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MUDLOG MD

COMPANY ExxonMobil Production

WELL PCU296-6A8

FIELD PICEANCE

REGION ROCKIES

COORDINATES 39.900102

108.212136

ELEVATION 7363.9

COUNTY, STATE RIO BLANCO, CO

API INDEX 05-103-11479-00

SPUD DATE 04/05/2010

CONTRACTOR HE

CO. REP. KEVIN GARDNER

RIG/TYPE 239 / FLEX 3

LOGGING UNIT 33

GEOLOGISTS NICK BAUER

JASON REISENBICHLER

ADD. PERSONS LAYNE GOOD

JASON REYNOLDS

CO. GEOLOGIST MELISSA SAURBORN

LOG INTERVAL

DEPTHS: 148' **TO** 9717'

DATES: 04/05/2010 **TO** 04/19/2010

SCALE: 1"=100'

CASING DATA

16" **AT** 147'

10.75" **AT** 4438'

AT

AT

HOLE SIZE

14.75" **TO** 4454'

9.875" **TO** 9717'

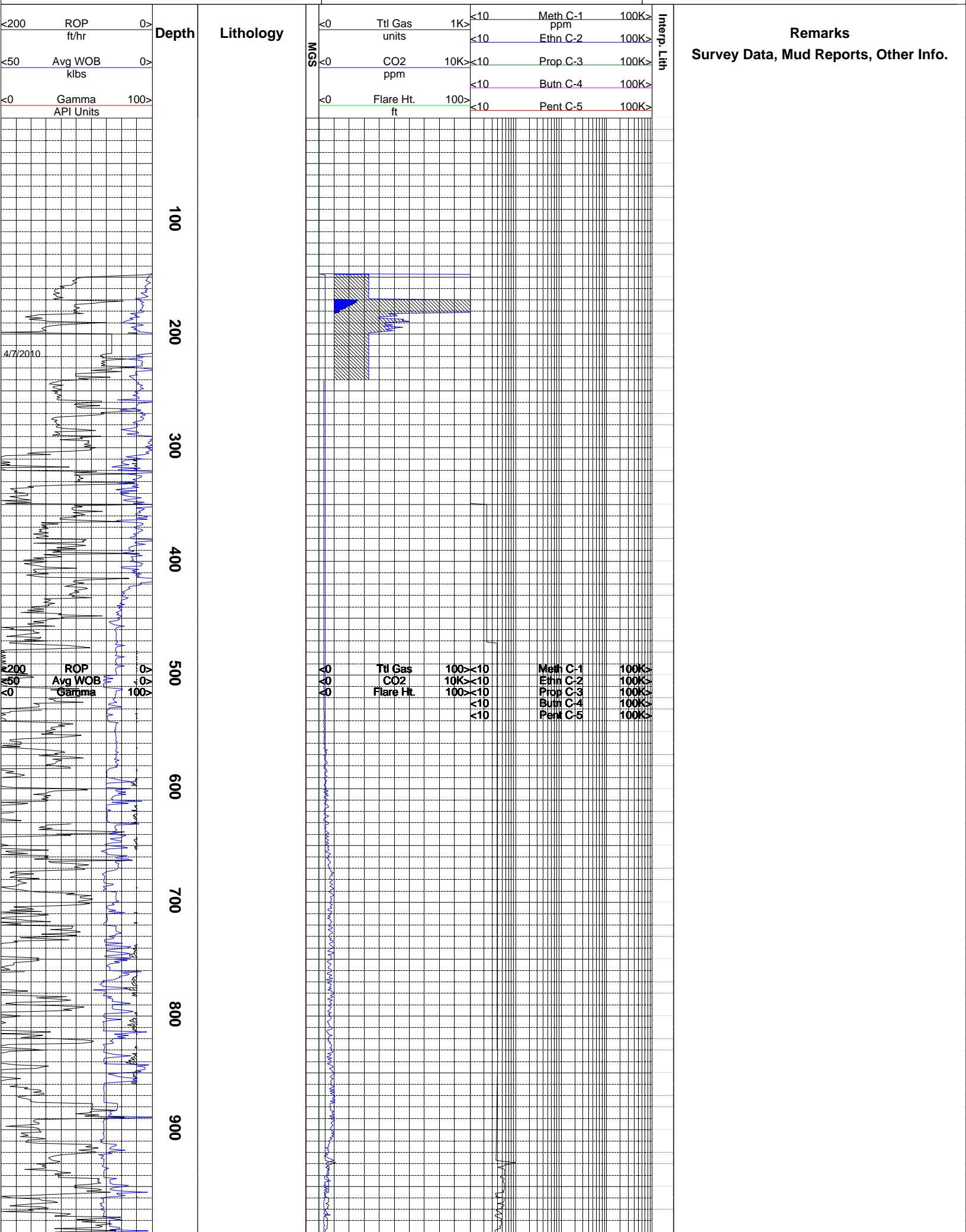
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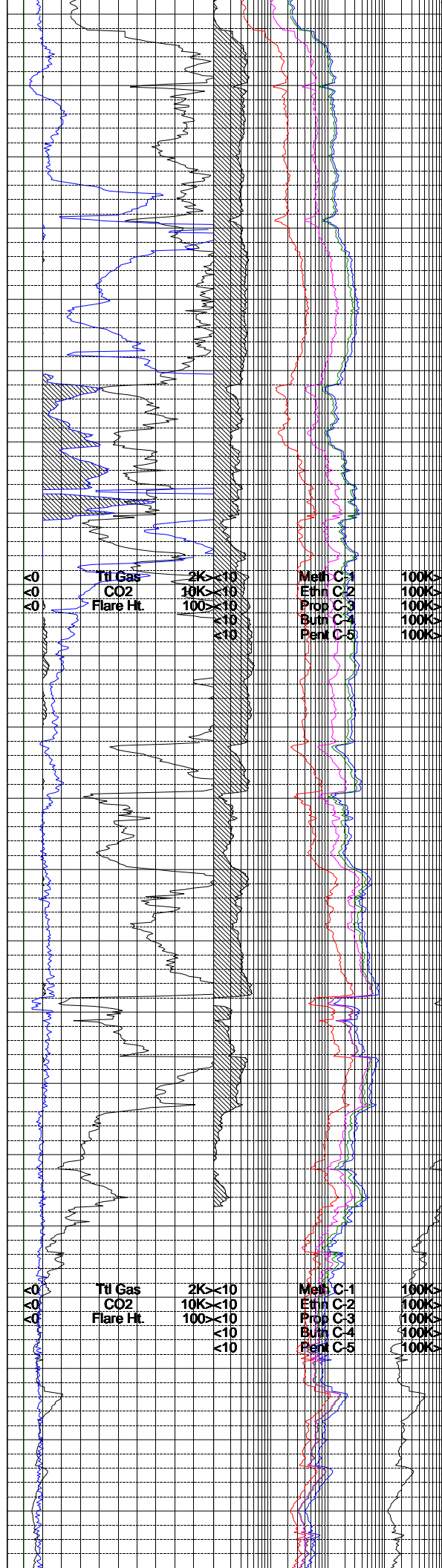
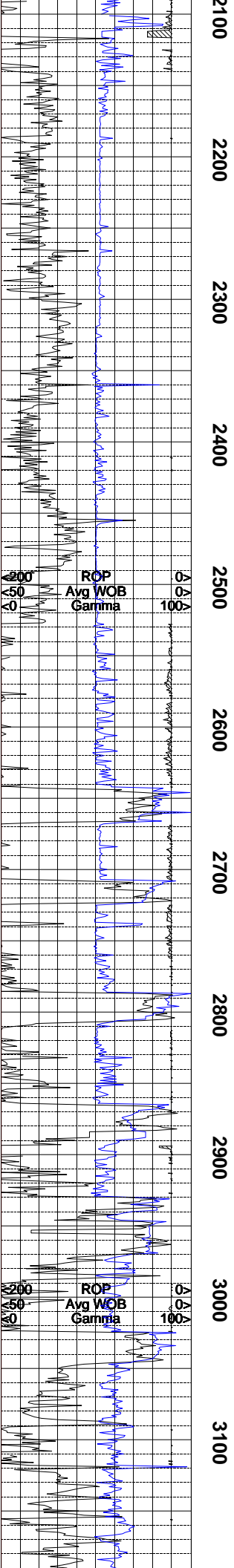
ABBREVIATIONS

