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

MUDLOG MD

COMPANY	ExxonMobil Production
WELL	PCU - 297-12A6
FIELD	Piceance Creek Unit
REGION	Rocky Mountain
COORDINATES	Lat: 39.889045
	Long: 108.237271
ELEVATION	GL: 7183.6'
	KB: 7213.8'
COUNTY, STATE	Rio Blanco, CO.
API INDEX	051031116400
SPUD DATE	08/18/08
CONTRACTOR	HP Drilling
CO. REP.	M.Sadler / J. Woods
RIG/TYPE	326 / FLEX FOUR
LOGGING UNIT	Canrig Unit 36
GEOLOGISTS	Jeremiah Kokes
	Brandon Laiche
ADD. PERSONS	Huel Strickland
	Patty Strickland
CO. GEOLOGIST	Chris Alba

LOG INTERVAL

DEPTHS:	4133'	**TO**	13444'
DATES:	06/01/09	**TO**	11/12/09
SCALE:	5" = 100'		

MUD TYPES

WATER BASE	**TO**	4133'
LSND	**TO**	4134'
DSF	**TO**	5811'
LSND	**TO**	6185'

CASING DATA

16.000"	**AT**	150'
10.750"	**AT**	4105'
7.000"	**AT**	9375'
4.500"	**AT**	13444'

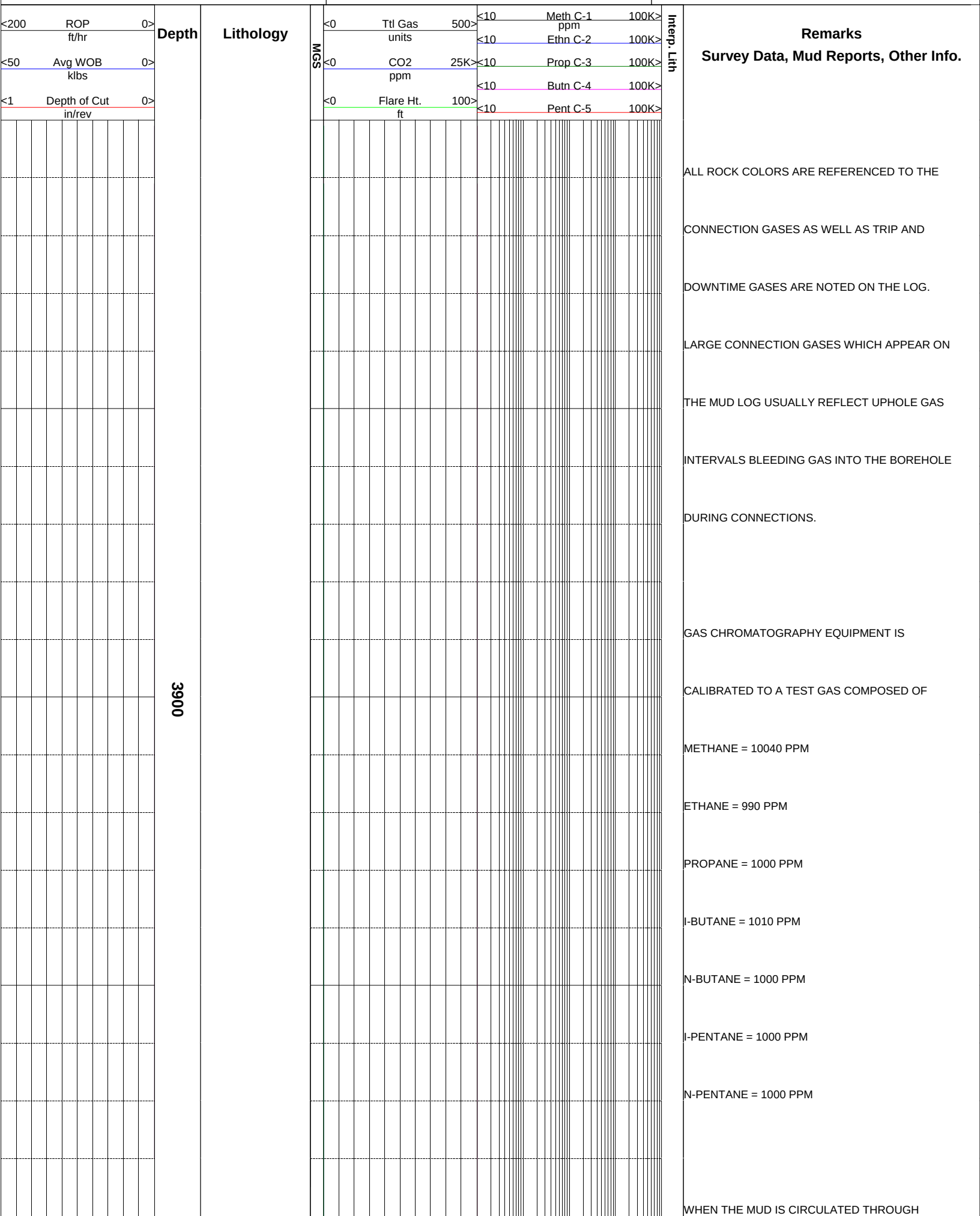
HOLE SIZE

14.250"	**TO**	4133'
9.875"	**TO**	9390'
6.125"	**TO**	13444'
	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

CONNECTION GASES AS WELL AS TRIP AND

DOWNTIME GASES ARE NOTED ON THE LOG.

LARGE CONNECTION GASES WHICH APPEAR ON

THE MUD LOG USUALLY REFLECT UPHOLE GAS

INTERVALS BLEEDING GAS INTO THE BOREHOLE

DURING CONNECTIONS.

GAS CHROMATOGRAPHY EQUIPMENT IS

CALIBRATED TO A TEST GAS COMPOSED OF

METHANE = 10040 PPM

ETHANE = 990 PPM

PROPANE = 1000 PPM

I-BUTANE = 1010 PPM

N-BUTANE = 1000 PPM

I-PENTANE = 1000 PPM

N-PENTANE = 1000 PPM

WHEN THE MUD IS CIRCULATED THROUGH

THE GAS BUSTER, THE INTERVAL IS MARKED IN THE MGS COLUMN AND SIZE OF FLARES ARE NOTED.

EVIDENCE OF FRACTURE FILL IS NOTED ON THE MUD LOG. KAOLIN PERCENTAGE IN SS INTERVALS IS ALSO NOTED ON THE MUD LOG.

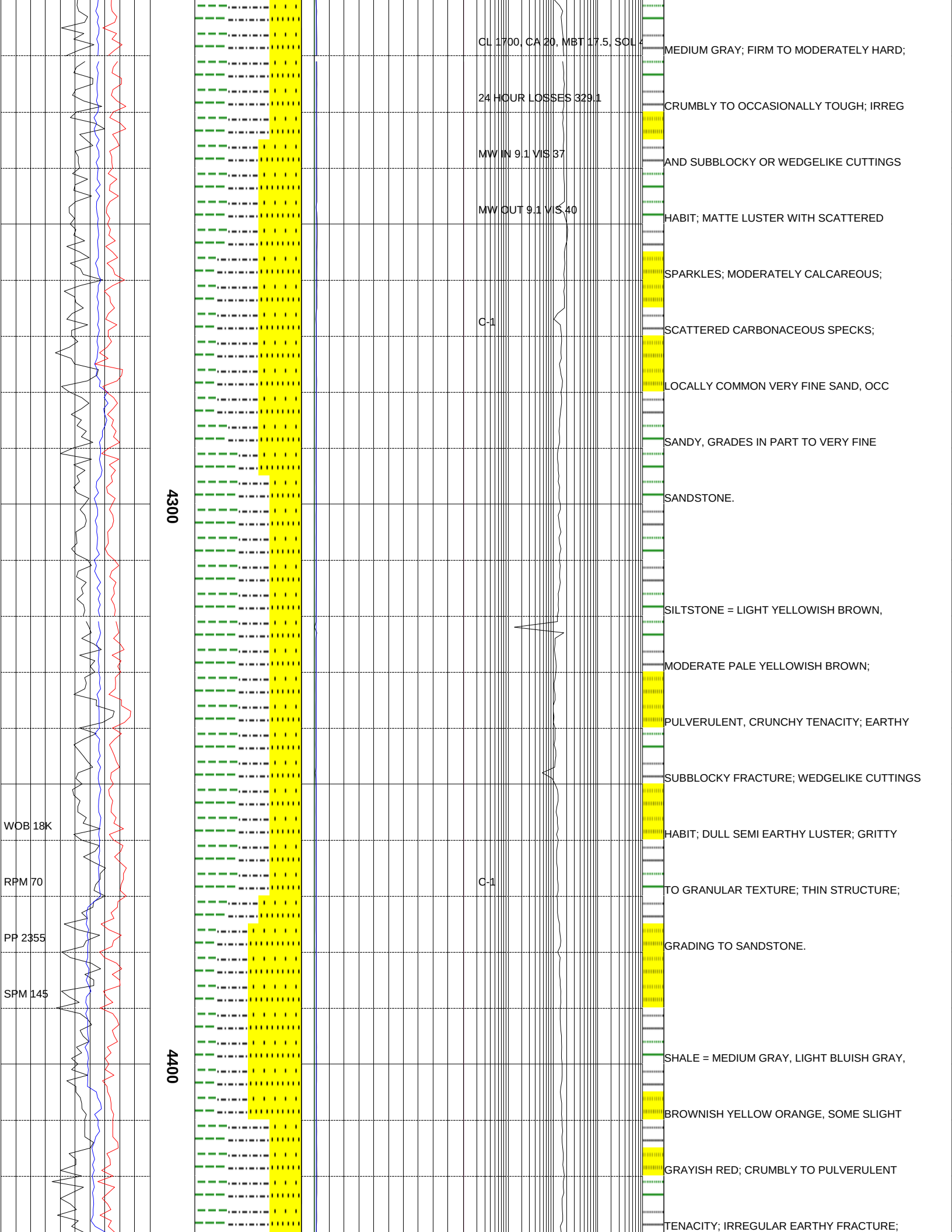
I UNIT OF GAS = 200 PPM METHANE

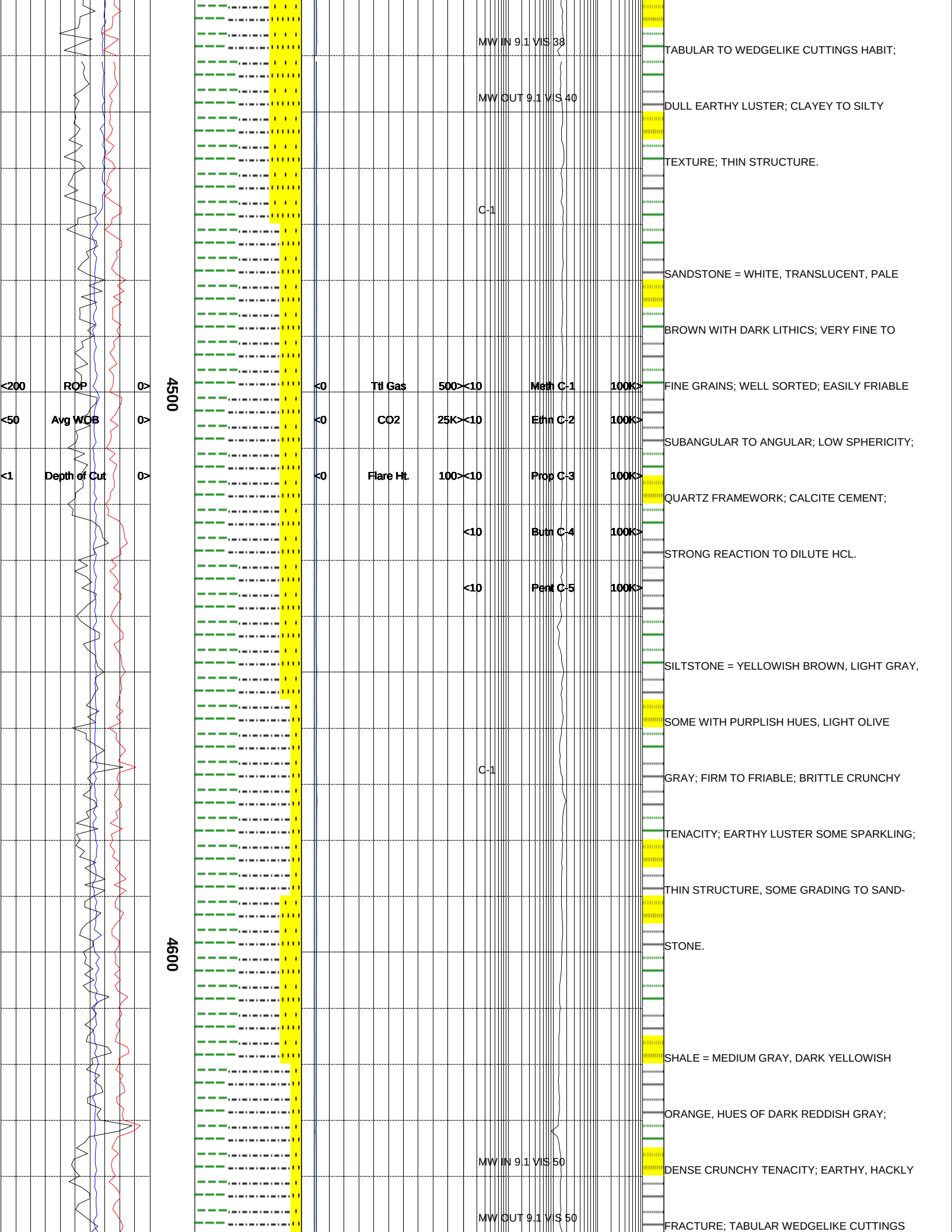
SET 10 3/4" SURFACE CASING AT 4118'

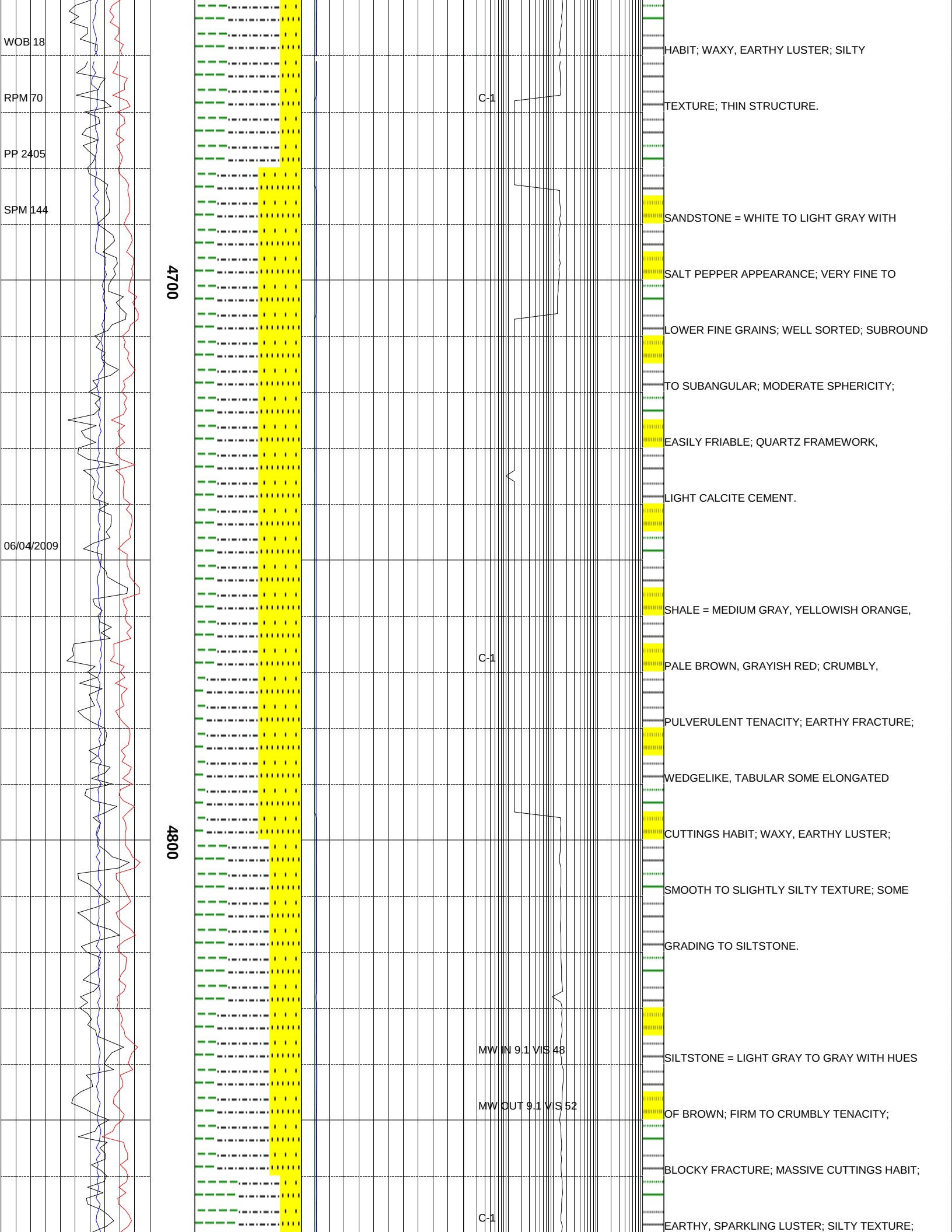
EPOCH COMMENCED LOGGING ON 6/03/2009 AT 4133' MD.

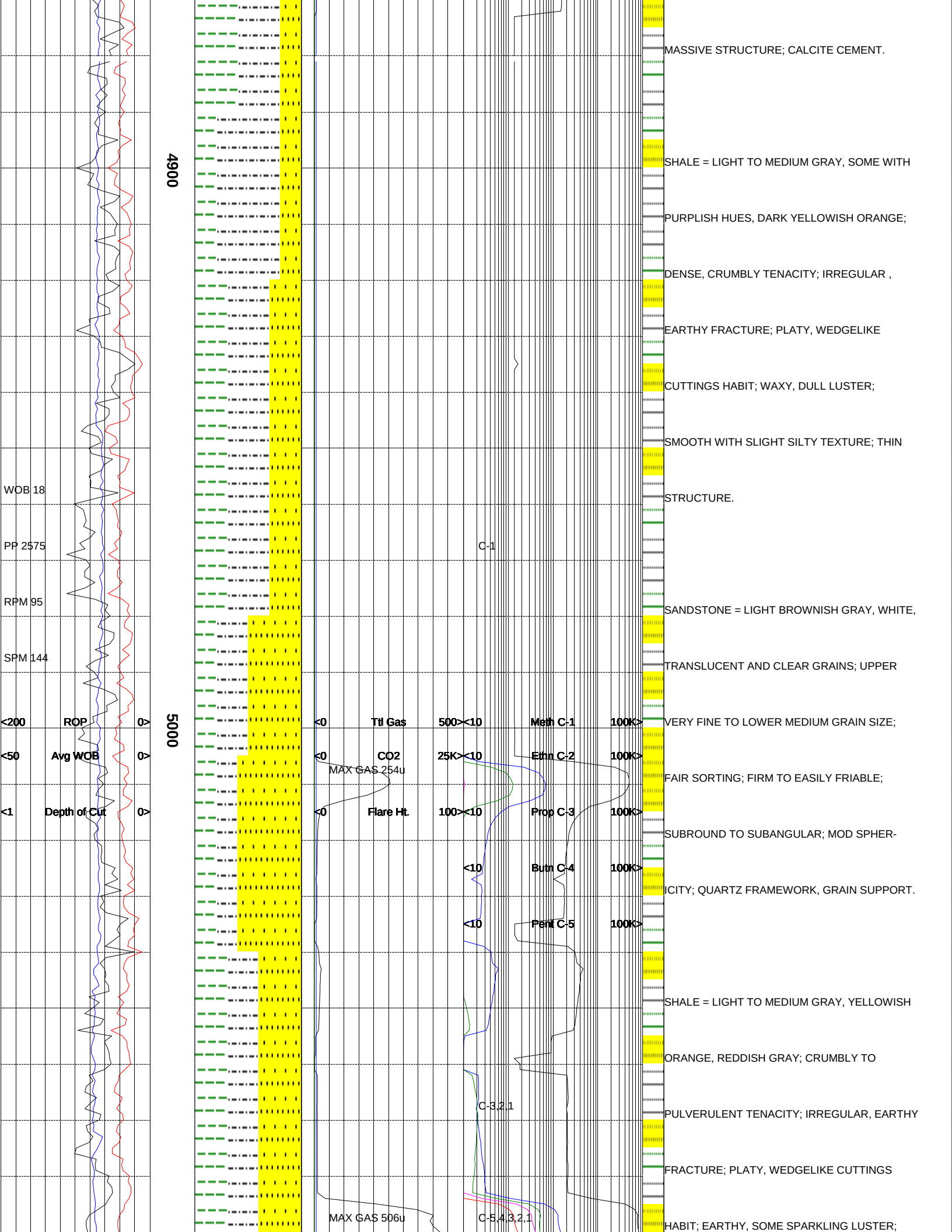
SHALE = MODERATE YELLOWISH BROWN; CRUMBLY, TENACITY; SUBBLOCKY FRACTURE; WEDGELIKE , TABULAR CUTTINGS HABIT; DULL EARTHY LUSTER, SILTY, CLAYEY TEXTURE; MASSIVE TO THICK STRUCTURE.

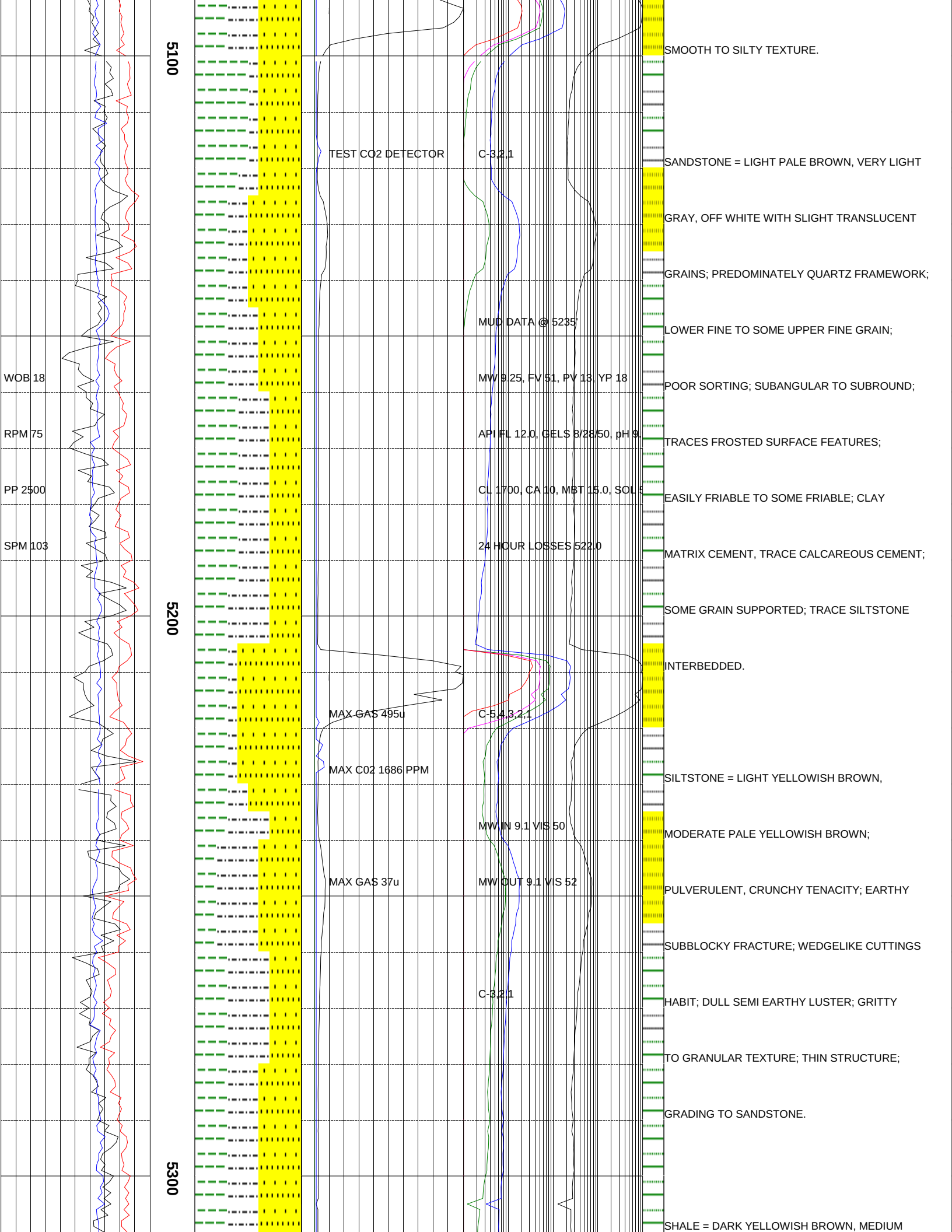
SILTSTONE = PURPLISH BROWN, LIGHT TO

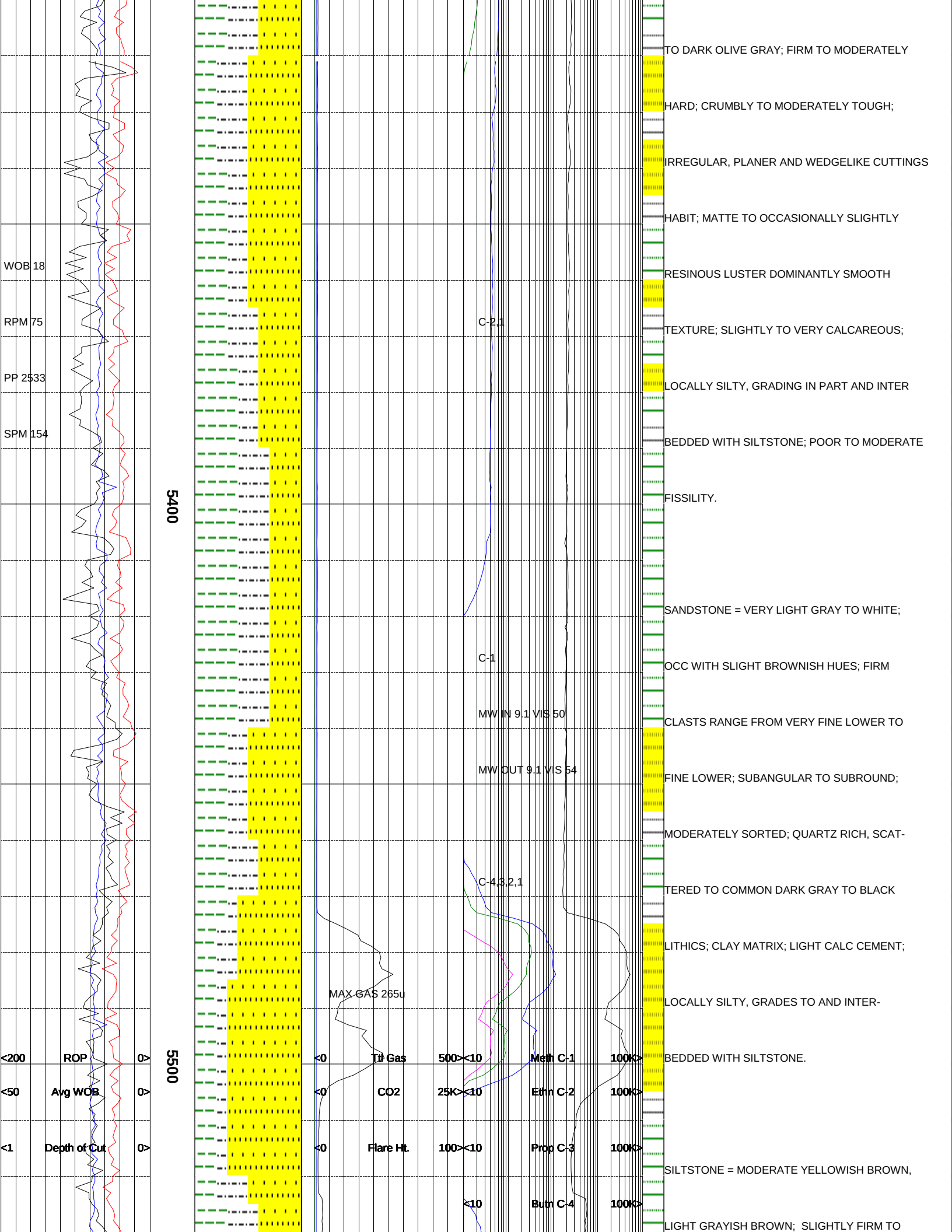

CL 1700, CA 20, MBT 17.5, SOL 4
24 HOUR LOSSES 329.1
MW IN 9.1 VIS 37
MW OUT 9.1 VIS 40
C-1
4300
WOB 18K
RPM 70
PP 2355
SPM 145
C-1
4400
MEDIUM GRAY; FIRM TO MODERATELY HARD;
CRUMBLY TO OCCASIONALLY TOUGH; IRREG
AND SUBBLOCKY OR WEDGELIKE CUTTINGS
HABIT; MATTE LUSTER WITH SCATTERED
SPARKLES; MODERATELY CALCAREOUS;
SCATTERED CARBONACEOUS SPECKS;
LOCALLY COMMON VERY FINE SAND, OCC
SANDY, GRADES IN PART TO VERY FINE
SANDSTONE.
SILTSTONE = LIGHT YELLOWISH BROWN,
MODERATE PALE YELLOWISH BROWN;
PULVERULENT, CRUNCHY TENACITY; EARTHY
SUBBLOCKY FRACTURE; WEDGELIKE CUTTINGS
HABIT; DULL SEMI EARTHY LUSTER; GRITTY
TO GRANULAR TEXTURE; THIN STRUCTURE;
GRADING TO SANDSTONE.
SHALE = MEDIUM GRAY, LIGHT BLUISH GRAY,
BROWNISH YELLOW ORANGE, SOME SLIGHT
GRAYISH RED; CRUMBLY TO PULVERULENT
TENACITY; IRREGULAR EARTHY FRACTURE;

