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MUDLOG MD

COMPANY	EXXONMOBIL
WELL	FRU197-33A2
FIELD	FREEDOM RANCH UNIT
REGION	ROCKIES
COORDINATES	39.915658 108.285631
ELEVATION	6390'
COUNTY, STATE	RIO BLANCO, CO
API INDEX	05-103-11098-00
SPUD DATE	2/1/2009
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	KEVIN GARDNER
RIG/TYPE	239 / Flex 3
LOGGING UNIT	MLU 033
GEOLOGISTS	LAYNE GOOD NICK BAUER
ADD. PERSONS	JASON REISENBICHLER
CO. GEOLOGIST	MELISSA SAURBORN

LOG INTERVAL

DEPTHS: 4000' **TO** 12297'
DATES: 6/26/2009 **TO** 7/10/2009
SCALE: 1" = 100'

CASING DATA

16" **AT** 130'
10.75" **AT** 3956'
7" **AT** 8536'

AT

HOLE SIZE

14.75" **TO** 3983'
9.875" **TO** 8555'
6.125" **TO** 12297'
TO

MUD TYPES

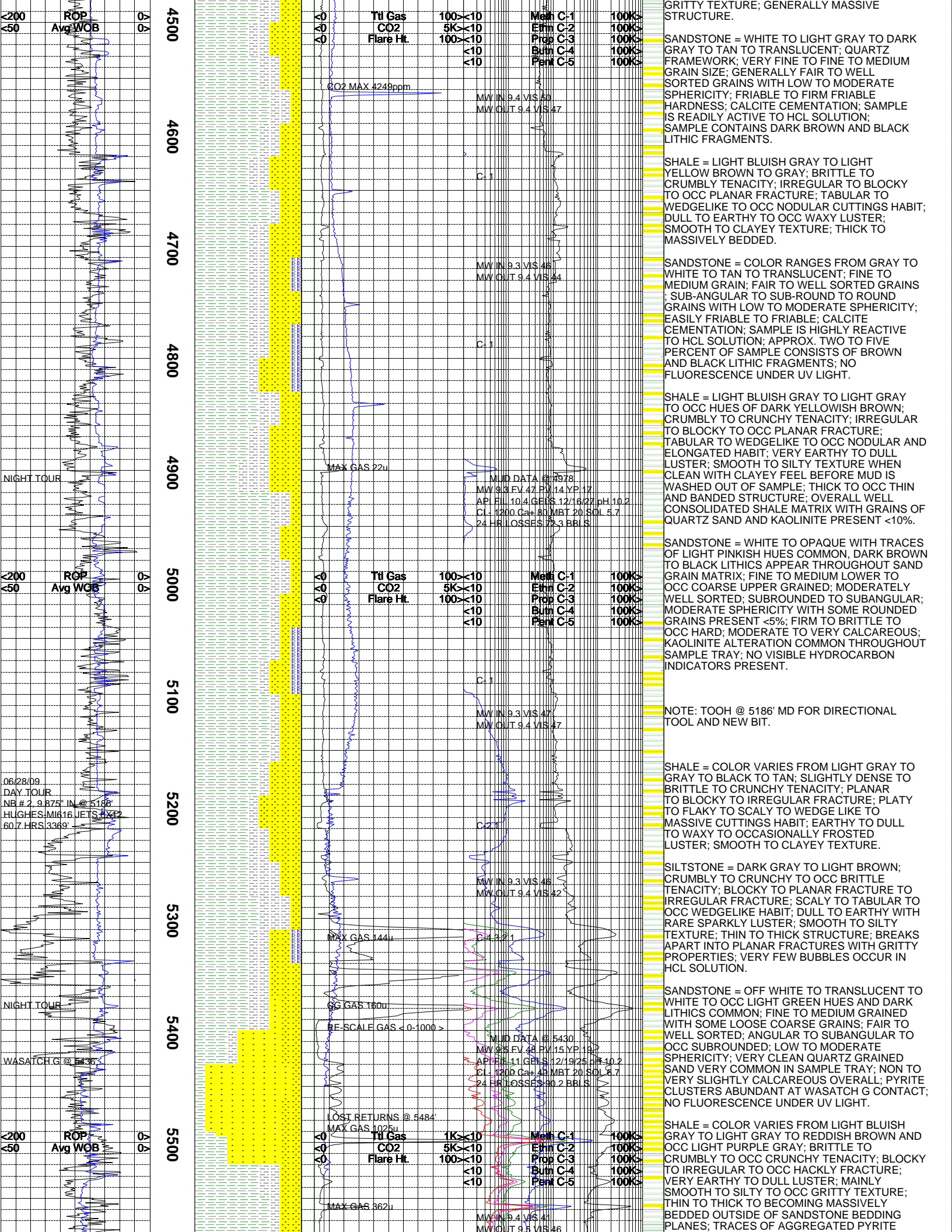
SPUD MUD **TO** 3983'
LSND **TO** 12297'
TO
TO

