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

Drilling Dynamics MD

COMPANY	ExxonMobil Production
WELL	FRU197-33B5
FIELD	Freedom Ranch
REGION	Rockies
COORDINATES	39.921295000 108.282534000
ELEVATION	6460.5'
COUNTY, STATE	Rio Blanco, CO
API INDEX	051031142500
SPUD DATE	04/24/2010
CONTRACTOR	HP
CO. REP.	Chad Jarvis
RIG/TYPE	HP321
LOGGING UNIT	Unit #31
GEOLOGISTS	Barbara Delaney Mike Franco
ADD. PERSONS	Chad Record
CO. GEOLOGIST	Chris Alba

LOG INTERVAL

DEPTHS: 4524' TO 12445'
DATES: 04/25/2010 TO 05/13/2010
SCALE: 1"=100'

CASING DATA

10.75" AT 4524'
4.5" AT 12444'
AT
AT

MUD TYPES

WATER-BASED TO 12445'
TO
TO
TO

HOLE SIZE

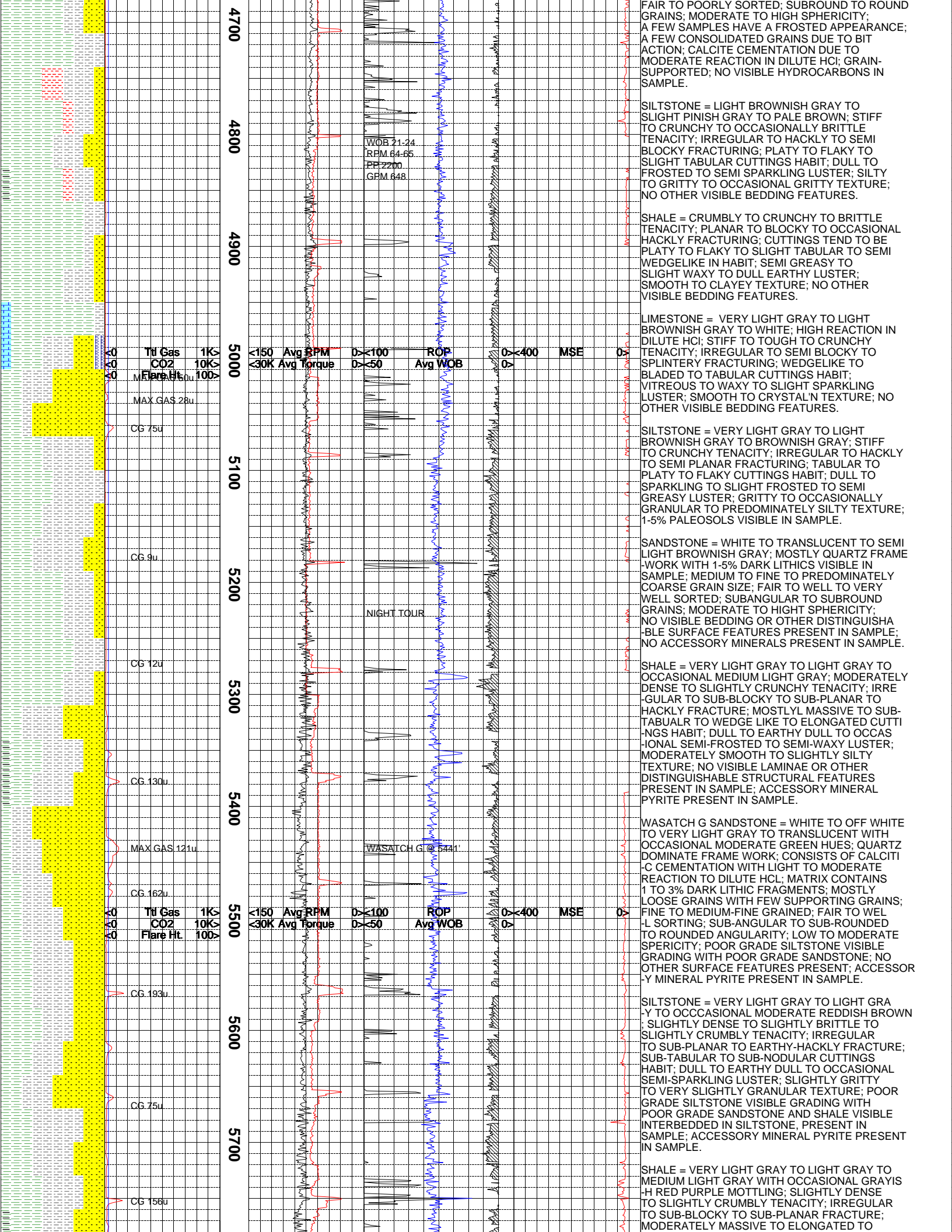
8.750" TO 11087'
7.875" TO 12445'
TO
TO

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		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		

Lithology	<0 Ttl Gas 1K>			Depth	<150 Avg RPM 0><100 ROP 0><400 MSE 0>			MGS	Remarks Survey Data, Mud Reports, Other Info.
	<0 CO2 10K>				ft/hr				
	<0 Flare Ht. 100>				<30K Avg Torque 0><50 Avg WOB 0>				
	ft				FTLBS klbs				
				3800					
				3900					
				4000	<150 Avg RPM 0><100 ROP 0><400 MSE 0> <30K Avg Torque 0><50 Avg WOB 0>				
				4100					
				4200					
				4300					ALL SAMPLE COLOR DESCRIPTIONS REFERENCED TO THE G.S.A. ROCK COLOR CHART.
				4400					ROCK CHARACTERISTICS AND CONSTITUENTS ARE LISTED FROM MOST ABUNDANT TO LEAST ABUNDANT PERCENTAGE OF SAMPLE. GAS 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 = 10,000 PPM ETHANE = 1,000 PPM PROPANE = 1,000 PPM I - BUTANE = 1,000 PPM N - BUTANE = 1,000 PPM I - PENTANE = 1,000 PPM N - PENTANE = 1,000 PPM
				4500	<150 Avg RPM 0><100 ROP 0><400 MSE 0> <30K Avg Torque 0><50 Avg WOB 0>				EPOCH WELL SERVICES COMMENCED LOGGING ON 04/25/2010 @ 4530'
				4600					SHALE = LIGHT GRAY TO LIGHT OLIVE GRAY; BRITTLE TO CRUMBLY TO CRUNCHY TENACITY; PREDOMINATELY PLANAR TO OCCASIONALLY BLOCKY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO OCCASIONALLY ELONGATED TABULAR IN HABIT; DULL TO SEMI GREASY TO EARTHY LUSTER; SILTY TO SMOOTH TO CLAYEY TEXTURE; VISIBLE NACHOLITE CRYSTALS IN MOST OF SAMPLE; 5-10% PALEOSOLS VISIBLE IN SAMPLE. SANDSTONE = TRANSLUCENT TO WHITE TO SEMI YELLOWISH GRAY; MOSTLY QUARTZ FRAMEWORK WITH 2-3% DARK LITHICS VISIBLE IN SAMPLE ; COARSE TO MEDIUM TO FINE GRAIN SIZE;



FAIR TO POORLY SORTED; SUBROUND TO ROUND GRAINS; MODERATE TO HIGH SPHERICITY; A FEW SAMPLES HAVE A FROSTED APPEARANCE; A FEW CONSOLIDATED GRAINS DUE TO BIT ACTION; CALCITE CEMENTATION DUE TO MODERATE REACTION IN DILUTE HCl; GRAIN-SUPPORTED; NO VISIBLE HYDROCARBONS IN SAMPLE.