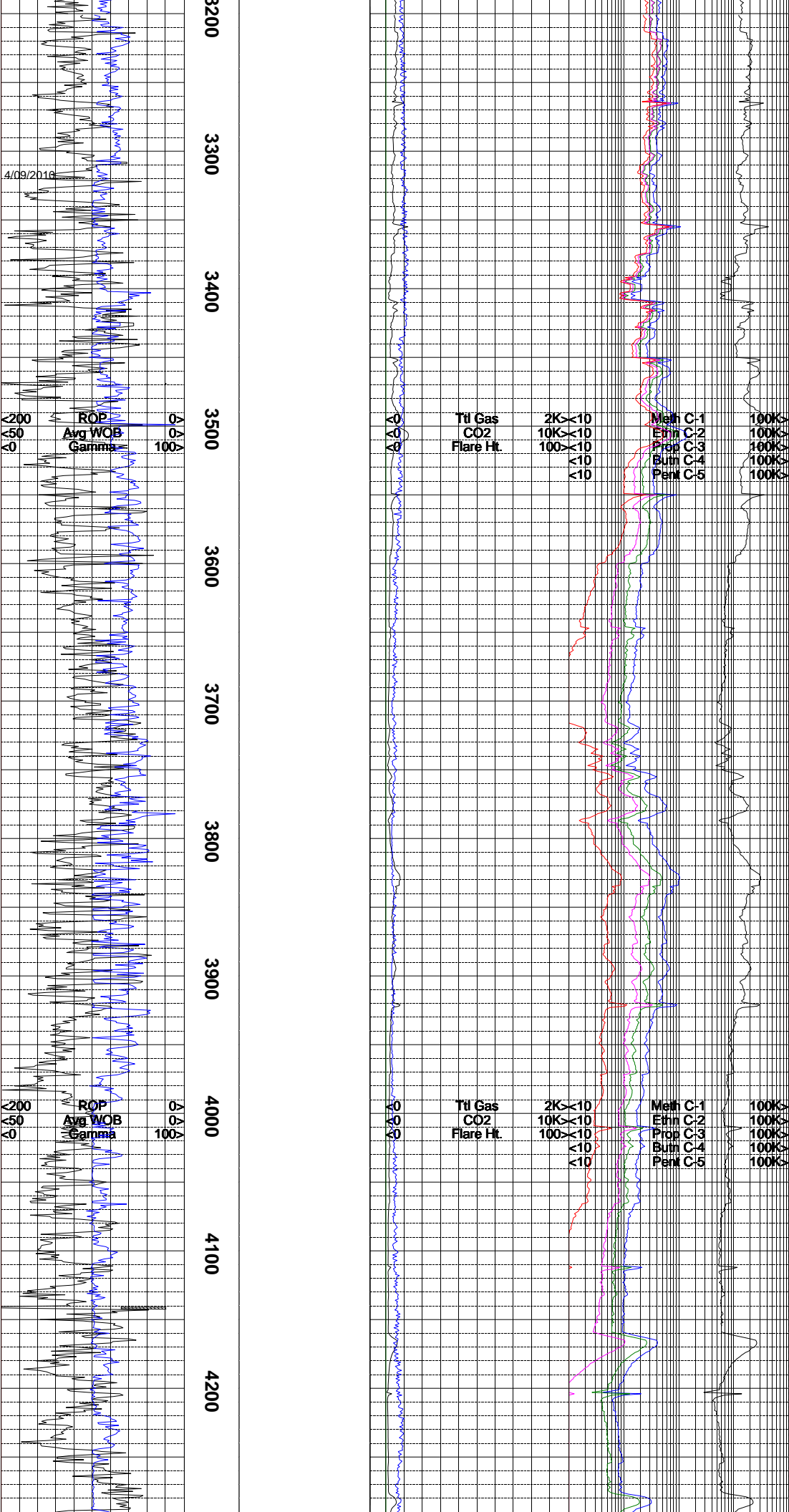
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm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

ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION	CLAY-MUDSTONE	GRANITE WASH	PHOSPHATE	SHALE TUFFACEOUS
BRECCIA	CLYST-TUFFACEOUS	GRANODIORITE	PORCELANITE	SHELL FRAGMENTS
CALCARENITE	CHLORITIZATION	GYPSUM	PORCELANEOUS CLYST	SIDERITE
CALCAREOUS TUFF	COAL	HALITE	PYRITE	SILICIFICATION
CALCILUTITE	CONGLOMERATE	HORNBL-QTZ-DIO	PYROCLASTICS	SILTSTONE
CARBONATES	CONGL. SAND	IGNEOUS (ACIDIC)	QUARTZ DIORITE	SILTST-TUFFACEOUS
CARBONACEOUS MAT	CONGL. SANDSTONE	IGNEOUS (BASIC)	QUARTZ LATITE	TUFF
CARBONACEOUS SH	COQUINA	INTRUSIVES	QUARTZ MONZONITE	VOLCANICLASTICS SEDS
CEMENT CONTAM.	DACITE	KAOLINITIC	RECRYSTALLIZED CALCITE	VOLCANICS
CHALK	DIATOMITE	LIMESTONE	RHYOLITE	
CRYSTALLINE TUFF	DIORITE	LITHIC TUFF	SALT	
CHERT - ARGILL	DOLOSTONE	MARL - DOLO	SAND	



The figure is a well log plot for well PCU296-6A8. The vertical axis represents depth in feet, ranging from 0 to 900. The horizontal axis at the top represents various data parameters: ROP (ft/hr) from 0 to 200, Avg WOB (klbs) from 0 to 50, Gamma (API Units) from 0 to 100, Ttl Gas (units) from 0 to 1K, CO2 (ppm) from 0 to 10K, Flare Ht. (ft) from 0 to 100, and gas composition (Meth C-1, Ethn C-2, Prop C-3, Butn C-4, Pent C-5) from 0 to 100K ppm. The plot shows several data tracks: ROP (black line), WOB (blue line), Gamma (black line), and gas composition (colored lines). A lithology block is visible between 150 and 250 ft depth, showing a transition from sandstone to shale. The plot is dated 4/7/2010.



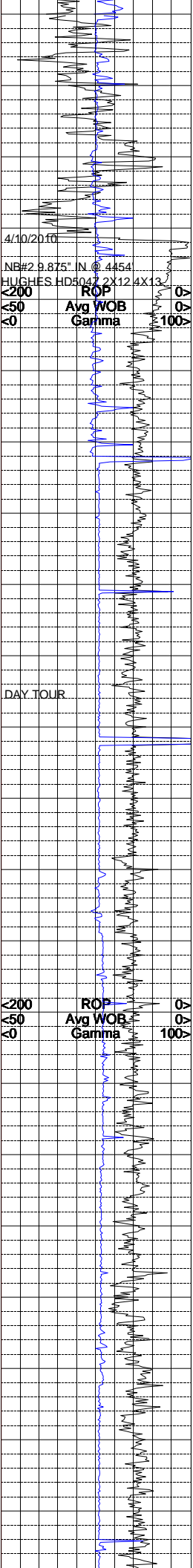


ALL ROCK COLORS ARE REFERENCED TO THE GSA ROCK COLOR CHART. ROCK CONSTITUENTS ARE DESCRIBED WET AND LISTED IN ORDER OF MOST ABUNDANT TO LEAST ABUNDANT WITH RESPECT TO PERCENTAGE IN SAMPLE. DEPTH IS REFERENCED TO RKB.

