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Anchorage, AK
(907) 561-2465

Drilling Dynamics MD

COMPANY	ExxonMobil Production
WELL	FRU 197-28A5
FIELD	PICEANCE CREEK
REGION	ROCKIES
COORDINATES	LAT: 39.9344449000 LON: 108.295900000
ELEVATION	GL = 6,082' KB = 6,109'
COUNTY, STATE	RIO BLANCO, CO
API INDEX	051031163300
SPUD DATE	08/05/2010
CONTRACTOR	HELMRICH AND PAYNE
CO. REP.	RICKY T. OWENS
RIG/TYPE	215 / FLEX 3
LOGGING UNIT	UNIT 051
GEOLOGISTS	GEORGE BAKER DEVIN CLAAR
ADD. PERSONS	BILL JOHANNING TRISH ORTIZ
CO. GEOLOGIST	MEL,ANIE BIGGS

LOG INTERVAL

DEPTHS: 149' **TO** 12,529'
DATES: 8/05/2010 **TO** 8/25/2010
SCALE: 1" =100'

CASING DATA

16" **AT** 120'
10.75" **AT** 3,566'
AT
AT

MUD TYPES

SPUD MUD **TO** 3,576'
BARO-TROL PLUS **TO** 12,529'
TO
TO

HOLE SIZE

14.75" **TO** 3,576'
8.75" **TO** 12,529'
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	

Lithology

<0 Ttl Gas 4K>
units
<0 CO2 10K>
ppm
<0 Flare Ht. 100>
ft

Depth

100

200

300

400

500

600

700

800

900

1000

<150 Avg RPM 0> <300 ROP 0> <400 MSE 0>
ft/hr
<30K Avg Torque 0> <50 Avg WOB 0>
FTLBS klbs

MGS

Remarks
Survey Data, Mud Reports, Other Info.

SPUD DATE 08/05/2010 @ 2:48 A.M.
BEGINING DEPTH OF 124.86'
NB #1 14.75" IN @ 106'
SEE EX 74M w/ 7-12's
56.5 HOUR TOTAL 3,470

RE-SCALE ROP 30-300

MAX GAS 91u
RE-SCALE GAS <0-500>

<0 Ttl Gas 500>
<0 CO2 20K>
<0 Flare Ht. 100>

<150 Avg RPM 0> <300 ROP 0> <400 MSE 0>
<30K Avg Torque 0> <50 Avg WOB 0>

MAX GAS 292u

MAX GAS 260u

MAX GAS 267u

MAX GAS 421u

MAX GAS 343u

MAX GAS 271u

MAX GAS 324u

CG 288u

MAX GAS 369u

MAX GAS 319u

CG 50u

MAX GAS 301u

<0 Ttl Gas 500>
<0 CO2 20K>
<0 Flare Ht. 100>

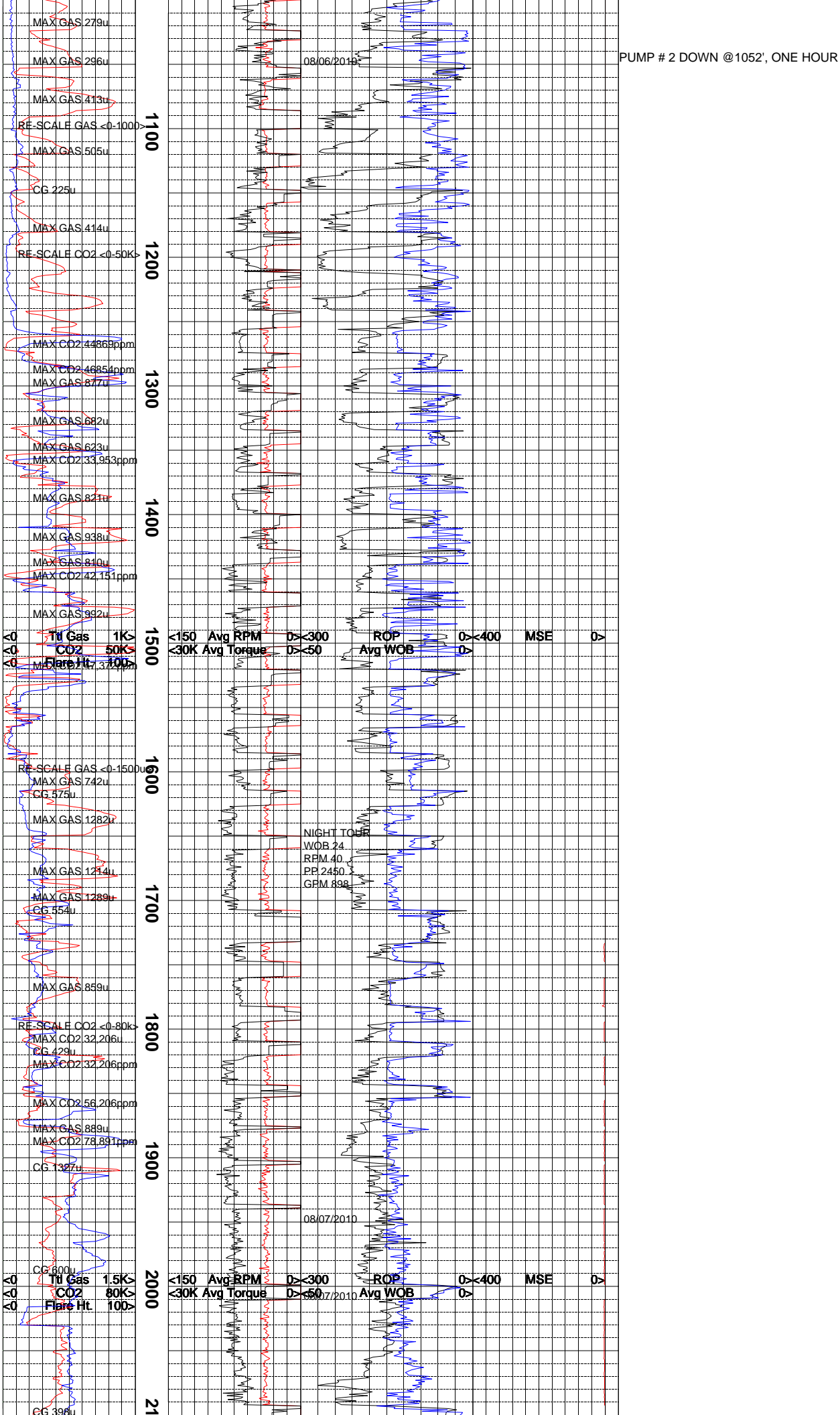
<150 Avg RPM 0> <300 ROP 0> <400 MSE 0>
<30K Avg Torque 0> <50 Avg WOB 0>