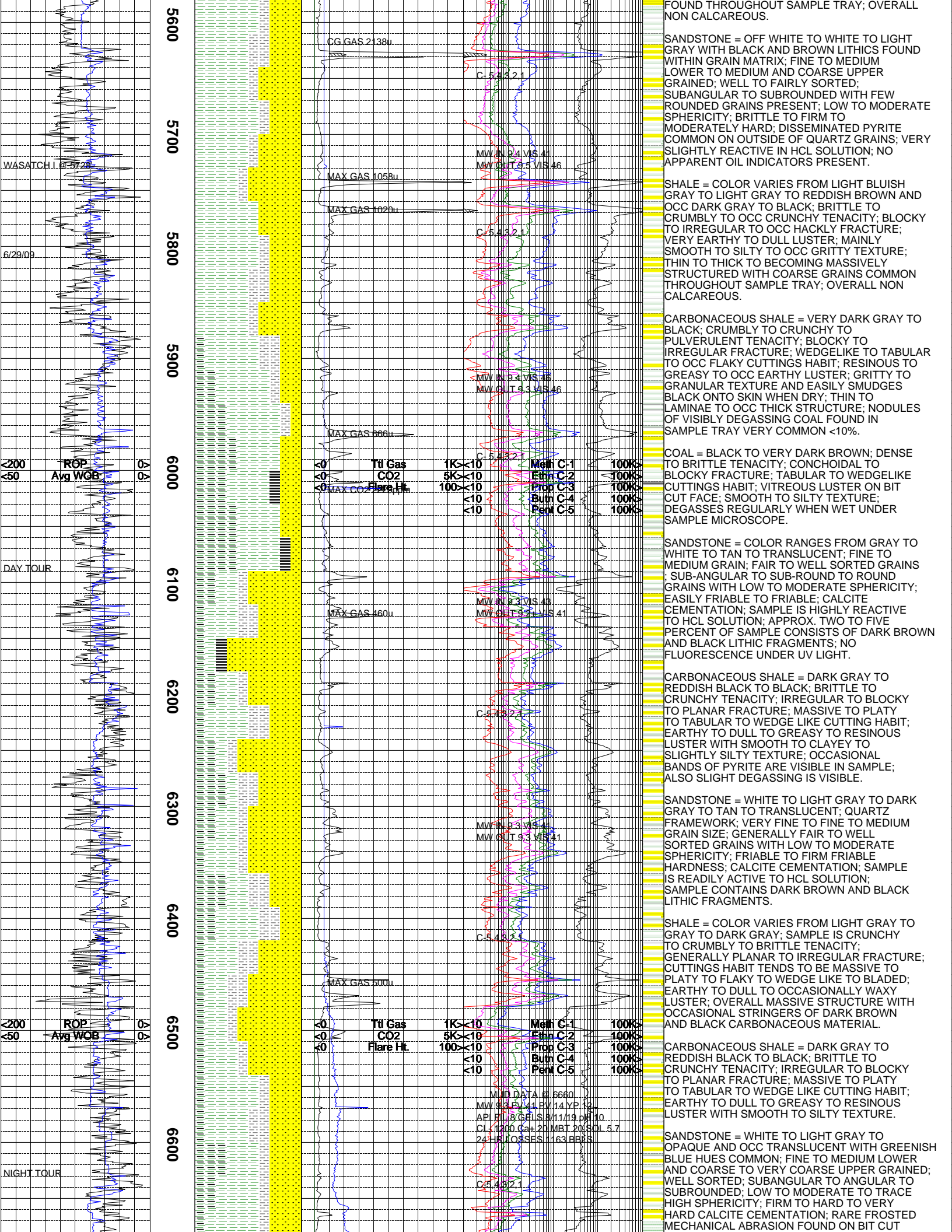
ABBREVIATIONS

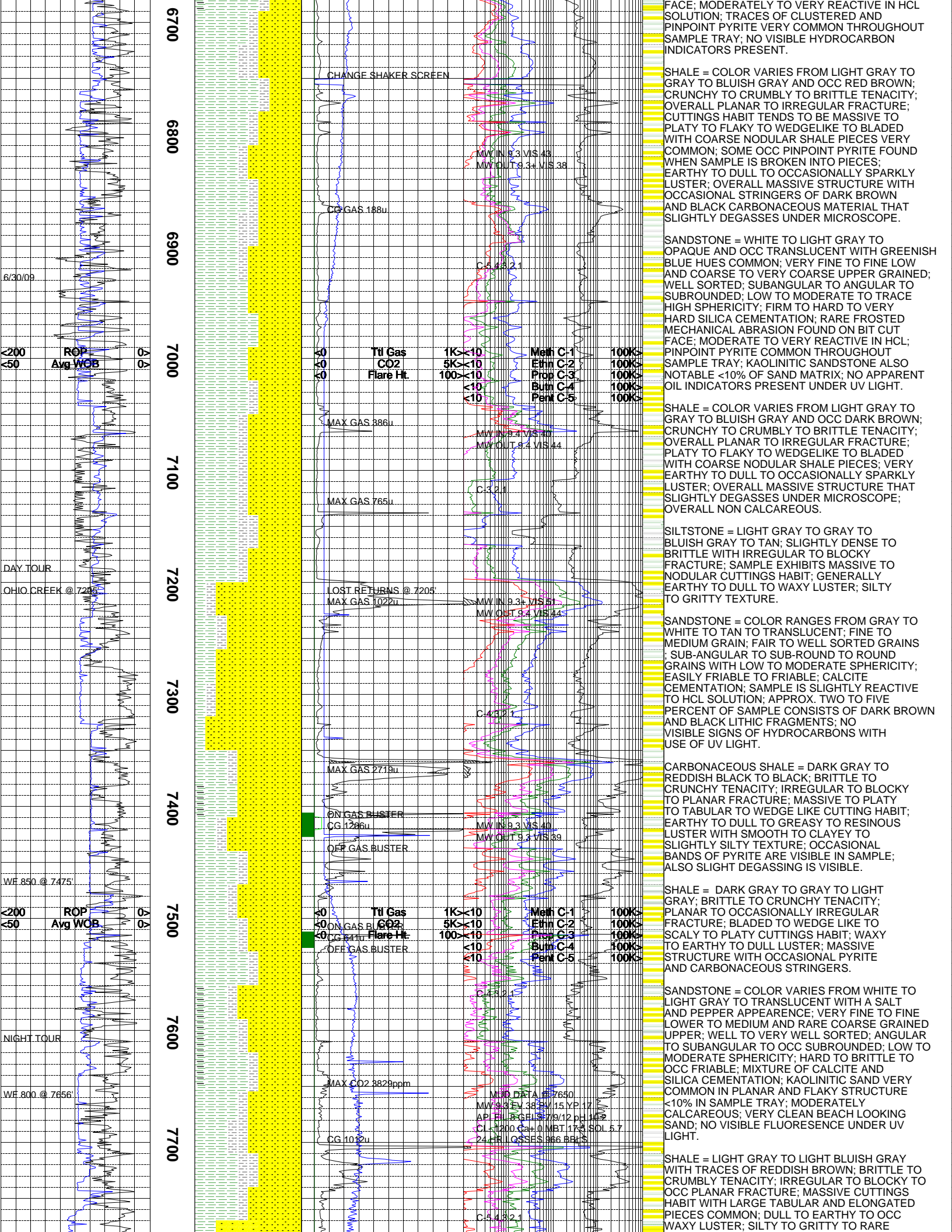
<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</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	

EXXONMOBIL			FRU197-33A2			7/13/2009									
			MGS	Ttl Gas units	CO2 ppm	Flare Ht. ft	<10 Meth C-1 ppm	<10 Ethn C-2 ppm	<10 Prop C-3 ppm	<10 Butn C-4 ppm	<10 Pent C-5 ppm	Interp. Lith	Remarks		
<200 ROP 0>															
ft/hr															
<50 Avg WOB 0>															
klbs															
Depth			Lithology												
3600															
3700															
3800															
3900															
4000															
4100															
4200															
4300															
4400															
06/27/09															
<200 ROP 0>												Interp. Lith	Remarks		
<50 Avg WOB 0>															
NB # 1, 9.875" IN @ 3982															
HUGHES HCD5042															
JETS 4X13, 2X12															
15.5 HRS 1204'															
DAY TOUR															







SOLUTION; MODERATELY TO VERY REACTIVE IN HCL
SOLUTION; TRACES OF CLUSTERED AND
PINPOINT PYRITE VERY COMMON THROUGHOUT
SAMPLE TRAY; NO VISIBLE HYDROCARBON
INDICATORS PRESENT.

