY.

SANDSTONE = ABUDANT VERY SMALL CLUSTERS, LIGHT BLUISH GRAY, SOME OFF WHITE, CLEAR TO TRANSLUCENT; UPPER VERY FINE TO LOWER FINE GRAIN; FAIR TO WELL SORTED; PREDOMINATELY SUB ANGULAR, TRACE SUB ROUND ANGULARITY; VERY LOW SPHERICITY; FROSTED IN PART; EASILY FRIABLE TO FRIABLE, SMAL CLUSTERS, POSSIBLE DUE TO PDC BIT; WEAK GRAIN SUPPORT, SILICA MATRIX CEMENT, SOM WHITE CLAY CEMENT; POOR TO FAIR VISUAL INTER GRANULAR POROSITY; SALT AND PEPPER APPERANCE DUE TO SPECKLED BLACK LITHIC/ CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = LIGHT GRAY, LIGHT BLUISH GRAY, CLEAR, TRANSLUCENT, TO OPAQUE; LOWER TO UPPER FINE GRAIN; FAIR SORTED; SUB ANGULAR IN PART, SOME SUB ROUND ANGULARITY; LOW TO MODERATE SPHERICITY; TRACE FROSTED SURFACE FEATURES; GRAIN SUPPORTED, SILICA MATRIX CEMENT TO SOME CALCAREOUS CEMENT, WEAK REACTION TO 10 % HCL; PREDOMINATELY TIGHT, POOR VISUAL INTER GRANULAR POROSITY; TRACE VERY FINE DARK GRAY / BLACK LITHIC SPECKLED IMBEDDED, SOME GRADING SILTSTONE INTERBEDDED.

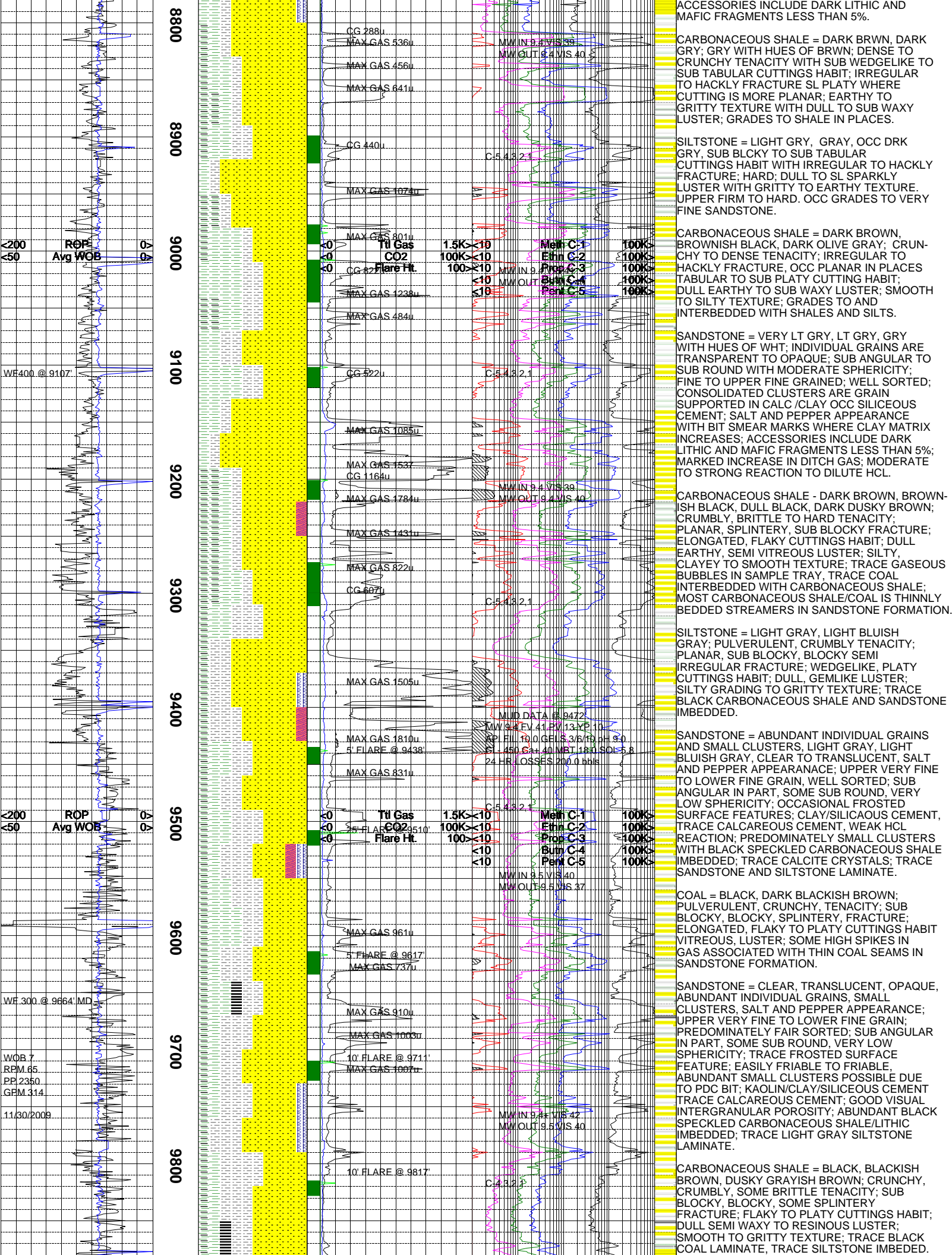
SILTSTONE = PALE YELLOWISH BROWN, LIGHT BLUISH/GREENISH GRAY; CRUNCHY, CRUMBLY, SEMI DENSE TENACITY; PLANAR, SUB BLOCKY BLOCKY FRACTURE; ELONGATED, FLAKY CUTTINGS HABIT; DULL, RESINOUS SPARKLING LUSTER; SILTY GRADING TO GRITTY TEXTURE; TRACES SPECKLED BLACK LITHIC, SOME SANDSTONE IMBEDDED.