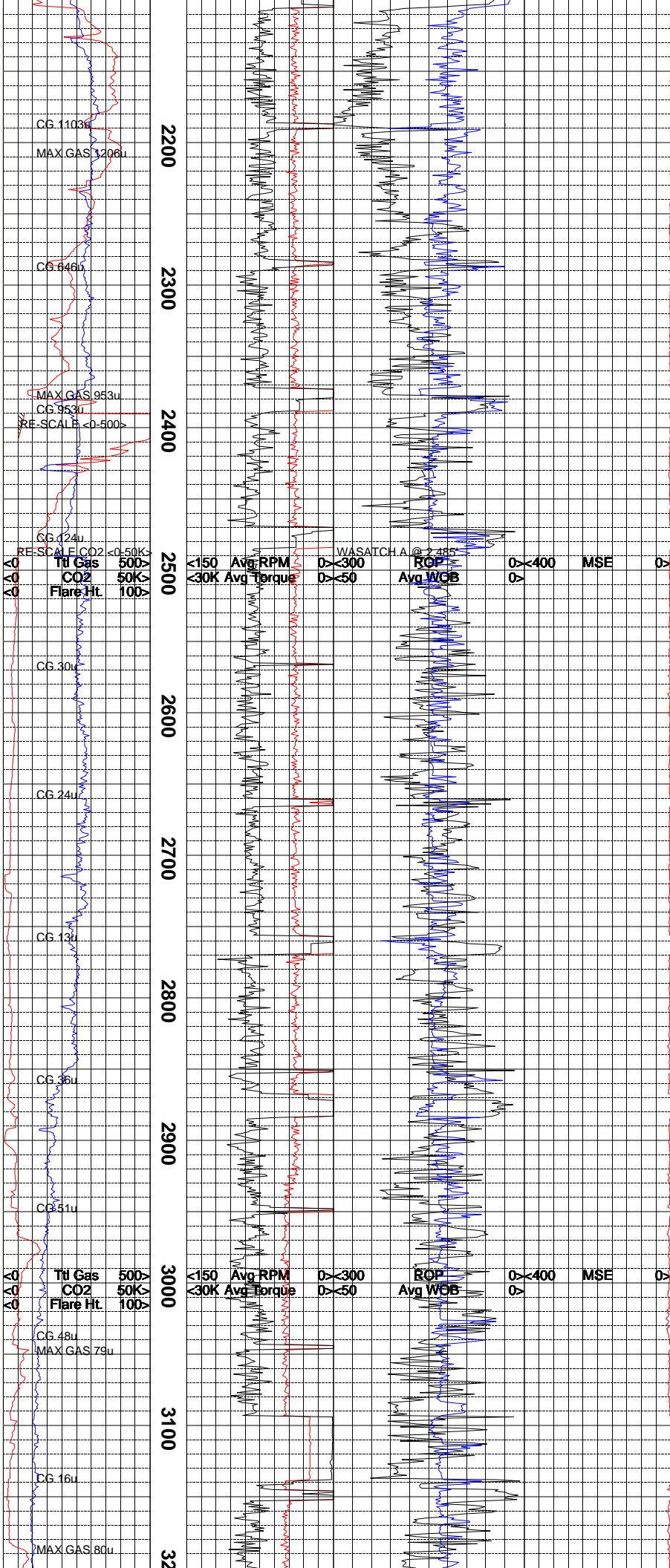
A-GROVE @ 623'

NIGHT TOUR

WOB 22
RPM 40
SP 2350
GPM 898
B-GROVE @ 848'

PUMPS DOWN @ 962' , 1 1/2 HOURS





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 EMPLOYMENT 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 LOG USING THE LITHOLOGY SYMBOL FOR METAMORPHICS. THE 10% DOES NOT REPRESENT 10% FRACTURE FILL IN SAMPLES. IT ONLY INDICATES THAT FRACTURE FILL HAS BEEN OBSERVED OVER THE INTERVAL.

SET 10.75" CASING AT 3,566'. DRILL TO 3,591' FOR FIT. RESUME DRILLING ON 08/11/2010.

SHALE = VARICOLORED; MOTTLED IN PART; DOM LIGHT GRAY TO MOTTLED GRAY YELLOW; SME BROWN TO DARK BROWN; SOFT TO MOD HARD; SLI TO MODERATELY CALCAREOUS; PLATY TO SLI NODULAR TO MASSIVE CTGS; VARIABLE AMOUNTS OF SILT; IRREGULAR FRACTURE; DULL EARTHY TO WAXY LUSTER; SMOOTH TO ROUGH TO SILTY TEXTURE; GRADING TO AND INTERBEDDED W/SILTSTONE. TRACE AMOUNTS OF WHITE, CRYSTALLINE NACHOLITE.

SANDSTONE = REDDISH BROWN TO LIGHT GREENISH GRAY SPECIMENS; REDDISH BROWN SPECIMENS ARE UPPER MEDIUM TO FINE GRD; GREENISH GRAY SPECIMENS ARE FINE TO VERY FINE GRAINED; ANGULAR TO SUBANGULAR; GRAIN TO MATRIX SUPPORTED; CALCAREOUS CEMENT; TRACE CHERT AND LITHIC FRAGMENTS IN REDDISH BROWN SPECIMENS; NO GAS INCREASES OVER INTERVALS.

SANDSTONE= ABUNDANT LOOSE GRAINS; LOWER MEDIUM TO FINE GRAINED; MOD SORTED; ANGULAR TO SUBANGULAR; DOM CALCAREOUS CEMENT WITH SOME SILICEOUS WHITE CLAY FILL; CLEAN W/MINOR BLACK UNIDENTIFIED GRAINS; ASSOCIATED WITH 500+ GAS SHOW.

