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
WELL	PCU-297-11B1
FIELD	PICEANCE CREEK
REGION	ROCKY MT
COORDINATES	LAT.39.879628000
	LON.108.240365000
ELEVATION	GL = 7126'
	KB = 7143'
COUNTY, STATE	RIO BLANCO CO. CO
API INDEX	051031137800
SPUD DATE	04/10/2009
CONTRACTOR	HELMERICH PAYNE
CO. REP.	RICKY T. OWENS
RIG/TYPE	FLEX 3
LOGGING UNIT	MLU038
GEOLOGISTS	GEORGE BAKER
	BRENDA MARSH
ADD. PERSONS	BILL JOHANNING
	DEVIN CLAAR
CO. GEOLOGIST	MICHAEL HOWELL

LOG INTERVAL

DEPTHS:	3960'	**TO**	8976'
DATES:	09/21/2009	**TO**	09/26/2009
SCALE:	5" = 100'		

MUD TYPES

LSND	**TO**	8976'
	TO	
	TO	
	TO	

CASING DATA

16"	**AT**	130'
10.75	**AT**	3953'
	AT	
	AT	

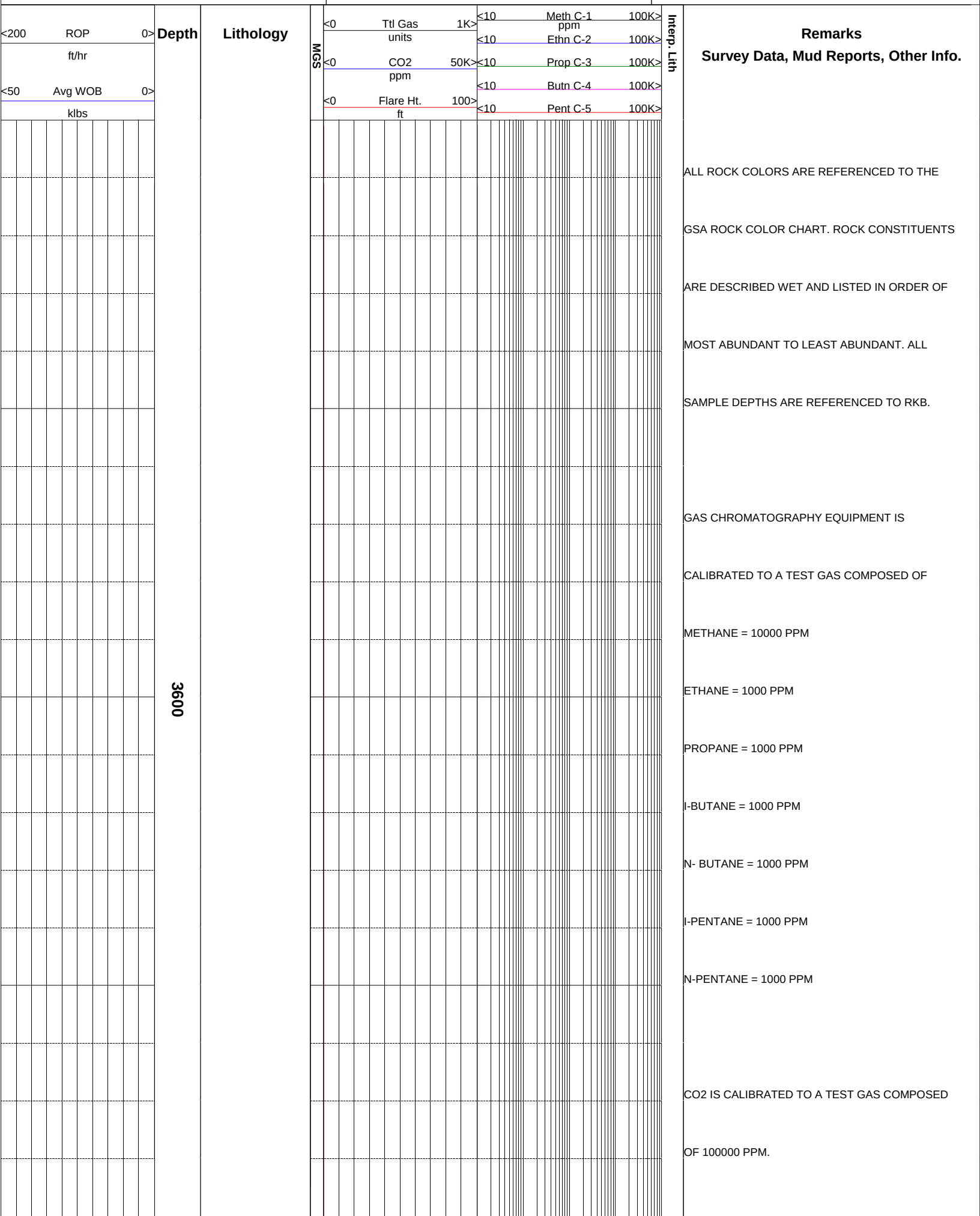
HOLE SIZE

9.875"	**TO**	8976'
	TO	
	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.

3700

3800

3900

1 UNIT OF GAS = 200 PPM C-1 ME

CONNECTION GAS, TRIP GAS AND WIPER GAS ARE NOTED ON THE MUD LOG. FLARE HEIGHTS AND DEPTHS OF GAS BUSTER USEAGE ARE ALSO NOTED.

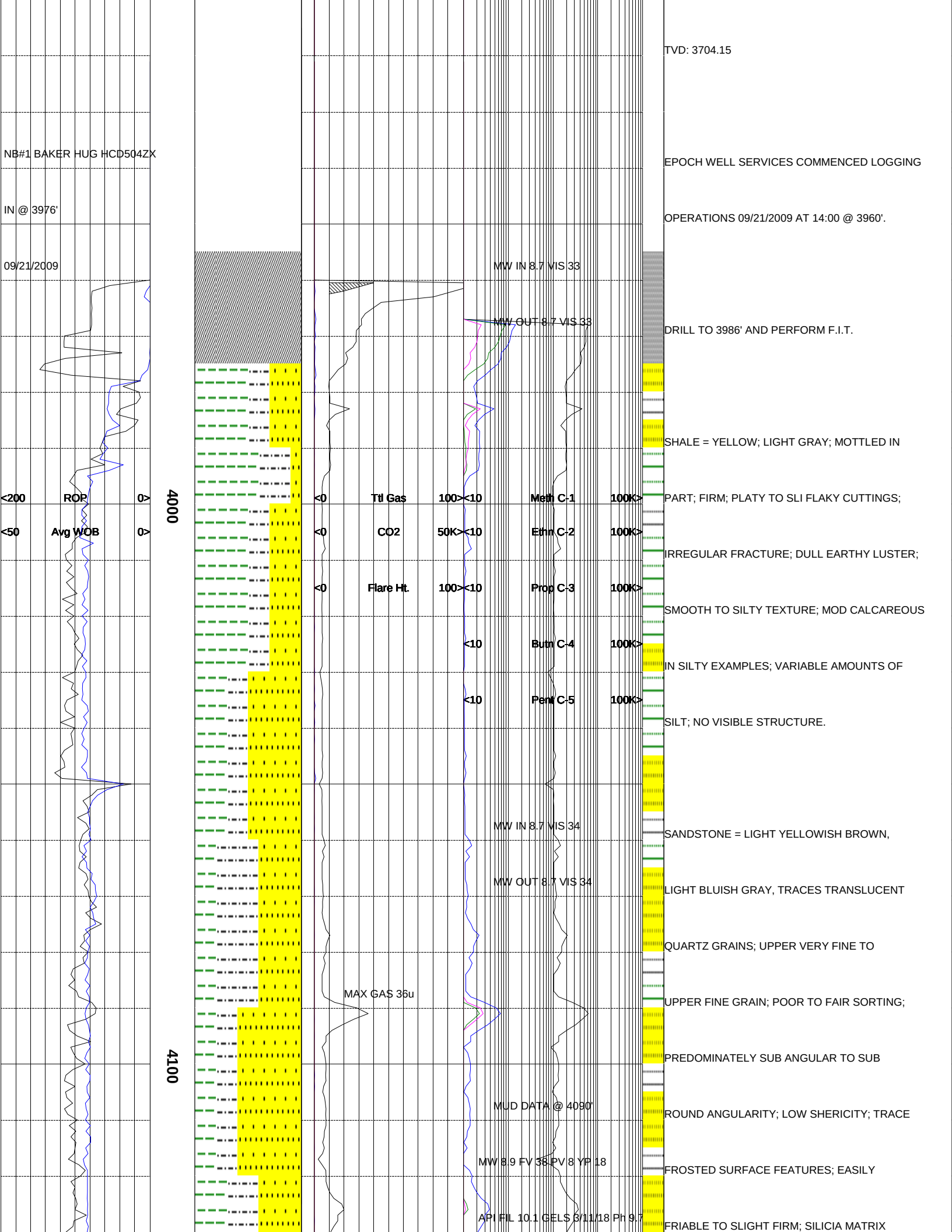
EARLY CONNECTION GASES REPRESENTING UP HOLE GAS INTERVALS BLEEDING INTO THE BOREHOLE ARE COMMON IN THE PRODUCTION INTERVAL.

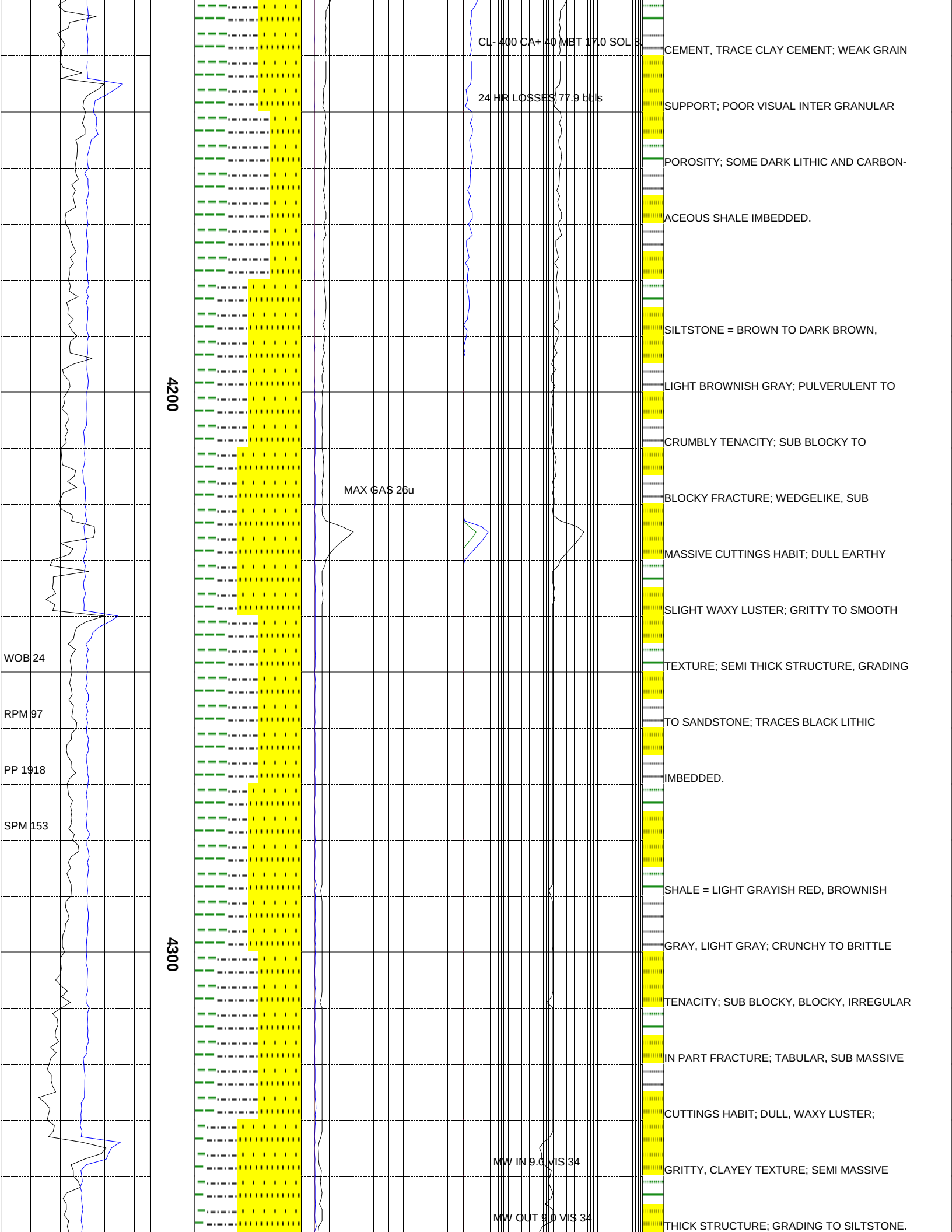
EVIDENCE OF FRACTURE FILL IS NOTED ON THE LOG USING THE LITHOLOGY SYMBOL FOR METAMORPHICS. THE 10% DOES NOT REPRESENT 10% FRACTURE FILL IN SAMPLE. IT ONLY INDICATES THAT FRACTURE FILL HAS BEEN OBSERVED OVER THE INTERVAL.

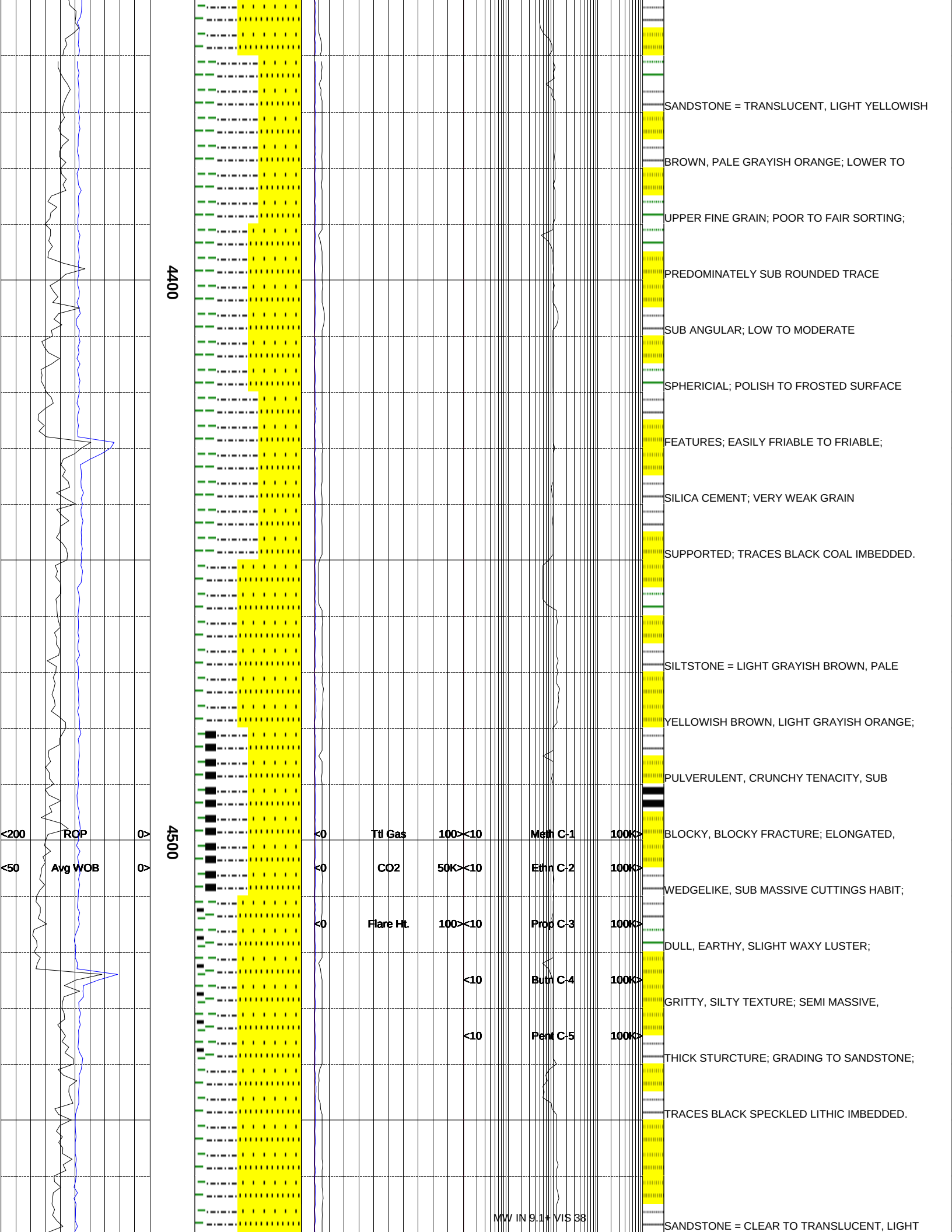
SURVEY DATA @ 3968'