SILTSTONE = LIGHT BROWNISH GRAY TO SLIGHT PINISH GRAY TO PALE BROWN; STIFF TO CRUNCHY TO OCCASIONALLY BRITTLE TENACITY; IRREGULAR TO HACKLY TO SEMI BLOCKY FRACTURING; PLATY TO FLAKY TO SLIGHT TABULAR CUTTINGS HABIT; DULL TO FROSTED TO SEMI SPARKLING LUSTER; SILTY TO GRITTY TO OCCASIONAL GRITTY TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

SHALE = CRUMBLY TO CRUNCHY TO BRITTLE TENACITY; PLANAR TO BLOCKY TO OCCASIONAL HACKLY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY TO SLIGHT TABULAR TO SEMI WEDGELIKE IN HABIT; SEMI GREASY TO SLIGHT WAXY TO DULL EARTHY LUSTER; SMOOTH TO CLAYEY TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

LIMESTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO WHITE; HIGH REACTION IN DILUTE HCl; STIFF TO TOUGH TO CRUNCHY TENACITY; IRREGULAR TO SEMI BLOCKY TO SPLINTERY FRACTURING; WEDGELIKE TO BLADED TO TABULAR CUTTINGS HABIT; VITREOUS TO WAXY TO SLIGHT SPARKLING LUSTER; SMOOTH TO CRYSTAL'N TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

SILTSTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO BROWNISH GRAY; STIFF TO CRUNCHY TENACITY; IRREGULAR TO HACKLY TO SEMI PLANAR FRACTURING; TABULAR TO PLATY TO FLAKY CUTTINGS HABIT; DULL TO SPARKLING TO SLIGHT FROSTED TO SEMI GREASY LUSTER; GRITTY TO OCCASIONALLY GRANULAR TO PREDOMINATELY SILTY TEXTURE; 1-5% PALEOSOLS VISIBLE IN SAMPLE.

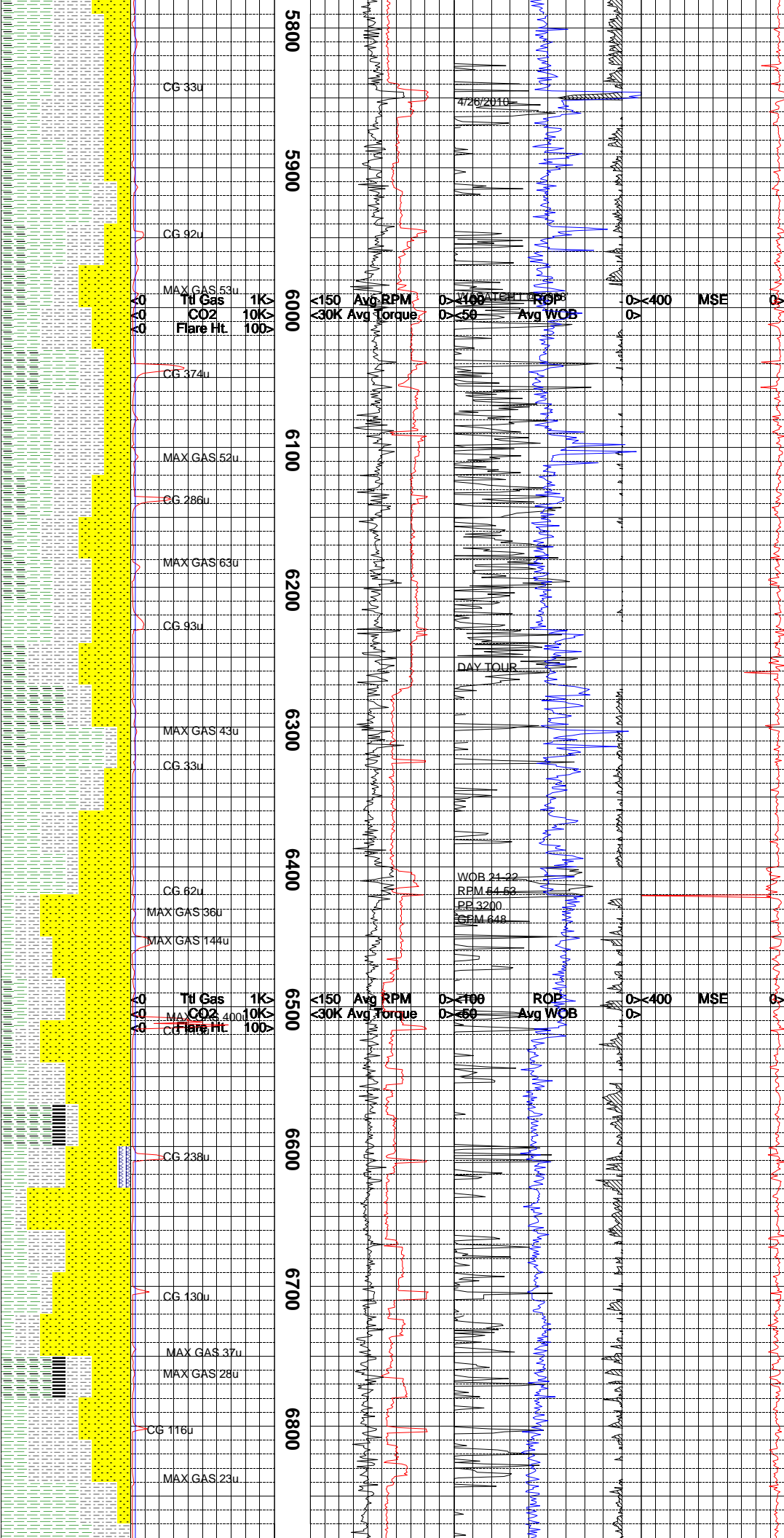
SANDSTONE = WHITE TO TRANSLUCENT TO SEMI LIGHT BROWNISH GRAY; MOSTLY QUARTZ FRAME -WORK WITH 1-5% DARK LITHICS VISIBLE IN SAMPLE; MEDIUM TO FINE TO PREDOMINATELY COARSE GRAIN SIZE; FAIR TO WELL TO VERY WELL SORTED; SUBANGULAR TO SUBROUND GRAINS; MODERATE TO HIGH SPHERICITY; NO VISIBLE BEDDING OR OTHER DISTINGUISHABLE SURFACE FEATURES PRESENT IN SAMPLE; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO OCCASIONAL MEDIUM LIGHT GRAY; MODERATELY DENSE TO SLIGHTLY CRUNCHY TENACITY; IRREGULAR TO SUB-BLOCKY TO SUB-PLANAR TO HACKLY FRACTURE; MOSTLY MASSIVE TO SUB-TABULAR TO WEDGE LIKE TO ELONGATED CUTTINGS HABIT; DULL TO EARTHY DULL TO OCCASIONAL SEMI-FROSTED TO SEMI-WAXY LUSTER; MODERATELY SMOOTH TO SLIGHTLY SILTY TEXTURE; NO VISIBLE LAMINAE OR OTHER DISTINGUISHABLE STRUCTURAL FEATURES PRESENT IN SAMPLE; ACCESSORY MINERAL PYRITE PRESENT IN SAMPLE.