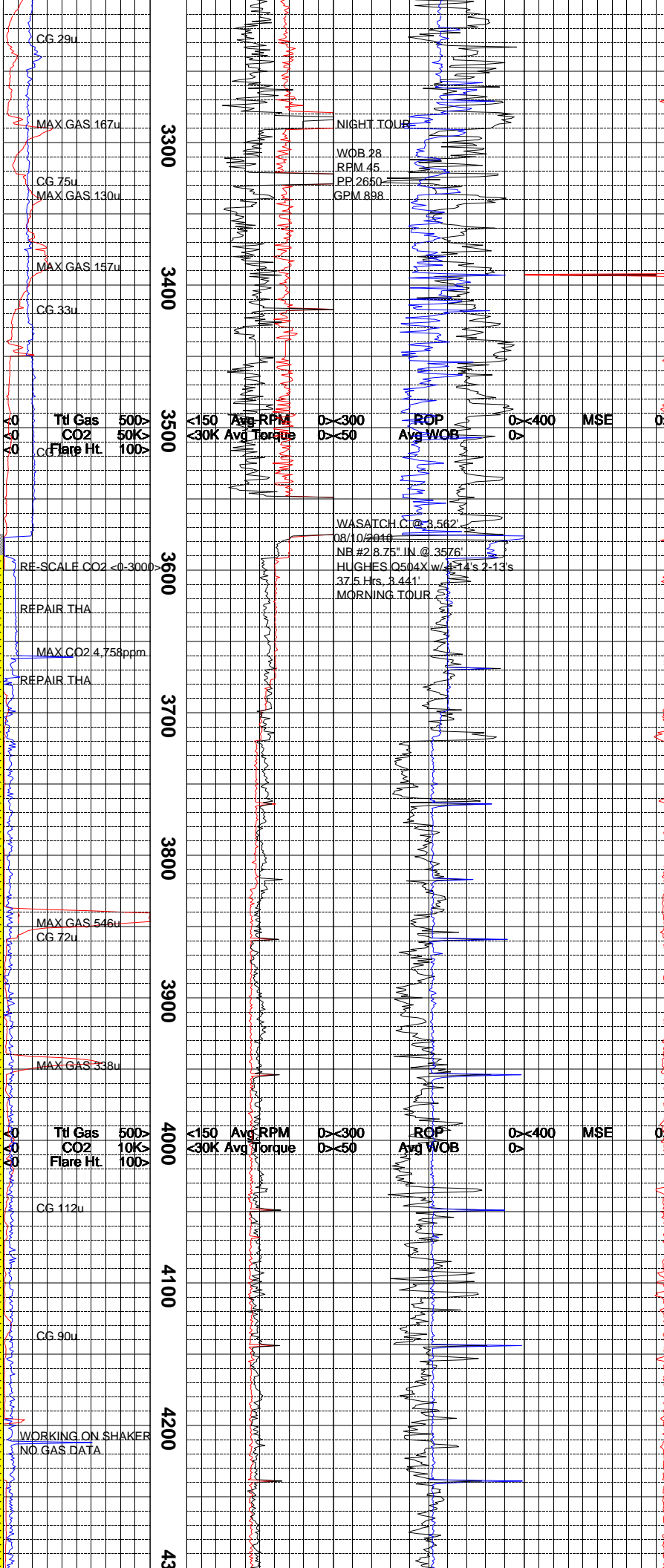
SHALE = MOTTLED IN PART; DOM YELLOW TO MOTTLED YELLOW GRAY; FIRM TO SLI HARD; PLATY TO FLAKY CUTTINGS; IRREGULAR TO PLANAR FRACTURE; DULL EARTHY TO SLI WAXY LUSTER; SMOOTH TO SILTY TEXTURE; SILTY IN PART; SME ISOLATED QUARTZ GRS; CALCAREOUS; NO VISIBLE STRUCTURE.

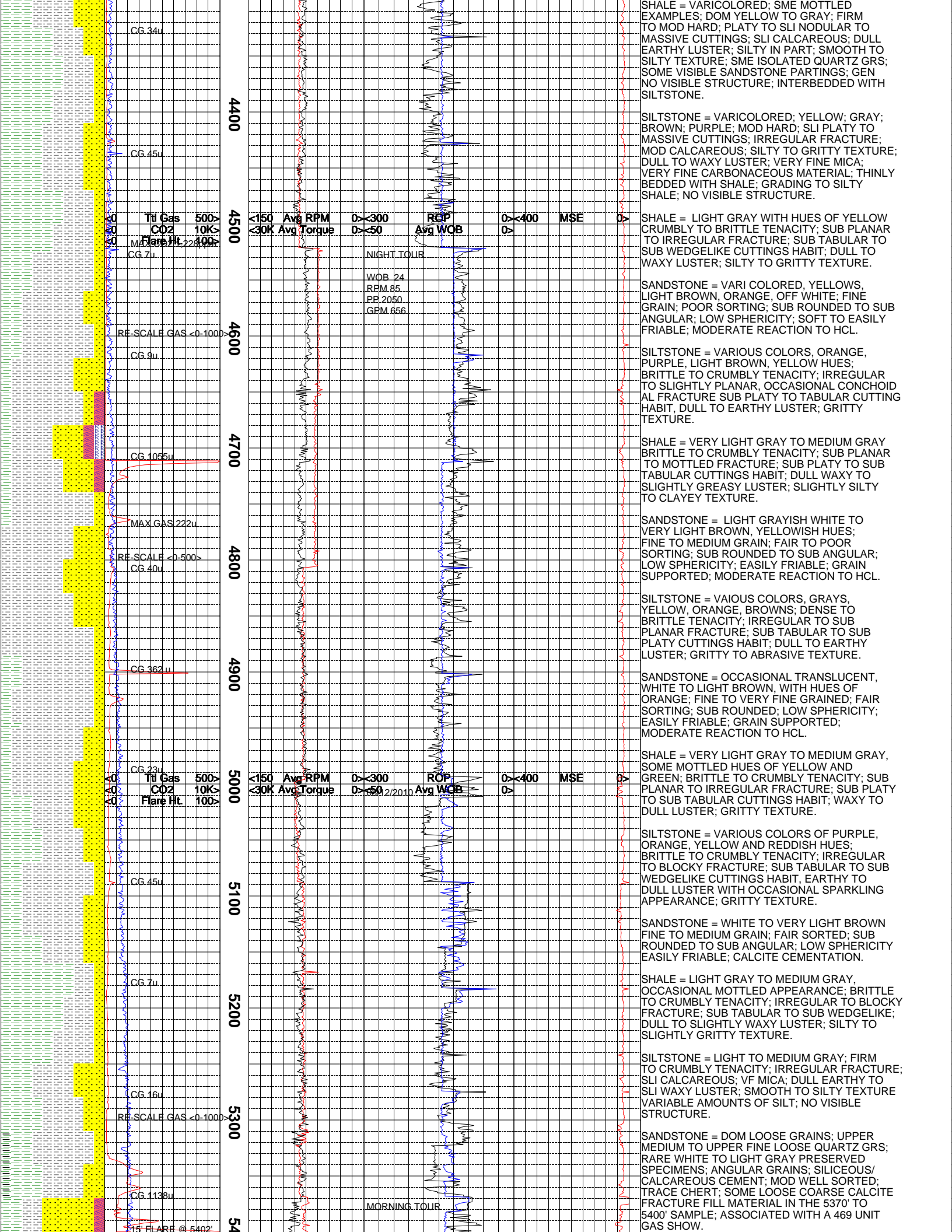
SILTSTONE = VARICOLORED; MOTTLED IN PART LT GRAY; PURPLE; LT BROWN; SL PLATY CTGS IRREGULAR FRACTURE; MOD TO VERY CALC; SME VERY FINE MICA AND CARBONACEOUS MAT; SILTY TO GRITTY TEXTURE; DULL TO WAXY LUSTER; GRADING TO VERY FINE GRAINED SANDSTONE.