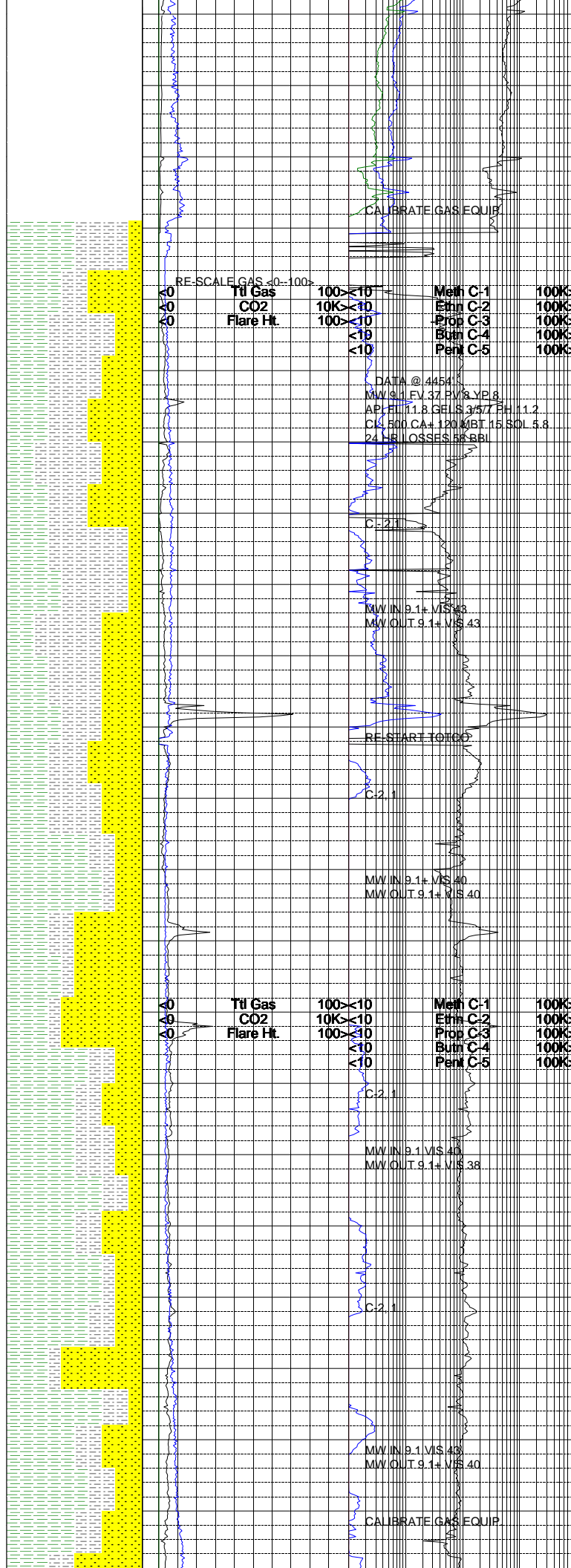
CONNECTION GASES AS WELL AS TRIP GASES AND DOWNTIME GASES ARE NOTED ON THE LOG. LARGE CONNECTION GASES WHICH APPEAR ON THE MUDLOG USUALLY REFLECT UPHOLE GAS INTERVALS BLEEDING INTO THE BORE HOLE DURING CONNECTIONS.

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

WHEN THE MUD IS RUN THROUGH THE MGS (MUD GAS SEPARATOR) THE INTERVAL IS MARKED ON THE LOG IN THE SLIDE COLUMN AND NOTED ON



4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
5300



THE LOG.

ALL SANDSTONE INTERVALS ARE EXAMINED FOR SAMPLE FLUORESCENCE IN THE UV SCOPE FOR HYDROCARBON FLUORESCENCE AND MINOR FLUORESCENCE FROM POSSIBLE FRACTURE FILL. ALL FLUORESCENCE IS NOTED ON THE MUDLOG.

10.5" SURFACE CASING WAS SET AT 4438'.

CANRIG DRILLING TECHNOLOGY LTD.
COMMENCED FULL LOGGING SERVICES ON 04/13/2010.

SILTSTONE = TAN TO BROWN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO PULVERANT TENACITY WITH IRREGULAR TO HACKLY FRACTURES; ELONGATED TO TABULAR CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUMBLY TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; WEDGE LIKE TO ELONGATED CTGS HABIT WITH A DULL TO SLIGHTLY FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SANDSTONE = MEDIUM TO FINE GRAIN SIZE WITH A TAN TO LIGHT GRAY IN COLOR; FAIR TO POOR SORTING WITH SUBROUND TO SUBANGULAR ANGULARITY; MODERATE TO LOW SPHERICITY WITH BRITTLE TO CRUNCHY TENACITY; WEDGE LIKE TO ELONGATED CTGS HABIT WITH A DULL TO FROSTED LUSTER; GRITTY TO GRANULAR TEXTURE WITH A CALCITIC FRAMEWORK.

