**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** | FRU197-33B1 |
| **FIELD** | PICEANCE CREEK |
| **REGION** | ROCKIES |
| **COORDINATES** | 39.921453000 |
| | -108.282474000 |
| **ELEVATION** | GL: 6459.5' |
| | RKB: 30.2' |
| **COUNTY, STATE** | RIO BLANCO, CO |
| **API INDEX** | 051031142800 |
| **SPUD DATE** | 06/19/2010 |
| **CONTRACTOR** | HP |
| **CO. REP.** | CANDANCE CURTIS |
| **RIG/TYPE** | HP321 |
| **LOGGING UNIT** | MLU#31 |
| **GEOLOGISTS** | B.DELANEY |
| | C.RECORD |
| **ADD. PERSONS** | M.FRANCO |
| **CO. GEOLOGIST** | CHRIS ALBA |

## LOG INTERVAL

| | | | |
|---|---|---|---|
| **DEPTHS:** | 4083' | **TO** | 12912' |
| **DATES:** | 06/19/2010 | **TO** | 07/01/2010 |
| **SCALE:** | 5" = 100' | | |

## MUD TYPES

| | | |
|---|---|---|
| WATER-BASED | **TO** | 4083' |
| LSND | **TO** | 12912' |
| | **TO** | |
| | **TO** | |

## CASING DATA

| | | |
|---|---|---|
| 16" | **AT** | 150' |
| 10.75" | **AT** | 4077' |
| 5" | **AT** | 12890' |
| | **AT** | |

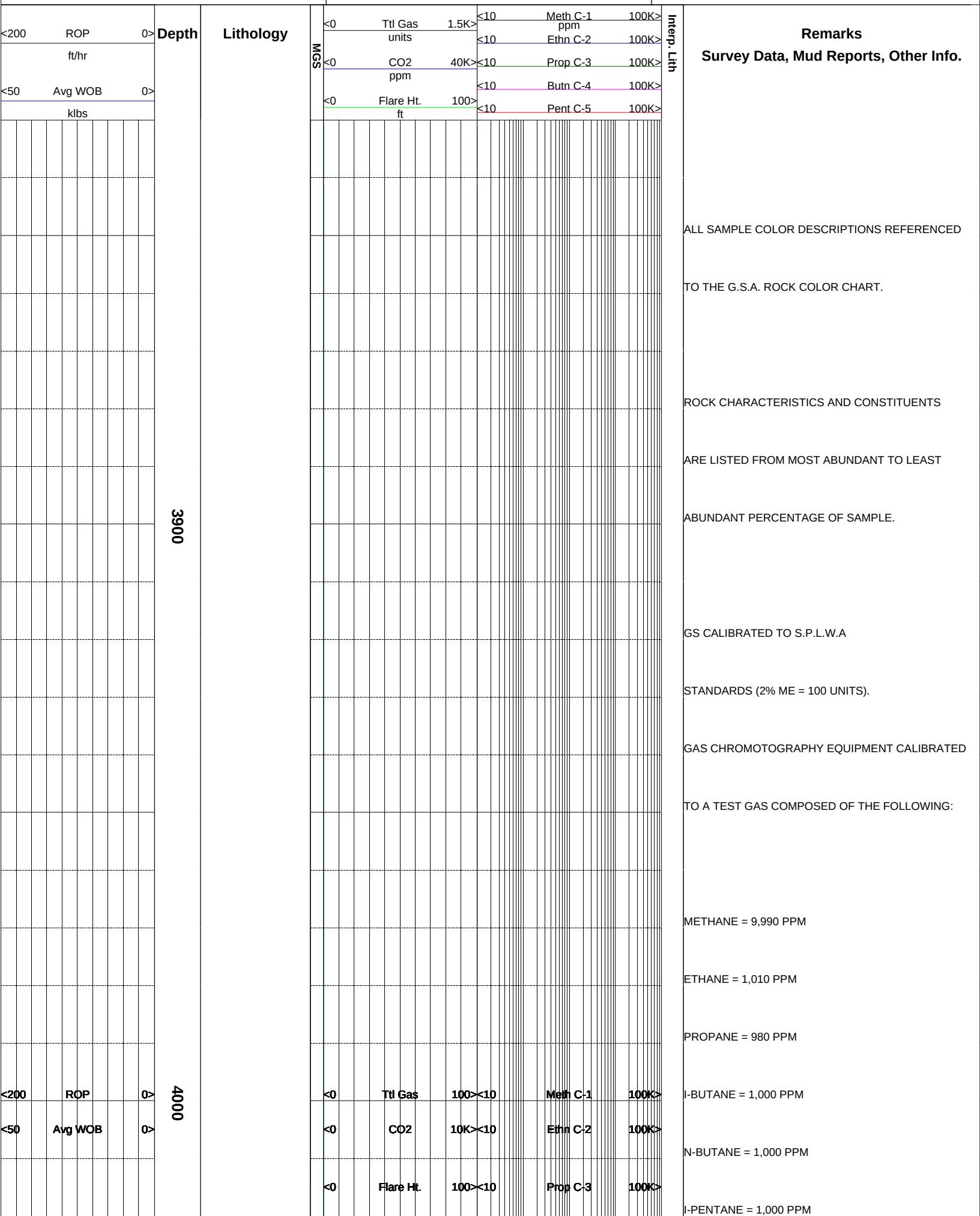
## HOLE SIZE

| | | |
|---|---|---|
| 14.75" | **TO** | 3934' |
| 8.75" | **TO** | 11147' |
| 7.875" | **TO** | 12912' |
| | **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 SAMPLE COLOR DESCRIPTIONS REFERENCED

TO THE G.S.A. ROCK COLOR CHART.

ROCK CHARACTERISTICS AND CONSTITUENTS

ARE LISTED FROM MOST ABUNDANT TO LEAST

ABUNDANT PERCENTAGE OF SAMPLE.

GS CALIBRATED TO S.P.L.W.A

STANDARDS (2% ME = 100 UNITS).

GAS CHROMOTOGRAPHY EQUIPMENT CALIBRATED

TO A TEST GAS COMPOSED OF THE FOLLOWING:

METHANE = 9,990 PPM

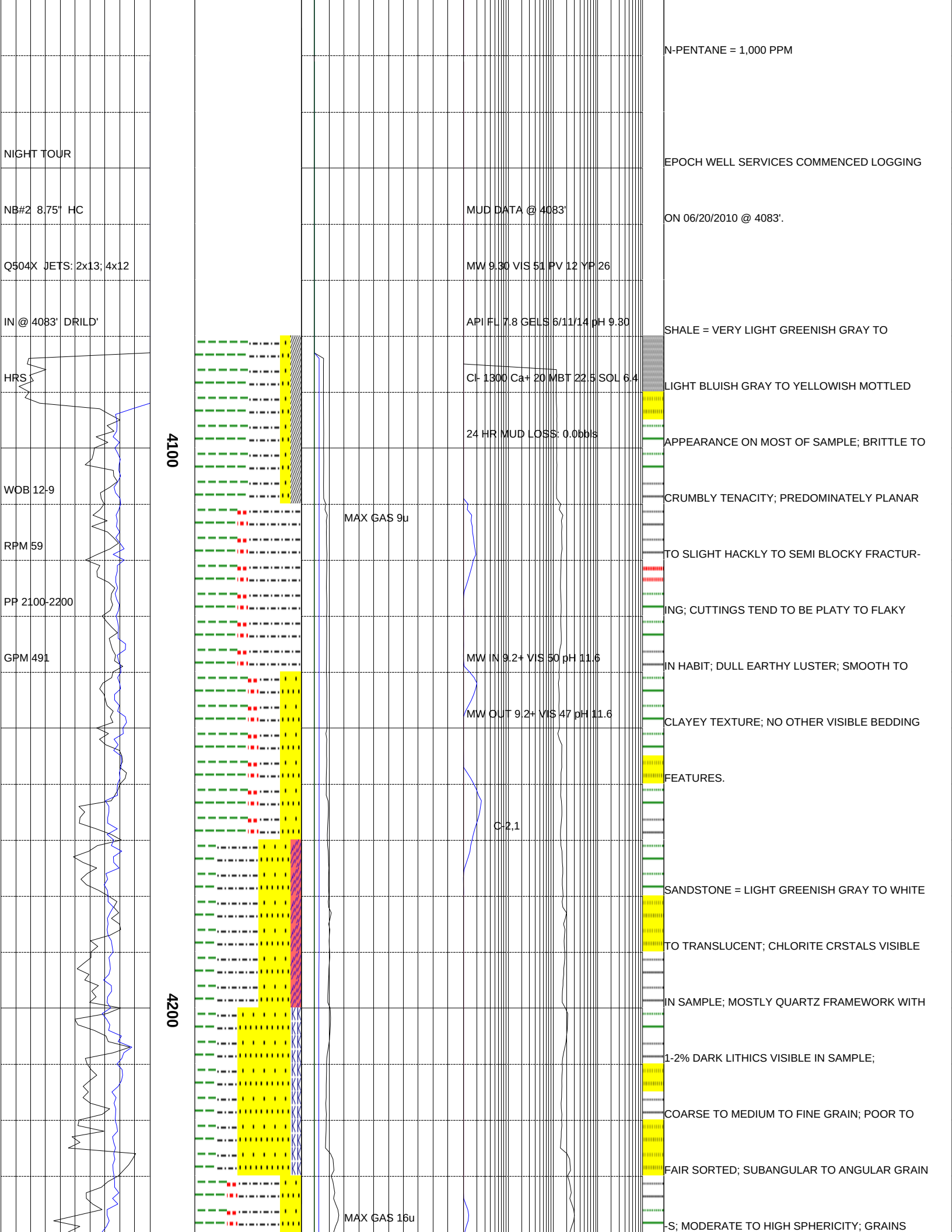
ETHANE = 1,010 PPM

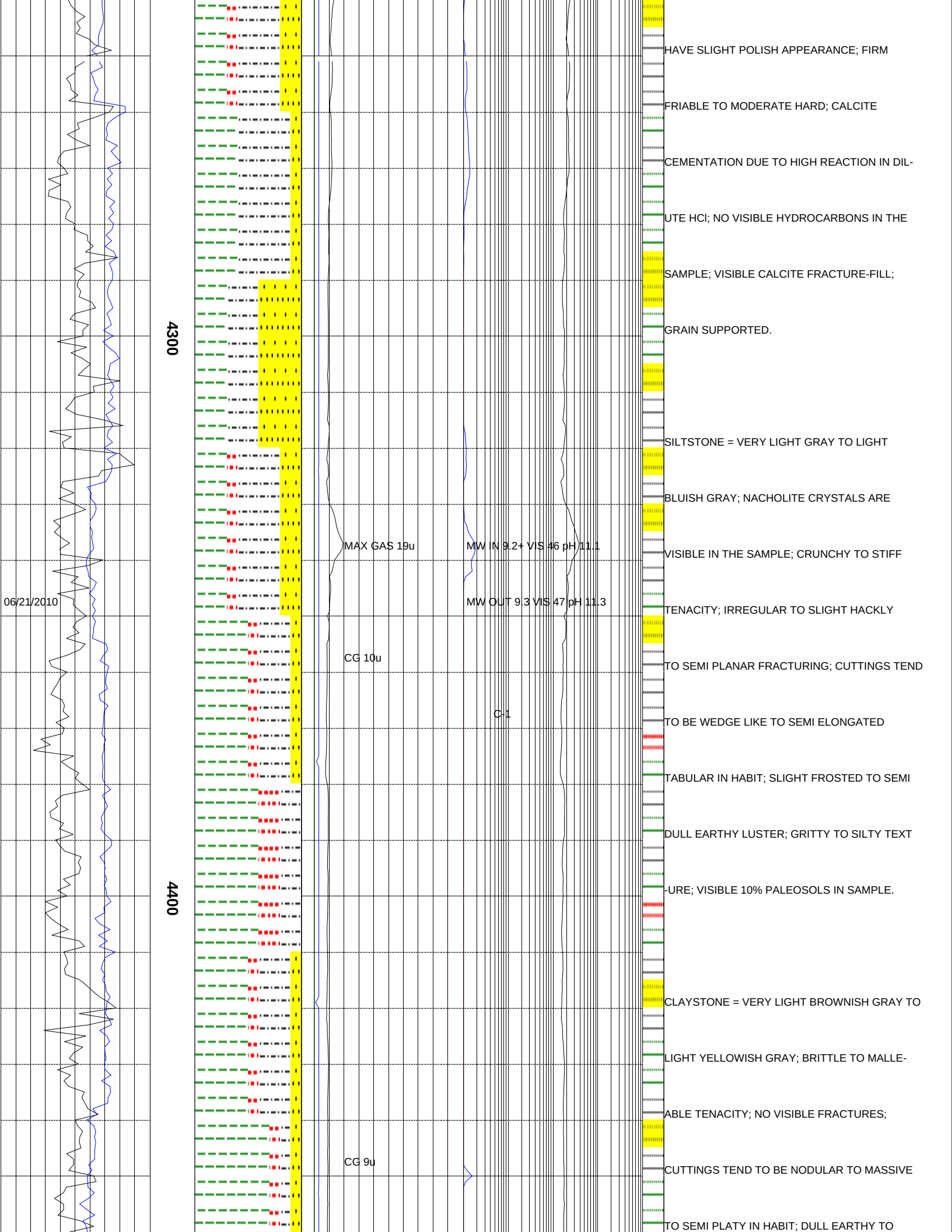
PROPANE = 980 PPM

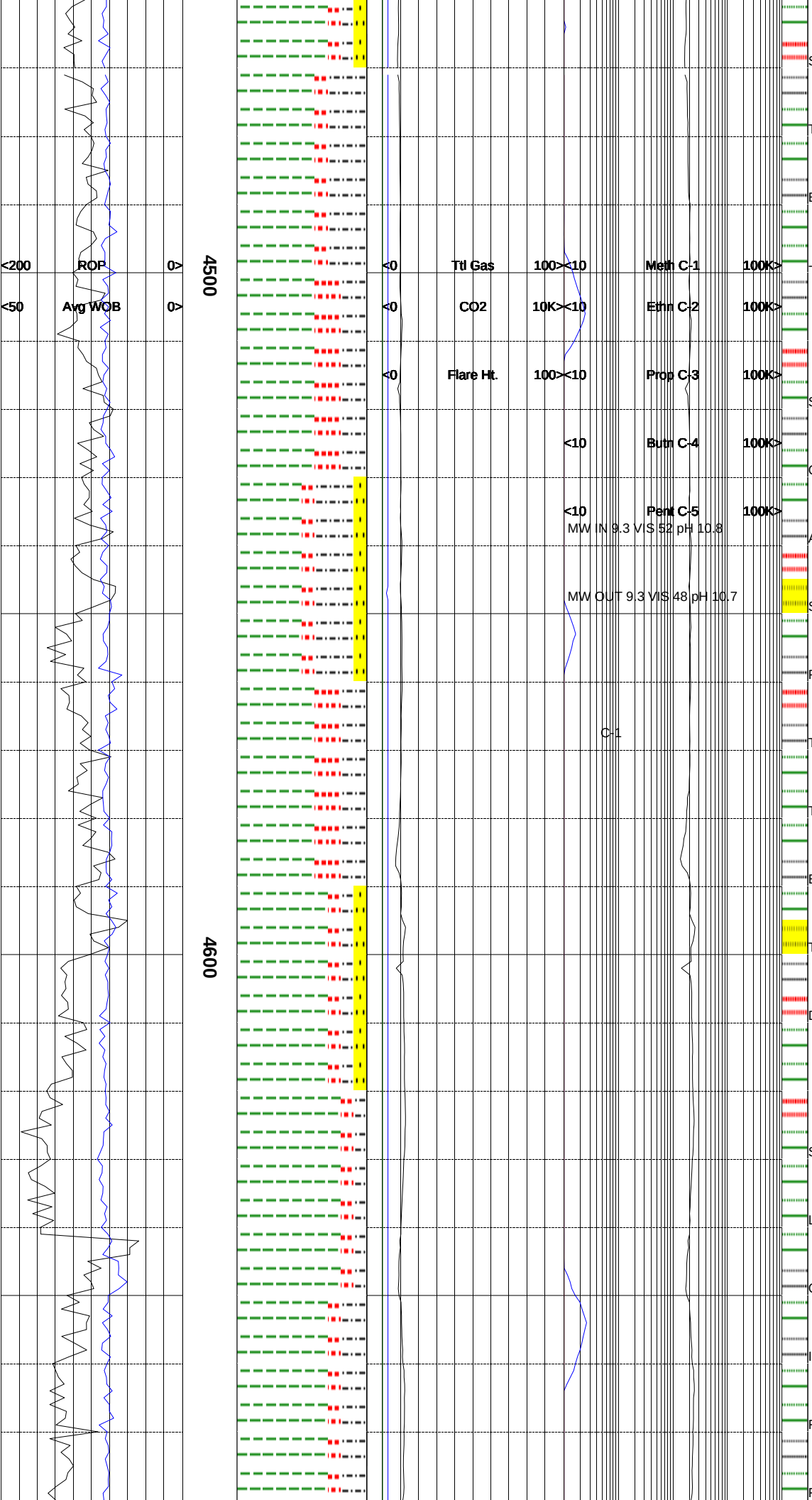
I-BUTANE = 1,000 PPM

N-BUTANE = 1,000 PPM

I-PENTANE = 1,000 PPM


N-PENTANE = 1,000 PPM
NIGHT TOUR
EPOCH WELL SERVICES COMMENCED LOGGING
NB#2 8.75" HC
MUD DATA @ 4083'
ON 06/20/2010 @ 4083'.
Q504X JETS: 2x13; 4x12
MW 9.30 VIS 51 PV 12 YP 26
IN @ 4083' DRILD'
API FL 7.8 GELS 6/11/14 pH 9.30
SHALE = VERY LIGHT GREENISH GRAY TO
HRS
Cl- 1300 Ca+ 20 MBT 22.5 SOL 6.4
LIGHT BLUISH GRAY TO YELLOWISH MOTTLED
24 HR MUD LOSS: 0.0bbls
APPEARANCE ON MOST OF SAMPLE; BRITTLE TO
4100
WOB 12-9
CRUMBLY TENACITY; PREDOMINATELY PLANAR
MAX GAS 9u
RPM 59
TO SLIGHT HACKLY TO SEMI BLOCKY FRACTUR-
PP 2100-2200
ING; CUTTINGS TEND TO BE PLATY TO FLAKY
GPM 491
MW IN 9.2+ VIS 50 pH 11.6
IN HABIT; DULL EARTHY LUSTER; SMOOTH TO
MW OUT 9.2+ VIS 47 pH 11.6
CLAYEY TEXTURE; NO OTHER VISIBLE BEDDING
FEATURES.
C-2,1
SANDSTONE = LIGHT GREENISH GRAY TO WHITE
TO TRANSLUCENT; CHLORITE CRSTALS VISIBLE
IN SAMPLE; MOSTLY QUARTZ FRAMEWORK WITH
4200
1-2% DARK LITHICS VISIBLE IN SAMPLE;
COARSE TO MEDIUM TO FINE GRAIN; POOR TO
FAIR SORTED; SUBANGULAR TO ANGULAR GRAIN
MAX GAS 16u
-S; MODERATE TO HIGH SPHERICITY; GRAINS


4300
4400
06/21/2010
MAX GAS 19u
MW IN 9.2+ VIS 46 pH 11.1
MW OUT 9.3 VIS 47 pH 11.3
CG 10u
C-1
CG 9u
HAVE SLIGHT POLISH APPEARANCE; FIRM
FRIABLE TO MODERATE HARD; CALCITE
CEMENTATION DUE TO HIGH REACTION IN DIL-
UTE HCl; NO VISIBLE HYDROCARBONS IN THE
SAMPLE; VISIBLE CALCITE FRACTURE-FILL;
GRAIN SUPPORTED.
SILTSTONE = VERY LIGHT GRAY TO LIGHT
BLUISH GRAY; NACHOLITE CRYSTALS ARE
VISIBLE IN THE SAMPLE; CRUNCHY TO STIFF
TENACITY; IRREGULAR TO SLIGHT HACKLY
TO SEMI PLANAR FRACTURING; CUTTINGS TEND
TO BE WEDGE LIKE TO SEMI ELONGATED
TABULAR IN HABIT; SLIGHT FROSTED TO SEMI
DULL EARTHY LUSTER; GRITTY TO SILTY TEXT
-URE; VISIBLE 10% PALEOSOLS IN SAMPLE.
CLAYSTONE = VERY LIGHT BROWNISH GRAY TO
LIGHT YELLOWISH GRAY; BRITTLE TO MALLE-
ABLE TENACITY; NO VISIBLE FRACTURES;
CUTTINGS TEND TO BE NODULAR TO MASSIVE
TO SEMI PLATY IN HABIT; DULL EARTHY TO




SEMI GREASY LUSTER; CLAYEY TO SMOOTH

TO SEMI MATTE TEXTURE; NO OTHER VISIBLE

BEDDING FEATURES; 5-10% PALEOSOLS VISIBL

-E IN SAMPLE.

SHALE = PALE YELLOWISH BROWN TO LIGHT

OLIVE GRAY TO YELLOWISH GRAY; MOTTLED

APPEARANCE IS PRESENT THROUGH OUT THE

SAMPLE; BRITTLE TO CRUMBLY TENACITY;

PREDOMINATELY PLANAR TO SLIGHT HACKLY

TO SEMI BLOCKY FRACTURING; CUTTINGS TEND

TO BE PLATY TO FLAKY IN HABIT; DULL

EARTHY TO SLIGHT GREASY LUSTER; CLAYEY

TO SMOOTH TEXTURE; NO OTHER VISIBLE BED-

DING FEATURES.

SILTSTONE = PALE YELLOWISH BROWN TO

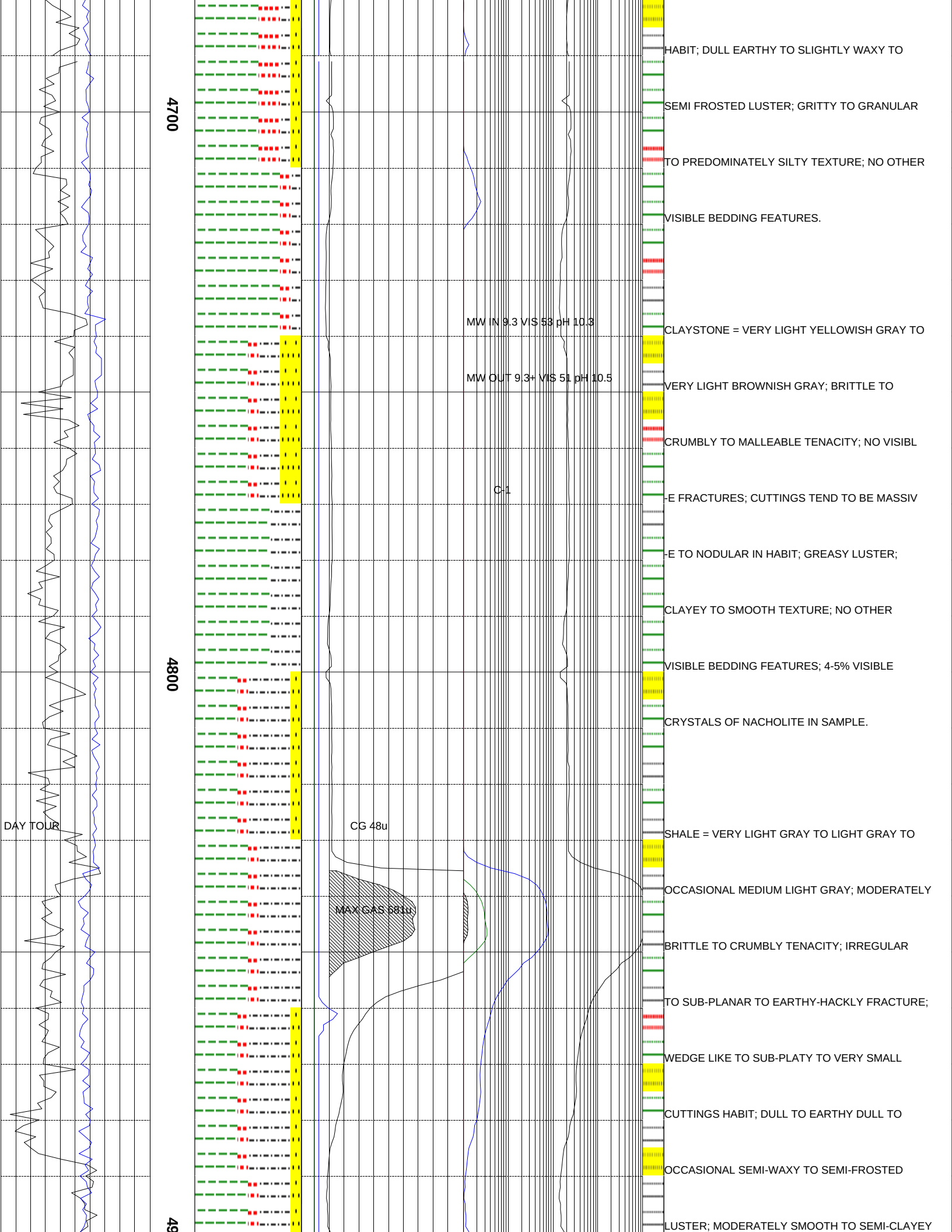
LIGHT GRAY TO OCCASIONALLY LIGHT BLUISH

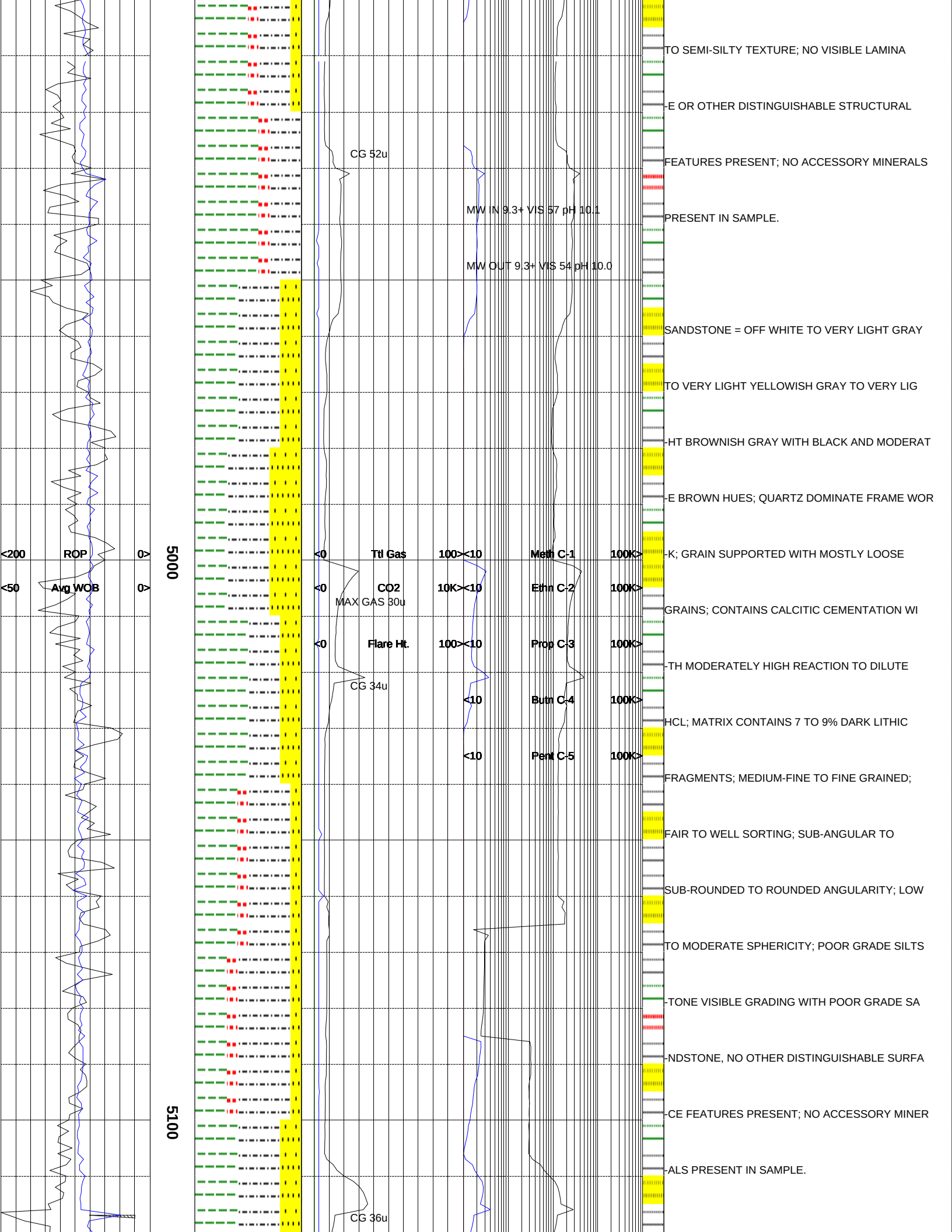
GRAY; CRUNCHY TO CRUMBLY TENACITY;

