



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Falcon Seaboard 11-90-12 #3

**Location** 1,847' FSL, 1,848' FWL, SEC. 12, T11S, R90W

**State** COLORADO

**County** GUNNISON

**Country** USA

**Rig Number** AZTEC 777

**API Number** 05-051-06045

**AFE #** 59050001

**Spud Date**  
6/27/2015

**Field** BULL MOUNTAIN - #7819

**Drilling Completed** 7/24/2015

**Surface Coordinates** LAT: 39.11241°N  
LONG: 107.39938° W NAD 83

**Ground Elevation** 7,531'

**K.B. Elevation** 7,549'

**Logged Interval** 577 To 9360

**Total Depth** 9360'

**Formation** S CANYON GROUP, CAMEO COALS, ROLLINS, COZZETTE, CORCORAN, DAKOTA, MANCOS

**Type of Drilling Fluid** GEL / POLYMER

## Other Symbols

### Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

### Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- X INTERCRYSTALLINE
- Q INTEROOLITIC
- M MOLDIC

ORGANIC

P PINPOINT

V VUGGY

### Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

NORMAL FAULT

OIL SHOW

OVERTURNED STRATA

REVERSE FAULT

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE

SURVEY

TRIP GAS

WIRELINE TESTED - LEFT

WIRELINE TESTED - RT

MN DEPTH

### Rounding

ANGULAR

ROUNDED

SUBANG

SUBRND

### Textures

BOUNDSTONE

CHALKY

CRYPTOXLN

E EARTHY

F FINELYXLN

GRAINSTONE

L LITHOGRAPHIC

MICROXLN

MUDSTONE

PACKSTONE

WACKESTONE

### Sorting

MODERATE

POOR

W WELL













### Smectitie

## Zone Color Coding

- Oil
- Condensate
- Gas
- Note
- Core
- Pressure
- Error
- Water
- Seal

## Accessories

## Fossils

 ALGAE  
 AMPHIPORA  
 BELEMNITE  
 BIOCLASTIC  
 BRACHIOPOD  
 BRYOZOA  
 CEPHALOPOD  
 CORAL  
 CRINOID  
 ECHINOID  
 FISH  
 FORAMINIFERA

## F FOSSIL













 GASTROPOD  
 OOLITE  
 OSTRACOD  
 PELECYPOD  
 PELLET  
 PISOLITE  
 PLANT REMAINS  
 PLANT SPORES  
 SCAPHOPOD  
 STROMATOPOROID

## Minerals

 ANHYDRITIC













 ARGILLACEOUS

 ARGILLITE GRAIN

 BENTONITE  
 BITUMENOUS SUBSTANCE  
 BRECCIA FRAGMENTS  
 CALCAREOUS  
 CARBONACEOUS FLAKES  
 CHTDK  
 CHTLT  
 COAL - THIN BEDS  
 DOLOMITIC  
 FELDSPAR  
 FERRUGINOUS PELLET  
 FERRUGINOUS

 GLAUCONITE



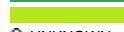





 GYPSIFEROUS

 HEAVY MINERAL  
 KAOLIN  
 MARLSTONE  
 MINERAL CRYSTALS  
 NODULES  
 PHOSPHATE PELLETS  
 PYRITE  
 SALT CAST  
 SANDY  
 SILICEOUS  
 SILTY  
 TUFFACEOUS









## Stringer

 ANHYDRITE STRINGER  
 BENTONITE STRINGER  
 COAL STRINGER  
 DOLOMITE STRINGER  
 GYPSUM STRINGER  
 LIMESTONE STRINGER  
 MARLSTONE (CALC) STRG  
 MARLSTONE (DOL) STRG  
 SANDSTONE STRINGER  
 SHALE STRINGER  
 SILTSTONE STRINGER

## Rock Types

 QUARTZ  
 CALCITE  
 Illite  
 Smectite  
 UNKNOWN  
 ANHYDRITE  
 GYPSUM  
 SALT

 SIDERITE or LIMONITE  
 ARG LIMESTONE  
 LIMESTONE  
 DOLOMITE  
 CHERT  
 COAL  
 MARLSTONE  
 CLAYSTONE

 SHALE  
 SHALE GRAY  
 RED SHALE  
 BROWN SHALE  
 SHALE COLORED  
 SILTSTONE  
 ARG SILTSTONE  
 SANDSTONE

 ARG SANDSTONE  
 CONGLOMERATE  
 BRECCIA  
 TILL  
 BENTONITE

## Operator

**Company** SG INTERESTS

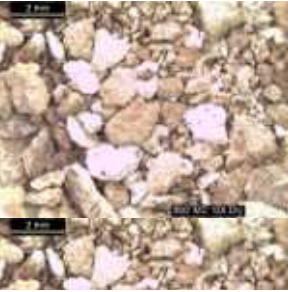
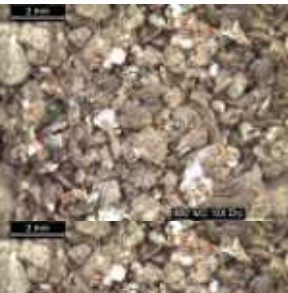

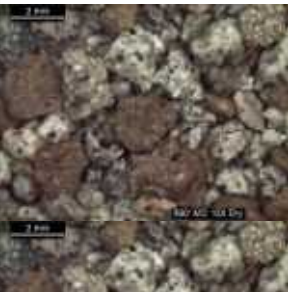
**Address** 100 Waugh Drive # 400  
Houston, TX 77007  
Phone: (713) 951-0100

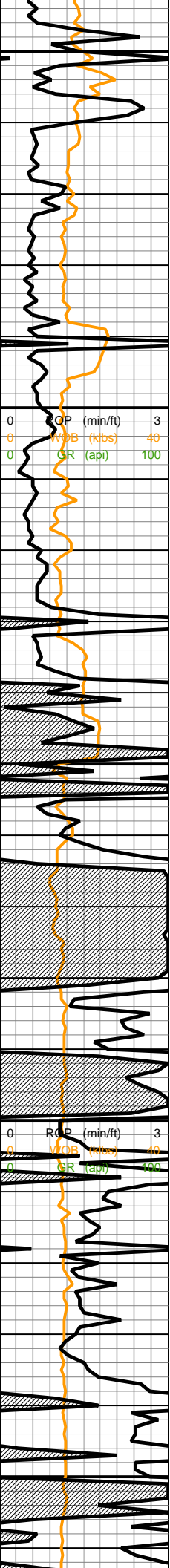
## Geologist

**Name** MIKE NEVILLE, TREVOR BURRELL

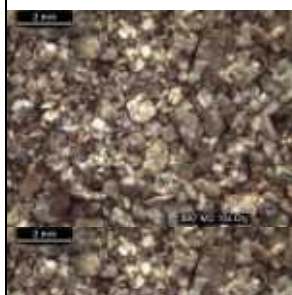
**Company** FIELD GEO SERVICES, INC.

**Address** 533 Bogart Lane, Unit A  
Grand Junction, CO 81505  
(970) 424-5162 Office

Drilling Curves			Slide	Depth (ft)	Images	Well Notes	Formation	Total Gas		% Lith	Lithology Descriptions
ROP	WOB	GR						C1	C2		
0 100											
0 100				560		FGS loggers on location on 6/26/2015 for Rig Up. Using MSI Redbox Gas dection. Began drilling Intermediate section @ 15:00 hrs on 6/27/15 from 577'.					
0 100				570							
0 100				580		Bit #: 2 Size: 12 1/4 " Manufacture: REED Serial #: A170716 Type: DSH616D-J1 Depth In: 577 ' MD					577 - 600: SS: modRdOr - Wh, w cons, v/fn to fn grn, subang to rnd, w to mody srted, sil cmt, imbd MICA, tt po fnt brlGn min flor, fnt drkYl o flor, strmg cut.
0 100				590		577' - Pump #2					
0 100				600		WOB: 12.4 klb PP: 1170 psi SPM: #2 126 ROP: 91.7ft/hr					600 - 630: SS: vltGy - occ modRdOr, mod cons, v/fn to med grn, subang to rnd, p srted, sil cmt, imbd MICA, free MICA, no stn, fnt brlGn min flor.
0 100				610							
0 100				620		Lag Depth: 620 Min.: 8.5' Strokes.: 783					
0 100				630							630 - 660: SS: ltGy - tr Wh, mod cons, med to v/fn grn, a to subang, p srted, sil cmt, imbd MICA & FLD, no stn.
0 100				640							
0 100				650							
0 100				660							660 - 690: SS: vltGy - Wh, w cons, v/fn to med grn, subang, mody srted, sil cmt, imbd MICA & FLD, free MICA & free QTZ, no stn.
0 100				670							
0 100				680							
0 100				690		WOB: 14.2 klb PP: 1435 psi SPM: #2 129 ROP: 15.5ft/hr					690 - 720: SS: Wh - ltBn, w cons, crs to v/fn grn, subang srted, sil to calc cmt, imbd MICA & FLD, free MICA & free QTZ, fnt ltOr min flor.
0 100				700							
0 100				710							
0 100				720							720 - 750: SS: Wh - vltGy, un to lsey cons, fn to med grn ang to subang, mody srted, no cmt, imbd MICA, free QTZ free MICA, no min flor.
0 100				730							
0 100				740		MD: 735 ' TVD: 735 ' Inclination: 1.49 ° Azimuth: 27.4 °					