SILTSTONE = TAN IN COLOR WITH LOW TO MODERATE SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH ELONGATED TO WEDGE LIKE CTGS HABIT WITH A DULL TO EARTHY LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = MEDIUM YELLOWISH BROWN TO MEDIUM GRAY COLOR; CRUMBLY TO CRUNCHY TEXTURE; IRREGULAR TO HACKLY TO BLOCKY FRACTURE; EARTHY TO DULL LUSTER; CLAYEY TO SILTY TEXTURE; SLIGHT TO FAIR REACTION WITH 10% HCL.

SANDSTONE = MEDIUM LIGHT GRAY TO LIGHT GRAY COLOR; QUARTZ GRAINS WITH LESS THAN 2% DARK LITHIC FRAGMENT; VERY FINE TO FINE GRAIN SIZE; SUBROUNDED GRAINS WITH MODERATE TO HIGH SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED WITH CACITE CEMENTATION; FAIR REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM GRAY TO BROWNISH GRAY COLOR; DENSE TO CRUNCHY TO CRUMBLY TENACITY; IRREGULAR TO HACKLY FRACTURE; WEDGE LIKE TO BLADED TO NODULAR CUTTINGS HABIT; EARTHY TO DULL LUSTER; CLAYEY TO SILTY TO SMOOTH TEXTURE; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; SLIGHT TO FAIR REACTION WITH HCL.

SILTSTONE = PALE YELLOWISH BROWN TO DARK YELLOWISH ORANGE COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR CUTTINGS HABIT; EARTHY LUSTER; MASSIVE STRUCTURE; SLIGHT REACTION TO 10% HCL.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM BLUISH GRAY TO MEDIUM GRAY COLOR; CRUNCHY TO DENSE TENACITY; HACKLY TO IRREGULAR FRACTURE; WEDGE LIKE TO HACKLY CUTTINGS HABIT; DULL TO WAXY LUSTER; SMOOTH TO SILTY TO GRITTY TEXTURE; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; SLIGHT REACTION WITH HCL.

SANDSTONE = MEDIUM LIGHT GRAY TO GRAYISH RED TO BROWNISH GRAY COLOR; CLEAR TO LIGHT BROWNISH TO PALE REDDISH BROWN COLORED QUARTZ GRAINS WITH ABOUT 2% DARK LITHIC FRAGMENTS; FINE TO MEDIUM GRAIN SIZE; SUBANGULAR TO ANGULAR GRAINS WITH MODERATE TO LOW SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED; SILICA CEMENTATION; SURFACE ENCRUSTATION ON GRAINS; TRACE OF MECHANICAL ABRASION ON

SILTSTONE = DARK YELLOWISH BROWN COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR CUTTINGS HABIT; SILTY TO GRITTY TEXTURE; MASSIVE STRUCTURE; NO REACTION WITH HCL.

SHALE = TAN TO GRAY IN COLOR WITH LOW TO MODERATE SPHERICITY; CRUMBLY TO CRUNCHY TENACITY WITH IRREGULAR TO PLANAR FRACTURES; ELONGATED TO TABULAR CTGS HABIT WITH A DULL TO EARTHY LUSTER

RE-SCALE GAS <0-500>

DATA @ 5415'
MW 9.15 EV 44 PV 18 YP 17
API FL 8.8 GELS 6.1/14 PH 10.1
CL 300 CA 40 MBT 20 SOL 6
24 HR LOSSES 2.5 BBL

CG 868U

Ttl Gas 500<10
CO2 10K<10
Flare Ht. 100<10
<10
<10

Meth C:1 100K<
Ethn C:2 100K<
Prop C:3 100K<
Burn C:4 100K<
Perm C:5 100K<

C-32.1

MW IN 9.2 VIS 43
MW OUT 9.2 VIS 44

MAX GAS 820U

CALIBRATE GAS EQ 1P

C-32.1

MW IN 9.1 VIS 42
MW OUT 9.2 VIS 41

MAX GAS 594U

C-32.1

Ttl Gas 500<10
CO2 10K<10
Flare Ht. 100<10
<10
<10

Meth C:1 100K<
Ethn C:2 100K<
Prop C:3 100K<
Burn C:4 100K<
Perm C:5 100K<

MW IN 9.1 VIS 42
MW OUT 9.1+ VIS 42

C-32.1

DATA @ 6098'
MW 9.15 EV 45 PV 18 YP 18
API FL 8.8 GELS 7.0/14 PH 9.4
CL 300 CA 40 MBT 20 SOL 6.2
24 HR LOSSES 22.5 BBL

MAX GAS 530U

C-32.1

MAX GAS 629U

MW IN 9.2 VIS 45
MW OUT 9.3 VIS 44

SHALE = GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO CRUMBLY TO BRITTLE TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULAR TO WEDGELIKE TO ELONGATED CTGS HABIT WITH A DULL TO FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SHALE = GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO CRUMBLY TO BRITTLE TENACITY WITH IRREGULAR TO PLANAR FRACTURES; TABULAR TO WEDGELIKE TO ELONGATED CTGS HABIT WITH A DULL TO FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

SILTSTONE = MODERATE YELLOWISH BROWN COLOR; CRUNCHY TENACITY; IRREGULAR FRACTURE; NODULAR CUTTINGS HABIT; EARTHY LUSTER; SILTY TO GRITTY TEXTURE, GRADING INTO SANDSTONE; MASSIVE STRUCTURE; FAIR REACTION WITH 10% HCL.