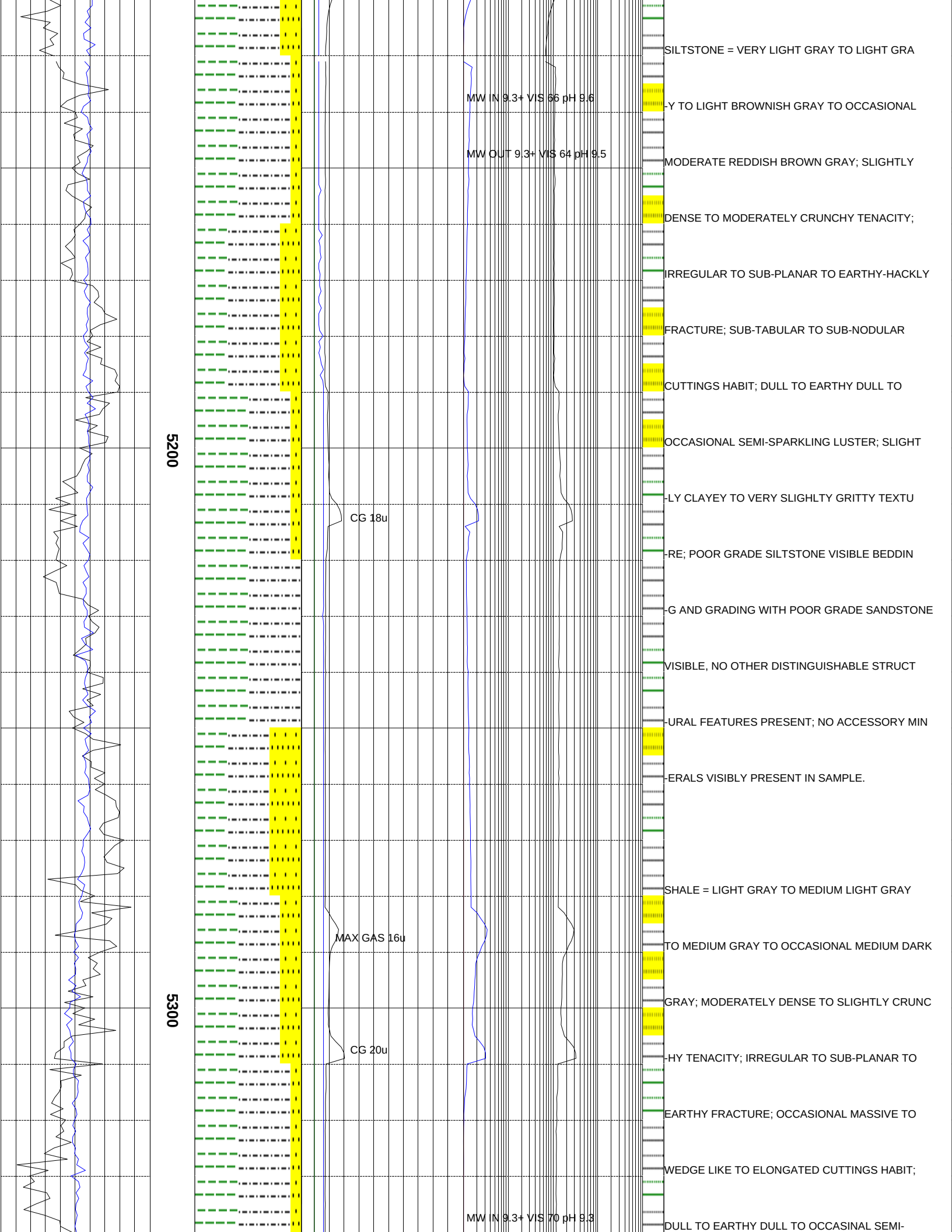
IRREGULAR TO PLANAR TO SEMI HACKLY

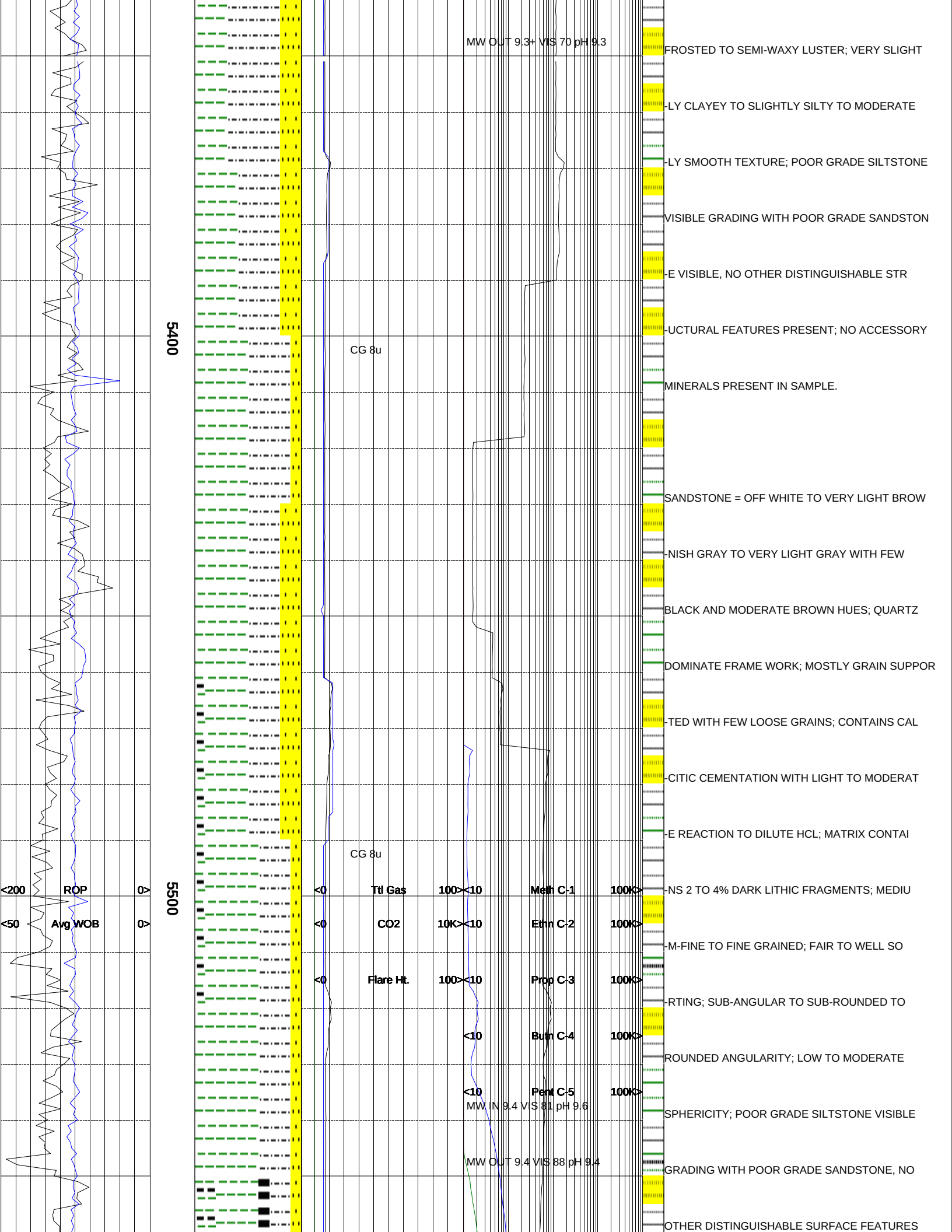
FRACTURING; CUTTINGS TEND TO BE PLATY TO

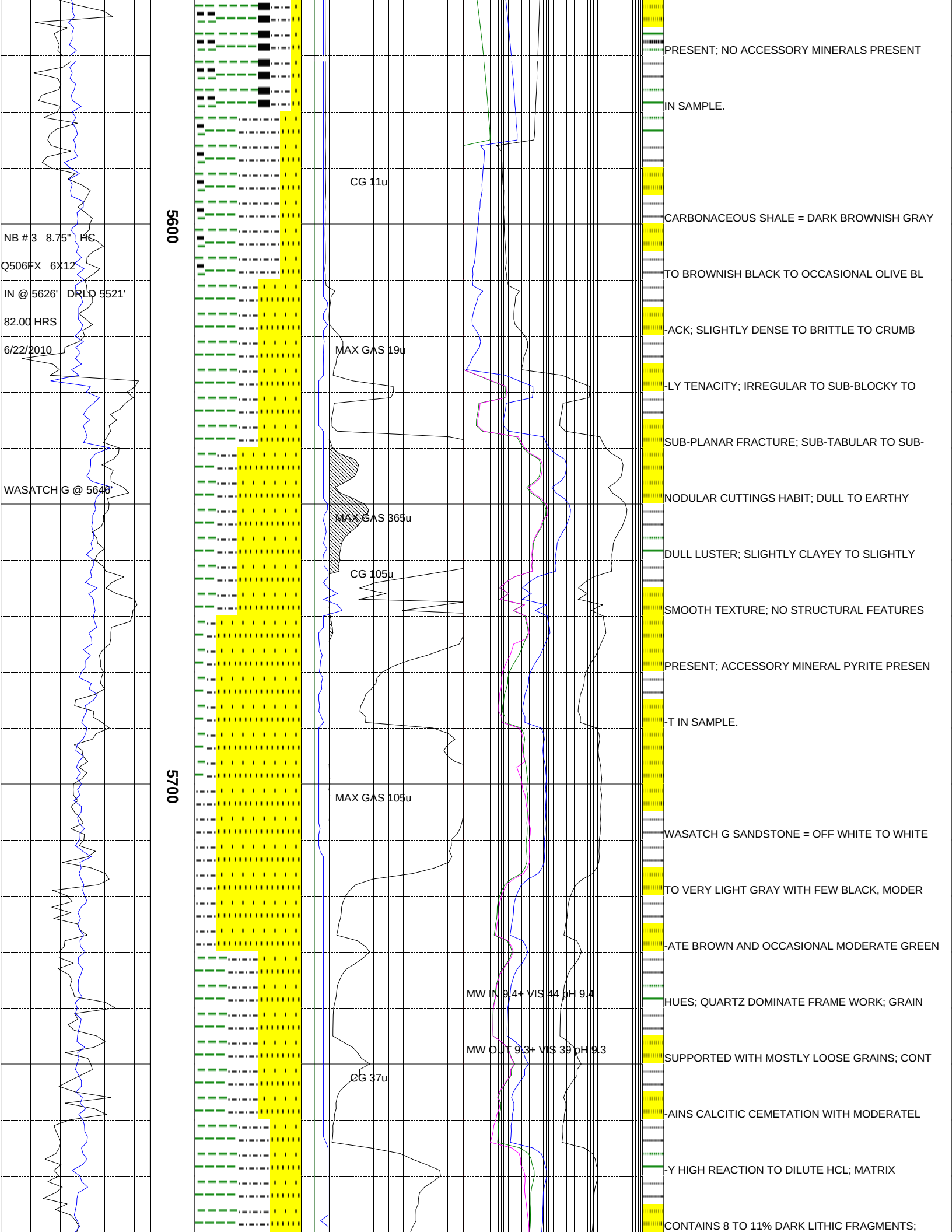
FLAKY TO PREDOMINATELY WEDGE-LIKE IN

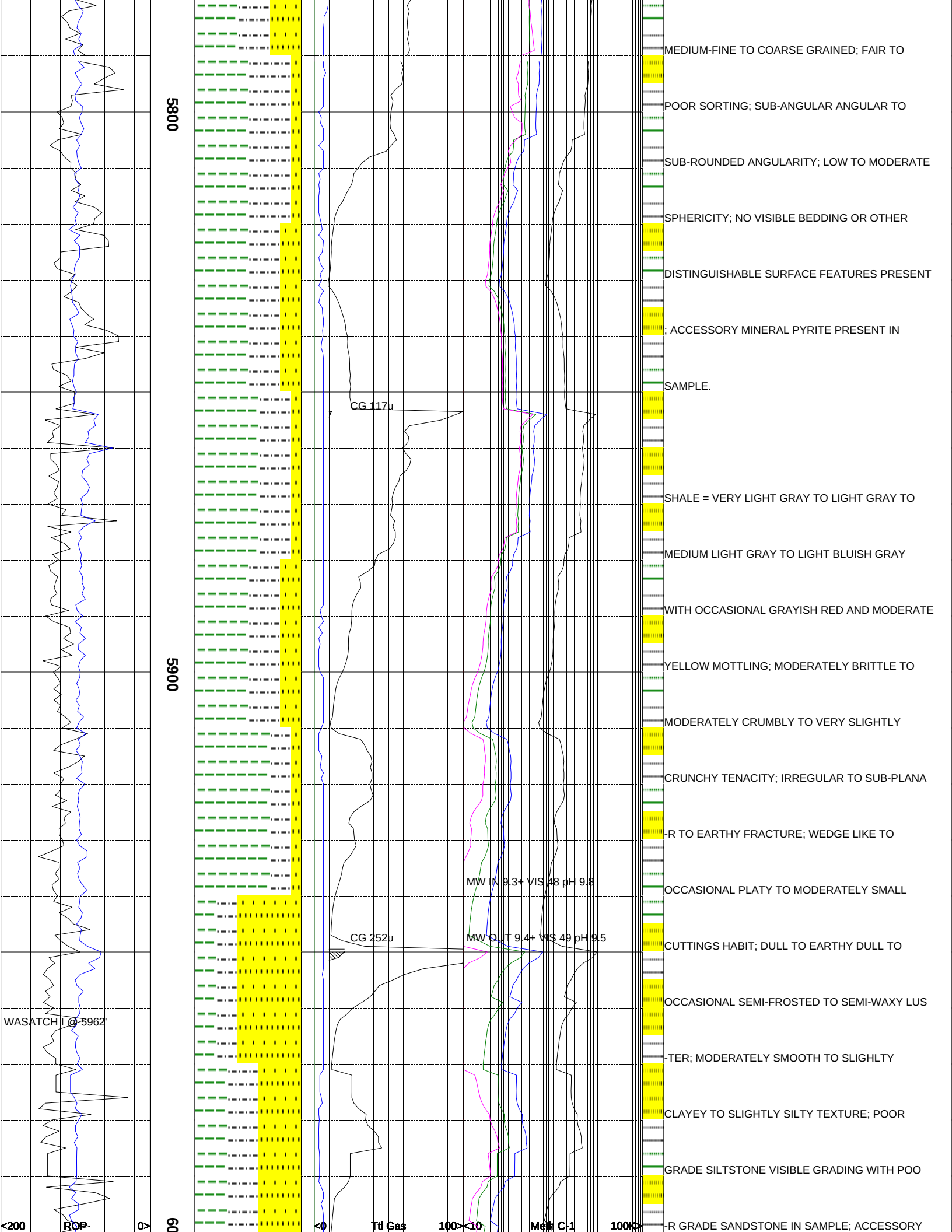

4700
4800
4900
MW IN 9.3 VIS 53 pH 10.3
MW OUT 9.3+ VIS 51 pH 10.5
C-1
DAY TOUR
CG 48u
MAX GAS 681u
HABIT; DULL EARTHY TO SLIGHTLY WAXY TO
SEMI FROSTED LUSTER; GRITTY TO GRANULAR
TO PREDOMINATELY SILTY TEXTURE; NO OTHER
VISIBLE BEDDING FEATURES.
CLAYSTONE = VERY LIGHT YELLOWISH GRAY TO
VERY LIGHT BROWNISH GRAY; BRITTLE TO
CRUMBLY TO MALLEABLE TENACITY; NO VISIBL
-E FRACTURES; CUTTINGS TEND TO BE MASSIV
-E TO NODULAR IN HABIT; GREASY LUSTER;
CLAYEY TO SMOOTH TEXTURE; NO OTHER
VISIBLE BEDDING FEATURES; 4-5% VISIBLE
CRYSTALS OF NACHOLITE IN SAMPLE.
SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO
OCCASIONAL MEDIUM LIGHT GRAY; MODERATELY
BRITTLE TO CRUMBLY TENACITY; IRREGULAR
TO SUB-PLANAR TO EARTHY-HACKLY FRACTURE;
WEDGE LIKE TO SUB-PLATY TO VERY SMALL
CUTTINGS HABIT; DULL TO EARTHY DULL TO
OCCASIONAL SEMI-WAXY TO SEMI-FROSTED
LUSTER; MODERATELY SMOOTH TO SEMI-CLAYEY

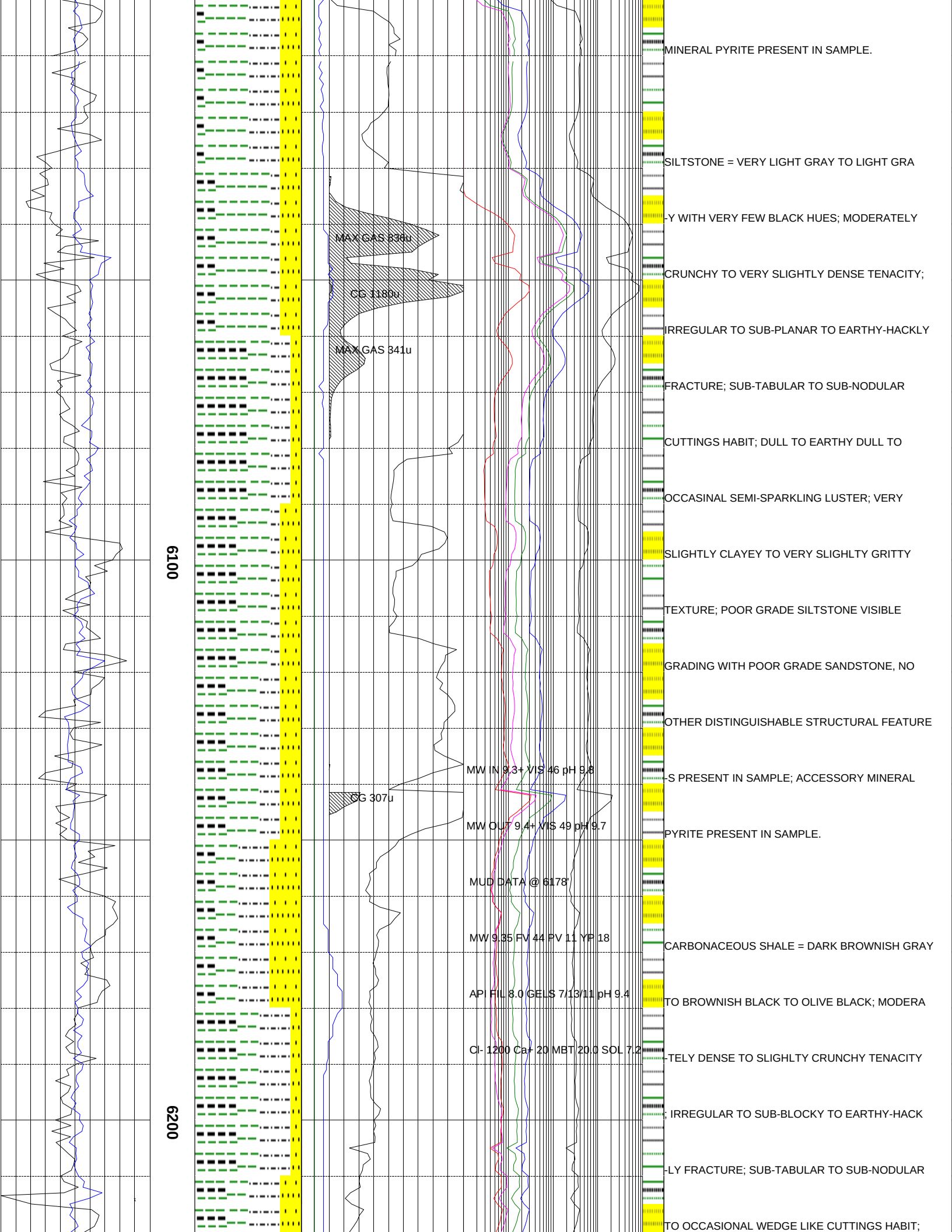

TO SEMI-SILTY TEXTURE; NO VISIBLE LAMINA
-E OR OTHER DISTINGUISHABLE STRUCTURAL
FEATURES PRESENT; NO ACCESSORY MINERALS
PRESENT IN SAMPLE.
CG 52u
MW IN 9.3+ VIS 57 pH 10.1
MW OUT 9.3+ VIS 54 pH 10.0
SANDSTONE = OFF WHITE TO VERY LIGHT GRAY
TO VERY LIGHT YELLOWISH GRAY TO VERY LIG
-HT BROWNISH GRAY WITH BLACK AND MODERAT
-E BROWN HUES; QUARTZ DOMINATE FRAME WOR
<200 ROP 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
-K; GRAIN SUPPORTED WITH MOSTLY LOOSE
5000
<50 Avg WOB 0>
<0 CO2 10K><10 Ethn C-2 100K>
MAX GAS 30u
GRAINS; CONTAINS CALCITIC CEMENTATION WI
<0 Flare Ht. 100><10 Prop C-3 100K>
-TH MODERATELY HIGH REACTION TO DILUTE
CG 34u
<10 Butn C-4 100K>
HCL; MATRIX CONTAINS 7 TO 9% DARK LITHIC
<10 Pent C-5 100K>
FRAGMENTS; MEDIUM-FINE TO FINE GRAINED;
FAIR TO WELL SORTING; SUB-ANGULAR TO
SUB-ROUNDED TO ROUNDED ANGULARITY; LOW
TO MODERATE SPHERICITY; POOR GRADE SILTS
-TONE VISIBLE GRADING WITH POOR GRADE SA
-NDSTONE, NO OTHER DISTINGUISHABLE SURFA
5100
-CE FEATURES PRESENT; NO ACCESSORY MINER
-ALS PRESENT IN SAMPLE.
CG 36u

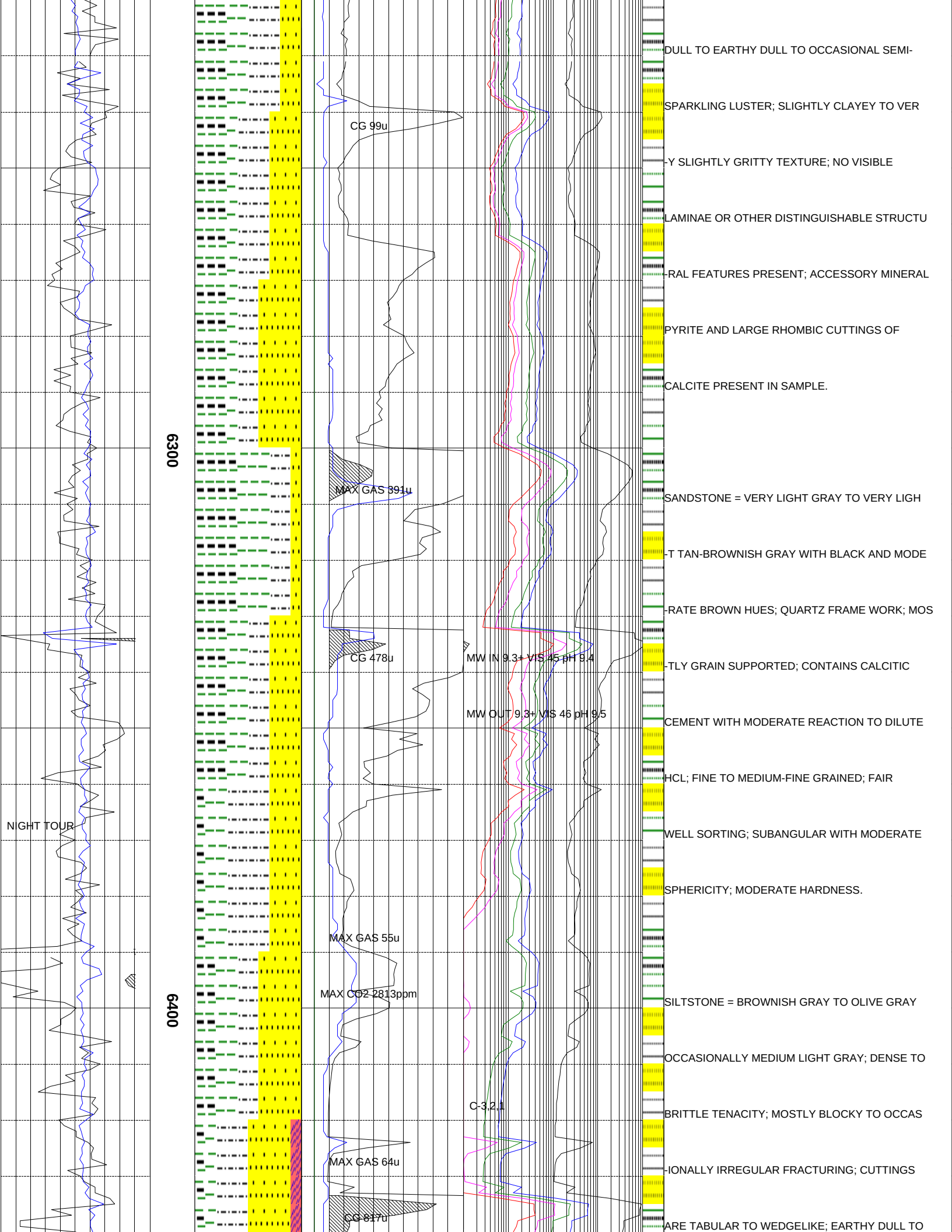

5200
5300
MW IN 9.3+ VIS 66 pH 9.6
MW OUT 9.3+ VIS 64 pH 9.5
CG 18u
MAX GAS 16u
CG 20u
MW IN 9.3+ VIS 70 pH 9.3
SILTSTONE = VERY LIGHT GRAY TO LIGHT GRA
-Y TO LIGHT BROWNISH GRAY TO OCCASIONAL
MODERATE REDDISH BROWN GRAY; SLIGHTLY
DENSE TO MODERATELY CRUNCHY TENACITY;
IRREGULAR TO SUB-PLANAR TO EARTHY-HACKLY
FRACTURE; SUB-TABULAR TO SUB-NODULAR
CUTTINGS HABIT; DULL TO EARTHY DULL TO
OCCASIONAL SEMI-SPARKLING LUSTER; SLIGHT
-LY CLAYEY TO VERY SLIGHLTY GRITTY TEXTU
-RE; POOR GRADE SILTSTONE VISIBLE BEDDIN
-G AND GRADING WITH POOR GRADE SANDSTONE
VISIBLE, NO OTHER DISTINGUISHABLE STRUCT
-URAL FEATURES PRESENT; NO ACCESSORY MIN
-ERALS VISIBLY PRESENT IN SAMPLE.
SHALE = LIGHT GRAY TO MEDIUM LIGHT GRAY
TO MEDIUM GRAY TO OCCASIONAL MEDIUM DARK
GRAY; MODERATELY DENSE TO SLIGHTLY CRUNC
-HY TENACITY; IRREGULAR TO SUB-PLANAR TO
EARTHY FRACTURE; OCCASIONAL MASSIVE TO
WEDGE LIKE TO ELONGATED CUTTINGS HABIT;
DULL TO EARTHY DULL TO OCCASINAL SEMI-

