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## Drilling Dynamics

COMPANY	ExxonMobil Production
WELL	PCU 296-6B1
FIELD	PICEANCE CREEK UNIT
REGION	ROCKIES MOUNTAINS
COORDINATES	LAT 39.905268000 LON 108.204977000
ELEVATION	GL = 7364.3' KB = 7391.3'
COUNTY, STATE	RIO BLANCO CO.
API INDEX	051031154600
SPUD DATE	12-17-2010
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	RICKY T OWENS
RIG/TYPE	215 / FLEX 3
LOGGING UNIT	MLU 51
GEOLOGISTS	BRENDA MARSH GEORGE BAKER
ADD. PERSONS	DEVIN CLAAR BILL JOHANNING
CO. GEOLOGIST	WILLIAM HOFFMAN

### LOG INTERVAL

DEPTHS: 144' TO 14,015'  
DATES: 12-19-2010 TO 01-16-2011  
SCALE: 1" = 100'

### CASING DATA

16" AT 144'  
10.75" AT 4,528'  
7" AT 9,967'  
AT

### MUD TYPES

LSND TO 14,015'  
TO  
TO  
TO  
TO

### HOLE SIZE

20" TO 144'  
14.75" TO 4,528'  
9.875" TO 10,067'  
6.125" TO 14,015'

### 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

Ttl Gas 500  
units

CO2 10K  
ppm

Flare Ht. 100  
ft

Depth

100

200

300

400

500

600

700

800

900

<150 Avg RPM 0> <300 ROP 0> <400 MSE 0>

ft/hr

psi

<30K Avg Torque 0> <50 Avg WOB 0>

FTLBS klbs

MGS

## Remarks

Survey Data, Mud Reports, Other Info.

Trap motor down

REPLACED GAS TRAP MOTOR

NB # 1, 14.75" IN @ 144'  
SEC. EX75M w/ 7-13's  
99.25 HRS 4386  
DAY TOUR

CANRIG DRILLING TECHNOLOGIES EPOCH DML  
COMENCED GAS AND WELL PARAMETER  
RECORDING FOR THE PCU 296-6B5 SURFACE  
SECTION ON 12/19/2010 AT 03:52 HRS.