SANDSTONE = MEDIUM LIGHT GRAY TO MEDIUM BROWNISH GRAY COLOR; PREDOMINANTLY QUARTZ GRAINS, CLEAR TO A LIGHT BROWNISH COLOR; LESS THAN 2% DARK LITHIC FRAGMENTS; FAIR SORTING; ANGULAR TO SUB-ANGULAR GRAINS; WITH LOW TO MODERATE SPHERICITY; FIRM HARDNESS; SILICA CEMENTATION; SLIGHT REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = BROWNISH GRAY TO BLUISH GRAY COLOR; BRITTLE TO DENSE TO CRUMBLY TENACITY; IRREGULAR TO CONCHOIDAL FRACTURE; WEDGELIKE TO ELONGATED TO NODULAR CUTTINGS HABIT; DULL TO WAXY LUSTER; CLAYEY TO SMOOTH TEXTURE; NO REACTION WITH HCL.

SILTSTONE = GRAYISH BROWN TO DARK YELLOWISH BROWN COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY FRACTURE; NODULAR TO TABULAR CUTTINGS HABIT; EARTHY TO SPARKLING LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE; TRACE REACTION WITH HCL.

SANDSTONE = MEDIUM GRAY TO BROWISH GRAY TO DUSKY RED COLOR; QUARTZ AND FELDSPAR GRAINS WITH ABOUT 2% DARK LITHIC FRAGMENTS; FINE TO VERY FINE TO MEDIUM GRAIN SIZE WITH POOR TO FAIR SORTING; SUBANGULAR TO ANGULAR GRAINS; MODERATE TO LOW SPHERICITY; FIRM TO FIRMLY FRIABLE; GRAIN AND MATRIX SUPPORTED; DUSKY RED MATRIX; SLIGHT TO TRACE REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

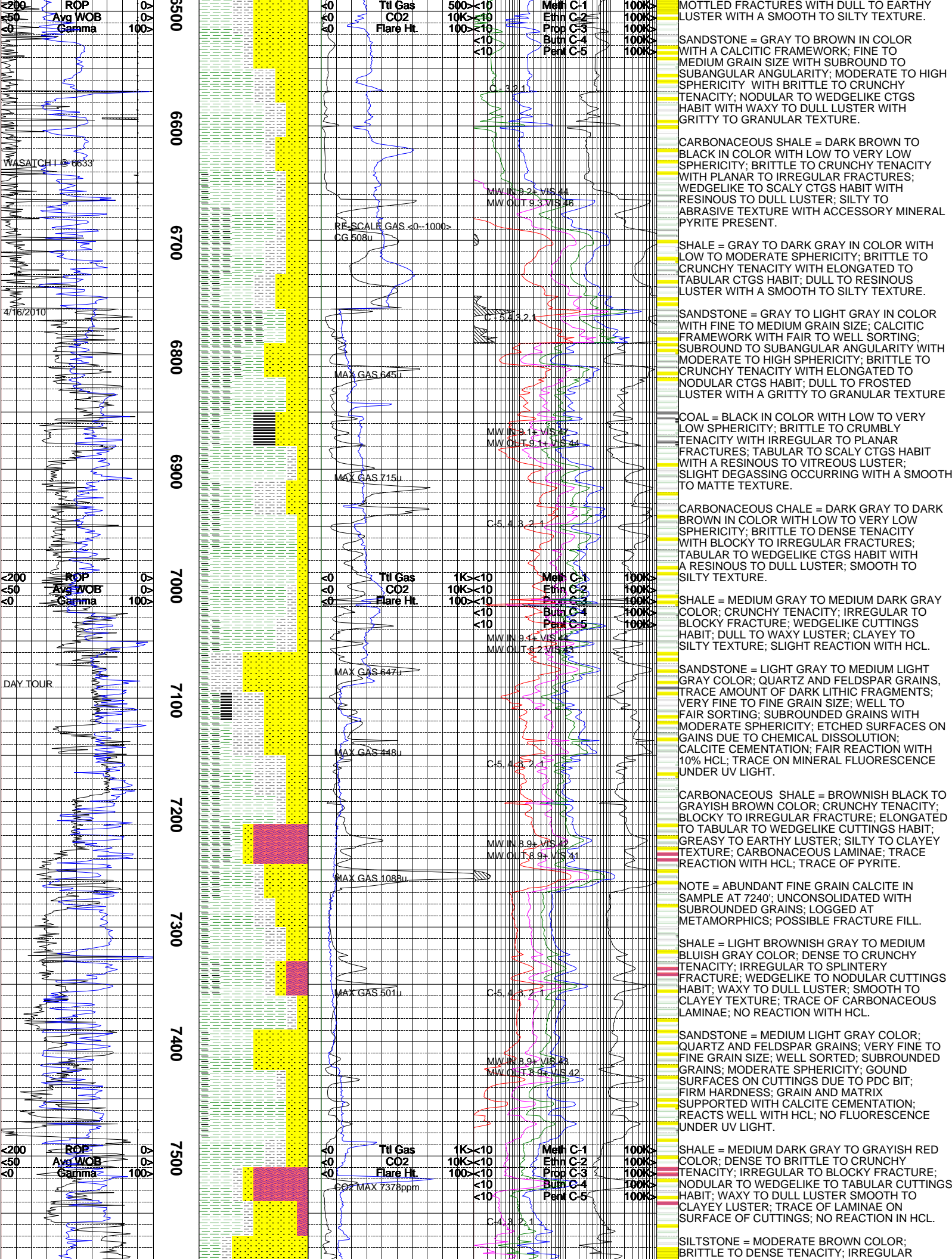
SHALE = GRAY TO BROWN IN COLOR WITH MODERATE TO LOW SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH IRREGULAR TO MOTTLED FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER; SMOOTH TO SILTY TEXTURE.