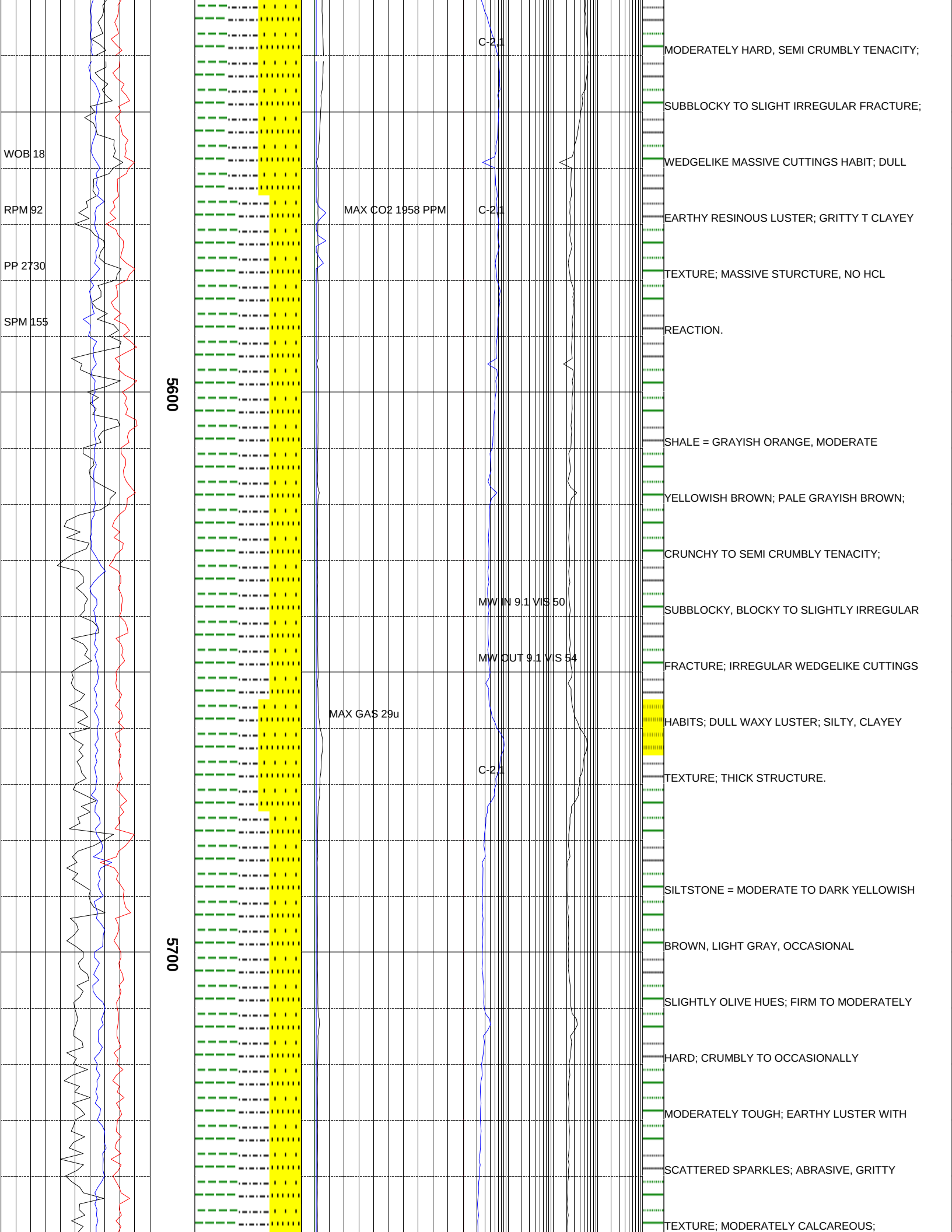

MW IN 9.1 VIS 38
MW OUT 9.1 VIS 40
C-1
C-1
MW IN 9.1 VIS 50
MW OUT 9.1 VIS 50
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
4500
4600
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
TABULAR TO WEDGELIKE CUTTINGS HABIT;
DULL EARTHY LUSTER; CLAYEY TO SILTY
TEXTURE; THIN STRUCTURE.
SANDSTONE = WHITE, TRANSLUCENT, PALE
BROWN WITH DARK LITHICS; VERY FINE TO
FINE GRAINS; WELL SORTED; EASILY FRIABLE
SUBANGULAR TO ANGULAR; LOW SPHERICITY;
QUARTZ FRAMEWORK; CALCITE CEMENT;
STRONG REACTION TO DILUTE HCL.
SILTSTONE = YELLOWISH BROWN, LIGHT GRAY,
SOME WITH PURPLISH HUES, LIGHT OLIVE
GRAY; FIRM TO FRIABLE; BRITTLE CRUNCHY
TENACITY; EARTHY LUSTER SOME SPARKLING;
THIN STRUCTURE, SOME GRADING TO SAND-
STONE.
SHALE = MEDIUM GRAY, DARK YELLOWISH
ORANGE, HUES OF DARK REDDISH GRAY;
DENSE CRUNCHY TENACITY; EARTHY, HACKLY
FRACTURE; TABULAR WEDGELIKE CUTTINGS

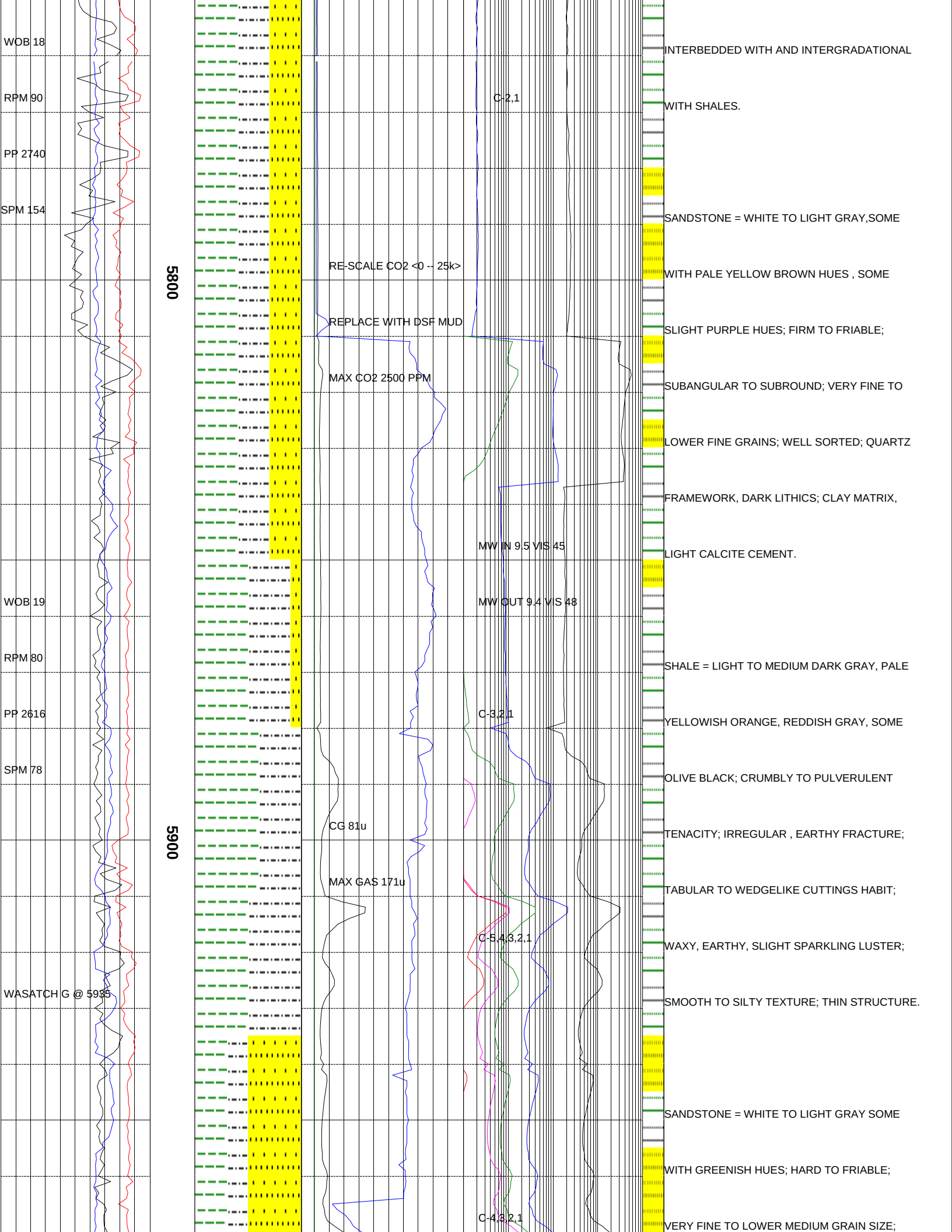

WOB 18
RPM 70
PP 2405
SPM 144
06/04/2009
4700
4800
C-1
C-1
MW IN 9.1 VIS 48
MW OUT 9.1 VIS 52
C-1
HABIT; WAXY, EARTHY LUSTER; SILTY
TEXTURE; THIN STRUCTURE.
SANDSTONE = WHITE TO LIGHT GRAY WITH
SALT PEPPER APPEARANCE; VERY FINE TO
LOWER FINE GRAINS; WELL SORTED; SUBROUND
TO SUBANGULAR; MODERATE SPHERICITY;
EASILY FRIABLE; QUARTZ FRAMEWORK,
LIGHT CALCITE CEMENT.
SHALE = MEDIUM GRAY, YELLOWISH ORANGE,
PALE BROWN, GRAYISH RED; CRUMBLY,
PULVERULENT TENACITY; EARTHY FRACTURE;
WEDGELIKE, TABULAR SOME ELONGATED
CUTTINGS HABIT; WAXY, EARTHY LUSTER;
SMOOTH TO SLIGHTLY SILTY TEXTURE; SOME
GRADING TO SILTSTONE.
SILTSTONE = LIGHT GRAY TO GRAY WITH HUES
OF BROWN; FIRM TO CRUMBLY TENACITY;
BLOCKY FRACTURE; MASSIVE CUTTINGS HABIT;
EARTHY, SPARKLING LUSTER; SILTY TEXTURE;

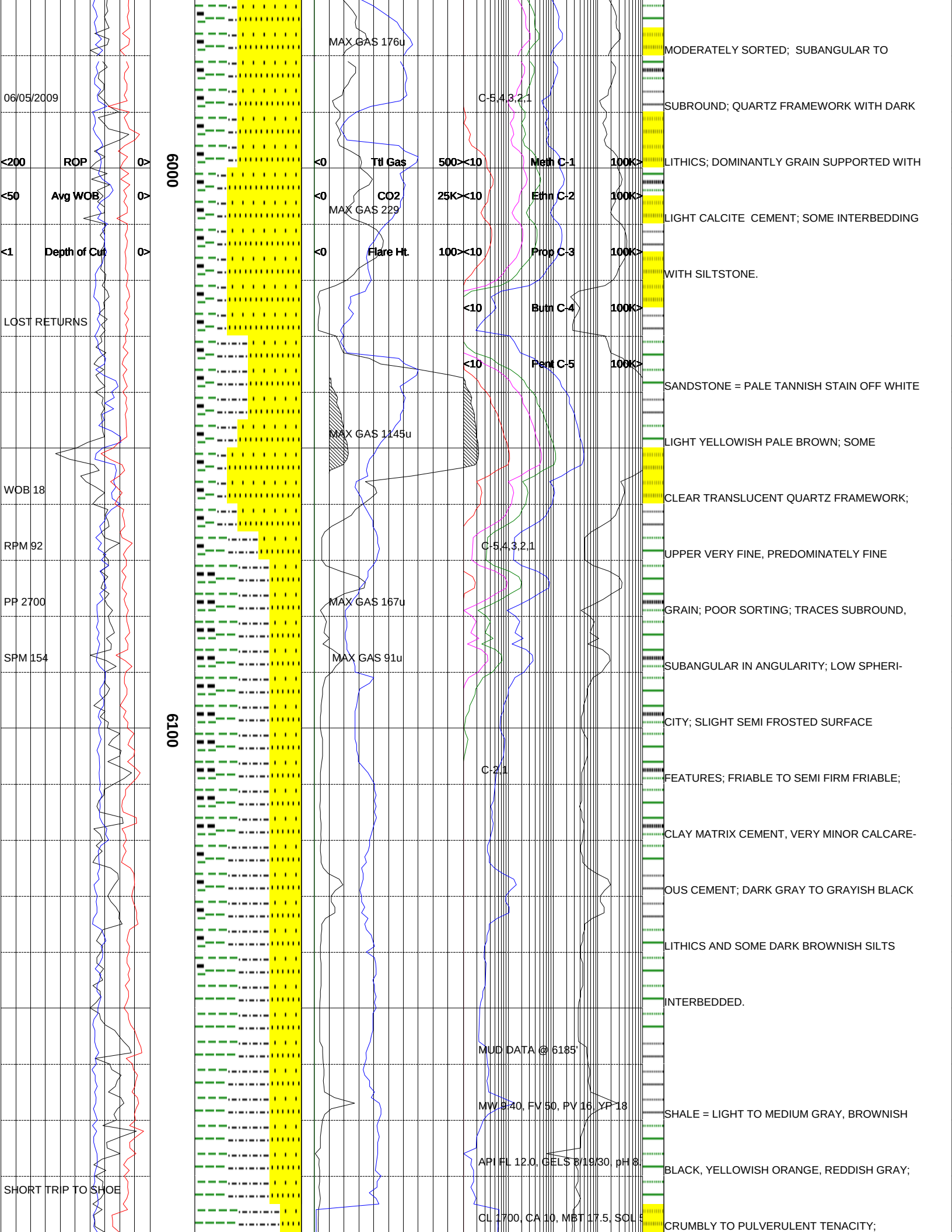

4900
5000
WOB 18
PP 2575
RPM 95
SPM 144
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
<0 Ttl Gas 500>
<0 CO2 25K>
MAX GAS 254u
<0 Flare Hit. 100>
MAX GAS 506u
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
C-1
C-3,2,1
C-5,4,3,2,1
MASSIVE STRUCTURE; CALCITE CEMENT.
SHALE = LIGHT TO MEDIUM GRAY, SOME WITH
PURPLISH HUES, DARK YELLOWISH ORANGE;
DENSE, CRUMBLY TENACITY; IRREGULAR ,
EARTHY FRACTURE; PLATY, WEDGELIKE
CUTTINGS HABIT; WAXY, DULL LUSTER;
SMOOTH WITH SLIGHT SILTY TEXTURE; THIN
STRUCTURE.
SANDSTONE = LIGHT BROWNISH GRAY, WHITE,
TRANSLUCENT AND CLEAR GRAINS; UPPER
VERY FINE TO LOWER MEDIUM GRAIN SIZE;
FAIR SORTING; FIRM TO EASILY FRIABLE;
SUBROUND TO SUBANGULAR; MOD SPHER-
ICITY; QUARTZ FRAMEWORK, GRAIN SUPPORT.
SHALE = LIGHT TO MEDIUM GRAY, YELLOWISH
ORANGE, REDDISH GRAY; CRUMBLY TO
PULVERULENT TENACITY; IRREGULAR, EARTHY
FRACTURE; PLATY, WEDGELIKE CUTTINGS
HABIT; EARTHY, SOME SPARKLING LUSTER;

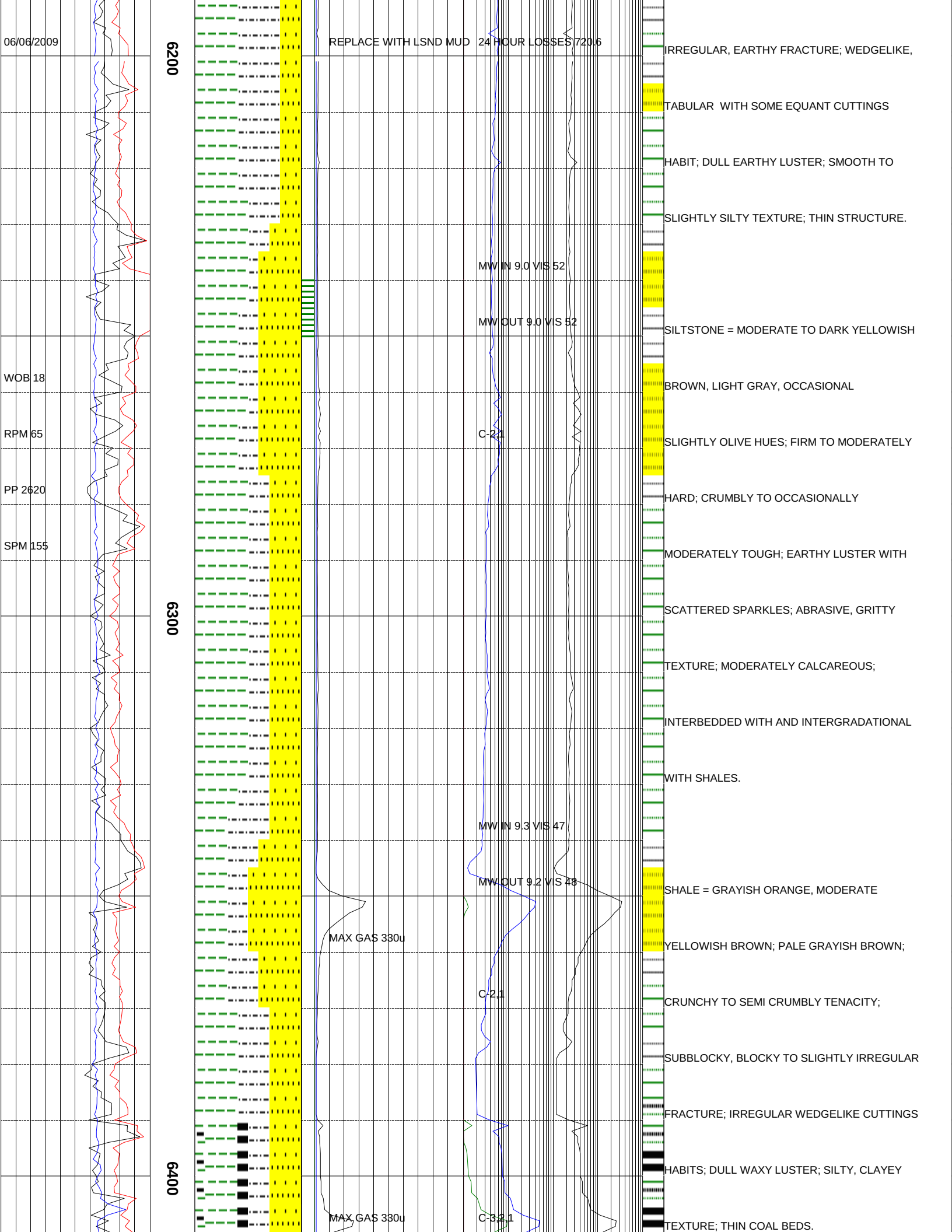

5100
5200
5300
WOB 18
RPM 75
PP 2500
SPM 103
TEST CO2 DETECTOR
C-3,2,1
MUD DATA @ 5235'
MW 9.25, FV 51, PV 13, YP 18
API FL 12.0, GELS 8/28/50, pH 9.
CL 1700, CA 10, MBT 15.0, SOL 5
24 HOUR LOSSES 522.0
MAX GAS 495u
C-5,4,3,2,1
MAX C02 1686 PPM
MW IN 9.1 VIS 50
MAX GAS 37u
MW OUT 9.1 VIS 52
C-3,2,1
SMOOTH TO SILTY TEXTURE.
SANDSTONE = LIGHT PALE BROWN, VERY LIGHT
GRAY, OFF WHITE WITH SLIGHT TRANSLUCENT
GRAINS; PREDOMINATELY QUARTZ FRAMEWORK;
LOWER FINE TO SOME UPPER FINE GRAIN;
POOR SORTING; SUBANGULAR TO SUBROUND;
TRACES FROSTED SURFACE FEATURES;
EASILY FRIABLE TO SOME FRIABLE; CLAY
MATRIX CEMENT, TRACE CALCAREOUS CEMENT;
SOME GRAIN SUPPORTED; TRACE SILTSTONE
INTERBEDDED.
SILTSTONE = LIGHT YELLOWISH BROWN,
MODERATE PALE YELLOWISH BROWN;
PULVERULENT, CRUNCHY TENACITY; EARTHY
SUBBLOCKY FRACTURE; WEDGELIKE CUTTINGS
HABIT; DULL SEMI EARTHY LUSTER; GRITTY
TO GRANULAR TEXTURE; THIN STRUCTURE;
GRADING TO SANDSTONE.
SHALE = DARK YELLOWISH BROWN, MEDIUM

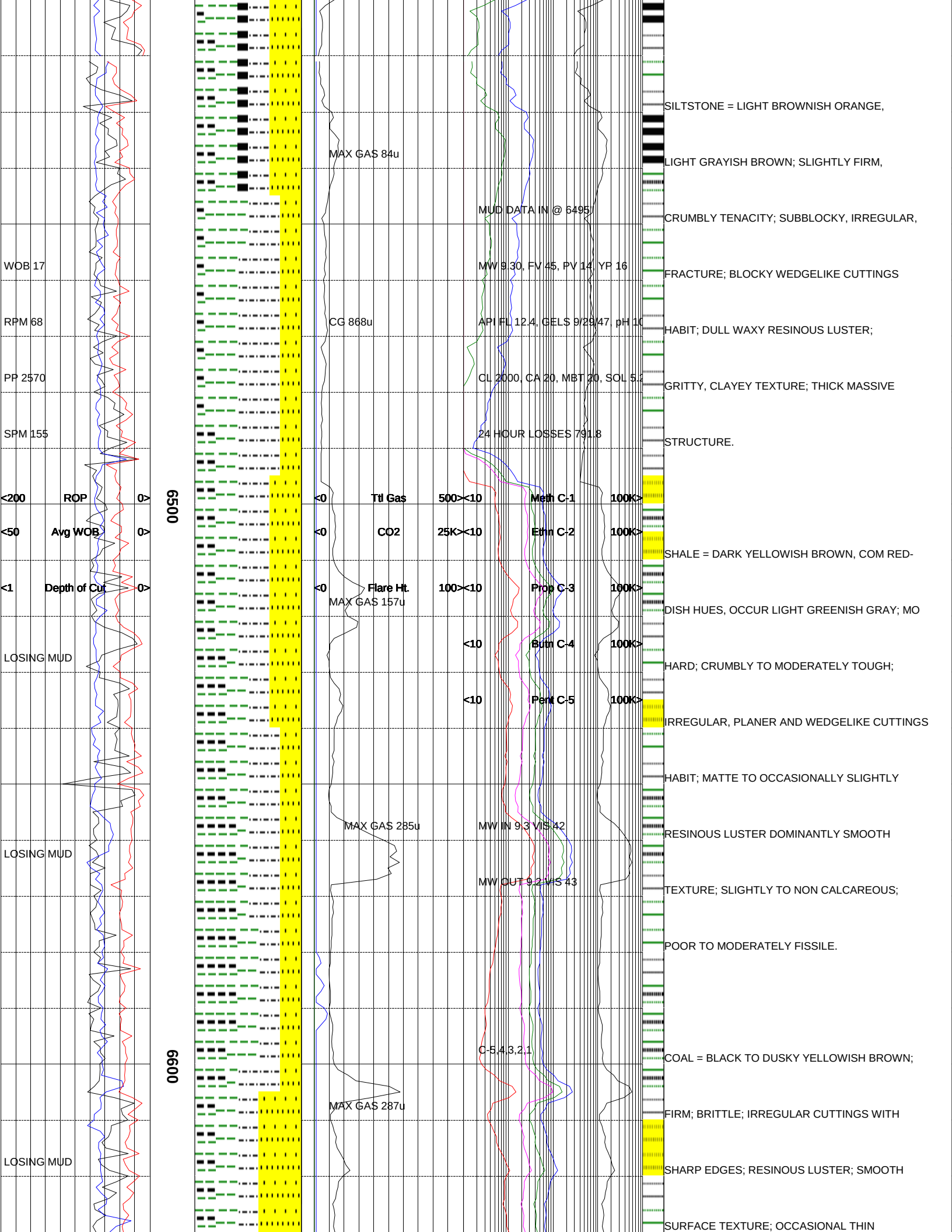

WOB 18
RPM 75
PP 2533
SPM 154
5400
5500
C-2,1
C-1
MW IN 9.1 VIS 50
MW OUT 9.1 VIS 54
C-4,3,2,1
MAX GAS 265u
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
<0 Tot Gas 500><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
TO DARK OLIVE GRAY; FIRM TO MODERATELY
HARD; CRUMBLY TO MODERATELY TOUGH;
IRREGULAR, PLANER AND WEDGELIKE CUTTINGS
HABIT; MATTE TO OCCASIONALLY SLIGHTLY
RESINOUS LUSTER DOMINANTLY SMOOTH
TEXTURE; SLIGHTLY TO VERY CALCAREOUS;
LOCALLY SILTY, GRADING IN PART AND INTER
BEDDED WITH SILTSTONE; POOR TO MODERATE
FISSILITY.
SANDSTONE = VERY LIGHT GRAY TO WHITE;
OCC WITH SLIGHT BROWNISH HUES; FIRM
CLASTS RANGE FROM VERY FINE LOWER TO
FINE LOWER; SUBANGULAR TO SUBROUND;
MODERATELY SORTED; QUARTZ RICH, SCAT-
TERED TO COMMON DARK GRAY TO BLACK
LITHICS; CLAY MATRIX; LIGHT CALC CEMENT;
LOCALLY SILTY, GRADES TO AND INTER-
BEDDED WITH SILTSTONE.
SILTSTONE = MODERATE YELLOWISH BROWN,
LIGHT GRAYISH BROWN; SLIGHTLY FIRM TO