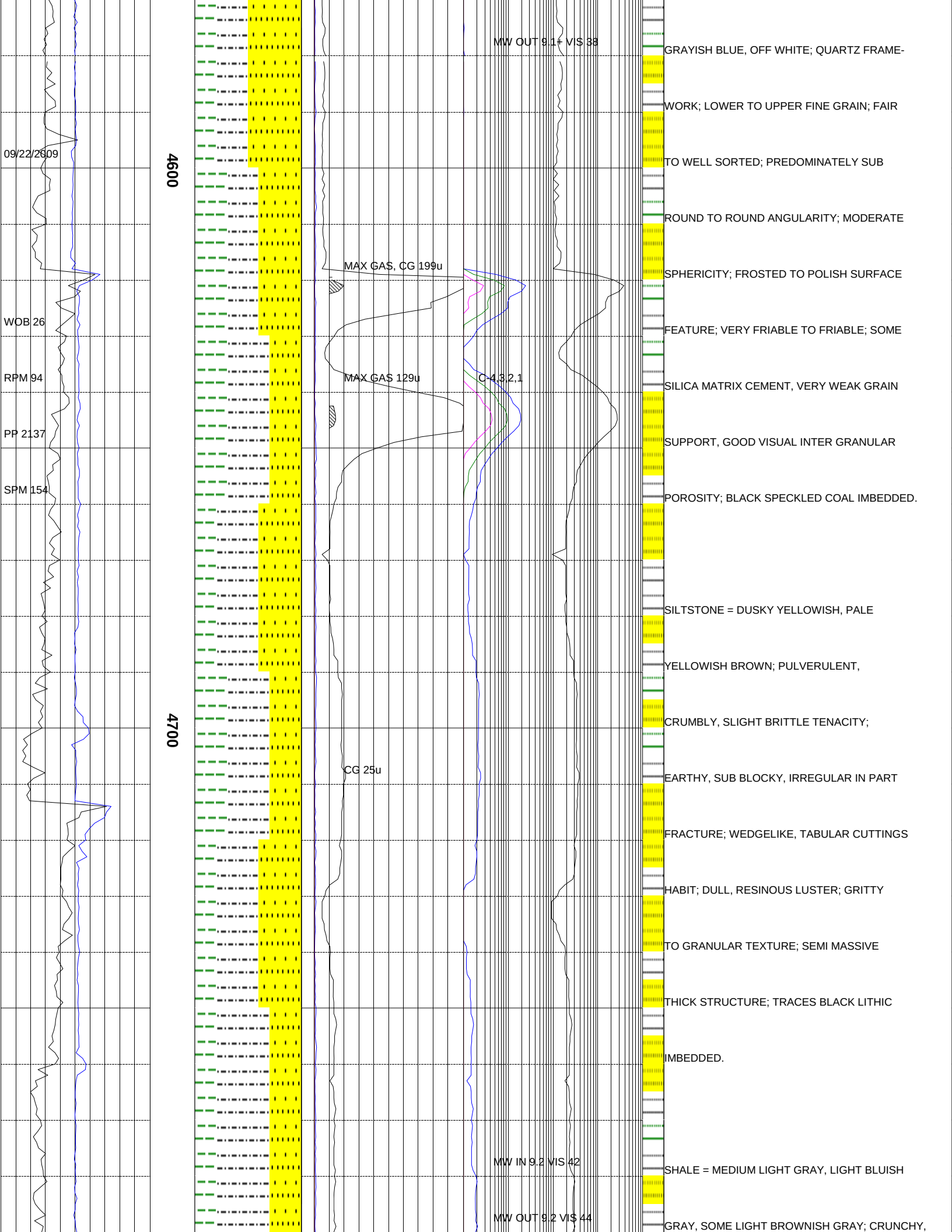
INC. 25.05

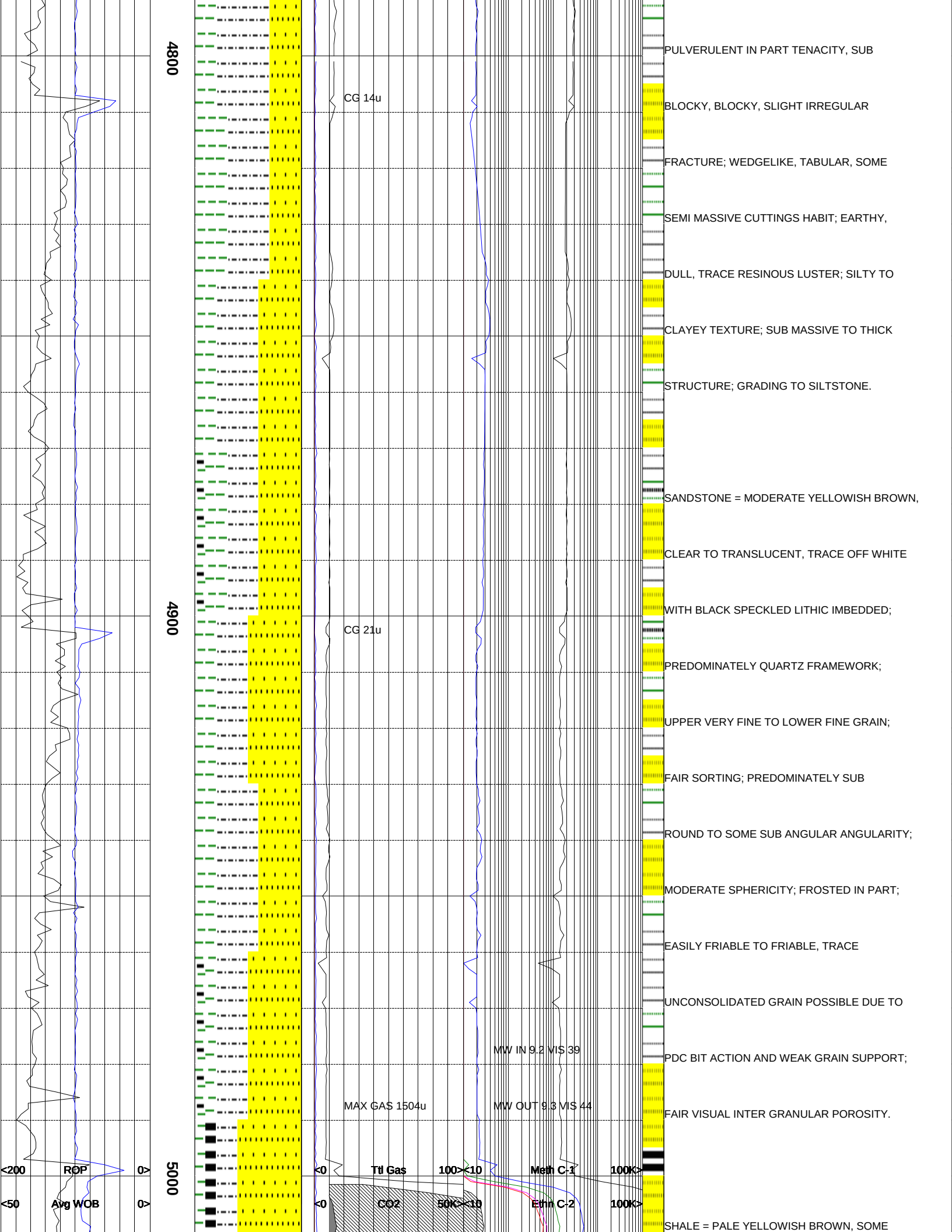
AZIMUTH: 187.66

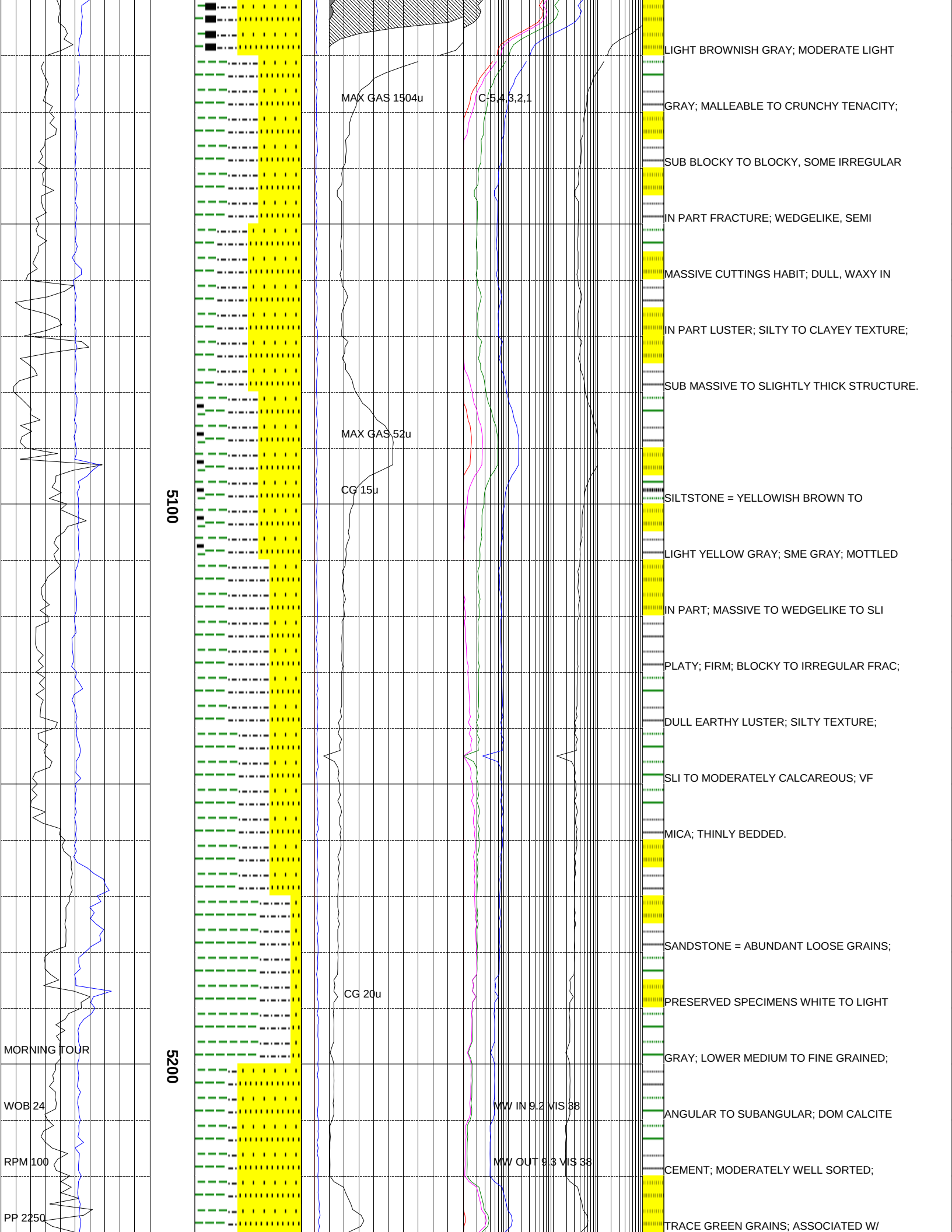

TVD: 3704.15
NB#1 BAKER HUG HCD504ZX
EPOCH WELL SERVICES COMMENCED LOGGING
IN @ 3976'
OPERATIONS 09/21/2009 AT 14:00 @ 3960'.
09/21/2009
MW IN 8.7 VIS 33
MW OUT 8.7 VIS 33
DRILL TO 3986' AND PERFORM F.I.T.
SHALE = YELLOW; LIGHT GRAY; MOTTLED IN
<200 ROP 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
PART; FIRM; PLATY TO SLI FLAKY CUTTINGS;
4000
<50 Avg WOB 0>
<0 CO2 50K><10 Ethn C-2 100K>
IRREGULAR FRACTURE; DULL EARTHY LUSTER;
<0 Flare Ht. 100><10 Prop C-3 100K>
SMOOTH TO SILTY TEXTURE; MOD CALCAREOUS
<10 Butn C-4 100K>
IN SILTY EXAMPLES; VARIABLE AMOUNTS OF
<10 Pent C-5 100K>
SILT; NO VISIBLE STRUCTURE.
MW IN 8.7 VIS 34
SANDSTONE = LIGHT YELLOWISH BROWN,
MW OUT 8.7 VIS 34
LIGHT BLUISH GRAY, TRACES TRANSLUCENT
QUARTZ GRAINS; UPPER VERY FINE TO
MAX GAS 36u
UPPER FINE GRAIN; POOR TO FAIR SORTING;
4100
PREDOMINATELY SUB ANGULAR TO SUB
MUD DATA @ 4090'
ROUND ANGULARITY; LOW SHERICITY; TRACE
MW 8.9 FV 38 PV 8 YP 18
FROSTED SURFACE FEATURES; EASILY
API FIL 10.1 GELS 3/11/18 Ph 9.7
FRIABLE TO SLIGHT FIRM; SILICIA MATRIX