SHALE = COLOR VARIES FROM LIGHT GRAY TO
GRAY TO BLuish GRAY AND OCC RED BROWN;
CRUNCHY TO CRUMBLY TO BRITTLE TENACITY;
OVERALL PLANAR TO IRREGULAR FRACTURE;
CUTTINGS HABIT TENDS TO BE MASSIVE TO
PLATY TO FLAKY TO WEDGE LIKE TO BLADED
WITH COARSE NODULAR SHALE PIECES VERY
COMMON; SOME OCC PINPOINT PYRITE FOUND
WHEN SAMPLE IS BROKEN INTO PIECES;
EARTHY TO DULL TO OCCASIONALLY SPARKLY
LUSTER; OVERALL MASSIVE STRUCTURE WITH
OCCASIONAL STRINGERS OF DARK BROWN
AND BLACK CARBONACEOUS MATERIAL THAT
SLIGHTLY DEGASSES UNDER MICROSCOPE.

SANDSTONE = WHITE TO LIGHT GRAY TO
OPAQUE AND OCC TRANSLUCENT WITH GREENISH
BLUE HUES COMMON; VERY FINE TO FINE LOW
AND COARSE TO VERY COARSE UPPER GRAINED;
WELL SORTED; SUBANGULAR TO ANGULAR TO
SUBROUNDED; LOW TO MODERATE TO TRACE
HIGH SPHERICITY; FIRM TO HARD TO VERY
HARD SILICA CEMENTATION; RARE FROSTED
MECHANICAL ABRASION FOUND ON BIT CUT
FACE; MODERATE TO VERY REACTIVE IN HCL;
PINPOINT PYRITE COMMON THROUGHOUT
SAMPLE TRAY; KAOLINITIC SANDSTONE ALSO
NOTABLE <10% OF SAND MATRIX; NO APPARENT
OIL INDICATORS PRESENT UNDER UV LIGHT.

SHALE = COLOR VARIES FROM LIGHT GRAY TO
GRAY TO BLuish GRAY AND OCC DARK BROWN;
CRUNCHY TO CRUMBLY TO BRITTLE TENACITY;
OVERALL PLANAR TO IRREGULAR FRACTURE;
PLATY TO FLAKY TO WEDGE LIKE TO BLADED
WITH COARSE NODULAR SHALE PIECES; VERY
EARTHY TO DULL TO OCCASIONALLY SPARKLY
LUSTER; OVERALL MASSIVE STRUCTURE THAT
SLIGHTLY DEGASSES UNDER MICROSCOPE;
OVERALL NON CALCAREOUS.

SILTSTONE = LIGHT GRAY TO GRAY TO
BLuish GRAY TO TAN; SLIGHTLY DENSE TO
BRITTLE WITH IRREGULAR TO BLOCKY
FRACTURE; SAMPLE EXHIBITS MASSIVE TO
NODULAR CUTTINGS HABIT; GENERALLY
EARTHY TO DULL TO WAXY LUSTER; SILTY
TO GRITTY TEXTURE.