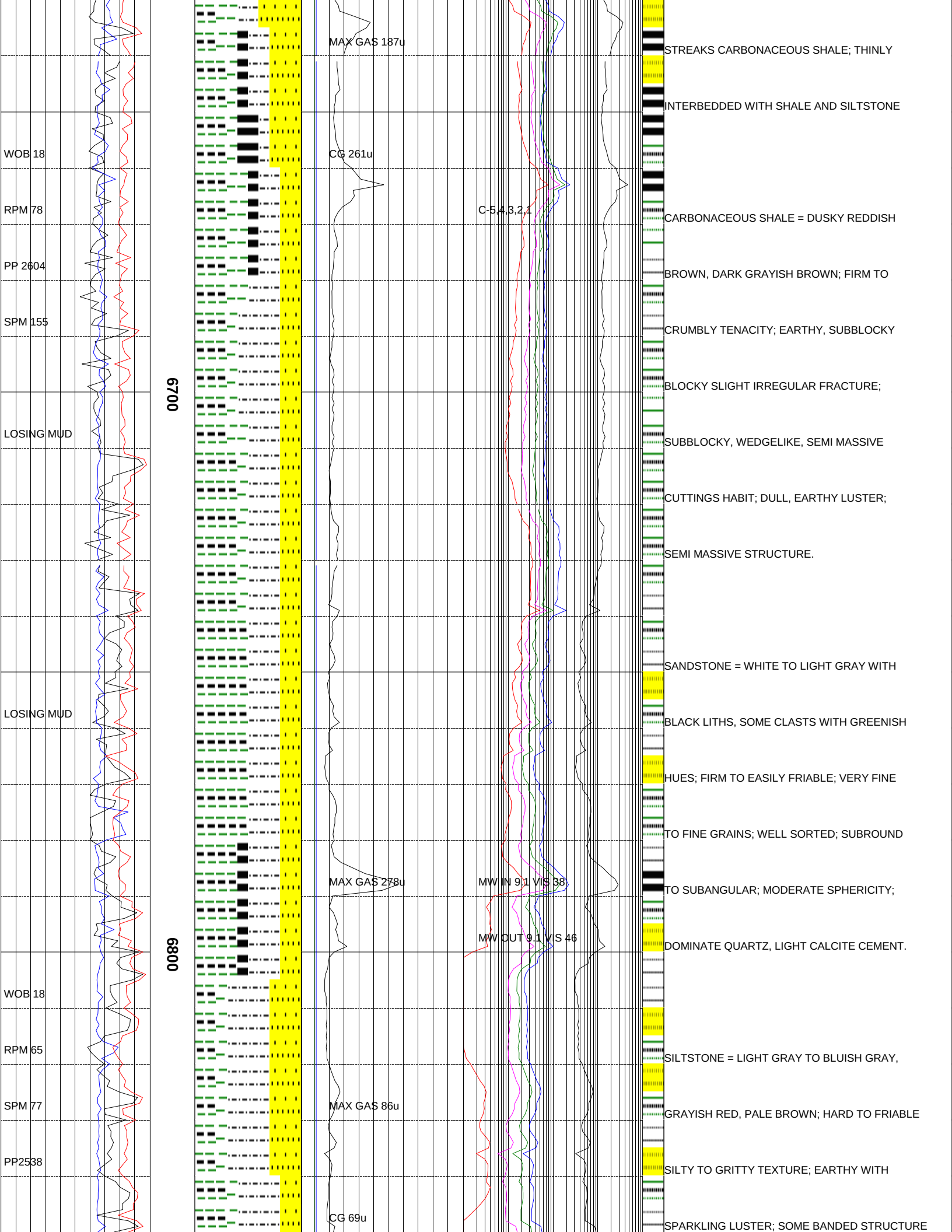

WOB 18
RPM 92
PP 2730
SPM 155
5600
5700
MAX CO2 1958 PPM
MAX GAS 29u
C-2,1
C-2,1
C-2,1
MW IN 9.1 VIS 50
MW OUT 9.1 VIS 54
MODERATELY HARD, SEMI CRUMBLY TENACITY;
SUBBLOCKY TO SLIGHT IRREGULAR FRACTURE;
WEDGELIKE MASSIVE CUTTINGS HABIT; DULL
EARTHY RESINOUS LUSTER; GRITTY T CLAYEY
TEXTURE; MASSIVE STURCTURE, NO HCL
REACTION.
SHALE = GRAYISH ORANGE, MODERATE
YELLOWISH BROWN; PALE GRAYISH BROWN;
CRUNCHY TO SEMI CRUMBLY TENACITY;
SUBBLOCKY, BLOCKY TO SLIGHTLY IRREGULAR
FRACTURE; IRREGULAR WEDGELIKE CUTTINGS
HABITS; DULL WAXY LUSTER; SILTY, CLAYEY
TEXTURE; THICK STRUCTURE.
SILTSTONE = MODERATE TO DARK YELLOWISH
BROWN, LIGHT GRAY, OCCASIONAL
SLIGHTLY OLIVE HUES; FIRM TO MODERATELY
HARD; CRUMBLY TO OCCASIONALLY
MODERATELY TOUGH; EARTHY LUSTER WITH
SCATTERED SPARKLES; ABRASIVE, GRITTY
TEXTURE; MODERATELY CALCAREOUS;

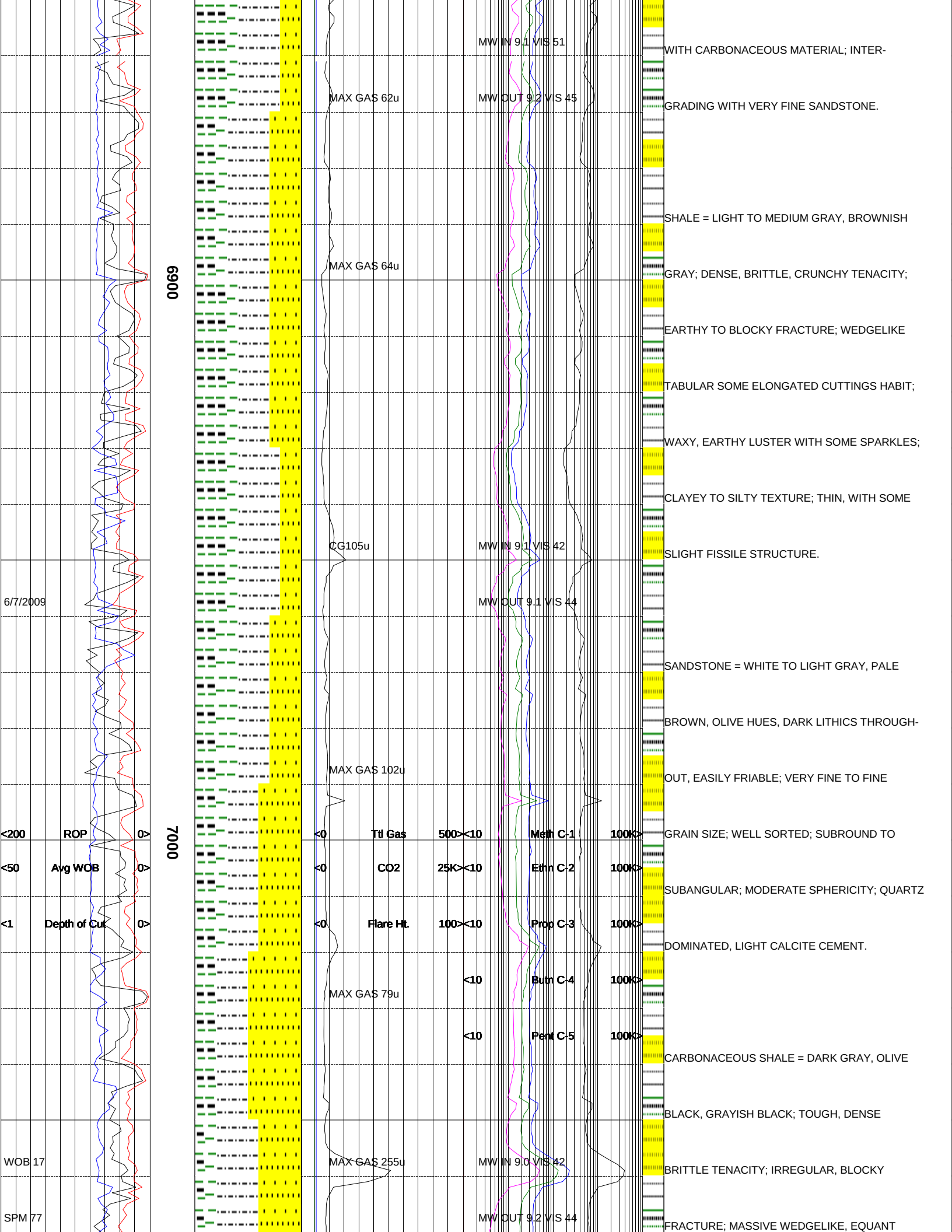

WOB 18
RPM 90
PP 2740
SPM 154
5800
RE-SCALE CO2 <0 -- 25k>
REPLACE WITH DSF MUD
MAX CO2 2500 PPM
C-2,1
MW IN 9.5 VIS 45
MW OUT 9.4 VIS 48
WOB 19
RPM 80
PP 2616
SPM 78
5900
CG 81u
MAX GAS 171u
C-3,2,1
C-5,4,3,2,1
C-4,3,2,1
WASATCH G @ 5935
INTERBEDDED WITH AND INTERGRADATIONAL
WITH SHALES.
SANDSTONE = WHITE TO LIGHT GRAY,SOME
WITH PALE YELLOW BROWN HUES , SOME
SLIGHT PURPLE HUES; FIRM TO FRIABLE;
SUBANGULAR TO SUBROUND; VERY FINE TO
LOWER FINE GRAINS; WELL SORTED; QUARTZ
FRAMEWORK, DARK LITHICS; CLAY MATRIX,
LIGHT CALCITE CEMENT.
SHALE = LIGHT TO MEDIUM DARK GRAY, PALE
YELLOWISH ORANGE, REDDISH GRAY, SOME
OLIVE BLACK; CRUMBLY TO PULVERULENT
TENACITY; IRREGULAR , EARTHY FRACTURE;
TABULAR TO WEDGELIKE CUTTINGS HABIT;
WAXY, EARTHY, SLIGHT SPARKLING LUSTER;
SMOOTH TO SILTY TEXTURE; THIN STRUCTURE.
SANDSTONE = WHITE TO LIGHT GRAY SOME
WITH GREENISH HUES; HARD TO FRIABLE;
VERY FINE TO LOWER MEDIUM GRAIN SIZE;

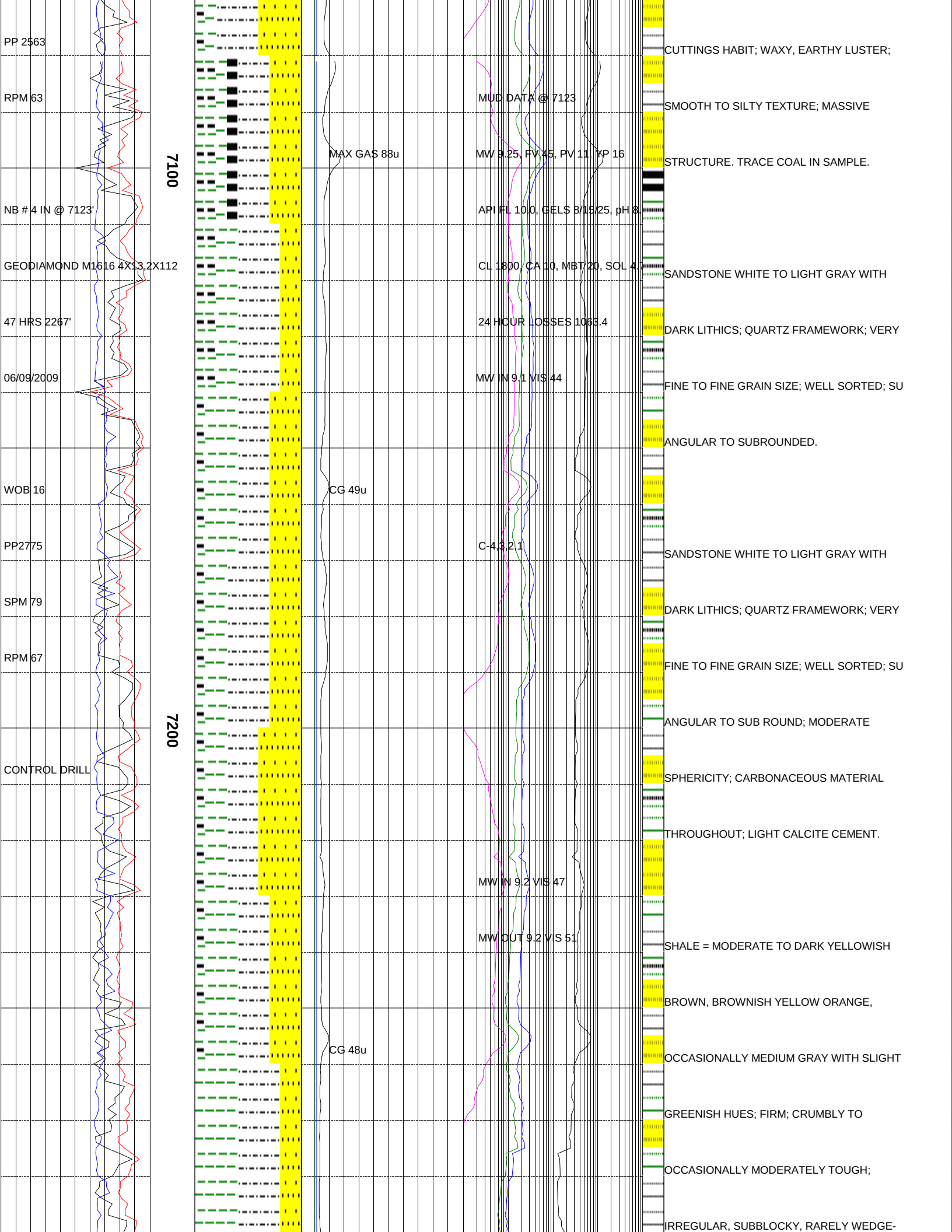

06/05/2009
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
LOST RETURNS
WOB 18
RPM 92
PP 2700
SPM 154
SHORT TRIP TO SHOE
6000
6100
MAX GAS 176u
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
MAX GAS 229
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
MAX GAS 1145u
MAX GAS 167u
MAX GAS 91u
C-5,4,3,2,1
C-5,4,3,2,1
C-2,1
MUD DATA @ 6185'
MW 9.40, FV 50, PV 16, YP 18
API FL 12.0, GELS 8/19/30, pH 8.
CL 1700, CA 10, MBT 17.5, SOL 5
MODERATELY SORTED; SUBANGULAR TO
SUBROUND; QUARTZ FRAMEWORK WITH DARK
LITHICS; DOMINANTLY GRAIN SUPPORTED WITH
LIGHT CALCITE CEMENT; SOME INTERBEDDING
WITH SILTSTONE.
SANDSTONE = PALE TANNISH STAIN OFF WHITE
LIGHT YELLOWISH PALE BROWN; SOME
CLEAR TRANSLUCENT QUARTZ FRAMEWORK;
UPPER VERY FINE, PREDOMINATELY FINE
GRAIN; POOR SORTING; TRACES SUBROUND,
SUBANGULAR IN ANGULARITY; LOW SPHERI-
CITY; SLIGHT SEMI FROSTED SURFACE
FEATURES; FRIABLE TO SEMI FIRM FRIABLE;
CLAY MATRIX CEMENT, VERY MINOR CALCARE-
OUS CEMENT; DARK GRAY TO GRAYISH BLACK
LITHICS AND SOME DARK BROWNISH SILTS
INTERBEDDED.
SHALE = LIGHT TO MEDIUM GRAY, BROWNISH
BLACK, YELLOWISH ORANGE, REDDISH GRAY;
CRUMBLY TO PULVERULENT TENACITY;

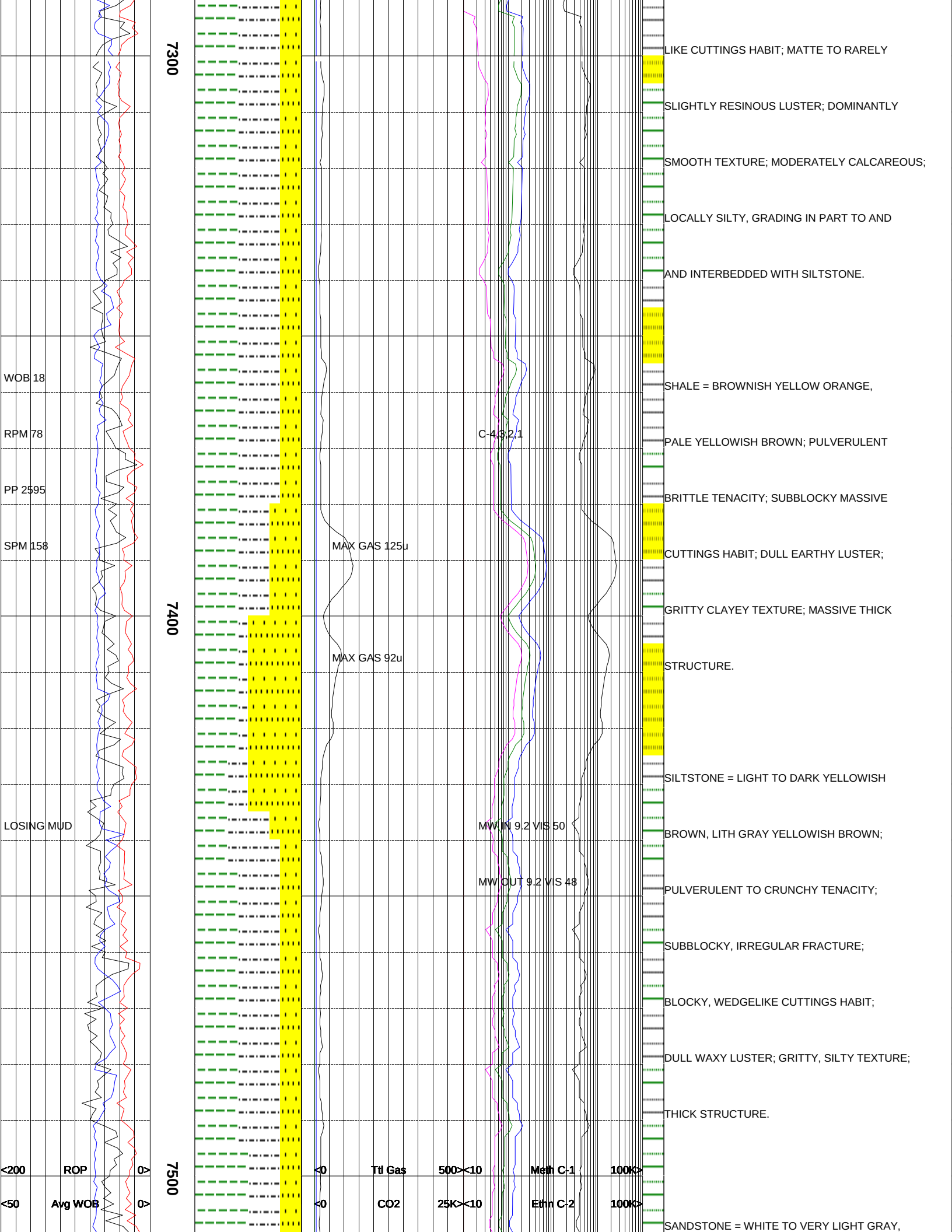

06/06/2009
6200
REPLACE WITH LSND MUD
24 HOUR LOSSES 720.6
IRREGULAR, EARTHY FRACTURE; WEDGELIKE,
TABULAR WITH SOME EQUANT CUTTINGS
HABIT; DULL EARTHY LUSTER; SMOOTH TO
SLIGHTLY SILTY TEXTURE; THIN STRUCTURE.
MW IN 9.0 VIS 52
MW OUT 9.0 VIS 52
SILTSTONE = MODERATE TO DARK YELLOWISH
WOB 18
BROWN, LIGHT GRAY, OCCASIONAL
RPM 65
C-2.1
SLIGHTLY OLIVE HUES; FIRM TO MODERATELY
PP 2620
HARD; CRUMBLY TO OCCASIONALLY
SPM 155
MODERATELY TOUGH; EARTHY LUSTER WITH
6300
SCATTERED SPARKLES; ABRASIVE, GRITTY
TEXTURE; MODERATELY CALCAREOUS;
INTERBEDDED WITH AND INTERGRADATIONAL
WITH SHALES.
MW IN 9.3 VIS 47
MW OUT 9.2 VIS 48
SHALE = GRAYISH ORANGE, MODERATE
MAX GAS 330u
YELLOWISH BROWN; PALE GRAYISH BROWN;
C-2.1
CRUNCHY TO SEMI CRUMBLY TENACITY;
SUBBLOCKY, BLOCKY TO SLIGHTLY IRREGULAR
FRACTURE; IRREGULAR WEDGELIKE CUTTINGS
6400
HABITS; DULL WAXY LUSTER; SILTY, CLAYEY
MAX GAS 330u
C-3.2.1
TEXTURE; THIN COAL BEDS.

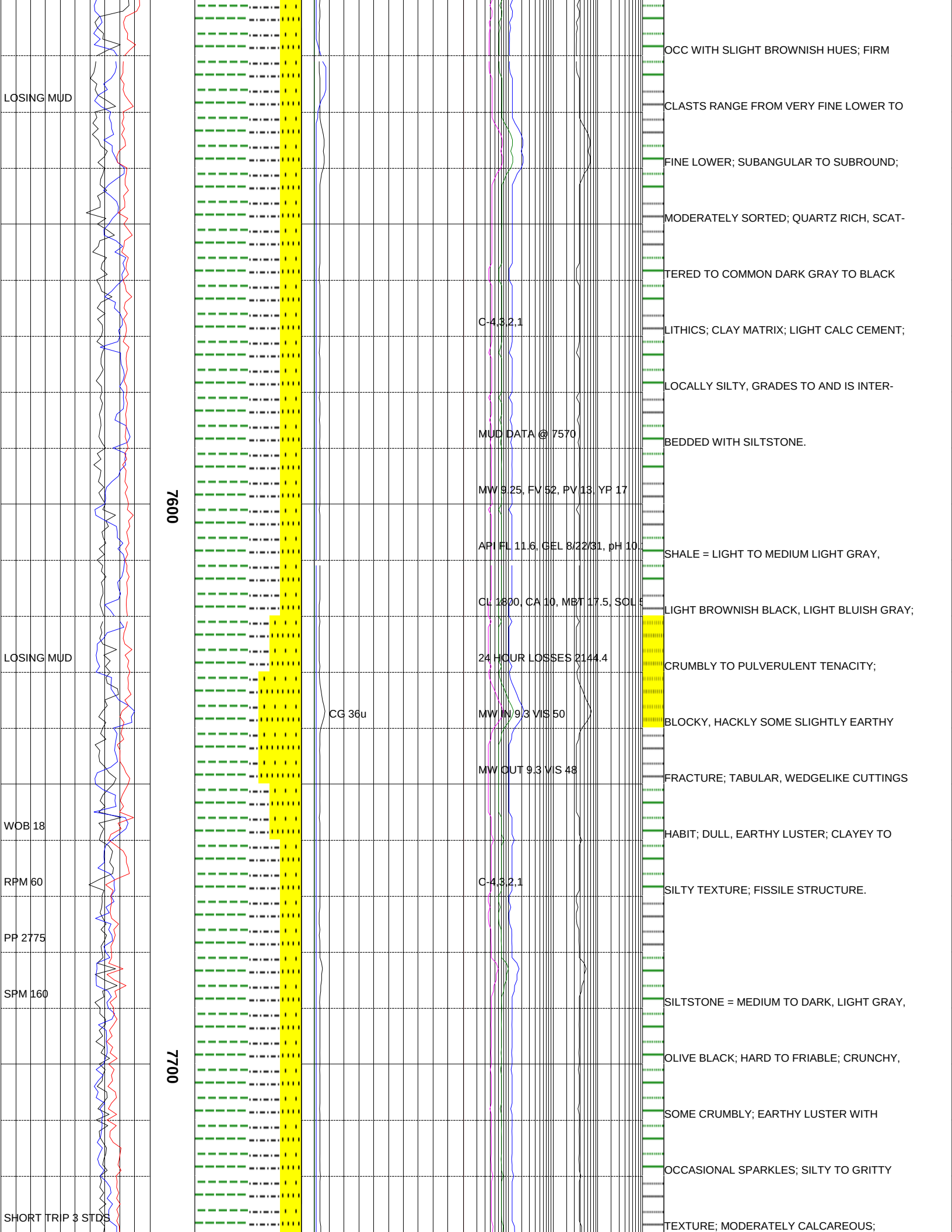

WOB 17
RPM 68
PP 2570
SPM 155
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
LOSING MUD
LOSING MUD
LOSING MUD
6500
6600
MAX GAS 84u
CG 868u
MAX GAS 157u
MAX GAS 285u
MAX GAS 287u
MUD DATA IN @ 6495'
MW 9.30, FV 45, PV 14, YP 16
API FL 12.4, GELS 9/29/47, pH 10
CL 2000, CA 20, MBT 20, SOL 5.2
24 HOUR LOSSES 791.8
MW IN 9.3 VIS 42
MW OUT 9.2 VIS 43
C-5,4,3,2,1
<0 Ttl Gas 500>
<0 CO2 25K>
<0 Flare Ht. 100>
<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>
SILTSTONE = LIGHT BROWNISH ORANGE,
LIGHT GRAYISH BROWN; SLIGHTLY FIRM,
CRUMBLY TENACITY; SUBBLOCKY, IRREGULAR,
FRACTURE; BLOCKY WEDGELIKE CUTTINGS
HABIT; DULL WAXY RESINOUS LUSTER;
GRITTY, CLAYEY TEXTURE; THICK MASSIVE
STRUCTURE.
SHALE = DARK YELLOWISH BROWN, COM RED-
DISH HUES, OCCUR LIGHT GREENISH GRAY; MO
HARD; CRUMBLY TO MODERATELY TOUGH;
IRREGULAR, PLANER AND WEDGELIKE CUTTINGS
HABIT; MATTE TO OCCASIONALLY SLIGHTLY
RESINOUS LUSTER DOMINANTLY SMOOTH
TEXTURE; SLIGHTLY TO NON CALCAREOUS;
POOR TO MODERATELY FISSILE.
COAL = BLACK TO DUSKY YELLOWISH BROWN;
FIRM; BRITTLE; IRREGULAR CUTTINGS WITH
SHARP EDGES; RESINOUS LUSTER; SMOOTH
SURFACE TEXTURE; OCCASIONAL THIN

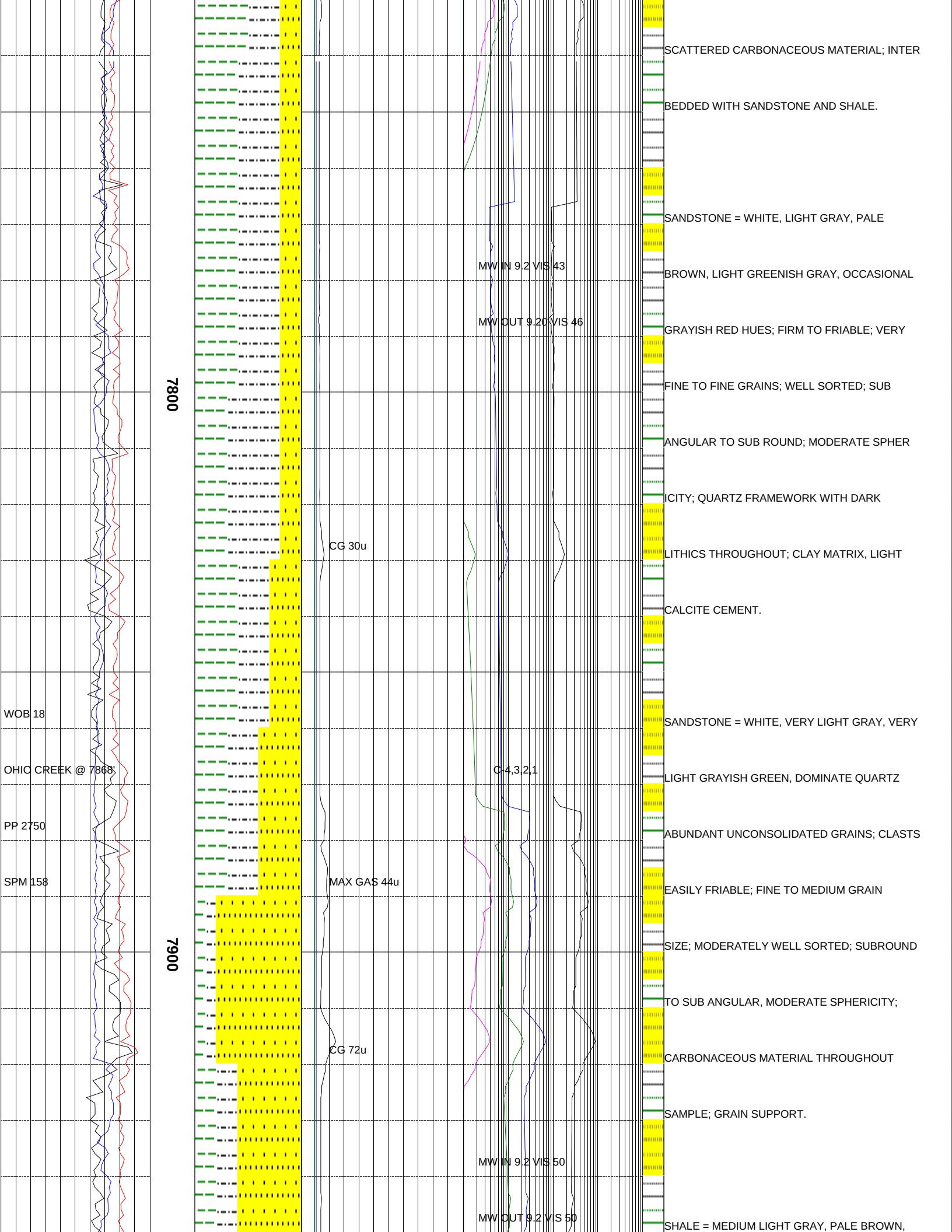

MAX GAS 187u
STREAKS CARBONACEOUS SHALE; THINLY
INTERBEDDED WITH SHALE AND SILTSTONE
WOB 18
CG 261u
RPM 78
C-5,4,3,2,1
CARBONACEOUS SHALE = DUSKY REDDISH
PP 2604
BROWN, DARK GRAYISH BROWN; FIRM TO
SPM 155
CRUMBLY TENACITY; EARTHY, SUBBLOCKY
6700
BLOCKY SLIGHT IRREGULAR FRACTURE;
LOSING MUD
SUBBLOCKY, WEDGELIKE, SEMI MASSIVE
CUTTINGS HABIT; DULL, EARTHY LUSTER;
SEMI MASSIVE STRUCTURE.
SANDSTONE = WHITE TO LIGHT GRAY WITH
LOSING MUD
BLACK LITHS, SOME CLASTS WITH GREENISH
HUES; FIRM TO EASILY FRIABLE; VERY FINE
TO FINE GRAINS; WELL SORTED; SUBROUND
MAX GAS 278u
MW IN 9.1 VIS 38
TO SUBANGULAR; MODERATE SPHERICITY;
MW OUT 9.1 VIS 46
6800
DOMINATE QUARTZ, LIGHT CALCITE CEMENT.
WOB 18
RPM 65
SILTSTONE = LIGHT GRAY TO BLUISH GRAY,
SPM 77
MAX GAS 86u
GRAYISH RED, PALE BROWN; HARD TO FRIABLE
PP2538
SILTY TO GRITTY TEXTURE; EARTHY WITH
CG 69u
SPARKLING LUSTER; SOME BANDED STRUCTURE