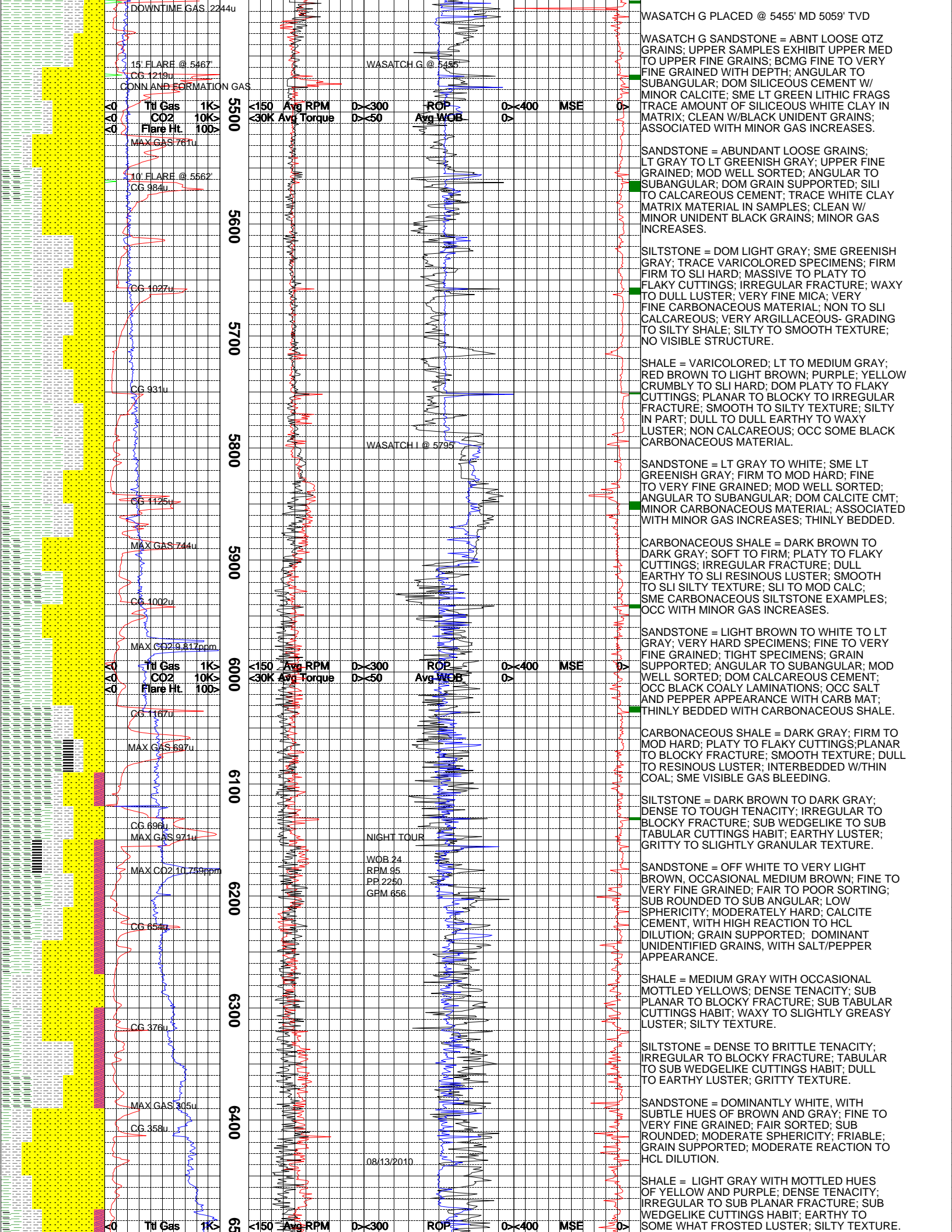
SHALE = VARICOLORED; LT TO MEDIUM BROWN; GRAY TO YELLOW GRAY; SLI PLATY TO FLAKY CUTTINGS; NON TO SLI CALCAREOUS; PLANAR TO IRREGULAR FRACTURE; DULL EARTHY TO WAXY LUSTER; ROUGH TO SILTY TEXTURE; VARIABLE AMOUNTS OF SILT; LT TO MED BRN SPECIMENS CONTAINS ABUNDANT CARBONACEOUS MATERIAL; VF MICA.

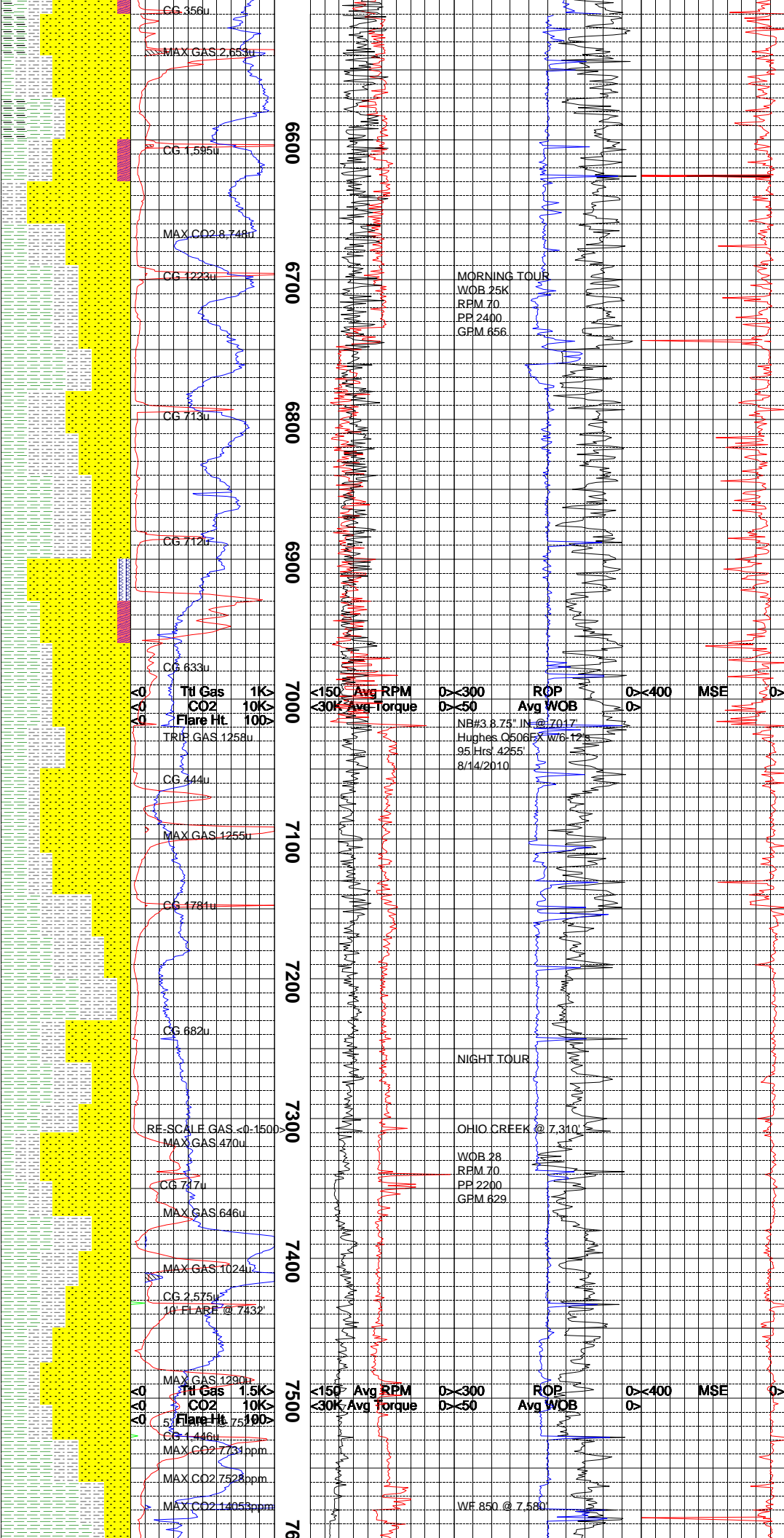
SANDSTONE = OFF WHITE; LIGHT GRAY; LOWER MEDIUM TO UPPER FINE GRAINED; WELL SRTEd ANGULAR TO SUBANGULAR; MOD AMOUNT OF LOOSE GRAINS; DOM CALCITE CEMENT; SME RED GRAINS IN MATRIX; GRAIN SUPPORTED; QUICK REACTION TO DILUTE HCL; LOW TO MOD SPHERICITY; TRACE BLACK GRAINS; THINLY BEDDED.