WASATCH G SANDSTONE = WHITE TO OFF WHITE TO VERY LIGHT GRAY TO TRANSLUCENT WITH OCCASIONAL MODERATE GREEN HUES; QUARTZ DOMINATE FRAME WORK; CONSISTS OF CALCITE CEMENTATION WITH LIGHT TO MODERATE REACTION TO DILUTE HCl; MATRIX CONTAINS 1 TO 3% DARK LITHIC FRAGMENTS; MOSTLY LOOSE GRAINS WITH FEW SUPPORTING GRAINS; FINE TO MEDIUM-FINE GRAINED; FAIR TO WELL SORTING; SUB-ANGULAR TO SUB-ROUNDED TO ROUNDED ANGULARITY; LOW TO MODERATE SPHERICITY; POOR GRADE SILTSTONE VISIBLE GRADING WITH POOR GRADE SANDSTONE; NO OTHER SURFACE FEATURES PRESENT; ACCESSORY MINERAL PYRITE PRESENT IN SAMPLE.

SILTSTONE = VERY LIGHT GRAY TO LIGHT GRAY TO OCCASIONAL MODERATE REDDISH BROWN; SLIGHTLY DENSE TO SLIGHTLY BRITTLE TO SLIGHTLY CRUMBLY 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; SLIGHTLY GRITTY TO VERY SLIGHTLY GRANULAR TEXTURE; POOR GRADE SILTSTONE VISIBLE GRADING WITH POOR GRADE SANDSTONE AND SHALE VISIBLE INTERBEDDED IN SILTSTONE, PRESENT IN SAMPLE; ACCESSORY MINERAL PYRITE PRESENT IN SAMPLE.

SHALE = VERY LIGHT GRAY TO LIGHT GRAY TO MEDIUM LIGHT GRAY WITH OCCASIONAL GRAYISH RED PURPLE MOTTLING; SLIGHTLY DENSE TO SLIGHTLY CRUMBLY TENACITY; IRREGULAR TO SUB-BLOCKY TO SUB-PLANAR FRACTURE; MODERATELY MASSIVE TO ELONGATED TO



WEDGE LIKE CUTTINGS HABIT; DULL TO EARTH
-Y DULL TO OCCASIONAL SEMI-WAXY TO SEMI-
FROSTED LUSTER; MODERATELY SMOOTH TO
SLIGHTLY SILTY TEXTURE; NO VISIBLE LAMIN
-AE OR OTHER DISTINGUISHABLE STRUCTURAL
FEATURES PRESENT; ACCESSORY MINERAL
PYRITE PRESENT IN SAMPLE.

CARBONACEOUS SHALE = BROWNISH BLACK TO
OLIVE BLACK TO DARK BROWNISH GRAY; MODER
-ATELY DENSE TO SLIGHTLY TOUGH TENACITY;
SUB-PLANAR TO SUB-TABULAR TO EARTHY
FRACTURE; OCCASIONAL MASSIVE TO SUB-
TABULAR TO SUB-NODULAR CUTTINGS HABIT;
DULL TO EARTHY DULL TO OCCASIONAL SLIGHT
-LY SEMI-SPARKLING LUSTER; VERY SLIGHTLY
GRITTY TO VERY SLIGHTLY CLAYEY TEXTURE;
POOR GRADE SILTSTONE VISIBLE BEDDING WIT
-H POOR GRADE SHALE, NO OTHER DISTINGUIS
-HABLE STRUCTURAL FEATURES PRESENT; ACCES
-SSORY MINERAL PYRITE PRESENT IN SAMPLE.

WASATCH I SANDSTONE = OFF WHITE TO VERY
LIGHT GRAY TO VERY LIGHT BROWNISH GRAY
WITH BLACK AND DARK BROWNISH GRAY HUES;
QUARTZ DOMINATE FRAME WORK; QUARTZ
CUTTINGS RANGE FROM SMOKY TO OFF WHITE;
CONSISTS OF CALCITIC CEMENTATION; MODERA
-TELY HIGH REACTION TO DILUTE HCL; MATRI
-X CONTAINS 3 TO 5% DARK LITHIC FRAGMENT
-S; MEDIUM-COARSE TO VERY COARSE GRAINED
; FAIR TO POOR SORTING; SUB-ANGULAR TO
SUB-ROUNDED ANGULARITY; LOW TO MODERATE
SPHERICITY; POOR GRADE SILTSTONE VISIBLE
GRADING WITH POOR GRADE SANDSTONE, VERY
SMALL AMOUNT OF COAL VISIBLE DEGASSING,
AND FRACTURE EVIDENCE IN SAMPLE; ACCESSO
-RY MINERALS PYRITE AND CALCITE PRESENT
IN SAMPLE.

SILTSTONE = LIGHT GRAY TO LIGHT BROWNISH
GRAY; SLIGHTLY DENSE TO SLIGHTLY TOUGH
TENACITY; IRREGULAR TO SUB-PLANAR TO
EARTHY HACKLY FRACTURE; SUB-TABULAR TO
SUB-NODULAR CUTTINGS HABIT; DULL TO EART
-HY DULL TO OCCASIONAL SEMI-SPARKLING
LUSTER; SLIGHTLY GRITTY TEXTURE; NO
OTHER VISIBLE BEDDING FEATURES.

CARBONACEOUS SHALE = BROWNISH GRAY TO
OLIVE GRAY TO OCCASIONALLY LIGHT OLIVE
GRAY; CRUNCHY TO CRUMBLY TO PREDOMINATE
BRITTLE TENACITY; PLANAR TO HACKLY TO
SEMI BLOCKY FRACTURING; CUTTINGS TEND TO
BE PLATY TO FLAKY TO ELONGATED TABULAR
IN HABIT; DULL EARTHY TO SLIGHT GREASY
TO OCCASIONALLY SPARKLING LUSTER; GRITTY
TO SILTY TO OCCASIONAL GRANULAR TEXTURE;
VISIBLE PYRITE CRYSTALS; VISIBLE BANDS
OF CARBONACEOUS MATERIAL; GRADES INTO A
LIGHT GRAY SHALE.