Ttl Gas 500  
units

CO2 10K  
ppm

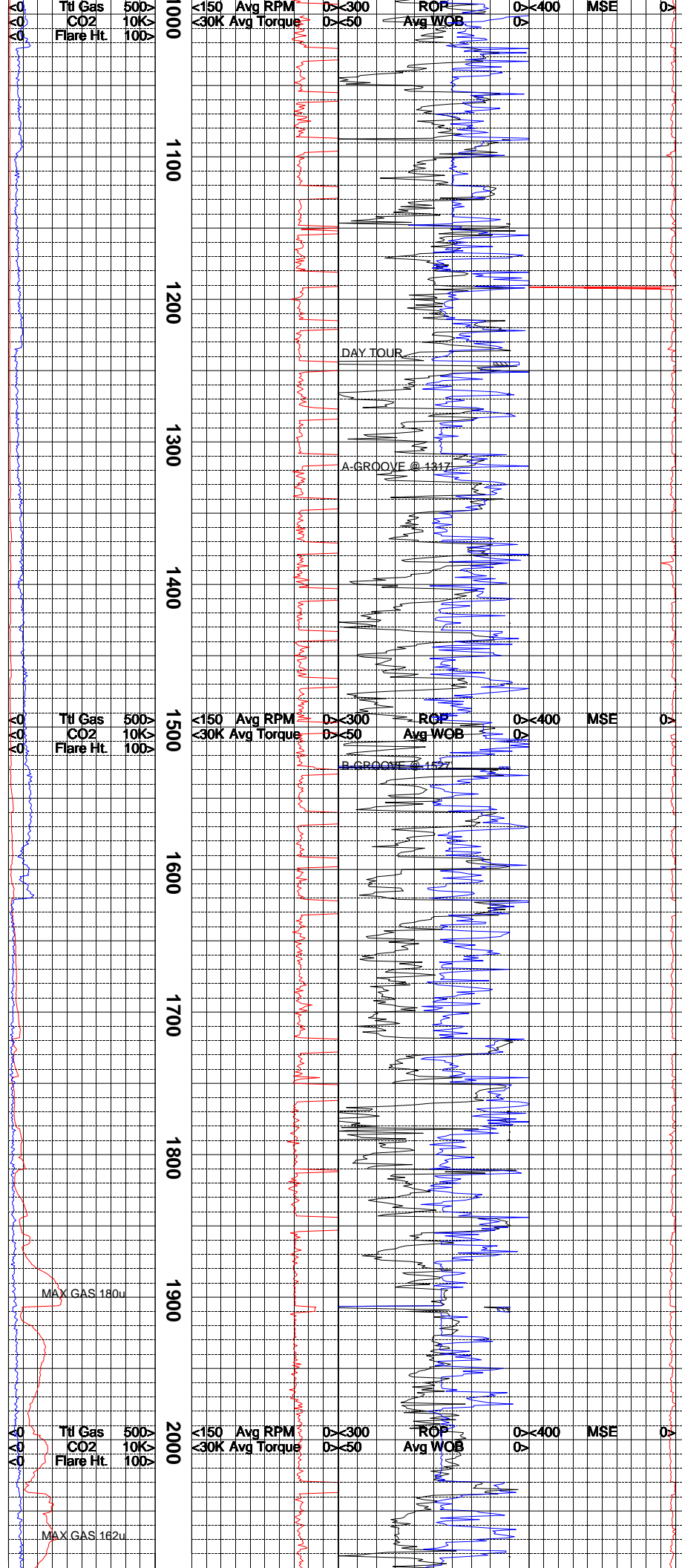
Flare Ht. 100  
ft

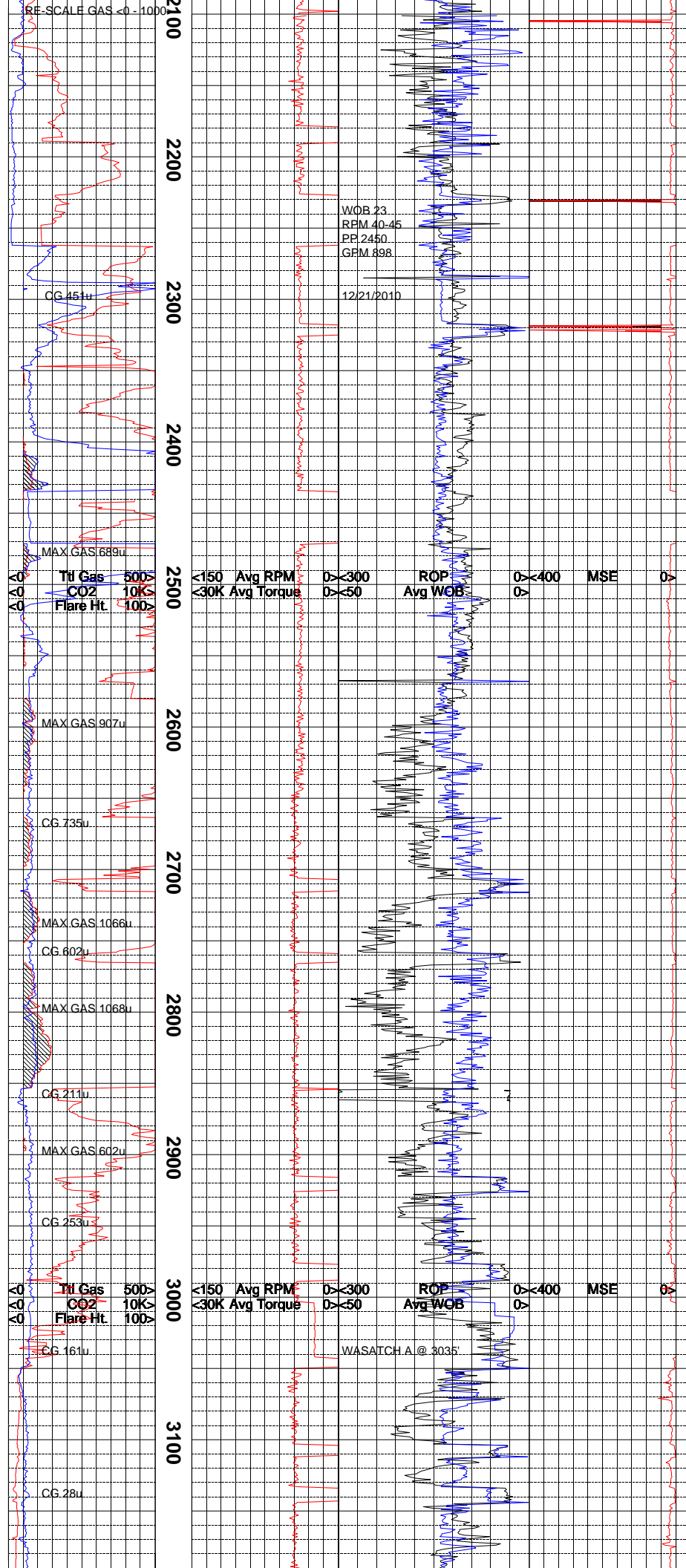