750  
760  
770  
780  
790  
800  
810  
820  
830  
840  
850  
860  
870  
880  
890  
900  
910  
920  
930  
940  
950  
960



793' 6/28/2015

MINDEPTH

MD: 800 '  
TVD: 800 '  
Inclination: 1.9 °

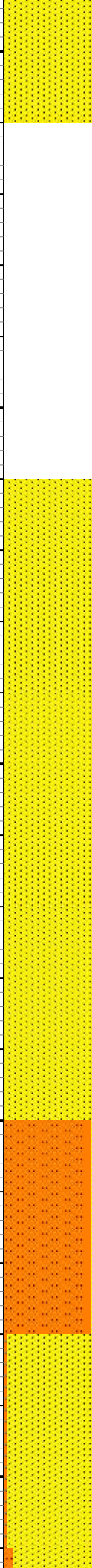
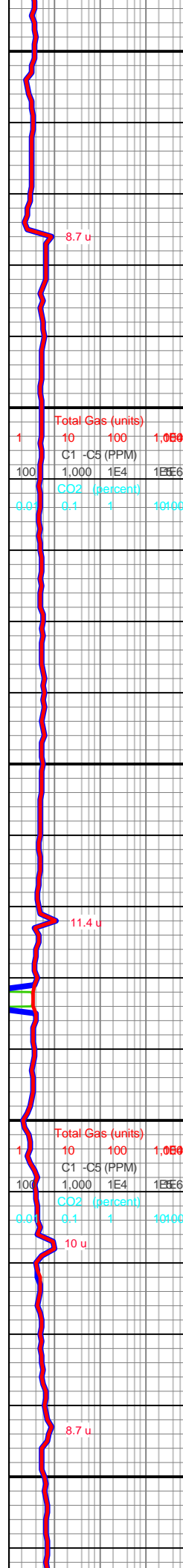
WOB: 10.2 klb  
PP: 1450 psi  
SPM: #2 130  
ROP: 97.2ft/hr

875' - Pump #1

WOB: 13.6 klb  
PP: 1444 psi  
SPM: #1 112  
ROP: 8.8ft/hr

Mud data  
917.2 ' MD  
WT: 8.9 ppg  
FV: 41

Mud data  
940 ' MD  
WT: 9.0 ppg  
FV: 40  
Solids: 3 %  
Cake: 2  
pH: 9  
Cl: 700 mg/l



750 - 780: SS: Wh - ltBn, mod cons, crs to fn grn, subang to w/rnd, mody srtd, sil to calc cmt, imbd MICA & FLD, fnt ltOr min flor.

780 - 810: SS: medltGy, w cons, v/fn grn, rnd, w srtd, sil cmt, imbd MICA & FLD, fnt brlGn min flor.

810 - 840: SS: v/ltGy - modRdBn, lsey cons, med to fn g subang, mody srtd, sil cmt, imbd FLD, fnt brlGn min flor.

840 - 870: SS: Wh - ltGy, un cons, med grn, subang, mod srtd, no cmt, imbd MICA & FLD, free QTZ & free MICA.

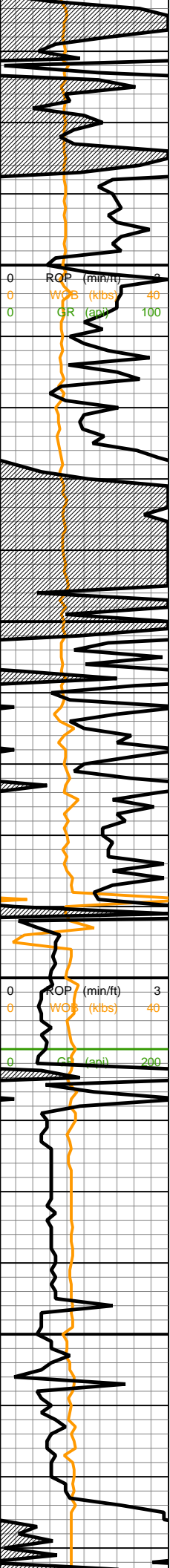
870 - 900: SS: Wh - v/ltGy, pred un to scat mod cons, fr crs grn, subang to ang, p srtd, arg cmt ip, imbd MICA & frags w/ scat FLD, scat free QTZ, g intrgr por, occ sltst intbds, no stn, no min flor, no o flor, no cut, no rng.

900 - 930: SLTST: medltGy, frm to occ hd, v/fn grn, w sil cmt, tr imbd CLAY, tt por, scat ss intbds aa, no stn, no min flor, no o flor, no cut, no rng.

930 - 960: SS: Wh - v/ltGy, occ clr, scat lt gy brn, pred unconcs, scat mod cons, fn to crs grn, subang to ang, p arg cmt ip, predy qtzs, imbd MICA & rk frags w/ scat FLD and sltst grns, occ free mica, g intrgr por, occ sltst intbds, no stn, no min flor, no o flor, no cut, no rng.

960 - 990: SS: ltGy - Wh, mod to lsey cons, fn to med to





MD: 978 '  
TVD: 978 '  
Inclination: 1.67 °  
Azimuth: 42.7 °

Mud data  
981 ' MD  
WT: 8.9 ppg  
FV: 39

WOB: 14 klb  
PP: 1515 psi  
SPM: #1 - 111  
ROP: 24.5ft/hr

Mud data  
1,008 ' MD  
WT: 9 ppg  
FV: 42

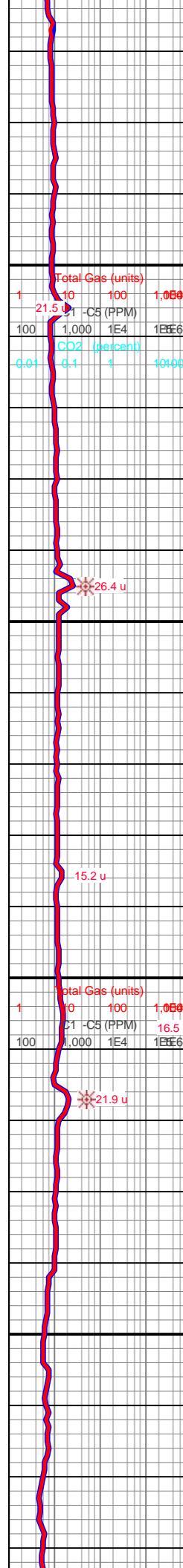
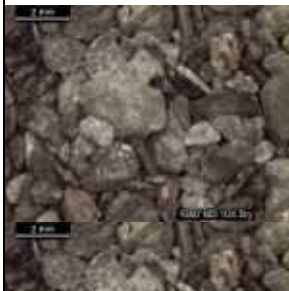
Lag Depth: 1,020  
Min: 12.5  
Strokes: 1,133

MD: 1,030 '  
Inclination: 1.4 °

Mud data  
1,059 ' MD  
WT: 9.0 ppg  
FV: 40

1,080' MD  
OHIO CREEK

WOB: 14.2 klb  
PP: 1750 psi  
SPM: #1 115  
ROP: 67.4ft/hr



Total Gas (units)

1 10 100 1,000

C1 -C5 (PPM)

100 1,000 1E4 1E6

CO2 (percent)

0.01 0.1 1 10 100

26.4 u

15.2 u

Total Gas (units)

1 10 100 1,000

C1 -C5 (PPM)

100 1,000 1E4 1E6

21.9 u

scat crs grn, subrnd to subang, mody to p srtd, arg to sc  
calc cmt, imbd MICA & FLD w/ tr GLAU, occ free QTZ &  
free MICA, g intrgr - tt por ip, no stn; n SLTST: mod brn,  
to occ hd, v/fn grn, w srtd, sil cmt, tr imbd CLAY, tt por;  
stn, no min flor, no o flor, no cut, no rng.