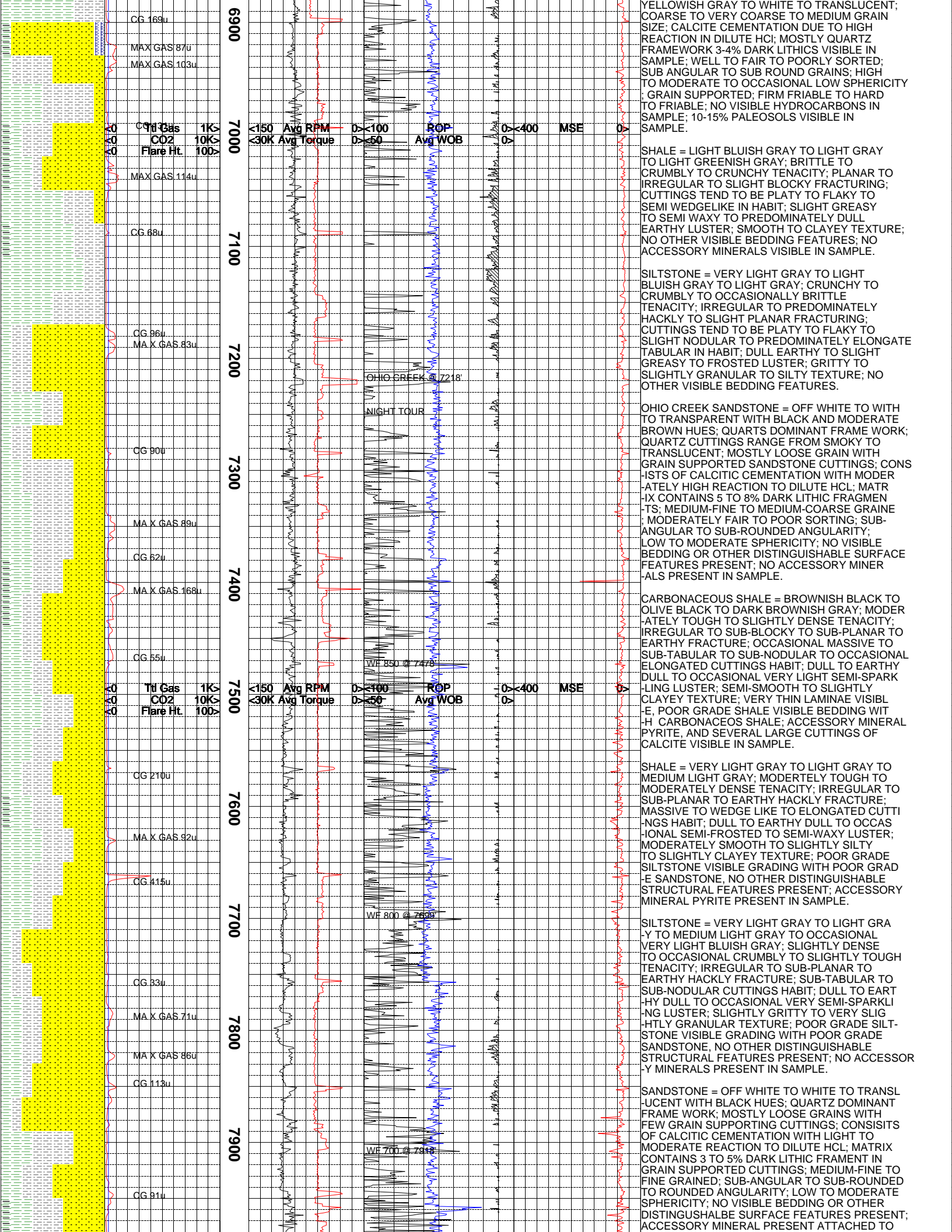
SANDSTONE = LIGHT BROWNISH GRAY TO WHITE
TO TRANSLUCENT TO SEMI YELLOWISH GRAY;
MOSTLY QUARTZ FRAMEWORK WITH 1-2% DARK
LITHICS VISIBLE IN SAMPLE; VERY COARSE
TO COARSE TO MEDIUM TO VERY FINE GRAIN;
VERY WELL TO WELL TO FAIR SORTED; SUB-
ANGULAR TO SUB ROUND TO ROUND GRAINS;
LOW TO MODERATE SPHERICITY; COARSE GRAIN
SAMPLES HAVE A SLIGHT POLISH APPEARANCE;
FINE GRAIN SANDSTONES HAVE A SLIGHT
FROSTED APPEARANCE; UNCONSOLIDATED GRAIN
DUE TO BIT ACTION; GRAIN SUPPORTED ;
CALCITE CEMENTATION DUE TO MODERATE
REACTION TO DILUTE HCL; NO VISIBLE HYDRO
-CARBONS IN SAMPLE.

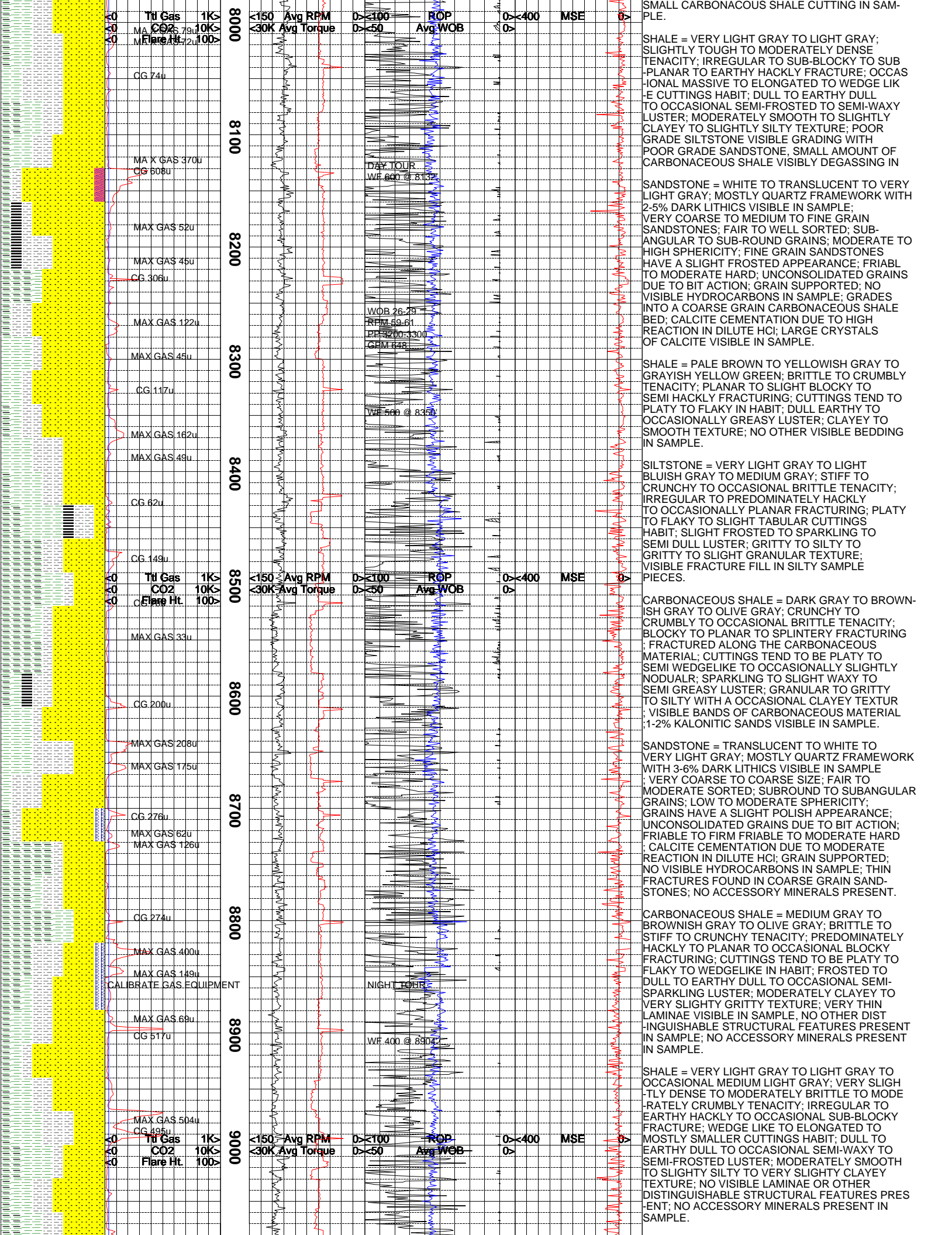
SILTSTONE = VERY LIGHT GRAY TO LIGHT
BLUISH GRAY TO OCCASIONAL LIGHT YELLOWIS
GRAY; STIFF TO CRUNCHY TENACITY; HACKLY
TO IRREGULAR FRACTURING; CUTTINGS TEND
TO BE WEDGELIKE TO PLATY TO SLIGHT BLADE
IN HABIT; DULL EARTHY TO SLIGHT GREASY
TO SEMI FROSTED LUSTER; GRANULAR TO
GRITTY TO SILTY TEXTURE; NO OTHER VISIBL
BEDDING FEATURES.