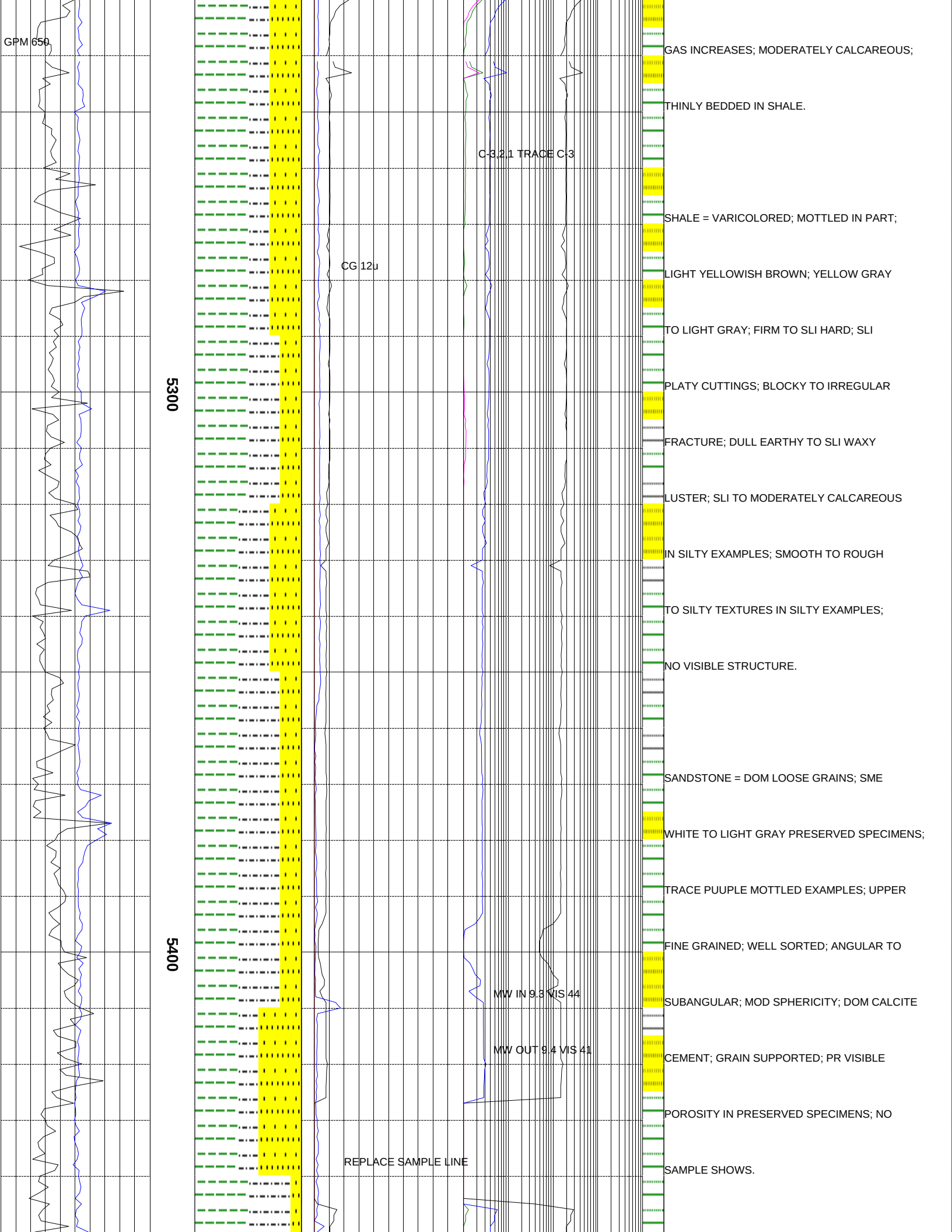

CL- 400 CA+ 40 MBT 17.0 SOL 3.
24 HR LOSSES 77.9 bbls
4200
MAX GAS 26u
WOB 24
RPM 97
PP 1918
SPM 153
4300
MW IN 9.0 VIS 34
MW OUT 9.0 VIS 34
CEMENT, TRACE CLAY CEMENT; WEAK GRAIN
SUPPORT; POOR VISUAL INTER GRANULAR
POROSITY; SOME DARK LITHIC AND CARBON-
ACEOUS SHALE IMBEDDED.
SILTSTONE = BROWN TO DARK BROWN,
LIGHT BROWNISH GRAY; PULVERULENT TO
CRUMBLY TENACITY; SUB BLOCKY TO
BLOCKY FRACTURE; WEDGELIKE, SUB
MASSIVE CUTTINGS HABIT; DULL EARTHY
SLIGHT WAXY LUSTER; GRITTY TO SMOOTH
TEXTURE; SEMI THICK STRUCTURE, GRADING
TO SANDSTONE; TRACES BLACK LITHIC
IMBEDDED.
SHALE = LIGHT GRAYISH RED, BROWNISH
GRAY, LIGHT GRAY; CRUNCHY TO BRITTLE
TENACITY; SUB BLOCKY, BLOCKY, IRREGULAR
IN PART FRACTURE; TABULAR, SUB MASSIVE
CUTTINGS HABIT; DULL, WAXY LUSTER;
GRITTY, CLAYEY TEXTURE; SEMI MASSIVE
THICK STRUCTURE; GRADING TO SILTSTONE.

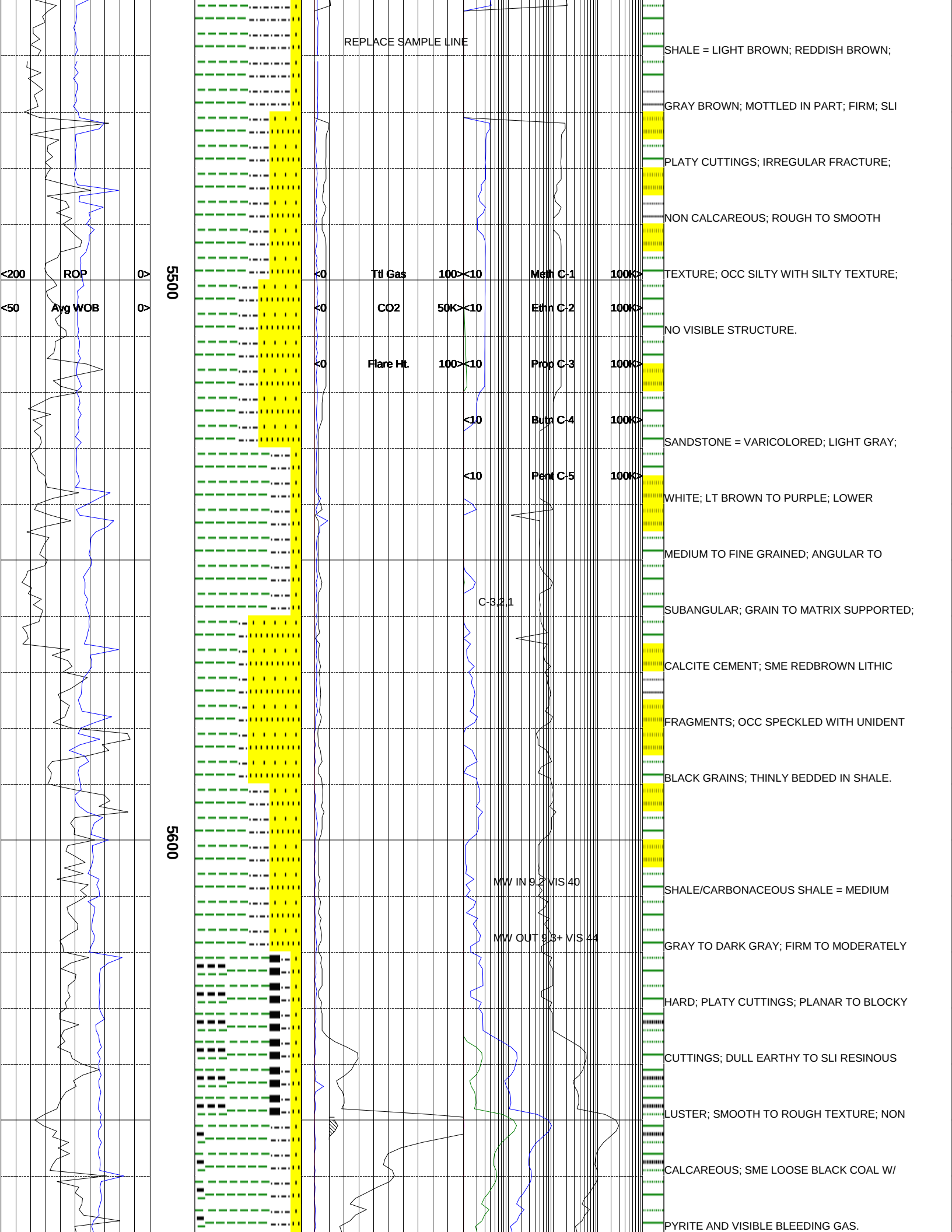

4400
4500
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
SANDSTONE = TRANSLUCENT, LIGHT YELLOWISH
BROWN, PALE GRAYISH ORANGE; LOWER TO
UPPER FINE GRAIN; POOR TO FAIR SORTING;
PREDOMINATELY SUB ROUNDED TRACE
SUB ANGULAR; LOW TO MODERATE
SPHERICIAL; POLISH TO FROSTED SURFACE
FEATURES; EASILY FRIABLE TO FRIABLE;
SILICA CEMENT; VERY WEAK GRAIN
SUPPORTED; TRACES BLACK COAL IMBEDDED.
SILTSTONE = LIGHT GRAYISH BROWN, PALE
YELLOWISH BROWN, LIGHT GRAYISH ORANGE;
PULVERULENT, CRUNCHY TENACITY, SUB
BLOCKY, BLOCKY FRACTURE; ELONGATED,
WEDGELIKE, SUB MASSIVE CUTTINGS HABIT;
DULL, EARTHY, SLIGHT WAXY LUSTER;
GRITTY, SILTY TEXTURE; SEMI MASSIVE,
THICK STURCTURE; GRADING TO SANDSTONE;
TRACES BLACK SPECKLED LITHIC IMBEDDED.
MW IN 9.1+ VIS 38
SANDSTONE = CLEAR TO TRANSLUCENT, LIGHT

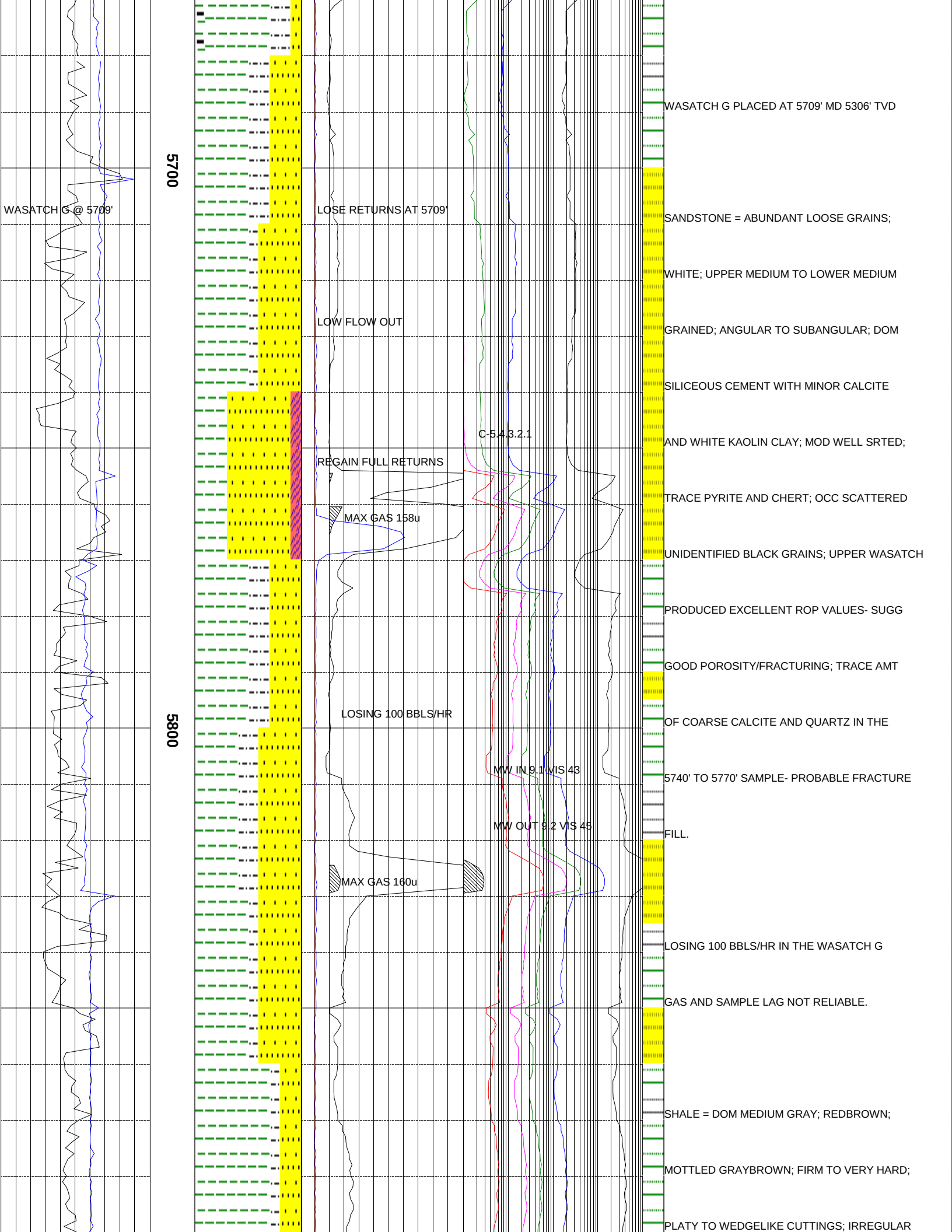

09/22/2009
WOB 26
RPM 94
PP 2137
SPM 154
4600
4700
MW OUT 9.1+ VIS 38
MAX GAS, CG 199u
MAX GAS 129u
C-4,3,2,1
CG 25u
MW IN 9.2 VIS 42
MW OUT 9.2 VIS 44
GRAYISH BLUE, OFF WHITE; QUARTZ FRAME-
WORK; LOWER TO UPPER FINE GRAIN; FAIR
TO WELL SORTED; PREDOMINATELY SUB
ROUND TO ROUND ANGULARITY; MODERATE
SPHERICITY; FROSTED TO POLISH SURFACE
FEATURE; VERY FRIABLE TO FRIABLE; SOME
SILICA MATRIX CEMENT, VERY WEAK GRAIN
SUPPORT, GOOD VISUAL INTER GRANULAR
POROSITY; BLACK SPECKLED COAL IMBEDDED.
SILTSTONE = DUSKY YELLOWISH, PALE
YELLOWISH BROWN; PULVERULENT,
CRUMBLY, SLIGHT BRITTLE TENACITY;
EARTHY, SUB BLOCKY, IRREGULAR IN PART
FRACTURE; WEDGELIKE, TABULAR CUTTINGS
HABIT; DULL, RESINOUS LUSTER; GRITTY
TO GRANULAR TEXTURE; SEMI MASSIVE
THICK STRUCTURE; TRACES BLACK LITHIC
IMBEDDED.
SHALE = MEDIUM LIGHT GRAY, LIGHT BLUISH
GRAY, SOME LIGHT BROWNISH GRAY; CRUNCHY,