990 - 1020: SLTST: medltGy, frm to occ hd, v/fn grn, w  
srtd, sil cmt, tr imbd CLAY, tt por, scat imbd mica, no str  
no min flor, no o flor, no cut, no rng. SS: v/ltGy - occ Wh  
mod to w cons, fn to med to scat crs grn, silty ip, subang  
ang, p to occ mody srtd, pred sil to occ arg cmt, imbd  
MICA & FLD, tr free QTZ & tr free MICA, tt - tr intrgr por,  
no stn, no min flor, no o flor, no cut, no rng. SH: medgy  
meddrkGy, subblyk to subsplt, silty txt, frm to occ fri, silty  
grdg to sh ip.

1020 - 1050: SH: medgy to meddrkGy, predy subsplt to  
subblyk, silty txt, frm to occ fri, clayey, silty ip, grdg to sh  
ip; SLTST: medltGy to occ lt brn, frm to occ hd, v/fn grn,  
srtd, sil cmt, clayey ip, tt to occ pp por, tr imbd mica, no  
stn, no min flor, no o flor, fnt flash cut, lt PaYl rng; SS:  
v/ltGy to Wh, mod, fn to med to scat crs grn, subang to  
p srtd, arg cmt, scat imbd MICA & FLD, tr free MICA, tt -  
intrgr por, no stn, no min flor, no o flor, no cut, no rng.

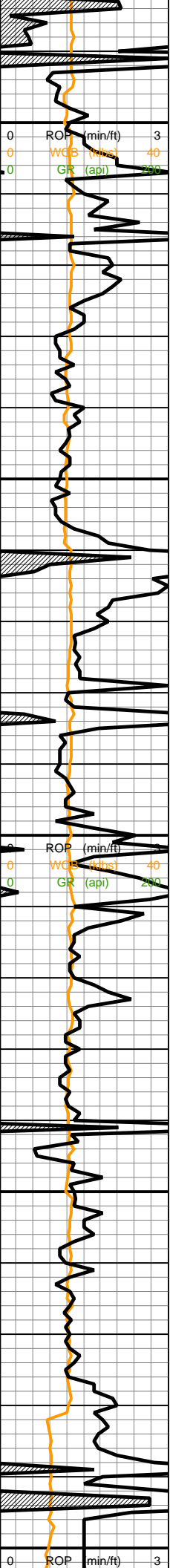
1050 - 1080: SLTST: ltGy, frm, v/fn grn, v/w srtd, sil cmt  
imbd MICA, no min flor, no o flor, fnt paYl rng. SS: Wh,  
mod cons, med to fn grn, subang to rnd, mody srtd, sil c  
imbd FLD & MICA, free MICA, fracd por, no stn, no min  
flor, paYl rng.

1080 - 1110: SLTST: medltGy - Blk, frm, v/fn to fn grn, w  
srtd, pred sil to calc cmt, tr imbd MICA, intrgr por, no stn,  
no min flor, g fsh cut, mod drkYl rng.

1110 - 1140: SLTST: medltGy, fri, v/fn grn, v/w srtd, sil  
cmt, tt por, no stn, fnt ltPk min flor, no o flor, strmg cut, lt  
brYl rng. SS: ltGy, mod cons, v/fn to fn grn, rnd, w srtd,  
cmt, imbd MICA, fracd por, no stn, no min flor, no o flor,  
cut. SH: modRd, subblyk, smth txt, sft, tr imbd MICA.

1140 - 1170: SS: v/ltGy, lsey cons, med to fn grn, subang  
w srtd, sil cmt, imbd MICA & FLD, free QTZ & free MICA  
fracd por, no stn, no min flor, lzy cut, fnt paYl rng. SLTS  
ltGy, frm, v/fn grn.

1170 - 1200: SS: ltGy - modRd, lsey to mod cons, crs to  
med grn, ang to subang, mody srtd, sil cmt, imbd FLD &  
MICA w/ PYR, free QTZ & free PYR w/ free MICA, fracd  
por, no stn, no min flor, no o flor, no cut, fnt paYl rng.  
SLTST: ltGy, frm, v/fn grn, v/w srtd, sil cmt, tt por, no str



1,190  
1,200  
1,210  
1,220  
1,230  
1,240  
1,250  
1,260  
1,270  
1,280  
1,290  
1,300  
1,310  
1,320  
1,330  
1,340  
1,350  
1,360  
1,370  
1,380  
1,390  
1,400



WOB: 13.8 kib  
PP: 1634 psi  
SPM: #1 110  
ROP: 62.6ft/hr

MD: 1,225 '  
Inclination: 2.64 °  
Azimuth: 47.7 °

MINDEPTH

1,274' 6/29/2015

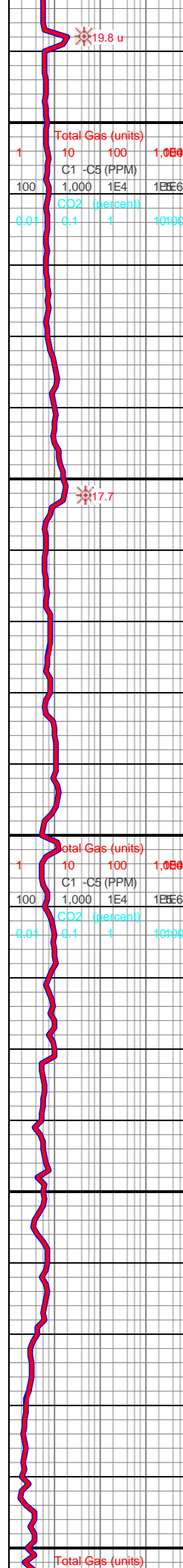
MD: 1,289 '  
Inclination: 2.3 °

WOB: 13.5 kib  
PP: 1684 psi  
SPM: #1 112  
ROP: 68ft/hr

MD: 1,321 '  
Inclination: 3.2 °

1,352' - Pump #2

WOB: 11 kib



19.8 u

Total Gas (units)  
1 10 100 1,000  
C1 -C5 (PPM)  
1,000 1E4 1E6  
CO2 (percent)  
0.01 0.1 1 10100

17.7

Total Gas (units)  
1 10 100 1,000  
C1 -C5 (PPM)  
1,000 1E4 1E6  
CO2 (percent)  
0.01 0.1 1 10100

Total Gas (units)

no min flor, no o flor, no cut, fnt paYI rng.

1200 - 1230: SS: Wh, un cons, med to crs grn, ang to subang, mody srted, no cmt, imbd FLD & MICA, free QTZ free MICA, mldc por, no stn, no min flor, no o flor, no cut, no rng. SLTST: medltGy, frm, v/fn grn, v/w srted, sil cmt, imbd MICA, fracd por, no stn, no min flor, no o flor, no cut, no rng.

1230 - 1260: SS: Wh - modRd, un cons, crs to med grn, subang, mody srted, no cmt, imbd MICA, free QTZ, fracd por, no stn, no min flor, no o flor, no cut, no rng. SLTST: medltGy, frm, v/fn grn.

1260 - 1290: SS: Wh - modRdOr, lsey cons, med to crs grn, subang, mody srted, no cmt, imbd FLD & MICA, free QTZ, fracd por, no stn, no min flor, no o flor, no cut, fnt paYI rng. SS: Wh - modRdOr, lsey cons, med to crs grn, subang, mody srted, no cmt, imbd FLD & MICA, free QTZ, fracd por, no stn, no min flor, no o flor, no cut, fnt paYI rng.

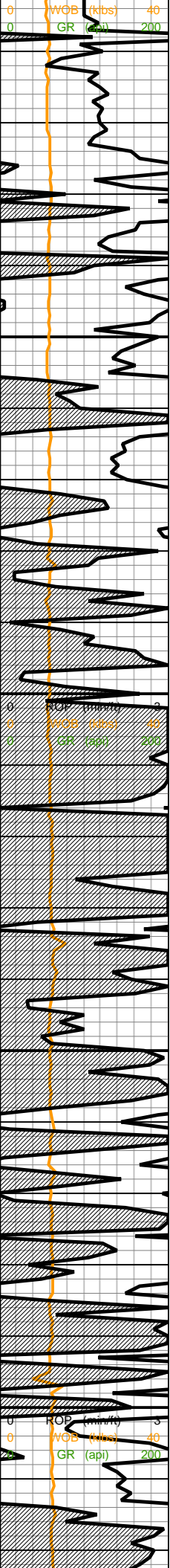
1290 - 1320: SS: Wh - modRdOr, un cons, fn to crs grn, subang to rnd, p srted, no cmt, imbd MICA & FLD w/ PYR free PYR & free QTZ w/ free MICA, fracd por, no stn, no min flor, no o flor, lzy cut, fnt briYI rng. SLTST: ltGy, frm, v/fn grn, v/w srted, sil cmt, imbd MICA, tt por, no stn, no min flor, no o flor, lzy cut, fnt briYI rng. SH: modRd, blkly, med txt, frm, imbd MICA.