SHALE = VARICOLORED; YELLOW; LT TO MED GRAY; YELLOW GRAY; MOTTLED IN PART; SLI PLATY TO SLI NODULAR; BCMG MOD SILTY IRREGULAR FRACTURE; SLI TO MOD CALC; VF MICA; OCC CARBONACEOUS MATERIAL; DULL EARTHY LUSTER; ROUGH TO SILTY TEXTURE; SOME SANDY TO SILTY SPECIMENS; TRACE LOOSE PYRITE; NO VISIBLE STRUCTURE.









CARBONACEOUS SHALE = DARK BROWN TO VERY DARK BROWN; DENSE TENACITY; BLOCKY TO PLANAR FRACTURE; SCALY TO NODULAR CUTTINGS HABIT; EARTHY LUSTER; GRITTY TO ROUGH TEXTURE; SME CARBONACEOUS MATERIAL.

SANDSTONE = OFFWHITE TO LIGHT GRAY; HARD PRESERVED SPECIMENS; FINE TO VERY FINE GRAINED; ANGULAR TO SUBROUNDED; MOD WELL SORTED; LOW TO MOD SPHERICITY; DOM CALCITE CEMENT WITH FAST REACTION TO DILUTE HCL; POOR VISIBLE POROSITY; MOD CLEAN WITH TRACE AMOUNTS OF UNIDENT BLACK GRAINS; THINLY BEDDED WITH SHALE.

SHALE = DOM LIGHT TO MEDIUM GRAY; SME REDBROWN SPECIMENS; SOFT TO SLI HARD; PLATY TO FLAKY CUTTINGS; PLANAR TO BLKY TO IRREGULAR FRACTURE; MODERATELY CALC; VF MICA; OCC W/SME CARBONACEOUS MATERIAL NO VISIBLE STRUCTURE.

SANDSTONE = LIGHT BROWN TO WHITE; FLAKY CUTTINGS; FINE TO VERY FINE GRAINED; ANG TO SUBANGULAR; DOM CALCITE CEMENT; GRAIN SUPPORTED; TRACE VERY HARD SILICEOUS SPECIMENS; OCC SME ARGILLACEOUS PARTINGS TIGHT POROSITY; OCC SPECKLED WITH CARB MATERIAL; THINLY BEDDED WITH SHALE.

SILTSTONE = LT TO MEDIUM GRAY; MOTTLED REDDISH GRAY EXAMPLES; HARD; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; SILTY TEXTURE; SLI SPARKLING LUSTER; VERY CALCAREOUS; OCC SPECKLED WITH CARB MATERIAL; TRACE PYRITE.

SANDSTONE = ABUNDANT LOOSE GRAINS; WHITE TO SALT AND PEPPER APPEARANCE; LOWER MEDIUM TO FINE GRAINED; ANGULAR TO SUBANGULAR; SILICEOUS CEMENT W/MINOR LOOSE WHITE KAOLIN CLAY MATRIX MATERIAL IN SAMPLES; TRACE MICA; RED TO GREEN GRS IN MATRIX; COARSE CALCITE ADHERING TO GRAIN CLUSTERS- FRACTURE FILL MATERIAL IN THE 6930'-6960' SAMPLES; ASSOCIATED W MINOR GAS INCREASES.

TRIP OUT AT 7017' TO CHANGE OUT BHA

SANDSTONE = ABUNDANT CLEAR TO TRANSP GRAINS; WH TO LT GRAY; SALT AND PEPPER APPEARANCE; DOM LOWER MEDIUM GRAINED; MOD HARD PRESERVED SPECIMENS; GRAIN SUPPORTED; SILICEOUS CEMENT W/MINOR CALCITE FILL; SME WHITE CLAY SILICEOUS FILL; BROWN MICA; SME SHALE PARTINGS; TRACE CHERT; LITHIC FRAGMENTS; DOM ANGULAR GRAINS; ASSOCIATED WITH MINOR GAS SHOWS.

SHALE = LT GRAY TO LT GREENISH GRAY; SME LT BROWN; SOME MOTTLED PURPLE TO BROWN; SOFT TO CRUNCHY; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; NON CALCAREOUS; DULL EARTHY TO WAXY LUSTER; SMOOTH TO SLI SILTY TEXTURE; VF MICA; SME SCATTERED CARBONACEOUS MATERIAL; DECREASE SILT CONTENT WITH DEPTH; NO VISIBLE STRUCTURE.