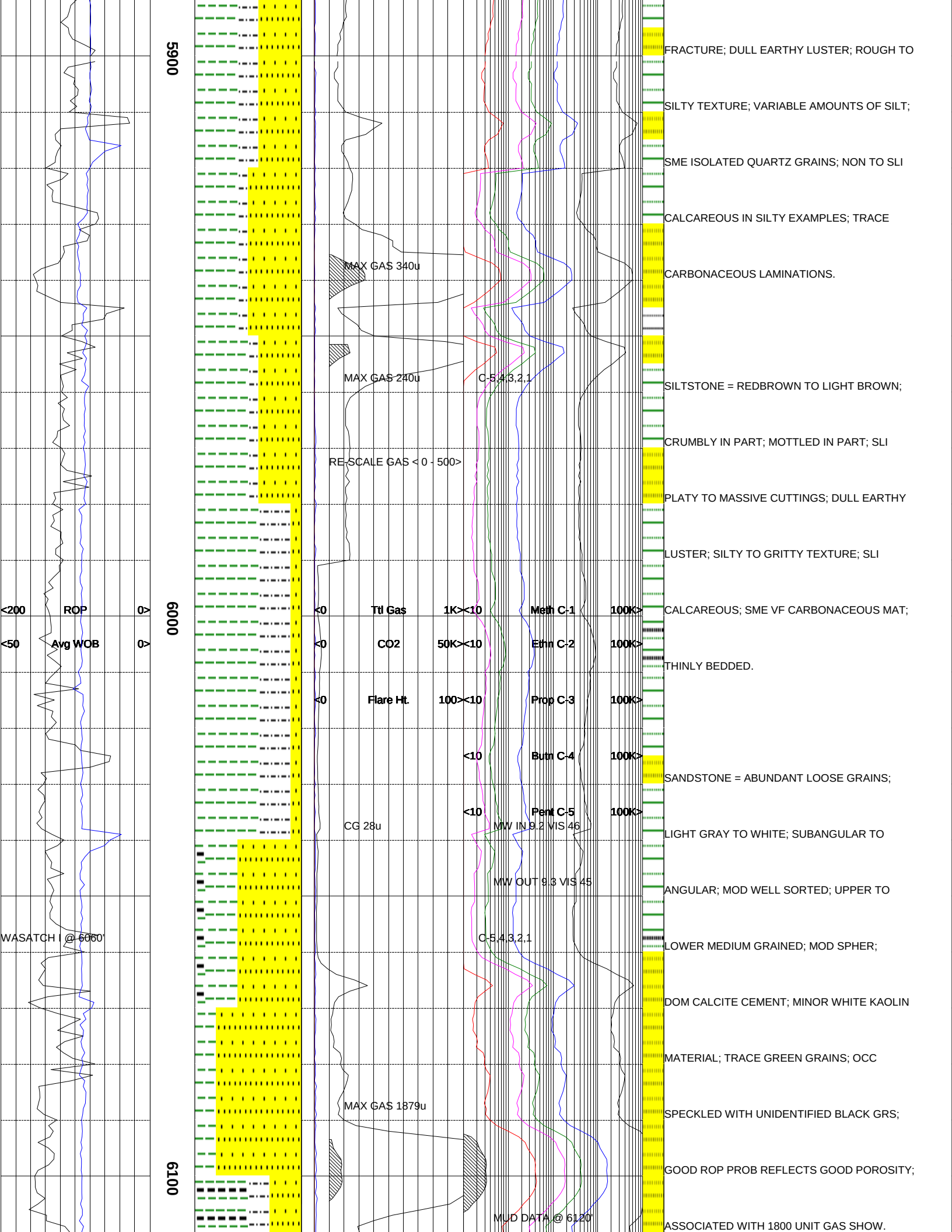

4800
4900
5000
CG 14u
CG 21u
MAX GAS 1504u
MW IN 9.2 VIS 39
MW OUT 9.3 VIS 44
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
PULVERULENT IN PART TENACITY, SUB
BLOCKY, BLOCKY, SLIGHT IRREGULAR
FRACTURE; WEDGELIKE, TABULAR, SOME
SEMI MASSIVE CUTTINGS HABIT; EARTHY,
DULL, TRACE RESINOUS LUSTER; SILTY TO
CLAYEY TEXTURE; SUB MASSIVE TO THICK
STRUCTURE; GRADING TO SILTSTONE.
SANDSTONE = MODERATE YELLOWISH BROWN,
CLEAR TO TRANSLUCENT, TRACE OFF WHITE
WITH BLACK SPECKLED LITHIC IMBEDDED;
PREDOMINATELY QUARTZ FRAMEWORK;
UPPER VERY FINE TO LOWER FINE GRAIN;
FAIR SORTING; PREDOMINATELY SUB
ROUND TO SOME SUB ANGULAR ANGULARITY;
MODERATE SPHERICITY; FROSTED IN PART;
EASILY FRIABLE TO FRIABLE, TRACE
UNCONSOLIDATED GRAIN POSSIBLE DUE TO
PDC BIT ACTION AND WEAK GRAIN SUPPORT;
FAIR VISUAL INTER GRANULAR POROSITY.
SHALE = PALE YELLOWISH BROWN, SOME

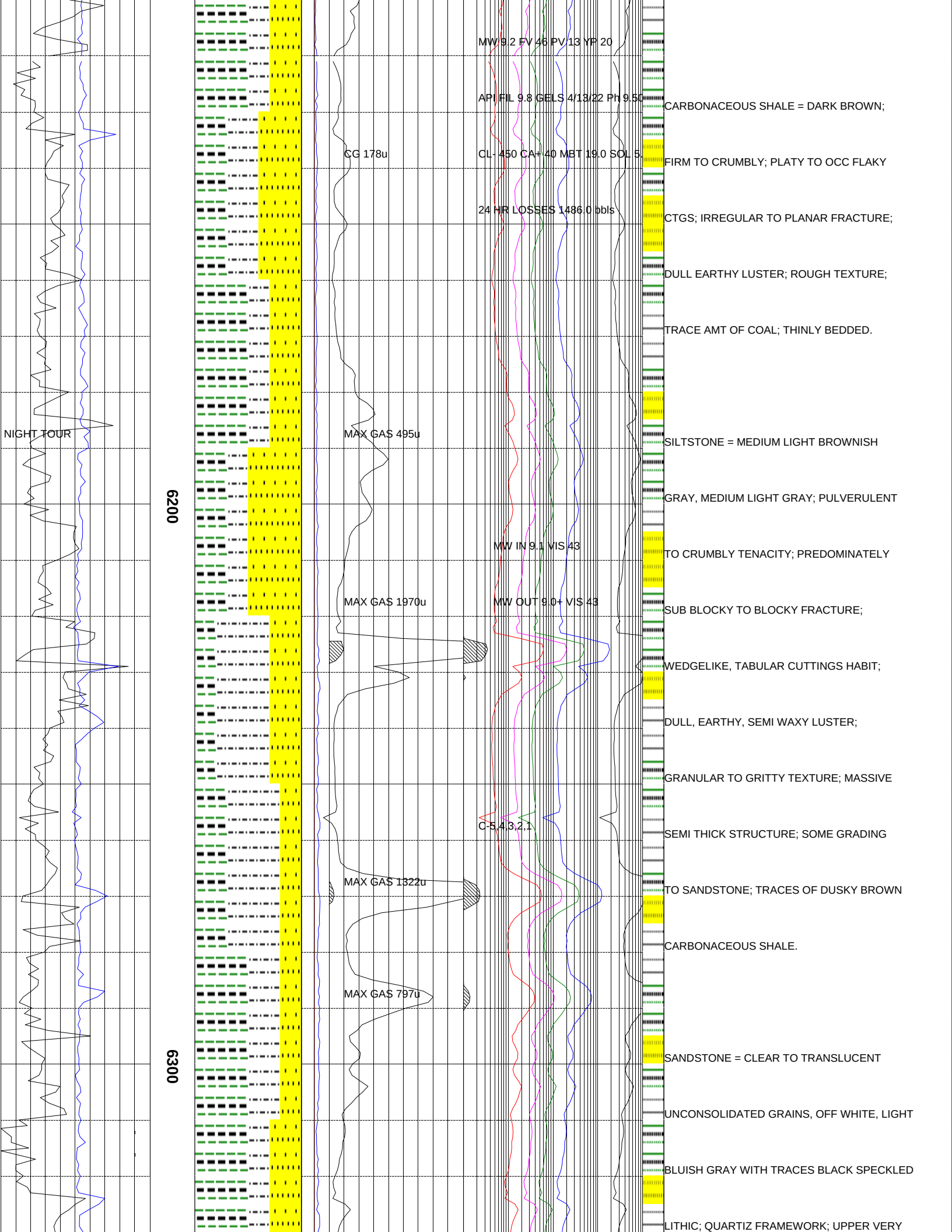

MAX GAS 1504u
C-5,4,3,2,1
MAX GAS 52u
CG 15u
5100
CG 20u
5200
MORNING TOUR
WOB 24
RPM 100
PP 2250
MW IN 9.2 VIS 38
MW OUT 9.3 VIS 38
LIGHT BROWNISH GRAY; MODERATE LIGHT
GRAY; MALLEABLE TO CRUNCHY TENACITY;
SUB BLOCKY TO BLOCKY, SOME IRREGULAR
IN PART FRACTURE; WEDGELIKE, SEMI
MASSIVE CUTTINGS HABIT; DULL, WAXY IN
IN PART LUSTER; SILTY TO CLAYEY TEXTURE;
SUB MASSIVE TO SLIGHTLY THICK STRUCTURE.
SILTSTONE = YELLOWISH BROWN TO
LIGHT YELLOW GRAY; SME GRAY; MOTTLED
IN PART; MASSIVE TO WEDGELIKE TO SLI
PLATY; FIRM; BLOCKY TO IRREGULAR FRAC;
DULL EARTHY LUSTER; SILTY TEXTURE;
SLI TO MODERATELY CALCAREOUS; VF
MICA; THINLY BEDDED.
SANDSTONE = ABUNDANT LOOSE GRAINS;
PRESERVED SPECIMENS WHITE TO LIGHT
GRAY; LOWER MEDIUM TO FINE GRAINED;
ANGULAR TO SUBANGULAR; DOM CALCITE
CEMENT; MODERATELY WELL SORTED;
TRACE GREEN GRAINS; ASSOCIATED W/

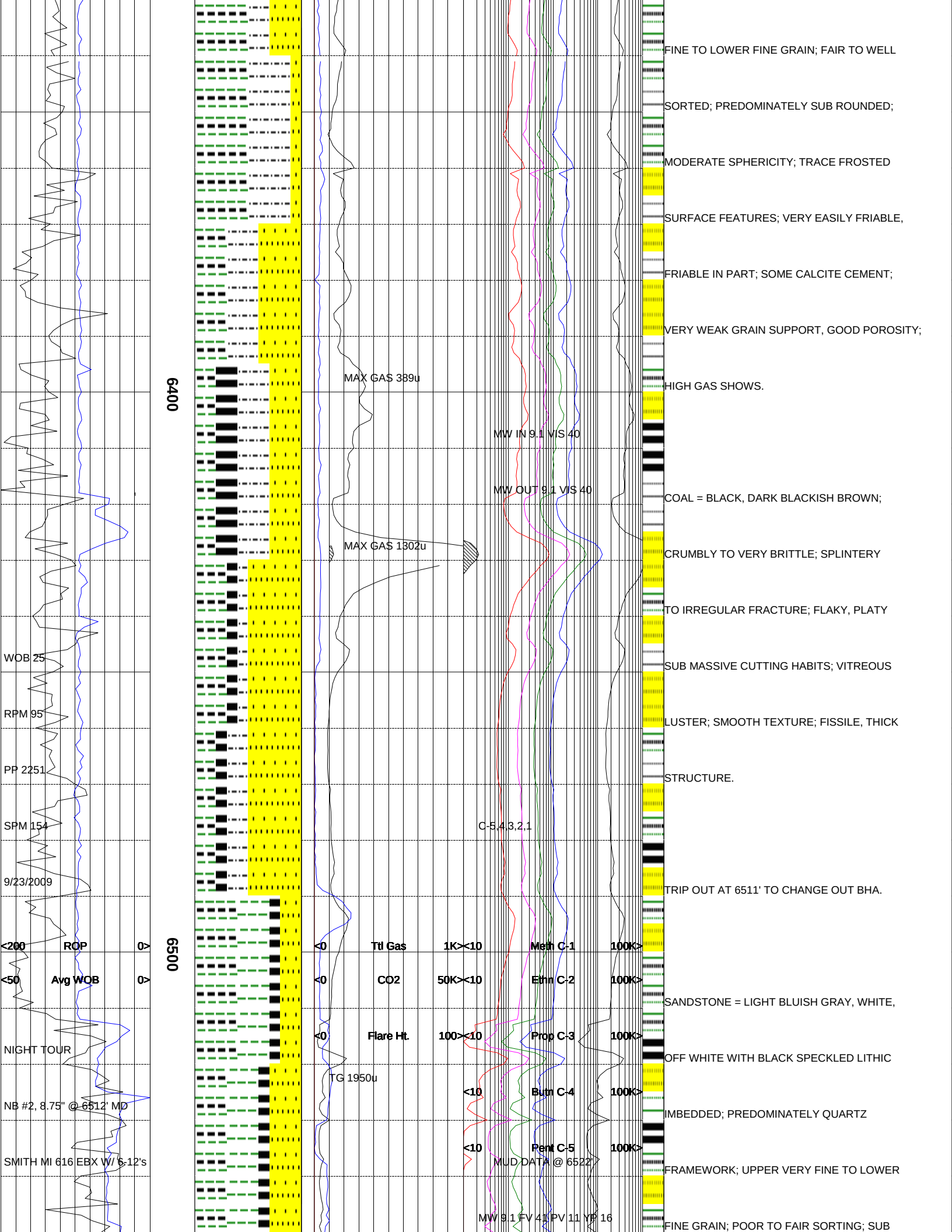

GPM 650
5300
5400
C-3,2,1 TRACE C-3
CG 12u
MW IN 9.3 VIS 44
MW OUT 9.4 VIS 41
REPLACE SAMPLE LINE
GAS INCREASES; MODERATELY CALCAREOUS;
THINLY BEDDED IN SHALE.
SHALE = VARICOLORED; MOTTLED IN PART;
LIGHT YELLOWISH BROWN; YELLOW GRAY
TO LIGHT GRAY; FIRM TO SLI HARD; SLI
PLATY CUTTINGS; BLOCKY TO IRREGULAR
FRACTURE; DULL EARTHY TO SLI WAXY
LUSTER; SLI TO MODERATELY CALCAREOUS
IN SILTY EXAMPLES; SMOOTH TO ROUGH
TO SILTY TEXTURES IN SILTY EXAMPLES;
NO VISIBLE STRUCTURE.
SANDSTONE = DOM LOOSE GRAINS; SME
WHITE TO LIGHT GRAY PRESERVED SPECIMENS;
TRACE PUUPLE MOTTLED EXAMPLES; UPPER
FINE GRAINED; WELL SORTED; ANGULAR TO
SUBANGULAR; MOD SPHERICITY; DOM CALCITE
CEMENT; GRAIN SUPPORTED; PR VISIBLE
POROSITY IN PRESERVED SPECIMENS; NO
SAMPLE SHOWS.