SHALE = DARK GRAYISH BROWN, LIGHT BROWN, DARK DUSKY BROWN; FIRM TO FIRM AND HARD TENACITY; SUB BLOCKY, BLOCKY, SEMI IRREGULAR FRACTURE; TABULAR, WEDGE LIKE, PLATY CUTTING HABIT; DULL, WAXY IN PART, LUSTER; CLAYEY GRADING TO SILTY TEXTURE; TRACE OF SILTSTONE IMBEDDED.

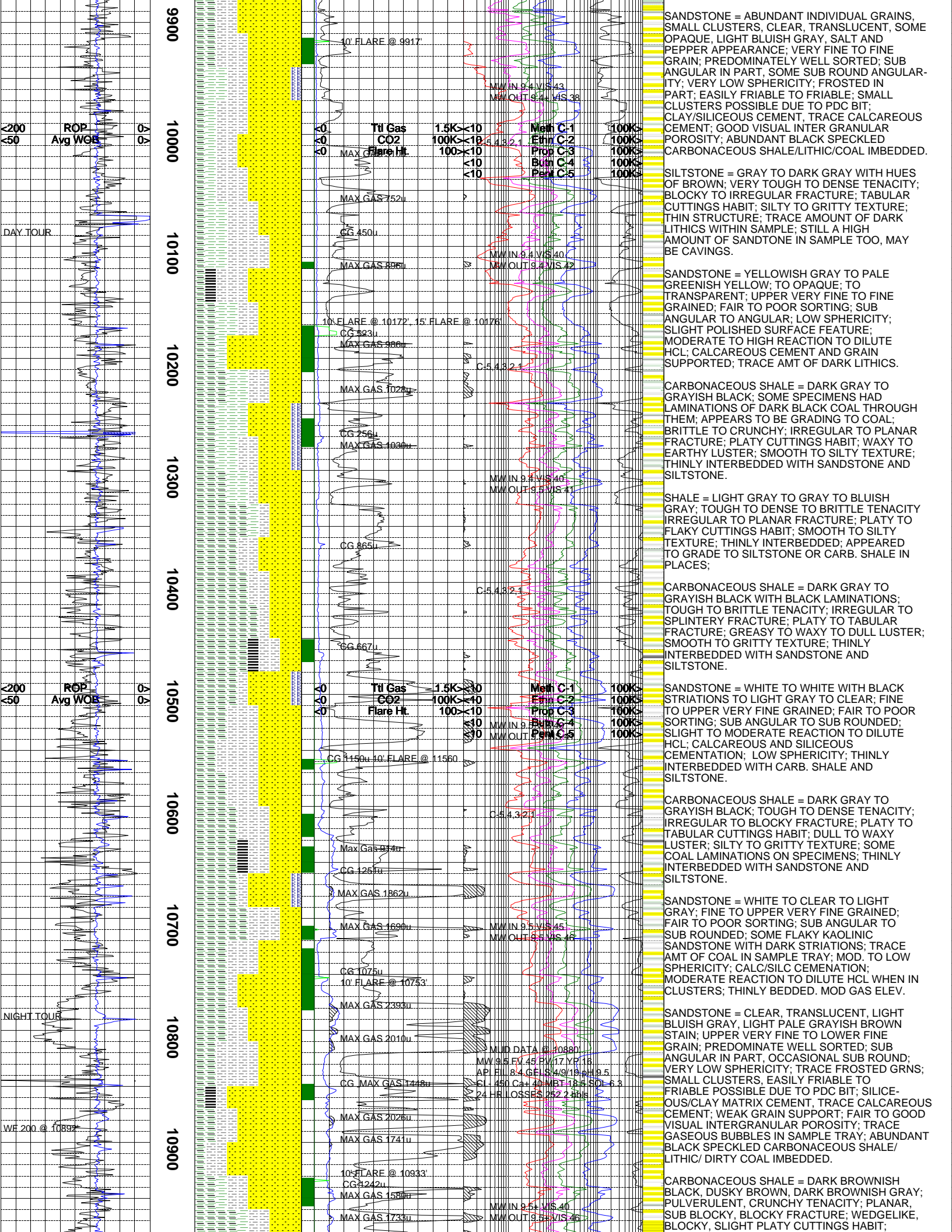
SANDSTONE = VERY SMALL CLUSTERS, CLEAR