SANDSTONE = WHITE; FINE TO MEDIUM GRAIN; FAIR SORTED; SUB ROUNDED TO SUB ANGULAR; LOW SPHERICITY; FIRM TO FRI; GRAIN SUPPORTED; MODERATE TO LOW REACTION TO HCL DILUTION; UNIDENTIFIED DARK INCLUSIONS, SALT AND PEPPER APPEARANCE; INCREASE IN ROP AND GAS

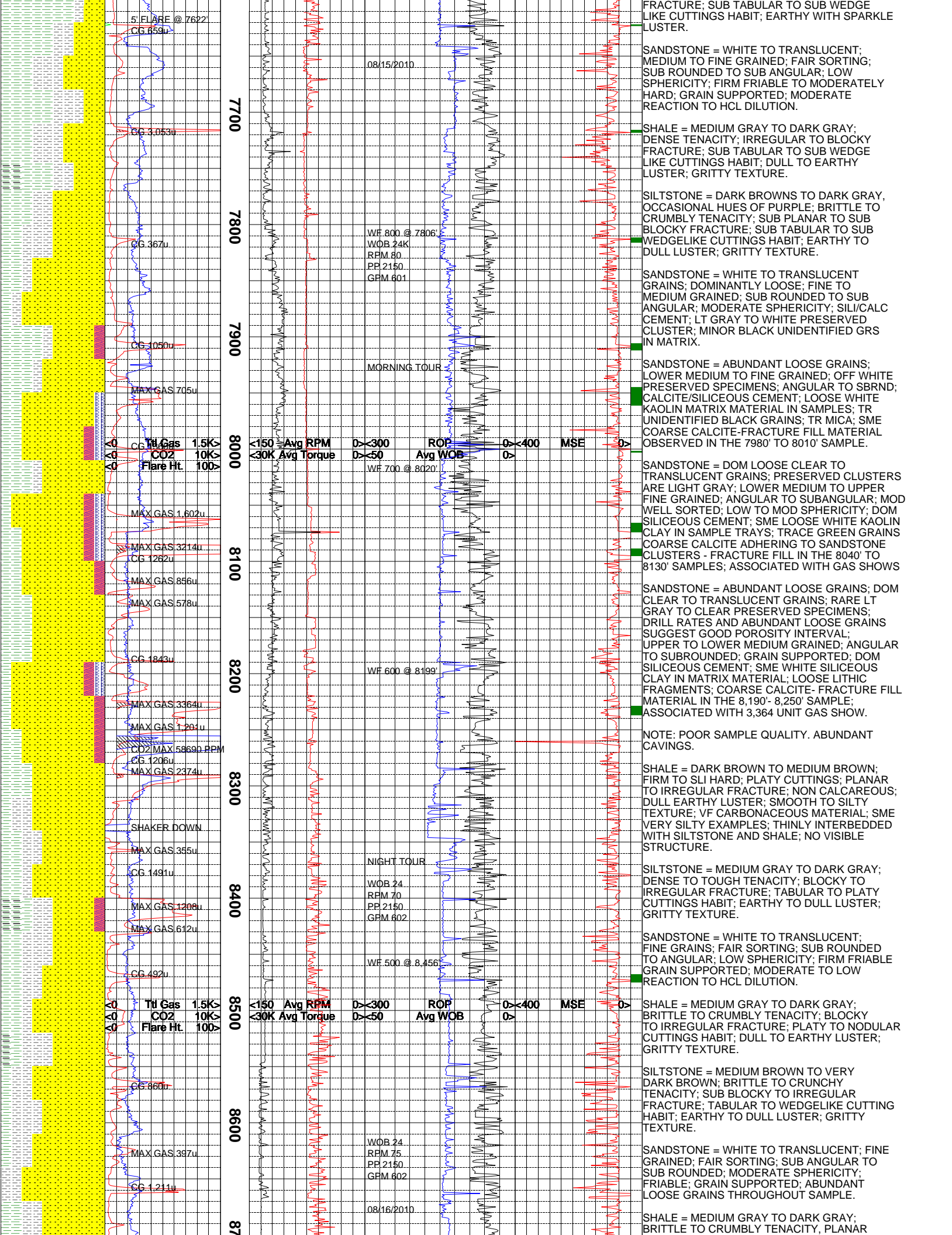
SHALE = MEDIUM GRAY TO DARK GRAY; BRITTLE TO CRUMBLY TENACITY; BLOCKY TO PLANAR FRACTURE; SUB TABULAR TO ELONGATED CUTTINGS HABIT; WAXY TO GREASY LUSTER; CLAYEY TO SILTY TEXTURE.

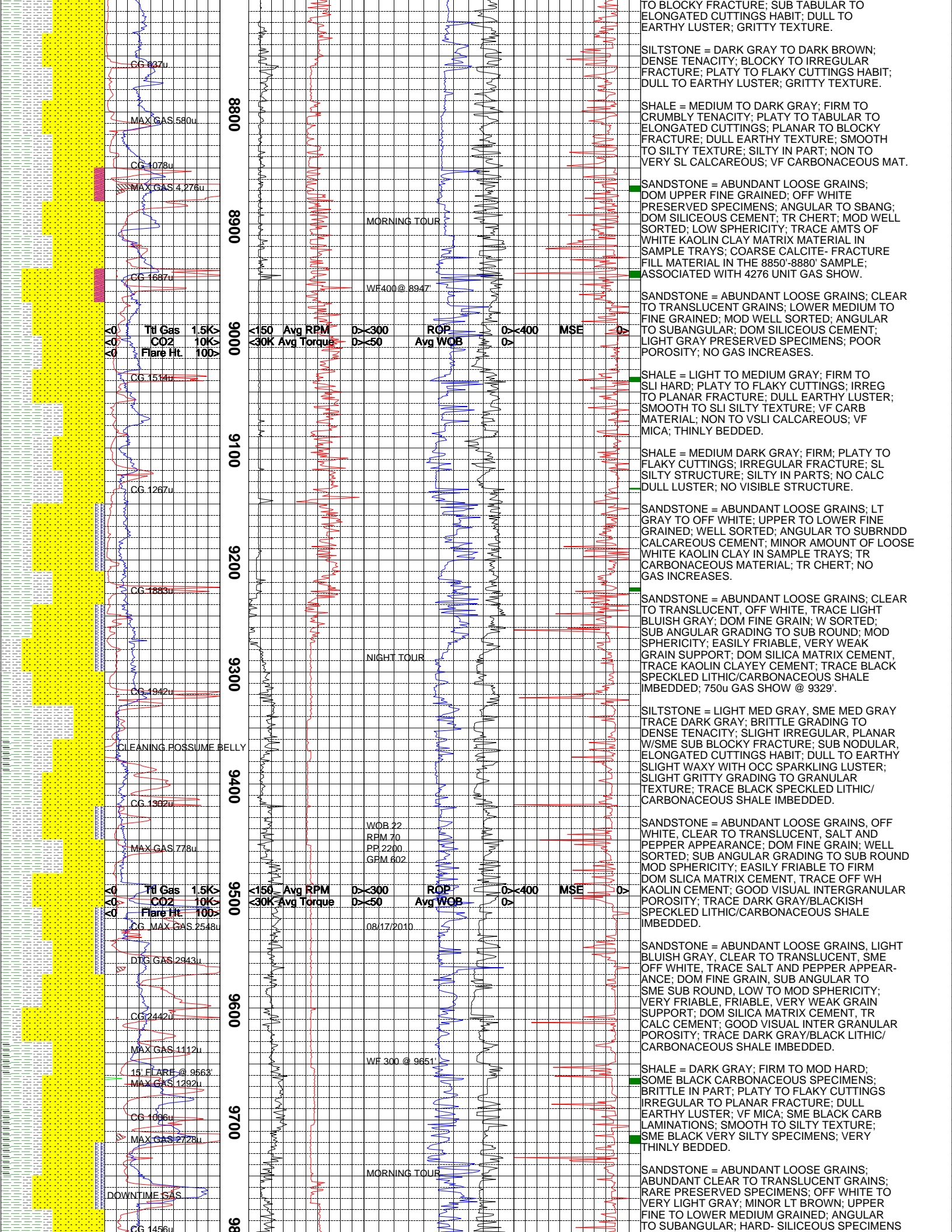
SILTSTONE = MEDIUM GRAY TO DARK GRAY; DENSE TENACITY; BLOCKY TO IRREGULAR FRACTURE; PLATY TO TABULAR CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SANDSTONE = DOMINANTLY WHITE, OCCASIONAL DARK BROWN; FINE TO MEDIUM GRAINED; FAIR SORTED; SUB ROUNDED TO SUB ANGULAR; LOW SPHERICITY; GRAIN SUPPORTED; LOW REACTION TO DILUTE HCL; UNIDENTIFIED BLACK INCLUSIONS THROUGH OUT.