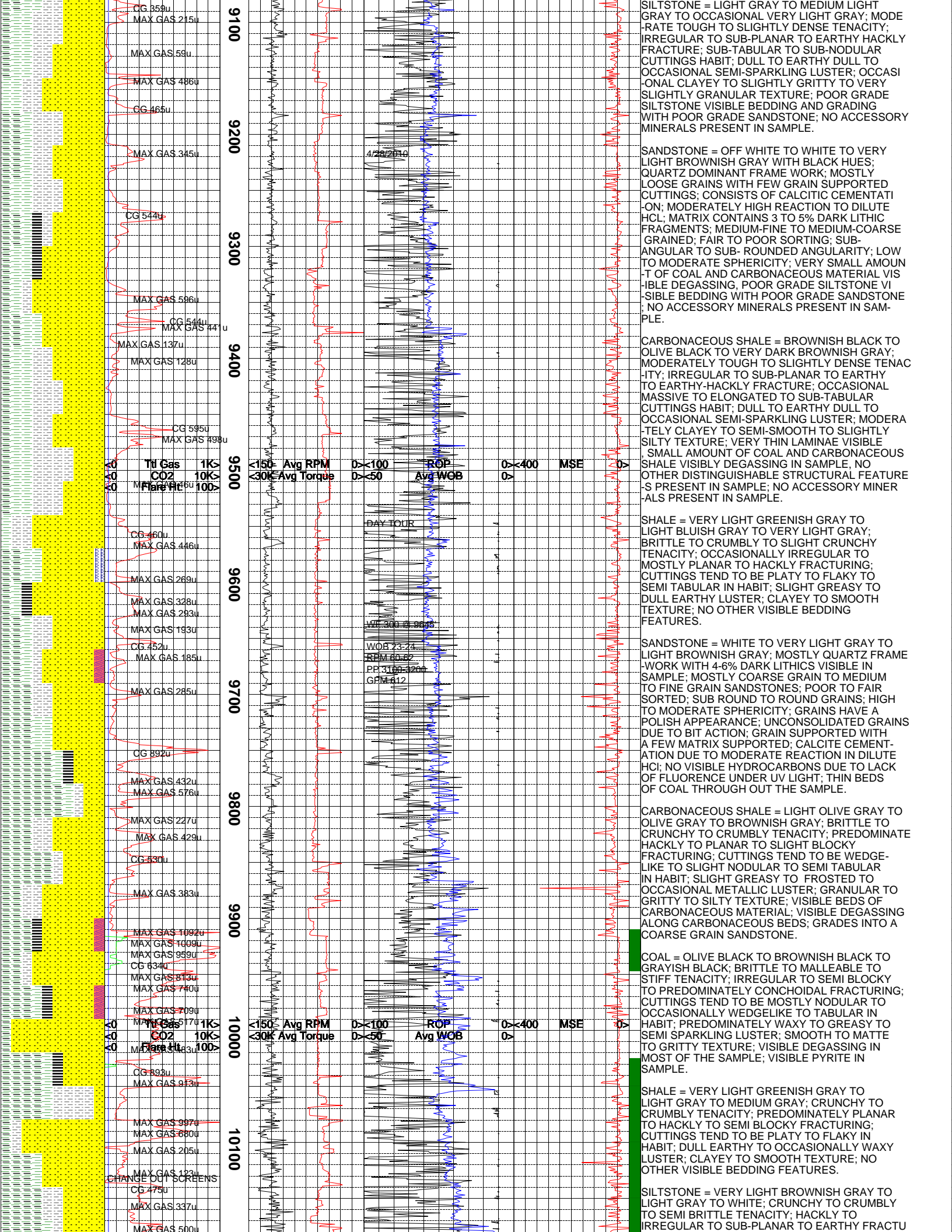
COAL = BLACK TO GRAYISH BLACK TO SLIGHT
BROWNISH BLACK; BRITTLE TO CRUMBLY TO
CRUNCHY TENACITY; CONCHOIDAL TO SPLINTER
TO IRREGULAR FRACTURING; WEDGELIKE TO
SLIGHTLY NODULAR TO OCCASIONALLY BLADED
CUTTINGS HABIT; DULL TO SPARKLING TO SEM
GREASY TO PREDOMINATELY WAXY LUSTER;
CLAYEY TO SEMI SILTY TO MOSTLY SMOOTH
TEXTURE; VISIBLE DEGASSING IN MOST OF
SAMPLE; VISIBLE CRYSTALS OF PYRITE.

SHALE = VERY LIGHT GRAY TO LIGHT OLIVE
GRAY; CRUMBLY TO BRITTLE TENACITY; HACK-
LY TO IRREGULAR TO BLOCKY FRACTURING;
CUTTINGS TEND TO BE PLATY TO FLAKY TO
ELONGATED TABULAR; EARTHY TO DULL TO
SEMI GREASY LUSTER; PREDOMINATELY CLAYEY
TO SMOOTH TEXTURE; NO VISIBLE BEDDING
IN SAMPLE; NO VISIBLE ACCESSORY MINERALS
PRESENT.