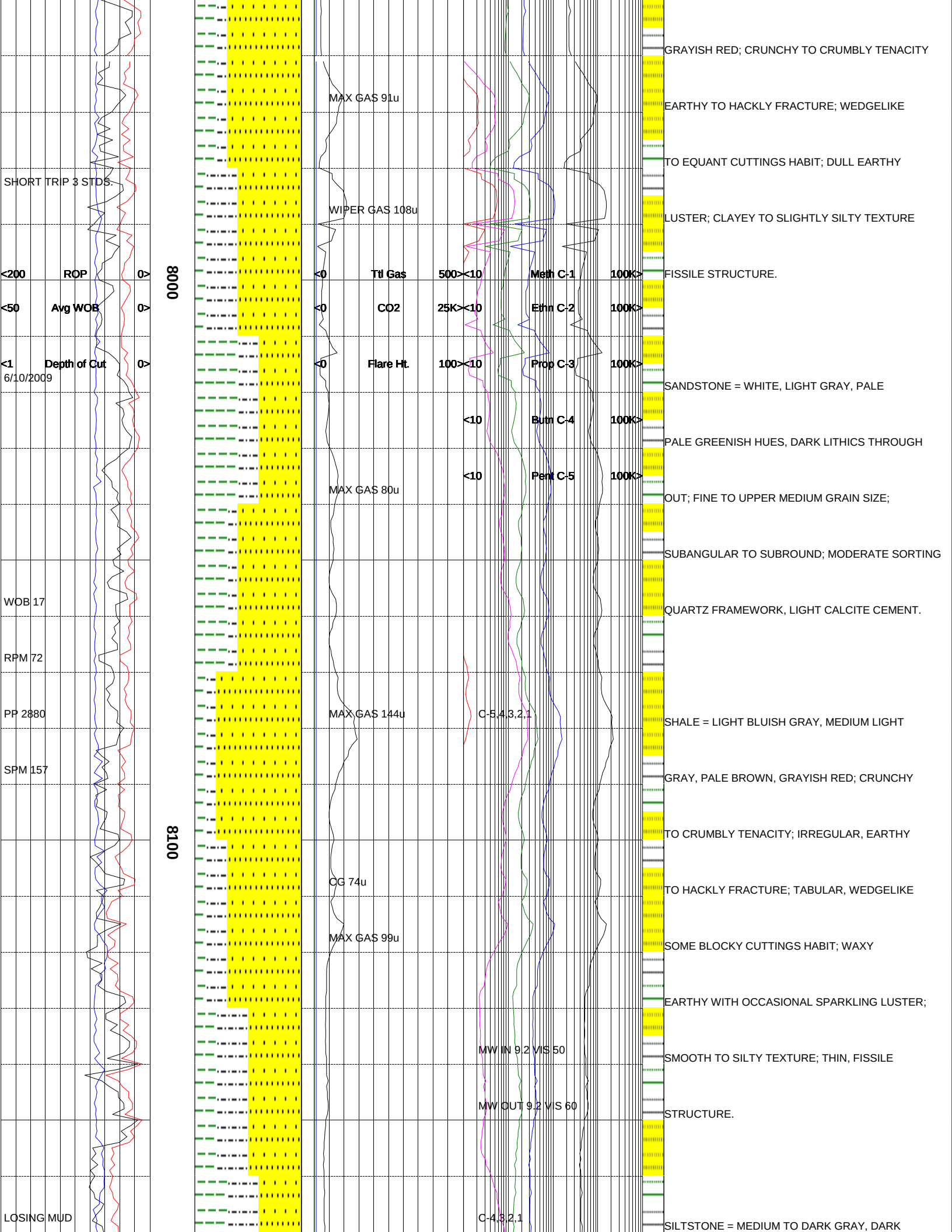

MW IN 9.1 VIS 51
MAX GAS 62u
MW OUT 9.2 VIS 45
6900
MAX GAS 64u
CG105u
MW IN 9.1 VIS 42
6/7/2009
MW OUT 9.1 VIS 44
MAX GAS 102u
7000
<200 ROP 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<50 Avg WOB 0>
<0 CO2 25K><10 Ethn C-2 100K>
<1 Depth of Cut 0>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
MAX GAS 79u
<10 Pent C-5 100K>
WOB 17
MAX GAS 255u
MW IN 9.0 VIS 42
SPM 77
MW OUT 9.2 VIS 44
WITH CARBONACEOUS MATERIAL; INTER-
GRADING WITH VERY FINE SANDSTONE.
SHALE = LIGHT TO MEDIUM GRAY, BROWNISH
GRAY; DENSE, BRITTLE, CRUNCHY TENACITY;
EARTHY TO BLOCKY FRACTURE; WEDGELIKE
TABULAR SOME ELONGATED CUTTINGS HABIT;
WAXY, EARTHY LUSTER WITH SOME SPARKLES;
CLAYEY TO SILTY TEXTURE; THIN, WITH SOME
SLIGHT FISSILE STRUCTURE.
SANDSTONE = WHITE TO LIGHT GRAY, PALE
BROWN, OLIVE HUES, DARK LITHICS THROUGH-
OUT, EASILY FRIABLE; VERY FINE TO FINE
GRAIN SIZE; WELL SORTED; SUBROUND TO
SUBANGULAR; MODERATE SPHERICITY; QUARTZ
DOMINATED, LIGHT CALCITE CEMENT.
CARBONACEOUS SHALE = DARK GRAY, OLIVE
BLACK, GRAYISH BLACK; TOUGH, DENSE
BRITTLE TENACITY; IRREGULAR, BLOCKY
FRACTURE; MASSIVE WEDGELIKE, EQUANT

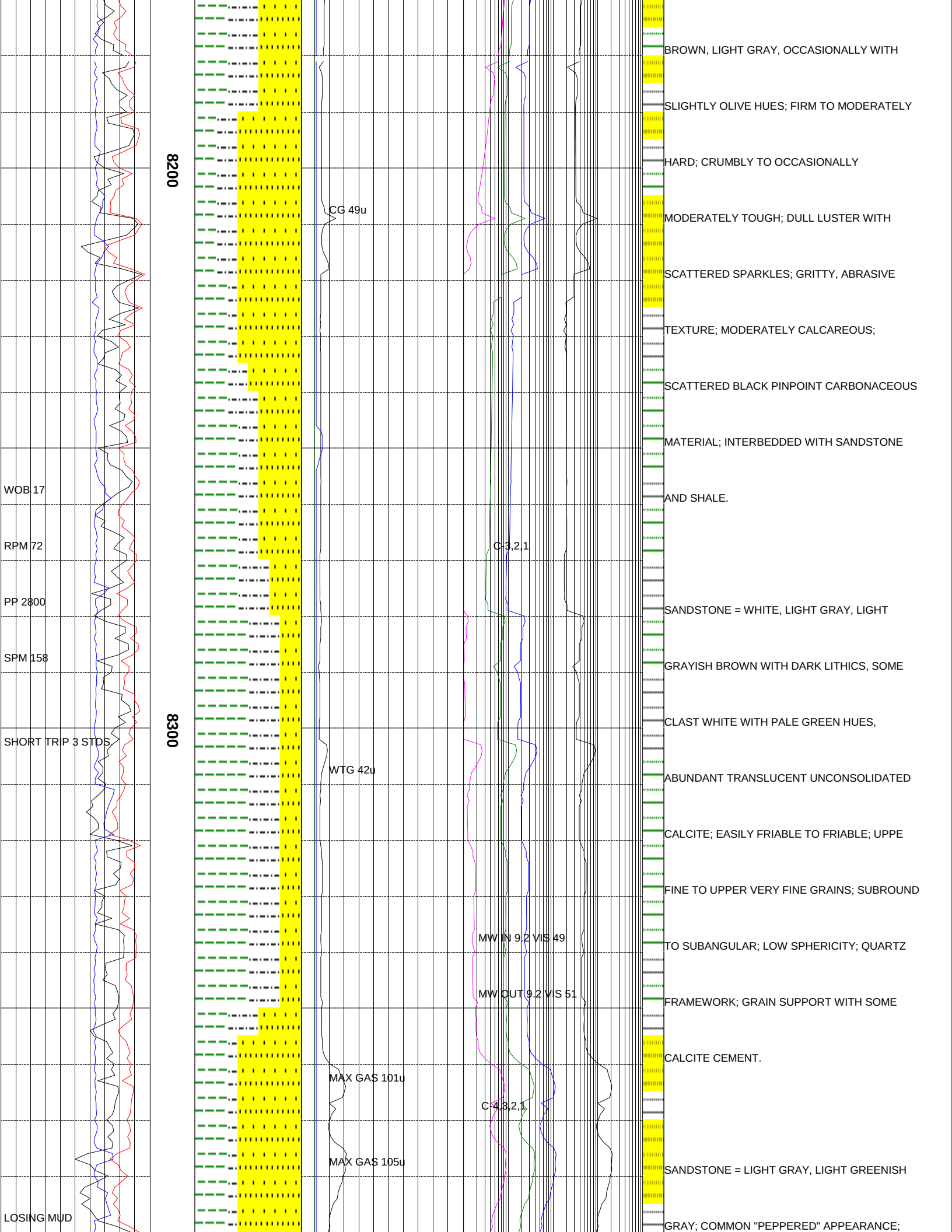

PP 2563
RPM 63
7100
NB # 4 IN @ 7123'
GEODIAMOND M1616 4X13.2X112
47 HRS 2267'
06/09/2009
WOB 16
PP2775
SPM 79
RPM 67
7200
CONTROL DRILL
MAX GAS 88u
CG 49u
CG 48u
MUD DATA @ 7123
MW 9.25, FV 45, PV 11, YP 16
API FL 10.0, GELS 8/15/25, pH 8.
CL 1600, CA 10, MBT 20, SOL 4.7
24 HOUR LOSSES 1063.4
MW IN 9.1 VIS 44
C-4,3,2,1
MW IN 9.2 VIS 47
MW OUT 9.2 VIS 51
CUTTINGS HABIT; WAXY, EARTHY LUSTER;
SMOOTH TO SILTY TEXTURE; MASSIVE
STRUCTURE. TRACE COAL IN SAMPLE.
SANDSTONE WHITE TO LIGHT GRAY WITH
DARK LITHICS; QUARTZ FRAMEWORK; VERY
FINE TO FINE GRAIN SIZE; WELL SORTED; SU
ANGULAR TO SUBROUNDED.
SANDSTONE WHITE TO LIGHT GRAY WITH
DARK LITHICS; QUARTZ FRAMEWORK; VERY
FINE TO FINE GRAIN SIZE; WELL SORTED; SU
ANGULAR TO SUB ROUND; MODERATE
SPHERICITY; CARBONACEOUS MATERIAL
THROUGHOUT; LIGHT CALCITE CEMENT.
SHALE = MODERATE TO DARK YELLOWISH
BROWN, BROWNISH YELLOW ORANGE,
OCCASIONALLY MEDIUM GRAY WITH SLIGHT
GREENISH HUES; FIRM; CRUMBLY TO
OCCASIONALLY MODERATELY TOUGH;
IRREGULAR, SUBBLOCKY, RARELY WEDGE-

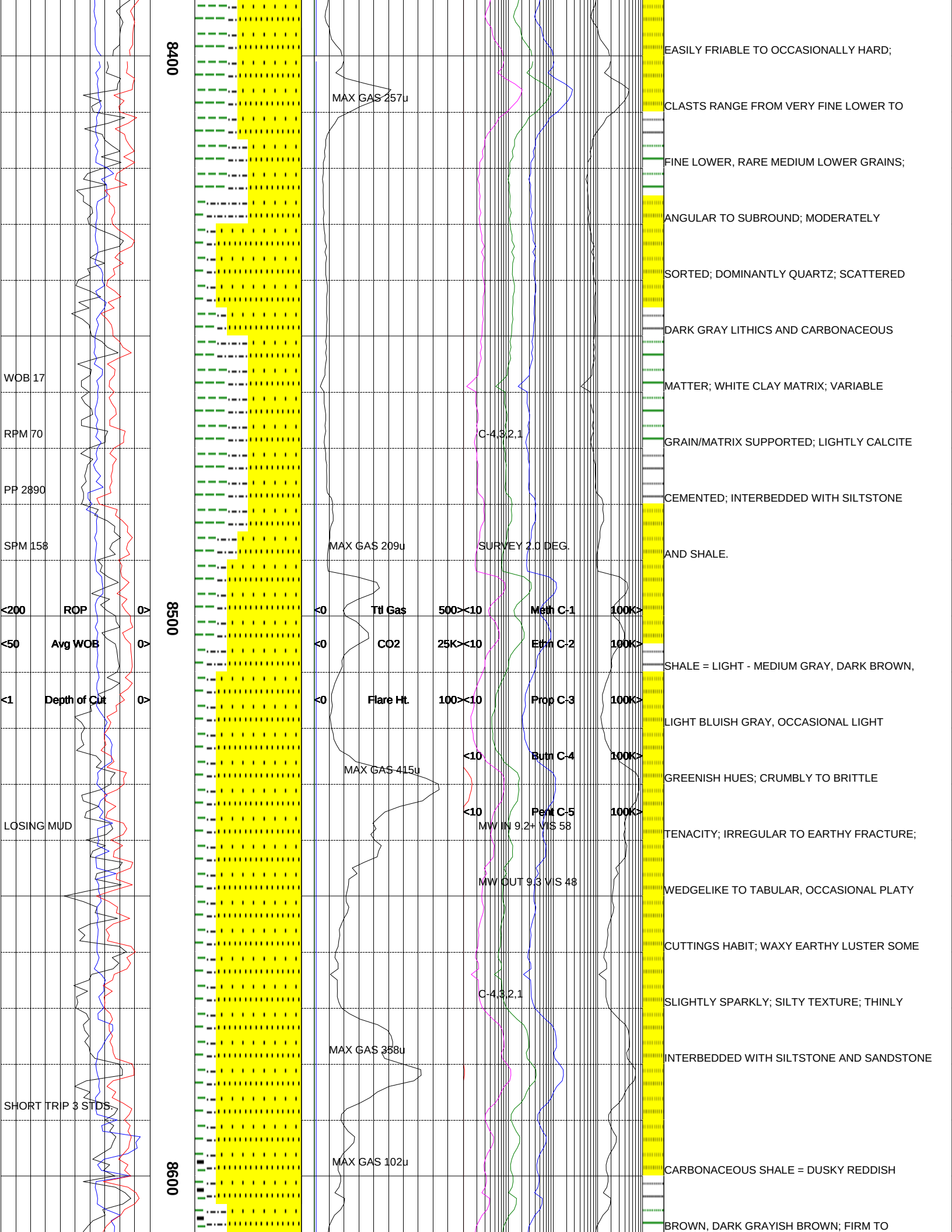

7300
7400
7500
WOB 18
RPM 78
PP 2595
SPM 158
LOSING MUD
MAX GAS 125u
MAX GAS 92u
C-4,3,2,1
MW IN 9.2 VIS 50
MW OUT 9.2 VIS 48
LIKE CUTTINGS HABIT; MATTE TO RARELY
SLIGHTLY RESINOUS LUSTER; DOMINANTLY
SMOOTH TEXTURE; MODERATELY CALCAREOUS;
LOCALLY SILTY, GRADING IN PART TO AND
AND INTERBEDDED WITH SILTSTONE.
SHALE = BROWNISH YELLOW ORANGE,
PALE YELLOWISH BROWN; PULVERULENT
BRITTLE TENACITY; SUBBLOCKY MASSIVE
CUTTINGS HABIT; DULL EARTHY LUSTER;
GRITTY CLAYEY TEXTURE; MASSIVE THICK
STRUCTURE.
SILTSTONE = LIGHT TO DARK YELLOWISH
BROWN, LITH GRAY YELLOWISH BROWN;
PULVERULENT TO CRUNCHY TENACITY;
SUBBLOCKY, IRREGULAR FRACTURE;
BLOCKY, WEDGELIKE CUTTINGS HABIT;
DULL WAXY LUSTER; GRITTY, SILTY TEXTURE;
THICK STRUCTURE.
SANDSTONE = WHITE TO VERY LIGHT GRAY,
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>

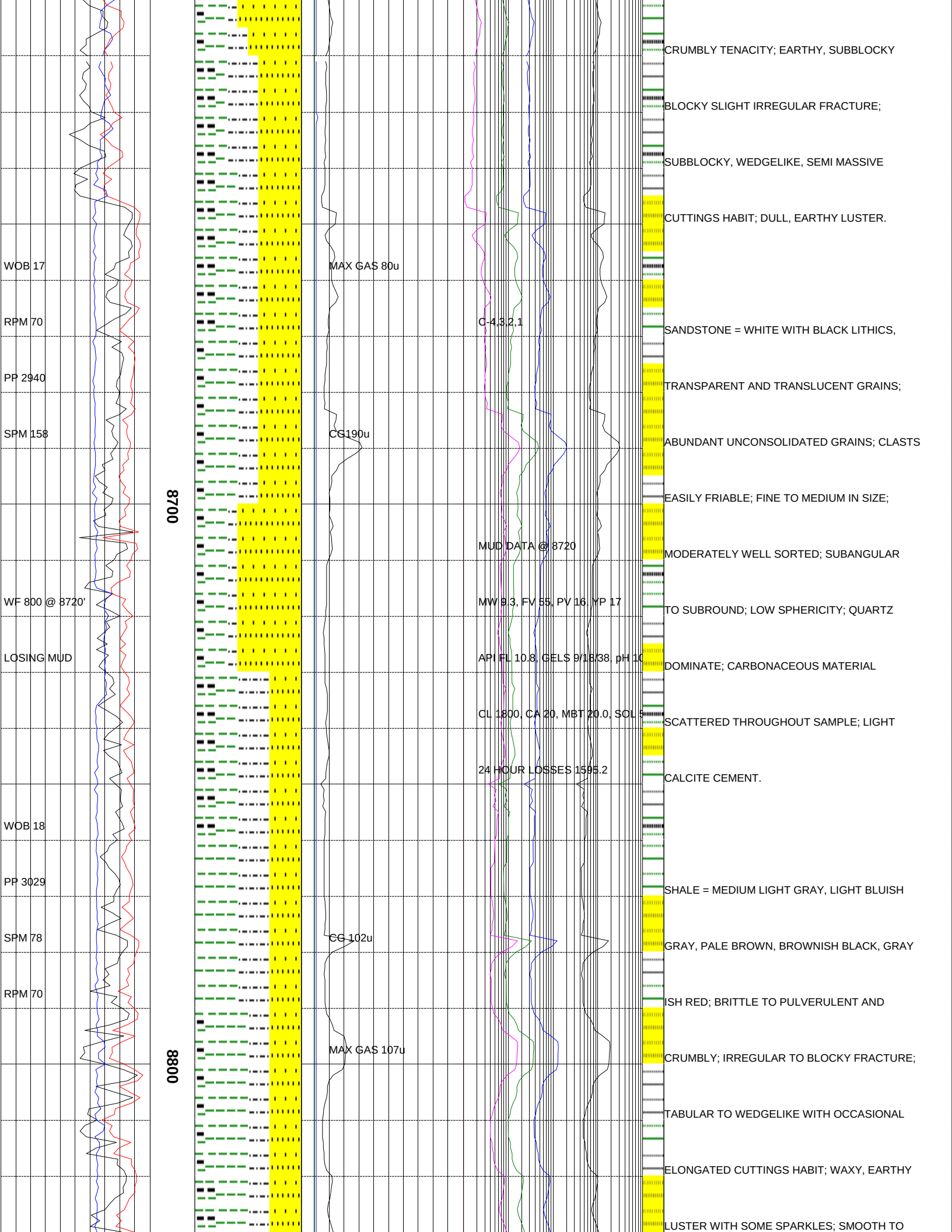

OCC WITH SLIGHT BROWNISH HUES; FIRM
LOSING MUD
CLASTS RANGE FROM VERY FINE LOWER TO
FINE LOWER; SUBANGULAR TO SUBROUND;
MODERATELY SORTED; QUARTZ RICH, SCAT-
TERED TO COMMON DARK GRAY TO BLACK
C-4,3,2,1
LITHICS; CLAY MATRIX; LIGHT CALC CEMENT;
LOCALLY SILTY, GRADES TO AND IS INTER-
MUD DATA @ 7570
BEDDED WITH SILTSTONE.
MW 9.25, FV 52, PV 13, YP 17
7600
API FL 11.6, GEL 8/22/31, pH 10.
SHALE = LIGHT TO MEDIUM LIGHT GRAY,
CL 1600, CA 10, MBT 17.5, SOL
LIGHT BROWNISH BLACK, LIGHT BLUISH GRAY;
LOSING MUD
24 HOUR LOSSES 2144.4
CRUMBLY TO PULVERULENT TENACITY;
CG 36u
MW IN 9.3 VIS 50
BLOCKY, HACKLY SOME SLIGHTLY EARTHY
MW OUT 9.3 VIS 48
FRACTURE; TABULAR, WEDGELIKE CUTTINGS
WOB 18
HABIT; DULL, EARTHY LUSTER; CLAYEY TO
RPM 60
C-4,3,2,1
SILTY TEXTURE; FISSILE STRUCTURE.
PP 2775
SPM 160
SILTSTONE = MEDIUM TO DARK, LIGHT GRAY,
7700
OLIVE BLACK; HARD TO FRIABLE; CRUNCHY,
SOME CRUMBLY; EARTHY LUSTER WITH
OCCASIONAL SPARKLES; SILTY TO GRITTY
SHORT TRIP 3 STDS
TEXTURE; MODERATELY CALCAREOUS;

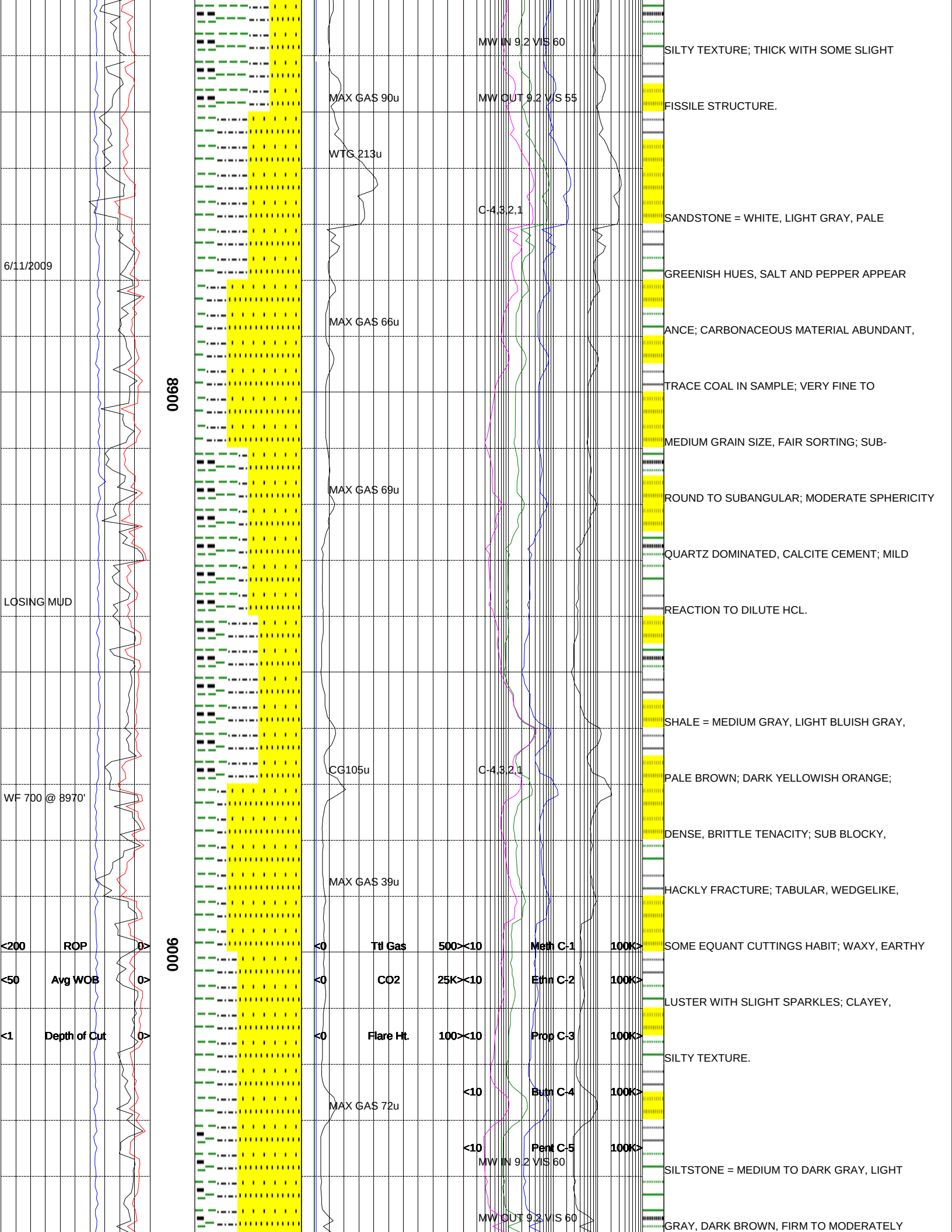

7800
7900
WOB 18
OHIO CREEK @ 7868'
PP 2750
SPM 158
CG 30u
MAX GAS 44u
CG 72u
MW IN 9.2 VIS 43
MW OUT 9.20 VIS 46
C-4,3,2,1
MW IN 9.2 VIS 50
MW OUT 9.2 VIS 50
SCATTERED CARBONACEOUS MATERIAL; INTER
BEDDED WITH SANDSTONE AND SHALE.
SANDSTONE = WHITE, LIGHT GRAY, PALE
BROWN, LIGHT GREENISH GRAY, OCCASIONAL
GRAYISH RED HUES; FIRM TO FRIABLE; VERY
FINE TO FINE GRAINS; WELL SORTED; SUB
ANGULAR TO SUB ROUND; MODERATE SPHER
ICITY; QUARTZ FRAMEWORK WITH DARK
LITHICS THROUGHOUT; CLAY MATRIX, LIGHT
CALCITE CEMENT.
SANDSTONE = WHITE, VERY LIGHT GRAY, VERY
LIGHT GRAYISH GREEN, DOMINATE QUARTZ
ABUNDANT UNCONSOLIDATED GRAINS; CLASTS
EASILY FRIABLE; FINE TO MEDIUM GRAIN
SIZE; MODERATELY WELL SORTED; SUBROUND
TO SUB ANGULAR, MODERATE SPHERICITY;
CARBONACEOUS MATERIAL THROUGHOUT
SAMPLE; GRAIN SUPPORT.
SHALE = MEDIUM LIGHT GRAY, PALE BROWN,