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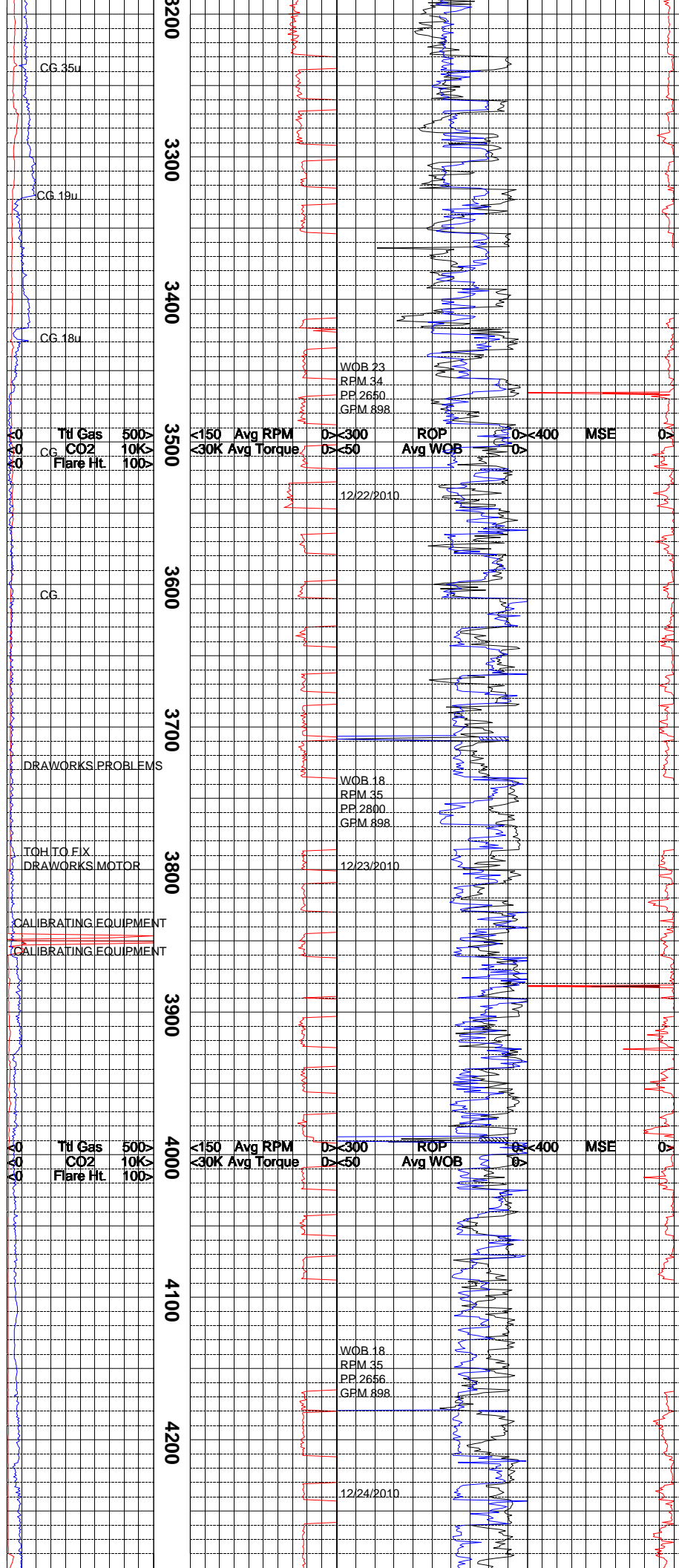
<30K Avg Torque 0> <50 Avg WOB 0>