1320 - 1350: SS: Wh - paYIshOr, un to lsey cons, crs to med grn, subang, w srted, sil cmt, imbd MICA & FLD, free MICA & free QTZ, fracd por, no stn, no min flor, no o flor, weak lzy cut, fnt paYI rng. SLTST: medltGy - bnshBlk, frm, v/fn grn, v/w srted, sil cmt, imbd MICA, tt por, no stn, min flor, no o flor, weak lzy cut, fnt paYI rng.

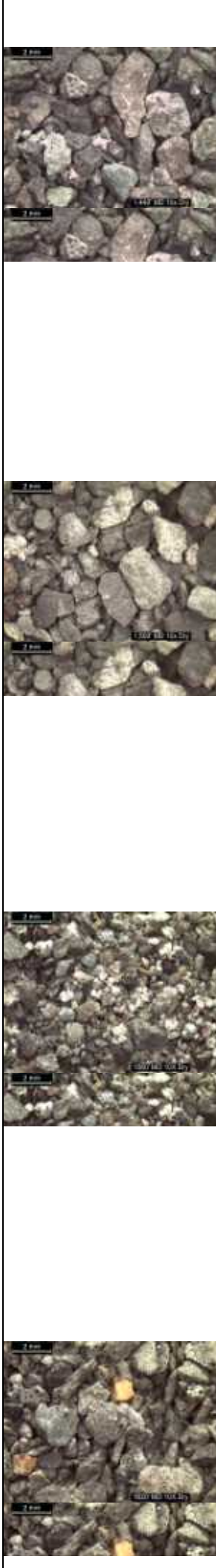
1350 - 1380: SS: Wh - vltGy - modRdOr, un to lsey cons, crs to fn grn, ang to rnd, p srted, no cmt, imbd MICA & FLD, free QTZ & free MICA, fracd por, no stn, no min flor, no o flor, weak lzy cut, mod briYI rng. SLTST: ltGy - modPk, frm, v/fn grn.

1380 - 1410: SS: Wh - vltGy - op, predy unconcs to scat lsey cons, fn to med grn, occ crs, ang to rnd, mod - p srted, no to scat arg cmt, abndt free QTZ, scat free mica & fld, co frags, g intgr to occ tt por, no stn, no min flor, no o flor, no cut, no rng. SLTST: ltGy - medltGy, frm to hd, v/fn grn, mody srted, sil cmt, occ imbd MICA, clayey ip, tt por, no min flor, no o flor, no cut, no rng.





1,410  
1,420  
1,430  
1,440  
1,450  
1,460  
1,470  
1,480  
1,490  
1,500  
1,510  
1,520  
1,530  
1,540  
1,550  
1,560  
1,570  
1,580  
1,590  
1,600  
1,610  
1,620



PP: 1544 psi  
SPM: #2 129  
ROP: 38.4ft/hr

**Mud data**  
1,459.2 ' MD  
WT: 9.0 ppg  
FV: 42

**MD: 1,475 '**  
**Inclination: 2.1 °**

**MD: 1,479 '**  
**Inclination: 2.46 °**  
**Azimuth: 50.5 °**

**Mud data**  
1,496 ' MD  
WT: 9.1 ppg  
FV: 45

WOB: 11 klb  
ROT: 155 rpm  
PP: 1700 psi  
SPM: #2 133  
ROP: 11.2ft/hr

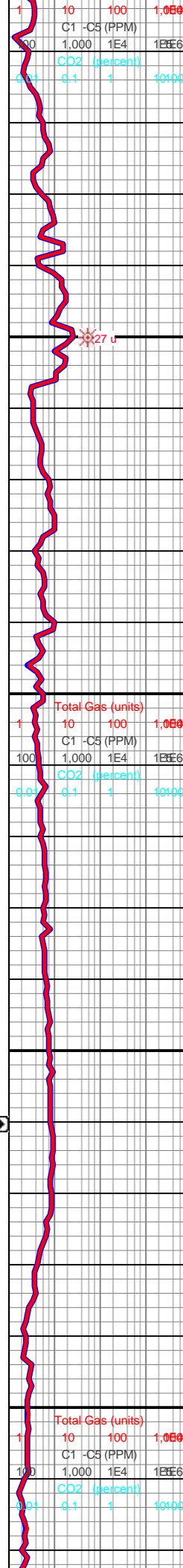
**Mud data**  
1,511 ' MD  
WT: 9 ppg  
FV: 39  
Solids: 3 %  
Cake: 2  
pH: 8.8  
Cl: 900 mg/l

Lag Depth: 1,540  
Min:: 18.16  
Strokes:: 2,110

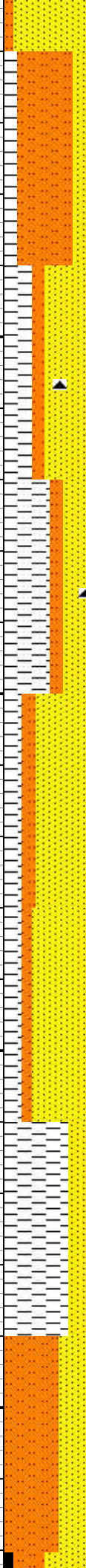
**1,560' MD**  
**Mesa Verde**

**MD: 1,579 '**  
**Inclination: 1.8 °**

WOB: 11.3 klb  
PP: 1886 psi  
SPM: #2 134  
ROP: 12.5ft/hr



1  
10  
100  
1,000  
C1 -C5 (PPM)  
1,000 1E4 1E6  
CO2 (percent)  
0.01 0.1 1 10100  
27 U  
Total Gas (units)  
1 10 100 1,000  
C1 -C5 (PPM)  
100 1,000 1E4 1E6  
CO2 (percent)  
0.01 0.1 1 10100  
Total Gas (units)  
1 10 100 1,000  
C1 -C5 (PPM)  
100 1,000 1E4 1E6  
CO2 (percent)  
0.01 0.1 1 10100



1410 - 1440: SLTST: ltGy - medltGy - occ lt brn, frm to H v/fn grn, mody srtld, sil cmt, scat imbd MICA, clayey ip, grdg to sh ip, tt por, no stn, no min flor, no o flor, no cut, rng. SS: Wh - v/ltGy - op, un to lsey cons, f to c grn, sub ang to sub rnd, mod srtld, arg to scat un cmt, abndt free QTZ, scat free mica & fld, intrgr to occ tt por, no stn, no min flor, no o flor, no cut, no rng.

1440 - 1470: SS: Wh - v/ltGy - op, un to lsey cons, f to c grn, sub ang to sub rnd, mod srtld, arg to no cmt, scat ca cmt, abnt free QTZ, scat free mica & fld, tr red orng cht, intrgr to occ tt por, no stn, no min flor, no o flor, no cut, no rng. SH: lt gy to med gy, subsplt to subblky, med to occ grty txt, frm, mmica ip, silty ip. SLTST: mod brn, subblky, vfg, w srt, sil cmt, tt.

1470 - 1500: SH: lt gy to med gy, subsplt to subblky, frm med to occ grty txt, occ coal lam, frm, mmica ip, occ silty SS: Wh - v/ltGy, un to mod cons, fn to crs grn, subang, mody srtld, calc cmt, silty ip, occ imbd MICA & FLD, abnt free QTZ, scat free MICA, tr red orng CHT, fr intrgr - tt po no stn, no min flor, no o flor. SLTST: med gy, subblky, v w srt, sil cmt, tt.

1500 - 1530: SS: Wh - v/ltGy, mod to occ un cons, fn to med grn, subang to subrnd, mody srtld, sil to occ arg cmt, occ imbd MICA & rk frags w/ FLD, occ free QTZ & scat free MICA, silty ip, fr intrgr - tt por, no stn, no min flor, no flor, no cut, no rng. SH: lt gy to med gy, subsplt to subblky, frm, med to occ grty txt, occ coal lam, frm, mmica ip, occ silty, occ grdg to sltst.