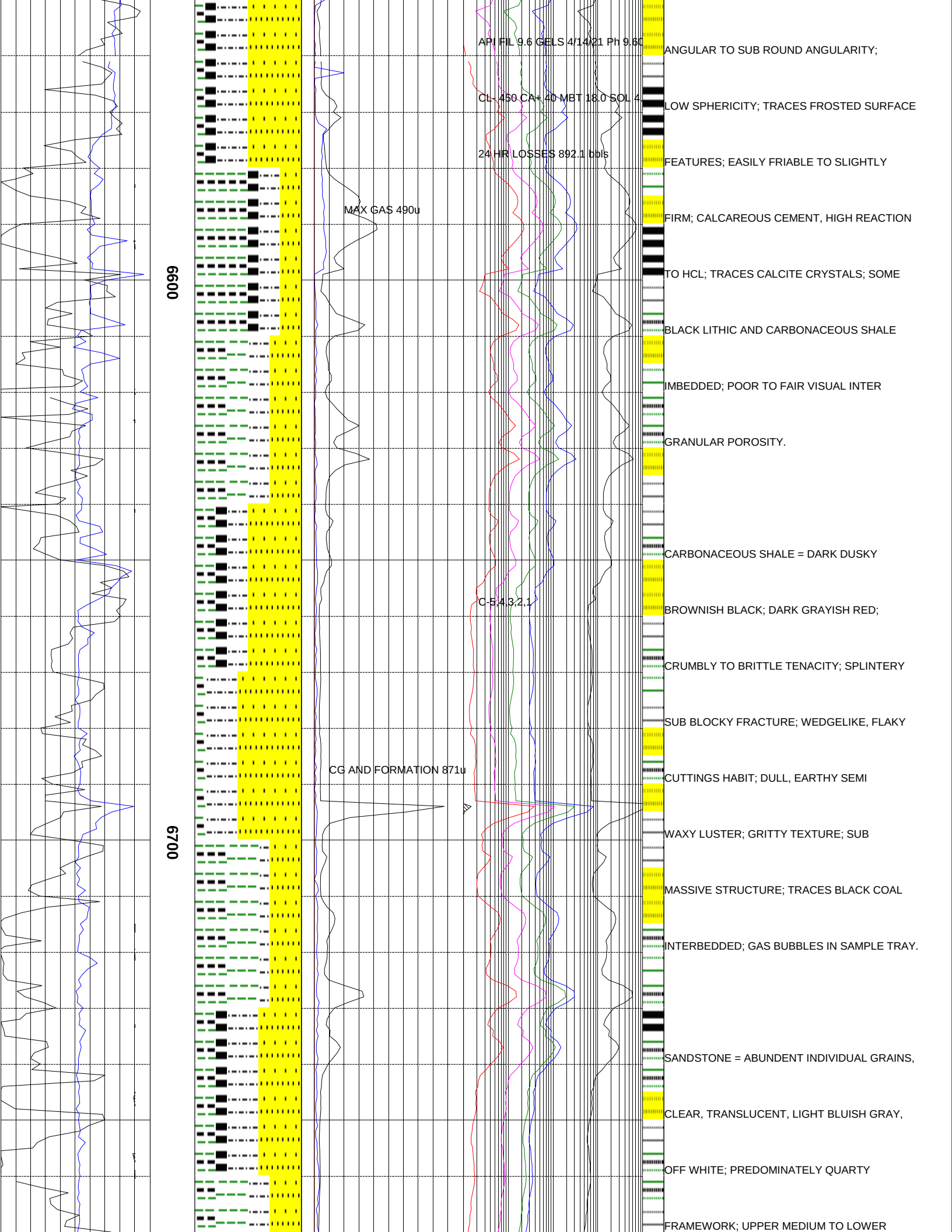

REPLACE SAMPLE LINE
<200 ROP 0>
<50 Avg WOB 0>
5500
<0 Ttl Gas 100><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
C-3,2,1
5600
MW IN 9.2 VIS 40
MW OUT 9.3+ VIS 44
SHALE = LIGHT BROWN; REDDISH BROWN;
GRAY BROWN; MOTTLED IN PART; FIRM; SLI
PLATY CUTTINGS; IRREGULAR FRACTURE;
NON CALCAREOUS; ROUGH TO SMOOTH
TEXTURE; OCC SILTY WITH SILTY TEXTURE;
NO VISIBLE STRUCTURE.
SANDSTONE = VARICOLORED; LIGHT GRAY;
WHITE; LT BROWN TO PURPLE; LOWER
MEDIUM TO FINE GRAINED; ANGULAR TO
SUBANGULAR; GRAIN TO MATRIX SUPPORTED;
CALCITE CEMENT; SME REDBROWN LITHIC
FRAGMENTS; OCC SPECKLED WITH UNIDENT
BLACK GRAINS; THINLY BEDDED IN SHALE.
SHALE/CARBONACEOUS SHALE = MEDIUM
GRAY TO DARK GRAY; FIRM TO MODERATELY
HARD; PLATY CUTTINGS; PLANAR TO BLOCKY
CUTTINGS; DULL EARTHY TO SLI RESINOUS
LUSTER; SMOOTH TO ROUGH TEXTURE; NON
CALCAREOUS; SME LOOSE BLACK COAL W/
PYRITE AND VISIBLE BLEEDING GAS.

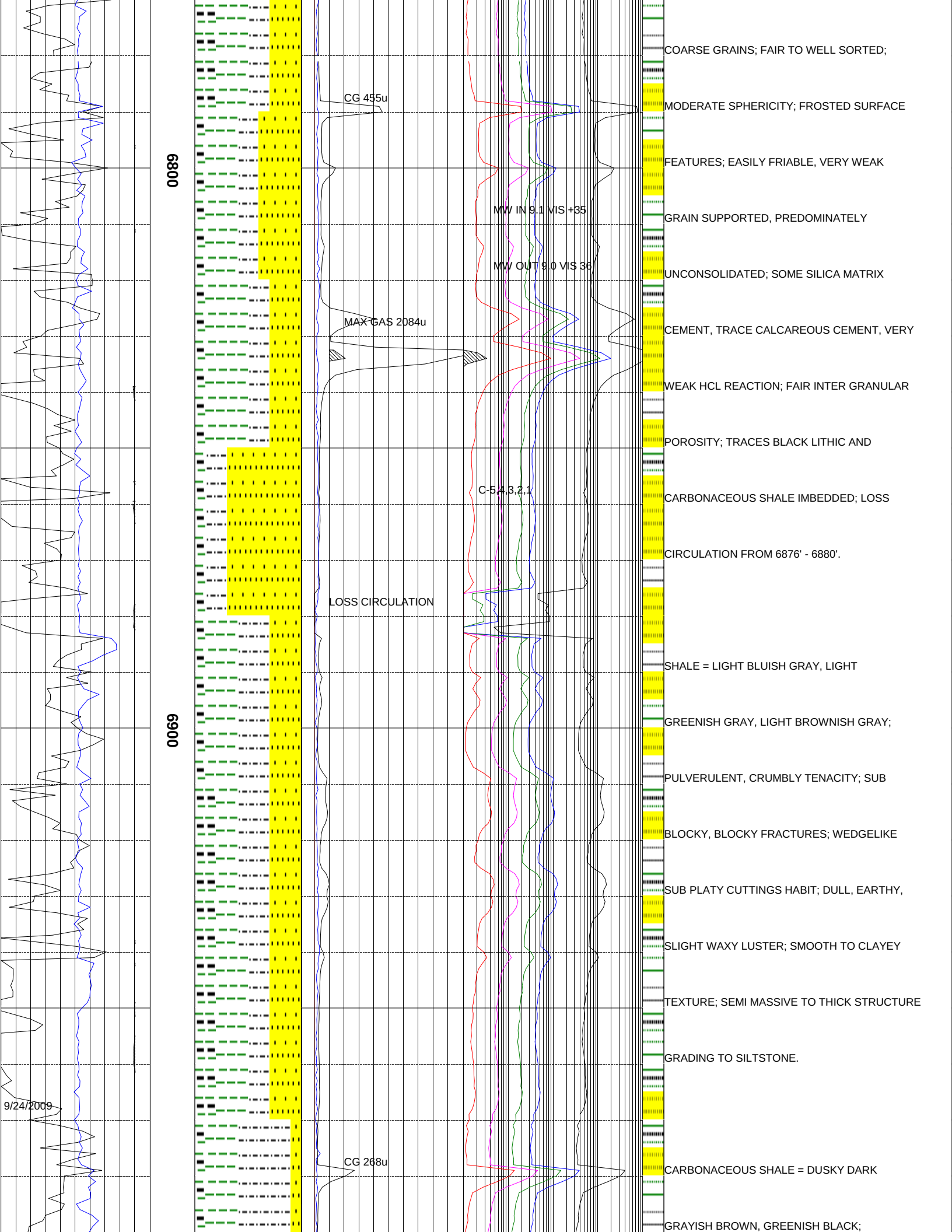

5700
5800
WASATCH G @ 5709'
LOSE RETURNS AT 5709'
LOW FLOW OUT
REGAIN FULL RETURNS
MAX GAS 158u
LOSING 100 BBLS/HR
MW IN 9.1 VIS 43
MW OUT 9.2 VIS 45
MAX GAS 160u
C-5.4.3.2.1
WASATCH G PLACED AT 5709' MD 5306' TVD
SANDSTONE = ABUNDANT LOOSE GRAINS;
WHITE; UPPER MEDIUM TO LOWER MEDIUM
GRAINED; ANGULAR TO SUBANGULAR; DOM
SILICEOUS CEMENT WITH MINOR CALCITE
AND WHITE KAOLIN CLAY; MOD WELL SRTED;
TRACE PYRITE AND CHERT; OCC SCATTERED
UNIDENTIFIED BLACK GRAINS; UPPER WASATCH
PRODUCED EXCELLENT ROP VALUES- SUGG
GOOD POROSITY/FRACTURING; TRACE AMT
OF COARSE CALCITE AND QUARTZ IN THE
5740' TO 5770' SAMPLE- PROBABLE FRACTURE
FILL.
LOSING 100 BBLS/HR IN THE WASATCH G
GAS AND SAMPLE LAG NOT RELIABLE.
SHALE = DOM MEDIUM GRAY; REDBROWN;
MOTTLED GRAYBROWN; FIRM TO VERY HARD;
PLATY TO WEDGELIKE CUTTINGS; IRREGULAR

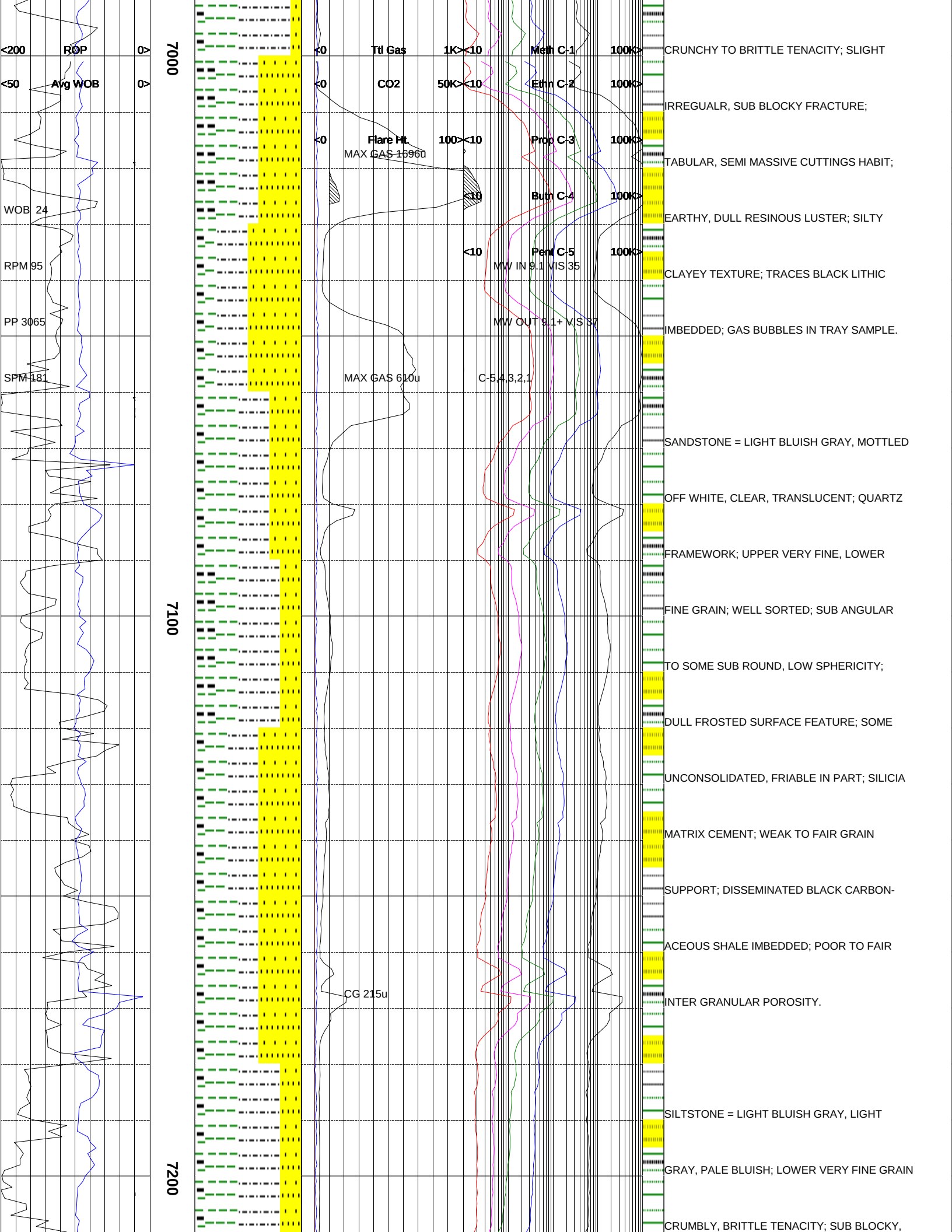

5900
6000
6100
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
MAX GAS 340u
MAX GAS 240u
C-5,4,3,2,1
RE-SCALE GAS < 0 - 500>
CG 28u
MW IN 9.2 VIS 46
MW OUT 9.3 VIS 45
WASATCH I @ 6060'
C-5,4,3,2,1
MAX GAS 1879u
MUD DATA @ 6120'
FRACTURE; DULL EARTHY LUSTER; ROUGH TO
SILTY TEXTURE; VARIABLE AMOUNTS OF SILT;
SME ISOLATED QUARTZ GRAINS; NON TO SLI
CALCAREOUS IN SILTY EXAMPLES; TRACE
CARBONACEOUS LAMINATIONS.
SILTSTONE = REDBROWN TO LIGHT BROWN;
CRUMBLY IN PART; MOTTLED IN PART; SLI
PLATY TO MASSIVE CUTTINGS; DULL EARTHY
LUSTER; SILTY TO GRITTY TEXTURE; SLI
CALCAREOUS; SME VF CARBONACEOUS MAT;
THINLY BEDDED.
SANDSTONE = ABUNDANT LOOSE GRAINS;
LIGHT GRAY TO WHITE; SUBANGULAR TO
ANGULAR; MOD WELL SORTED; UPPER TO
LOWER MEDIUM GRAINED; MOD SPHER;
DOM CALCITE CEMENT; MINOR WHITE KAOLIN
MATERIAL; TRACE GREEN GRAINS; OCC
SPECKLED WITH UNIDENTIFIED BLACK GRS;
GOOD ROP PROB REFLECTS GOOD POROSITY;
ASSOCIATED WITH 1800 UNIT GAS SHOW.


MW 9.2 FV 46 PV 13 YP 20
API FIL 9.8 GELS 4/13/22 Ph 9.50
CG 178u
CL- 450 CA+ 40 MBT 19.0 SOL 5.
24 HR LOSSES 1486.0 bbls
CARBONACEOUS SHALE = DARK BROWN;
FIRM TO CRUMBLY; PLATY TO OCC FLAKY
CTGS; IRREGULAR TO PLANAR FRACTURE;
DULL EARTHY LUSTER; ROUGH TEXTURE;
TRACE AMT OF COAL; THINLY BEDDED.
NIGHT TOUR
MAX GAS 495u
SILTSTONE = MEDIUM LIGHT BROWNISH
GRAY, MEDIUM LIGHT GRAY; PULVERULENT
6200
MW IN 9.1 VIS 43
TO CRUMBLY TENACITY; PREDOMINATELY
MAX GAS 1970u
MW OUT 9.0+ VIS 43
SUB BLOCKY TO BLOCKY FRACTURE;
WEDGELIKE, TABULAR CUTTINGS HABIT;
DULL, EARTHY, SEMI WAXY LUSTER;
GRANULAR TO GRITTY TEXTURE; MASSIVE
C-5,4,3,2,1
SEMI THICK STRUCTURE; SOME GRADING
MAX GAS 1322u
TO SANDSTONE; TRACES OF DUSKY BROWN
CARBONACEOUS SHALE.
MAX GAS 797u
6300
SANDSTONE = CLEAR TO TRANSLUCENT
UNCONSOLIDATED GRAINS, OFF WHITE, LIGHT
BLUISH GRAY WITH TRACES BLACK SPECKLED
LITHIC; QUARTIZ FRAMEWORK; UPPER VERY


6400
6500
MAX GAS 389u
MW IN 9.1 VIS 40
MW OUT 9.1 VIS 40
MAX GAS 1302u
WOB 25
RPM 95
PP 2251
SPM 154
9/23/2009
<200 ROP 0>
<50 Avg WOB 0>
NIGHT TOUR
NB #2, 8.75" @ 6512' MD
SMITH MI 616 EBX W/ 6-12's
C-5,4,3,2,1
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
TG 1950u
<10 Butn C-4 100K>
<10 Pent C-5 100K>
MUD DATA @ 6522'
MW 9.1 FV 41 PV 11 YP 16
FINE TO LOWER FINE GRAIN; FAIR TO WELL
SORTED; PREDOMINATELY SUB ROUNDED;
MODERATE SPHERICITY; TRACE FROSTED
SURFACE FEATURES; VERY EASILY FRIABLE,
FRIABLE IN PART; SOME CALCITE CEMENT;
VERY WEAK GRAIN SUPPORT, GOOD POROSITY;
HIGH GAS SHOWS.
COAL = BLACK, DARK BLACKISH BROWN;
CRUMBLY TO VERY BRITTLE; SPLINTERY
TO IRREGULAR FRACTURE; FLAKY, PLATY
SUB MASSIVE CUTTING HABITS; VITREOUS
LUSTER; SMOOTH TEXTURE; FISSILE, THICK
STRUCTURE.
TRIP OUT AT 6511' TO CHANGE OUT BHA.
SANDSTONE = LIGHT BLUISH GRAY, WHITE,
OFF WHITE WITH BLACK SPECKLED LITHIC
IMBEDDED; PREDOMINATELY QUARTZ
FRAMEWORK; UPPER VERY FINE TO LOWER
FINE GRAIN; POOR TO FAIR SORTING; SUB