SHALE = MEDIUM GRAY TO DARK GRAY; DENSE TO TOUGH TENACITY; BLOCKY TO IRREGULAR FRACTURE; SUB PLATY TO ELONGATED CUTTINGS HABIT; WAXY TO DULL LUSTER; SILTY TO GRITTY TEXTURE.

SILTSTONE = MEDIUM BROWN WITH OCCASIONAL REDDISH HUES; BRITTLE TO CRUMBLY TENACITY; PLANAR TO BLOCKY





TO BLOCKY FRACTURE; SUB TABULAR TO ELONGATED CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SILTSTONE = DARK GRAY TO DARK BROWN; DENSE TENACITY; BLOCKY TO IRREGULAR FRACTURE; PLATY TO FLAKY CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SHALE = MEDIUM TO DARK GRAY; FIRM TO CRUMBLY TENACITY; PLATY TO TABULAR TO ELONGATED CUTTINGS; PLANAR TO BLOCKY FRACTURE; DULL EARTHY TEXTURE; SMOOTH TO SILTY TEXTURE; SILTY IN PART; NON TO VERY SL CALCREOUS; VF CARBONACEOUS MAT.

SANDSTONE = ABUNDANT LOOSE GRAINS; DOM UPPER FINE GRAINED; OFF WHITE PRESERVED SPECIMENS; ANGULAR TO SBANG; DOM SILICEOUS CEMENT; TR CHERT; MOD WELL SORTED; LOW SPHERICITY; TRACE AMTS OF WHITE KAOLIN CLAY MATRIX MATERIAL IN SAMPLE TRAYS; COARSE CALCITE- FRACTURE FILL MATERIAL IN THE 8850'-8880' SAMPLE; ASSOCIATED WITH 4276 UNIT GAS SHOW.

SANDSTONE = ABUNDANT LOOSE GRAINS; CLEAR TO TRANSLUCENT GRAINS; LOWER MEDIUM TO FINE GRAINED; MOD WELL SORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT; LIGHT GRAY PRESERVED SPECIMENS; POOR POROSITY; NO GAS INCREASES.

SHALE = LIGHT TO MEDIUM GRAY; FIRM TO SLI HARD; PLATY TO FLAKY CUTTINGS; IRREG TO PLANAR FRACTURE; DULL EARTHY LUSTER; SMOOTH TO SLI SILTY TEXTURE; VF CARB MATERIAL; NON TO VSLI CALCREOUS; VF MICA; THINLY BEDDED.

SHALE = MEDIUM DARK GRAY; FIRM; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; SL SILTY STRUCTURE; SILTY IN PARTS; NO CALC DULL LUSTER; NO VISIBLE STRUCTURE.

SANDSTONE = ABUNDANT LOOSE GRAINS; LT GRAY TO OFF WHITE; UPPER TO LOWER FINE GRAINED; WELL SORTED; ANGULAR TO SUBRNDD CALCREOUS CEMENT; MINOR AMOUNT OF LOOSE WHITE KAOLIN CLAY IN SAMPLE TRAYS; TR CARBONACEOUS MATERIAL; TR CHERT; NO GAS INCREASES.

SANDSTONE = ABUNDANT LOOSE GRAINS; CLEAR TO TRANSLUCENT, OFF WHITE, TRACE LIGHT BLUISH GRAY; DOM FINE GRAIN; W SORTED; SUB ANGULAR GRADING TO SUB ROUND; MOD SPHERICITY; EASILY FRIABLE, VERY WEAK GRAIN SUPPORT; DOM SILICA MATRIX CEMENT, TRACE KAOLIN CLAYEY CEMENT; TRACE BLACK SPECKLED LITHIC/CARBONACEOUS SHALE IMBEDDED; 750u GAS SHOW @ 9329'.

SILTSTONE = LIGHT MED GRAY, SME MED GRAY TRACE DARK GRAY; BRITTLE GRADING TO DENSE TENACITY; SLIGHT IRREGULAR, PLANAR W/SME SUB BLOCKY FRACTURE; SUB NODULAR, ELONGATED CUTTINGS HABIT; DULL TO EARTHY SLIGHT WAXY WITH OCC SPARKLING LUSTER; SLIGHT GRITTY GRADING TO GRANULAR TEXTURE; TRACE BLACK SPECKLED LITHIC/ CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS, OFF WHITE, CLEAR TO TRANSLUCENT, SALT AND PEPPER APPEARANCE; DOM FINE GRAIN; WELL SORTED; SUB ANGULAR GRADING TO SUB ROUND MOD SPHERICITY; EASILY FRIABLE TO FIRM DOM SILICA MATRIX CEMENT, TRACE OFF WH KAOLIN CEMENT; GOOD VISUAL INTERGRANULAR POROSITY; TRACE DARK GRAY/BLACKISH SPECKLED LITHIC/CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS, LIGHT BLUISH GRAY, CLEAR TO TRANSLUCENT, SME OFF WHITE, TRACE SALT AND PEPPER APPEAR- ANCE; DOM FINE GRAIN, SUB ANGULAR TO SME SUB ROUND, LOW TO MOD SPHERICITY; VERY FRIABLE, FRIABLE, VERY WEAK GRAIN SUPPORT; DOM SILICA MATRIX CEMENT, TR CALC CEMENT; GOOD VISUAL INTER GRANULAR POROSITY; TRACE DARK GRAY/BLACK LITHIC/ CARBONACEOUS SHALE IMBEDDED.