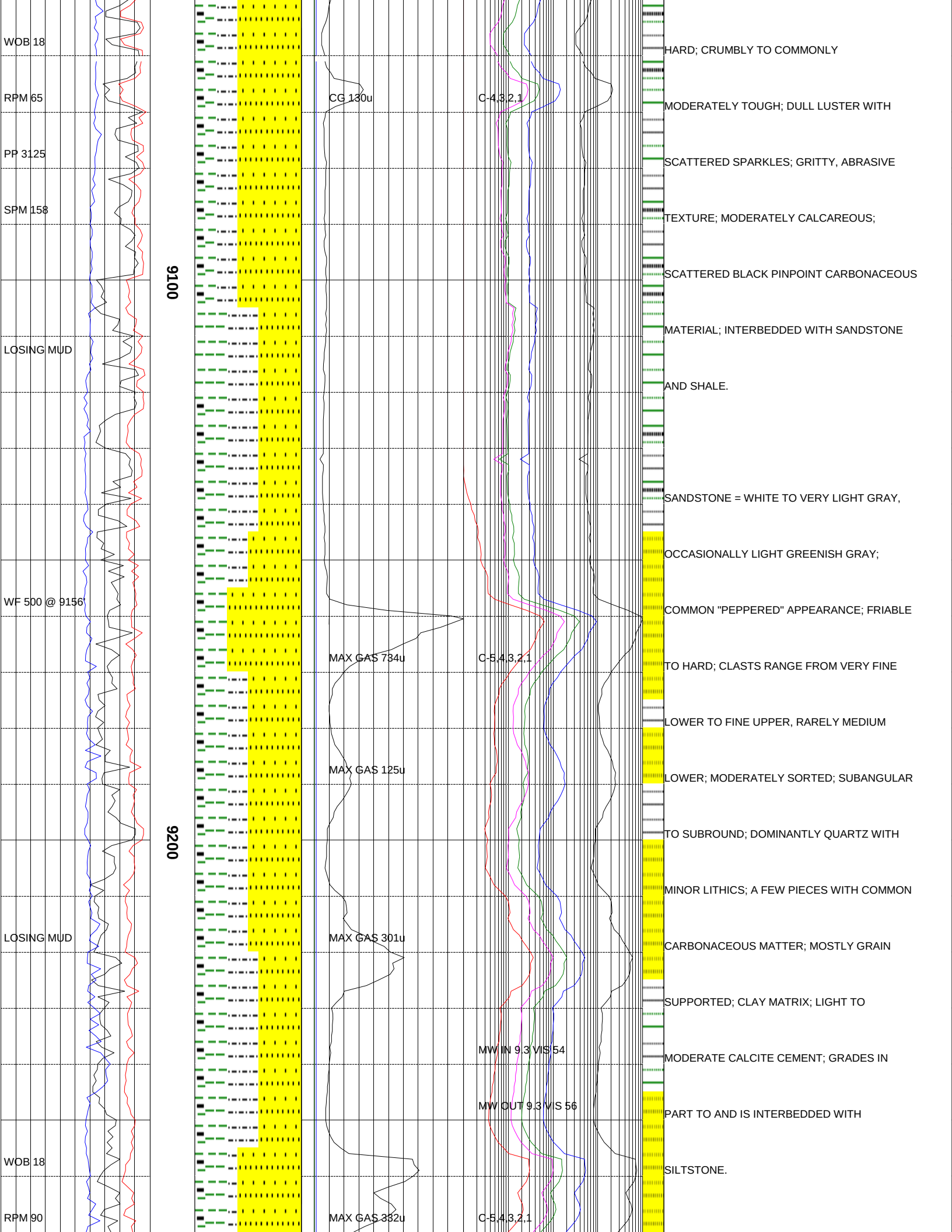

SHORT TRIP 3 STDS.
WOB 17
RPM 72
PP 2880
SPM 157
LOSING MUD
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
6/10/2009
8000
8100
MAX GAS 91u
WIPER GAS 108u
<0 Ttl Gas 500>
<0 CO2 25K>
<0 Flare Ht. 100>
MAX GAS 80u
MAX GAS 144u
CG 74u
MAX GAS 99u
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
C-5,4,3,2,1
MW IN 9.2 VIS 50
MW OUT 9.2 VIS 60
C-4,3,2,1
GRAYISH RED; CRUNCHY TO CRUMBLY TENACITY
EARTHY TO HACKLY FRACTURE; WEDGELIKE
TO EQUANT CUTTINGS HABIT; DULL EARTHY
LUSTER; CLAYEY TO SLIGHTLY SILTY TEXTURE
FISSILE STRUCTURE.
SANDSTONE = WHITE, LIGHT GRAY, PALE
PALE GREENISH HUES, DARK LITHICS THROUGH
OUT; FINE TO UPPER MEDIUM GRAIN SIZE;
SUBANGULAR TO SUBROUND; MODERATE SORTING
QUARTZ FRAMEWORK, LIGHT CALCITE CEMENT.
SHALE = LIGHT BLUISH GRAY, MEDIUM LIGHT
GRAY, PALE BROWN, GRAYISH RED; CRUNCHY
TO CRUMBLY TENACITY; IRREGULAR, EARTHY
TO HACKLY FRACTURE; TABULAR, WEDGELIKE
SOME BLOCKY CUTTINGS HABIT; WAXY
EARTHY WITH OCCASIONAL SPARKLING LUSTER;
SMOOTH TO SILTY TEXTURE; THIN, FISSILE
STRUCTURE.
SILTSTONE = MEDIUM TO DARK GRAY, DARK

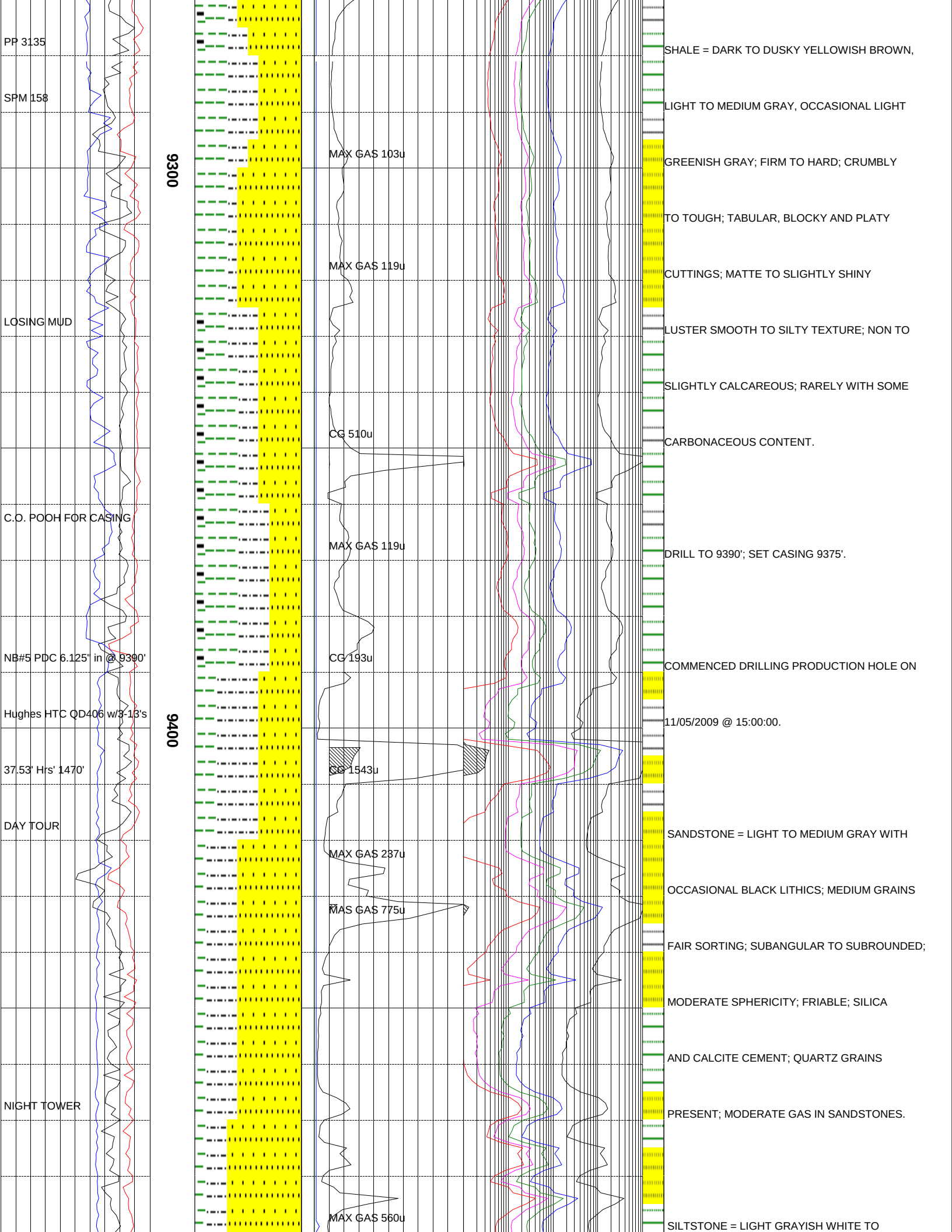

8200
8300
WOB 17
RPM 72
PP 2800
SPM 158
SHORT TRIP 3 STDS
LOSING MUD
CG 49u
WTG 42u
MAX GAS 101u
MAX GAS 105u
C-3,2,1
MW IN 9.2 VIS 49
MW OUT 9.2 VIS 51
C-4,3,2,1
BROWN, LIGHT GRAY, OCCASIONALLY WITH
SLIGHTLY OLIVE HUES; FIRM TO MODERATELY
HARD; CRUMBLY TO OCCASIONALLY
MODERATELY TOUGH; DULL LUSTER WITH
SCATTERED SPARKLES; GRITTY, ABRASIVE
TEXTURE; MODERATELY CALCAREOUS;
SCATTERED BLACK PINPOINT CARBONACEOUS
MATERIAL; INTERBEDDED WITH SANDSTONE
AND SHALE.
SANDSTONE = WHITE, LIGHT GRAY, LIGHT
GRAYISH BROWN WITH DARK LITHICS, SOME
CLAST WHITE WITH PALE GREEN HUES,
ABUNDANT TRANSLUCENT UNCONSOLIDATED
CALCITE; EASILY FRIABLE TO FRIABLE; UPPE
FINE TO UPPER VERY FINE GRAINS; SUBROUND
TO SUBANGULAR; LOW SPHERICITY; QUARTZ
FRAMEWORK; GRAIN SUPPORT WITH SOME
CALCITE CEMENT.
SANDSTONE = LIGHT GRAY, LIGHT GREENISH
GRAY; COMMON "PEPPERED" APPEARANCE;

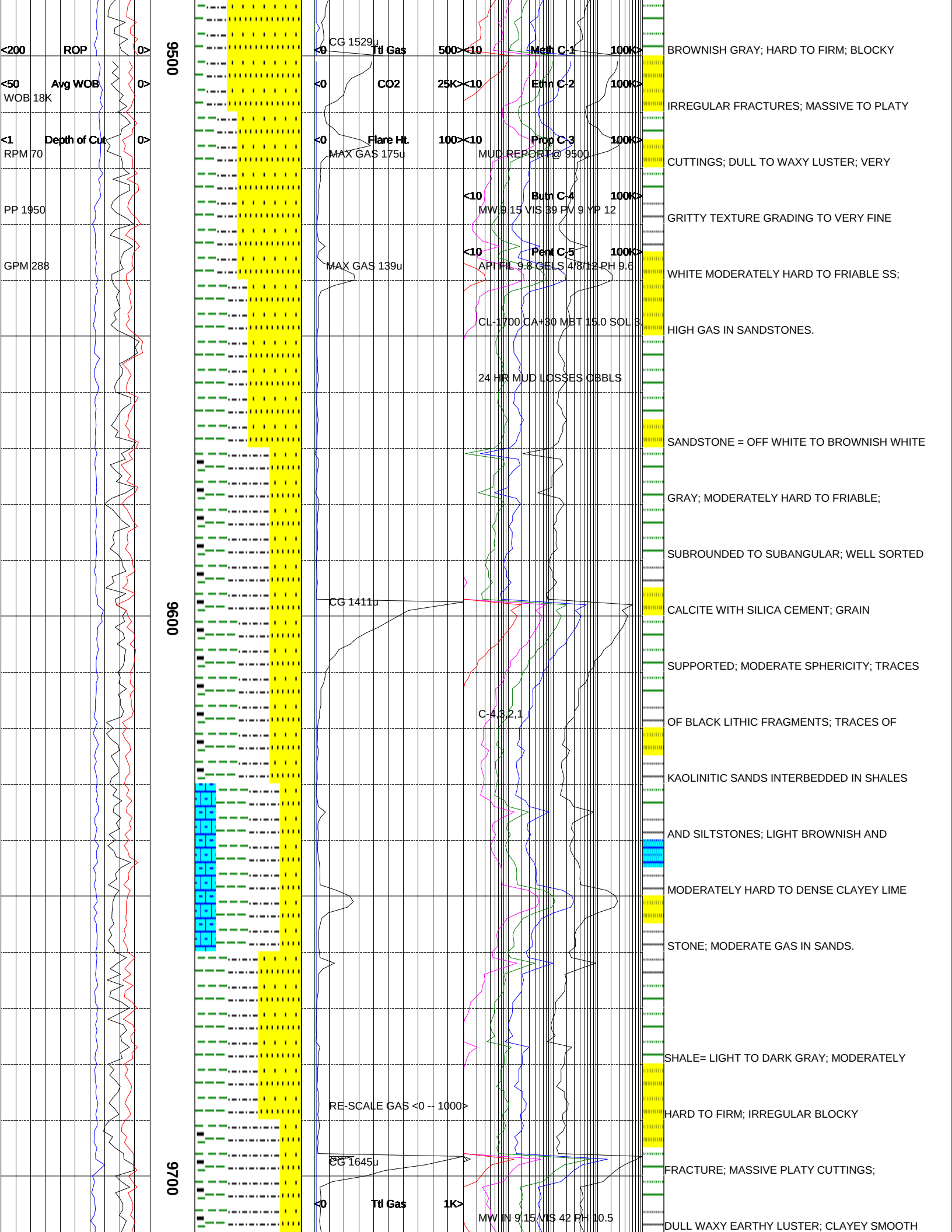

8400
8500
8600
WOB 17
RPM 70
PP 2890
SPM 158
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
LOSING MUD
SHORT TRIP 3 STDS.
MAX GAS 257u
MAX GAS 209u
MAX GAS 415u
MAX GAS 358u
MAX GAS 102u
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 25K><10 Etha C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
C-4,3,2,1
SURVEY 2.0 DEG.
MW IN 9.2+ VIS 58
MW OUT 9.3 VIS 48
C-4,3,2,1
EASILY FRIABLE TO OCCASIONALLY HARD;
CLASTS RANGE FROM VERY FINE LOWER TO
FINE LOWER, RARE MEDIUM LOWER GRAINS;
ANGULAR TO SUBROUND; MODERATELY
SORTED; DOMINANTLY QUARTZ; SCATTERED
DARK GRAY LITHICS AND CARBONACEOUS
MATTER; WHITE CLAY MATRIX; VARIABLE
GRAIN/MATRIX SUPPORTED; LIGHTLY CALCITE
CEMENTED; INTERBEDDED WITH SILTSTONE
AND SHALE.
SHALE = LIGHT - MEDIUM GRAY, DARK BROWN,
LIGHT BLUISH GRAY, OCCASIONAL LIGHT
GREENISH HUES; CRUMBLY TO BRITTLE
TENACITY; IRREGULAR TO EARTHY FRACTURE;
WEDGELIKE TO TABULAR, OCCASIONAL PLATY
CUTTINGS HABIT; WAXY EARTHY LUSTER SOME
SLIGHTLY SPARKLY; SILTY TEXTURE; THINLY
INTERBEDDED WITH SILTSTONE AND SANDSTONE
CARBONACEOUS SHALE = DUSKY REDDISH
BROWN, DARK GRAYISH BROWN; FIRM TO

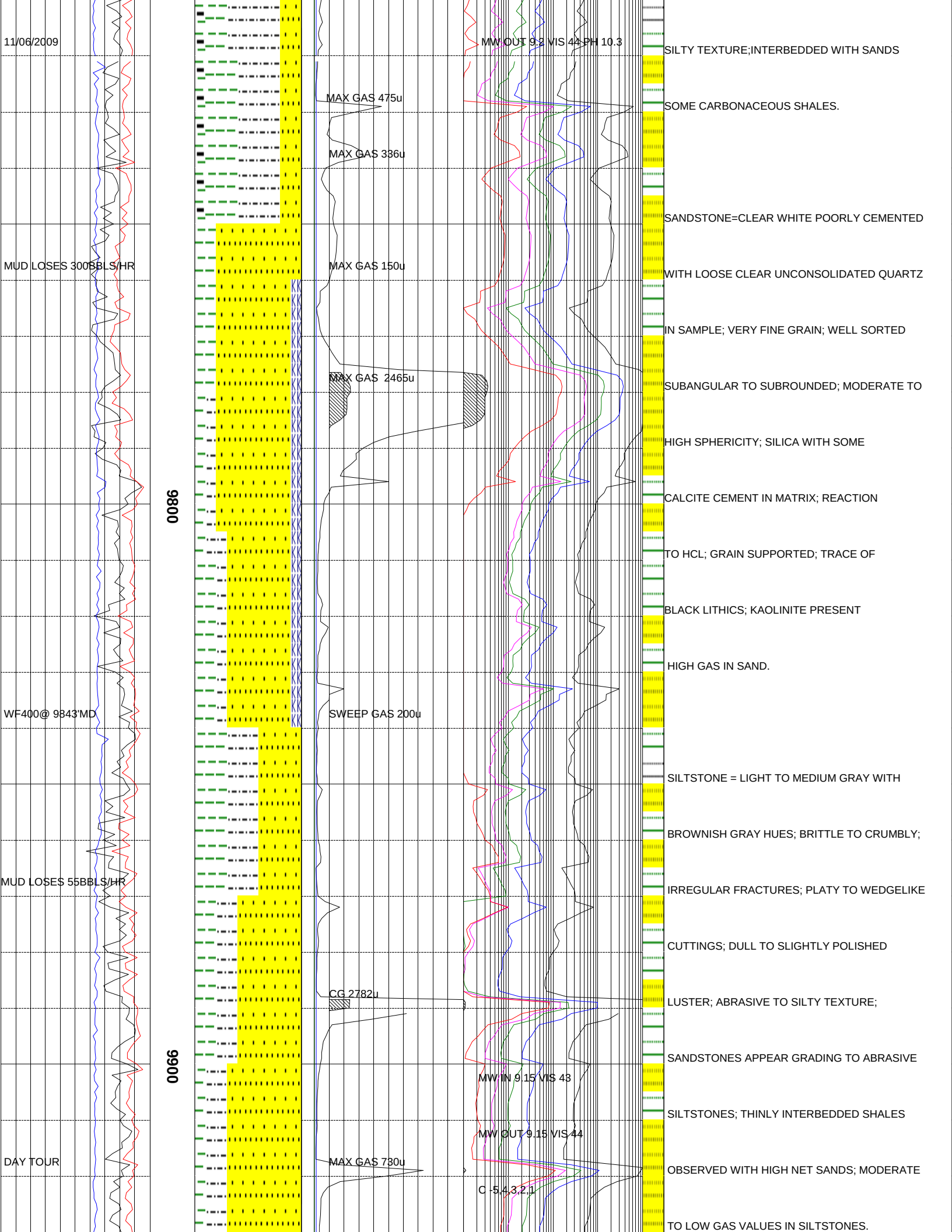

CRUMBLY TENACITY; EARTHY, SUBBLOCKY
BLOCKY SLIGHT IRREGULAR FRACTURE;
SUBBLOCKY, WEDGELIKE, SEMI MASSIVE
CUTTINGS HABIT; DULL, EARTHY LUSTER.
WOB 17
MAX GAS 80u
RPM 70
C-4,3,2,1
SANDSTONE = WHITE WITH BLACK LITHICS,
PP 2940
TRANSPARENT AND TRANSLUCENT GRAINS;
SPM 158
CG190u
ABUNDANT UNCONSOLIDATED GRAINS; CLASTS
8700
EASILY FRIABLE; FINE TO MEDIUM IN SIZE;
MUD DATA @ 8720
MODERATELY WELL SORTED; SUBANGULAR
WF 800 @ 8720'
MW 9.3, FV 55, PV 16, YP 17
TO SUBROUND; LOW SPHERICITY; QUARTZ
LOSING MUD
API FL 10.8, GELS 9/18/38, pH 10
DOMINATE; CARBONACEOUS MATERIAL
CL 1800, CA 20, MBT 20.0, SOL 5
SCATTERED THROUGHOUT SAMPLE; LIGHT
24 HOUR LOSSES 1595.2
CALCITE CEMENT.
WOB 18
PP 3029
SHALE = MEDIUM LIGHT GRAY, LIGHT BLUISH
SPM 78
CG 102u
GRAY, PALE BROWN, BROWNISH BLACK, GRAY
RPM 70
ISH RED; BRITTLE TO PULVERULENT AND
MAX GAS 107u
8800
CRUMBLY; IRREGULAR TO BLOCKY FRACTURE;
TABULAR TO WEDGELIKE WITH OCCASIONAL
ELONGATED CUTTINGS HABIT; WAXY, EARTHY
LUSTER WITH SOME SPARKLES; SMOOTH TO

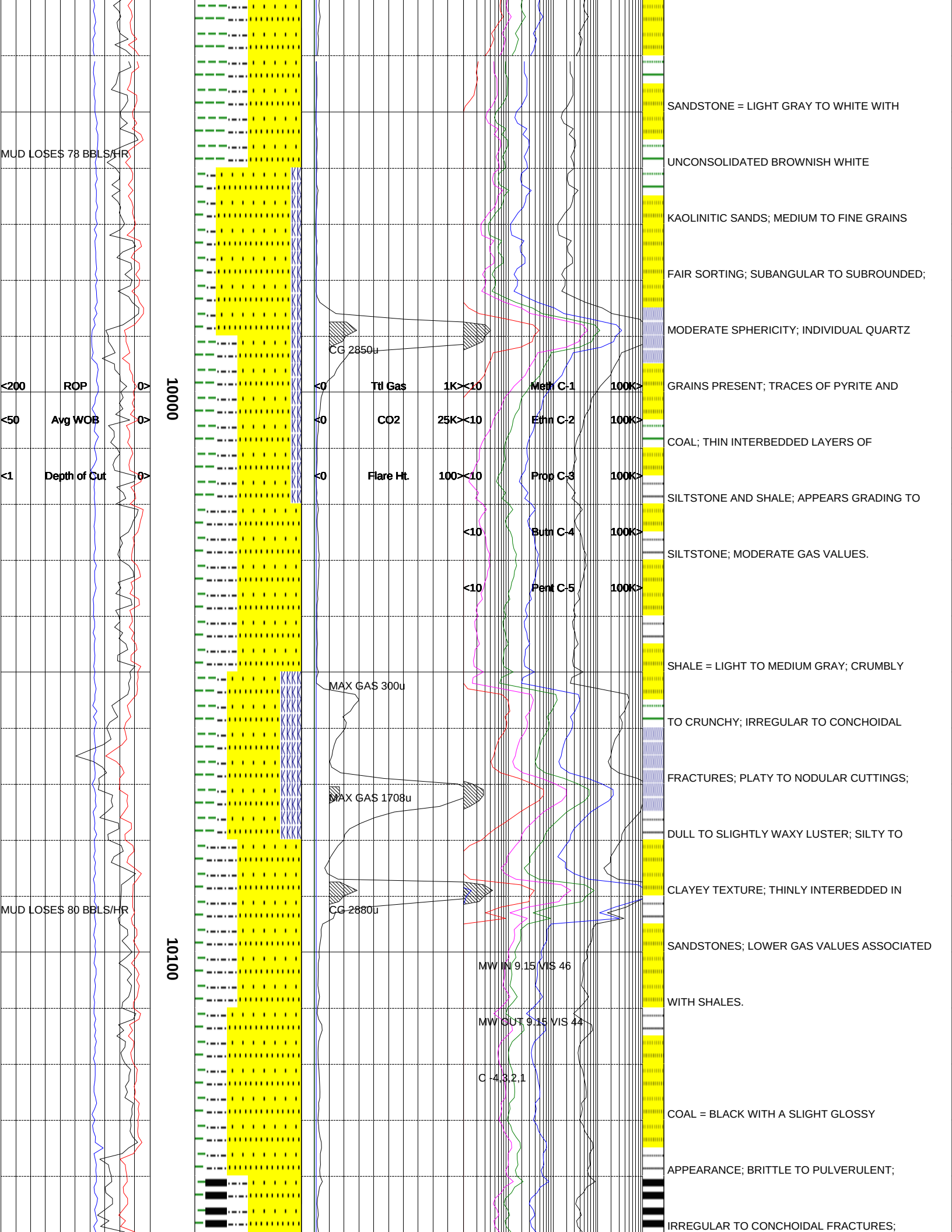

MW IN 9.2 VIS 60
MAX GAS 90u
MW OUT 9.2 VIS 55
WTG 213u
C-4,3,2,1
6/11/2009
MAX GAS 66u
8900
MAX GAS 69u
LOSING MUD
CG105u
C-4,3,2,1
WF 700 @ 8970'
MAX GAS 39u
9000
<200 ROP 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<50 Avg WOB 0>
<0 CO2 25K><10 Ethn C-2 100K>
<1 Depth of Cut 0>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
MAX GAS 72u
<10 Pent C-5 100K>
MW IN 9.2 VIS 60
MW OUT 9.2 VIS 60
SILTY TEXTURE; THICK WITH SOME SLIGHT
FISSILE STRUCTURE.
SANDSTONE = WHITE, LIGHT GRAY, PALE
GREENISH HUES, SALT AND PEPPER APPEAR
ANCE; CARBONACEOUS MATERIAL ABUNDANT,
TRACE COAL IN SAMPLE; VERY FINE TO
MEDIUM GRAIN SIZE, FAIR SORTING; SUB-
ROUND TO SUBANGULAR; MODERATE SPHERICITY
QUARTZ DOMINATED, CALCITE CEMENT; MILD
REACTION TO DILUTE HCL.
SHALE = MEDIUM GRAY, LIGHT BLUISH GRAY,
PALE BROWN; DARK YELLOWISH ORANGE;
DENSE, BRITTLE TENACITY; SUB BLOCKY,
HACKLY FRACTURE; TABULAR, WEDGELIKE,
SOME EQUANT CUTTINGS HABIT; WAXY, EARTHY
LUSTER WITH SLIGHT SPARKLES; CLAYEY,
SILTY TEXTURE.
SILTSTONE = MEDIUM TO DARK GRAY, LIGHT
GRAY, DARK BROWN, FIRM TO MODERATELY

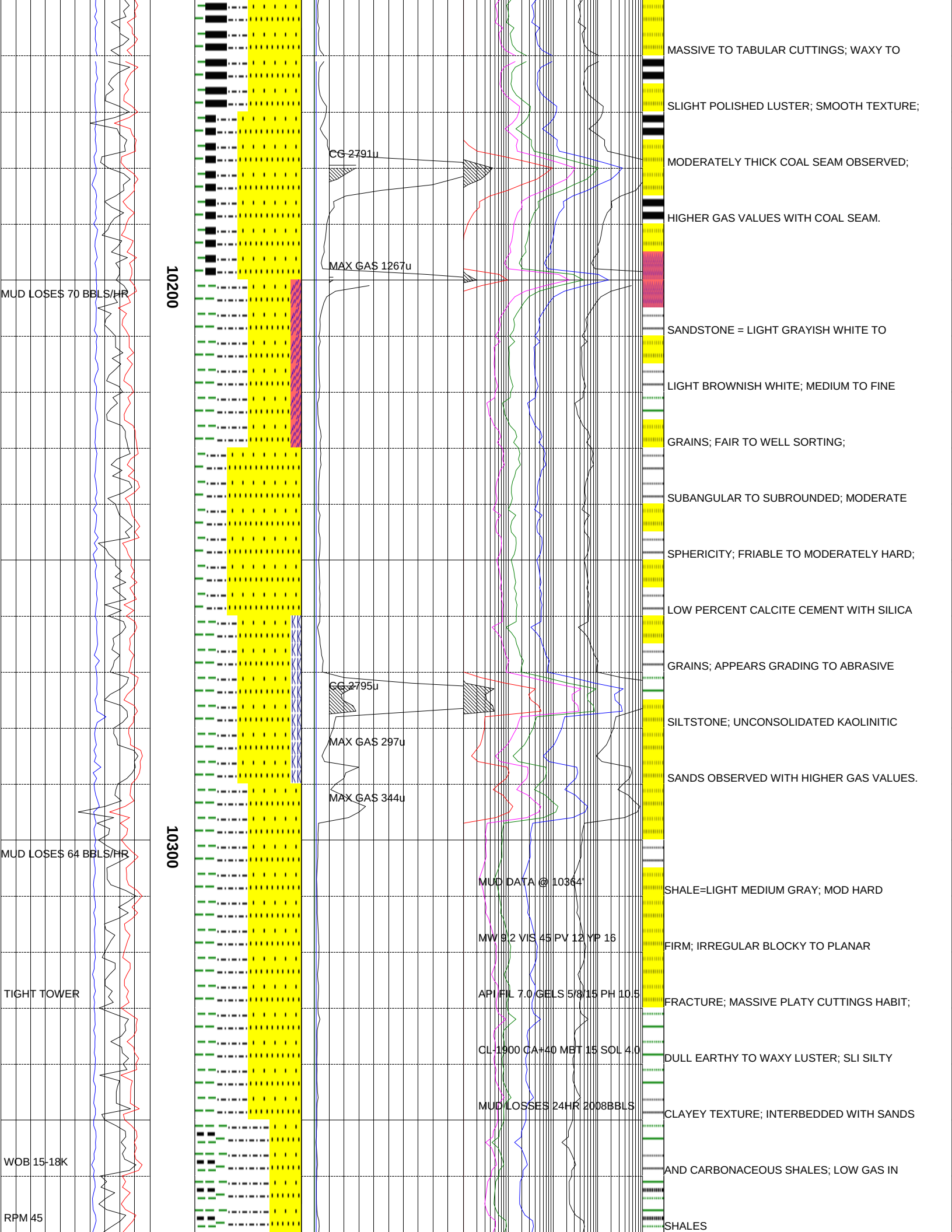

WOB 18
RPM 65
PP 3125
SPM 158
9100
LOSING MUD
WF 500 @ 9156'
9200
LOSING MUD
WOB 18
RPM 90
CG 130u
C-4,3,2,1
MAX GAS 734u
C-5,4,3,2,1
MAX GAS 125u
MAX GAS 301u
MW IN 9.3 VIS 54
MW OUT 9.3 VIS 56
MAX GAS 332u
C-5,4,3,2,1
HARD; CRUMBLY TO COMMONLY
MODERATELY TOUGH; DULL LUSTER WITH
SCATTERED SPARKLES; GRITTY, ABRASIVE
TEXTURE; MODERATELY CALCAREOUS;
SCATTERED BLACK PINPOINT CARBONACEOUS
MATERIAL; INTERBEDDED WITH SANDSTONE
AND SHALE.
SANDSTONE = WHITE TO VERY LIGHT GRAY,
OCCASIONALLY LIGHT GREENISH GRAY;
COMMON "PEPPERED" APPEARANCE; FRIABLE
TO HARD; CLASTS RANGE FROM VERY FINE
LOWER TO FINE UPPER, RARELY MEDIUM
LOWER; MODERATELY SORTED; SUBANGULAR
TO SUBROUND; DOMINANTLY QUARTZ WITH
MINOR LITHICS; A FEW PIECES WITH COMMON
CARBONACEOUS MATTER; MOSTLY GRAIN
SUPPORTED; CLAY MATRIX; LIGHT TO
MODERATE CALCITE CEMENT; GRADES IN
PART TO AND IS INTERBEDDED WITH
SILTSTONE.