NIGHT TOUR  
WOB 12  
RPM 30  
PP 1750  
GPM 826

12/20/2010

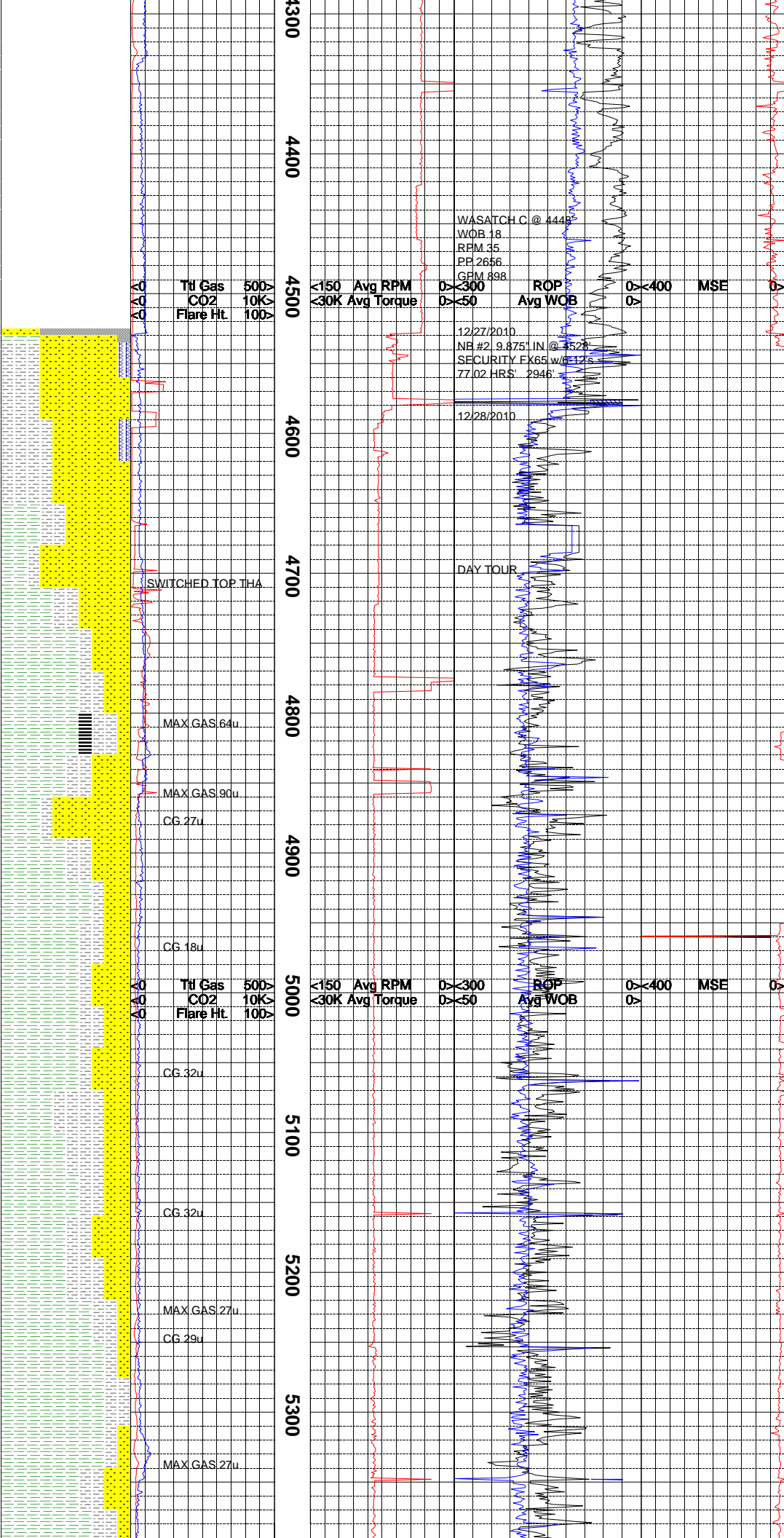






NOTE: DEPTH NOT TRACKING. TROUBLE SHOOTING DRAWWORKS MOTOR AND SENSORS.

NOTE: TOH CHECK BIT FIX DRAWWORKS MOTOR 12/22/2010 @ 15:30HRS. RESUMED DRILLING AHEAD 12/23/2010 05:00 HRS.