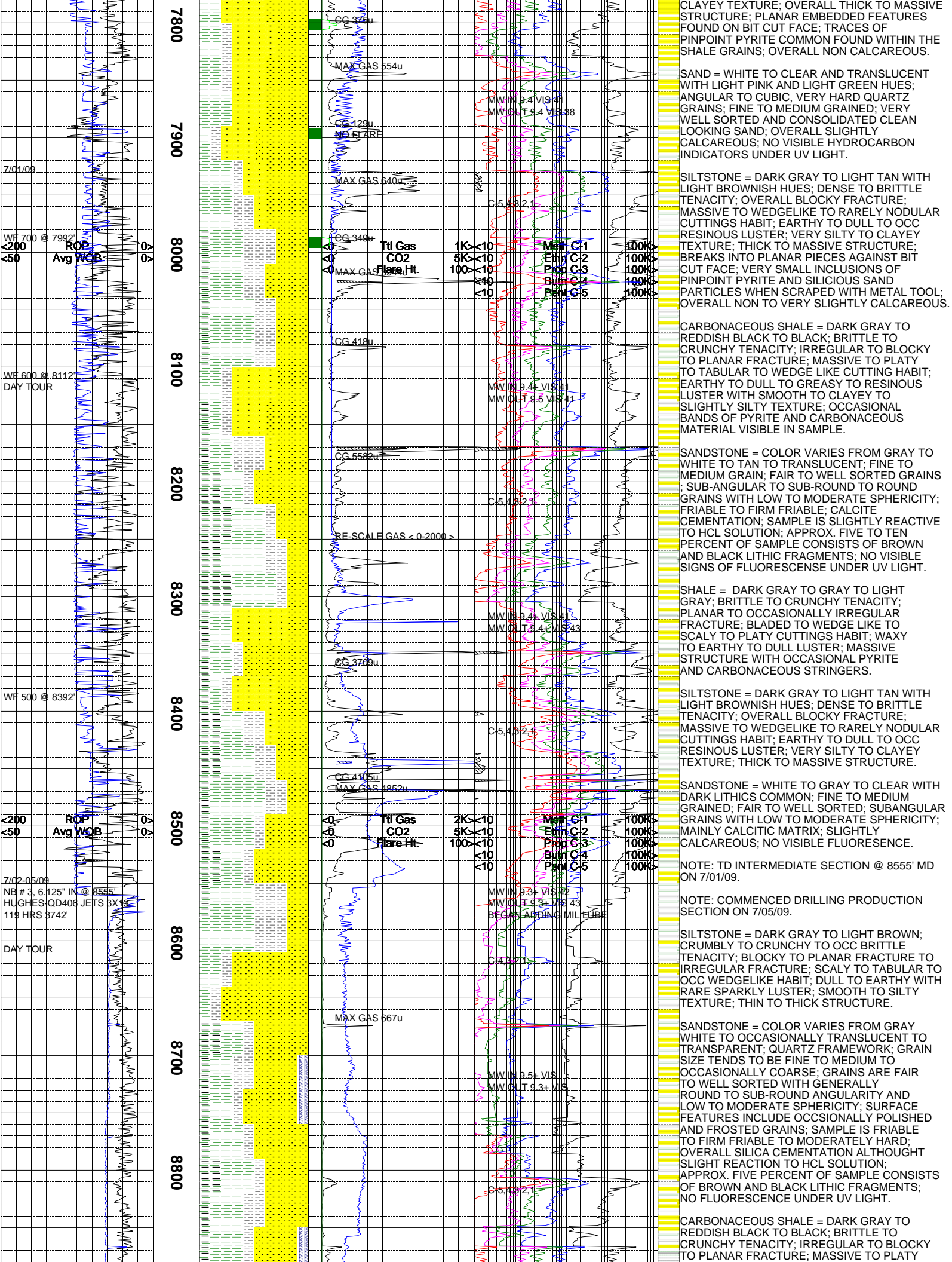
SANDSTONE = COLOR RANGES FROM GRAY TO
WHITE TO TAN TO TRANSLUCENT; FINE TO
MEDIUM GRAIN; FAIR TO WELL SORTED GRAINS
; SUB-ANGULAR TO SUB-ROUND TO ROUND
GRAINS WITH LOW TO MODERATE SPHERICITY;
EASILY FRIABLE TO FRIABLE; CALCITE
CEMENTATION; SAMPLE IS SLIGHTLY REACTIVE
TO HCL SOLUTION; APPROX. TWO TO FIVE
PERCENT OF SAMPLE CONSISTS OF DARK BROWN
AND BLACK LITHIC FRAGMENTS; NO
VISIBLE SIGNS OF HYDROCARBONS WITH
USE OF UV LIGHT.