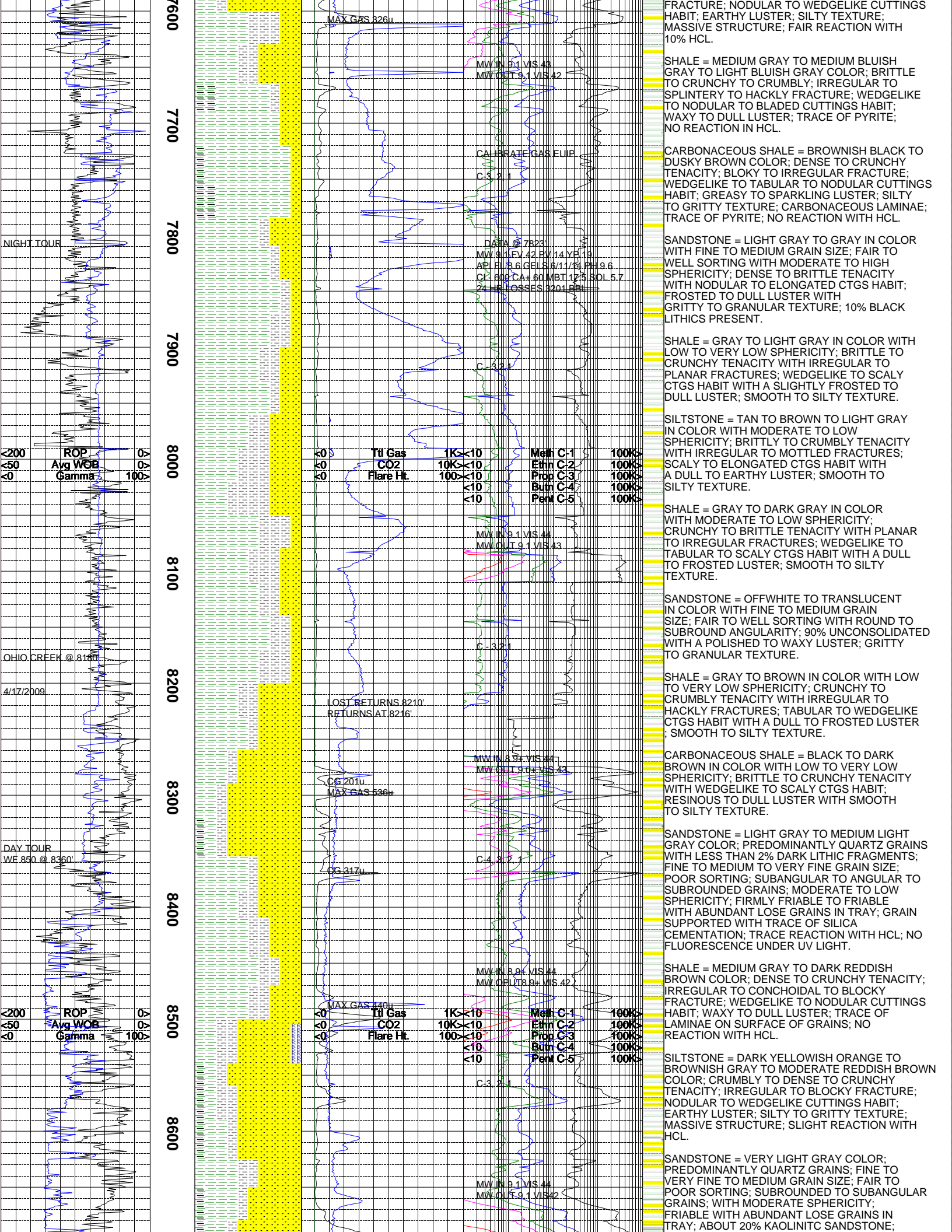
SILTSTONE = TAN TO LIGHT GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUMBLY TO CRUNCHY CTGS HABIT WITH DULL TO EARTHY LUSTER; HACKLY TO MOTTLED FRACTURES WITH ELONGATED TO WEDGELIKE CTGS HABIT; SMOOTH TO SILTY TEXTURE.