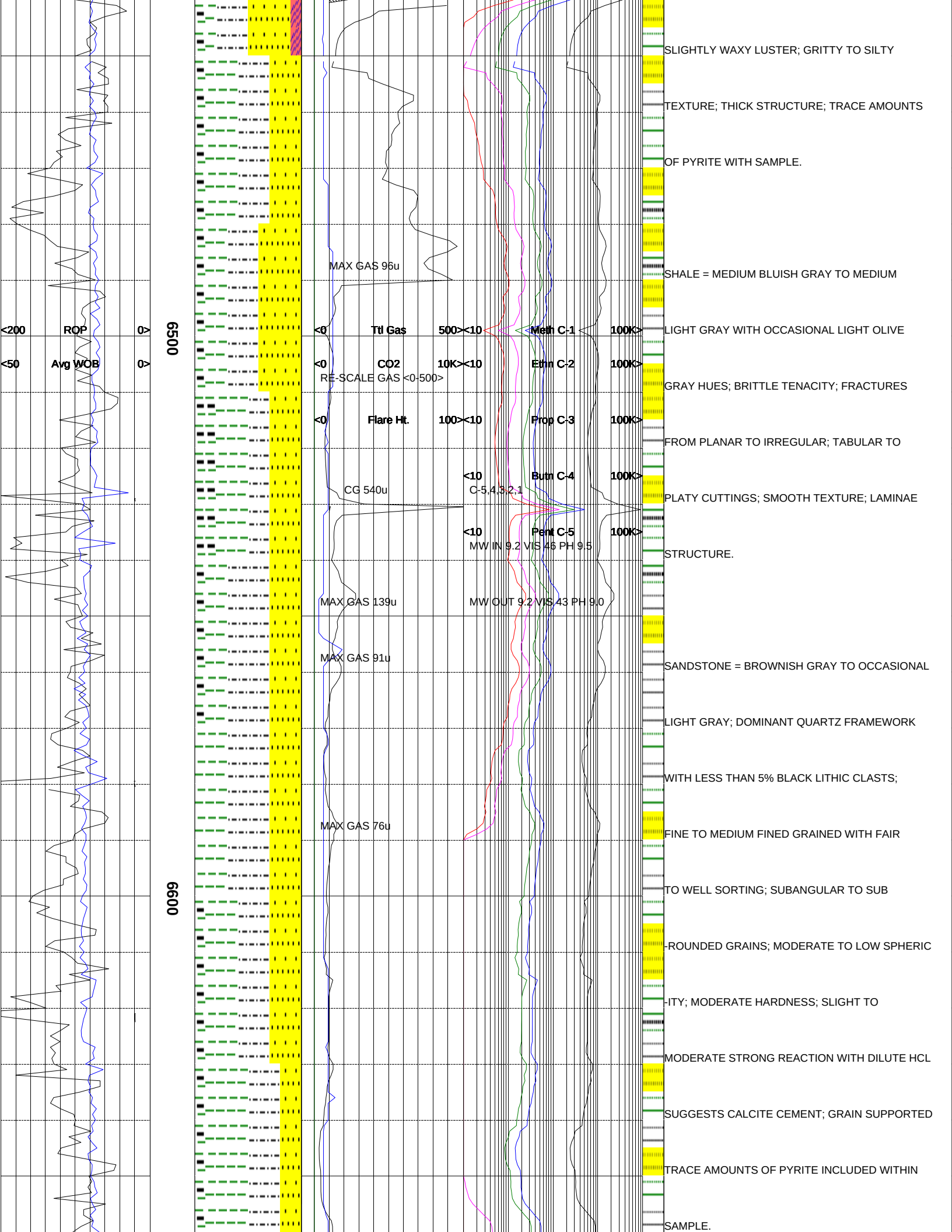

MW OUT 9.3+ VIS 70 pH 9.3
FROSTED TO SEMI-WAXY LUSTER; VERY SLIGHT
-LY CLAYEY TO SLIGHTLY SILTY TO MODERATE
-LY SMOOTH TEXTURE; POOR GRADE SILTSTONE
VISIBLE GRADING WITH POOR GRADE SANDSTON
-E VISIBLE, NO OTHER DISTINGUISHABLE STR
-UCTURAL FEATURES PRESENT; NO ACCESSORY
5400
CG 8u
MINERALS PRESENT IN SAMPLE.
SANDSTONE = OFF WHITE TO VERY LIGHT BROW
-NISH GRAY TO VERY LIGHT GRAY WITH FEW
BLACK AND MODERATE BROWN HUES; QUARTZ
DOMINATE FRAME WORK; MOSTLY GRAIN SUPPOR
-TED WITH FEW LOOSE GRAINS; CONTAINS CAL
-CITIC CEMENTATION WITH LIGHT TO MODERAT
-E REACTION TO DILUTE HCL; MATRIX CONTAI
CG 8u
<200 ROP 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
-NS 2 TO 4% DARK LITHIC FRAGMENTS; MEDIU
5500
<50 Avg WOB 0>
<0 CO2 10K><10 Etnn C-2 100K>
-M-FINE TO FINE GRAINED; FAIR TO WELL SO
<0 Flare Ht. 100><10 Prop C-3 100K>
-RTING; SUB-ANGULAR TO SUB-ROUNDED TO
<10 Butn C-4 100K>
ROUNDED ANGULARITY; LOW TO MODERATE
<10 Pent C-5 100K>
SPHERICITY; POOR GRADE SILTSTONE VISIBLE
MW IN 9.4 VIS 81 pH 9.6
MW OUT 9.4 VIS 88 pH 9.4
GRADING WITH POOR GRADE SANDSTONE, NO
OTHER DISTINGUISHABLE SURFACE FEATURES

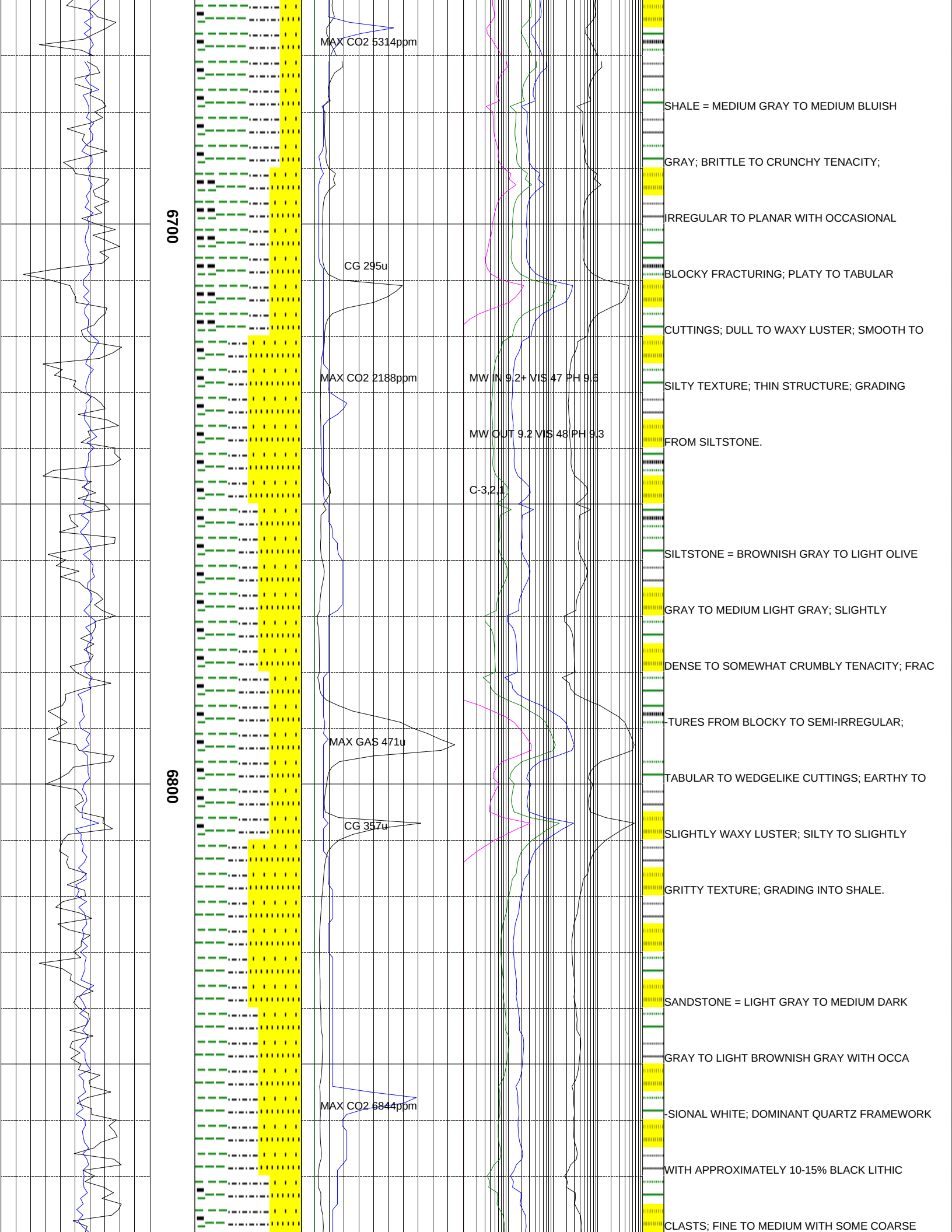

5600
5700
NB # 3 8.75" HC
Q506FX 6X12
IN @ 5626' DRLD 5521'
82.00 HRS
6/22/2010
WASATCH G @ 5646'
CG 11u
MAX GAS 19u
MAX GAS 365u
CG 105u
MAX GAS 105u
MW IN 9.4+ VIS 44 pH 9.4
MW OUT 9.3+ VIS 39 pH 9.3
CG 37u
PRESENT; NO ACCESSORY MINERALS PRESENT
IN SAMPLE.
CARBONACEOUS SHALE = DARK BROWNISH GRAY
TO BROWNISH BLACK TO OCCASIONAL OLIVE BL
-ACK; SLIGHTLY DENSE TO BRITTLE TO CRUMB
-LY TENACITY; IRREGULAR TO SUB-BLOCKY TO
SUB-PLANAR FRACTURE; SUB-TABULAR TO SUB-
NODULAR CUTTINGS HABIT; DULL TO EARTHY
DULL LUSTER; SLIGHTLY CLAYEY TO SLIGHTLY
SMOOTH TEXTURE; NO STRUCTURAL FEATURES
PRESENT; ACCESSORY MINERAL PYRITE PRESEN
-T IN SAMPLE.
WASATCH G SANDSTONE = OFF WHITE TO WHITE
TO VERY LIGHT GRAY WITH FEW BLACK, MODER
-ATE BROWN AND OCCASIONAL MODERATE GREEN
HUES; QUARTZ DOMINATE FRAME WORK; GRAIN
SUPPORTED WITH MOSTLY LOOSE GRAINS; CONT
-AINS CALCITIC CEMETATION WITH MODERATEL
-Y HIGH REACTION TO DILUTE HCL; MATRIX
CONTAINS 8 TO 11% DARK LITHIC FRAGMENTS;

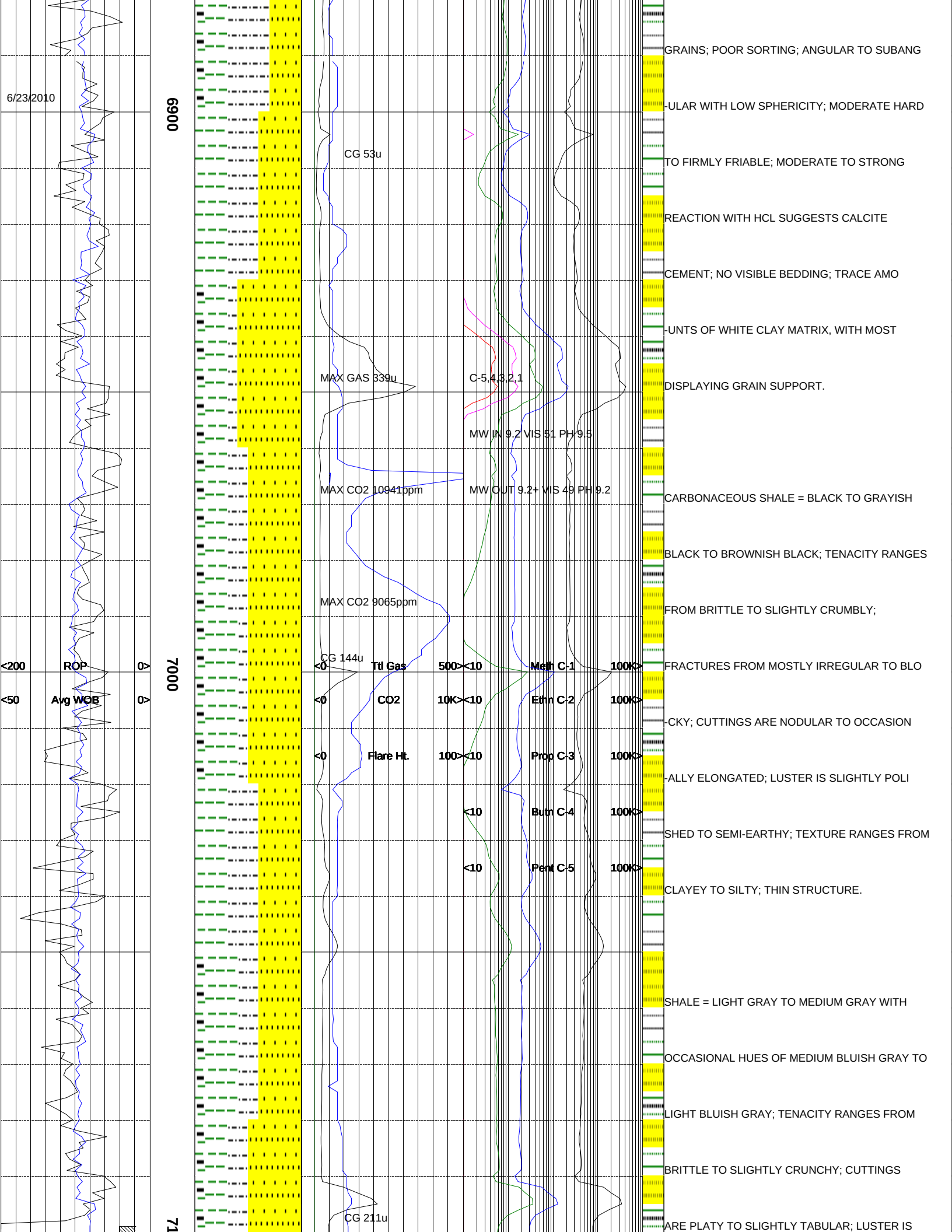

5800
5900
6000
CG 117u
CG 252u
MW IN 9.3+ VIS 48 pH 9.8
MW OUT 9.4+ VIS 49 pH 9.5
WASATCH I @ 5962'
<200 ROP 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
MEDIUM-FINE TO COARSE GRAINED; FAIR TO
POOR SORTING; SUB-ANGULAR ANGULAR TO
SUB-ROUNDED ANGULARITY; LOW TO MODERATE
SPHERICITY; NO VISIBLE BEDDING OR OTHER
DISTINGUISHABLE SURFACE FEATURES PRESENT
; ACCESSORY MINERAL PYRITE PRESENT IN
SAMPLE.
SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO
MEDIUM LIGHT GRAY TO LIGHT BLUISH GRAY
WITH OCCASIONAL GRAYISH RED AND MODERATE
YELLOW MOTTLING; MODERATELY BRITTLE TO
MODERATELY CRUMBLY TO VERY SLIGHTLY
CRUNCHY TENACITY; IRREGULAR TO SUB-PLANA
-R TO EARTHY FRACTURE; WEDGE LIKE TO
OCCASIONAL PLATY TO MODERATELY SMALL
CUTTINGS HABIT; DULL TO EARTHY DULL TO
OCCASIONAL SEMI-FROSTED TO SEMI-WAXY LUS
-TER; MODERATELY SMOOTH TO SLIGHLTY
CLAYEY TO SLIGHTLY SILTY TEXTURE; POOR
GRADE SILTSTONE VISIBLE GRADING WITH POO
-R GRADE SANDSTONE IN SAMPLE; ACCESSORY

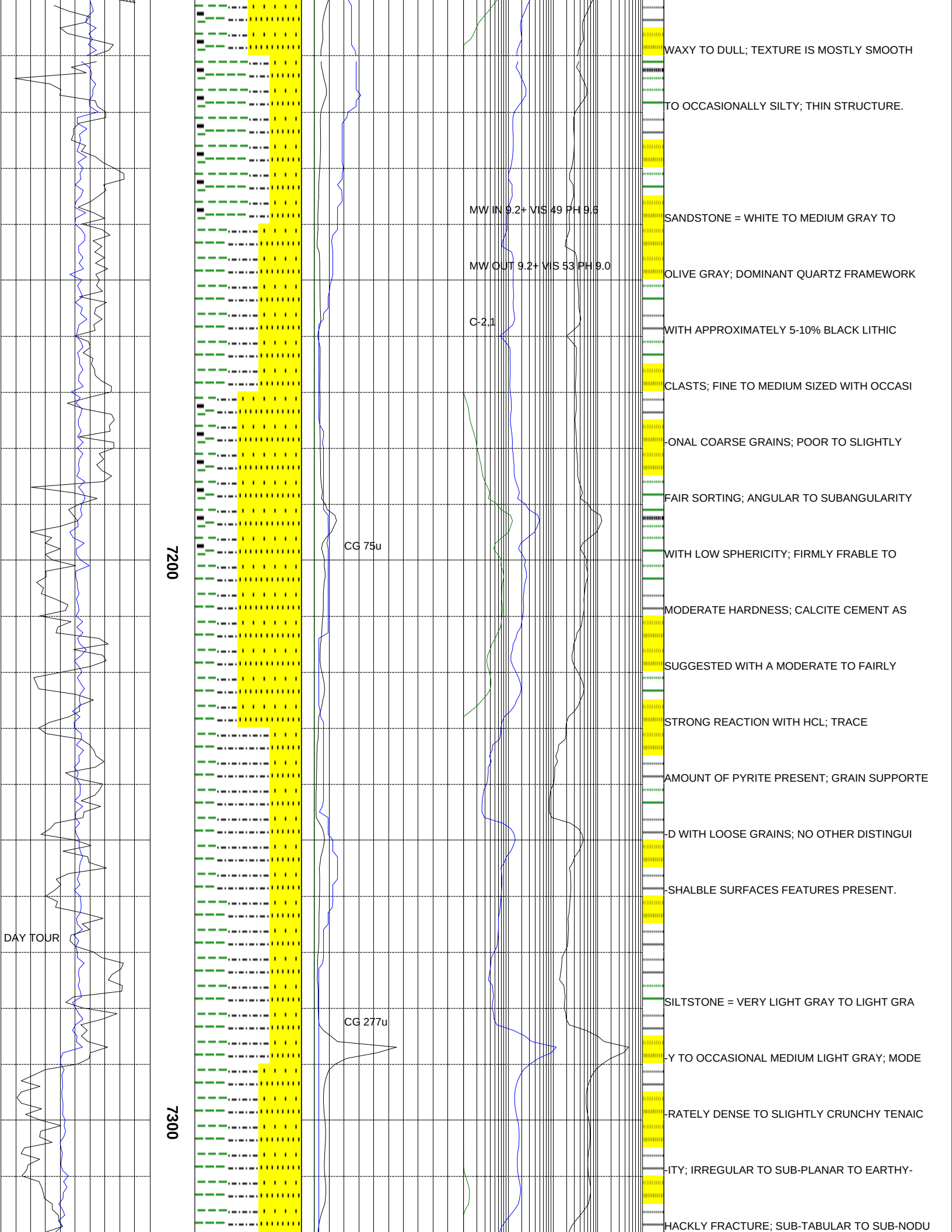

6100
6200
MAX GAS 336u
CG 1180u
MAX GAS 341u
CG 307u
MW IN 9.3+ VIS 46 pH 9.8
MW OUT 9.4+ VIS 49 pH 9.7
MUD DATA @ 6178'
MW 9.35 FV 44 PV 11 YP 18
API FIL 8.0 GELS 7/13/11 pH 9.4
Cl- 1200 Ca+ 20 MBT 20.0 SOL 7.2
MINERAL PYRITE PRESENT IN SAMPLE.
SILTSTONE = VERY LIGHT GRAY TO LIGHT GRA
-Y WITH VERY FEW BLACK HUES; MODERATELY
CRUNCHY TO VERY SLIGHTLY DENSE TENACITY;
IRREGULAR TO SUB-PLANAR TO EARTHY-HACKLY
FRACTURE; SUB-TABULAR TO SUB-NODULAR
CUTTINGS HABIT; DULL TO EARTHY DULL TO
OCCASINAL SEMI-SPARKLING LUSTER; VERY
SLIGHTLY CLAYEY TO VERY SLIGHLTY GRITTY
TEXTURE; POOR GRADE SILTSTONE VISIBLE
GRADING WITH POOR GRADE SANDSTONE, NO
OTHER DISTINGUISHABLE STRUCTURAL FEATURE
-S PRESENT IN SAMPLE; ACCESSORY MINERAL
-PYRITE PRESENT IN SAMPLE.
CARBONACEOUS SHALE = DARK BROWNISH GRAY
TO BROWNISH BLACK TO OLIVE BLACK; MODERA
-TELY DENSE TO SLIGHLTY CRUNCHY TENACITY
; IRREGULAR TO SUB-BLOCKY TO EARTHY-HACK
-LY FRACTURE; SUB-TABULAR TO SUB-NODULAR
TO OCCASIONAL WEDGE LIKE CUTTINGS HABIT;

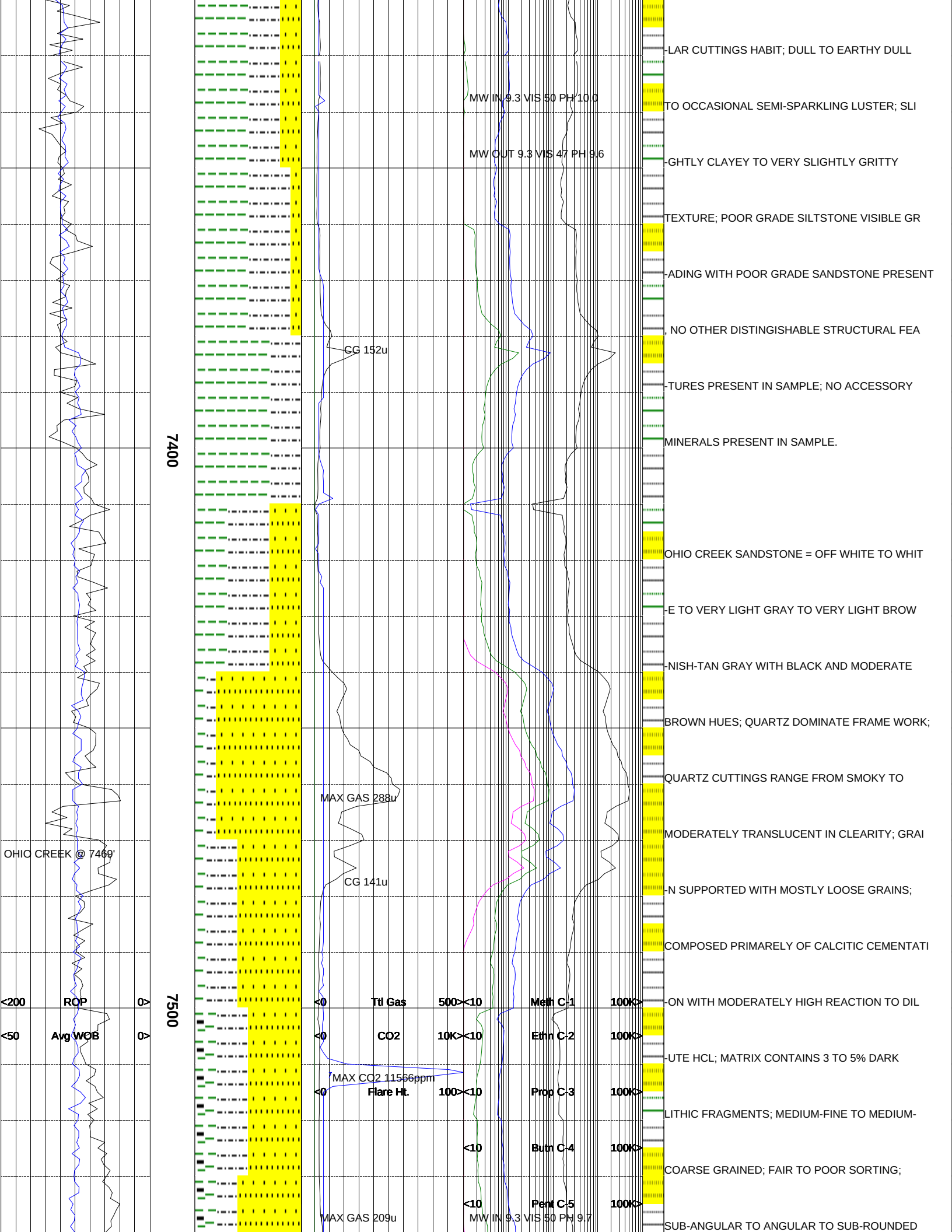

6300
6400
NIGHT TOUR
CG 99u
MAX GAS 391u
CG 478u
MW IN 9.3+ VIS 45 pH 9.4
MW OUT 9.3+ VIS 46 pH 9.5
MAX GAS 55u
MAX CO2 2813ppm
C-3,2,1
MAX GAS 64u
CG 817u
DULL TO EARTHY DULL TO OCCASIONAL SEMI-
SPARKLING LUSTER; SLIGHTLY CLAYEY TO VER
-Y SLIGHTLY GRITTY TEXTURE; NO VISIBLE
LAMINAE OR OTHER DISTINGUISHABLE STRUCTU
-RAL FEATURES PRESENT; ACCESSORY MINERAL
PYRITE AND LARGE RHOMBIC CUTTINGS OF
CALCITE PRESENT IN SAMPLE.
SANDSTONE = VERY LIGHT GRAY TO VERY LIGH
-T TAN-BROWNISH GRAY WITH BLACK AND MODE
-RATE BROWN HUES; QUARTZ FRAME WORK; MOS
-TLY GRAIN SUPPORTED; CONTAINS CALCITIC
CEMENT WITH MODERATE REACTION TO DILUTE
HCL; FINE TO MEDIUM-FINE GRAINED; FAIR
WELL SORTING; SUBANGULAR WITH MODERATE
SPHERICITY; MODERATE HARDNESS.
SILTSTONE = BROWNISH GRAY TO OLIVE GRAY
OCCASIONALLY MEDIUM LIGHT GRAY; DENSE TO
BRITTLE TENACITY; MOSTLY BLOCKY TO OCCAS
-IONALLY IRREGULAR FRACTURING; CUTTINGS
ARE TABULAR TO WEDGELIKE; EARTHY DULL TO