API FIL 9.6 GELS 4/14/21 Ph 9.60
CL- 450 CA+ 40 MBT 18.0 SOL 4
24 HR LOSSES 892.1 bbls
MAX GAS 490u
6600
C-5,4,3,2,1
CG AND FORMATION 871u
6700
ANGULAR TO SUB ROUND ANGULARITY;
LOW SPHERICITY; TRACES FROSTED SURFACE
FEATURES; EASILY FRIABLE TO SLIGHTLY
FIRM; CALCAREOUS CEMENT, HIGH REACTION
TO HCL; TRACES CALCITE CRYSTALS; SOME
BLACK LITHIC AND CARBONACEOUS SHALE
IMBEDDED; POOR TO FAIR VISUAL INTER
GRANULAR POROSITY.
CARBONACEOUS SHALE = DARK DUSKY
BROWNISH BLACK; DARK GRAYISH RED;
CRUMBLY TO BRITTLE TENACITY; SPLINTERY
SUB BLOCKY FRACTURE; WEDGELIKE, FLAKY
CUTTINGS HABIT; DULL, EARTHY SEMI
WAXY LUSTER; GRITTY TEXTURE; SUB
MASSIVE STRUCTURE; TRACES BLACK COAL
INTERBEDDED; GAS BUBBLES IN SAMPLE TRAY.
SANDSTONE = ABUNDENT INDIVIDUAL GRAINS,
CLEAR, TRANSLUCENT, LIGHT BLUISH GRAY,
OFF WHITE; PREDOMINATELY QUARTY
FRAMEWORK; UPPER MEDIUM TO LOWER


6800
6900
CG 455u
MW IN 9.1 VIS +35
MW OUT 9.0 VIS 36
MAX GAS 2084u
C-5,4,3,2,1
LOSS CIRCULATION
CG 268u
9/24/2009
COARSE GRAINS; FAIR TO WELL SORTED;
MODERATE SPHERICITY; FROSTED SURFACE
FEATURES; EASILY FRIABLE, VERY WEAK
GRAIN SUPPORTED, PREDOMINATELY
UNCONSOLIDATED; SOME SILICA MATRIX
CEMENT, TRACE CALCAREOUS CEMENT, VERY
WEAK HCL REACTION; FAIR INTER GRANULAR
POROSITY; TRACES BLACK LITHIC AND
CARBONACEOUS SHALE IMBEDDED; LOSS
CIRCULATION FROM 6876' - 6880'.
SHALE = LIGHT BLUISH GRAY, LIGHT
GREENISH GRAY, LIGHT BROWNISH GRAY;
PULVERULENT, CRUMBLY TENACITY; SUB
BLOCKY, BLOCKY FRACTURES; WEDGELIKE
SUB PLATY CUTTINGS HABIT; DULL, EARTHY,
SLIGHT WAXY LUSTER; SMOOTH TO CLAYEY
TEXTURE; SEMI MASSIVE TO THICK STRUCTURE
GRADING TO SILTSTONE.
CARBONACEOUS SHALE = DUSKY DARK
GRAYISH BROWN, GREENISH BLACK;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WOB 24
RPM 95
PP 3065
SPM 181
7000
7100
7200
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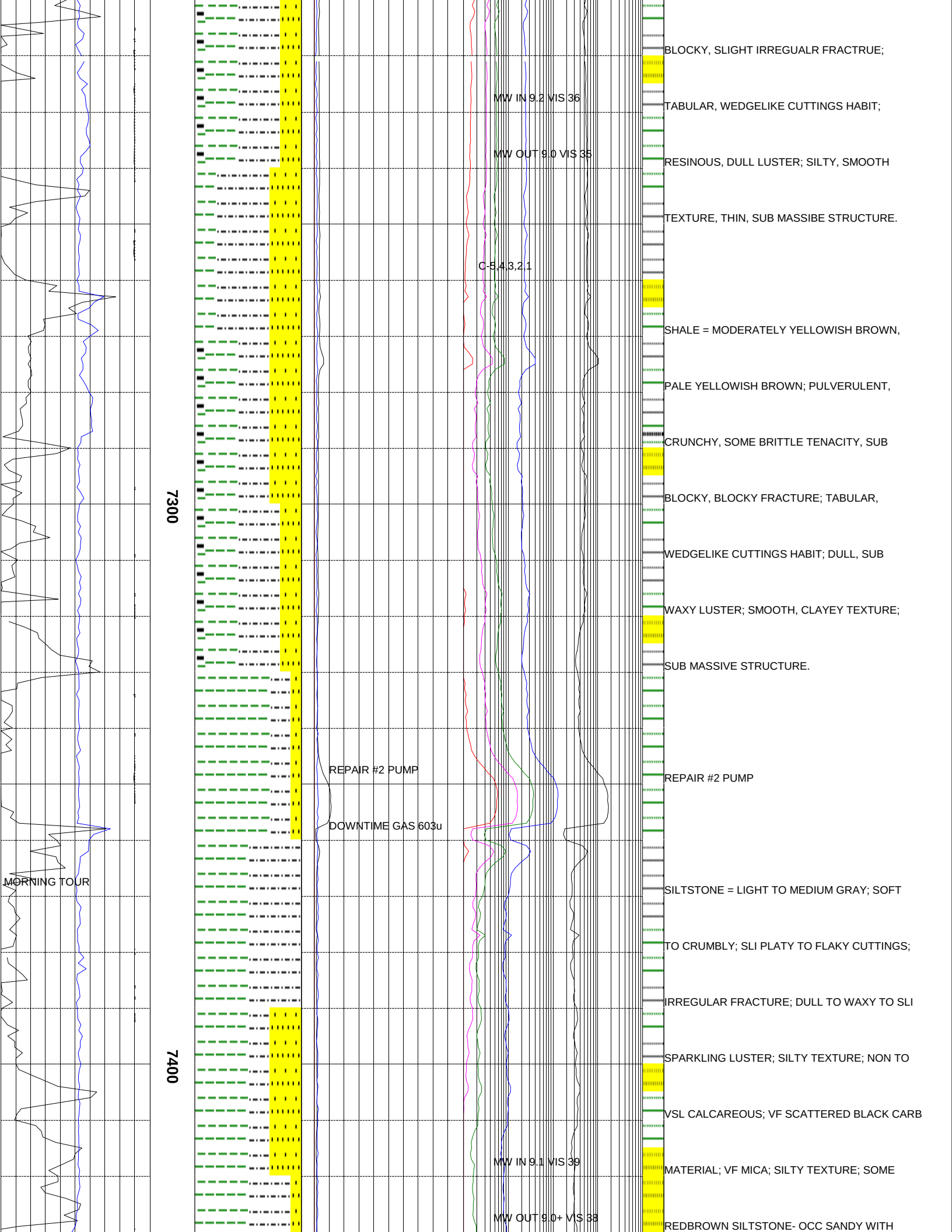
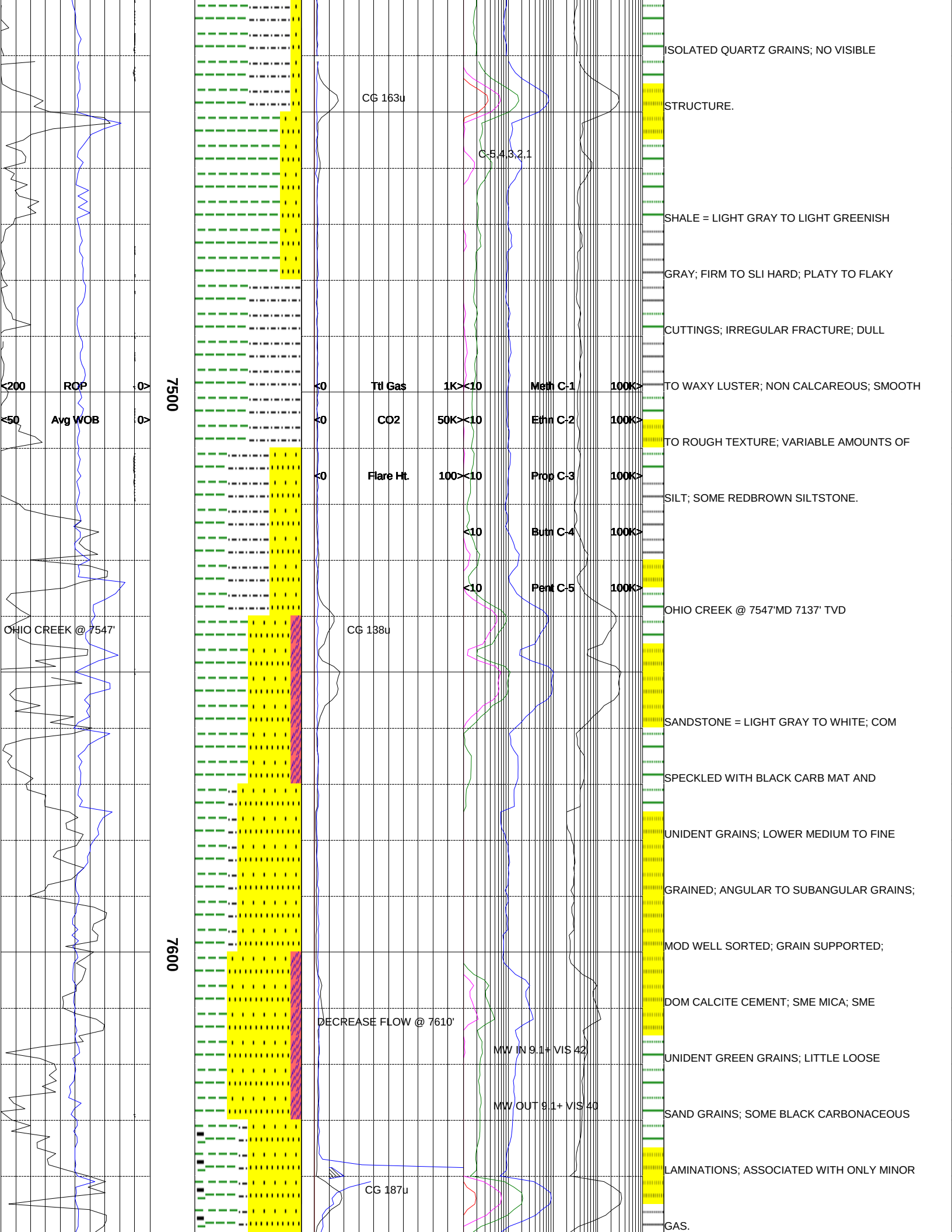
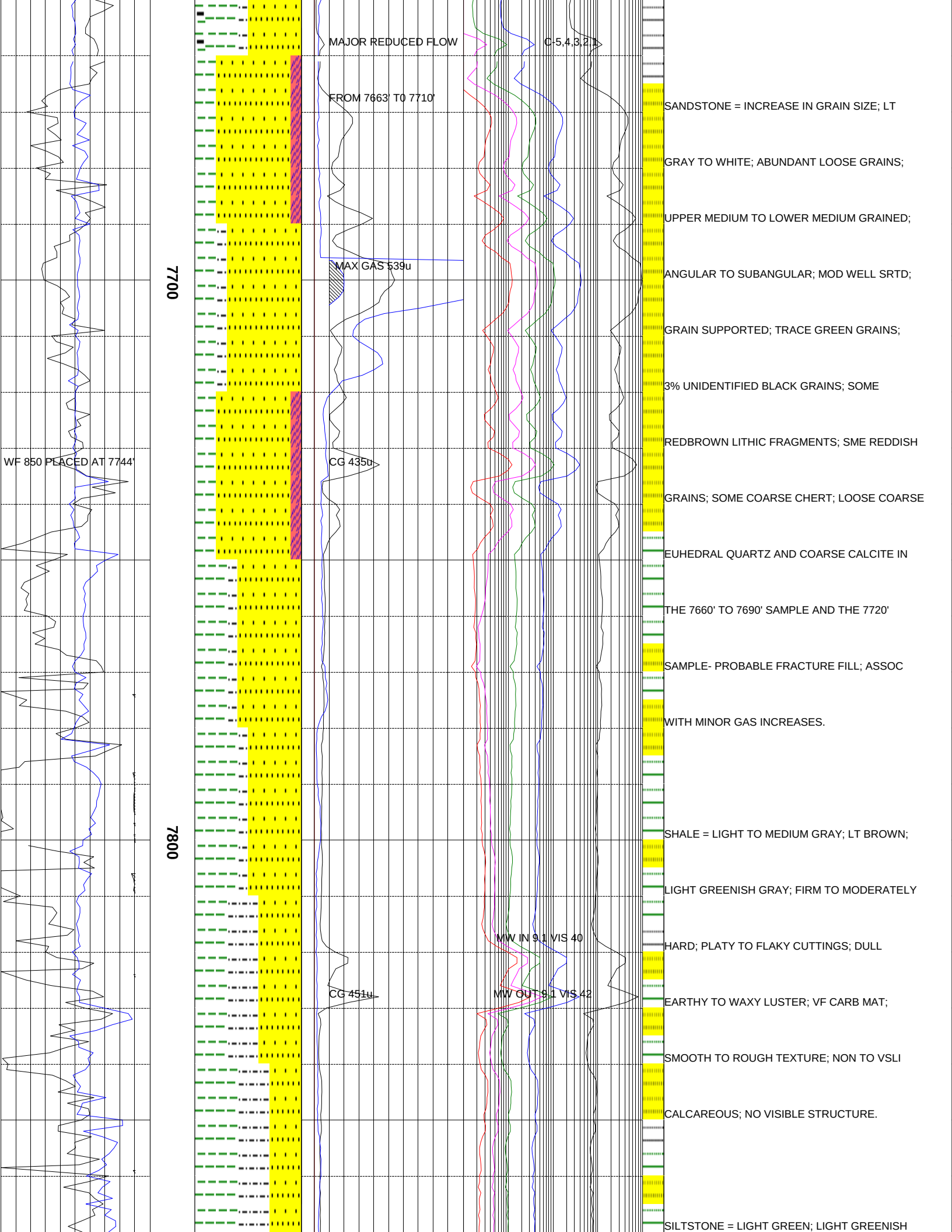
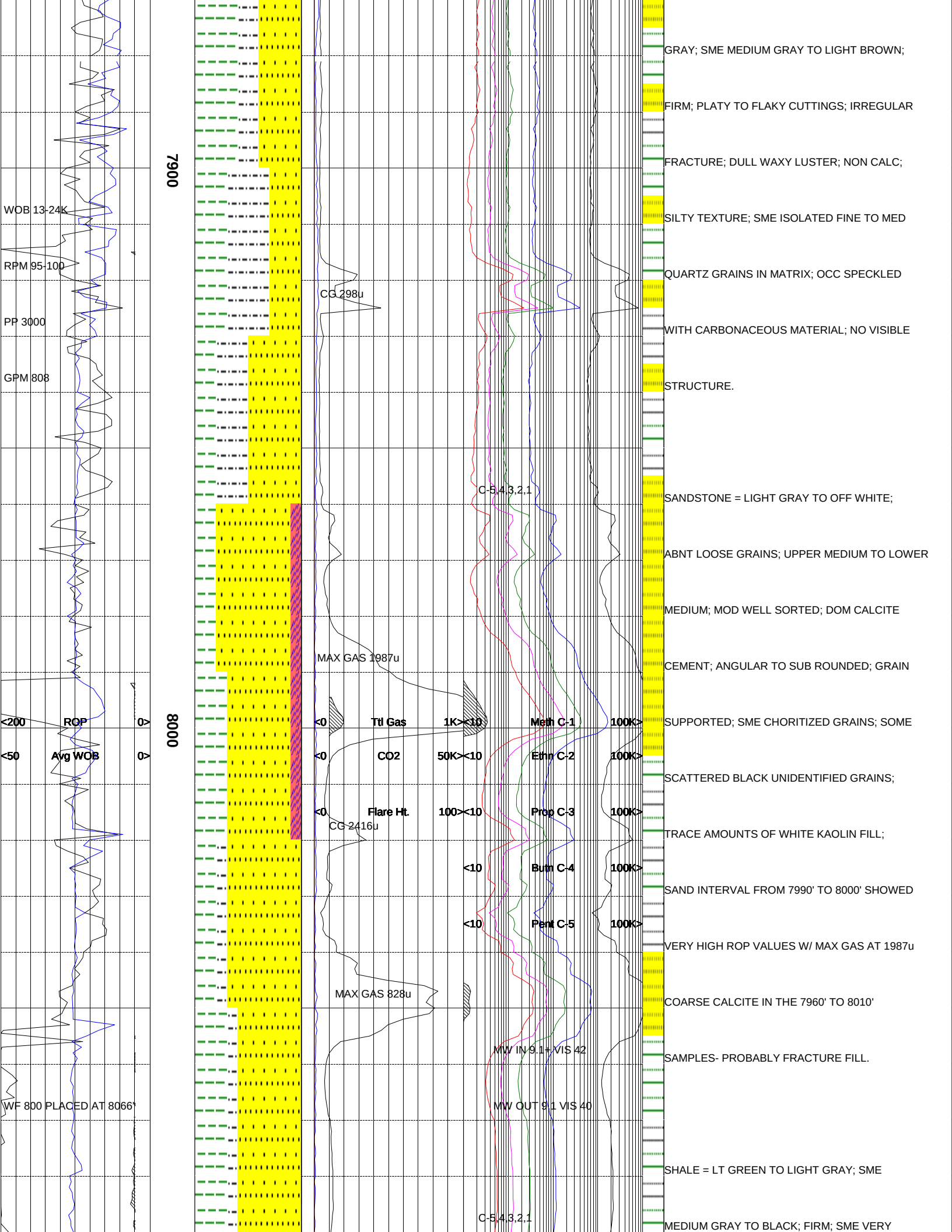
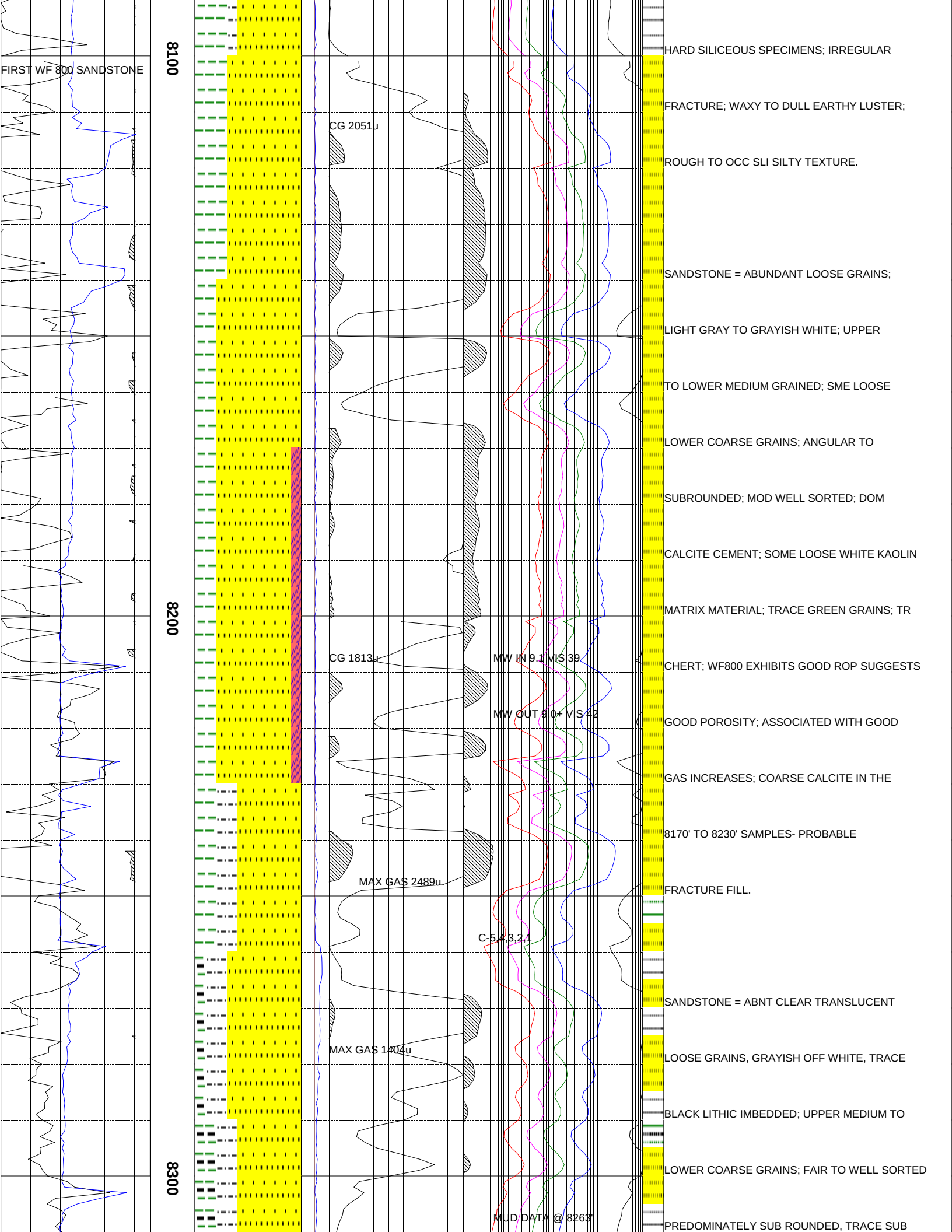
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht 100><10 Prop C-3 100K>
MAX GAS 16960
<10 Buth C-4 100K>
<10 Pent C-5 100K>
MW IN 9.1 VIS 35
MW OUT 9.1+ VIS 37
MAX GAS 610u
C-5,4,3,2,1
CG 215u
CRUNCHY TO BRITTLE TENACITY; SLIGHT
IRREGUALR, SUB BLOCKY FRACTURE;
TABULAR, SEMI MASSIVE CUTTINGS HABIT;
EARTHY, DULL RESINOUS LUSTER; SILTY
CLAYEY TEXTURE; TRACES BLACK LITHIC
IMBEDDED; GAS BUBBLES IN TRAY SAMPLE.
SANDSTONE = LIGHT BLUISH GRAY, MOTTLED
OFF WHITE, CLEAR, TRANSLUCENT; QUARTZ
FRAMEWORK; UPPER VERY FINE, LOWER
FINE GRAIN; WELL SORTED; SUB ANGULAR
TO SOME SUB ROUND, LOW SPHERICITY;
DULL FROSTED SURFACE FEATURE; SOME
UNCONSOLIDATED, FRIABLE IN PART; SILICIA
MATRIX CEMENT; WEAK TO FAIR GRAIN
SUPPORT; DISSEMINATED BLACK CARBON-
ACEOUS SHALE IMBEDDED; POOR TO FAIR
INTER GRANULAR POROSITY.
SILTSTONE = LIGHT BLUISH GRAY, LIGHT
GRAY, PALE BLUISH; LOWER VERY FINE GRAIN
CRUMBLY, BRITTLE TENACITY; SUB BLOCKY,