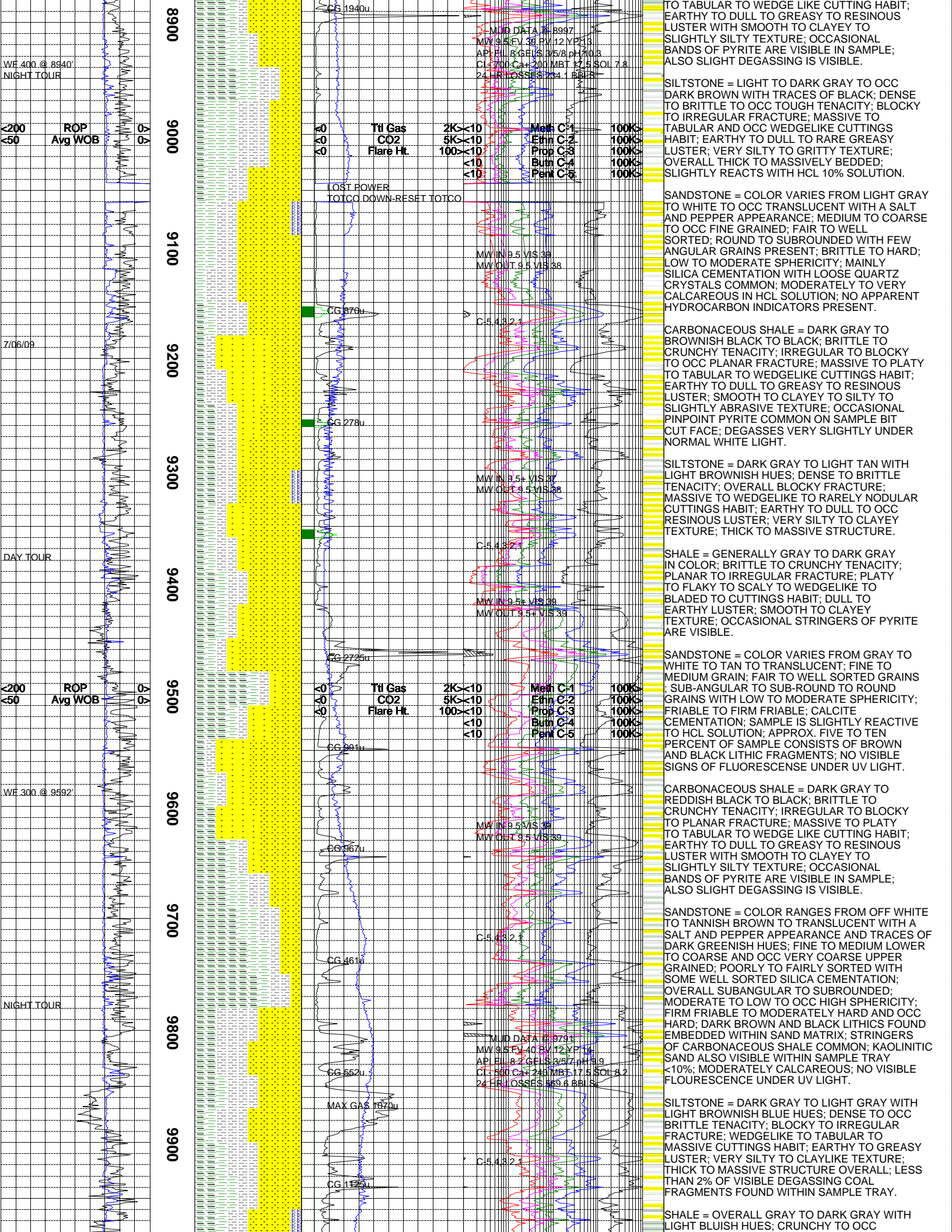
CARBONACEOUS SHALE = DARK GRAY TO
REDDISH BLACK TO BLACK; BRITTLE TO
CRUNCHY TENACITY; IRREGULAR TO BLOCKY
TO PLANAR FRACTURE; MASSIVE TO PLATY
TO TABULAR TO WEDGE LIKE CUTTING HABIT;
EARTHY TO DULL TO GREASY TO RESINOUS
LUSTER WITH SMOOTH TO CLAYEY TO
SLIGHTLY SILTY TEXTURE; OCCASIONAL
BANDS OF PYRITE ARE VISIBLE IN SAMPLE;
ALSO SLIGHT DEGASSING IS VISIBLE.