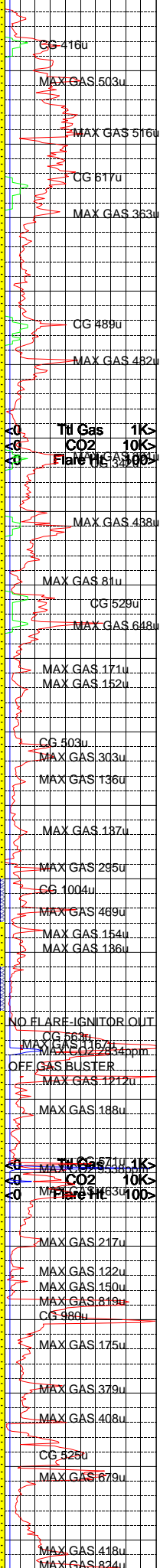
SANDSTONE = VERY LIGHT GRAY TO LIGHT



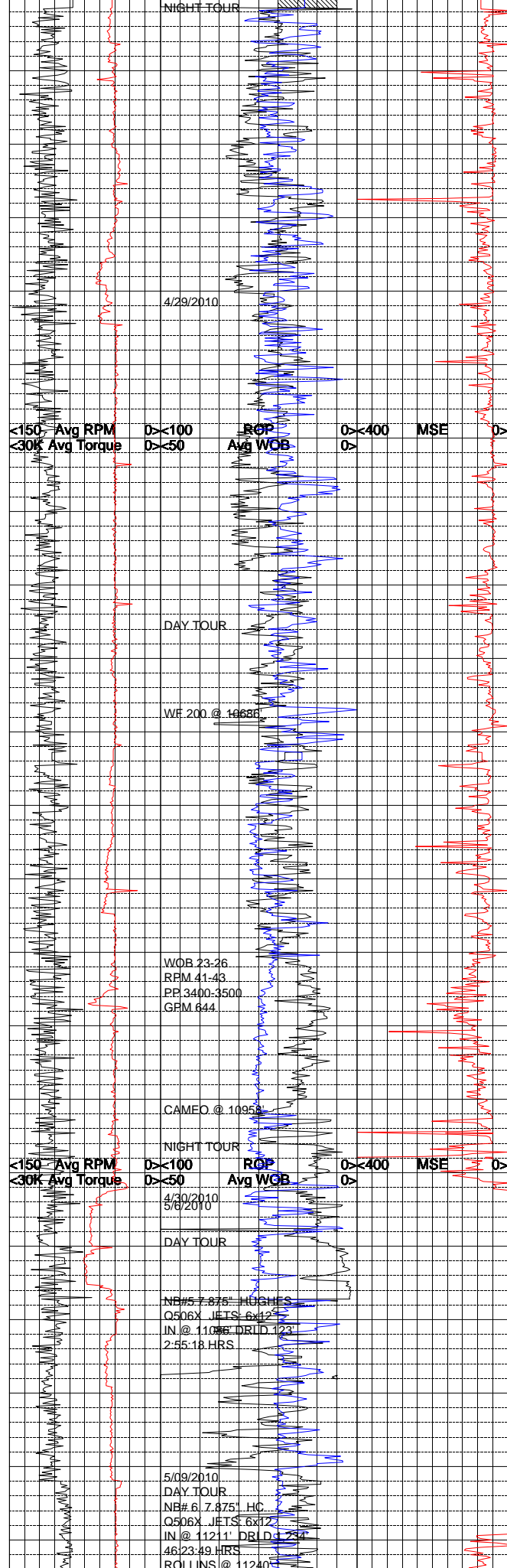




CALIBRATE GAS EQUIPMENT



10920
10300
10400
10500
10600
10700
10800
10900
11000
11100
11200



RE; SUB-TABULAR TO SUB-NODULAR CUTTINGS HABIT; DULL TO EARTHY DULL TO OCCASIONAL VERY SLIGHTLY SEMI-SPARKLING LUSTER; SLIGHTLY GRITTY TO VERY SLIGHTLY GRANULAR TO OCCASIONAL CLAYEY TEXTURE; POOR GRADE SILTSTONE VISIBLE GRADING WITH POOR GRADE SANDSTONE; NO VISIBLE LAMINAE OR OTHER DISTINGUISHABLE STRUCTURAL FEATURE -S PRESENT; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

SANDSTONE = VERY LIGHT GRAY TO OFF WHITE TO VERY LIGHT TANISH-BROWN GRAY TO LIGHT BROWNISH GRAY WITH BLACK AND MODERATE BROWN HUES; QUARTZ DOMINATE FRAME WORK; MOSTLY GRAIN SUPPORTED WITH FEW LOOSE GRAINS; CONSISTS OF CALCITIC CEMENTATION WITH LIGHT TO MODERATE REACTION TO DILUTE HCL; MATRIX CONTAINS 3 TO 5% DARK LIT -HIC FRAGMENTS; FINE TO MEDIUM-COARSE GRAINED; FAIR TO POOR SORTING; SUB-ANGULAR TO SUB-ROUNDED ANGULARITY; LOW TO MODERATE SPHERICITY; POOR GRADE SANDSTONE VISIBLE GRADING WITH POOR GRADE SILTS -TONE, VERY SMALL AMOUNT OF COAL AND CARBONACEOUS SHALE VISIBLY DEGASSING IN SAMPLE; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

CARBONACEOUS SHALE = BROWNISH BLACK TO OLIVE BLACK TO VERY DARK BROWNISH GRAY; SLIGHTLY TOUGH TO MODERATELY DENSE TO OCCASIONAL SLIGHTLY CRUNCHY TENACITY; IRREGULAR TO SUB-BLOCKY TO SUB-PLANAR TO EARTHY TO HACKLY FRACTURE; OCCASIONAL MASSIVE TO ELONGATED TO SUB-TABULAR TO SUB-NODULAR CUTTINGS HABIT; DULL TO EARTHY DULL TO OCCASIONAL SEMI-SPARKLING LUSTER; SLIGHTLY SMOOTH TO SLIGHTLY CLAYEY TO VERY SLIGHTLY GRITTY TEXTURE; POOR GRADE SANDSTONE VISIBLE BEDDING WITH CARBONACEOUS SHALE, AND POOR GRADE SILTSTONE VISIBLE GRADING WITH POOR GRADE SANDSTONE, VERY SMALL AMOUNT OF COAL VISIBLY DEGASSING IN SAMPLE; NO ACCESSORY MINERALS PRESENT.