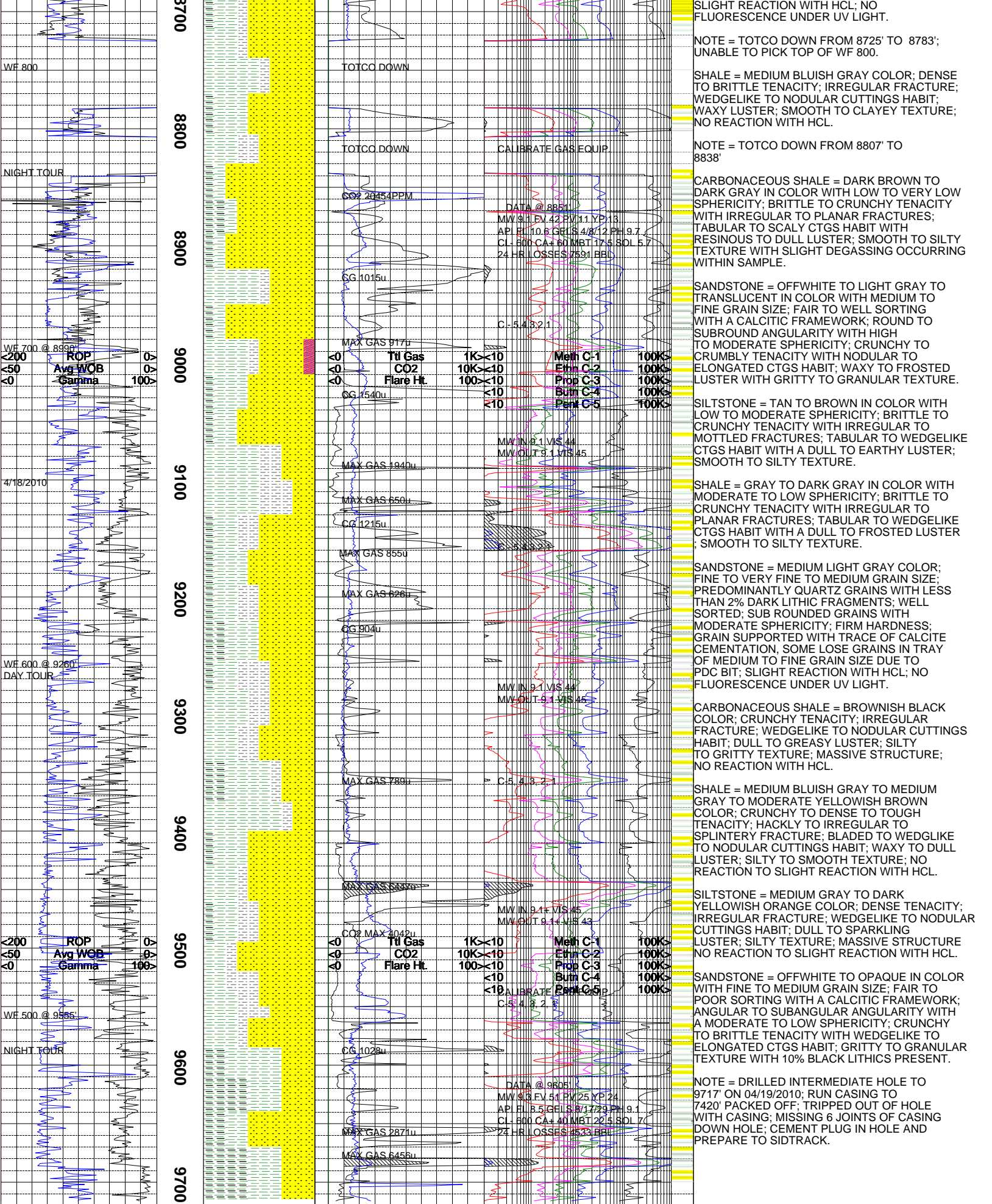
SANDSTONE = GRAY TO BROWN TO LIGHT GRAY IN COLOR; FINE TO MEDIUM GRAIN SIZE WITH FAIR TO WELL SORTING; SUBROUND TO SUBANGULAR ANGULARITY WITH MODERATE TO HIGH SPHERICITY; BRITTLE TO CRUNCHY TENACITY WITH NODULAR TO ELONGATED CTGS HABIT; FROSTED TO WAXY LUSTER WITH A GRITTY TO GRANULAR TEXTURE.

SHALE = BROWN TO GRAY IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO BRITTLE TENACITY WITH IRREGULAR TO HACKLY FRACTURES; TABULAR TO WEDGELIKE CTGS HABIT WITH A DULL TO FROSTED LUSTER WITH A SMOOTH TO SILTY TEXTURE.

SILTSTONE = LIGHT GRAY TO TAN IN COLOR WITH MODERATE TO LOW SPHERICITY; CRUNCHY TO CRUMBLY TENACITY WITH WEDGELIKE TO ELONGATED CTGS HABIT; IRREGULAR TO







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