1530 - 1560: SS: Wh, un to lsey cons, med to crs grn, subang, w srtld, calc cmt, imbd FLD & MICA, free QTZ & free MICA, fracd por, no stn, no min flor, no o flor, no cut, brtYI rng. SH: medltGy, blk, grty txt, hd. SLTST: ltGy, frm, v/fn grn, v/w srtld, sil cmt, imbd MICA, tt por, no stn, min flor, no o flor, no cut, lt brtYI rng.

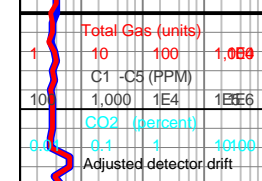
1560 - 1590: SH: medltGy - GyshGn, subblky, med txt, imbd MICA & PYR xls, free PYR. SS: Wh - v/ltGy, un to lsey cons, med grn, subang, w srtld, calc cmt, imbd FLD PYR w/ MICA, free QTZ & free PYR, fracd por, no stn, min flor, no o flor, no cut, no rng.

1590 - 1620: SS: Wh - v/ltGy, mod cons, v/fn to fn grn, r w srtld, calc cmt, imbd MICA, fracd por, no stn, no min flor, no o flor, weak lzy cut, fnt paYI rng. SH: ltGn, subblky, s txt, brit, imbd MICA.

1620 - 1650: SS: Wh - v/ltGy, lsey cons, med to crs grn, subang to rnd, w srtld, calc cmt, imbd MICA, free QTZ &



**Mud data**  
1,812' MD  
WT: 9.1 ppg  
FV: 41  
Solids: 3.5 %  
Cake: 2  
pH: 9  
Cl: 800 mg/l



free MICA, fracd por, no stn, no min flor, no o flor, weak lzy cut, fnt brYl rng. SLTST: medltGy, frm, v/fn grn, v/w grn, calc cmt, tt por, no stn, no min flor, no o flor, weak lzy cut, fnt brYl rng.

1650 - 1680: SS: Wh - v/ltGy, un to mod cons, med to c crs grn, subang, mody srted, sil cmt, imbd FLD & MICA, free QTZ & free MICA, fracd por, ltBn stn, no min flor, no o flor, no cut, fnt paYl rng. SLTST: medltGy, hd to frm, v/fn grn, srted, calc cmt, tt por, no stn, no min flor, no o flor, no cut, paYl rng.

1680 - 1710: SS: Wh - v/ltGy, mod to occ un cons, med to c crs grn, subang, mody srted, sil cmt, imbd FLD & MICA, free QTZ & free MICA, fr - p intgr por, tt ip, silty ip, grdg silst ip, no stn, no min flor, no o flor, no cut, no rng. SLTST: medltGy, hd to frm, v/fn grn, w srted, clayey ip, sil to occ calc cmt, inbd mica ip, tt por, no stn, no min flor, no o flor, no cut, no rng. SH: medltGy - GyshGn, subblky, med txt frm.

1710 - 1740: SS: Opq - v/ltGy, un to lsey cons, fn to c crs grn, subrnd to subang, mody srted, arg to scat calc cmt, o imbd FLD, abnt free QTZ, fr intgr por, no stn, no min flor, no o flor, no cut, no rng. SLTST: medltGy, hd to frm, v/fr grn, w srted, clayey ip, sil to occ calc cmt, inbd mica ip, tt por, no stn, no min flor, no o flor, no cut, no rng. SH: as above.

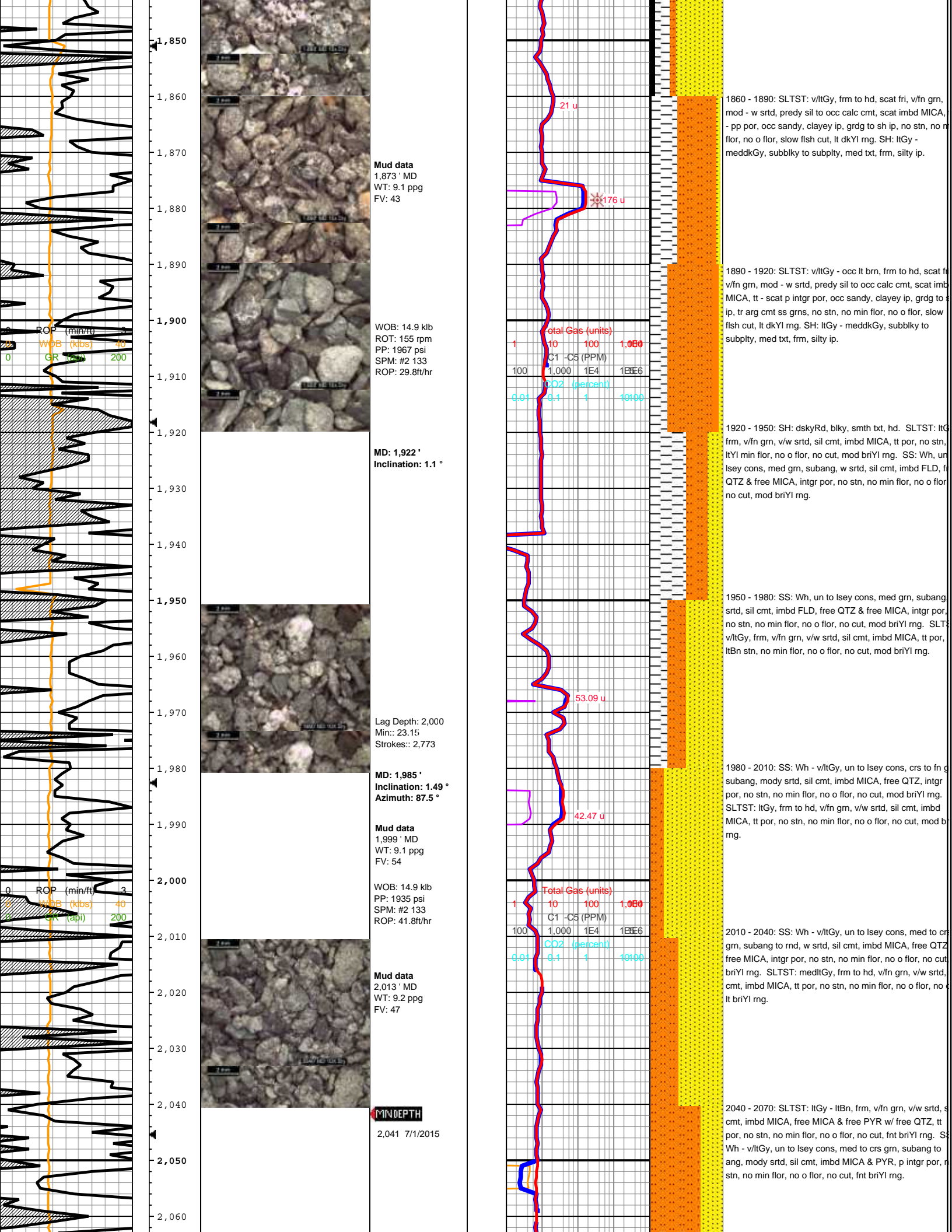
1740 - 1770: SS: Opq - v/ltGy, un cons, fn to c crs grn, subrnd to subang, mody srted, no cmt, abnt qtz, occ fld, t cht, g intgr por, no stn, no min flor, no o flor, no cut, no r

1770 - 1800: SS: Opq - v/ltGy, predy un to trace lsely co vfn to c crs grn, subrnd to subang, p - mody srted, no to occ arg cmt, abnt qtz, occ fld, occ cht, fr - g intgr por, no stn, min flor, no o flor, g flash cut, lt Payl rng. SLTST: medltGy, hd to frm, v/fn grn, w srted, clayey ip, sil cmt, inbd mica ip, por, no stn, no min flor, no o flor, no cut, no rng.

1800 - 1830: SH: ltGy - medltGy, subblky, med to silty tx frm, scat imbd MICA & occ COAL, rr c qtz grn, silty ip, grdg to silst ip. SLTST: v/ltGy, hd to scat fri, v/fn grn, w srted, pred calc to tr sil cmt, scat imbd MICA, occ free CA, tt - scat pp por, no stn, no min flor, no o flor, slow flsh cu fnt paYl rng.