SANDSTONE = LIGHT BROWNISH GRAY TO YELLOWISH GRAY TO WHITE TO SLIGHTLY TRANSLUCENT; MOSTLY QUARTZ FRAMEWORK WITH 7-8% DARK LITHICS VISIBLE IN SAMPLE; COARSE TO MEDIUM TO OCCASIONAL FINE GRAIN SANDSTONES; VERY POOR TO POOR TO FAIR SORTED; SUBANGULAR TO SUBROUND GRAINS; SPHERICITY IS MODERATE TO HIGH; GRAIN SUPPORTED; NO VISIBLE HYDROCARBONS; HIGH REACTION IN DILUTE HCL INDICATING CALCITE CEMENTATION; GRAINS ARE SEMI FROSTED IN APPEARANCE; VISIBLE BEDS OF THIN COAL IN COARSE GRAIN SANDSTONES.

COAL = GRAYISH BLACK TO OLIVE BLACK TO BROWNISH BLACK; STIFF TO MALLEABLE TO CRUNCHY TENACITY; HACKLY TO SPLINTERY TO CONCHOIDAL FRACTURING; CUTTINGS TEND TO BE NODULAR TO BLADED TO WEDGELIKE IN HABIT; DULL TO SPARKLING TO SLIGHT METALLIC TO SEMI GREASY WAXY LUSTER; SMOOTH TO CRYSTALLINE TO SEMI MATTE TEXTURE; THIN LAMINAE OF PYRITE IS VISIBLE IN SAMPLE; VISIBLE DEGASSING IN MOST OF SAMPLE.

TOOK A KICK @ 10904', GAINED 64bbbls. LOST RETURNS .REGAIN RETURNS @ 10906'.

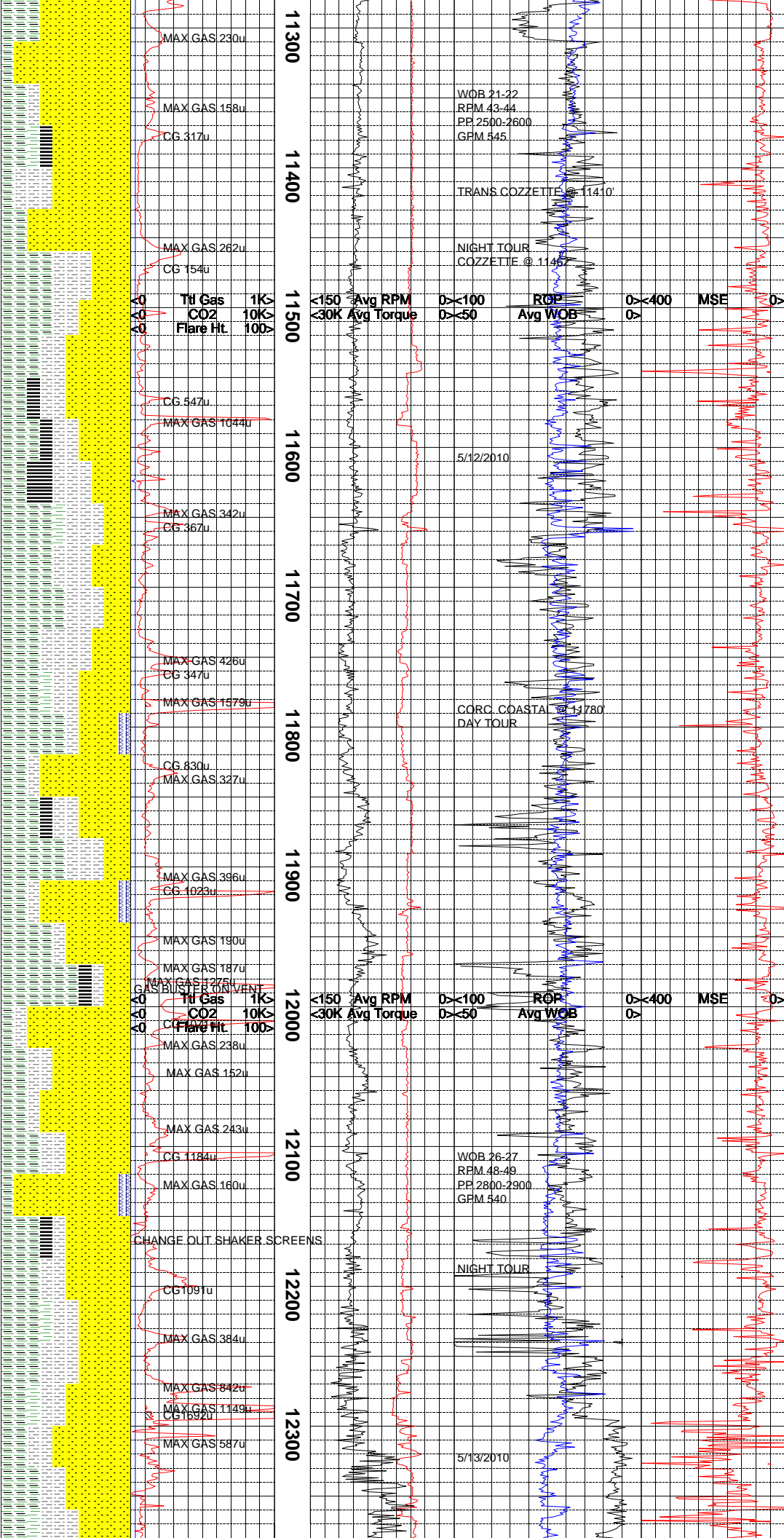
SHALE = VERY LIGHT GREENISH GRAY TO LIGHT GRAY TO PALE BLUE; BRITTLE TO CRUMBLY TENACITY; CUTTINGS TEND TO BE PLATY TO FLAKY IN HABIT; DULL EARTHY TO EARTHY DULL TO OCCASIONAL SEMI-WAXY TO SEMI-FROSTED LUSTER; MODERATELY SMOOTH TO SLIGHTLY SILTY TO VERY SLIGHTLY CLAYEY TEXTURE; NO VISIBLE LAMINAE OR OTHER STRUCTURAL FEATURES PRESENT; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

TRIP OUT OF HOLE FOR NEW BIT @ 11086'

CARBONACEOUS SHALE = BROWNISH BLACK TO GRAYISH BLACK; CRUNCHY TO CRUMBLY TO OCCASIONAL MALLEABLE TENACITY; PLANAR TO HACKLY FRACTURING; PLATY TO FLAKY TO SEMI TABULAR CUTTINGS HABIT; DULL EARTHY TO SEMI FROSTED TO SLIGHT SPARKLING LUSTER; SMOOTH TO PREDOMINATELY SILTY TO SEMI GRITTY TEXTURE; VISIBLE BEDS OF CARBONACEOUS MATERIAL; VISIBLE DEGASSING IN MOST OF SAMPLE.

PIPE STUCK AT 11202'.