NOTE = REACHED CASING POINT 12/24/2010  
BEGAN TRIPPING OUT OF HOLE AT 16:30 HRS.  
RESUMED DRILLING AHEAD IN INTERMEDIATE  
SECTION 12/28/2010 AT 02:13 HRS

ALL ROCK COLORS ARE REFERENCED TO THE  
GSA ROCK COLOR CHART, ROCK CONSTITUENTS  
ARE DESCRIBED WET AND LISTED IN ORDER OF  
MOST ABUNDANT TO LEAST ABUNDANT, ALL  
SAMPLE DEPTHS ARE REFERENCED TO RKB.

GAS CHROMATOGRAPHY EQUIPMENT IS  
CALIBRATED TO A TEST GAS COMPOSED OF  
METHANE = 10000 PPM  
ETHANE = 1000 PPM  
PROPANE = 1000 PPM  
I-BUTANE = 1000 PPM  
N- BUTANE = 1000 PPM  
I- PENTANE = 1000 PPM  
N- PENTANE = 1000 PPM

CO2 IS CALIBRATED TO A TEST GAS COMPOSED  
OF 100000 PPM

CONNECTION GAS, TRIP GAS, AND WIPER GAS  
ARE NOTED ON THE MUDLOG, FLARE HEIGHTS  
AND DEPTHS OF GAS BUSTER USAGE ARE ALSO  
NOTED.

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

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

CANRIG WELL SERVICE COMMENCED LOGGING  
OPERATION ON 12/17/2010 @ 16:25 HRS AT A  
DEPTH OF 144'.

SURVEY DATA AT 4530 MD  
INCL: 0.80  
AZIM: 80.79  
TVD: 4420.16

SHALE = YLWISH GRY, YLWISH BRWN WITH  
HUES OF REDDISH BRWN; GRY: COMMON  
MOTTLED APPEARANCE; DENSE TO CRUNCHY  
TENACITY WITH MASSIVE TO SUB TABULAR OCC  
SUB WEDGELIKE CUTTINGS HABIT; DOMINANTLY  
IRREGULAR FRACTURE OCC HACKLY; EARTHY  
GRITTY TO SMOOTH TEXTURE WITH DULL TO  
SL WAXY TEXTURE WHERE SMOOTH; GRADES TO  
AND INTERBEDDED WITH SILTSTONE.

SHALE = YLWISH GRY, YLWISH TAN WITH OCC  
HUES OF REDDISH BRWN; GRY: COMMON  
MOTTLED APPEARANCE; DENSE TO CRUNCHY  
TENACITY WITH MASSIVE TO SUB TABULAR OCC  
SUB WEDGELIKE CUTTINGS HABIT; DOMINANTLY  
IRREGULAR FRACTURE OCC HACKLY; EARTHY  
GRITTY TO SMOOTH TEXTURE WITH DULL TO  
SL WAXY TEXTURE WHERE SMOOTH; GRADES TO  
AND INTERBEDDED WITH SILTSTONE.

SANDSTONE = LT GRY, GRY, GRY WITH HUES  
YLW TAN; INDIVIDUAL GRAINS ARE TANSP  
TO OPAQUE; SUB ANGULAR TO SUB ROUND  
WITH LOW TO OCC MODERATE SPHERICITY;  
OVERALL MODERATELY SORTED; HARD TO  
FRIABLE; DOMINANTLY CONSOLIDATED;  
CLUSTERS ARE GRAIN SUPPORTED IN A CALC/  
CLAY CEMENT; SL TO MODERATE REACTION TO  
DILUTE HCL; SL TO NO INCREASE IN DITCH  
GAS; ACCESSORIES INCLUDE DARK LITHIC AND  
MAFIC FRAGMENTS LESS THAN 3%.

SHALE = YLW GRY, YLW TAN, GRY, GRY WITH  
PURPLE HUES, MOTTLED APPEARANCE; DENSE  
TO CRUNCHY TENACITY OCC SUB SECITILE  
WHEN HYDRATED; EARTHY TO SMOOTH OCC  
GRITTY TEXTURE WITH DULL EARTHY TO SL  
WAXY LUSTER; MASSIVE TO SUB TABULAR  
CUTTINGS HABIT WITH IRREGULAR TO HACKLY  
FRACTURE; BECOMES SILTY IN PLACES.

NOTE= VERY POOR QULITY SAMPLE.  
DOMINANTLY CAVINGS. HI VIS SWEEPS EVERY  
STAND.

SHALE = YLWISH GRY, YLWISH TAN WITH OCC