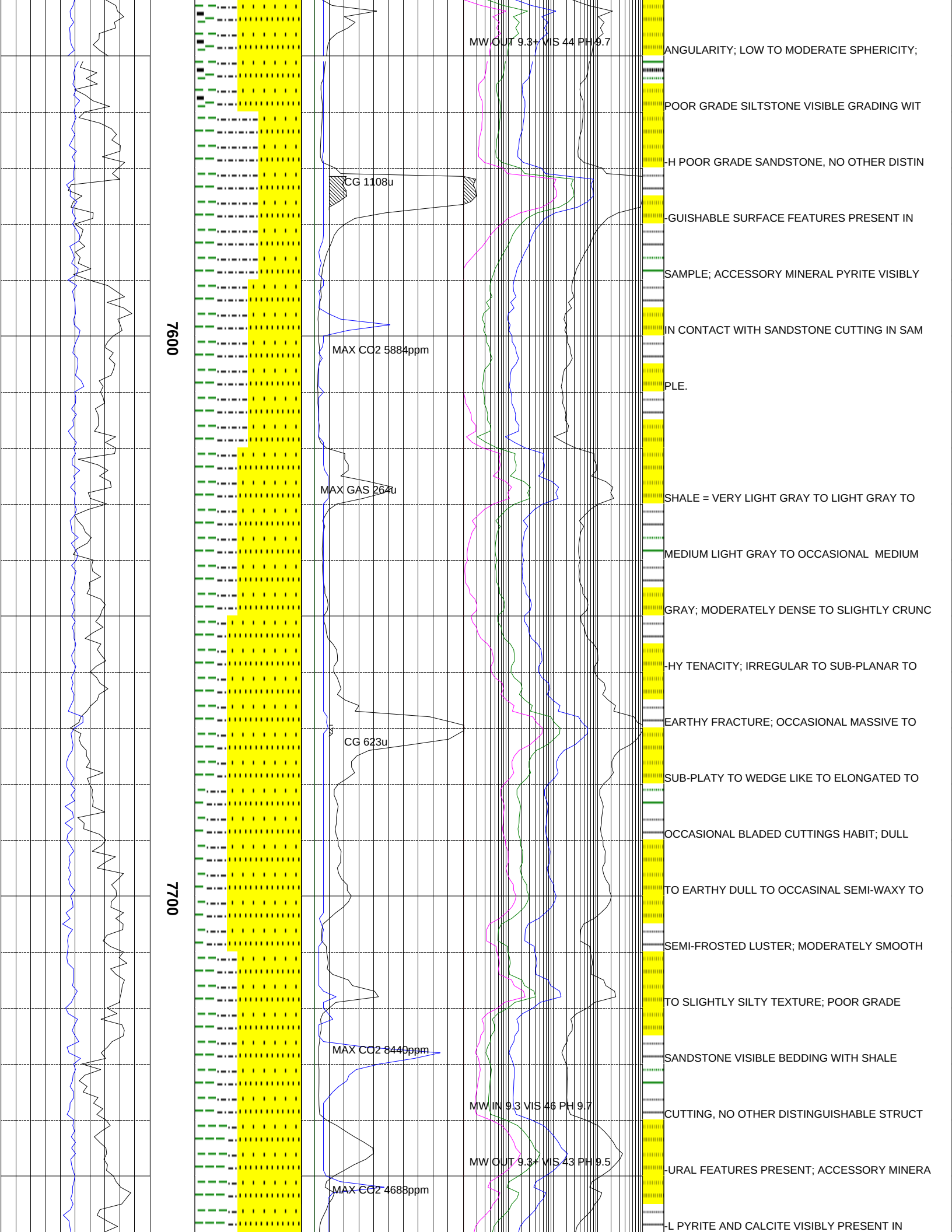

SLIGHTLY WAXY LUSTER; GRITTY TO SILTY
TEXTURE; THICK STRUCTURE; TRACE AMOUNTS
OF PYRITE WITH SAMPLE.
MAX GAS 96u
SHALE = MEDIUM BLUISH GRAY TO MEDIUM
<200 ROP 0>
<0 Ttl Gas 500>
<10 Meth C-1 100K>
LIGHT GRAY WITH OCCASIONAL LIGHT OLIVE
6500
<50 Avg WOB 0>
<0 CO2 10K>
<10 Ethn C-2 100K>
RE-SCALE GAS <0-500>
GRAY HUES; BRITTLE TENACITY; FRACTURES
<0 Flare Ht. 100>
<10 Prop C-3 100K>
FROM PLANAR TO IRREGULAR; TABULAR TO
<10 Butn C-4 100K>
CG 540u
C-5,4,3,2,1
PLATY CUTTINGS; SMOOTH TEXTURE; LAMINAE
<10 Pent C-5 100K>
MW IN 9.2 VIS 46 PH 9.5
STRUCTURE.
MAX GAS 139u
MW OUT 9.2 VIS 43 PH 9.0
MAX GAS 91u
SANDSTONE = BROWNISH GRAY TO OCCASIONAL
LIGHT GRAY; DOMINANT QUARTZ FRAMEWORK
WITH LESS THAN 5% BLACK LITHIC CLASTS;
MAX GAS 76u
FINE TO MEDIUM FINED GRAINED WITH FAIR
6600
TO WELL SORTING; SUBANGULAR TO SUB
-ROUNDED GRAINS; MODERATE TO LOW SPHERIC
-ITY; MODERATE HARDNESS; SLIGHT TO
MODERATE STRONG REACTION WITH DILUTE HCL
SUGGESTS CALCITE CEMENT; GRAIN SUPPORTED
TRACE AMOUNTS OF PYRITE INCLUDED WITHIN
SAMPLE.

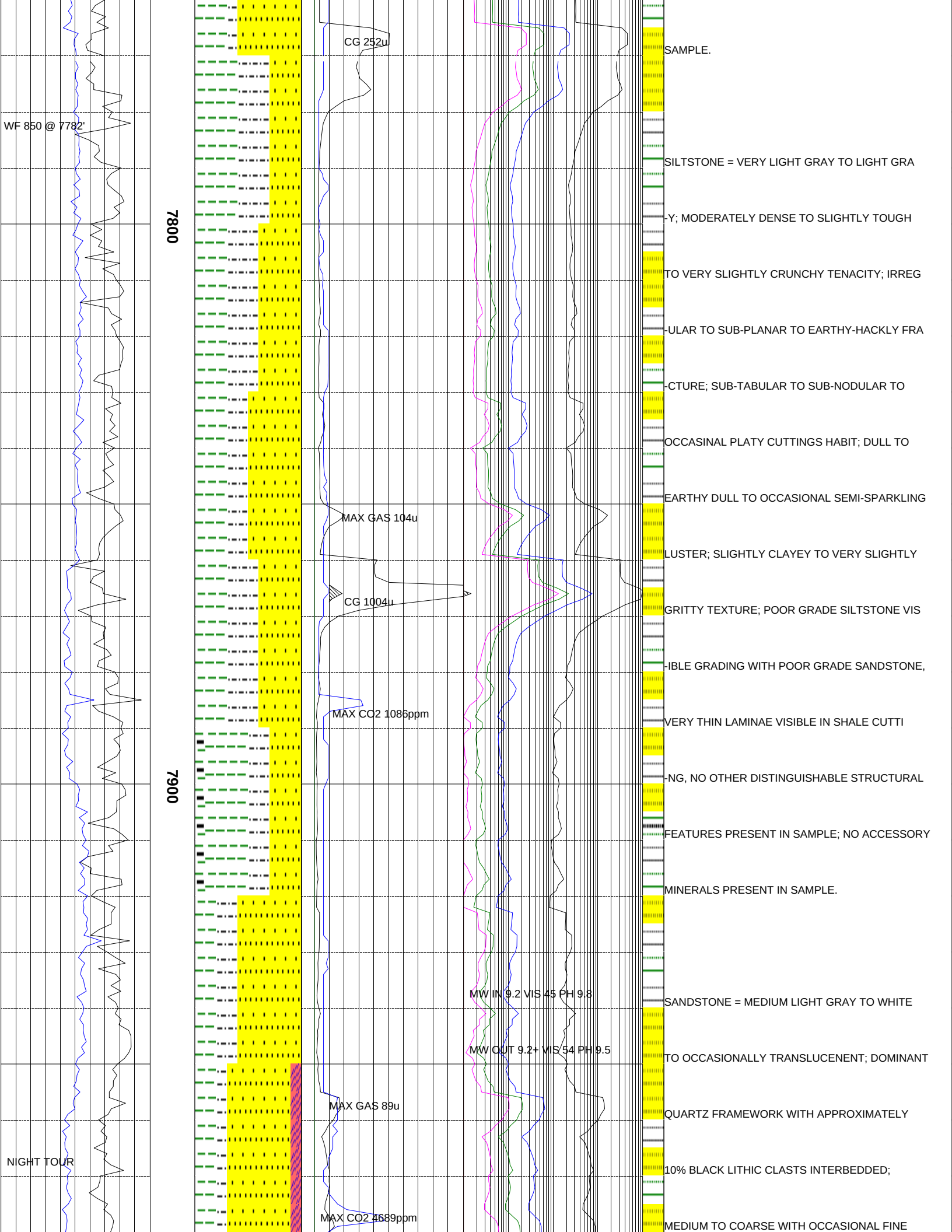

MAX CO2 5314ppm
6700
CG 295u
MAX CO2 2188ppm
MW IN 9.2+ VIS 47 PH 9.6
MW OUT 9.2 VIS 48 PH 9.3
C-3,2,1
6800
MAX GAS 471u
CG 357u
MAX CO2 6844ppm
SHALE = MEDIUM GRAY TO MEDIUM BLUISH
GRAY; BRITTLE TO CRUNCHY TENACITY;
IRREGULAR TO PLANAR WITH OCCASIONAL
BLOCKY FRACTURING; PLATY TO TABULAR
CUTTINGS; DULL TO WAXY LUSTER; SMOOTH TO
SILTY TEXTURE; THIN STRUCTURE; GRADING
FROM SILTSTONE.
SILTSTONE = BROWNISH GRAY TO LIGHT OLIVE
GRAY TO MEDIUM LIGHT GRAY; SLIGHTLY
DENSE TO SOMEWHAT CRUMBLY TENACITY; FRAC
-TURES FROM BLOCKY TO SEMI-IRREGULAR;
TABULAR TO WEDGELIKE CUTTINGS; EARTHY TO
SLIGHTLY WAXY LUSTER; SILTY TO SLIGHTLY
GRITTY TEXTURE; GRADING INTO SHALE.
SANDSTONE = LIGHT GRAY TO MEDIUM DARK
GRAY TO LIGHT BROWNISH GRAY WITH OCCA
-SIONAL WHITE; DOMINANT QUARTZ FRAMEWORK
WITH APPROXIMATELY 10-15% BLACK LITHIC
CLASTS; FINE TO MEDIUM WITH SOME COARSE

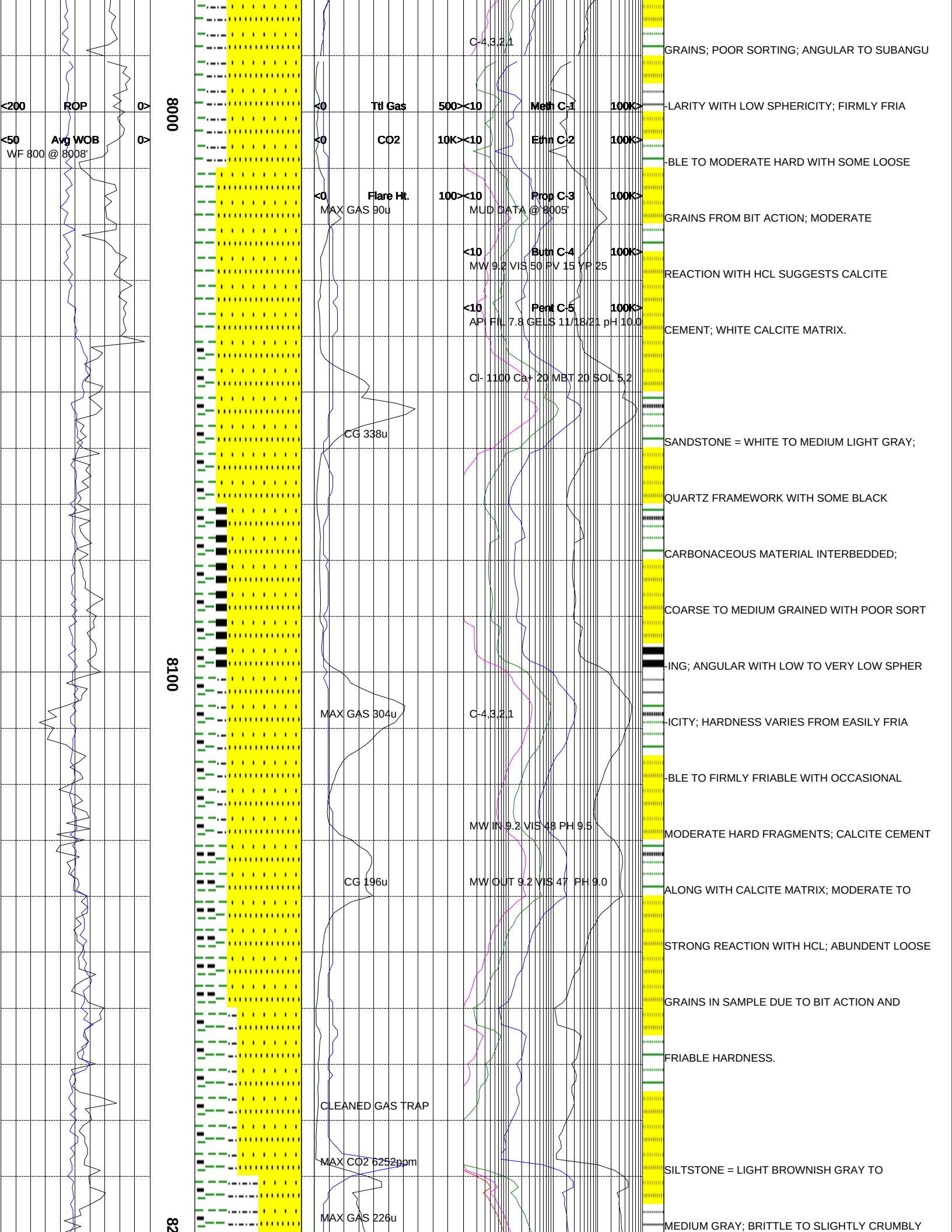

6/23/2010
6900
7000
7100
CG 53u
MAX GAS 339u
C-5,4,3,2,1
MW IN 9.2 VIS 51 PH 9.5
MAX CO2 10941ppm
MW OUT 9.2+ VIS 49 PH 9.2
MAX CO2 9065ppm
CG 144u
CG 211u
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
GRAINS; POOR SORTING; ANGULAR TO SUBANG
-ULAR WITH LOW SPHERICITY; MODERATE HARD
TO FIRMLY FRIABLE; MODERATE TO STRONG
REACTION WITH HCL SUGGESTS CALCITE
CEMENT; NO VISIBLE BEDDING; TRACE AMO
-UNTS OF WHITE CLAY MATRIX, WITH MOST
DISPLAYING GRAIN SUPPORT.
CARBONACEOUS SHALE = BLACK TO GRAYISH
BLACK TO BROWNISH BLACK; TENACITY RANGES
FROM BRITTLE TO SLIGHTLY CRUMBLY;
FRACTURES FROM MOSTLY IRREGULAR TO BLO
-CKY; CUTTINGS ARE NODULAR TO OCCASION
-ALLY ELONGATED; LUSTER IS SLIGHTLY POLI
SHED TO SEMI-EARTHY; TEXTURE RANGES FROM
CLAYEY TO SILTY; THIN STRUCTURE.
SHALE = LIGHT GRAY TO MEDIUM GRAY WITH
OCCASIONAL HUES OF MEDIUM BLUISH GRAY TO
LIGHT BLUISH GRAY; TENACITY RANGES FROM
BRITTLE TO SLIGHTLY CRUNCHY; CUTTINGS
ARE PLATY TO SLIGHTLY TABULAR; LUSTER IS

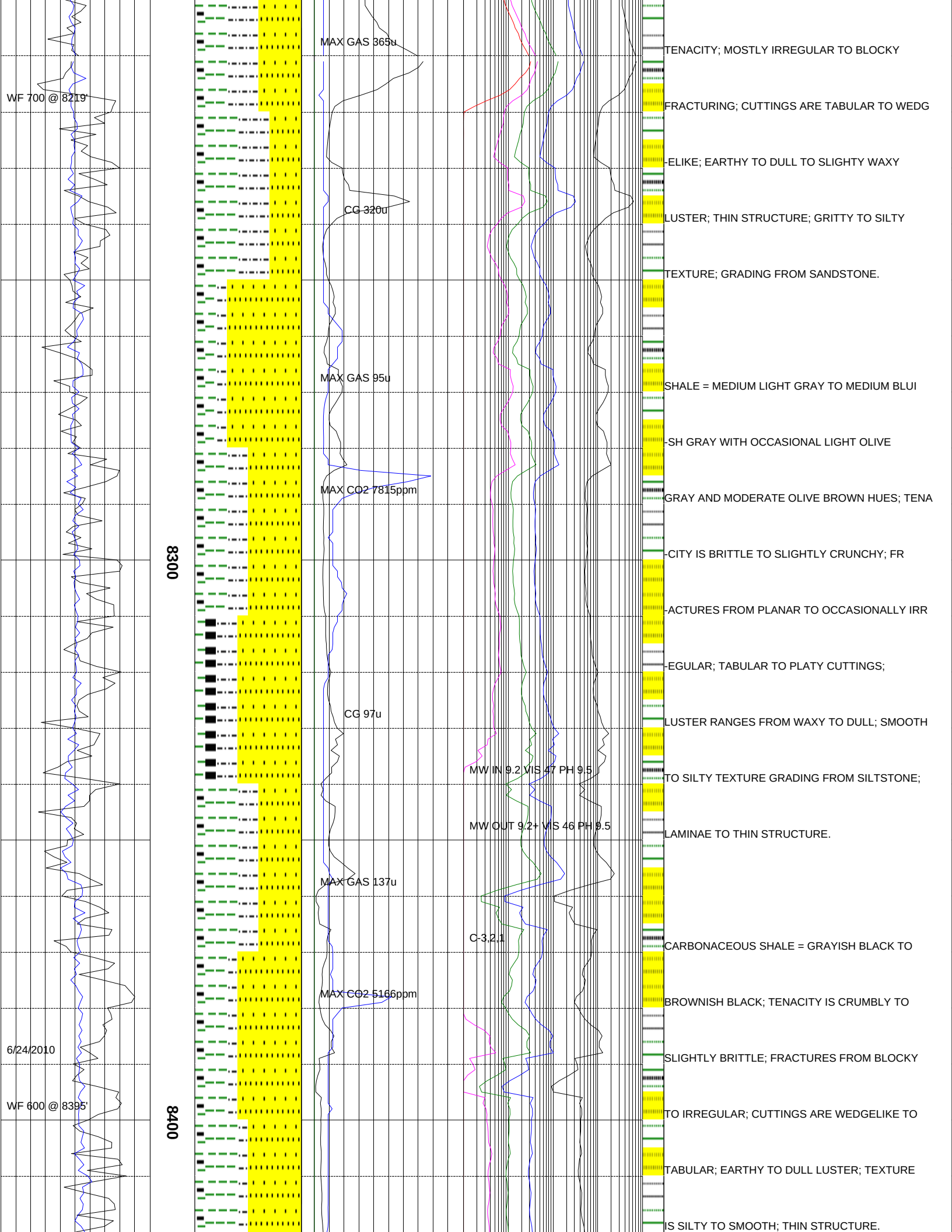

WAXY TO DULL; TEXTURE IS MOSTLY SMOOTH
TO OCCASIONALLY SILTY; THIN STRUCTURE.
MW IN 9.2+ VIS 49 PH 9.6
MW OUT 9.2+ VIS 53 PH 9.0
SANDSTONE = WHITE TO MEDIUM GRAY TO
OLIVE GRAY; DOMINANT QUARTZ FRAMEWORK
C-2,1
WITH APPROXIMATELY 5-10% BLACK LITHIC
CLASTS; FINE TO MEDIUM SIZED WITH OCCASI
-ONAL COARSE GRAINS; POOR TO SLIGHTLY
FAIR SORTING; ANGULAR TO SUBANGULARITY
7200
CG 75u
WITH LOW SPHERICITY; FIRMLY FRABLE TO
MODERATE HARDNESS; CALCITE CEMENT AS
SUGGESTED WITH A MODERATE TO FAIRLY
STRONG REACTION WITH HCL; TRACE
AMOUNT OF PYRITE PRESENT; GRAIN SUPPORTE
-D WITH LOOSE GRAINS; NO OTHER DISTINGUI
-SHALBLE SURFACES FEATURES PRESENT.
DAY TOUR
SILTSTONE = VERY LIGHT GRAY TO LIGHT GRA
CG 277u
-Y TO OCCASIONAL MEDIUM LIGHT GRAY; MODE
7300
-RATELY DENSE TO SLIGHTLY CRUNCHY TENAIC
-ITY; IRREGULAR TO SUB-PLANAR TO EARTHY-
HACKLY FRACTURE; SUB-TABULAR TO SUB-NODU

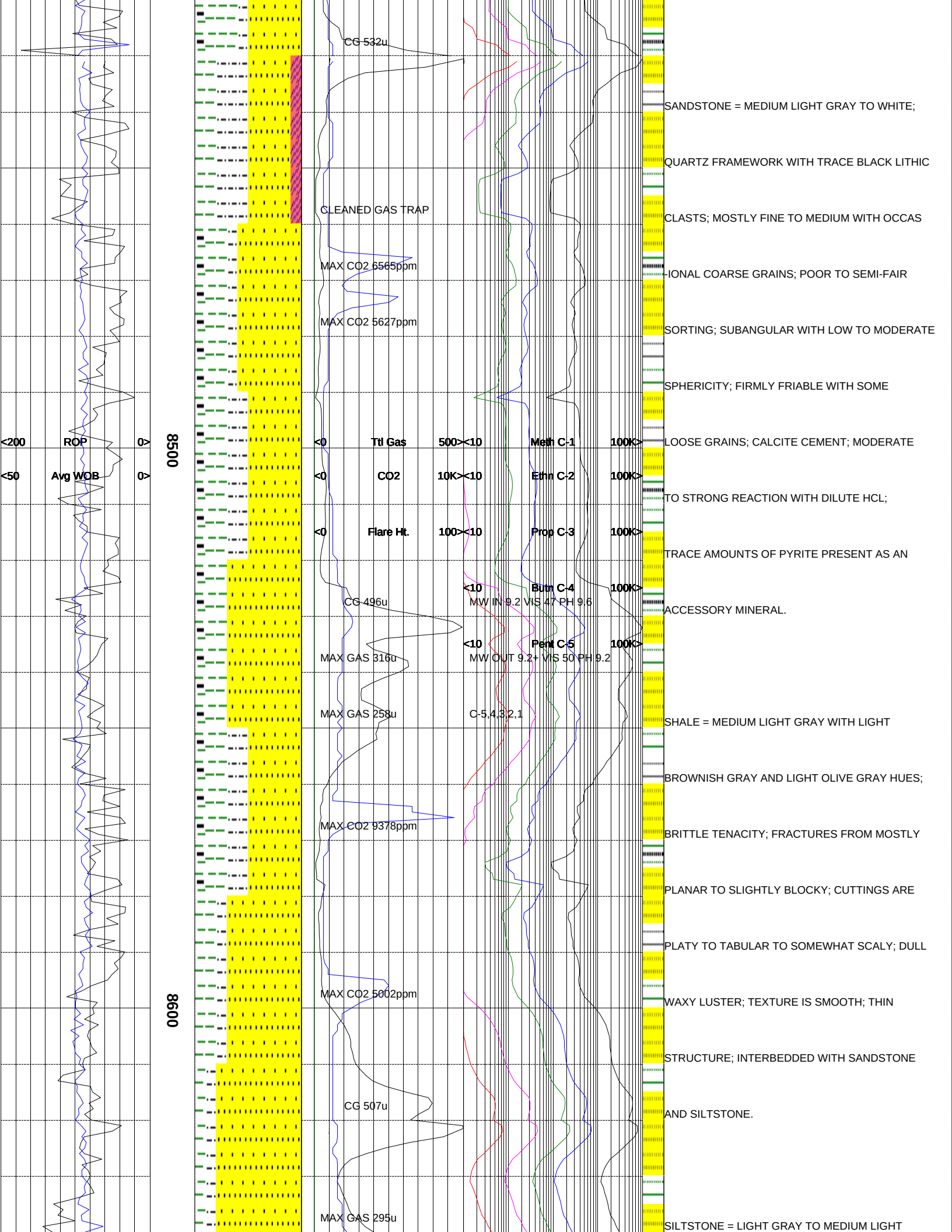

-LAR CUTTINGS HABIT; DULL TO EARTHY DULL
MW IN 9.3 VIS 50 PH 10.0
TO OCCASIONAL SEMI-SPARKLING LUSTER; SLI
MW OUT 9.3 VIS 47 PH 9.6
-GHTLY CLAYEY TO VERY SLIGHTLY GRITTY
TEXTURE; POOR GRADE SILTSTONE VISIBLE GR
-ADING WITH POOR GRADE SANDSTONE PRESENT
, NO OTHER DISTINGISHABLE STRUCTURAL FEA
CG 152u
-TURES PRESENT IN SAMPLE; NO ACCESSORY
7400
MINERALS PRESENT IN SAMPLE.
OHIO CREEK SANDSTONE = OFF WHITE TO WHIT
-E TO VERY LIGHT GRAY TO VERY LIGHT BROW
-NISH-TAN GRAY WITH BLACK AND MODERATE
BROWN HUES; QUARTZ DOMINATE FRAME WORK;
QUARTZ CUTTINGS RANGE FROM SMOKY TO
MAX GAS 288u
MODERATELY TRANSLUCENT IN CLEARITY; GRAI
OHIO CREEK @ 7469'
CG 141u
-N SUPPORTED WITH MOSTLY LOOSE GRAINS;
COMPOSED PRIMARELY OF CALCITIC CEMENTATI
<200 ROP 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
-ON WITH MODERATELY HIGH REACTION TO DIL
7500
<50 Avg WOB 0>
<0 CO2 10K><10 Etnn C-2 100K>
-UTE HCL; MATRIX CONTAINS 3 TO 5% DARK
MAX CO2 11566ppm
<0 Flare Ht. 100><10 Prop C-3 100K>
LITHIC FRAGMENTS; MEDIUM-FINE TO MEDIUM-
<10 Butn C-4 100K>
COARSE GRAINED; FAIR TO POOR SORTING;
<10 Pent C-5 100K>
MAX GAS 209u
MW IN 9.3 VIS 50 PH 9.7
SUB-ANGULAR TO ANGULAR TO SUB-ROUNDED