SHALE = DARK GRAY; FIRM TO MOD HARD; SOME BLACK CARBONACEOUS SPECIMENS; BRITTLE IN PART; PLATY TO FLAKY CUTTINGS IRREGULAR TO PLANAR FRACTURE; DULL EARTHY LUSTER; VF MICA; SME BLACK CARB LAMINATIONS; SMOOTH TO SILTY TEXTURE; SME BLACK VERY SILTY SPECIMENS; VERY THINLY BEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS; ABUNDANT CLEAR TO TRANSLUCENT GRAINS; RARE PRESERVED SPECIMENS; OFF WHITE TO VERY LIGHT GRAY; MINOR LT BROWN; UPPER FINE TO LOWER MEDIUM GRAINED; ANGULAR TO SUBANGULAR; HARD- SILICEOUS SPECIMENS

MOD W SORTED; MINOR AMTS OF LOOSE WHITE KAOLIN CLAY IN SAMPLE TRAYS.

CARBONACEOUS SHALE = DARK GRAY; FIRM TO SLI HARD; PLATY TO WEDGE LIKE TO MASSIVE CUTTINGS; IRREGULAR FRACTURE; DULL EARTHY TO SLI RESINOUS LUSTER; ROUGH TEXTURE; NON CALCAREOUS; TRACE AMOUNTS OF VITREOUS COAL IN SAMPLE TRAYS; SOME COARSE CARBONACEOUS FRAGMENTS IN MATRIX; TRACE PYRITE.

SANDSTONE = WHITE; LT BROWN TO DARK BROWN; MOD HARD; DOM FINE GRAINED; ANGULAR TO SUBANGULAR; MOD REACTION WITH DILUTE HCL; DOM CALCITE CEMENT; TR AMOUNTS OF WHITE KAOLIN CLAY IN SAMPLE TRAYS; DOM GRAIN SUPPORTED; SME V CARB EXAMPLES; INDIVIDUAL CARB CLUSTER TO THIN CARBONACEOUS/COALY LAMINATIONS; TRACE AMTS OF COARSE CALCITE IN THE 9930 TO 9960' SAMPLE; INTERBEDDED WITH CARB SHALE; ASSOCIATED WITH GAS INCREASES.

CARBONACEOUS SHALE = BLACK TO DARK BRN; FIRM; PLATY TO FLAKY CUTTING; PLANAR TO BLOCKY FRACTURE; SOME COALY BRITTLE SPECIMENS; DULL TO RESINOUS LUSTER; W/ RESINOUS TO VITREOUS COAL SPECIMENS.

SHALE = LT GRY, MOD LT GRY, TR DARK GRY; DENSE TO TOUGH IN PART TENACITY; EARTHY, HACKLY IN PART, PLANAR TO SLI IRREGULAR FRACTURE; WEDGE LIKE TO ELONGATED, TR PLATY CUTTINGS HABIT; DULL, EARTHY, SUB WAXY TR VITREOUS LUSTER; MODERATE SMOOTH, GRADING TO SILTY, SME GRITTY TEXTURE; TRACE VF BLACK CARBONACEOUS SHALE/COALY SPECKLED IMBEDDED, NO NOTED DEGASSING IS SAMPLE TRAY.

CARBONACEOUS SHALE = V DARK BROWNISH BLACK, DARK OLIVE BLACK TO BROWNISH GRY; DOM CRUNCHY, SME CRUMBLY TO TOUGH TENACITY; EARTHY TO HACKLY, SUB BLOCKY SLI IRREGULAR FRACTURE; SUB MASSIVE, ELONGATED, WEDGE LIKE IN PART CUTTINGS HABIT; DULL, EARTHY IN PART, SME SPARKIN TO TR VITREOUS LUSTER; SMOOTH/SILKY GRADING TO SLI GRITTY/GRANULAR TEXTURE; TRACE AMOUNTS OF SPECKLED COALY/CARB IN SAMPLE TRAY; VERY SMALL AMOUNTS OF DEGASSING IN SAMPLE TRAY (FROM TRACE AMOUNTS OF COAL).

NOTE: SHUT WELL IN AT 10327'

NOTE: SHUT WELL IN AT 10412'

SANDSTONE = DOM LOOSE GRAINS; PRESERVED SPECIMENS ARE WHITE TO LT BROWN; LOWER MEDIUM TO UPPER FINE GRAINED; GRAIN SUPPORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT; TR CALCITE; LOW SPHER; TR WHITE KAOLIN CLAY IN SAMPLE TRAYS; COARSE CALCITE IN SAMPLE TRAYS FROM 10350'-10440'-FRACTURE FILL; ASSOCIATED WITH HIGH GAS SHOWS.

CARBONACEOUS SHALE = DARK BROWN TO DARK GRAY; CRUMBLY TENACITY; IRREGULAR FRACTURE; PLATY TO MASSIVE CUTTINGS; DULL TO RESINOUS LUSTER; ROUGH TO SILTY TEXTURE; ABUNDANT CARBONACEOUS MAT; COAL LAMINATIONS; NON CALCAREOUS; OCC VERY SILTY- GRADING TO CARBONACEOUS SILTSTONE; OCC THIN SAND ADHERING TO SHALE SPECIMENS; BEDDED WITH THIN SS; MINOR GAS INCREASES.

SANDSTONE = WHITE TO LIGHT GRAY; MEDIUM TO FINE GRAINED; ANGULAR TO SUB-ANGULAR WELL SORTED; MOD TO LOW SPHERICITY; CALC CEMENT; MOD REACTION TO HCL; SMALL CLUSTER EXHIBITS WEAK GRAIN SUPPORT; THINLY BEDDED IN CARBONACEOUS SHALE AND SILTSTONE.

CARBONACEOUS SHALE = DARK GRAY TO BLACK; HARD TO CRUMBLY; IRREGULAR FRACTURE; PLATY TO MASSIVE CUTTINGS; DULL EARTHY TO RESINOUS LUSTER; COALY IN PART; ROUGH TO SILTY TO GRITTY TEXTURE; SILTY AND SANDY EXAMPLES; NON CALCAREOUS; TRACE PYRITE; TRACE AMOUNT OF LOOSE COAL IN SAMPLE TRAYS.

CARBONACEOUS SHALE = BLACK TO DARK GRAY; MOD HARD; PLATY CUTTINGS; PLANAR TO IRREGULAR FRACTURE; DULL EARTHY TO RESINOUS LUSTER; ROUGH TEXTURE; SME SILTY EXAMPLES; INTERBEDDED WITH THIN COAL; NON CALCAREOUS.

SANDSTONE = ABUNDANT LOOSE GRAINS; DOM UPPER FINE GRAINED; WELL SORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT W/ MINOR CALCITE AND KAOLIN CLAY FILL; LOW SPHERICITY; COAL/CARBONACEOUS LAMINATION OCC VERY COALY; TR AMTS OF WHITE KAOLIN