1830 - 1860: SS: Opq - v/ltGy, uncon, vfn to med to occ crs grn, subrnd to subang, mody srted, no to tr arg cmt, abnt qtz, co frags com, occ fld, fr - g intgr por, no stn, no min flor, no o flor, g wet flash cut, mod dkYl rng. SH: ltGy - medltGy, subblky, med txt, frm, silty ip, grdg to silst ip.





Mud data  
1,873' MD  
WT: 9.1 ppg  
FV: 43

WOB: 14.9 kib  
ROT: 155 rpm  
PP: 1967 psi  
SPM: #2 133  
ROP: 29.8ft/hr

MD: 1,922'  
Inclination: 1.1°

Lag Depth: 2,000  
Min:: 23.15  
Strokes:: 2,773

MD: 1,985'  
Inclination: 1.49°  
Azimuth: 87.5°

Mud data  
1,999' MD  
WT: 9.1 ppg  
FV: 54

WOB: 14.9 kib  
PP: 1935 psi  
SPM: #2 133  
ROP: 41.8ft/hr

Mud data  
2,013' MD  
WT: 9.2 ppg  
FV: 47

MINDEPTH  
2,041 7/1/2015

1860 - 1890: SLTST: v/litGy, frm to hd, scat fri, v/fn grn, mod - w srt, predy sil to occ calc cmt, scat imbd MICA, - pp por, occ sandy, clayey ip, grdg to sh ip, no stn, no min flor, no o flor, slow fish cut, lt dkYl rng. SH: ltGy - meddkGy, subblky to subply, med txt, frm, silty ip.

1890 - 1920: SLTST: v/litGy - occ lt brn, frm to hd, scat fri, v/fn grn, mod - w srt, predy sil to occ calc cmt, scat imbd MICA, tt - scat p intr por, occ sandy, clayey ip, grdg to sh ip, tr arg cmt ss grns, no stn, no min flor, no o flor, slow fish cut, lt dkYl rng. SH: ltGy - meddkGy, subblky to subply, med txt, frm, silty ip.

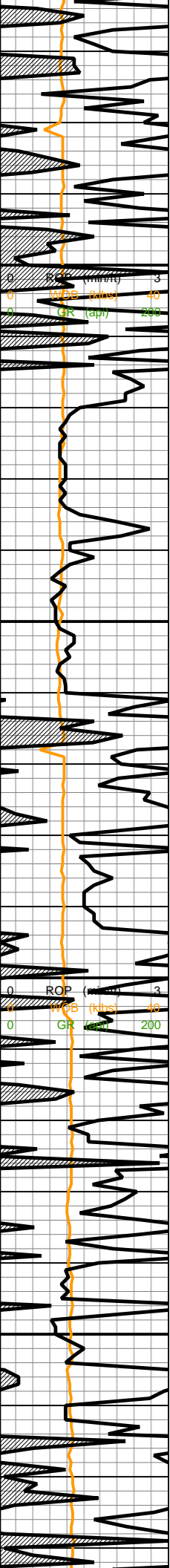
1920 - 1950: SH: dskyRd, blkly, smth txt, hd. SLTST: ltGy - v/fn grn, v/w srt, sil cmt, imbd MICA, tt por, no stn, ltYl min flor, no o flor, no cut, mod briYl rng. SS: Wh, un lsey cons, med grn, subang, w srt, sil cmt, imbd FLD, free QTZ & free MICA, intr por, no stn, no min flor, no o flor, no cut, mod briYl rng.

1950 - 1980: SS: Wh, un to lsey cons, med grn, subang, srt, sil cmt, imbd FLD, free QTZ & free MICA, intr por, no stn, no min flor, no o flor, no cut, mod briYl rng. SLTST: v/litGy, frm, v/fn grn, v/w srt, sil cmt, imbd MICA, tt por, ltBn stn, no min flor, no o flor, no cut, mod briYl rng.

1980 - 2010: SS: Wh - v/litGy, un to lsey cons, crs to fn grn, subang, mody srt, sil cmt, imbd MICA, free QTZ, intr por, no stn, no min flor, no o flor, no cut, mod briYl rng. SLTST: ltGy, frm to hd, v/fn grn, v/w srt, sil cmt, imbd MICA, tt por, no stn, no min flor, no o flor, no cut, mod briYl rng.

2010 - 2040: SS: Wh - v/litGy, un to lsey cons, med to crs grn, subang to rnd, w srt, sil cmt, imbd MICA, free QTZ & free MICA, intr por, no stn, no min flor, no o flor, no cut, mod briYl rng. SLTST: medltGy, frm to hd, v/fn grn, v/w srt, sil cmt, imbd MICA, tt por, no stn, no min flor, no o flor, no cut, mod briYl rng.

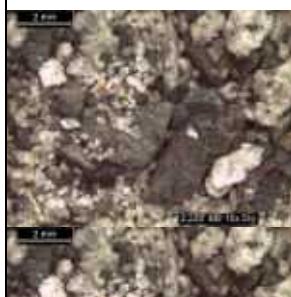
2040 - 2070: SLTST: ltGy - ltBn, frm, v/fn grn, v/w srt, sil cmt, imbd MICA, free MICA & free PYR w/ free QTZ, tt por, no stn, no min flor, no o flor, no cut, fnt briYl rng. SS: Wh - v/litGy, un to lsey cons, med to crs grn, subang to ang, mody srt, sil cmt, imbd MICA & PYR, p intr por, no stn, no min flor, no o flor, no cut, fnt briYl rng.



2,070  
2,080  
2,090  
2,100  
2,110  
2,120  
2,130  
2,140  
2,150  
2,160  
2,170  
2,180  
2,190  
2,200  
2,210  
2,220  
2,230  
2,240  
2,250  
2,260  
2,270  
2,280



WOB: 14.6 klb  
ROT: 155 rpm  
PP: 1755 psi  
SPM: #1 - 109  
ROP: 12.1ft/hr



WOB: 16 klb  
ROT: 155 rpm  
PP: 1933 psi  
SPM: # 1 109  
ROP: 39.1ft/hr

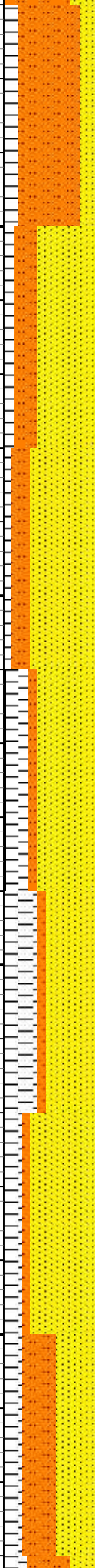
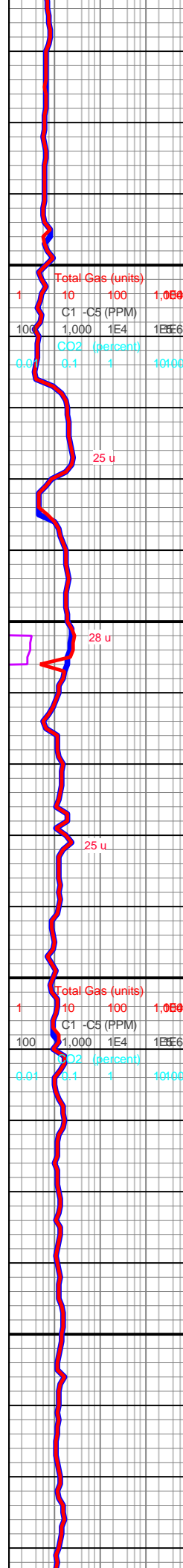
MD: 2,222 '  
Inclination: 1 °

Mud data  
2,228' MD  
WT: 9.1 ppg  
FV: 46  
Solids: 3.5 %  
Cake: 2  
pH: 8.9  
Cl: 1100 mg/l

MD: 2,238 '  
Inclination: 1.41 °  
Azimuth: 89.6 °



Mud data



2070 - 2100: SLTST: ltGy - ltBn, frm, v/fn grn, w srtd, sil cmt, occ imbd MICA, tr free MICA & free QTZ, tt por, occ ss strg, occ coal lam, no stn, no min flor, no o flor, no cut, fnt briYl rng. SS: as above. SH: medltGy - meddrkGy, subblky to subsplt, med to slty txt, frm, tr imbd COAL.

2100 - 2130: SS: Wh - v/ltGy, un to tr lsely cons, med to crs grn, subang to ang, mody srtd, arg cmt, occ MICA grns, fr intrgr por, tr ltbrn stn, no min flor, no o flor, slow cut, fnt briYl rng. SLTST: ltGy - ltBn, frm to hd, v/fn grn, w srtd, sil cmt, occ coal lam, occ imbd MICA, tt - tr pp por, no stn, no min flor, no o flor, slow cut, fnt briYl rng.