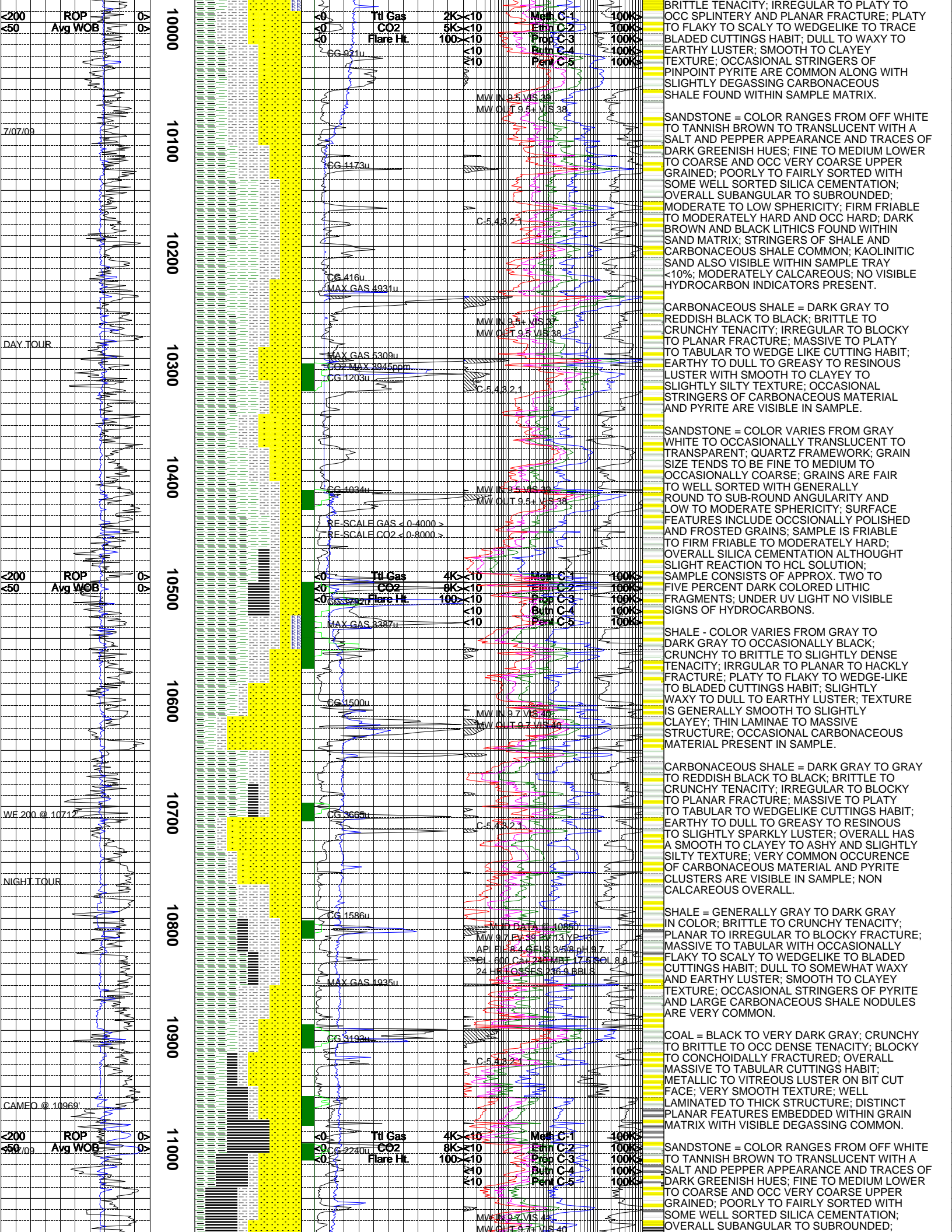
SHALE = DARK GRAY TO GRAY TO LIGHT
GRAY; BRITTLE TO CRUNCHY TENACITY;
PLANAR TO OCCASIONALLY IRREGULAR
FRACTURE; BLADED TO WEDGE LIKE TO
SCALY TO PLATY CUTTINGS HABIT; WAXY
TO EARTHY TO DULL LUSTER; MASSIVE
STRUCTURE WITH OCCASIONAL PYRITE
AND CARBONACEOUS STRINGERS.