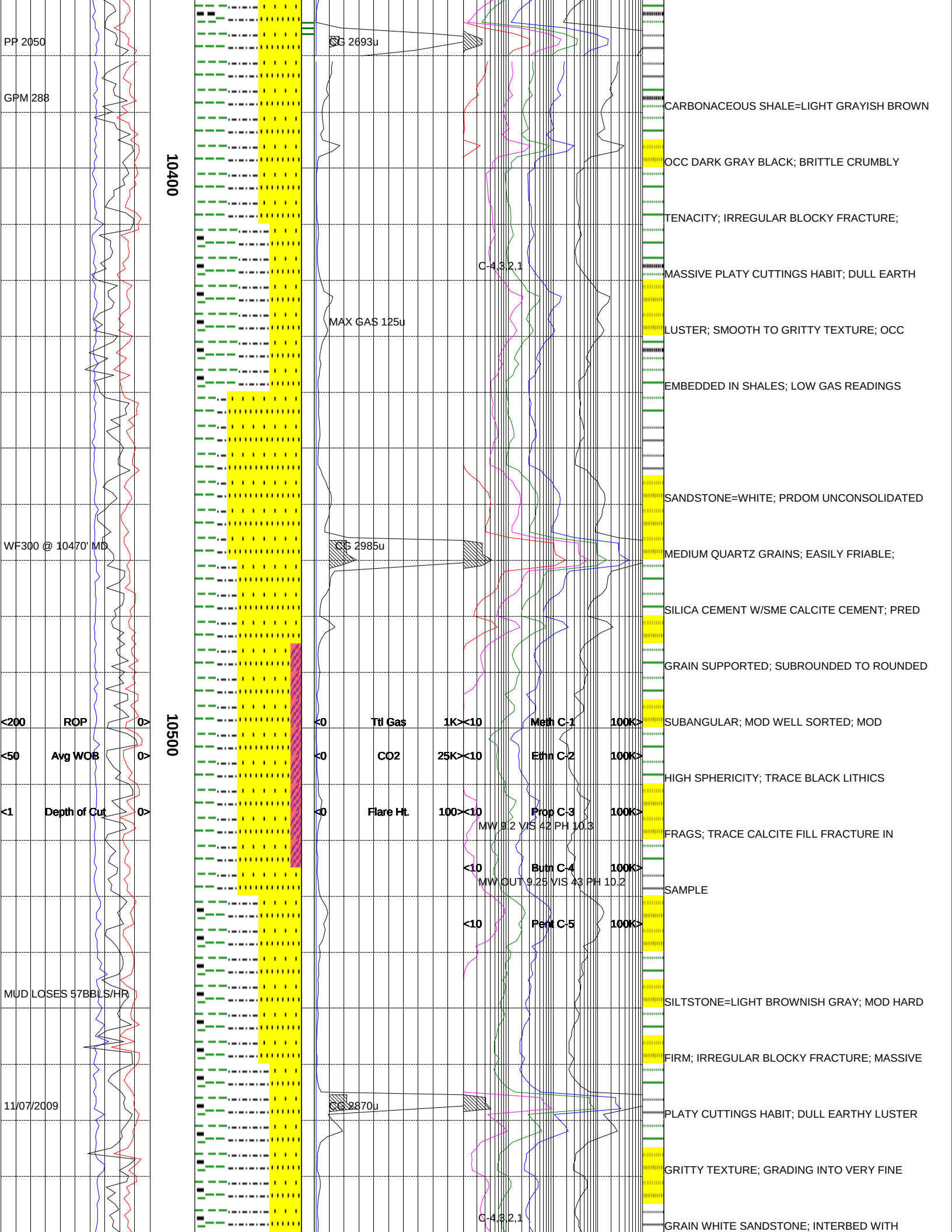

PP 3135
SPM 158
9300
MAX GAS 103u
MAX GAS 119u
LOSING MUD
CG 510u
C.O. POOH FOR CASING
MAX GAS 119u
NB#5 PDC 6.125" in @ 9390'
CG 193u
Hughes HTC QD406 w/3-13's
9400
37.53' Hrs' 1470'
CG 1543u
DAY TOUR
MAX GAS 237u
MAS GAS 775u
NIGHT TOWER
MAX GAS 560u
SHALE = DARK TO DUSKY YELLOWISH BROWN,
LIGHT TO MEDIUM GRAY, OCCASIONAL LIGHT
GREENISH GRAY; FIRM TO HARD; CRUMBLY
TO TOUGH; TABULAR, BLOCKY AND PLATY
CUTTINGS; MATTE TO SLIGHTLY SHINY
LUSTER SMOOTH TO SILTY TEXTURE; NON TO
SLIGHTLY CALCAREOUS; RARELY WITH SOME
CARBONACEOUS CONTENT.
DRILL TO 9390'; SET CASING 9375'.
COMMENCED DRILLING PRODUCTION HOLE ON
11/05/2009 @ 15:00:00.
SANDSTONE = LIGHT TO MEDIUM GRAY WITH
OCCASIONAL BLACK LITHICS; MEDIUM GRAINS
FAIR SORTING; SUBANGULAR TO SUBROUNDED;
MODERATE SPHERICITY; FRIABLE; SILICA
AND CALCITE CEMENT; QUARTZ GRAINS
PRESENT; MODERATE GAS IN SANDSTONES.
SILTSTONE = LIGHT GRAYISH WHITE TO

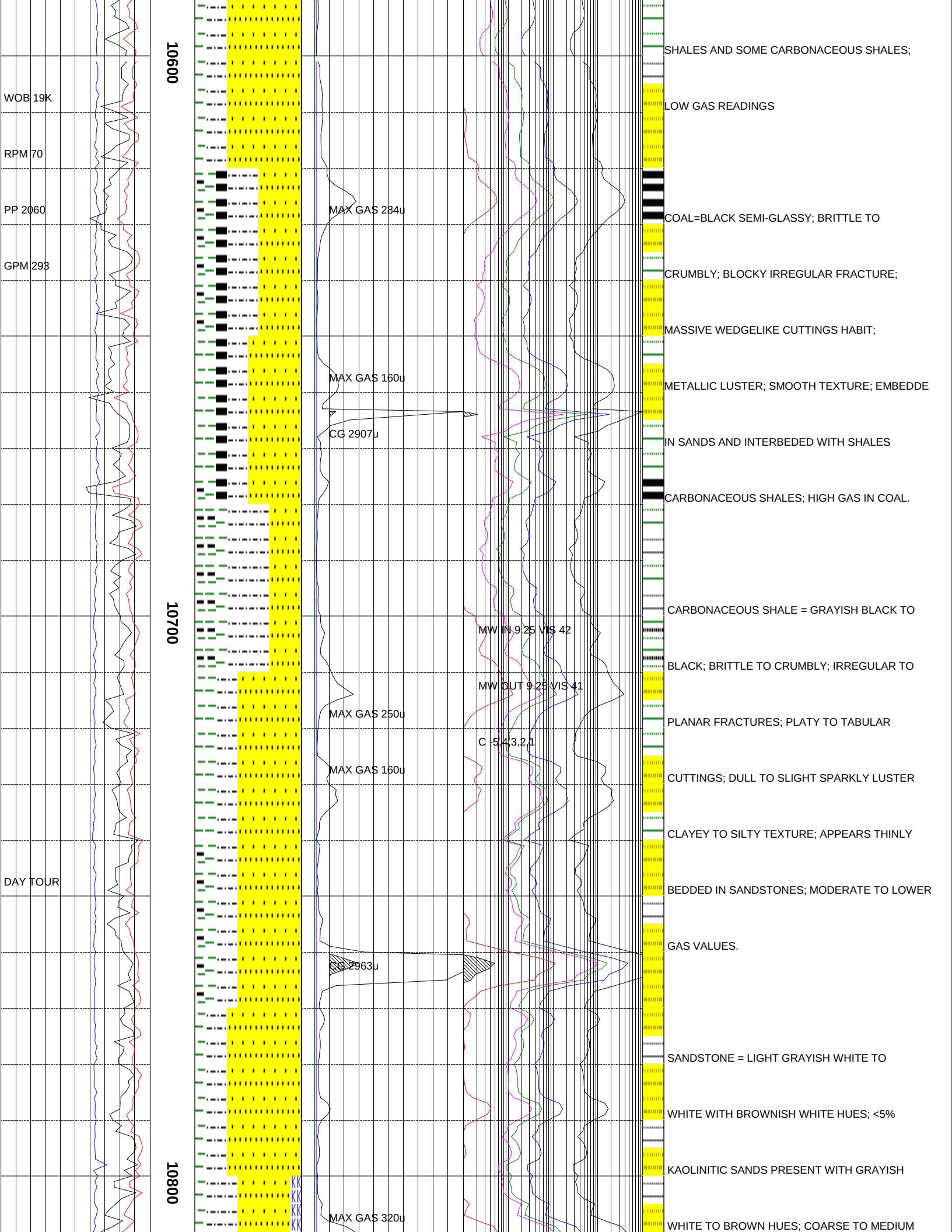

<200 ROP 0>
<50 Avg WOB 0>
WOB 18K
<1 Depth of Cut 0>
RPM 70
PP 1950
GPM 288
9500
9600
9700
CG 1529u
<0 Ttl Gas 500>
<0 CO2 25K>
<0 Flare Ht. 100>
MAX GAS 175u
MAX GAS 139u
CG 1411u
RE-SCALE GAS <0 -- 1000>
CG 1645u
<0 Ttl Gas 1K>
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
MUD REPORT@ 9500
MW 9.15 VIS 39 PV 9 YP 12
API FIL 9.8 GELS 4/8/12 PH 9.6
CL-1700 CA+30 MBT 15.0 SOL 3.
24 HR MUD LOSSES 0BBLS
C-4,3,2,1
MW IN 9.15 VIS 42 PH 10.5
BROWNISH GRAY; HARD TO FIRM; BLOCKY
IRREGULAR FRACTURES; MASSIVE TO PLATY
CUTTINGS; DULL TO WAXY LUSTER; VERY
GRITTY TEXTURE GRADING TO VERY FINE
WHITE MODERATELY HARD TO FRIABLE SS;
HIGH GAS IN SANDSTONES.
SANDSTONE = OFF WHITE TO BROWNISH WHITE
GRAY; MODERATELY HARD TO FRIABLE;
SUBROUNDED TO SUBANGULAR; WELL SORTED
CALCITE WITH SILICA CEMENT; GRAIN
SUPPORTED; MODERATE SPHERICITY; TRACES
OF BLACK LITHIC FRAGMENTS; TRACES OF
KAOLINITIC SANDS INTERBEDDED IN SHALES
AND SILTSTONES; LIGHT BROWNISH AND
MODERATELY HARD TO DENSE CLAYEY LIME
STONE; MODERATE GAS IN SANDS.
SHALE= LIGHT TO DARK GRAY; MODERATELY
HARD TO FIRM; IRREGULAR BLOCKY
FRACTURE; MASSIVE PLATY CUTTINGS;
DULL WAXY EARTHY LUSTER; CLAYEY SMOOTH

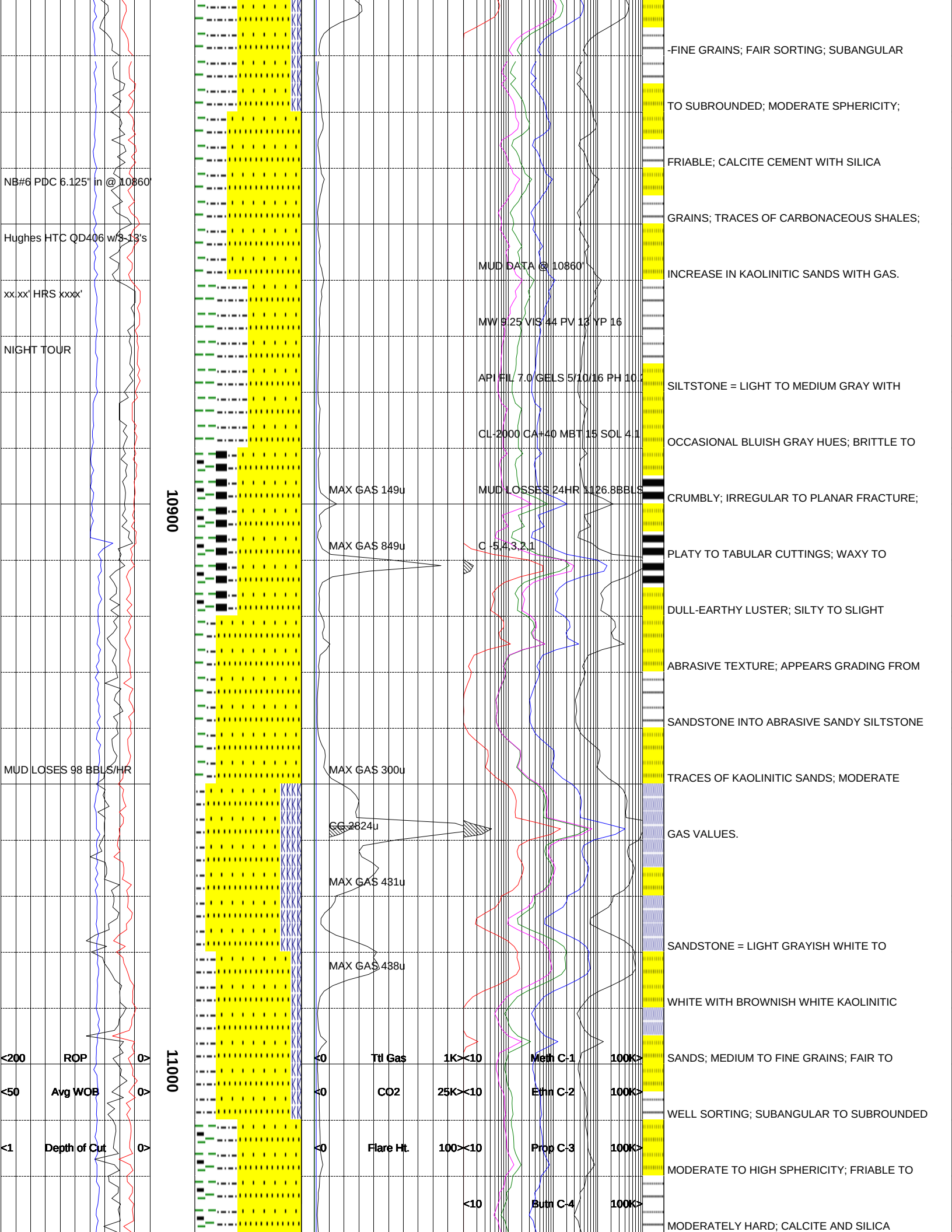

11/06/2009
MW OUT 9.2 VIS 44 PH 10.3
SILTY TEXTURE;INTERBEDDED WITH SANDS
MAX GAS 475u
SOME CARBONACEOUS SHALES.
MAX GAS 336u
SANDSTONE=CLEAR WHITE POORLY CEMENTED
MUD LOSES 300BBLS/HR
MAX GAS 150u
WITH LOOSE CLEAR UNCONSOLIDATED QUARTZ
IN SAMPLE; VERY FINE GRAIN; WELL SORTED
MAX GAS 2465u
SUBANGULAR TO SUBROUNDED; MODERATE TO
HIGH SPHERICITY; SILICA WITH SOME
CALCITE CEMENT IN MATRIX; REACTION
9800
TO HCL; GRAIN SUPPORTED; TRACE OF
BLACK LITHICS; KAOLINITE PRESENT
HIGH GAS IN SAND.
WF400@ 9843'MD
SWEEP GAS 200u
SILTSTONE = LIGHT TO MEDIUM GRAY WITH
BROWNISH GRAY HUES; BRITTLE TO CRUMBLY;
MUD LOSES 55BBLS/HR
IRREGULAR FRACTURES; PLATY TO WEDGELIKE
CUTTINGS; DULL TO SLIGHTLY POLISHED
CG 2782u
LUSTER; ABRASIVE TO SILTY TEXTURE;
9900
SANDSTONES APPEAR GRADING TO ABRASIVE
MW IN 9.15 VIS 43
SILTSTONES; THINLY INTERBEDDED SHALES
MW OUT 9.15 VIS 44
DAY TOUR
MAX GAS 730u
OBSERVED WITH HIGH NET SANDS; MODERATE
C -5,4,3,2,1
TO LOW GAS VALUES IN SILTSTONES.

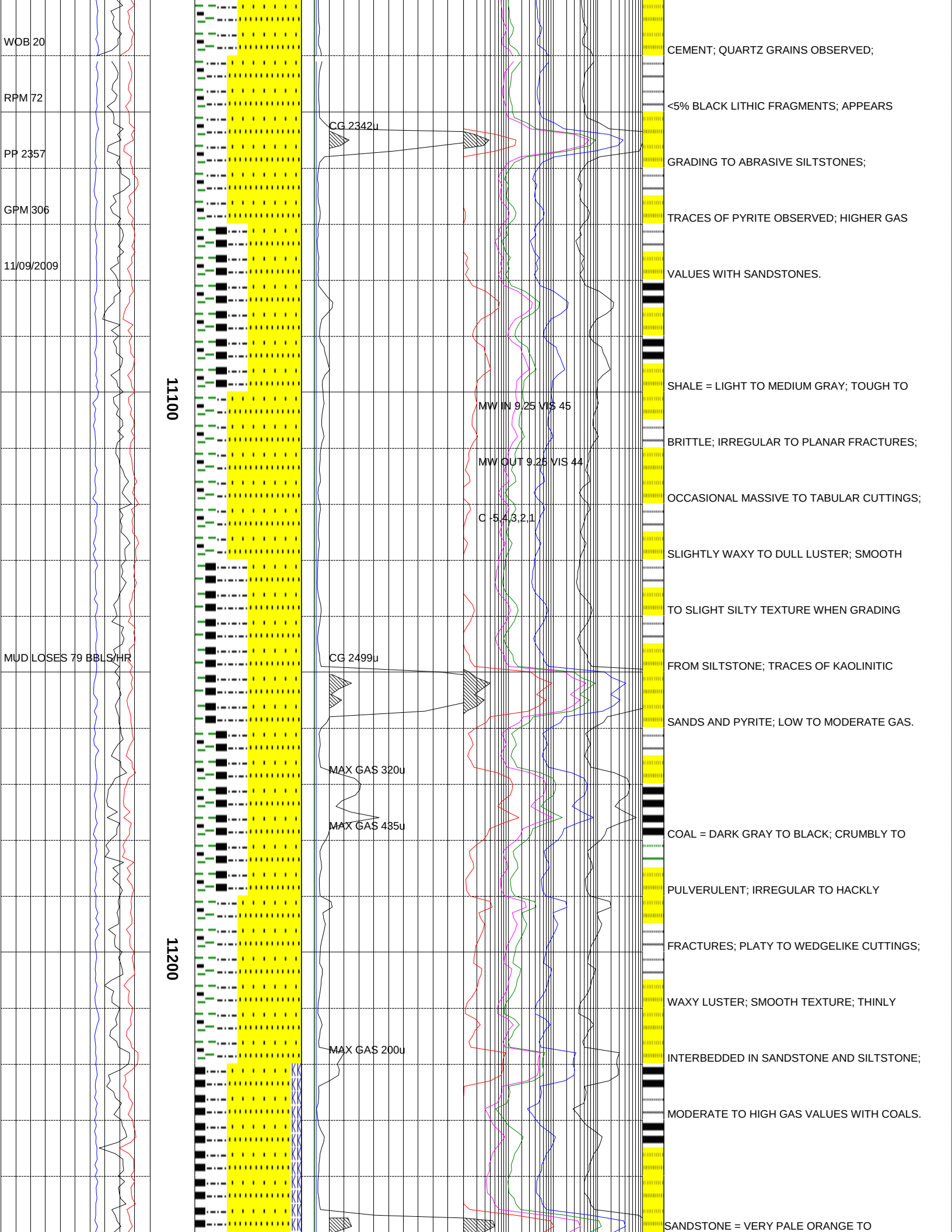

MUD LOSES 78 BBLS/HR
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
10000
CG 2850u
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
MAX GAS 300u
MAX GAS 1708u
MUD LOSES 80 BBLS/HR
CG 2880u
10100
MW IN 9.15 VIS 46
MW OUT 9.15 VIS 44
C -4,3,2,1
SANDSTONE = LIGHT GRAY TO WHITE WITH
UNCONSOLIDATED BROWNISH WHITE
KAOLINITIC SANDS; MEDIUM TO FINE GRAINS
FAIR SORTING; SUBANGULAR TO SUBROUNDED;
MODERATE SPHERICITY; INDIVIDUAL QUARTZ
GRAINS PRESENT; TRACES OF PYRITE AND
COAL; THIN INTERBEDDED LAYERS OF
SILTSTONE AND SHALE; APPEARS GRADING TO
SILTSTONE; MODERATE GAS VALUES.
SHALE = LIGHT TO MEDIUM GRAY; CRUMBLY
TO CRUNCHY; IRREGULAR TO CONCHOIDAL
FRACTURES; PLATY TO NODULAR CUTTINGS;
DULL TO SLIGHTLY WAXY LUSTER; SILTY TO
CLAYEY TEXTURE; THINLY INTERBEDDED IN
SANDSTONES; LOWER GAS VALUES ASSOCIATED
WITH SHALES.
COAL = BLACK WITH A SLIGHT GLOSSY
APPEARANCE; BRITTLE TO PULVERULENT;
IRREGULAR TO CONCHOIDAL FRACTURES;

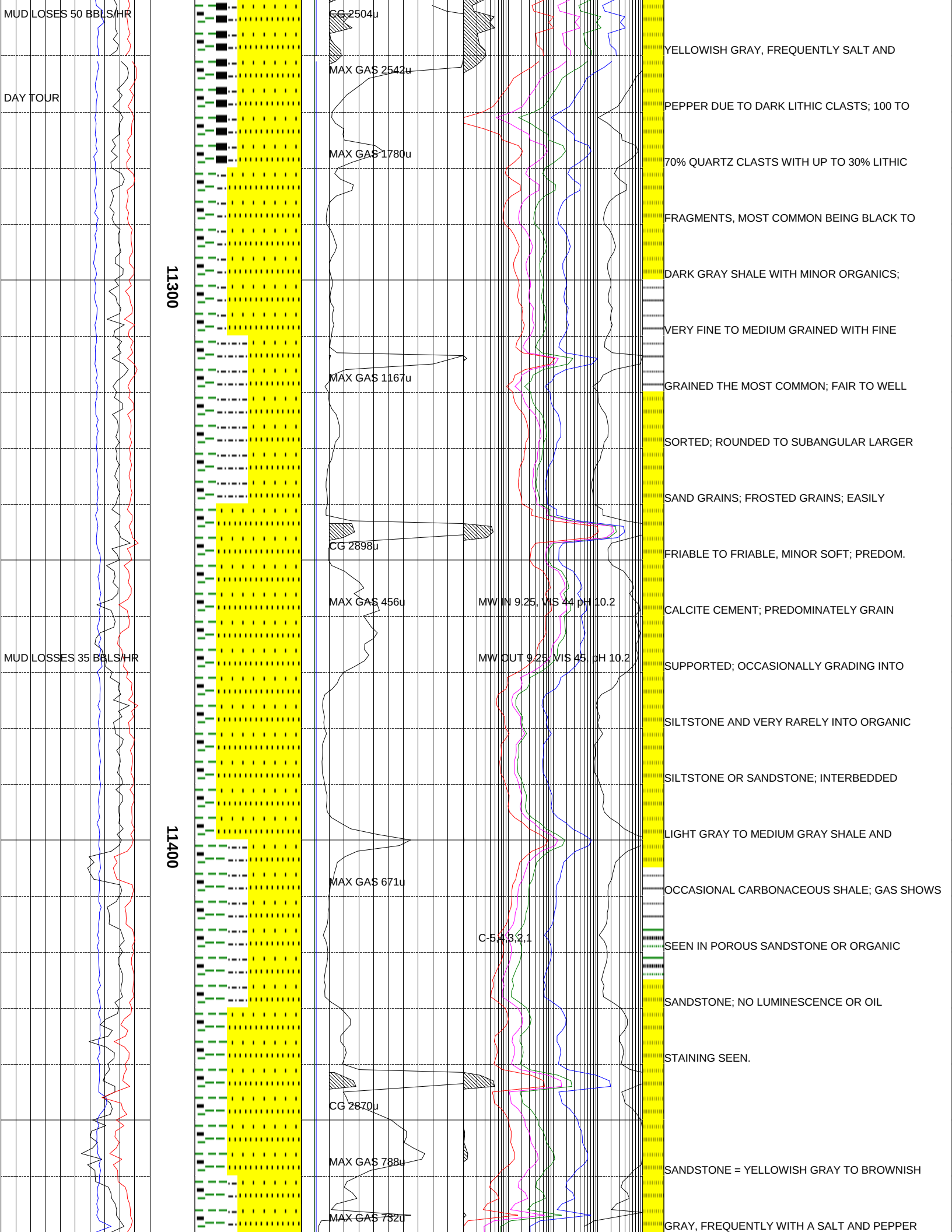

MASSIVE TO TABULAR CUTTINGS; WAXY TO
SLIGHT POLISHED LUSTER; SMOOTH TEXTURE;
MODERATELY THICK COAL SEAM OBSERVED;
HIGHER GAS VALUES WITH COAL SEAM.
CG 2791u
MAX GAS 1267u
10200
MUD LOSES 70 BBLS/HR
SANDSTONE = LIGHT GRAYISH WHITE TO
LIGHT BROWNISH WHITE; MEDIUM TO FINE
GRAINS; FAIR TO WELL SORTING;
SUBANGULAR TO SUBROUNDED; MODERATE
SPHERICITY; FRIABLE TO MODERATELY HARD;
LOW PERCENT CALCITE CEMENT WITH SILICA
GRAINS; APPEARS GRADING TO ABRASIVE
CG 2795u
SILTSTONE; UNCONSOLIDATED KAOLINITIC
MAX GAS 297u
SANDS OBSERVED WITH HIGHER GAS VALUES.
MAX GAS 344u
10300
MUD LOSES 64 BBLS/HR
MUD DATA @ 10364'
SHALE=LIGHT MEDIUM GRAY; MOD HARD
MW 9.2 VIS 45 PV 12 YP 16
FIRM; IRREGULAR BLOCKY TO PLANAR
TIGHT TOWER
API FIL 7.0 GELS 5/8/15 PH 10.5
FRACTURE; MASSIVE PLATY CUTTINGS HABIT;
CL-1900 CA+40 MBT 15 SOL 4.0
DULL EARTHY TO WAXY LUSTER; SLI SILTY
MUD LOSSES 24HR 2008BBLS
CLAYEY TEXTURE; INTERBEDDED WITH SANDS
WOB 15-18K
AND CARBONACEOUS SHALES; LOW GAS IN
RPM 45
SHALES