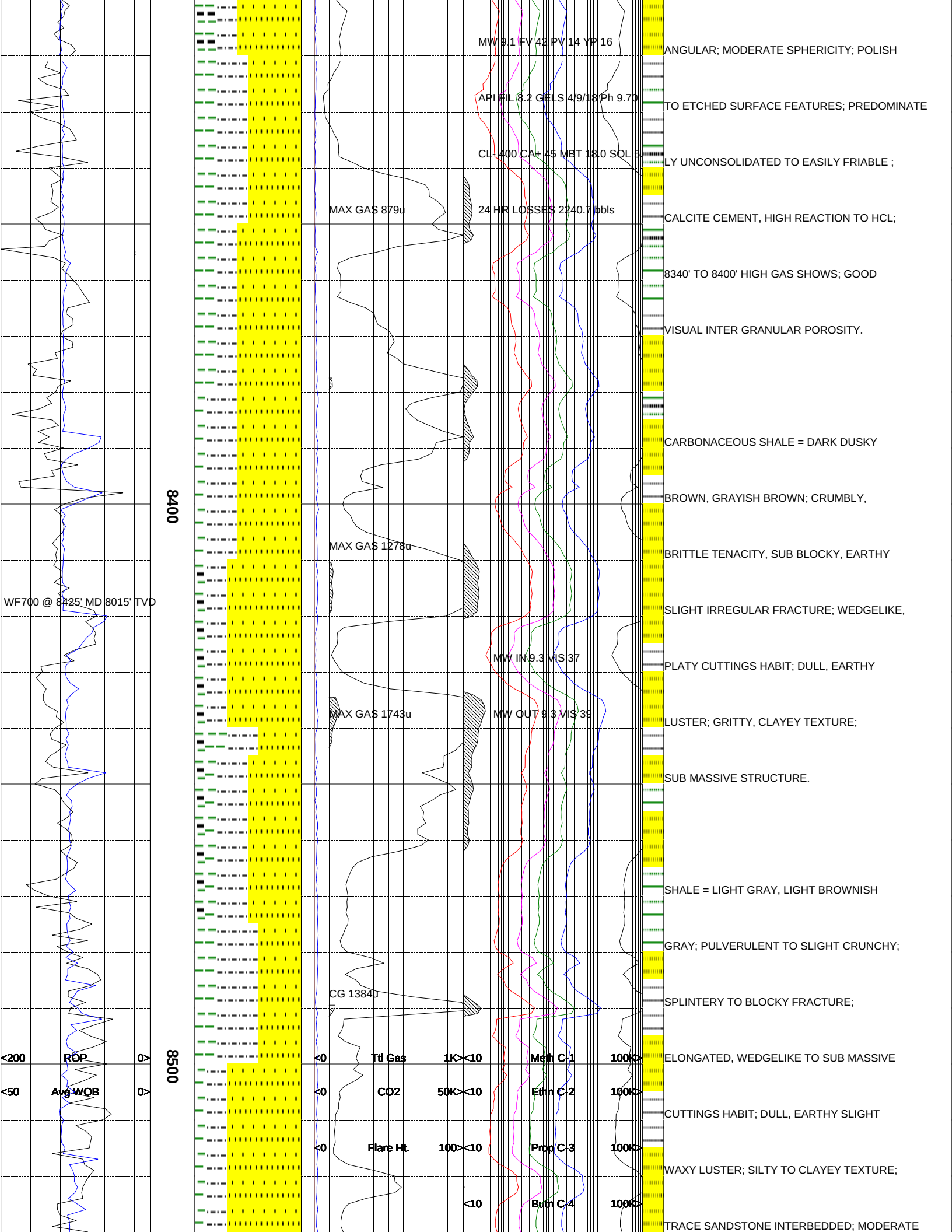

BLOCKY, SLIGHT IRREGUALR FRACTRUE;
MW IN 9.2 VIS 36
TABULAR, WEDGELIKE CUTTINGS HABIT;
MW OUT 9.0 VIS 35
RESINOUS, DULL LUSTER; SILTY, SMOOTH
TEXTURE, THIN, SUB MASSIBE STRUCTURE.
C-5,4,3,2,1
SHALE = MODERATELY YELLOWISH BROWN,
PALE YELLOWISH BROWN; PULVERULENT,
CRUNCHY, SOME BRITTLE TENACITY, SUB
7300
BLOCKY, BLOCKY FRACTURE; TABULAR,
WEDGELIKE CUTTINGS HABIT; DULL, SUB
WAXY LUSTER; SMOOTH, CLAYEY TEXTURE;
SUB MASSIVE STRUCTURE.
REPAIR #2 PUMP
REPAIR #2 PUMP
DOWNTIME GAS 603u
MORNING TOUR
SILTSTONE = LIGHT TO MEDIUM GRAY; SOFT
TO CRUMBLY; SLI PLATY TO FLAKY CUTTINGS;
IRREGULAR FRACTURE; DULL TO WAXY TO SLI
SPARKLING LUSTER; SILTY TEXTURE; NON TO
7400
VSL CALCAREOUS; VF SCATTERED BLACK CARB
MW IN 9.1 VIS 39
MATERIAL; VF MICA; SILTY TEXTURE; SOME
MW OUT 9.0+ VIS 38
REDBROWN SILTSTONE- OCC SANDY WITH

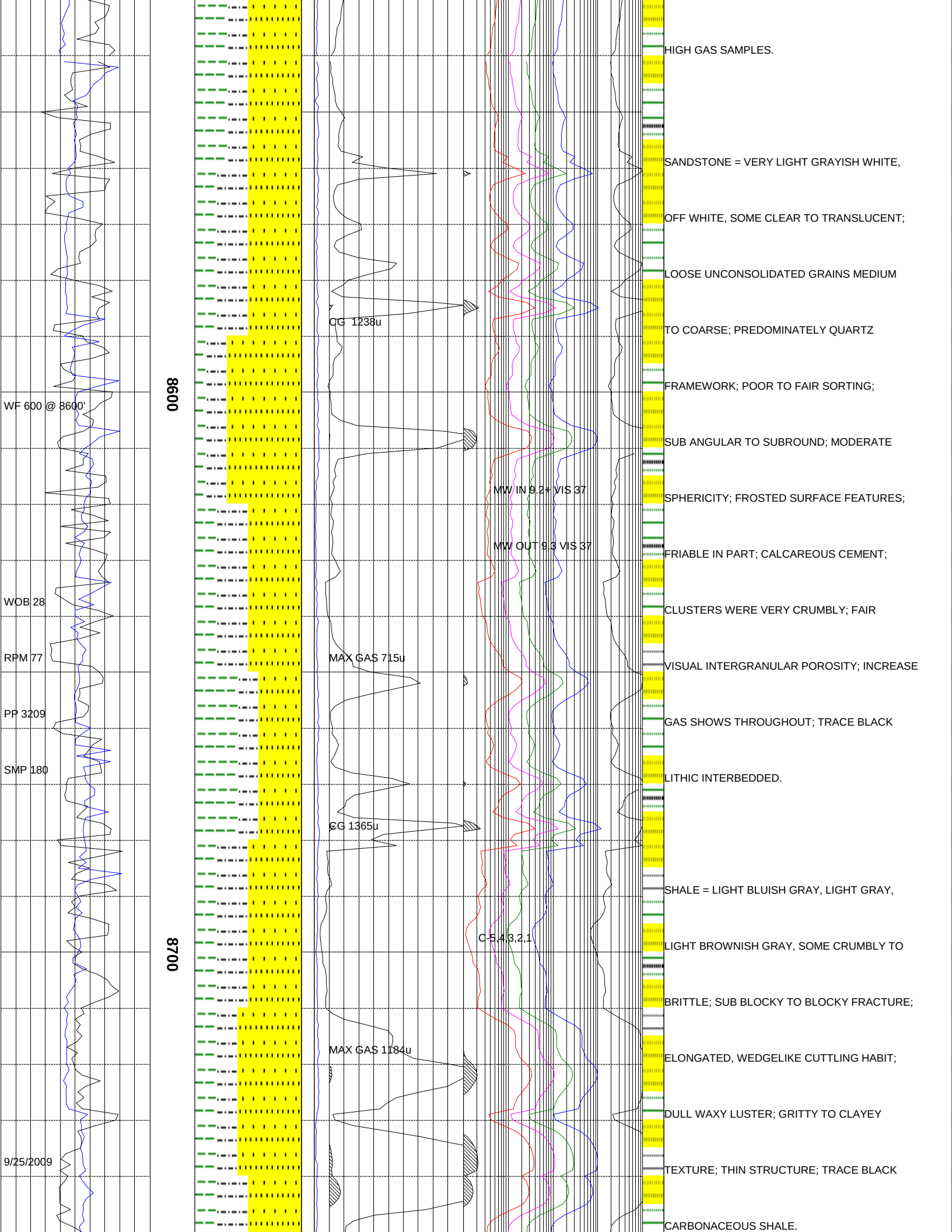

<200 ROP 0>
<50 Avg WOB 0>
7500
7600
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
CG 163u
C-5,4,3,2,1
OHIO CREEK @ 7547'
CG 138u
DECREASE FLOW @ 7610'
MW IN 9.1+ VIS 42
MW OUT 9.1+ VIS 40
CG 187u
ISOLATED QUARTZ GRAINS; NO VISIBLE
STRUCTURE.
SHALE = LIGHT GRAY TO LIGHT GREENISH
GRAY; FIRM TO SLI HARD; PLATY TO FLAKY
CUTTINGS; IRREGULAR FRACTURE; DULL
TO WAXY LUSTER; NON CALCAREOUS; SMOOTH
TO ROUGH TEXTURE; VARIABLE AMOUNTS OF
SILT; SOME REDBROWN SILTSTONE.
OHIO CREEK @ 7547'MD 7137' TVD
SANDSTONE = LIGHT GRAY TO WHITE; COM
SPECKLED WITH BLACK CARB MAT AND
UNIDENT GRAINS; LOWER MEDIUM TO FINE
GRAINED; ANGULAR TO SUBANGULAR GRAINS;
MOD WELL SORTED; GRAIN SUPPORTED;
DOM CALCITE CEMENT; SME MICA; SME
UNIDENT GREEN GRAINS; LITTLE LOOSE
SAND GRAINS; SOME BLACK CARBONACEOUS
LAMINATIONS; ASSOCIATED WITH ONLY MINOR
GAS.