2130 - 2160: SS: Wh - v/ltGy, un to tr lsely cons, med to crs grn, subang to ang, mody srtd, arg cmt ip, occ imbd MICA grns, g - fr intrgr por, tr ltbrn stn, no min flor, no o flor, slow cut, fnt briYl rng. SLTST: ltGy - ltBn, frm to hd, v/fn grn, w srtd, sil cmt, imbd MICA, clayey ip, grdg to stn, ip, tt - tr pp por, no stn, no min flor, no o flor, no cut, no rng.

2160 - 2190: SS: Wh - v/ltGy - opq, un to tr lsely cons, mod to crs grn, subang to ang, mody srtd, arg to tr sil cmt ip, abnt free qtz, tr co frags, tr free MICA grns, g - fr intrgr por, no stn, no min flor, no o flor, slow cut, fnt briYl rng. SH: ltGrnGy - meddrkGy, subblky to subsplt, med to slty txt, frm, v clayey ip, tr imbd COAL.

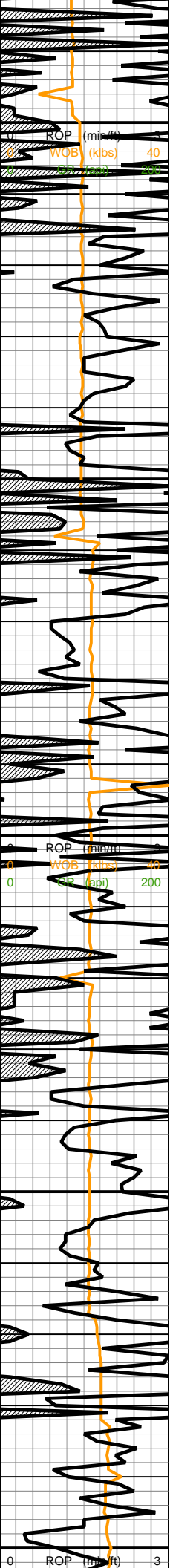
2190 - 2220: SS: Opq - Wh - occ v/ltGy, mod to lsey cor, occ un, fn to crs grn, subang to ang, mody srtd, arg to sil cmt, occ calc cmt, occ imbd FLD & rk frags, abnt free QTZ & free MICA, scat coal frags, tt - fr intrgr por, no stn, no min flor, no o flor, no cut. SH: ltGrnGy - meddrkGy, subblky to subsplt, med to slty txt, frm, clayey ip, tr COAL lam.

2220 - 2250: SS: Opq - Wh - occ v/ltGy, pred mod to occ un cons, fn to crs grn, subang to ang, mody srtd, sil to calc to tr arg cmt, occ imbd FLD & rk frags w/ scat MICA abnt free QTZ, tt - fr intrgr por, no stn, no min flor, no o flor, no cut. SH: ltGrnGy - meddrkGy, subblky to subsplt, med to slty txt, frm, clayey ip, tr COAL lam. SLTST: as above.

2250 - 2280: SS: Opq - Wh - occ v/ltGy, pred mod to occ un cons, fn to crs grn, subang to ang, mody srtd, sil to calc to tr arg cmt, occ imbd FLD & rk frags w/ scat MICA abnt free QTZ, tr coal frags, tt - fr intrgr por, no stn, no min flor, no o flor, no cut. SLTST: ltGy - medBn, frm to hd, v/fn grn, w srtd, sil cmt, imbd MICA, sandy ip, tt - tr pp por, no stn, no min flor, no o flor, no cut, no rng.

2280 - 2310: SLTST: ltGy to lt med Brn, frm to occ fri, v/ltGy, w srtd, pred calc to scat sil cmt, imbd MICA, w srtd, sil cmt, imbd MICA, sandy ip, tt - tr pp por, no stn, no min flor, no o flor, no cut, no rng.





2,290  
2,300  
2,310  
2,320  
2,330  
2,340  
2,350  
2,360  
2,370  
2,380  
2,390  
2,400  
2,410  
2,420  
2,430  
2,440  
2,450  
2,460  
2,470  
2,480  
2,490  
2,500

**Mud data**  
2,287' MD  
WT: 9.1 ppg  
FV: 50  
pH: 9.5

WOB: 18.7 kib  
ROT: 155 rpm  
PP: 1856 psi  
SPM: #1 108  
ROP: 45.7ft/hr

**Mud data**  
2,318' MD  
WT: 9.1 ppg  
FV: 46  
pH: 9.5

WOB: 20.1 kib

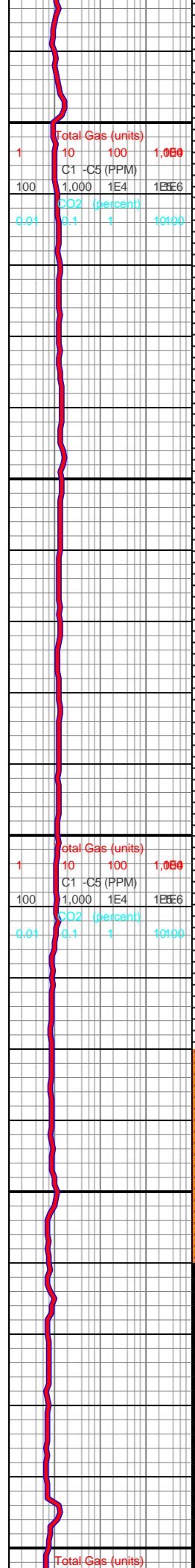
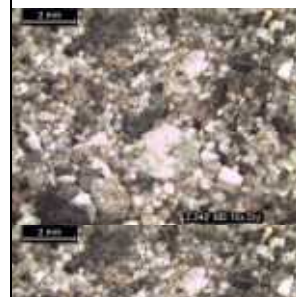
**Mud data**  
2,369' MD  
WT: 9.1 ppg  
FV: 45  
Solids: 9.3 %

WOB: 20.1 kib  
PP: 1845 psi  
SPM: #1 109  
ROP: 29.4ft/hr

MD: 2,480'  
Inclination: 1.7 °

**MINDEPTH**  
2,490 7/2/2015

MD: 2,491'  
Inclination: 2.29 °  
Azimuth: 97.7 °



tr pp por, no stn, no min flor, no o flor, no cut, no rng. SS  
Opq - Wh - occ v/ltGy, predy mod cons, occ un cons, fn  
crs grn, subang to ang, mody srtld, calc to arg, rr sil cmt,  
occ imbd FLD & MICA, tr coal frags, tt - fr intgr por, no  
stn, no min flor, no o flor, no cut. SH: ltGrnGy - meddrkGy  
occ dk brn, subbly to subspit, med txt, frm, clayey ip,  
mmica ip, tr co lams.

2310 - 2340: SS: Opq - Wh - occ v/ltGy, predy un cons,  
occ mod cons, fn to crs grn, subang to ang, mody srtld, a  
to sil cmt, abnt qtz, occ imbd FLD & MICA, tr coal frags,  
- fr intgr por, no stn, no min flor, no o flor, no cut. SH:  
ltGrnGy - meddrkGy, occ dk brn, subbly to subspit, med  
txt, frm, clayey ip, mmica ip.

2340 - 2370: SH: medGy, blkly to subbly, med txt, brit.  
SLTST: v/ltGy, frm, v/fn grn, w srtld, sil cmt, imbd MICA,  
free MICA, tt por, no stn, no min flor, no o flor, no cut, no  
rng. SS: Wh, un to lsey cons, med grn, subang, w srtld, s  
cmt, imbd MICA, free QTZ & free MICA, intgr por, no stn  
no min flor, no o flor, no cut, no rng.