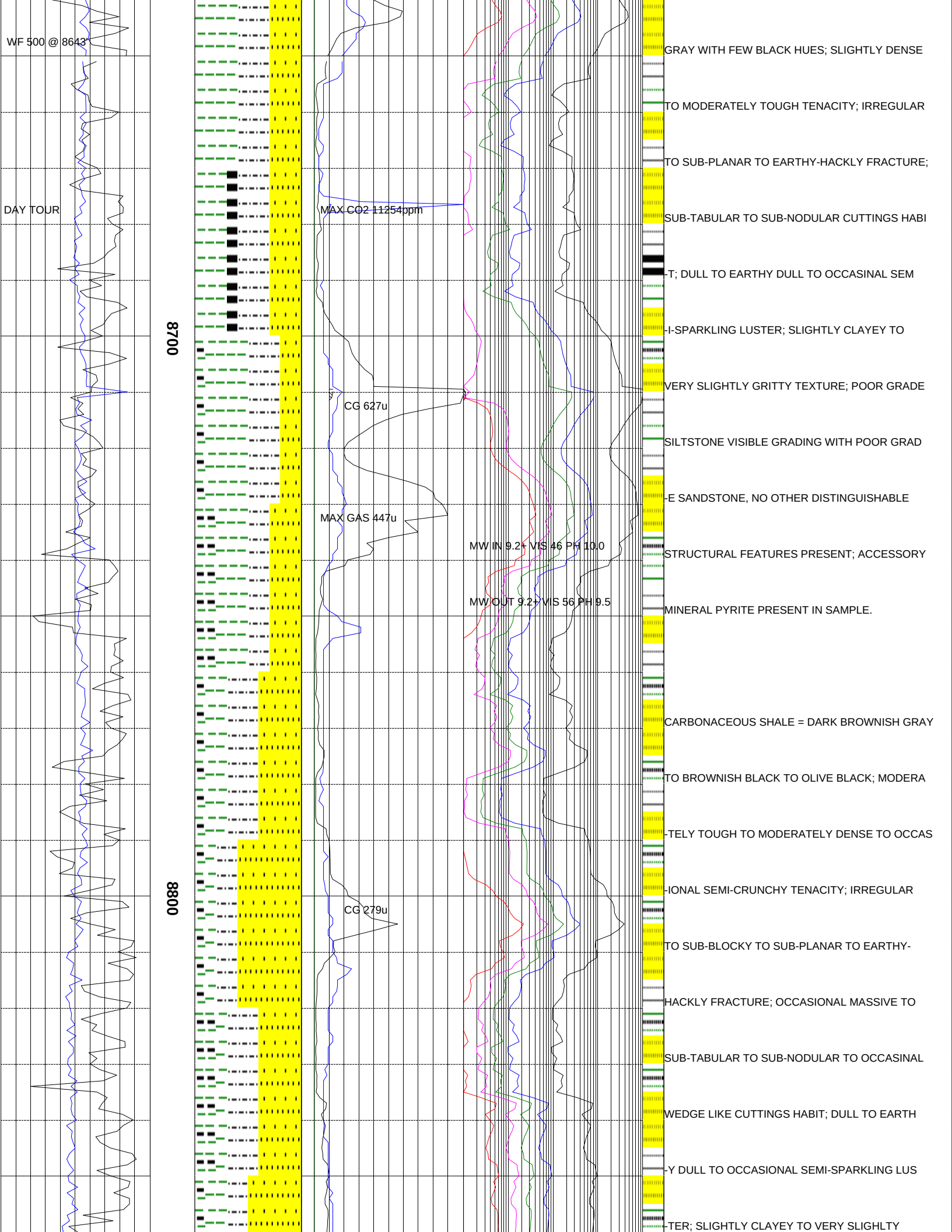

MW OUT 9.3+ VIS 44 PH 9.7
ANGULARITY; LOW TO MODERATE SPHERICITY;
POOR GRADE SILTSTONE VISIBLE GRADING WIT
H POOR GRADE SANDSTONE, NO OTHER DISTIN
CG 1108u
GUISHABLE SURFACE FEATURES PRESENT IN
SAMPLE; ACCESSORY MINERAL PYRITE VISIBLY
IN CONTACT WITH SANDSTONE CUTTING IN SAM
7600
MAX CO2 5884ppm
PLE.
MAX GAS 264u
SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO
MEDIUM LIGHT GRAY TO OCCASIONAL MEDIUM
GRAY; MODERATELY DENSE TO SLIGHTLY CRUNC
HY TENACITY; IRREGULAR TO SUB-PLANAR TO
EARTHY FRACTURE; OCCASIONAL MASSIVE TO
CG 623u
SUB-PLATY TO WEDGE LIKE TO ELONGATED TO
OCCASIONAL BLADED CUTTINGS HABIT; DULL
7700
TO EARTHY DULL TO OCCASINAL SEMI-WAXY TO
SEMI-FROSTED LUSTER; MODERATELY SMOOTH
TO SLIGHTLY SILTY TEXTURE; POOR GRADE
MAX CO2 8440ppm
SANDSTONE VISIBLE BEDDING WITH SHALE
MW IN 9.3 VIS 46 PH 9.7
CUTTING, NO OTHER DISTINGUISHABLE STRUCT
MW OUT 9.3+ VIS 43 PH 9.5
URAL FEATURES PRESENT; ACCESSORY MINERA
MAX CO2 4688ppm
L PYRITE AND CALCITE VISIBLY PRESENT IN

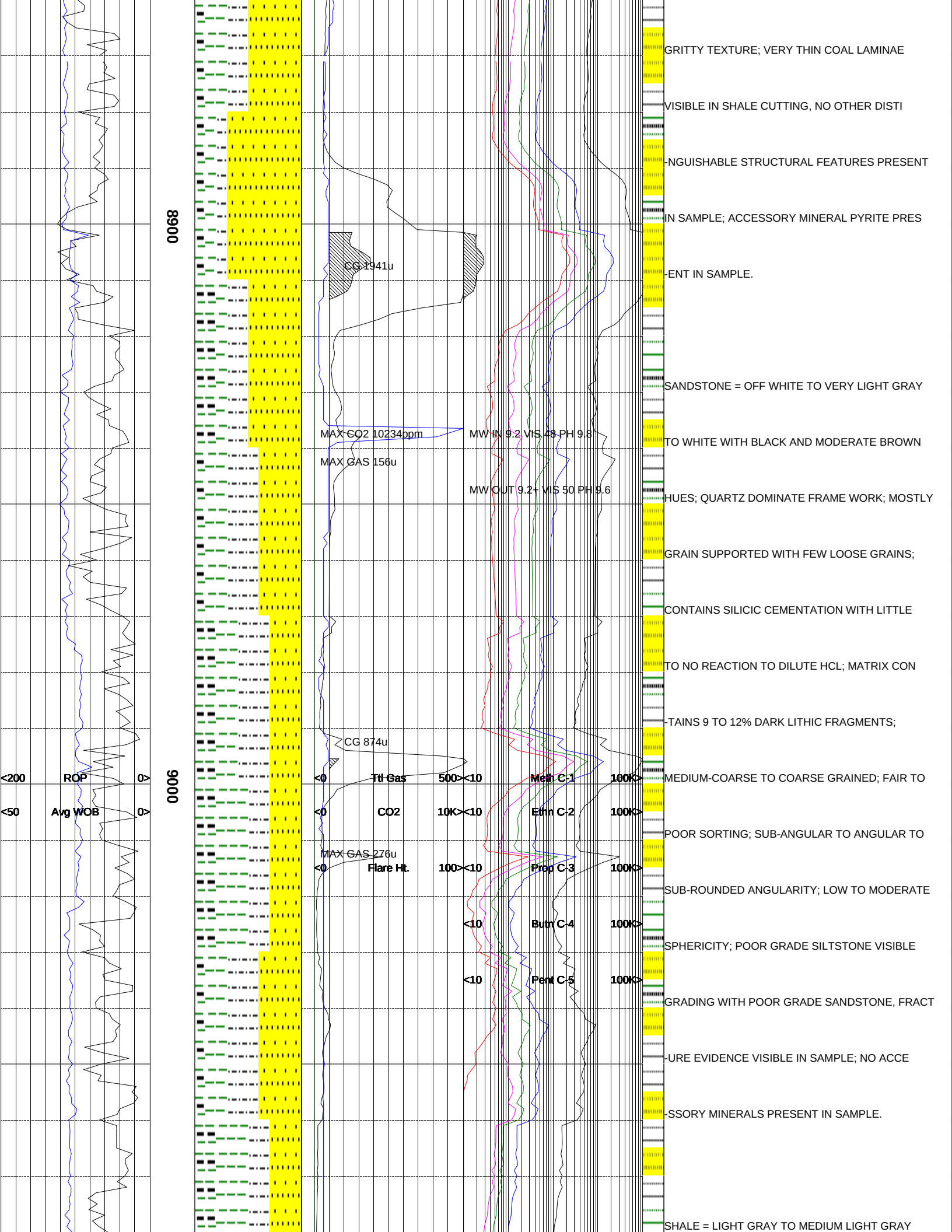

CG 252u
WF 850 @ 7782'
7800
MAX GAS 104u
CG 1004u
MAX CO2 1086ppm
7900
MW IN 9.2 VIS 45 PH 9.8
MW OUT 9.2+ VIS 54 PH 9.5
MAX GAS 89u
NIGHT TOUR
MAX CO2 4689ppm
SAMPLE.
SILTSTONE = VERY LIGHT GRAY TO LIGHT GRA
-Y; MODERATELY DENSE TO SLIGHTLY TOUGH
TO VERY SLIGHTLY CRUNCHY TENACITY; IRREG
-ULAR TO SUB-PLANAR TO EARTHY-HACKLY FRA
-CTURE; SUB-TABULAR TO SUB-NODULAR TO
OCCASINAL PLATY CUTTINGS HABIT; DULL TO
EARTHY DULL TO OCCASIONAL SEMI-SPARKLING
LUSTER; SLIGHTLY CLAYEY TO VERY SLIGHTLY
GRITTY TEXTURE; POOR GRADE SILTSTONE VIS
-IBLE GRADING WITH POOR GRADE SANDSTONE,
VERY THIN LAMINAE VISIBLE IN SHALE CUTTI
-NG, NO OTHER DISTINGUISHABLE STRUCTURAL
FEATURES PRESENT IN SAMPLE; NO ACCESSORY
MINERALS PRESENT IN SAMPLE.
SANDSTONE = MEDIUM LIGHT GRAY TO WHITE
TO OCCASIONALLY TRANSLUCENENT; DOMINANT
QUARTZ FRAMEWORK WITH APPROXIMATELY
10% BLACK LITHIC CLASTS INTERBEDDED;
MEDIUM TO COARSE WITH OCCASIONAL FINE


<200 ROP 0>
<50 Avg WOB 0>
WF 800 @ 8008'
8000
8100
8200
<0 Ttl Gas 500>
<0 CO2 10K>
<0 Flare Ht. 100>
MAX GAS 90u
CG 338u
MAX GAS 304u
CG 196u
CLEANED GAS TRAP
MAX CO2 6252ppm
MAX GAS 226u
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
C-4,3,2,1
MUD DATA @ 8005'
MW 9.2 VIS 50 PV 15 YP 25
API FIL 7.8 GELS 11/18/21 pH 10.0
Cl- 1100 Ca+ 20 MBT 20 SOL 5.2
C-4,3,2,1
MW IN 9.2 VIS 48 PH 9.5
MW OUT 9.2 VIS 47 PH 9.0
GRAINS; POOR SORTING; ANGULAR TO SUBANGU
-LARITY WITH LOW SPHERICITY; FIRMLY FRIA
-BLE TO MODERATE HARD WITH SOME LOOSE
GRAINS FROM BIT ACTION; MODERATE
REACTION WITH HCL SUGGESTS CALCITE
CEMENT; WHITE CALCITE MATRIX.
SANDSTONE = WHITE TO MEDIUM LIGHT GRAY;
QUARTZ FRAMEWORK WITH SOME BLACK
CARBONACEOUS MATERIAL INTERBEDDED;
COARSE TO MEDIUM GRAINED WITH POOR SORT
-ING; ANGULAR WITH LOW TO VERY LOW SPHER
-ICITY; HARDNESS VARIES FROM EASILY FRIA
-BLE TO FIRMLY FRIABLE WITH OCCASIONAL
MODERATE HARD FRAGMENTS; CALCITE CEMENT
ALONG WITH CALCITE MATRIX; MODERATE TO
STRONG REACTION WITH HCL; ABUNDENT LOOSE
GRAINS IN SAMPLE DUE TO BIT ACTION AND
FRIABLE HARDNESS.
SILTSTONE = LIGHT BROWNISH GRAY TO
MEDIUM GRAY; BRITTLE TO SLIGHTLY CRUMBLY


MAX GAS 365u
TENACITY; MOSTLY IRREGULAR TO BLOCKY
WF 700 @ 8219'
FRACTURING; CUTTINGS ARE TABULAR TO WEDG
-ELIKE; EARTHY TO DULL TO SLIGHTY WAXY
CG 320u
LUSTER; THIN STRUCTURE; GRITTY TO SILTY
TEXTURE; GRADING FROM SANDSTONE.
MAX GAS 95u
SHALE = MEDIUM LIGHT GRAY TO MEDIUM BLUI
-SH GRAY WITH OCCASIONAL LIGHT OLIVE
MAX CO2 7815ppm
GRAY AND MODERATE OLIVE BROWN HUES; TENA
-CITY IS BRITTLE TO SLIGHTLY CRUNCHY; FR
8300
-ACTURES FROM PLANAR TO OCCASIONALLY IRR
-EGULAR; TABULAR TO PLATY CUTTINGS;
CG 97u
LUSTER RANGES FROM WAXY TO DULL; SMOOTH
MW IN 9.2 VIS 47 PH 9.5
TO SILTY TEXTURE GRADING FROM SILTSTONE;
MW OUT 9.2+ VIS 46 PH 9.5
LAMINAE TO THIN STRUCTURE.
MAX GAS 137u
C-3,2,1
CARBONACEOUS SHALE = GRAYISH BLACK TO
MAX CO2 5166ppm
BROWNISH BLACK; TENACITY IS CRUMBLY TO
6/24/2010
SLIGHTLY BRITTLE; FRACTURES FROM BLOCKY
WF 600 @ 8395'
8400
TO IRREGULAR; CUTTINGS ARE WEDGELIKE TO
TABULAR; EARTHY TO DULL LUSTER; TEXTURE
IS SILTY TO SMOOTH; THIN STRUCTURE.


<200 ROP 0>
<50 Avg WOB 0>
8500
8600
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
CG 532u
CLEANED GAS TRAP
MAX CO2 6565ppm
MAX CO2 5627ppm
CG 496u
MW IN 9.2 VIS 47 PH 9.6
MAX GAS 316u
MW OUT 9.2+ VIS 50 PH 9.2
MAX GAS 258u
C-5,4,3,2,1
MAX CO2 9378ppm
MAX CO2 5002ppm
CG 507u
MAX GAS 295u
SANDSTONE = MEDIUM LIGHT GRAY TO WHITE;
QUARTZ FRAMEWORK WITH TRACE BLACK LITHIC
CLASTS; MOSTLY FINE TO MEDIUM WITH OCCAS
-IONAL COARSE GRAINS; POOR TO SEMI-FAIR
SORTING; SUBANGULAR WITH LOW TO MODERATE
SPHERICITY; FIRMLY FRIABLE WITH SOME
LOOSE GRAINS; CALCITE CEMENT; MODERATE
TO STRONG REACTION WITH DILUTE HCL;
TRACE AMOUNTS OF PYRITE PRESENT AS AN
ACCESSORY MINERAL.
SHALE = MEDIUM LIGHT GRAY WITH LIGHT
BROWNISH GRAY AND LIGHT OLIVE GRAY HUES;
BRITTLE TENACITY; FRACTURES FROM MOSTLY
PLANAR TO SLIGHTLY BLOCKY; CUTTINGS ARE
PLATY TO TABULAR TO SOMEWHAT SCALY; DULL
WAXY LUSTER; TEXTURE IS SMOOTH; THIN
STRUCTURE; INTERBEDDED WITH SANDSTONE
AND SILTSTONE.
SILTSTONE = LIGHT GRAY TO MEDIUM LIGHT


WF 500 @ 8643'
DAY TOUR
8700
8800
MAX CO2 11254ppm
CG 627u
MAX GAS 447u
MW IN 9.2+ VIS 46 PH 10.0
MW OUT 9.2+ VIS 56 PH 9.5
CG 279u
GRAY WITH FEW BLACK HUES; SLIGHTLY DENSE
TO MODERATELY TOUGH TENACITY; IRREGULAR
TO SUB-PLANAR TO EARTHY-HACKLY FRACTURE;
SUB-TABULAR TO SUB-NODULAR CUTTINGS HABI
T; DULL TO EARTHY DULL TO OCCASINAL SEM
I-SPARKLING LUSTER; SLIGHTLY CLAYEY TO
VERY SLIGHTLY GRITTY TEXTURE; POOR GRADE
SILTSTONE VISIBLE GRADING WITH POOR GRAD
E SANDSTONE, NO OTHER DISTINGUISHABLE
STRUCTURAL FEATURES PRESENT; ACCESSORY
MINERAL PYRITE PRESENT IN SAMPLE.
CARBONACEOUS SHALE = DARK BROWNISH GRAY
TO BROWNISH BLACK TO OLIVE BLACK; MODERA
TELY TOUGH TO MODERATELY DENSE TO OCCAS
IONAL SEMI-CRUNCHY TENACITY; IRREGULAR
TO SUB-BLOCKY TO SUB-PLANAR TO EARTHY-
HACKLY FRACTURE; OCCASIONAL MASSIVE TO
SUB-TABULAR TO SUB-NODULAR TO OCCASINAL
WEDGE LIKE CUTTINGS HABIT; DULL TO EARTH
Y DULL TO OCCASIONAL SEMI-SPARKLING LUS
TER; SLIGHTLY CLAYEY TO VERY SLIGHLTY




GRITTY TEXTURE; VERY THIN COAL LAMINAE

VISIBLE IN SHALE CUTTING, NO OTHER DISTI

-NGUISHABLE STRUCTURAL FEATURES PRESENT

IN SAMPLE; ACCESSORY MINERAL PYRITE PRES

-ENT IN SAMPLE.

SANDSTONE = OFF WHITE TO VERY LIGHT GRAY

TO WHITE WITH BLACK AND MODERATE BROWN

-HUES; QUARTZ DOMINATE FRAME WORK; MOSTLY

GRAIN SUPPORTED WITH FEW LOOSE GRAINS;

CONTAINS SILICIC CEMENTATION WITH LITTLE

TO NO REACTION TO DILUTE HCL; MATRIX CON

-TAINS 9 TO 12% DARK LITHIC FRAGMENTS;

MEDIUM-COARSE TO COARSE GRAINED; FAIR TO

POOR SORTING; SUB-ANGULAR TO ANGULAR TO

SUB-ROUNDED ANGULARITY; LOW TO MODERATE

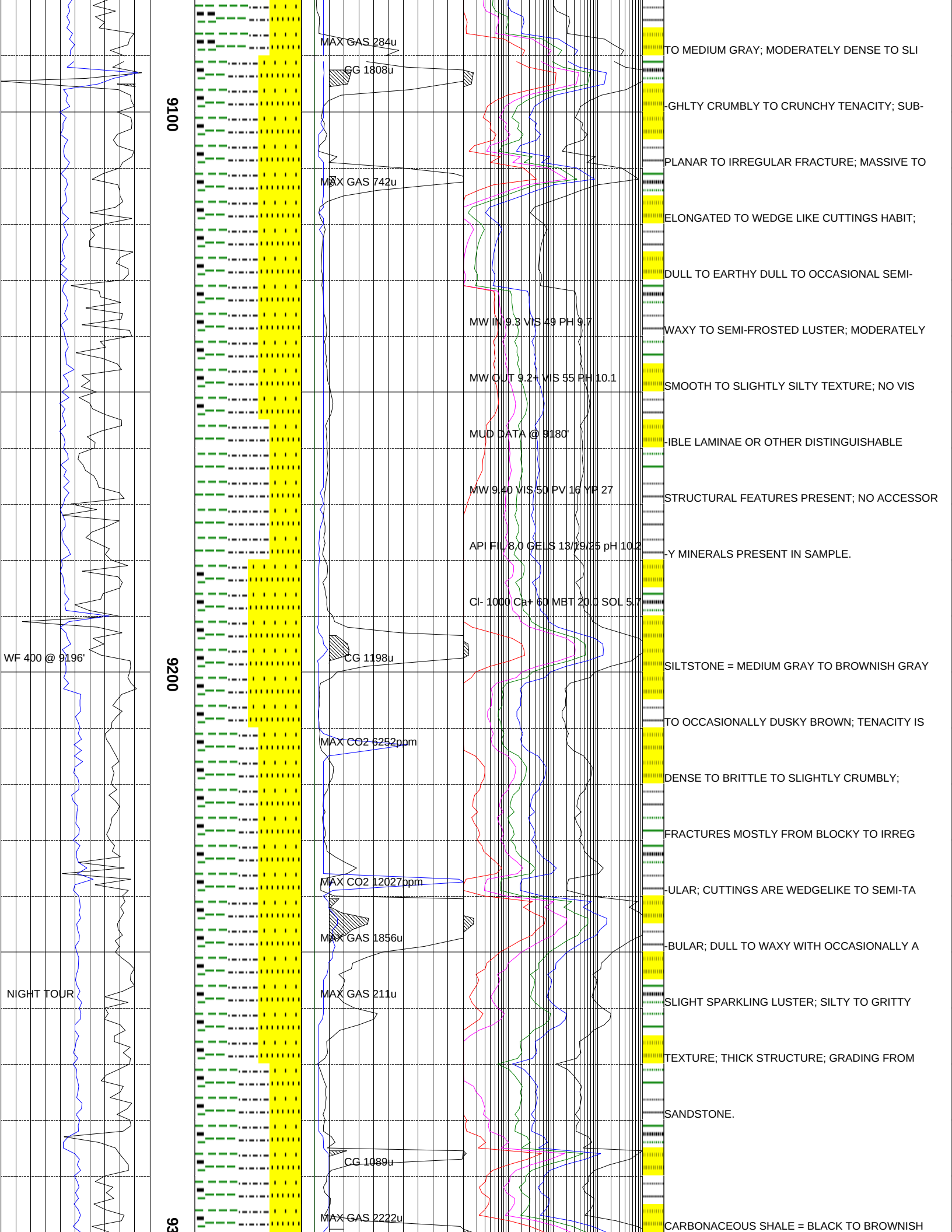
SPHERICITY; POOR GRADE SILTSTONE VISIBLE

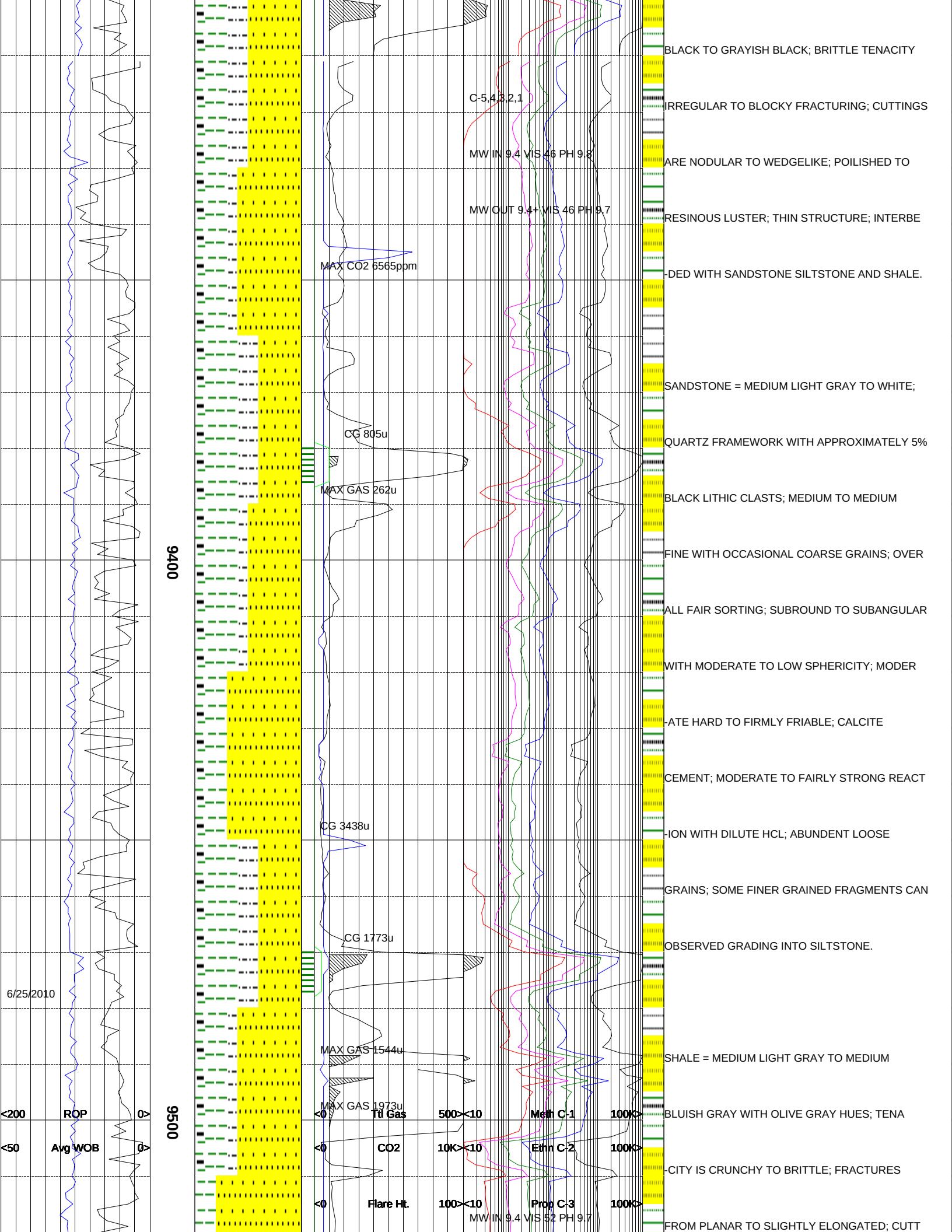
GRADING WITH POOR GRADE SANDSTONE, FRACT

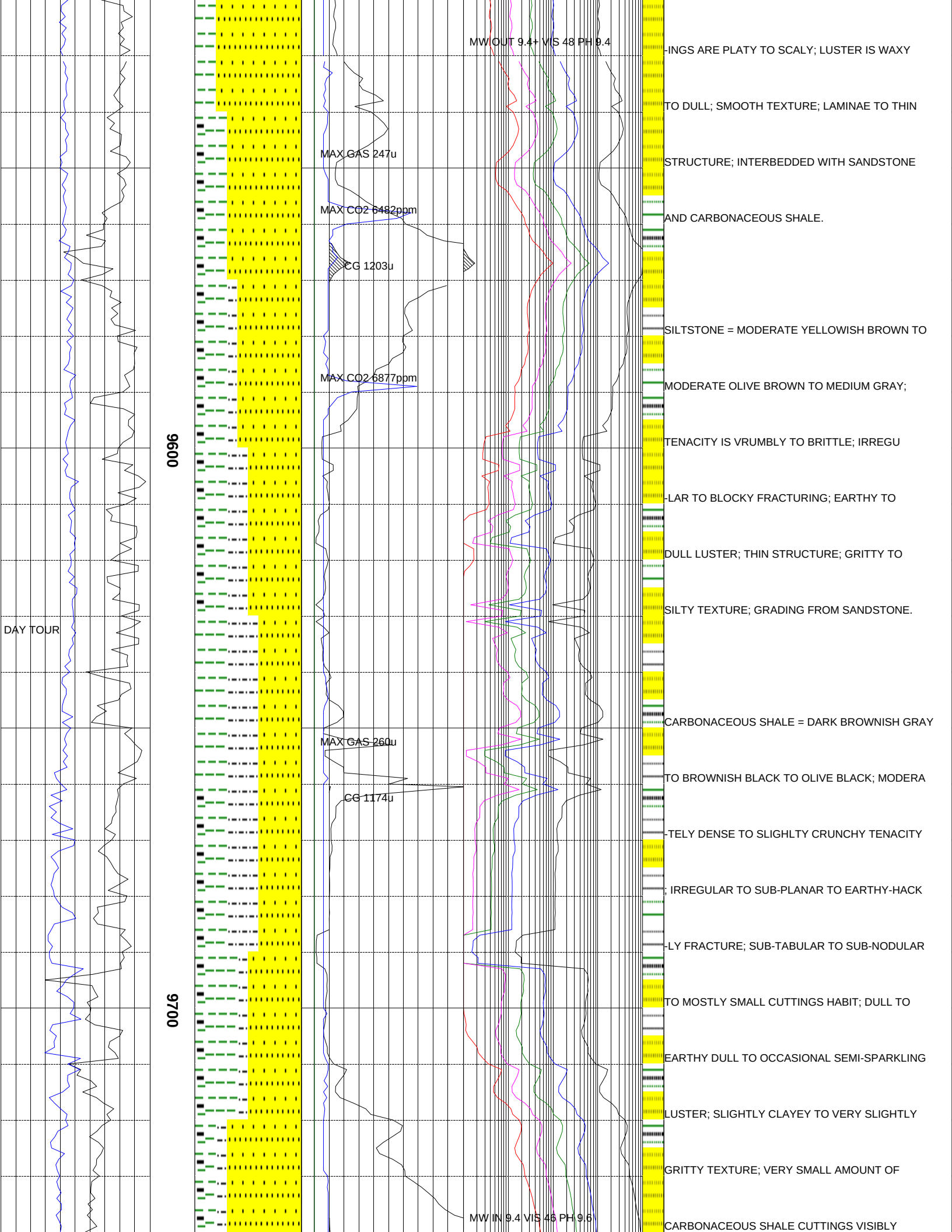
-URE EVIDENCE VISIBLE IN SAMPLE; NO ACCE

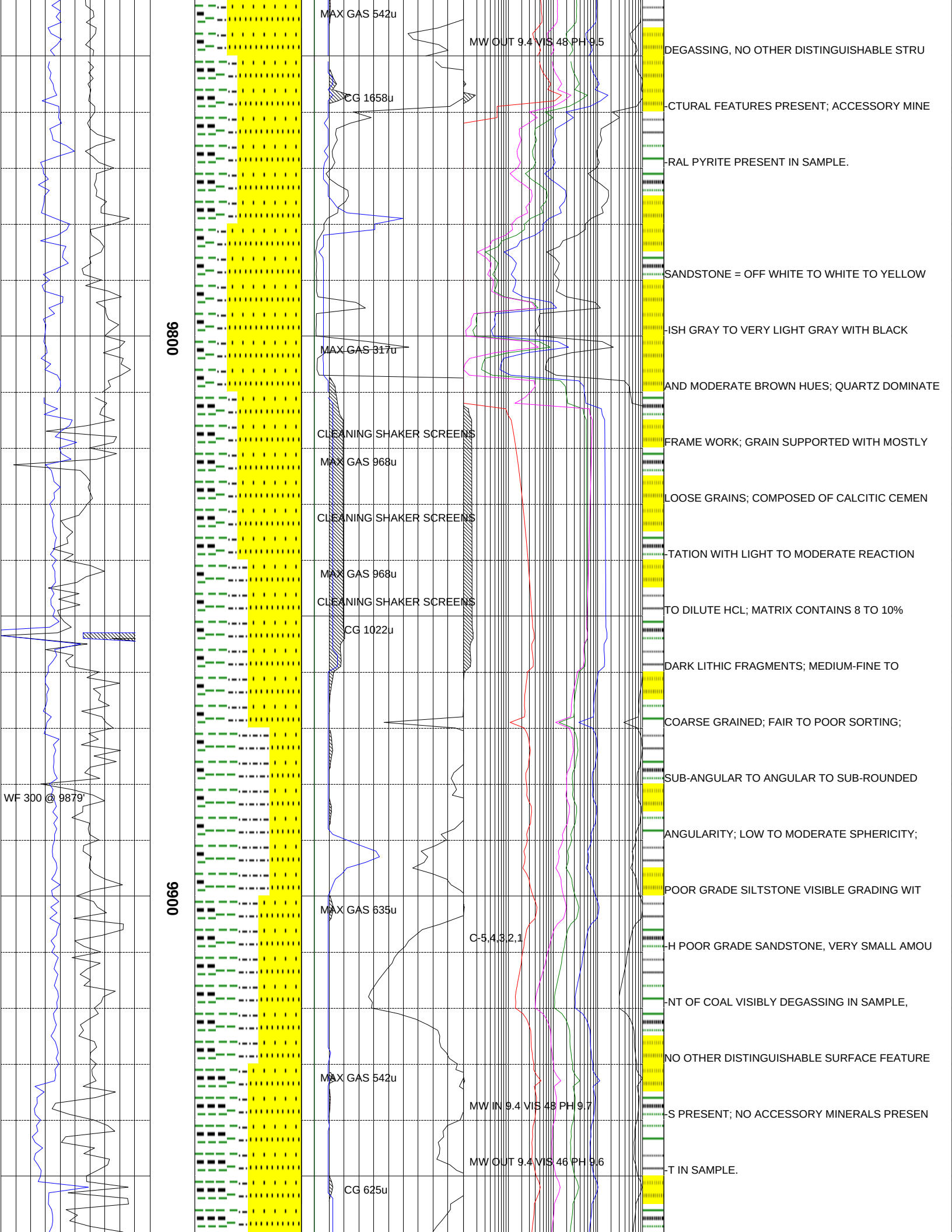
-SSORY MINERALS PRESENT IN SAMPLE.