ROLLINS SANDSTONE = WHITE TO LIGHT BROWNISH GRAY TO OCCASIONALLY TRANSLUCENT; MOSTLY QUARTZ FRAMEWORK WITH 5-6% DARK LITHICS VISIBLE IN SAMPLE; VERY COARSE TO PREDOMINATELY FINE GRAIN TO MEDIUM GRAIN SIZE; FAIR TO WELL TO VERY WELL SORTED; SUBANGULAR TO SUB ROUND TO ROUND GRAINS; MODERATE TO HIGH SPHERICITY



-Y; FEW GRAINS HAVE A SLIGHT POLISH APPEARANCE; UNCONSOLIDATED GRAINS DUE TO BIT ACTION; CALCITE CEMENTATION DUE TO MODERATE REACTION IN DILUTE HCl; GRAIN SUPPORTED; NO VISIBLE HYDROCARBONS IN SAMPLE UNDER FLOURENCES.

SILTSTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO LIGHT GREENISH GRAY; CRUNCHY TO CRUMBLY TO SEMI BRITTLE TENACITY; IRREGULAR TO SLIGHT HACKLY TO SEMI PLANAR FRACTURING; TABULAR TO WEDGE -LIKE CUTTINGS HABIT; DULL EARTHY TO SEM FROSTED TO OCCASIONAL WAXY LUSTER; SILTY TO SLIGHT GRITTY TEXTURE; NO OTHER VISIBLE ACCESSORY MINERALS PRESENT IN THE SAMPLE.

CARBONACEOUS SHALE = OLIVE BLACK TO DARK BROWNISH BLACK; MODERATELY DENSE TO VERY SLIGHTLY TOUGH TENACITY; IRREGULAR TO SUB-PLANAR TO SUB-BLOCKY TO EARTHY-HACKLY FRACTURE; SUB-TABULAR TO SUB-NODULAR TO OCCASIONAL WEDGE LIKE CUTTING -S HABIT; DULL TO EARTHY DULL TO OCCASIO -NAL SEMI-SPARKLING LUSTER; SLIGHTLY CLAYEY TO VERY SLIGHTLY GRITTY TEXTURE; POOR GRADE SILTSTONE VISIBLE BEDDING WIT -H POOR GRADE CARBONACEOUS SHALE, VERY SMALL AMOUNT OF COAL VISIBLE DEGAISSING IN SAMPLE; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

SANDSTONE = OFF WHITE TO PALE WHITE TO VERY LIGHT TANISH-BROWN TO VERY LIGHT BROWNISH GRAY WITH BLACK AND MODERATE BROWN HUES; QUARTZ DOMINANTE FRAME WORK ; QUARTZ CUTTINGS RANGE FROM SMOKY TO OCCASIONAL SLIGHTLY TRANSLUCENT; CONSIST -S MOSTLY SILICIC CEMENTATION WITH VERY LIGHT TO NO EFFERVESCING; MATRIX CONTAIN -S 3 TO 5% DARK LITHIC FRAGMENTS; MOSTLY GRAIN SUPPORTED WITH FEW LOOSE GRAINS; MEDIUM-FINE TO MEDIUM-COARSE GRAINED; MODERATELY FAIR TO POOR SORTING; SUB-ANGULAR TO SUB-ROUNDED ANGULARITY; LOW TO MODERATE SPHERICITY; POOR GRADE SILTS -TONE VISIBLE GRADING WITH POOR GRADE SANDSTONE; ACCESSORY MINERAL PYRITE PRESENT IN SAMPLE.

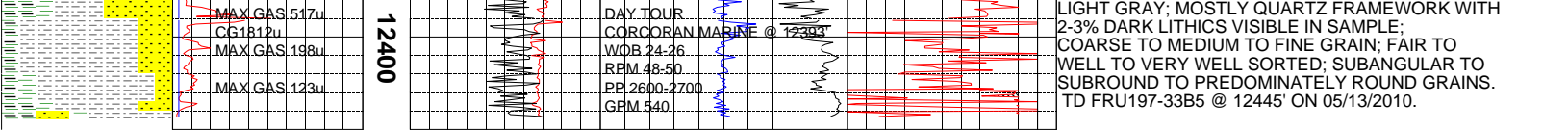
SILTSTONE = VERY LIGHT GRAY TO LIGHT BROWNISH GRAY TO LIGHT YELLOWISH GRAY; CRUNCHY TO CRUMBLY TO SEMI BRITTLE TENACITY; GRADES INTO A MEDIUM TO COARSE GRAIN SANDSTONE; SPLINTERY TO PLANAR TO PREDOMINATELY HACKLY FRACTURING; CUTTING TEND TO BE PLATY TO FLAKY TO SLIGHTLY TABULAR IN HABIT; SEMI GREASY TO SLIGHT FROSTED TO OCCASIONALLY DULL LUSTER; SILTY TO GRITTY TO OCCASIONALLY GRANULAR TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

CARBONACEOUS SHALE = DARK BROWNISH GRAY TO DARK GRAY TO OLIVE GRAY; CRUNCHY TO CRUMBLY TO SLIGHT MALLEABLE TENACITY; IRREGULAR TO PLANAR FRACTURING; CUTTINGS TEND TO BE PLATY TO TABULAR TO SEMI WEDGE-LIKE IN HABIT; WAXY TO SEMI FROSTED TO DULL EARTHY LUSTER; GRITTY TO SILTY TO SLIGHT GRANULAR IN TEXTURE; VISIBLE PYRITE CRYSTALS THROUGH OUT THE SAMPLE; VISIBLE BANDS OF CARBONACEOUS MATERIAL ALONG BEDDING PLANES.

SANDSTONE = TRANSLUCENT TO WHITE TO VERY LIGHT BROWNISH GRAY; VERY COARSE TO COARSE TO PREDOMINATELY MEDIUM GRAIN SIZE; MOSTLY QUARTZ FRAMEWORK WITH 4-6% DARK LITHICS VISIBLE IN THE SAMPLE; SLIGHT REACTION IN DILUTE HCl INDICATING CALCITIC DOLMITE CEMENTATION; GRAIN SUPPORTED; UNCONSOLIDATED GRAINS DUE TO BIT ACTION; FIRM FRIABLE TO MODERATE HARD TO HARD; SUBANGULAR TO ANGULAR TO SUBROUND GRAINS; MODERATE TO LOW TO OCCASIONAL HIGH SPHERICITY; GRAINS HAVE A SLIGHT FROSTED APPEARANCE; BANDS OF KAOLINITIC SANDS VISIBLE IN SAMPLE, NO OTHER DISTINGUISHABLE SURFACE FEATURES PRESENT; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

SILTSTONE = LIGHT GRAY TO MEDIUM LIGHT GRAY TO VERY LIGHT BROWNISH GRAY; SLIGHT -LY DENSE TO MODERATELY TOUGH 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; VERY SLIGHTLY GRITTY TO VERY SLIGHTLY GRANULAR -R TEXTURE; POOR GRADE SANDSTONE VISIBLE GRADING WITH POOR GRADE SILTSTONE, POOR GRADE SANDSTONE VISIBLE BEDDING WITH POOR GRADE CARBONACEOUS SHALE, NO OTHER SURFACE FEATURES PRESENT IN SAMPLE; NO ACCESSORY MINERALS PRESENT IN SAMPLE.

SANDSTONE = TRANSLUCENT TO WHITE TO VERY



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