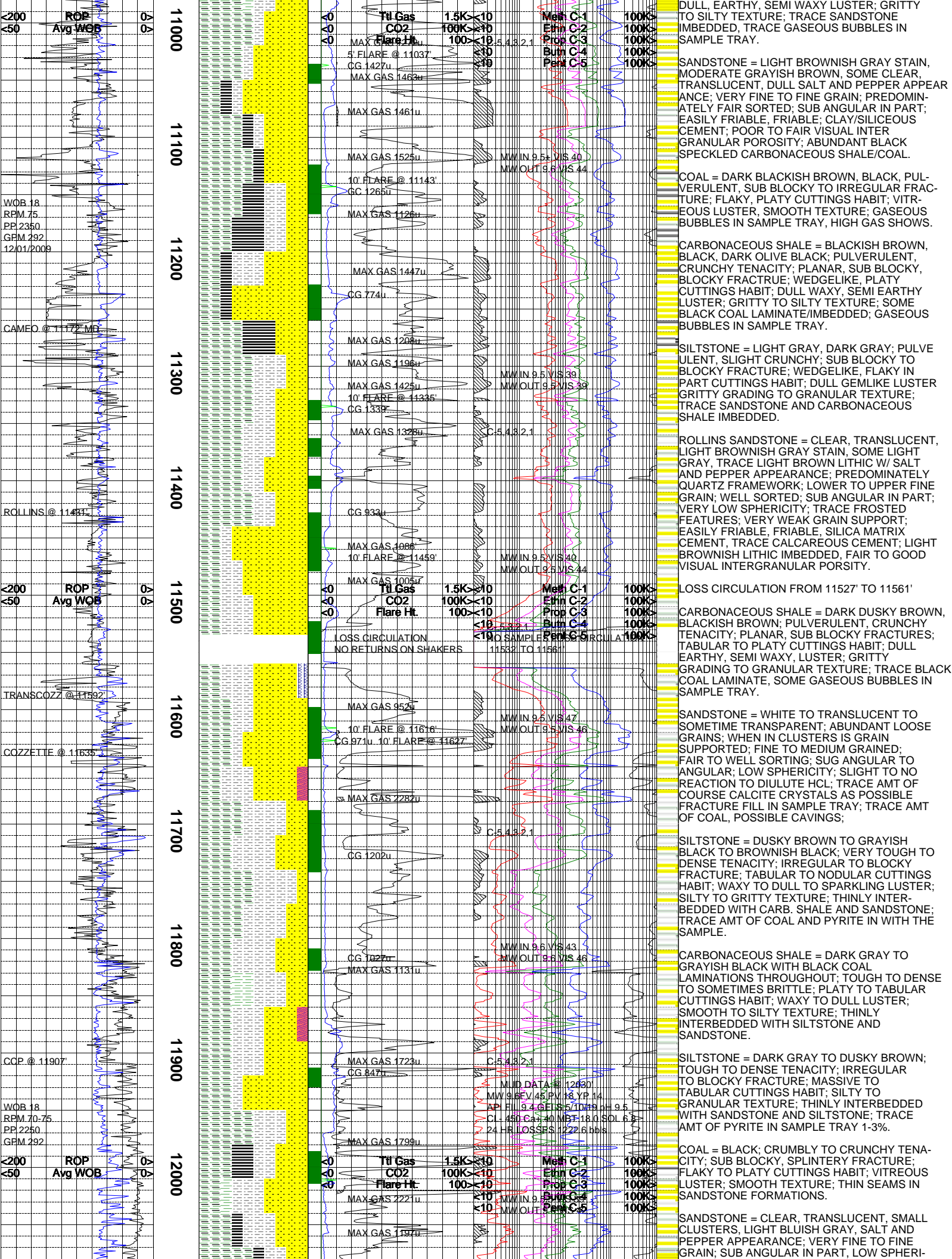


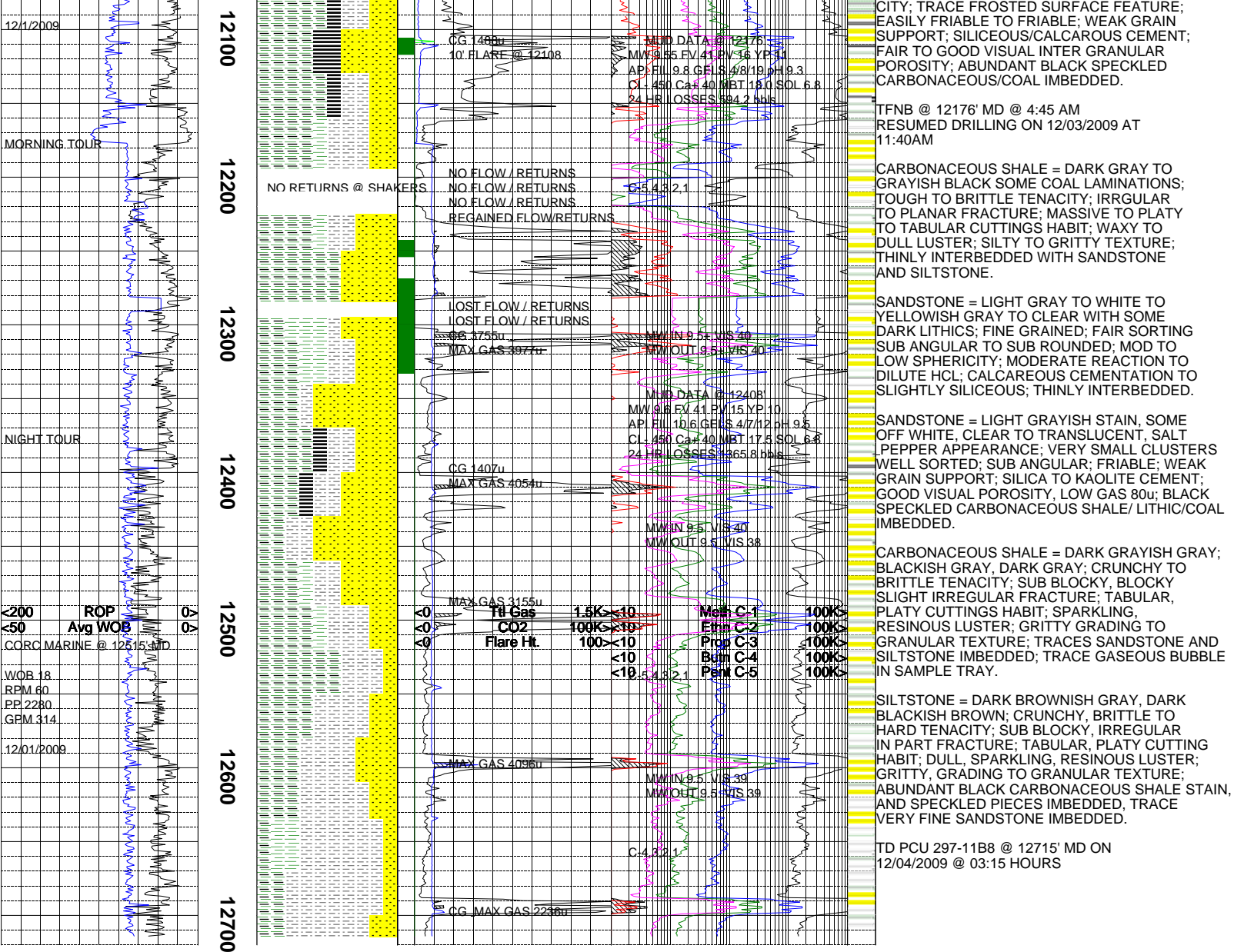












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