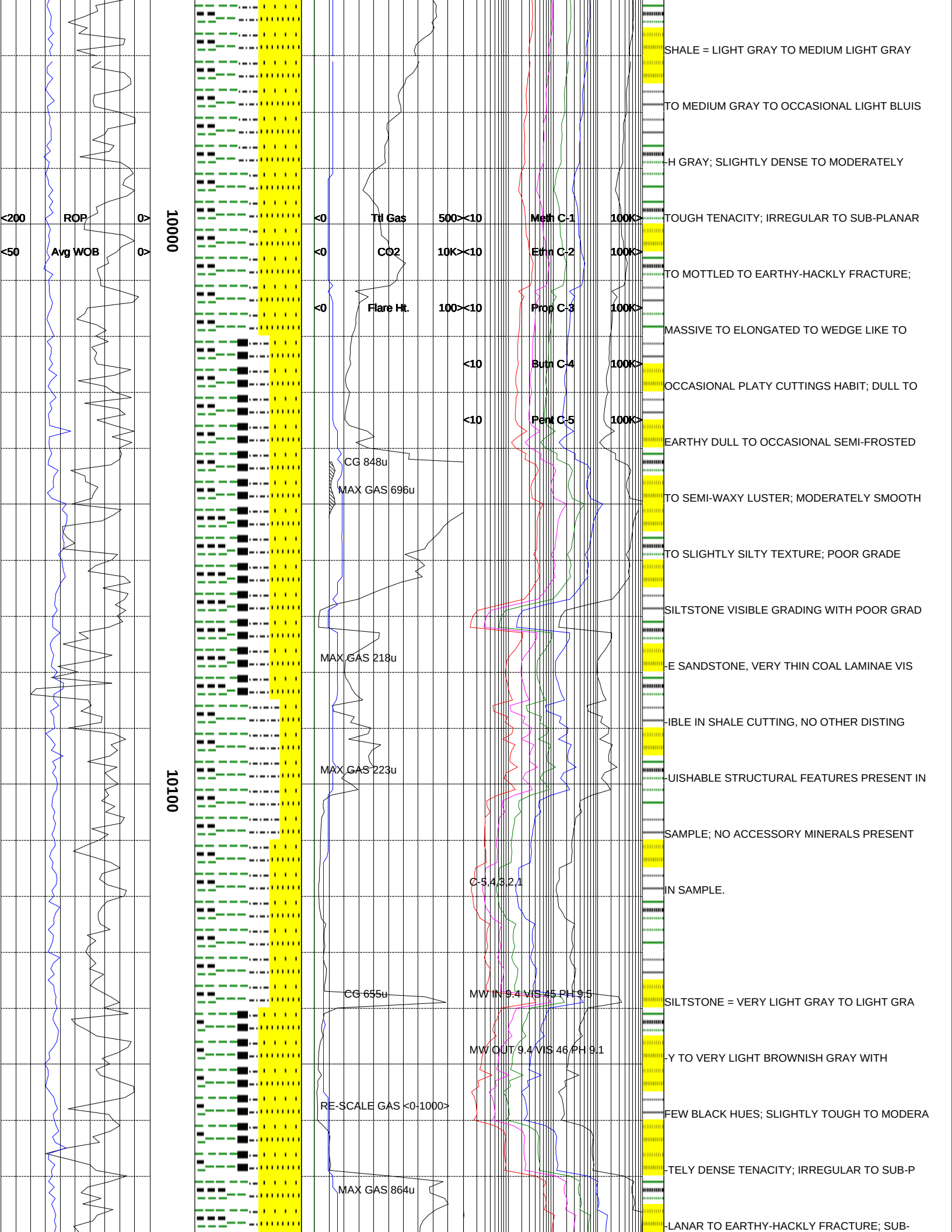
SHALE = LIGHT GRAY TO MEDIUM LIGHT GRAY

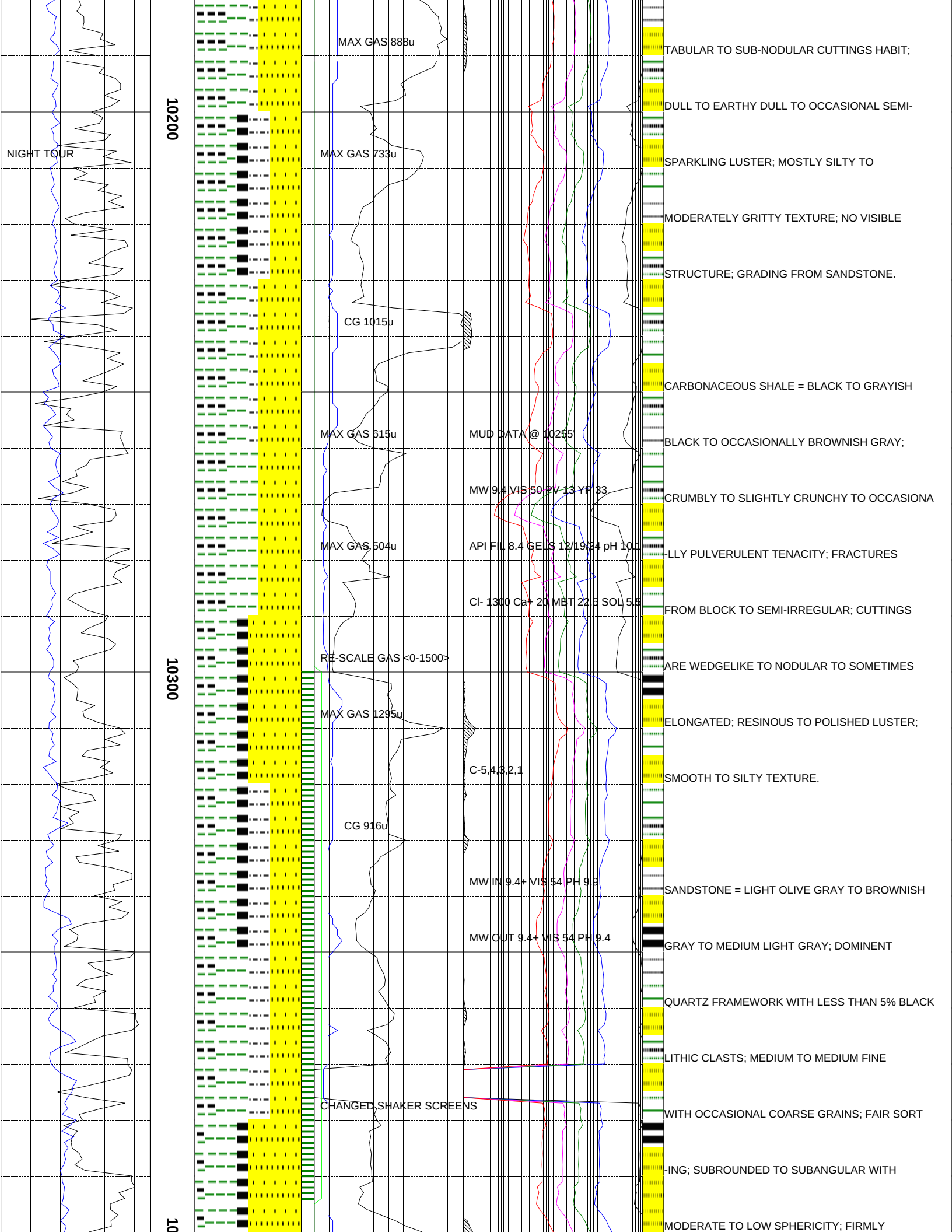

9100
9200
MAX GAS 284u
GG 1808u
MAX GAS 742u
MW IN 9.3 VIS 49 PH 9.7
MW OUT 9.2+ VIS 55 PH 10.1
MUD DATA @ 9180'
MW 9.40 VIS 50 PV 16 YP 27
API FIL 8.0 GELS 13/19/25 pH 10.2
Cl- 1000 Ca+ 60 MBT 20.0 SOL 5.7
WF 400 @ 9196'
CG 1198u
MAX CO2 6252ppm
MAX CO2 12027ppm
MAX GAS 1856u
NIGHT TOUR
MAX GAS 211u
CG 1089u
MAX GAS 2222u
TO MEDIUM GRAY; MODERATELY DENSE TO SLI
-GHLTY CRUMBLY TO CRUNCHY TENACITY; SUB-
PLANAR TO IRREGULAR FRACTURE; MASSIVE TO
ELONGATED TO WEDGE LIKE CUTTINGS HABIT;
DULL TO EARTHY DULL TO OCCASIONAL SEMI-
WAXY TO SEMI-FROSTED LUSTER; MODERATELY
SMOOTH TO SLIGHTLY SILTY TEXTURE; NO VIS
-IBLE LAMINAE OR OTHER DISTINGUISHABLE
STRUCTURAL FEATURES PRESENT; NO ACCESSOR
-Y MINERALS PRESENT IN SAMPLE.
SILTSTONE = MEDIUM GRAY TO BROWNISH GRAY
TO OCCASIONALLY DUSKY BROWN; TENACITY IS
DENSE TO BRITTLE TO SLIGHTLY CRUMBLY;
FRACTURES MOSTLY FROM BLOCKY TO IRREG
-ULAR; CUTTINGS ARE WEDGELIKE TO SEMI-TA
-BULAR; DULL TO WAXY WITH OCCASIONALLY A
SLIGHT SPARKLING LUSTER; SILTY TO GRITTY
TEXTURE; THICK STRUCTURE; GRADING FROM
SANDSTONE.
CARBONACEOUS SHALE = BLACK TO BROWNISH

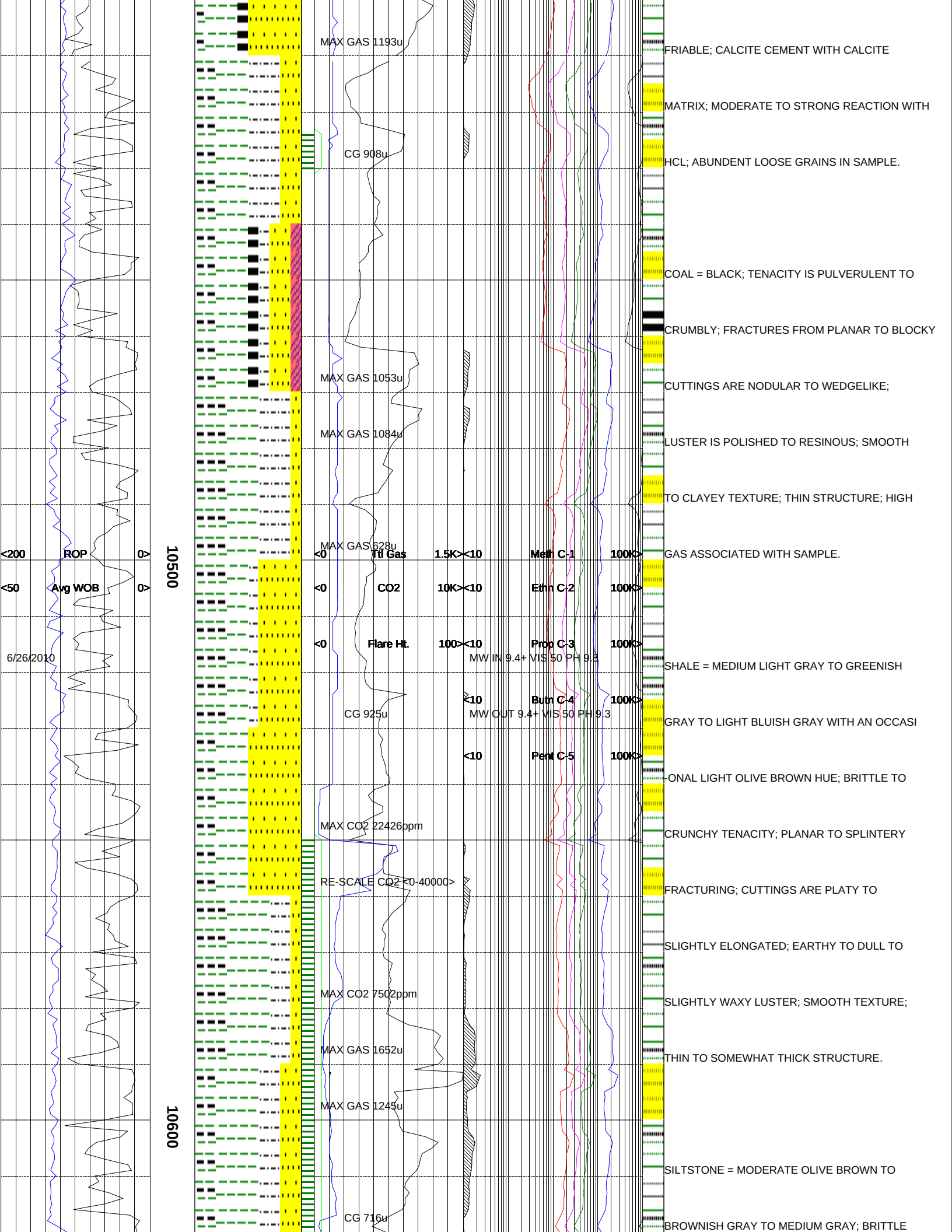

C-5,4,3,2,1
MW IN 9.4 VIS 46 PH 9.8
MW OUT 9.4+ VIS 46 PH 9.7
MAX CO2 6565ppm
CG 805u
MAX GAS 262u
CG 3438u
CG 1773u
MAX GAS 1544u
MAX GAS 1973u
MW IN 9.4 VIS 52 PH 9.7
9400
9500
6/25/2010
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
BLACK TO GRAYISH BLACK; BRITTLE TENACITY
IRREGULAR TO BLOCKY FRACTURING; CUTTINGS
ARE NODULAR TO WEDGELIKE; POILISHED TO
RESINOUS LUSTER; THIN STRUCTURE; INTERBE
DED WITH SANDSTONE SILTSTONE AND SHALE.
SANDSTONE = MEDIUM LIGHT GRAY TO WHITE;
QUARTZ FRAMEWORK WITH APPROXIMATELY 5%
BLACK LITHIC CLASTS; MEDIUM TO MEDIUM
FINE WITH OCCASIONAL COARSE GRAINS; OVER
ALL FAIR SORTING; SUBROUND TO SUBANGULAR
WITH MODERATE TO LOW SPHERICITY; MODER
ATE HARD TO FIRMLY FRIABLE; CALCITE
CEMENT; MODERATE TO FAIRLY STRONG REACT
ION WITH DILUTE HCL; ABUNDENT LOOSE
GRAINS; SOME FINER GRAINED FRAGMENTS CAN
OBSERVED GRADING INTO SILTSTONE.
SHALE = MEDIUM LIGHT GRAY TO MEDIUM
BLUISH GRAY WITH OLIVE GRAY HUES; TENA
CITY IS CRUNCHY TO BRITTLE; FRACTURES
FROM PLANAR TO SLIGHTLY ELONGATED; CUTT

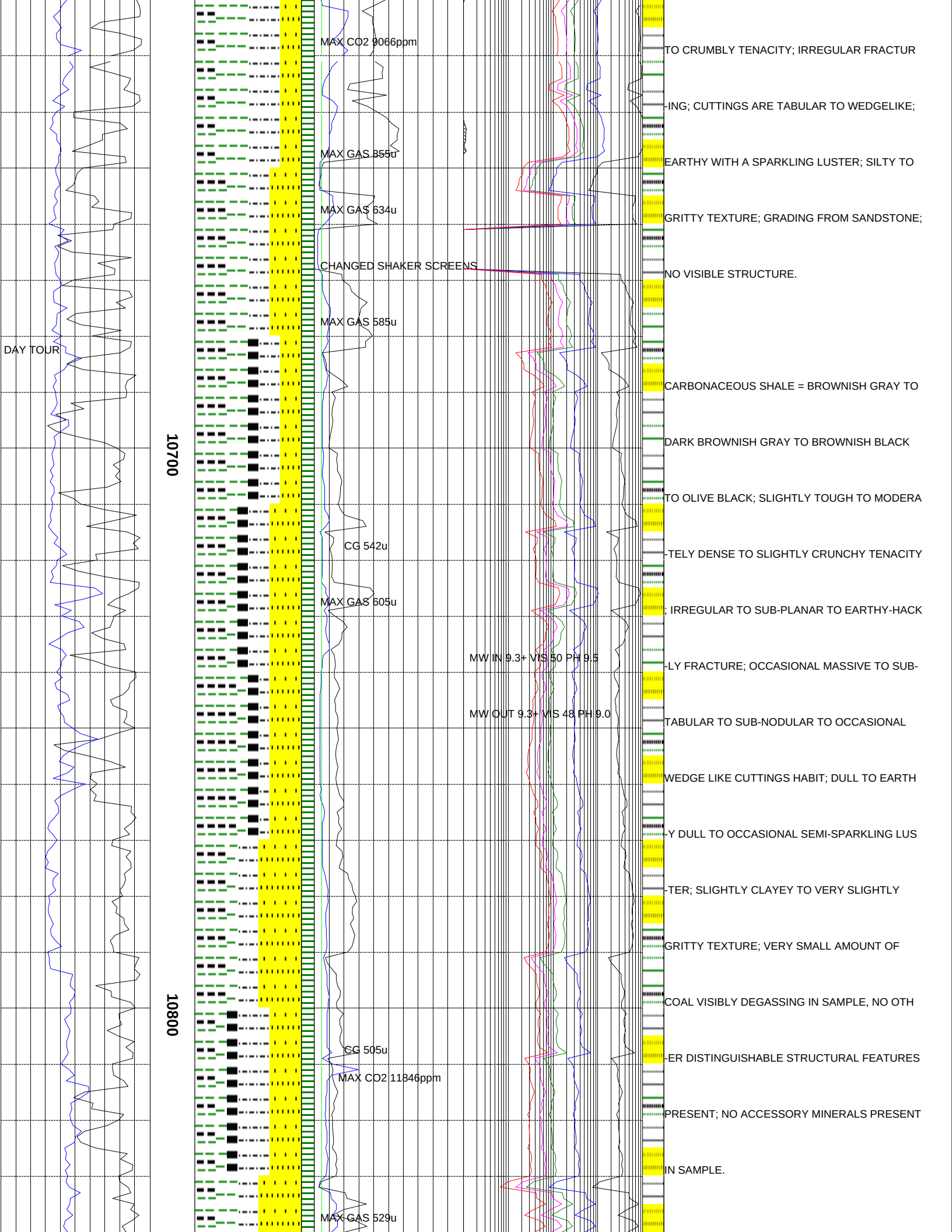

MW OUT 9.4+ VIS 48 PH 9.4
MAX GAS 247u
MAX CO2 6482ppm
CG 1203u
MAX CO2 6877ppm
9600
DAY TOUR
MAX GAS 260u
CG 1174u
9700
MW IN 9.4 VIS 46 PH 9.6
-INGS ARE PLATY TO SCALY; LUSTER IS WAXY
TO DULL; SMOOTH TEXTURE; LAMINAE TO THIN
STRUCTURE; INTERBEDDED WITH SANDSTONE
AND CARBONACEOUS SHALE.
SILTSTONE = MODERATE YELLOWISH BROWN TO
MODERATE OLIVE BROWN TO MEDIUM GRAY;
TENACITY IS VRUMBLY TO BRITTLE; IRREGU
-LAR TO BLOCKY FRACTURING; EARTHY TO
DULL LUSTER; THIN STRUCTURE; GRITTY TO
SILTY TEXTURE; GRADING FROM SANDSTONE.
CARBONACEOUS SHALE = DARK BROWNISH GRAY
TO BROWNISH BLACK TO OLIVE BLACK; MODERA
-TELY DENSE TO SLIGHLTY CRUNCHY TENACITY
; IRREGULAR TO SUB-PLANAR TO EARTHY-HACK
-LY FRACTURE; SUB-TABULAR TO SUB-NODULAR
TO MOSTLY SMALL CUTTINGS HABIT; DULL TO
EARTHY DULL TO OCCASIONAL SEMI-SPARKLING
LUSTER; SLIGHTLY CLAYEY TO VERY SLIGHTLY
GRITTY TEXTURE; VERY SMALL AMOUNT OF
CARBONACEOUS SHALE CUTTINGS VISIBLY

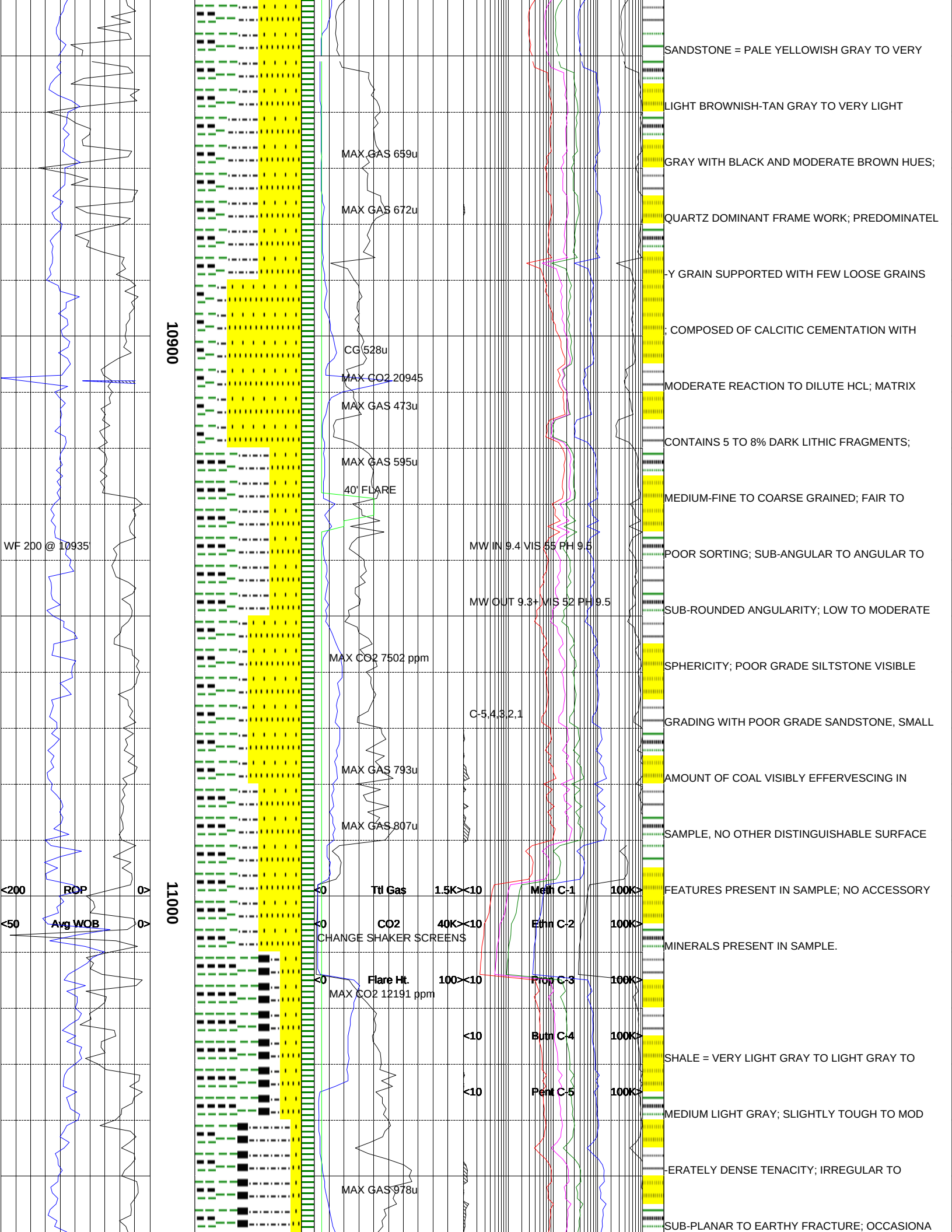

MAX GAS 542u
MW OUT 9.4 VIS 48 PH 9.5
DEGASSING, NO OTHER DISTINGUISHABLE STRU
CG 1658u
-CTURAL FEATURES PRESENT; ACCESSORY MINE
-RAL PYRITE PRESENT IN SAMPLE.
9800
SANDSTONE = OFF WHITE TO WHITE TO YELLOW
-ISH GRAY TO VERY LIGHT GRAY WITH BLACK
MAX GAS 317u
AND MODERATE BROWN HUES; QUARTZ DOMINATE
CLEANING SHAKER SCREENS
FRAME WORK; GRAIN SUPPORTED WITH MOSTLY
MAX GAS 968u
LOOSE GRAINS; COMPOSED OF CALCITIC CEMEN
CLEANING SHAKER SCREENS
-TATION WITH LIGHT TO MODERATE REACTION
MAX GAS 968u
CLEANING SHAKER SCREENS
TO DILUTE HCL; MATRIX CONTAINS 8 TO 10%
CG 1022u
DARK LITHIC FRAGMENTS; MEDIUM-FINE TO
COARSE GRAINED; FAIR TO POOR SORTING;
SUB-ANGULAR TO ANGULAR TO SUB-ROUNDED
WF 300 @ 9879'
ANGULARITY; LOW TO MODERATE SPHERICITY;
9900
POOR GRADE SILTSTONE VISIBLE GRADING WIT
MAX GAS 635u
C-5,4,3,2,1
-H POOR GRADE SANDSTONE, VERY SMALL AMOU
-NT OF COAL VISIBLY DEGASSING IN SAMPLE,
NO OTHER DISTINGUISHABLE SURFACE FEATURE
MAX GAS 542u
MW IN 9.4 VIS 48 PH 9.7
-S PRESENT; NO ACCESSORY MINERALS PRESEN
MW OUT 9.4 VIS 46 PH 9.6
-T IN SAMPLE.
CG 625u