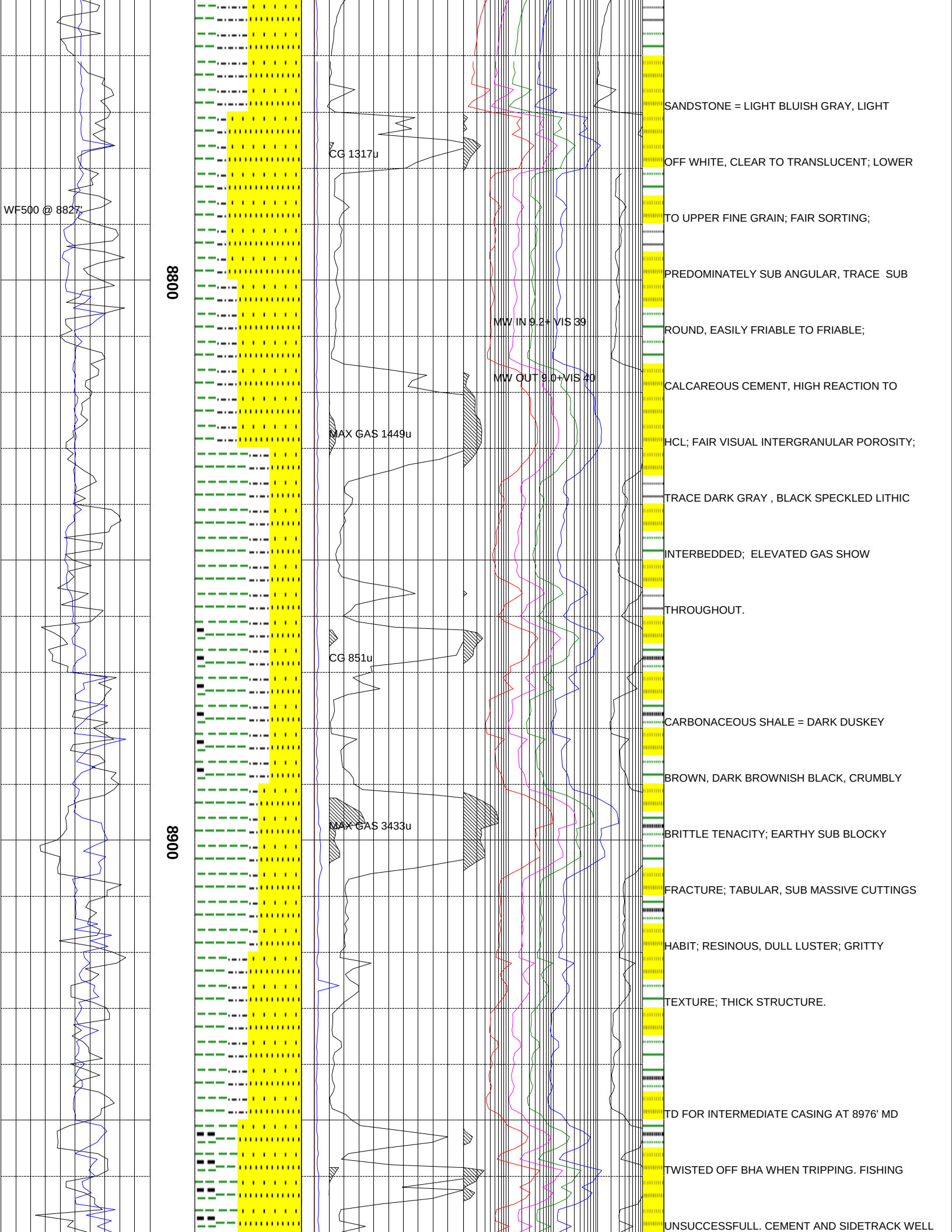

MAJOR REDUCED FLOW
C-5,4,3,2,1
FROM 7663' T0 7710'
7700
MAX GAS 539u
WF 850 PLACED AT 7744'
CG 435u
7800
MW IN 9.1 VIS 40
CG 451u
MW OUT 9.1 VIS 42
SANDSTONE = INCREASE IN GRAIN SIZE; LT
GRAY TO WHITE; ABUNDANT LOOSE GRAINS;
UPPER MEDIUM TO LOWER MEDIUM GRAINED;
ANGULAR TO SUBANGULAR; MOD WELL SRTD;
GRAIN SUPPORTED; TRACE GREEN GRAINS;
3% UNIDENTIFIED BLACK GRAINS; SOME
REDBROWN LITHIC FRAGMENTS; SME REDDISH
GRAINS; SOME COARSE CHERT; LOOSE COARSE
EUHEDRAL QUARTZ AND COARSE CALCITE IN
THE 7660' TO 7690' SAMPLE AND THE 7720'
SAMPLE- PROBABLE FRACTURE FILL; ASSOC
WITH MINOR GAS INCREASES.
SHALE = LIGHT TO MEDIUM GRAY; LT BROWN;
LIGHT GREENISH GRAY; FIRM TO MODERATELY
HARD; PLATY TO FLAKY CUTTINGS; DULL
EARTHY TO WAXY LUSTER; VF CARB MAT;
SMOOTH TO ROUGH TEXTURE; NON TO VSLI
CALCAREOUS; NO VISIBLE STRUCTURE.
SILTSTONE = LIGHT GREEN; LIGHT GREENISH


7900
8000
WOB 13-24K
RPM 95-100
PP 3000
GPM 808
<200 ROP 0>
<50 Avg WOB 0>
WF 800 PLACED AT 8066'
CG 298u
MAX GAS 1987u
CG 2416u
MAX GAS 828u
C-5,4,3,2,1
C-5,4,3,2,1
<0 Ttl Gas 1K><10
<0 CO2 50K><10
<0 Flare Ht. 100><10
Meth C-1 100K>
Eth C-2 100K>
Prop C-3 100K>
<10 Bum C-4 100K>
<10 Pent C-5 100K>
MW IN 9.1+ VIS 42
MW OUT 9.1 VIS 40
GRAY; SME MEDIUM GRAY TO LIGHT BROWN;
FIRM; PLATY TO FLAKY CUTTINGS; IRREGULAR
FRACTURE; DULL WAXY LUSTER; NON CALC;
SILTY TEXTURE; SME ISOLATED FINE TO MED
QUARTZ GRAINS IN MATRIX; OCC SPECKLED
WITH CARBONACEOUS MATERIAL; NO VISIBLE
STRUCTURE.
SANDSTONE = LIGHT GRAY TO OFF WHITE;
ABNT LOOSE GRAINS; UPPER MEDIUM TO LOWER
MEDIUM; MOD WELL SORTED; DOM CALCITE
CEMENT; ANGULAR TO SUB ROUNDED; GRAIN
SUPPORTED; SME CHORITIZED GRAINS; SOME
SCATTERED BLACK UNIDENTIFIED GRAINS;
TRACE AMOUNTS OF WHITE KAOLIN FILL;
SAND INTERVAL FROM 7990' TO 8000' SHOWED
VERY HIGH ROP VALUES W/ MAX GAS AT 1987u
COARSE CALCITE IN THE 7960' TO 8010'
SAMPLES- PROBABLY FRACTURE FILL.
SHALE = LT GREEN TO LIGHT GRAY; SME
MEDIUM GRAY TO BLACK; FIRM; SME VERY


8100
8200
8300
FIRST WF 800 SANDSTONE
CG 2051u
CG 1813u
MW IN 9.1 VIS 39
MW OUT 9.0+ VIS 42
MAX GAS 2489u
C-5,4,3,2,1
MAX GAS 1404u
MUD DATA @ 8263'
HARD SILICEOUS SPECIMENS; IRREGULAR
FRACTURE; WAXY TO DULL EARTHY LUSTER;
ROUGH TO OCC SLI SILTY TEXTURE.
SANDSTONE = ABUNDANT LOOSE GRAINS;
LIGHT GRAY TO GRAYISH WHITE; UPPER
TO LOWER MEDIUM GRAINED; SME LOOSE
LOWER COARSE GRAINS; ANGULAR TO
SUBROUNDED; MOD WELL SORTED; DOM
CALCITE CEMENT; SOME LOOSE WHITE KAOLIN
MATRIX MATERIAL; TRACE GREEN GRAINS; TR
CHERT; WF800 EXHIBITS GOOD ROP SUGGESTS
GOOD POROSITY; ASSOCIATED WITH GOOD
GAS INCREASES; COARSE CALCITE IN THE
8170' TO 8230' SAMPLES- PROBABLE
FRACTURE FILL.
SANDSTONE = ABNT CLEAR TRANSLUCENT
LOOSE GRAINS, GRAYISH OFF WHITE, TRACE
BLACK LITHIC IMBEDDED; UPPER MEDIUM TO
LOWER COARSE GRAINS; FAIR TO WELL SORTED
PREDOMINATELY SUB ROUNDED, TRACE SUB


MW 9.1 FV 42 PV 14 YP 16
API FIL 8.2 GELS 4/9/18 Ph 9.70
CL- 400 CA+ 45 MBT 18.0 SOL 5.
MAX GAS 879u
24 HR LOSSES 2240.7 bbls
8400
MAX GAS 1278u
WF700 @ 8425' MD 8015' TVD
MW IN 9.3 VIS 37
MAX GAS 1743u
MW OUT 9.3 VIS 39
CG 1384u
8500
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 1K><10 Meth C-1 100K>
<0 CO2 50K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
ANGULAR; MODERATE SPHERICITY; POLISH
TO ETCHED SURFACE FEATURES; PREDOMINATE
LY UNCONSOLIDATED TO EASILY FRIABLE ;
CALCITE CEMENT, HIGH REACTION TO HCL;
8340' TO 8400' HIGH GAS SHOWS; GOOD
VISUAL INTER GRANULAR POROSITY.
CARBONACEOUS SHALE = DARK DUSKY
BROWN, GRAYISH BROWN; CRUMBLY,
BRITTLE TENACITY, SUB BLOCKY, EARTHY
SLIGHT IRREGULAR FRACTURE; WEDGELIKE,
PLATY CUTTINGS HABIT; DULL, EARTHY
LUSTER; GRITTY, CLAYEY TEXTURE;
SUB MASSIVE STRUCTURE.
SHALE = LIGHT GRAY, LIGHT BROWNISH
GRAY; PULVERULENT TO SLIGHT CRUNCHY;
SPLINTERY TO BLOCKY FRACTURE;
ELONGATED, WEDGELIKE TO SUB MASSIVE
CUTTINGS HABIT; DULL, EARTHY SLIGHT
WAXY LUSTER; SILTY TO CLAYEY TEXTURE;
TRACE SANDSTONE INTERBEDDED; MODERATE


8600
8700
WF 600 @ 8600'
WOB 28
RPM 77
PP 3209
SMP 180
9/25/2009
CG 1238u
MW IN 9.2+ VIS 37
MW OUT 9.3 VIS 37
MAX GAS 715u
CG 1365u
C-5,4,3,2,1
MAX GAS 1184u
HIGH GAS SAMPLES.
SANDSTONE = VERY LIGHT GRAYISH WHITE,
OFF WHITE, SOME CLEAR TO TRANSLUCENT;
LOOSE UNCONSOLIDATED GRAINS MEDIUM
TO COARSE; PREDOMINATELY QUARTZ
FRAMEWORK; POOR TO FAIR SORTING;
SUB ANGULAR TO SUBROUND; MODERATE
SPHERICITY; FROSTED SURFACE FEATURES;
FRIABLE IN PART; CALCAREOUS CEMENT;
CLUSTERS WERE VERY CRUMBLY; FAIR
VISUAL INTERGRANULAR POROSITY; INCREASE
GAS SHOWS THROUGHOUT; TRACE BLACK
LITHIC INTERBEDDED.
SHALE = LIGHT BLUISH GRAY, LIGHT GRAY,
LIGHT BROWNISH GRAY, SOME CRUMBLY TO
BRITTLE; SUB BLOCKY TO BLOCKY FRACTURE;
ELONGATED, WEDGELIKE CUTTLING HABIT;
DULL WAXY LUSTER; GRITTY TO CLAYEY
TEXTURE; THIN STRUCTURE; TRACE BLACK
CARBONACEOUS SHALE.


WF500 @ 8827'
8800
8900
CG 1317u
MW IN 9.2+ VIS 39
MW OUT 9.0+VIS 40
MAX GAS 1449u
CG 851u
MAX GAS 3433u
SANDSTONE = LIGHT BLUISH GRAY, LIGHT
OFF WHITE, CLEAR TO TRANSLUCENT; LOWER
TO UPPER FINE GRAIN; FAIR SORTING;
PREDOMINATELY SUB ANGULAR, TRACE SUB
ROUND, EASILY FRIABLE TO FRIABLE;
CALCAREOUS CEMENT, HIGH REACTION TO
HCL; FAIR VISUAL INTERGRANULAR POROSITY;
TRACE DARK GRAY , BLACK SPECKLED LITHIC
INTERBEDDED; ELEVATED GAS SHOW
THROUGHOUT.
CARBONACEOUS SHALE = DARK DUSKEY
BROWN, DARK BROWNISH BLACK, CRUMBLY
BRITTLE TENACITY; EARTHY SUB BLOCKY
FRACTURE; TABULAR, SUB MASSIVE CUTTINGS
HABIT; RESINOUS, DULL LUSTER; GRITTY
TEXTURE; THICK STRUCTURE.
TD FOR INTERMEDIATE CASING AT 8976' MD
TWISTED OFF BHA WHEN TRIPPING. FISHING
UNSUCCESSFULL. CEMENT AND SIDETRACK WELL