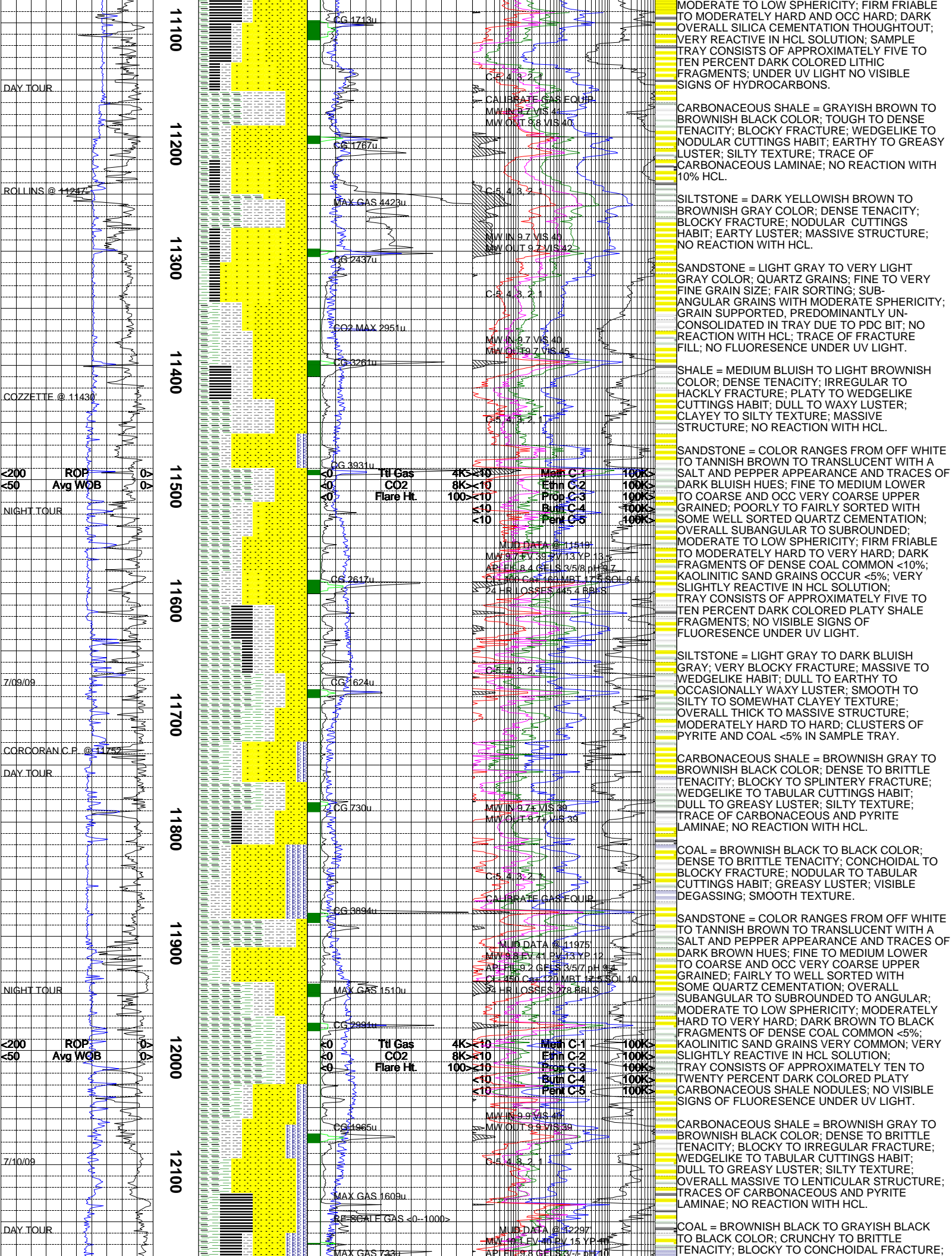
SANDSTONE = COLOR VARIES FROM WHITE TO
LIGHT GRAY TO TRANSLUCENT WITH A SALT
AND PEPPER APPEARANCE; VERY FINE TO FINE
LOWER TO MEDIUM AND RARE COARSE GRAINED
UPPER; WELL TO VERY WELL SORTED; ANGULAR
TO SUBANGULAR TO OCC SUBROUNDED; LOW TO
MODERATE SPHERICITY; HARD TO BRITTLE TO
OCC FRIABLE; MIXTURE OF CALCITE AND
SILICA CEMENTATION; KAOLINITIC SAND VERY
COMMON IN PLANAR AND FLAKY STRUCTURE
<10% IN SAMPLE TRAY; MODERATELY
CALCAREOUS; VERY CLEAN BEACH LOOKING
SAND; NO VISIBLE FLUORESCENCE UNDER UV
LIGHT.

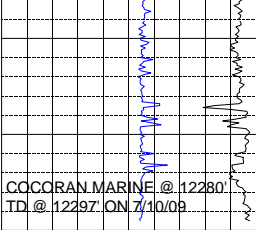
SHALE = LIGHT GRAY TO LIGHT BLuish GRAY
WITH TRACES OF REDDISH BROWN; BRITTLE TO
CRUMBLY TENACITY; IRREGULAR TO BLOCKY TO
OCC PLANAR FRACTURE; MASSIVE CUTTINGS
HABIT WITH LARGE TABULAR AND ELONGATED
PIECES COMMON; DULL TO EARTHY TO OCC
WAXY LUSTER; SILTY TO GRITTY TO RARE



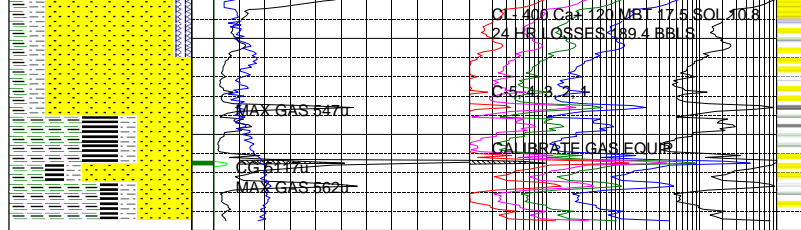








12200
123



DI 400 C-4 120 MBT 17.5 SOL 10.8
24 HR LOSSES 169.4 BBL/S
C-5 4.3 1.1
SILTSTONE = BROWNISH GRAY COLOR; BRITTLE
TENACITY; IRREGULAR FRACTURE; NODULAR
CUTTINGS HABIT; EARTHY LUSTER; SILTY
TEXTURE; MASSIVE STRUCTURE.
NOTE = TD PRODUCTION @ 12297' 07/10/09.

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