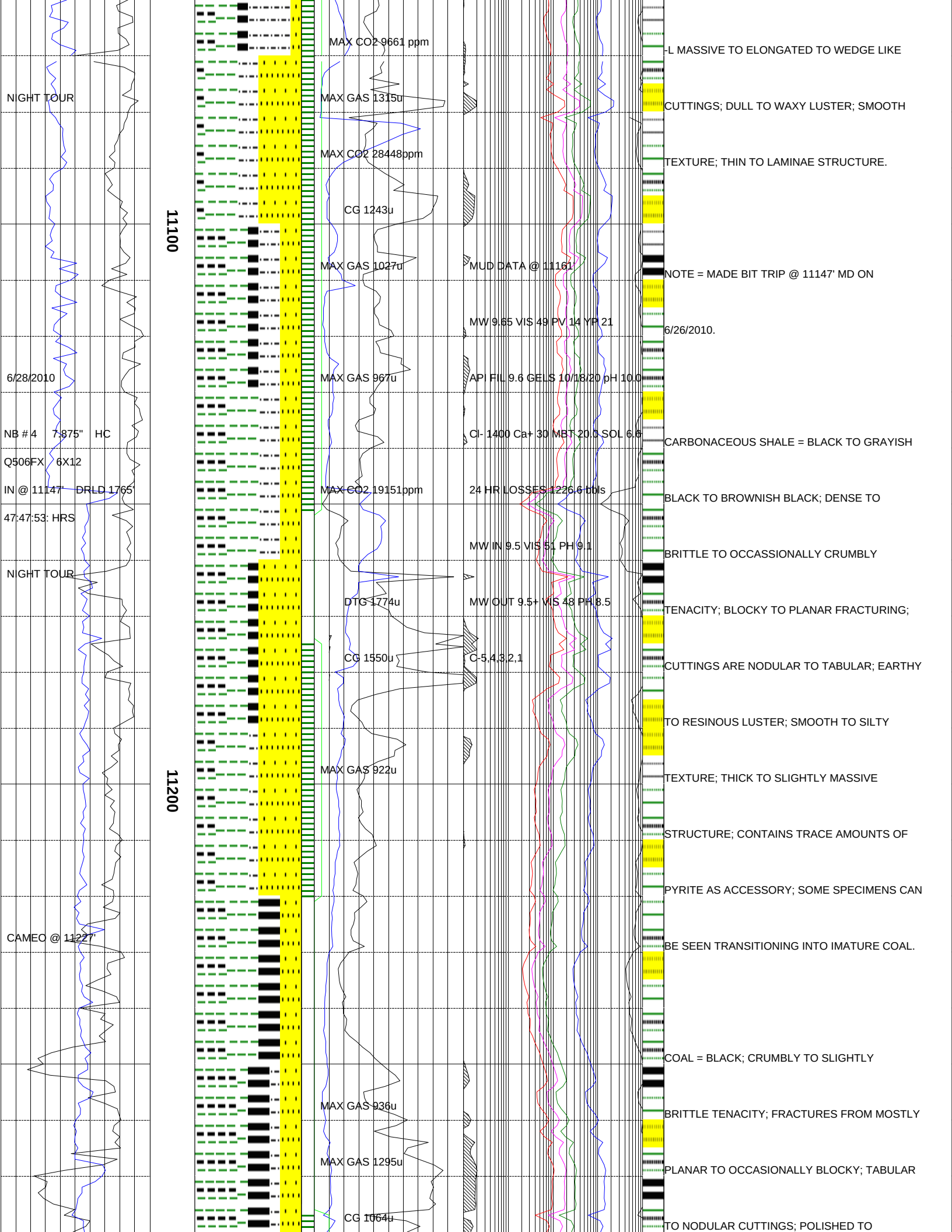

<200 ROP 0>
<50 Avg WOB 0>
10000
<0 Ttl Gas 500><10 Meth C-1 100K>
<0 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buth C-4 100K>
<10 Pent C-5 100K>
CG 848u
MAX GAS 696u
MAX GAS 218u
MAX GAS 223u
10100
C-5,4,3,2,1
CG 655u
MW IN 9.4 VIS 45 PH 9.5
MW OUT 9.4 VIS 46 PH 9.1
RE-SCALE GAS <0-1000>
MAX GAS 864u
SHALE = LIGHT GRAY TO MEDIUM LIGHT GRAY
TO MEDIUM GRAY TO OCCASIONAL LIGHT BLUIS
-H GRAY; SLIGHTLY DENSE TO MODERATELY
TOUGH TENACITY; IRREGULAR TO SUB-PLANAR
TO MOTTLED TO EARTHY-HACKLY FRACTURE;
MASSIVE TO ELONGATED TO WEDGE LIKE TO
OCCASIONAL PLATY CUTTINGS HABIT; DULL TO
EARTHY DULL TO OCCASIONAL SEMI-FROSTED
TO SEMI-WAXY LUSTER; MODERATELY SMOOTH
TO SLIGHTLY SILTY TEXTURE; POOR GRADE
SILTSTONE VISIBLE GRADING WITH POOR GRAD
-E SANDSTONE, VERY THIN COAL LAMINAE VIS
-IBLE IN SHALE CUTTING, NO OTHER DISTING
-UISHABLE STRUCTURAL FEATURES PRESENT IN
SAMPLE; NO ACCESSORY MINERALS PRESENT
IN SAMPLE.
SILTSTONE = VERY LIGHT GRAY TO LIGHT GRA
-Y TO VERY LIGHT BROWNISH GRAY WITH
FEW BLACK HUES; SLIGHTLY TOUGH TO MODERA
-TELY DENSE TENACITY; IRREGULAR TO SUB-P
-LANAR TO EARTHY-HACKLY FRACTURE; SUB-

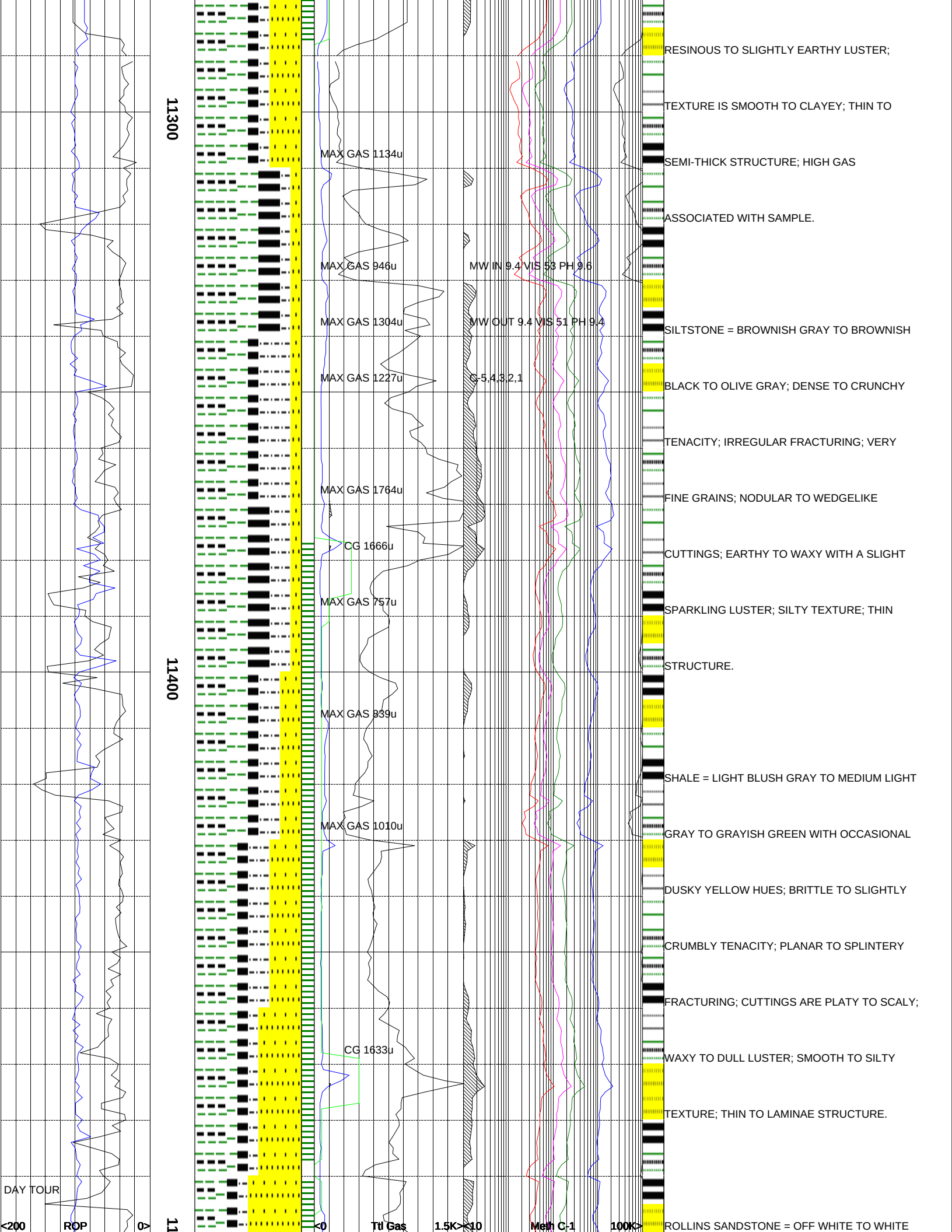

MAX GAS 888u
TABULAR TO SUB-NODULAR CUTTINGS HABIT;
DULL TO EARTHY DULL TO OCCASIONAL SEMI-
10200
NIGHT TOUR
MAX GAS 733u
SPARKLING LUSTER; MOSTLY SILTY TO
MODERATELY GRITTY TEXTURE; NO VISIBLE
STRUCTURE; GRADING FROM SANDSTONE.
CG 1015u
CARBONACEOUS SHALE = BLACK TO GRAYISH
MAX GAS 615u
MUD DATA @ 10255'
BLACK TO OCCASIONALLY BROWNISH GRAY;
MW 9.4 VIS 50 PV 13 YP 33
CRUMBLY TO SLIGHTLY CRUNCHY TO OCCASIONA
MAX GAS 504u
API FIL 8.4 GELS 12/19/24 pH 10.1
-LLY PULVERULENT TENACITY; FRACTURES
Cl- 1300 Ca+ 20 MBT 22.5 SOL 5.5
FROM BLOCK TO SEMI-IRREGULAR; CUTTINGS
RE-SCALE GAS <0-1500>
ARE WEDGELIKE TO NODULAR TO SOMETIMES
10300
MAX GAS 1295u
ELONGATED; RESINOUS TO POLISHED LUSTER;
C-5,4,3,2,1
SMOOTH TO SILTY TEXTURE.
CG 916u
MW IN 9.4+ VIS 54 PH 9.9
SANDSTONE = LIGHT OLIVE GRAY TO BROWNISH
MW OUT 9.4+ VIS 54 PH 9.4
GRAY TO MEDIUM LIGHT GRAY; DOMINENT
QUARTZ FRAMEWORK WITH LESS THAN 5% BLACK
LITHIC CLASTS; MEDIUM TO MEDIUM FINE
CHANGED SHAKER SCREENS
WITH OCCASIONAL COARSE GRAINS; FAIR SORT
-ING; SUBROUNDED TO SUBANGULAR WITH
MODERATE TO LOW SPHERICITY; FIRMLY

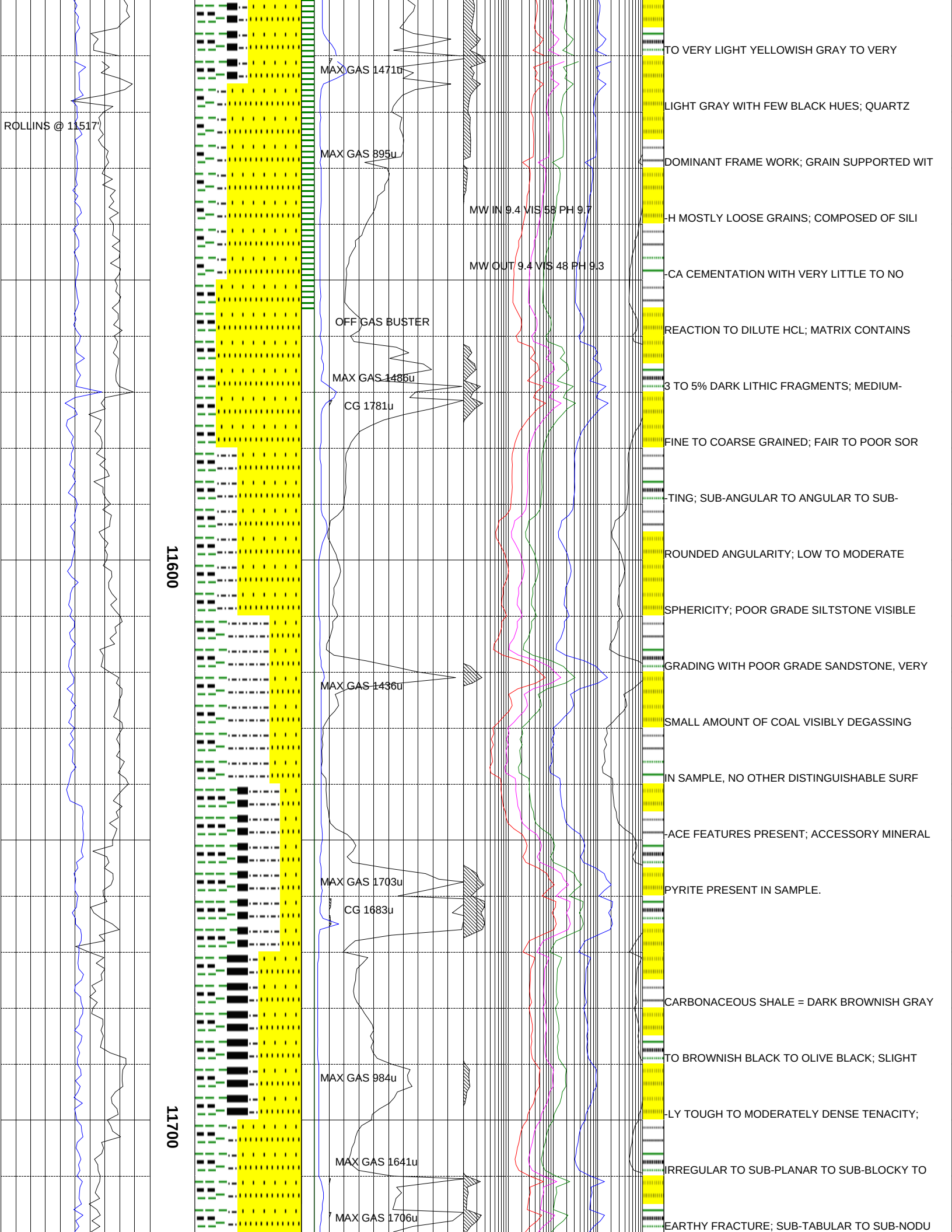

MAX GAS 1193u
CG 908u
MAX GAS 1053u
MAX GAS 1084u
MAX GAS 628u
<200 ROP 0>
<0 Ttl Gas 1.5K><10 Meth C-1 100K>
<50 Avg WOB 0>
<0 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
6/26/2010
MW IN 9.4+ VIS 50 PH 9.8
<10 Butn C-4 100K>
CG 925u
MW OUT 9.4+ VIS 50 PH 9.3
<10 Pent C-5 100K>
MAX CO2 22426ppm
RE-SCALE CO2 <0-40000>
MAX CO2 7502ppm
MAX GAS 1652u
MAX GAS 1245u
CG 716u
10500
10600
FRIABLE; CALCITE CEMENT WITH CALCITE
MATRIX; MODERATE TO STRONG REACTION WITH
HCL; ABUNDENT LOOSE GRAINS IN SAMPLE.
COAL = BLACK; TENACITY IS PULVERULENT TO
CRUMBLY; FRACTURES FROM PLANAR TO BLOCKY
CUTTINGS ARE NODULAR TO WEDGELIKE;
LUSTER IS POLISHED TO RESINOUS; SMOOTH
TO CLAYEY TEXTURE; THIN STRUCTURE; HIGH
GAS ASSOCIATED WITH SAMPLE.
SHALE = MEDIUM LIGHT GRAY TO GREENISH
GRAY TO LIGHT BLUISH GRAY WITH AN OCCASI
-ONAL LIGHT OLIVE BROWN HUE; BRITTLE TO
CRUNCHY TENACITY; PLANAR TO SPLINTERY
FRACTURING; CUTTINGS ARE PLATY TO
SLIGHTLY ELONGATED; EARTHY TO DULL TO
SLIGHTLY WAXY LUSTER; SMOOTH TEXTURE;
THIN TO SOMEWHAT THICK STRUCTURE.
SILTSTONE = MODERATE OLIVE BROWN TO
BROWNISH GRAY TO MEDIUM GRAY; BRITTLE

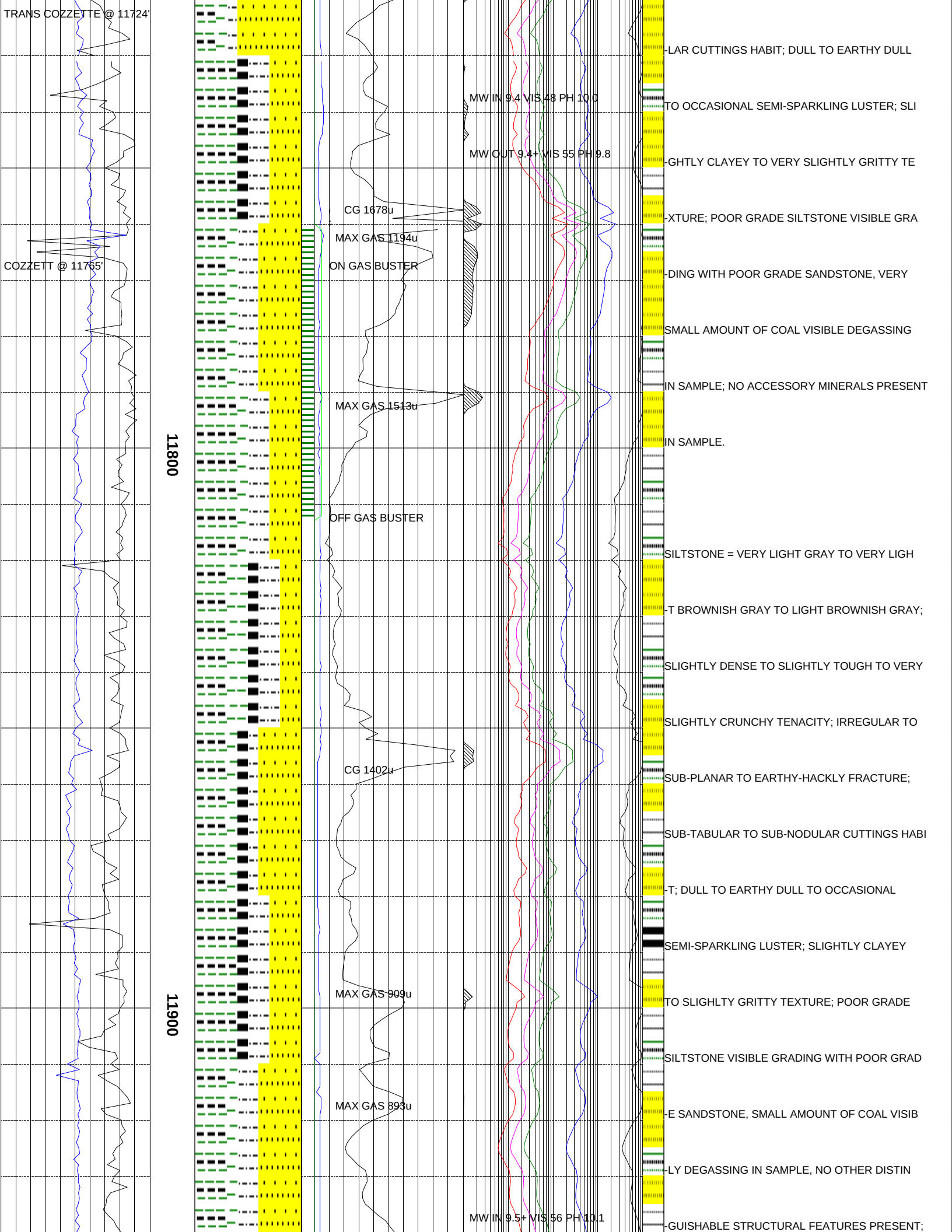

MAX CO2 9066ppm
MAX GAS 855u
MAX GAS 634u
CHANGED SHAKER SCREENS
MAX GAS 585u
DAY TOUR
10700
CG 542u
MAX GAS 605u
MW IN 9.3+ VIS 50 PH 9.5
MW OUT 9.3+ VIS 48 PH 9.0
10800
CG 505u
MAX CO2 11846ppm
MAX GAS 529u
-TO CRUMBLY TENACITY; IRREGULAR FRACTUR
-ING; CUTTINGS ARE TABULAR TO WEDGELIKE;
EARTHY WITH A SPARKLING LUSTER; SILTY TO
GRITTY TEXTURE; GRADING FROM SANDSTONE;
NO VISIBLE STRUCTURE.
CARBONACEOUS SHALE = BROWNISH GRAY TO
DARK BROWNISH GRAY TO BROWNISH BLACK
TO OLIVE BLACK; SLIGHTLY TOUGH TO MODERA
-TELY DENSE TO SLIGHTLY CRUNCHY TENACITY
; IRREGULAR TO SUB-PLANAR TO EARTHY-HACK
-LY FRACTURE; OCCASIONAL MASSIVE TO SUB-
TABULAR TO SUB-NODULAR TO OCCASIONAL
WEDGE LIKE CUTTINGS HABIT; DULL TO EARTH
-Y DULL TO OCCASIONAL SEMI-SPARKLING LUS
-TER; SLIGHTLY CLAYEY TO VERY SLIGHTLY
GRITTY TEXTURE; VERY SMALL AMOUNT OF
COAL VISIBLY DEGASSING IN SAMPLE, NO OTH
-ER DISTINGUISHABLE STRUCTURAL FEATURES
PRESENT; NO ACCESSORY MINERALS PRESENT
IN SAMPLE.