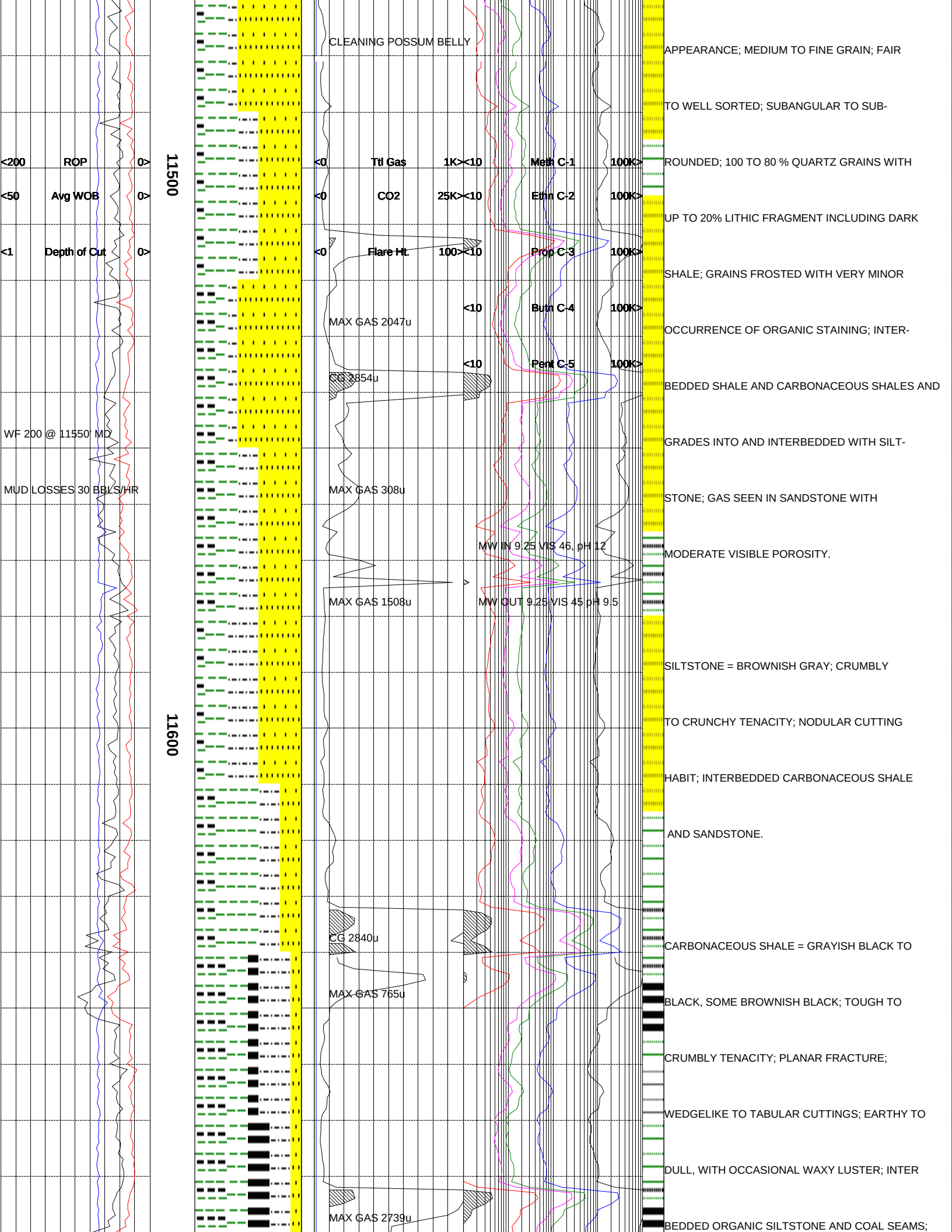

PP 2050
GPM 288
10400
CG 2693u
MAX GAS 125u
C-4,3,2,1
CARBONACEOUS SHALE=LIGHT GRAYISH BROWN
OCC DARK GRAY BLACK; BRITTLE CRUMBLY
TENACITY; IRREGULAR BLOCKY FRACTURE;
MASSIVE PLATY CUTTINGS HABIT; DULL EARTH
LUSTER; SMOOTH TO GRITTY TEXTURE; OCC
EMBEDDED IN SHALES; LOW GAS READINGS
WF300 @ 10470' MD
CG 2985u
SANDSTONE=WHITE; PRDOM UNCONSOLIDATED
MEDIUM QUARTZ GRAINS; EASILY FRIABLE;
SILICA CEMENT W/SME CALCITE CEMENT; PRED
GRAIN SUPPORTED; SUBROUNDED TO ROUNDED
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
10500
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
SUBANGULAR; MOD WELL SORTED; MOD
HIGH SPHERICITY; TRACE BLACK LITHICS
FRAGS; TRACE CALCITE FILL FRACTURE IN
MW 9.2 VIS 42 PH 10.3
<10 Buth C-4 100K>
MW OUT 9.25 VIS 43 PH 10.2
SAMPLE
<10 Pent C-5 100K>
MUD LOSES 57BBLS/HR
SILTSTONE=LIGHT BROWNISH GRAY; MOD HARD
FIRM; IRREGULAR BLOCKY FRACTURE; MASSIVE
11/07/2009
CG 2870u
PLATY CUTTINGS HABIT; DULL EARTHY LUSTER
GRITTY TEXTURE; GRADING INTO VERY FINE
C-4,3,2,1
GRAIN WHITE SANDSTONE; INTERBED WITH

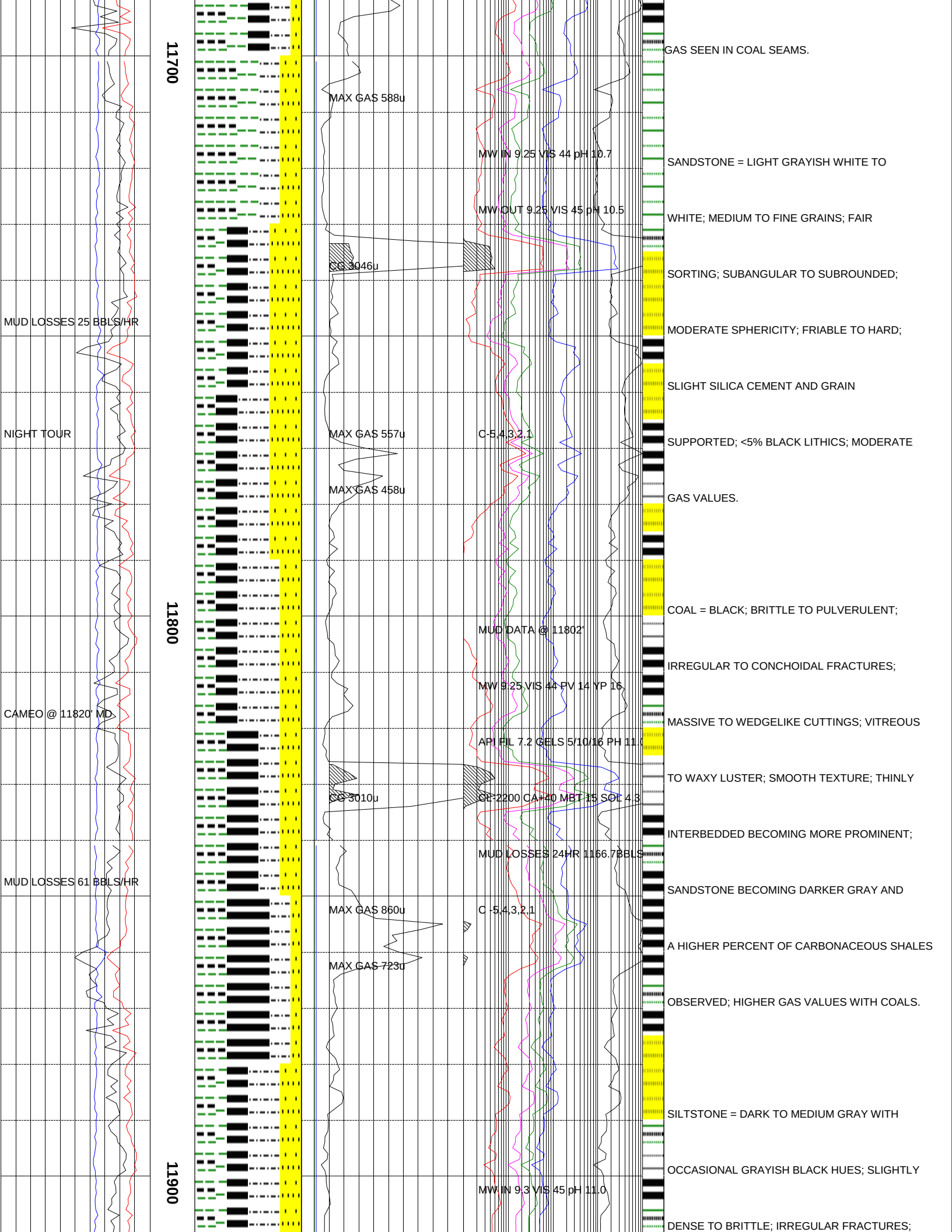

10600
WOB 19K
RPM 70
PP 2060
GPM 293
MAX GAS 284u
MAX GAS 160u
CG 2907u
10700
MW IN 9.25 VIS 42
MW OUT 9.25 VIS 41
MAX GAS 250u
C 1,4,3,2,1
MAX GAS 160u
DAY TOUR
CG 2963u
10800
MAX GAS 320u
SHALES AND SOME CARBONACEOUS SHALES;
LOW GAS READINGS
COAL=BLACK SEMI-GLASSY; BRITTLE TO
CRUMBLY; BLOCKY IRREGULAR FRACTURE;
MASSIVE WEDGELIKE CUTTINGS HABIT;
METALLIC LUSTER; SMOOTH TEXTURE; EMBEDDE
IN SANDS AND INTERBEDED WITH SHALES
CARBONACEOUS SHALES; HIGH GAS IN COAL.
CARBONACEOUS SHALE = GRAYISH BLACK TO
BLACK; BRITTLE TO CRUMBLY; IRREGULAR TO
PLANAR FRACTURES; PLATY TO TABULAR
CUTTINGS; DULL TO SLIGHT SPARKLY LUSTER
CLAYEY TO SILTY TEXTURE; APPEARS THINLY
BEDDED IN SANDSTONES; MODERATE TO LOWER
GAS VALUES.
SANDSTONE = LIGHT GRAYISH WHITE TO
WHITE WITH BROWNISH WHITE HUES; <5%
KAOLINITIC SANDS PRESENT WITH GRAYISH
WHITE TO BROWN HUES; COARSE TO MEDIUM

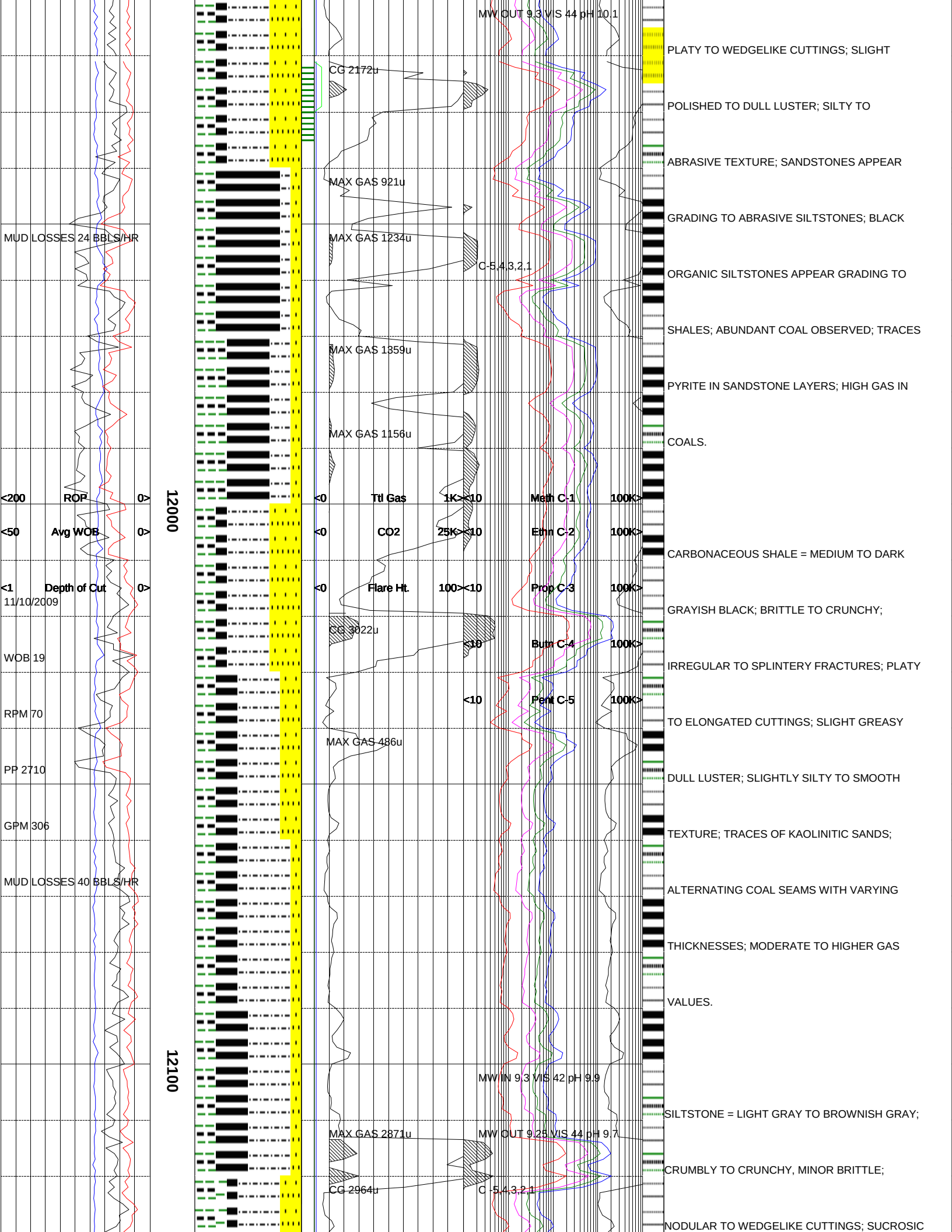

NB#6 PDC 6.125" in @ 10860'
Hughes HTC QD406 w/3-13's
xx.xx' HRS xxxx'
NIGHT TOUR
MUD LOSES 98 BBLS/HR
10900
11000
MAX GAS 149u
MAX GAS 849u
MAX GAS 300u
CG 2824u
MAX GAS 431u
MAX GAS 438u
MUD DATA @ 10860'
MW 9.25 VIS 44 PV 13 YP 16
API FIL 7.0 GELS 5/10/16 PH 10.2
CL-2000 CA+40 MBT 15 SOL 4.1
MUD LOSSES 24HR 1126.8BBLS
C -5,4,3,2,1
-FINE GRAINS; FAIR SORTING; SUBANGULAR
TO SUBROUNDED; MODERATE SPHERICITY;
FRIABLE; CALCITE CEMENT WITH SILICA
GRAINS; TRACES OF CARBONACEOUS SHALES;
INCREASE IN KAOLINITIC SANDS WITH GAS.
SILTSTONE = LIGHT TO MEDIUM GRAY WITH
OCCASIONAL BLUISH GRAY HUES; BRITTLE TO
CRUMBLY; IRREGULAR TO PLANAR FRACTURE;
PLATY TO TABULAR CUTTINGS; WAXY TO
DULL-EARTHY LUSTER; SILTY TO SLIGHT
ABRASIVE TEXTURE; APPEARS GRADING FROM
SANDSTONE INTO ABRASIVE SANDY SILTSTONE
TRACES OF KAOLINITIC SANDS; MODERATE
GAS VALUES.
SANDSTONE = LIGHT GRAYISH WHITE TO
WHITE WITH BROWNISH WHITE KAOLINITIC
SANDS; MEDIUM TO FINE GRAINS; FAIR TO
WELL SORTING; SUBANGULAR TO SUBROUNDED
MODERATE TO HIGH SPHERICITY; FRIABLE TO
MODERATELY HARD; CALCITE AND SILICA
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>

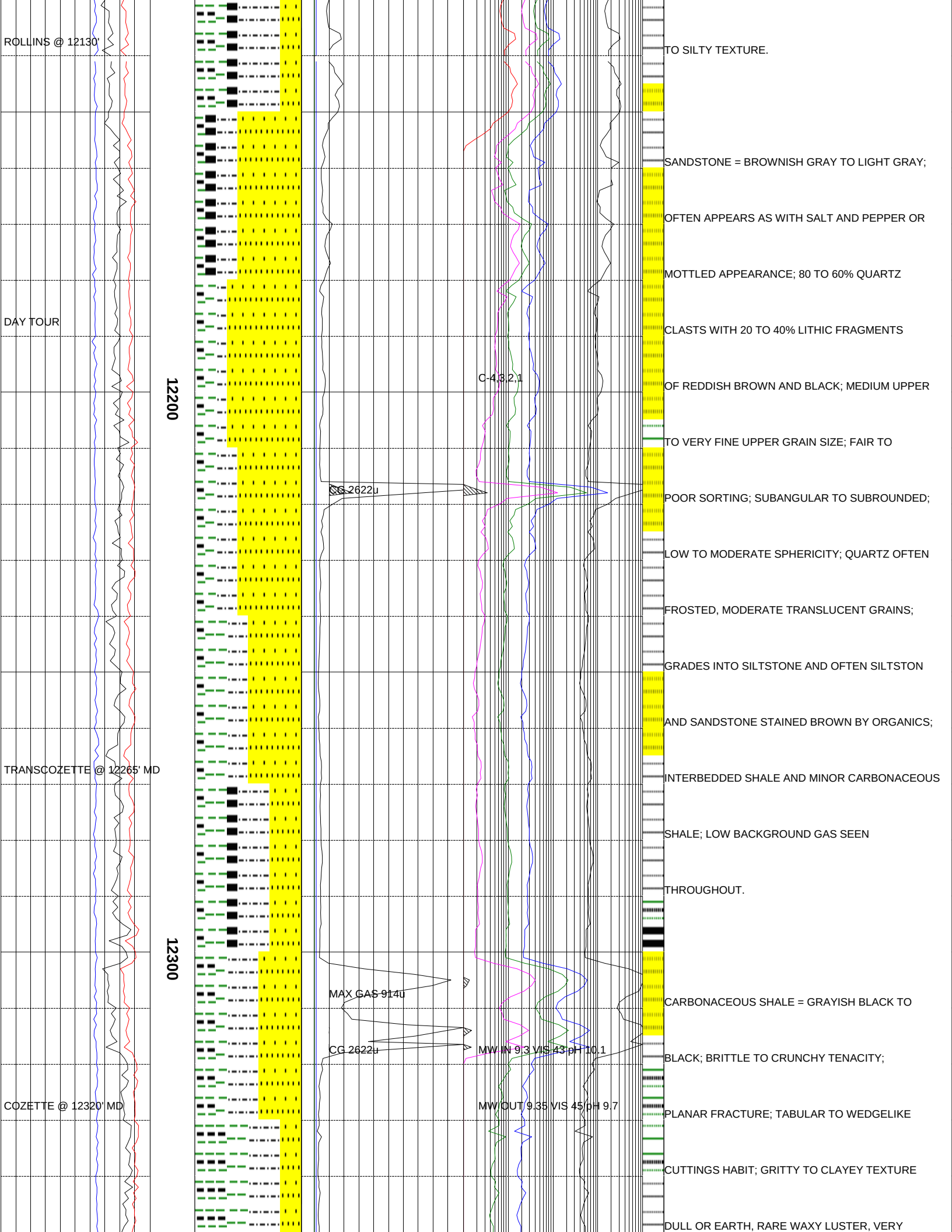

WOB 20
RPM 72
PP 2357
GPM 306
11/09/2009
11100
MUD LOSES 79 BBLS/HR
11200
CG 2342u
MW IN 9.25 VIS 45
MW OUT 9.25 VIS 44
C -5,4,3,2,1
CG 2499u
MAX GAS 320u
MAX GAS 435u
MAX GAS 200u
CEMENT; QUARTZ GRAINS OBSERVED;
<5% BLACK LITHIC FRAGMENTS; APPEARS
GRADING TO ABRASIVE SILTSTONES;
TRACES OF PYRITE OBSERVED; HIGHER GAS
VALUES WITH SANDSTONES.
SHALE = LIGHT TO MEDIUM GRAY; TOUGH TO
BRITTLE; IRREGULAR TO PLANAR FRACTURES;
OCCASIONAL MASSIVE TO TABULAR CUTTINGS;
SLIGHTLY WAXY TO DULL LUSTER; SMOOTH
TO SLIGHT SILTY TEXTURE WHEN GRADING
FROM SILTSTONE; TRACES OF KAOLINITIC
SANDS AND PYRITE; LOW TO MODERATE GAS.
COAL = DARK GRAY TO BLACK; CRUMBLY TO
PULVERULENT; IRREGULAR TO HACKLY
FRACTURES; PLATY TO WEDGELIKE CUTTINGS;
WAXY LUSTER; SMOOTH TEXTURE; THINLY
INTERBEDDED IN SANDSTONE AND SILTSTONE;
MODERATE TO HIGH GAS VALUES WITH COALS.
SANDSTONE = VERY PALE ORANGE TO

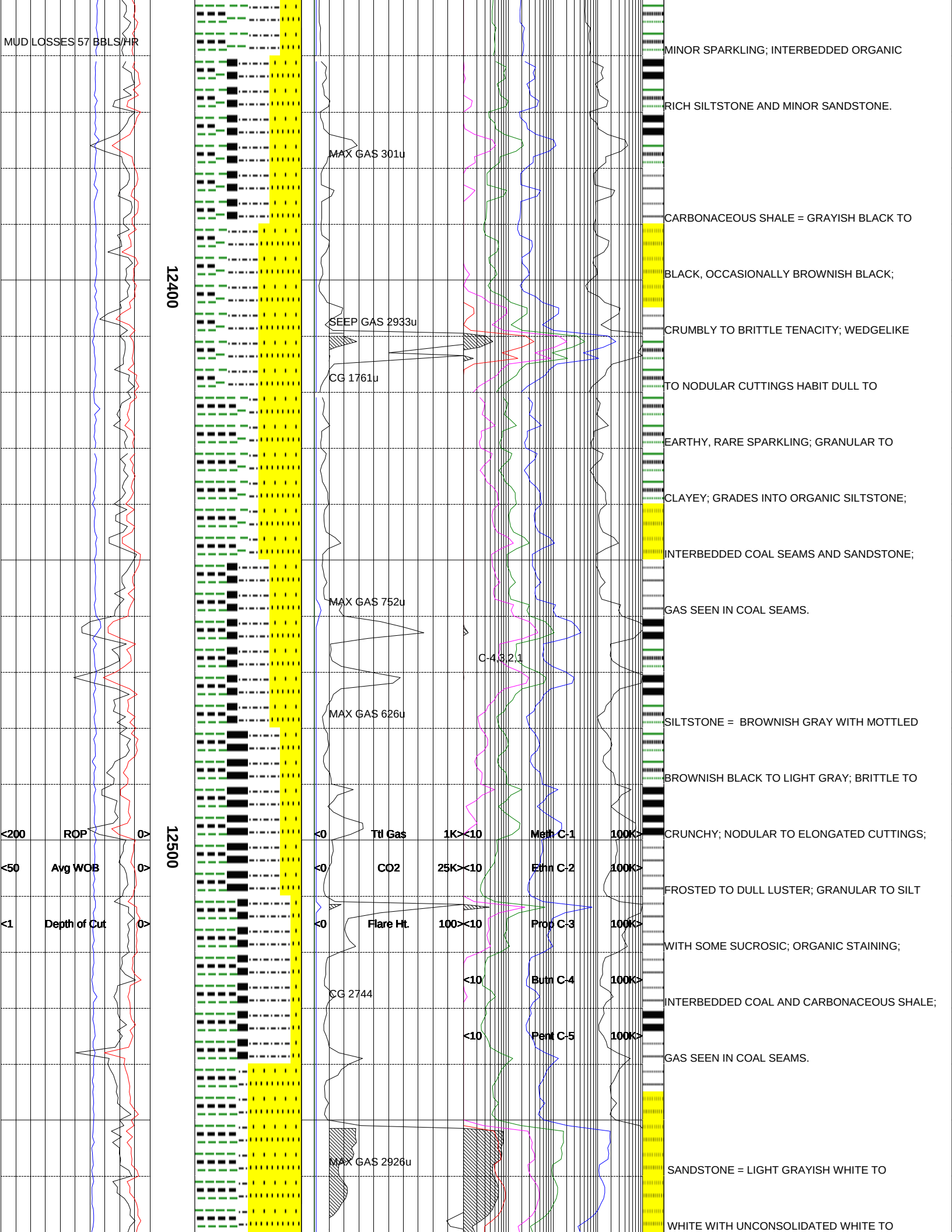

MUD LOSES 50 BBLS/HR
DAY TOUR
11300
MUD LOSSES 35 BBLS/HR
11400
CG 2504u
MAX GAS 2542u
MAX GAS 1780u
MAX GAS 1167u
CG 2898u
MAX GAS 456u
MW IN 9.25, VIS 44 pH 10.2
MW OUT 9.25, VIS 45, pH 10.2
MAX GAS 671u
C-5,4,3,2,1
CG 2870u
MAX GAS 788u
MAX GAS 732u
YELLOWISH GRAY, FREQUENTLY SALT AND
PEPPER DUE TO DARK LITHIC CLASTS; 100 TO
70% QUARTZ CLASTS WITH UP TO 30% LITHIC
FRAGMENTS, MOST COMMON BEING BLACK TO
DARK GRAY SHALE WITH MINOR ORGANICS;
VERY FINE TO MEDIUM GRAINED WITH FINE
GRAINED THE MOST COMMON; FAIR TO WELL
SORTED; ROUNDED TO SUBANGULAR LARGER
SAND GRAINS; FROSTED GRAINS; EASILY
FRIABLE TO FRIABLE, MINOR SOFT; PREDOM.
CALCITE CEMENT; PREDOMINATELY GRAIN
SUPPORTED; OCCASIONALLY GRADING INTO
SILTSTONE AND VERY RARELY INTO ORGANIC
SILTSTONE OR SANDSTONE; INTERBEDDED
LIGHT GRAY TO MEDIUM GRAY SHALE AND
OCCASIONAL CARBONACEOUS SHALE; GAS SHOWS
SEEN IN POROUS SANDSTONE OR ORGANIC
SANDSTONE; NO LUMINESCENCE OR OIL
STAINING SEEN.
SANDSTONE = YELLOWISH GRAY TO BROWNISH
GRAY, FREQUENTLY WITH A SALT AND PEPPER