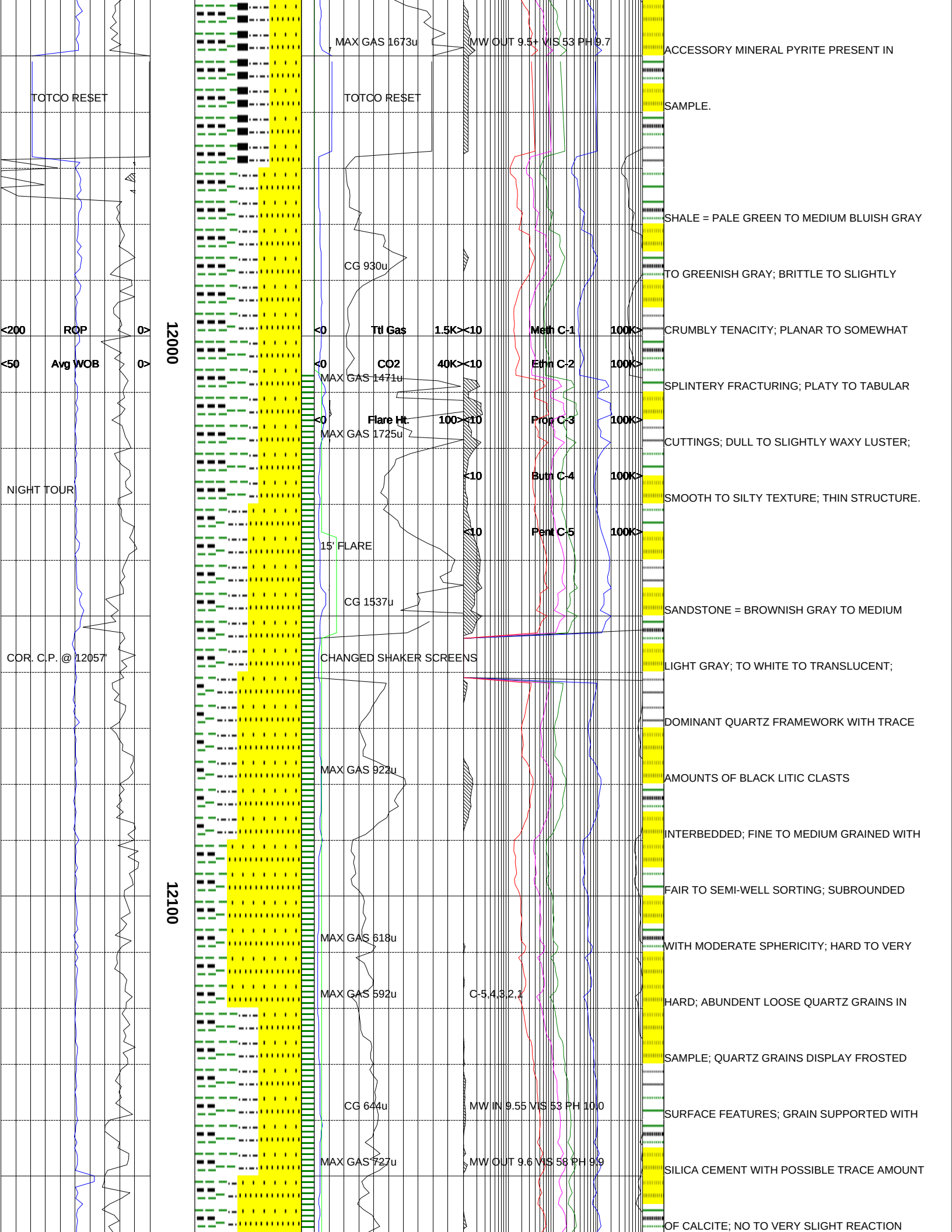

10900
11000
MAX GAS 659u
MAX GAS 672u
CG 528u
MAX CO2 20945
MAX GAS 473u
MAX GAS 595u
40' FLARE
WF 200 @ 10935'
MW IN 9.4 VIS 55 PH 9.5
MW OUT 9.3+ VIS 52 PH 9.5
MAX CO2 7502 ppm
C-5,4,3,2,1
MAX GAS 793u
MAX GAS 807u
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 1.5K>
<0 CO2 40K>
CHANGE SHAKER SCREENS
<0 Flare Ht. 100>
MAX CO2 12191 ppm
<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>
MAX GAS 978u
SANDSTONE = PALE YELLOWISH GRAY TO VERY
LIGHT BROWNISH-TAN GRAY TO VERY LIGHT
GRAY WITH BLACK AND MODERATE BROWN HUES;
QUARTZ DOMINANT FRAME WORK; PREDOMINATEL
-Y GRAIN SUPPORTED WITH FEW LOOSE GRAINS
; COMPOSED OF CALCITIC CEMENTATION WITH
MODERATE REACTION TO DILUTE HCL; MATRIX
CONTAINS 5 TO 8% DARK LITHIC FRAGMENTS;
MEDIUM-FINE TO COARSE GRAINED; FAIR TO
POOR SORTING; SUB-ANGULAR TO ANGULAR TO
SUB-ROUNDED ANGULARITY; LOW TO MODERATE
SPHERICITY; POOR GRADE SILTSTONE VISIBLE
GRADING WITH POOR GRADE SANDSTONE, SMALL
AMOUNT OF COAL VISIBLY EFFERVESCING IN
SAMPLE, NO OTHER DISTINGUISHABLE SURFACE
FEATURES PRESENT IN SAMPLE; NO ACCESSORY
MINERALS PRESENT IN SAMPLE.
SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO
MEDIUM LIGHT GRAY; SLIGHTLY TOUGH TO MOD
-ERATELY DENSE TENACITY; IRREGULAR TO
SUB-PLANAR TO EARTHY FRACTURE; OCCASIONA

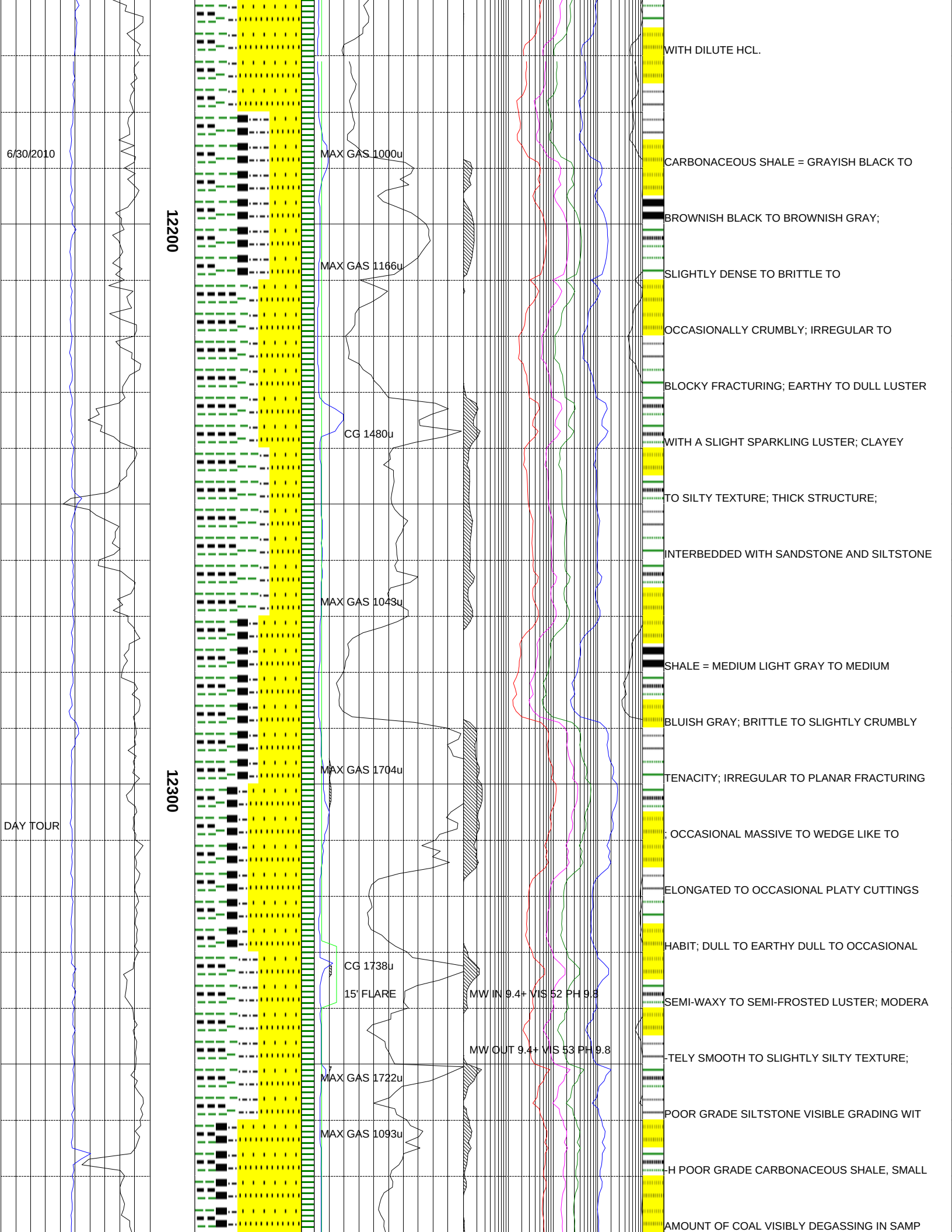

MAX CO2 9661 ppm
-L MASSIVE TO ELONGATED TO WEDGE LIKE
NIGHT TOUR
MAX GAS 1315u
CUTTINGS; DULL TO WAXY LUSTER; SMOOTH
MAX CO2 28448ppm
TEXTURE; THIN TO LAMINAE STRUCTURE.
CG 1243u
11100
MAX GAS 1027u
MUD DATA @ 11161'
NOTE = MADE BIT TRIP @ 11147' MD ON
MW 9.65 VIS 49 PV 14 YP 21
6/26/2010.
6/28/2010
MAX GAS 967u
API FIL 9.6 GELS 10/18/20 pH 10.0
NB # 4 7.875" HC
Cl- 1400 Ca+ 30 MBT 20.0 SOL 6.6
CARBONACEOUS SHALE = BLACK TO GRAYISH
Q506FX 6X12
IN @ 11147' DRLD 1765'
MAX CO2 19151ppm
24 HR LOSSES 1226.6 bbls
BLACK TO BROWNISH BLACK; DENSE TO
47:47:53: HRS
MW IN 9.5 VIS 51 PH 9.1
BRITTLE TO OCCASSIONALLY CRUMBLY
NIGHT TOUR
DTG 1774u
MW OUT 9.5+ VIS 48 PH 8.5
TENACITY; BLOCKY TO PLANAR FRACTURING;
CG 1550u
C-5,4,3,2,1
CUTTINGS ARE NODULAR TO TABULAR; EARTHY
TO RESINOUS LUSTER; SMOOTH TO SILTY
MAX GAS 922u
TEXTURE; THICK TO SLIGHTLY MASSIVE
11200
STRUCTURE; CONTAINS TRACE AMOUNTS OF
PYRITE AS ACCESSORY; SOME SPECIMENS CAN
CAMEO @ 11227'
BE SEEN TRANSITIONING INTO IMATURE COAL.
COAL = BLACK; CRUMBLY TO SLIGHTLY
MAX GAS 936u
BRITTLE TENACITY; FRACTURES FROM MOSTLY
MAX GAS 1295u
PLANAR TO OCCASIONALLY BLOCKY; TABULAR
CG 1064u
TO NODULAR CUTTINGS; POLISHED TO

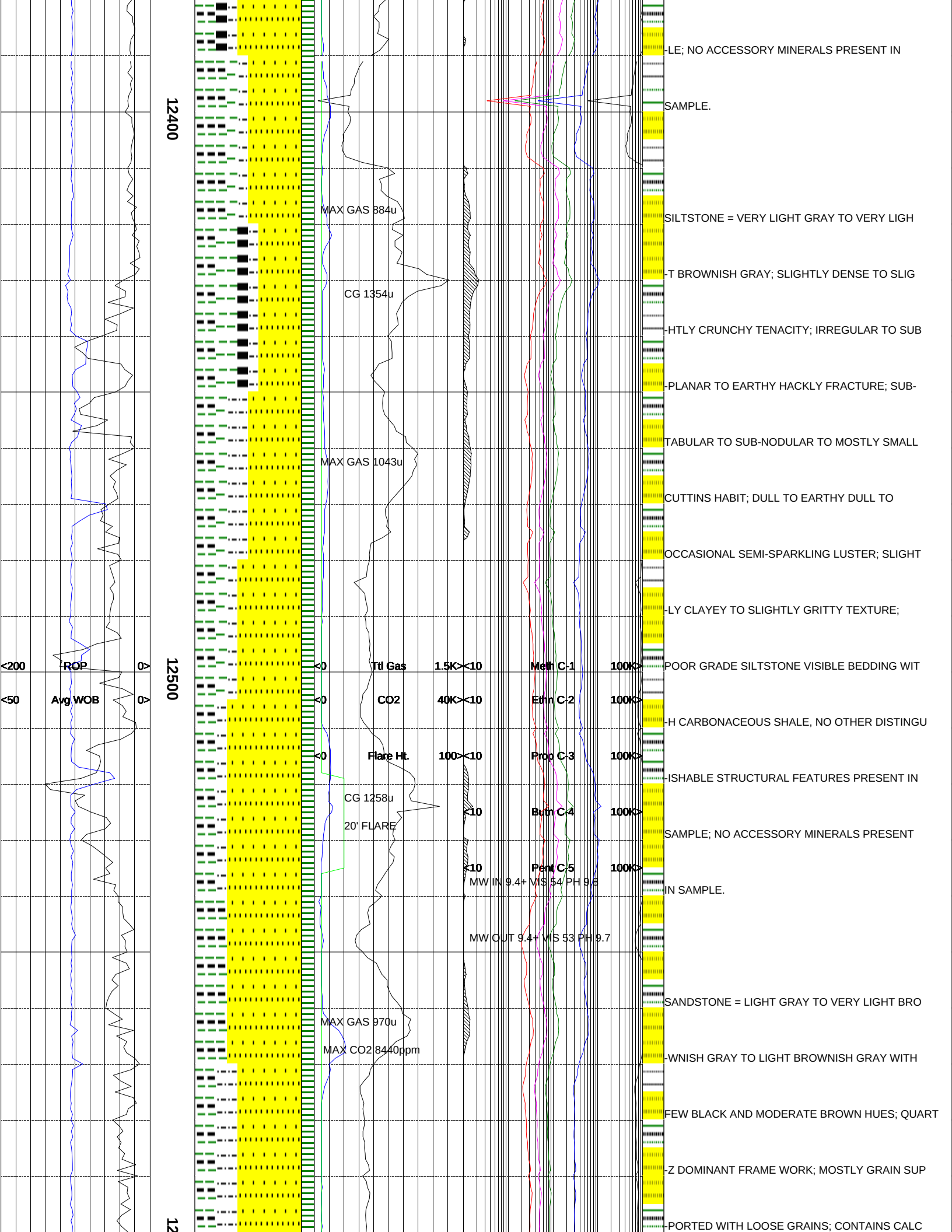

11300
11400
MAX GAS 1134u
MAX GAS 946u
MW IN 9.4 VIS 53 PH 9.6
MAX GAS 1304u
MW OUT 9.4 VIS 51 PH 9.4
MAX GAS 1227u
C-5,4,3,2,1
MAX GAS 1764u
CG 1666u
MAX GAS 757u
MAX GAS 839u
MAX GAS 1010u
CG 1633u
RESINOUS TO SLIGHTLY EARTHY LUSTER;
TEXTURE IS SMOOTH TO CLAYEY; THIN TO
SEMI-THICK STRUCTURE; HIGH GAS
ASSOCIATED WITH SAMPLE.
SILTSTONE = BROWNISH GRAY TO BROWNISH
BLACK TO OLIVE GRAY; DENSE TO CRUNCHY
TENACITY; IRREGULAR FRACTURING; VERY
FINE GRAINS; NODULAR TO WEDGELIKE
CUTTINGS; EARTHY TO WAXY WITH A SLIGHT
SPARKLING LUSTER; SILTY TEXTURE; THIN
STRUCTURE.
SHALE = LIGHT BLUSH GRAY TO MEDIUM LIGHT
GRAY TO GRAYISH GREEN WITH OCCASIONAL
DUSKY YELLOW HUES; BRITTLE TO SLIGHTLY
CRUMBLY TENACITY; PLANAR TO SPLINTERY
FRACTURING; CUTTINGS ARE PLATY TO SCALY;
WAXY TO DULL LUSTER; SMOOTH TO SILTY
TEXTURE; THIN TO LAMINAE STRUCTURE.
ROLLINS SANDSTONE = OFF WHITE TO WHITE
DAY TOUR
<200 ROP 0>
<0 Ttl Gas 1.5K>
<10 Meth C-1 100K>

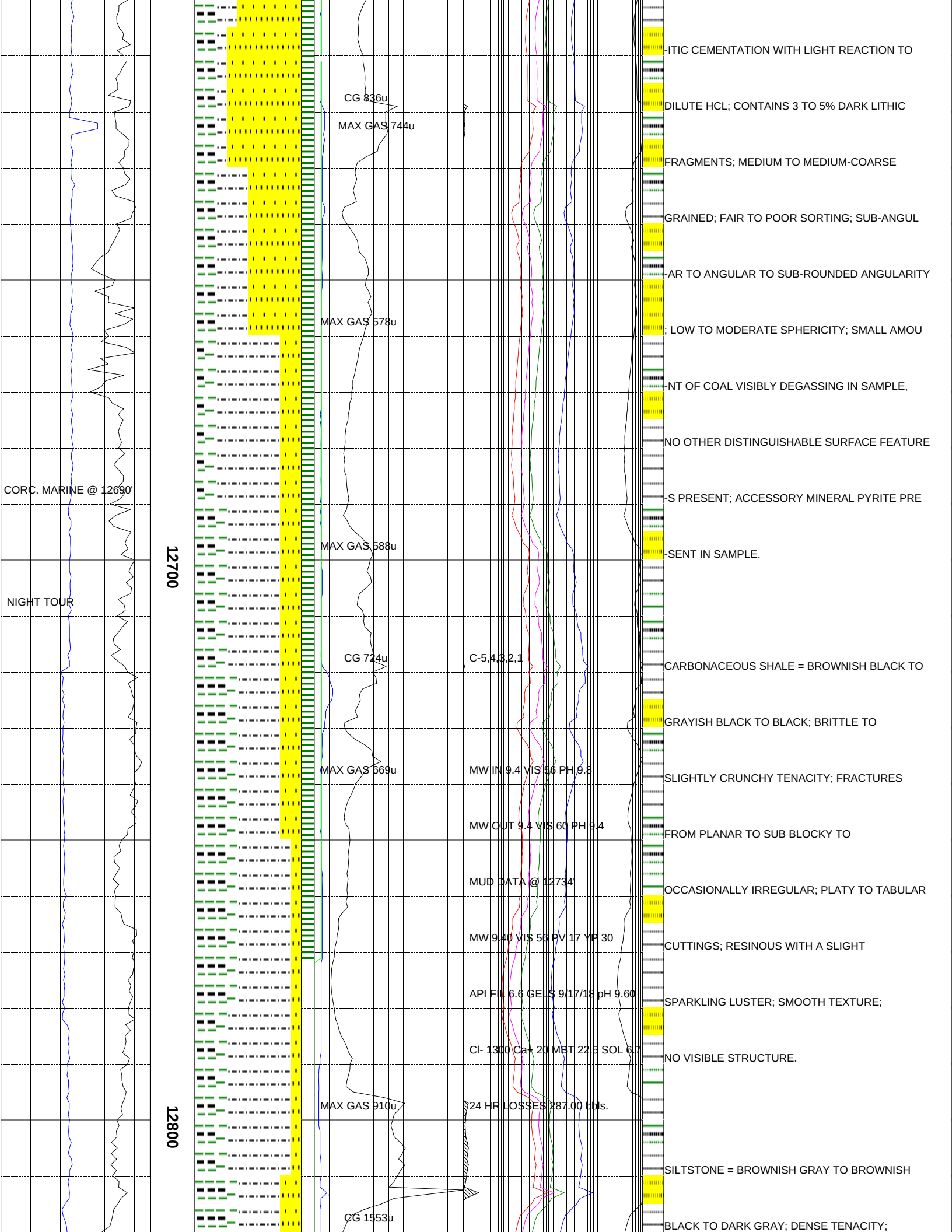

ROLLINS @ 11517'
MAX GAS 1471u
MAX GAS 895u
MW IN 9.4 VIS 58 PH 9.7
MW OUT 9.4 VIS 48 PH 9.3
OFF GAS BUSTER
MAX GAS 1486u
CG 1781u
11600
MAX GAS 1436u
MAX GAS 1703u
CG 1683u
MAX GAS 984u
11700
MAX GAS 1641u
MAX GAS 1706u
TO VERY LIGHT YELLOWISH GRAY TO VERY
LIGHT GRAY WITH FEW BLACK HUES; QUARTZ
DOMINANT FRAME WORK; GRAIN SUPPORTED WIT
H MOSTLY LOOSE GRAINS; COMPOSED OF SILI
CA CEMENTATION WITH VERY LITTLE TO NO
REACTION TO DILUTE HCL; MATRIX CONTAINS
3 TO 5% DARK LITHIC FRAGMENTS; MEDIUM-
FINE TO COARSE GRAINED; FAIR TO POOR SOR
TING; SUB-ANGULAR TO ANGULAR TO SUB-
ROUNDED ANGULARITY; LOW TO MODERATE
SPHERICITY; POOR GRADE SILTSTONE VISIBLE
GRADING WITH POOR GRADE SANDSTONE, VERY
SMALL AMOUNT OF COAL VISIBLY DEGASSING
IN SAMPLE, NO OTHER DISTINGUISHABLE SURF
ACE FEATURES PRESENT; ACCESSORY MINERAL
PYRITE PRESENT IN SAMPLE.
CARBONACEOUS SHALE = DARK BROWNISH GRAY
TO BROWNISH BLACK TO OLIVE BLACK; SLIGHT
LY TOUGH TO MODERATELY DENSE TENACITY;
IRREGULAR TO SUB-PLANAR TO SUB-BLOCKY TO
EARTHY FRACTURE; SUB-TABULAR TO SUB-NODU


TRANS COZZETTE @ 11724'
COZZETT @ 11765'
11800
11900
CG 1678u
MAX GAS 1194u
ON GAS BUSTER
MAX GAS 1513u
OFF GAS BUSTER
CG 1402u
MAX GAS 909u
MAX GAS 893u
MW IN 9.4 VIS 48 PH 10.0
MW OUT 9.4+ VIS 55 PH 9.8
MW IN 9.5+ VIS 56 PH 10.1
-LAR CUTTINGS HABIT; DULL TO EARTHY DULL
TO OCCASIONAL SEMI-SPARKLING LUSTER; SLI
-GHTLY CLAYEY TO VERY SLIGHTLY GRITTY TE
-XTURE; POOR GRADE SILTSTONE VISIBLE GRA
-DING WITH POOR GRADE SANDSTONE, VERY
SMALL AMOUNT OF COAL VISIBLE DEGASSING
IN SAMPLE; NO ACCESSORY MINERALS PRESENT
IN SAMPLE.
SILTSTONE = VERY LIGHT GRAY TO VERY LIGH
-T BROWNISH GRAY TO LIGHT BROWNISH GRAY;
SLIGHTLY DENSE TO SLIGHTLY TOUGH TO VERY
SLIGHTLY CRUNCHY TENACITY; IRREGULAR TO
SUB-PLANAR TO EARTHY-HACKLY FRACTURE;
SUB-TABULAR TO SUB-NODULAR CUTTINGS HABI
-T; DULL TO EARTHY DULL TO OCCASIONAL
SEMI-SPARKLING LUSTER; SLIGHTLY CLAYEY
TO SLIGHLTY GRITTY TEXTURE; POOR GRADE
SILTSTONE VISIBLE GRADING WITH POOR GRAD
-E SANDSTONE, SMALL AMOUNT OF COAL VISIB
-LY DEGASSING IN SAMPLE, NO OTHER DISTIN
-GUISHABLE STRUCTURAL FEATURES PRESENT;


MAX GAS 1673u
MW OUT 9.5+ VIS 53 PH 9.7
ACCESSORY MINERAL PYRITE PRESENT IN
TOTCO RESET
TOTCO RESET
SAMPLE.
SHALE = PALE GREEN TO MEDIUM BLUISH GRAY
CG 930u
TO GREENISH GRAY; BRITTLE TO SLIGHTLY
<200 ROP 0>
<0 Ttl Gas 1.5K>
<10 Meth C-1 100K>
CRUMBLY TENACITY; PLANAR TO SOMEWHAT
12000
<50 Avg WOB 0>
<0 CO2 40K>
<10 Ethn C-2 100K>
MAX GAS 1471u
SPLINTERY FRACTURING; PLATY TO TABULAR
<0 Flare Ht. 100>
<10 Prop C-3 100K>
MAX GAS 1725u
CUTTINGS; DULL TO SLIGHTLY WAXY LUSTER;
<10 Buth C-4 100K>
NIGHT TOUR
SMOOTH TO SILTY TEXTURE; THIN STRUCTURE.
<10 Pent C-5 100K>
15' FLARE
CG 1537u
SANDSTONE = BROWNISH GRAY TO MEDIUM
COR. C.P. @ 12057'
CHANGED SHAKER SCREENS
LIGHT GRAY; TO WHITE TO TRANSLUCENT;
DOMINANT QUARTZ FRAMEWORK WITH TRACE
MAX GAS 922u
AMOUNTS OF BLACK LITIC CLASTS
INTERBEDDED; FINE TO MEDIUM GRAINED WITH
FAIR TO SEMI-WELL SORTING; SUBROUNDED
12100
MAX GAS 618u
WITH MODERATE SPHERICITY; HARD TO VERY
MAX GAS 592u
C-5,4,3,2,1
HARD; ABUNDENT LOOSE QUARTZ GRAINS IN
SAMPLE; QUARTZ GRAINS DISPLAY FROSTED
CG 644u
MW IN 9.55 VIS 53 PH 10.0
SURFACE FEATURES; GRAIN SUPPORTED WITH
MAX GAS 727u
MW OUT 9.6 VIS 58 PH 9.9
SILICA CEMENT WITH POSSIBLE TRACE AMOUNT
OF CALCITE; NO TO VERY SLIGHT REACTION


WITH DILUTE HCL.
6/30/2010
MAX GAS 1000u
CARBONACEOUS SHALE = GRAYISH BLACK TO
12200
BROWNISH BLACK TO BROWNISH GRAY;
MAX GAS 1166u
SLIGHTLY DENSE TO BRITTLE TO
OCCASIONALLY CRUMBLY; IRREGULAR TO
BLOCKY FRACTURING; EARTHY TO DULL LUSTER
CG 1480u
WITH A SLIGHT SPARKLING LUSTER; CLAYEY
TO SILTY TEXTURE; THICK STRUCTURE;
INTERBEDDED WITH SANDSTONE AND SILTSTONE
MAX GAS 1043u
SHALE = MEDIUM LIGHT GRAY TO MEDIUM
BLUISH GRAY; BRITTLE TO SLIGHTLY CRUMBLY
MAX GAS 1704u
TENACITY; IRREGULAR TO PLANAR FRACTURING
12300
DAY TOUR
; OCCASIONAL MASSIVE TO WEDGE LIKE TO
ELONGATED TO OCCASIONAL PLATY CUTTINGS
HABIT; DULL TO EARTHY DULL TO OCCASIONAL
CG 1738u
15' FLARE
MW IN 9.4+ VIS 52 PH 9.8
SEMI-WAXY TO SEMI-FROSTED LUSTER; MODERA
MW OUT 9.4+ VIS 53 PH 9.8
-TELY SMOOTH TO SLIGHTLY SILTY TEXTURE;
MAX GAS 1722u
POOR GRADE SILTSTONE VISIBLE GRADING WIT
MAX GAS 1093u
-H POOR GRADE CARBONACEOUS SHALE, SMALL
AMOUNT OF COAL VISIBLY DEGASSING IN SAMP


12400
12500
<200
ROP
0>
<50
Avg WOB
0>
<0
Ttl Gas
1.5K><10
Meth C-1
100K>
<0
CO2
40K><10
Eth C-2
100K>
<0
Flare Ht.
100><10
Prop C-3
100K>
<10
Buta C-4
100K>
<10
Pent C-5
100K>
MAX GAS 884u
CG 1354u
MAX GAS 1043u
CG 1258u
20' FLARE
MW IN 9.4+ VIS 54 PH 9.8
MW OUT 9.4+ VIS 53 PH 9.7
MAX GAS 970u
MAX CO2 8440ppm
-LE; NO ACCESSORY MINERALS PRESENT IN
SAMPLE.
SILTSTONE = VERY LIGHT GRAY TO VERY LIGH
-T BROWNISH GRAY; SLIGHTLY DENSE TO SLIG
-HTLY CRUNCHY TENACITY; IRREGULAR TO SUB
-PLANAR TO EARTHY HACKLY FRACTURE; SUB-
TABULAR TO SUB-NODULAR TO MOSTLY SMALL
CUTTINS HABIT; DULL TO EARTHY DULL TO
OCCASIONAL SEMI-SPARKLING LUSTER; SLIGHT
-LY CLAYEY TO SLIGHTLY GRITTY TEXTURE;
-POOR GRADE SILTSTONE VISIBLE BEDDING WIT
-H CARBONACEOUS SHALE, NO OTHER DISTINGU
-ISHABLE STRUCTURAL FEATURES PRESENT IN
SAMPLE; NO ACCESSORY MINERALS PRESENT
-IN SAMPLE.
SANDSTONE = LIGHT GRAY TO VERY LIGHT BRO
-WNISH GRAY TO LIGHT BROWNISH GRAY WITH
FEW BLACK AND MODERATE BROWN HUES; QUART
-Z DOMINANT FRAME WORK; MOSTLY GRAIN SUP
-PORTED WITH LOOSE GRAINS; CONTAINS CALC


-ITIC CEMENTATION WITH LIGHT REACTION TO
DILUTE HCL; CONTAINS 3 TO 5% DARK LITHIC
FRAGMENTS; MEDIUM TO MEDIUM-COARSE
GRAINED; FAIR TO POOR SORTING; SUB-ANGUL
-AR TO ANGULAR TO SUB-ROUNDED ANGULARITY
; LOW TO MODERATE SPHERICITY; SMALL AMOU
-NT OF COAL VISIBLY DEGASSING IN SAMPLE,
NO OTHER DISTINGUISHABLE SURFACE FEATURE
-S PRESENT; ACCESSORY MINERAL PYRITE PRE
-SENT IN SAMPLE.
CARBONACEOUS SHALE = BROWNISH BLACK TO
GRAYISH BLACK TO BLACK; BRITTLE TO
SLIGHTLY CRUNCHY TENACITY; FRACTURES
FROM PLANAR TO SUB BLOCKY TO
OCCASIONALLY IRREGULAR; PLATY TO TABULAR
CUTTINGS; RESINOUS WITH A SLIGHT
SPARKLING LUSTER; SMOOTH TEXTURE;
NO VISIBLE STRUCTURE.
SILTSTONE = BROWNISH GRAY TO BROWNISH
BLACK TO DARK GRAY; DENSE TENACITY;
CG 836u
MAX GAS 744u
MAX GAS 578u
MAX GAS 588u
CG 724u
C-5,4,3,2,1
MAX GAS 669u
MW IN 9.4 VIS 56 PH 9.8
MW OUT 9.4 VIS 60 PH 9.4
MUD DATA @ 12734'
MW 9.40 VIS 56 PV 17 YP 30
API FIL 6.6 GELS 9/17/18 pH 9.60
Cl- 1300 Ca+ 20 MBT 22.5 SOL 6.7
MAX GAS 910u
24 HR LOSSES 287.00 bbls.
CG 1553u
CORC. MARINE @ 12690'
NIGHT TOUR
12700
12800