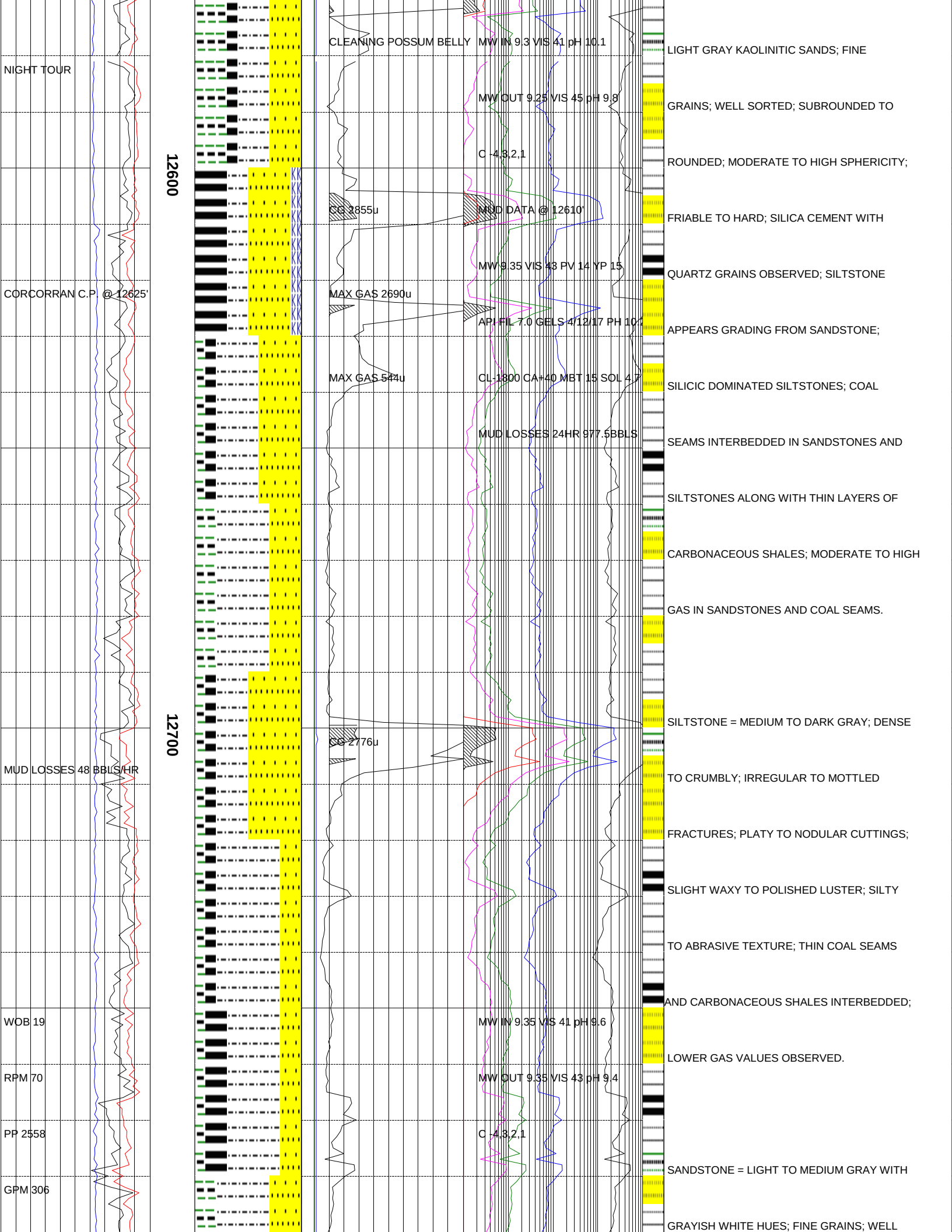

<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
11500
11600
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
CLEANING POSSUM BELLY
MAX GAS 2047u
CG 2854u
WF 200 @ 11550' MD
MUD LOSSES 30 BBLS/HR
MAX GAS 308u
MW IN 9.25 VIS 46, pH 12
MAX GAS 1508u
MW OUT 9.25 VIS 45 pH 9.5
CG 2840u
MAX GAS 765u
MAX GAS 2739u
APPEARANCE; MEDIUM TO FINE GRAIN; FAIR
TO WELL SORTED; SUBANGULAR TO SUB-
ROUNDED; 100 TO 80 % QUARTZ GRAINS WITH
UP TO 20% LITHIC FRAGMENT INCLUDING DARK
SHALE; GRAINS FROSTED WITH VERY MINOR
OCCURRENCE OF ORGANIC STAINING; INTER-
BEDDED SHALE AND CARBONACEOUS SHALES AND
GRADES INTO AND INTERBEDDED WITH SILT-
STONE; GAS SEEN IN SANDSTONE WITH
MODERATE VISIBLE POROSITY.
SILTSTONE = BROWNISH GRAY; CRUMBLY
TO CRUNCHY TENACITY; NODULAR CUTTING
HABIT; INTERBEDDED CARBONACEOUS SHALE
AND SANDSTONE.
CARBONACEOUS SHALE = GRAYISH BLACK TO
BLACK, SOME BROWNISH BLACK; TOUGH TO
CRUMBLY TENACITY; PLANAR FRACTURE;
WEDGELIKE TO TABULAR CUTTINGS; EARTHY TO
DULL, WITH OCCASIONAL WAXY LUSTER; INTER
BEDDED ORGANIC SILTSTONE AND COAL SEAMS;

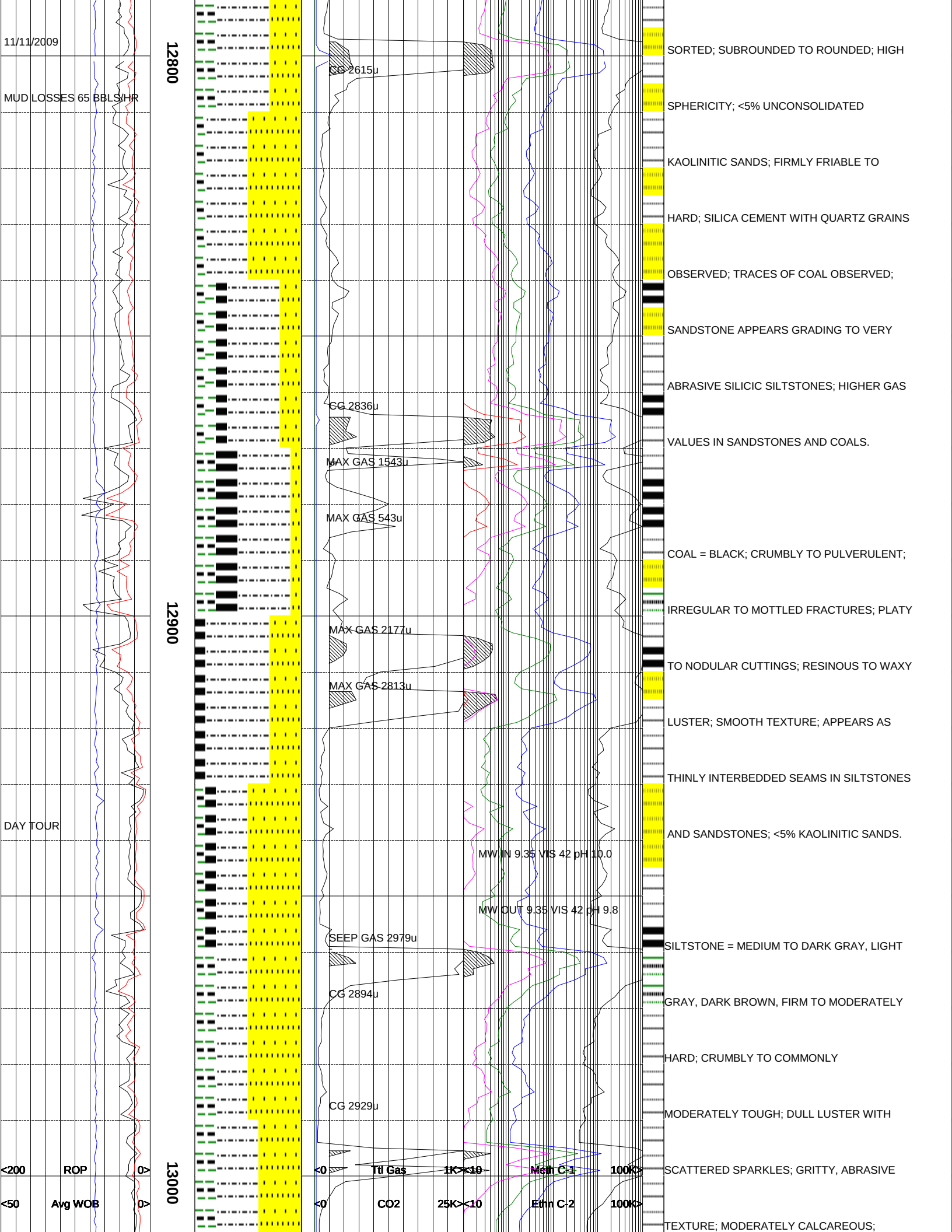

11700
11800
11900
GAS SEEN IN COAL SEAMS.
MAX GAS 588u
MW IN 9.25 VIS 44 pH 10.7
SANDSTONE = LIGHT GRAYISH WHITE TO
MW OUT 9.25 VIS 45 pH 10.5
WHITE; MEDIUM TO FINE GRAINS; FAIR
CG 3046u
SORTING; SUBANGULAR TO SUBROUNDED;
MUD LOSSES 25 BBLS/HR
MODERATE SPHERICITY; FRIABLE TO HARD;
SLIGHT SILICA CEMENT AND GRAIN
NIGHT TOUR
MAX GAS 557u
C-5,4,3,2,1
SUPPORTED; <5% BLACK LITHICS; MODERATE
MAX GAS 458u
GAS VALUES.
COAL = BLACK; BRITTLE TO PULVERULENT;
MUD DATA @ 11802'
IRREGULAR TO CONCHOIDAL FRACTURES;
MW 9.25 VIS 44 PV 14 YP 16
CAMEO @ 11820' MD
MASSIVE TO WEDGELIKE CUTTINGS; VITREOUS
API FIL 7.2 GELS 5/10/16 PH 11.(
TO WAXY LUSTER; SMOOTH TEXTURE; THINLY
CG 3010u
CL 2200 CA+40 MBT 15 SOL 4.3
INTERBEDDED BECOMING MORE PROMINENT;
MUD LOSSES 24HR 1166.7BBLS
MUD LOSSES 61 BBLS/HR
SANDSTONE BECOMING DARKER GRAY AND
MAX GAS 860u
C -5,4,3,2,1
A HIGHER PERCENT OF CARBONACEOUS SHALES
MAX GAS 723u
OBSERVED; HIGHER GAS VALUES WITH COALS.
SILTSTONE = DARK TO MEDIUM GRAY WITH
OCCASIONAL GRAYISH BLACK HUES; SLIGHTLY
MW IN 9.3 VIS 45 pH 11.0
DENSE TO BRITTLE; IRREGULAR FRACTURES;

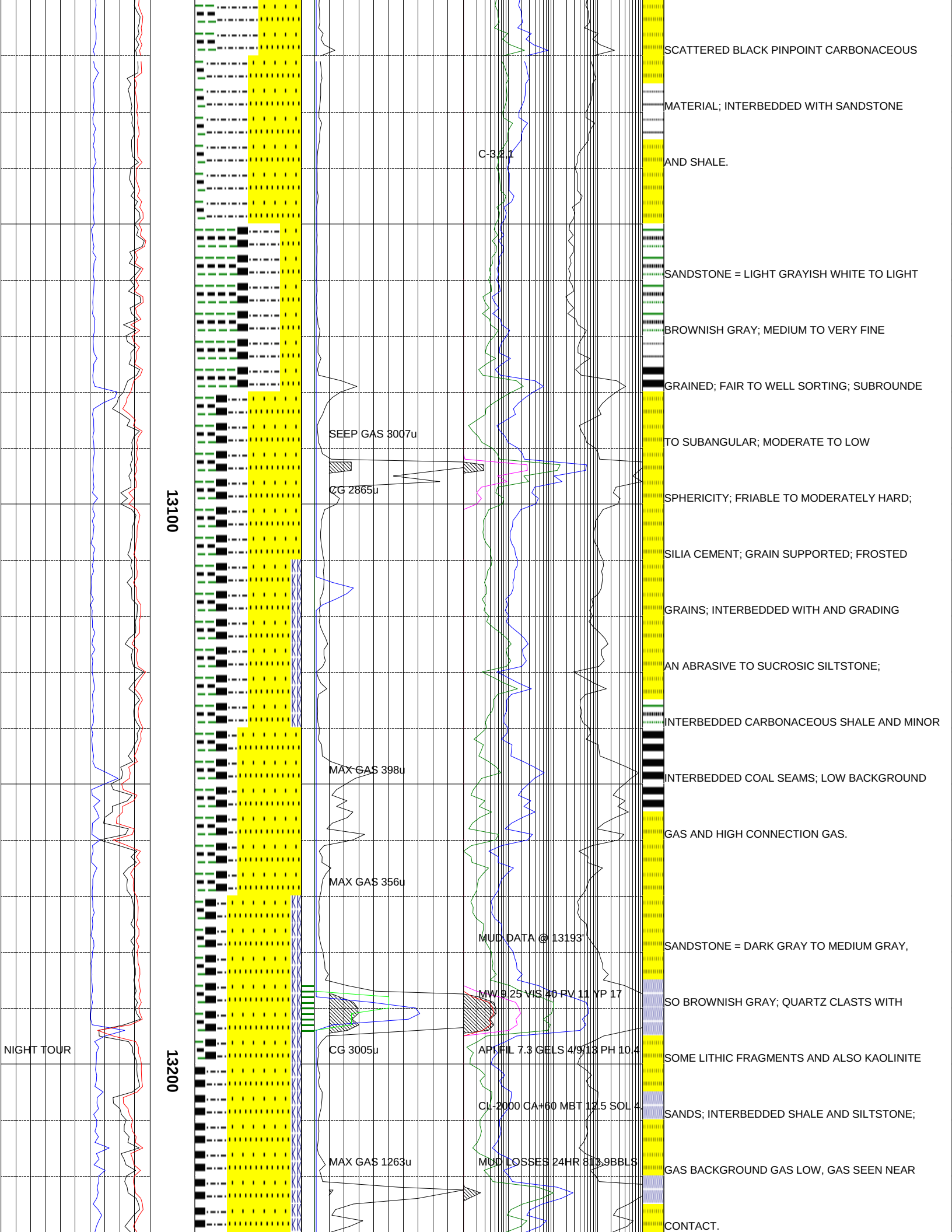

MW OUT 9.3 VIS 44 pH 10.1
PLATY TO WEDGELIKE CUTTINGS; SLIGHT
CG 2172u
POLISHED TO DULL LUSTER; SILTY TO
ABRASIVE TEXTURE; SANDSTONES APPEAR
MAX GAS 921u
GRADING TO ABRASIVE SILTSTONES; BLACK
MUD LOSSES 24 BBLS/HR
MAX GAS 1234u
C-5,4,3,2,1
ORGANIC SILTSTONES APPEAR GRADING TO
SHALES; ABUNDANT COAL OBSERVED; TRACES
MAX GAS 1359u
PYRITE IN SANDSTONE LAYERS; HIGH GAS IN
MAX GAS 1156u
COALS.
<200 ROP 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
12000
<50 Avg WOB 0>
<0 CO2 25K><10 Etnn C-2 100K>
CARBONACEOUS SHALE = MEDIUM TO DARK
<1 Depth of Cut 0>
<0 Flare Ht. 100><10 Prop C-3 100K>
11/10/2009
GRAYISH BLACK; BRITTLE TO CRUNCHY;
CG 3022u
<10 Butn C-4 100K>
WOB 19
IRREGULAR TO SPLINTERY FRACTURES; PLATY
<10 Pent C-5 100K>
RPM 70
TO ELONGATED CUTTINGS; SLIGHT GREASY
MAX GAS 486u
PP 2710
DULL LUSTER; SLIGHTLY SILTY TO SMOOTH
GPM 306
TEXTURE; TRACES OF KAOLINITIC SANDS;
MUD LOSSES 40 BBLS/HR
ALTERNATING COAL SEAMS WITH VARYING
THICKNESSES; MODERATE TO HIGHER GAS
VALUES.
12100
MW IN 9.3 VIS 42 pH 9.9
SILTSTONE = LIGHT GRAY TO BROWNISH GRAY;
MAX GAS 2871u
MW OUT 9.25 VIS 44 pH 9.7
CRUMBLY TO CRUNCHY, MINOR BRITTLE;
CG 2964u
C -5,4,3,2,1
NODULAR TO WEDGELIKE CUTTINGS; SUCROSIC

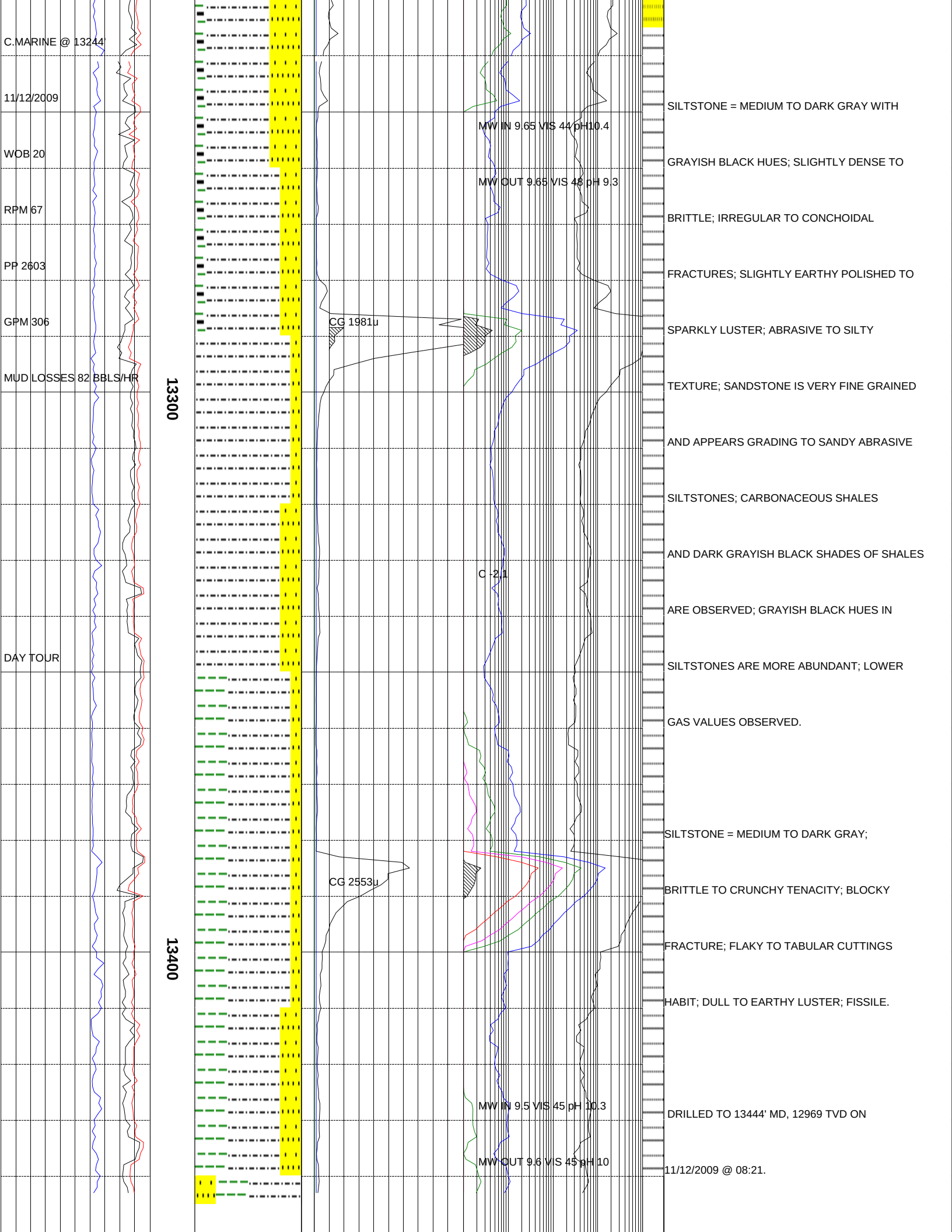

ROLLINS @ 12130'
DAY TOUR
12200
C-4,3,2,1
CG 2622u
TRANSCOZETTE @ 12265' MD
12300
MAX GAS 914u
CG 2622u
MW IN 9.3 VIS 43 pH 10.1
COZETTE @ 12320' MD
MW OUT 9.35 VIS 45 pH 9.7
TO SILTY TEXTURE.
SANDSTONE = BROWNISH GRAY TO LIGHT GRAY;
OFTEN APPEARS AS WITH SALT AND PEPPER OR
MOTTLED APPEARANCE; 80 TO 60% QUARTZ
CLASTS WITH 20 TO 40% LITHIC FRAGMENTS
OF REDDISH BROWN AND BLACK; MEDIUM UPPER
TO VERY FINE UPPER GRAIN SIZE; FAIR TO
POOR SORTING; SUBANGULAR TO SUBROUNDED;
LOW TO MODERATE SPHERICITY; QUARTZ OFTEN
FROSTED, MODERATE TRANSLUCENT GRAINS;
GRADES INTO SILTSTONE AND OFTEN SILTSTON
AND SANDSTONE STAINED BROWN BY ORGANICS;
INTERBEDDED SHALE AND MINOR CARBONACEOUS
SHALE; LOW BACKGROUND GAS SEEN
THROUGHOUT.
CARBONACEOUS SHALE = GRAYISH BLACK TO
BLACK; BRITTLE TO CRUNCHY TENACITY;
PLANAR FRACTURE; TABULAR TO WEDGELIKE
CUTTINGS HABIT; GRITTY TO CLAYEY TEXTURE
DULL OR EARTH, RARE WAXY LUSTER, VERY


MUD LOSSES 57 BBLS/HR
12400
12500
MAX GAS 301u
SEEP GAS 2933u
CG 1761u
MAX GAS 752u
C-4,3,2,1
MAX GAS 626u
CG 2744
MAX GAS 2926u
<200 ROP 0>
<50 Avg WOB 0>
<1 Depth of Cut 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 25K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
MINOR SPARKLING; INTERBEDDED ORGANIC
RICH SILTSTONE AND MINOR SANDSTONE.
CARBONACEOUS SHALE = GRAYISH BLACK TO
BLACK, OCCASIONALLY BROWNISH BLACK;
CRUMBLY TO BRITTLE TENACITY; WEDGELIKE
TO NODULAR CUTTINGS HABIT DULL TO
EARTHY, RARE SPARKLING; GRANULAR TO
CLAYEY; GRADES INTO ORGANIC SILTSTONE;
INTERBEDDED COAL SEAMS AND SANDSTONE;
GAS SEEN IN COAL SEAMS.
SILTSTONE = BROWNISH GRAY WITH MOTTLED
BROWNISH BLACK TO LIGHT GRAY; BRITTLE TO
CRUNCHY; NODULAR TO ELONGATED CUTTINGS;
FROSTED TO DULL LUSTER; GRANULAR TO SILT
WITH SOME SUCROSIC; ORGANIC STAINING;
INTERBEDDED COAL AND CARBONACEOUS SHALE;
GAS SEEN IN COAL SEAMS.
SANDSTONE = LIGHT GRAYISH WHITE TO
WHITE WITH UNCONSOLIDATED WHITE TO


CLEANING POSSUM BELLY
MW IN 9.3 VIS 41 pH 10.1
NIGHT TOUR
MW OUT 9.25 VIS 45 pH 9.8
C -4,3,2,1
12600
CG 2855u
MUD DATA @ 12610'
MW 9.35 VIS 43 PV 14 YP 15
CORCORRAN C.P. @ 12625'
MAX GAS 2690u
API FIL 7.0 GELS 4/12/17 PH 10.1
MAX GAS 544u
CL-1800 CA+40 MBT 15 SOL 4.7
MUD LOSSES 24HR 977.5BBLS
12700
CG 2776u
MUD LOSSES 48 BBLS/HR
WOB 19
MW IN 9.35 VIS 41 pH 9.6
RPM 70
MW OUT 9.35 VIS 43 pH 9.4
PP 2558
C -4,3,2,1
GPM 306
LIGHT GRAY KAOLINITIC SANDS; FINE
GRAINS; WELL SORTED; SUBROUNDED TO
ROUNDED; MODERATE TO HIGH SPHERICITY;
FRIABLE TO HARD; SILICA CEMENT WITH
QUARTZ GRAINS OBSERVED; SILTSTONE
APPEARS GRADING FROM SANDSTONE;
SILICIC DOMINATED SILTSTONES; COAL
SEAMS INTERBEDDED IN SANDSTONES AND
SILTSTONES ALONG WITH THIN LAYERS OF
CARBONACEOUS SHALES; MODERATE TO HIGH
GAS IN SANDSTONES AND COAL SEAMS.
SILTSTONE = MEDIUM TO DARK GRAY; DENSE
TO CRUMBLY; IRREGULAR TO MOTTLED
FRACTURES; PLATY TO NODULAR CUTTINGS;
SLIGHT WAXY TO POLISHED LUSTER; SILTY
TO ABRASIVE TEXTURE; THIN COAL SEAMS
AND CARBONACEOUS SHALES INTERBEDDED;
LOWER GAS VALUES OBSERVED.
SANDSTONE = LIGHT TO MEDIUM GRAY WITH
GRAYISH WHITE HUES; FINE GRAINS; WELL


11/11/2009
12800
MUD LOSSES 65 BBLS/HR
CG 2615u
SORTED; SUBROUNDED TO ROUNDED; HIGH
SPHERICITY; <5% UNCONSOLIDATED
KAOLINITIC SANDS; FIRMLY FRIABLE TO
HARD; SILICA CEMENT WITH QUARTZ GRAINS
OBSERVED; TRACES OF COAL OBSERVED;
SANDSTONE APPEARS GRADING TO VERY
ABRASIVE SILICIC SILTSTONES; HIGHER GAS
CG 2836u
VALUES IN SANDSTONES AND COALS.
MAX GAS 1543u
MAX GAS 543u
COAL = BLACK; CRUMBLY TO PULVERULENT;
12900
IRREGULAR TO MOTTLED FRACTURES; PLATY
MAX GAS 2177u
TO NODULAR CUTTINGS; RESINOUS TO WAXY
MAX GAS 2813u
LUSTER; SMOOTH TEXTURE; APPEARS AS
THINLY INTERBEDDED SEAMS IN SILTSTONES
DAY TOUR
AND SANDSTONES; <5% KAOLINITIC SANDS.
MW IN 9.35 VIS 42 pH 10.0
MW OUT 9.35 VIS 42 pH 9.8
SEEP GAS 2979u
SILTSTONE = MEDIUM TO DARK GRAY, LIGHT
CG 2894u
GRAY, DARK BROWN, FIRM TO MODERATELY
HARD; CRUMBLY TO COMMONLY
CG 2929u
MODERATELY TOUGH; DULL LUSTER WITH
13000
SCATTERED SPARKLES; GRITTY, ABRASIVE
TEXTURE; MODERATELY CALCAREOUS;
<200 ROP 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
<50 Avg WOB 0>
<0 CO2 25K><10 Eth C-2 100K>


SCATTERED BLACK PINPOINT CARBONACEOUS
MATERIAL; INTERBEDDED WITH SANDSTONE
AND SHALE.
C-3.2.1
SANDSTONE = LIGHT GRAYISH WHITE TO LIGHT
BROWNISH GRAY; MEDIUM TO VERY FINE
GRAINED; FAIR TO WELL SORTING; SUBROUNDE
TO SUBANGULAR; MODERATE TO LOW
SPHERICITY; FRIABLE TO MODERATELY HARD;
SILIA CEMENT; GRAIN SUPPORTED; FROSTED
GRAINS; INTERBEDDED WITH AND GRADING
AN ABRASIVE TO SUCROSIC SILTSTONE;
INTERBEDDED CARBONACEOUS SHALE AND MINOR
INTERBEDDED COAL SEAMS; LOW BACKGROUND
GAS AND HIGH CONNECTION GAS.
SANDSTONE = DARK GRAY TO MEDIUM GRAY,
SO BROWNISH GRAY; QUARTZ CLASTS WITH
SOME LITHIC FRAGMENTS AND ALSO KAOLINITE
SANDS; INTERBEDDED SHALE AND SILTSTONE;
GAS BACKGROUND GAS LOW, GAS SEEN NEAR
CONTACT.
SEEP GAS 3007u
CG 2865u
MAX GAS 398u
MAX GAS 356u
MUD DATA @ 13193'
MW 9.25 VIS 40 PV 11 YP 17
API FIL 7.3 GELS 4/9/13 PH 10.4
CL-2000 CA+60 MBT 12.5 SOL 4.
MUD LOSSES 24HR 813.9BBLS
CG 3005u
MAX GAS 1263u
13100
13200
NIGHT TOUR


C.MARINE @ 13244
11/12/2009
WOB 20
RPM 67
PP 2603
GPM 306
MUD LOSSES 82 BBLS/HR
DAY TOUR
13300
13400
CG 1981u
CG 2553u
MW IN 9.65 VIS 44 pH10.4
MW OUT 9.65 VIS 48 pH 9.3
C -2,1
MW IN 9.5 VIS 45 pH 10.3
MW OUT 9.6 VIS 45 pH 10
SILTSTONE = MEDIUM TO DARK GRAY WITH
GRAYISH BLACK HUES; SLIGHTLY DENSE TO
BRITTLE; IRREGULAR TO CONCHOIDAL
FRACTURES; SLIGHTLY EARTHY POLISHED TO
SPARKLY LUSTER; ABRASIVE TO SILTY
TEXTURE; SANDSTONE IS VERY FINE GRAINED
AND APPEARS GRADING TO SANDY ABRASIVE
SILTSTONES; CARBONACEOUS SHALES
AND DARK GRAYISH BLACK SHADES OF SHALES
ARE OBSERVED; GRAYISH BLACK HUES IN
SILTSTONES ARE MORE ABUNDANT; LOWER
GAS VALUES OBSERVED.
SILTSTONE = MEDIUM TO DARK GRAY;
BRITTLE TO CRUNCHY TENACITY; BLOCKY
FRACTURE; FLAKY TO TABULAR CUTTINGS
HABIT; DULL TO EARTHY LUSTER; FISSILE.
DRILLED TO 13444' MD, 12969 TVD ON
11/12/2009 @ 08:21.