2370 - 2400: As Above, with free PYRITE

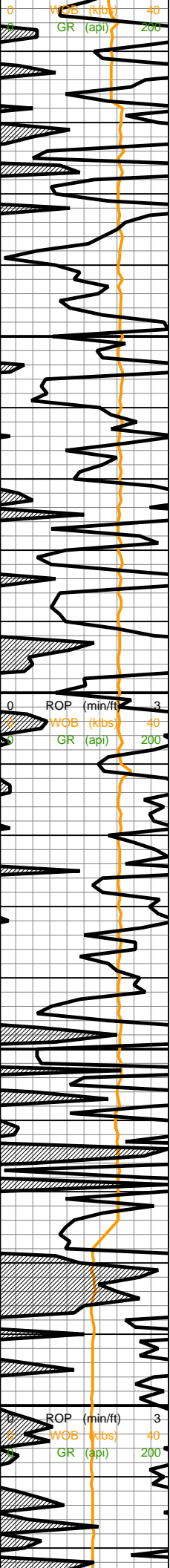
2400 - 2430: SLTST: v/ltGy, frm, fn grn, w srtld, sil cmt,  
imbd MICA, tt por, no stn, ltYl min flor, no o flor, no cut,  
rng. SH: medGy, blkly to subbly, grty to slty txt, brit. SS  
Wh, un to lsey cons, fn to med grn, subang, w srtld, sil c  
imbd MICA, free QTZ & free MICA, intgr por, no stn, no  
min flor, no o flor, no cut, no rng.

2430 - 2460: SS: Wh, un to lsey cons, fn to crs grn, ang  
subang, mody srtld, sil cmt, imbd MICA, free QTZ & free  
PYR w/ free MICA, intgr por, no stn, no min flor, no o flor  
no cut, no rng. SLTST: medltGy, frm, v/fn to fn grn, w s  
sil cmt, imbd MICA, tt por, no stn, no min flor, no o flor, r  
cut, no rng.

2460 - 2490: SH: medltGy, blkly to subbly, grty txt, brit.  
SLTST: v/ltGy, fri, fn grn, w srtld, calc cmt, imbd MICA, tt  
por, no stn, no min flor, no o flor, no cut, lt paYl rng. SS  
Wh, un to lsey cons, med grn, subang, w srtld, sil cmt, im  
MICA, intgr por, no stn, no min flor, no o flor, no cut, lt pa  
rng, trace imbd COAL

2490 - 2520: As Above





2,510

2,520

2,530

2,540

2,550

2,560

2,570

2,580

2,590

2,600

2,610

2,620

2,630

2,640

2,650

2,660

2,670

2,680

2,690

2,700

2,710

2,720

WOB: 25.5 klb  
PP: 2011 psi  
SPM: #1 116  
ROP: 25ft/hr

Lag Depth: 2,500  
Min:: 27.3ft  
Strokes:: 2,910

WOB: 27.8 klb  
PP: 2068 psi  
SPM: #1 118  
ROP: 23.6ft/hr

MD: 2,609 '  
Inclination: 2.6 °

**Mud data**  
2,672' MD  
WT: 9.3 ppg  
FV: 53  
pH: 9.2, 672' - Pump #2

**Mud data**  
2,698' MD  
WT: 9.2 ppg  
FV: 54  
Solids: 4 %  
Cake: 2  
pH: 9.1  
Cl: 800 mg/l

WOB: 20.5 klb  
ROT: 155 rpm  
PP: 1673 psi  
SPM: #2 128  
ROP: 10.4ft/hr

**Mud data**  
2,721.2' MD  
WT: 9.3 ppg

1

10

100

1,000

100

1,000

1E4

1E6

CO2 (percent)

0.01

0.1

1

10

100

1,000

2520 - 2550: SS: Wh, un to lsey cons, fn to crs grn, subang, mody srted, sil cmt, imbd MICA, free PYR, intrgr por, no stn, no min flor, no o flor, no cut, briYI rng. SH: medGy, blkly, grty to slty txt, brit, imbd COAL & PYRC spec, free PYR. SLTST: ltGy, fri, v/fn grn.

2550 - 2580: SLTST: v/ltGy - ltGy, fri, v/fn grn, w/w srted, to calc cmt, imbd MICA, tt por, no stn, no min flor, no o f no cut, fnt paYI rng. SH: drkRdBn, blkly to subblkly, grty slty txt, brit. SS: Wh, un to lsey cons, med grn, subang, srted, sil to calc cmt, imbd MICA, intrgr por, no stn, no min flor, no o flor, no cut, fnt paYI rng.

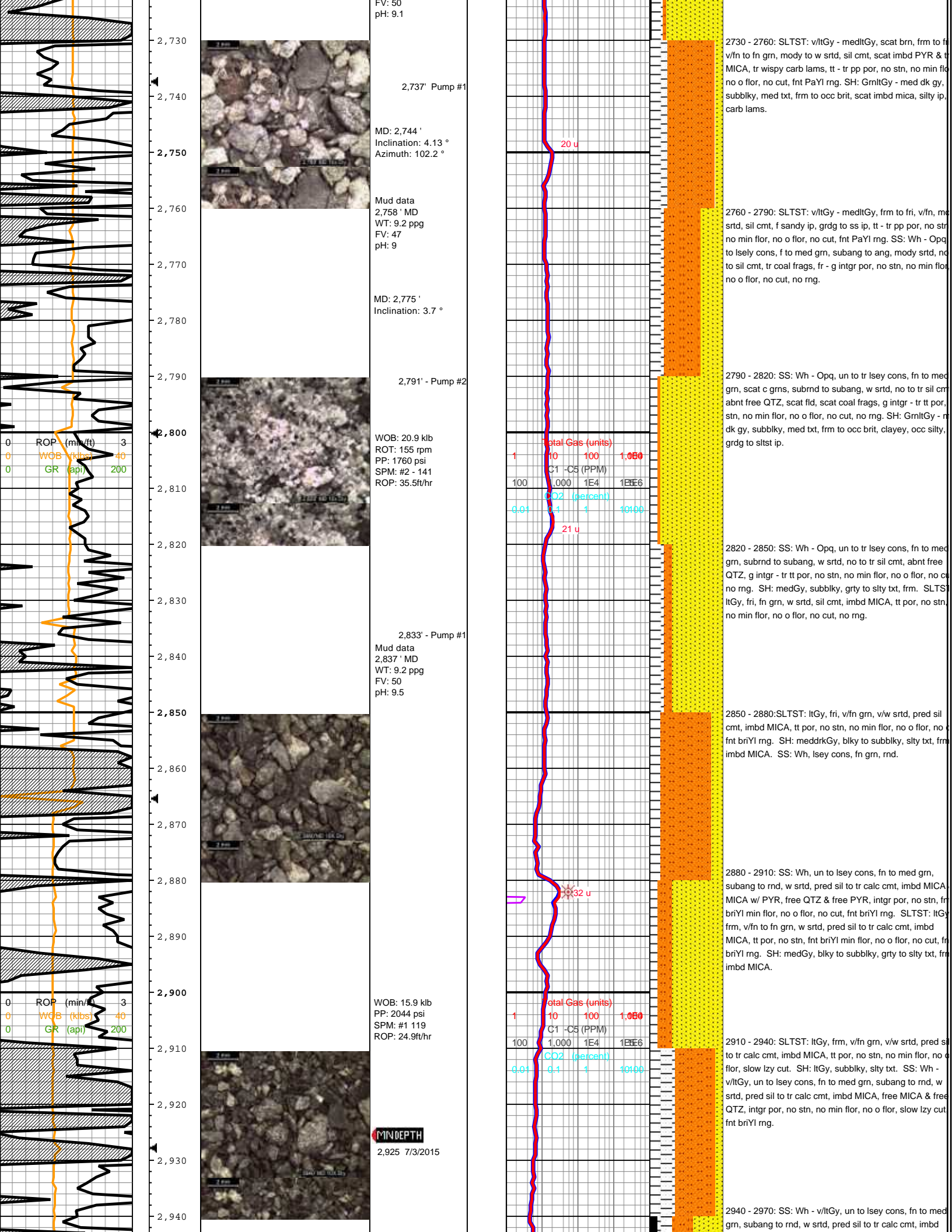
2580 - 2610: SLTST: v/ltGy - ltGy, fri, v/fn grn, w srted, sil to calc cmt, imbd MICA, f sandy ip, tr coal frags, tt por, n stn, no min flor, no o flor, no cut, fnt paYI rng. SS: Wh, u lsey cons, med grn, subang, w srted, sil to calc cmt, imbd MICA, occ wispy carb lams, silty ip, p - fr intrgr por, no st no min flor, no o flor, no cut, fnt paYI rng. SH: med dk gy blkly to subblkly, med to slty txt, frm to occ brit, grdgy to st

2610 - 2640: SLTST: v/ltGy - ltGy, frm to fri, v/fn grn, w srted, predy sil to tr calc cmt, imbd MICA com, rr pyr grms sandy ip, occ coal frags, tt - tr pp por, no stn, no min flor, no o flor, no cut, fnt paYI rng. SS: as above. SH: as abov

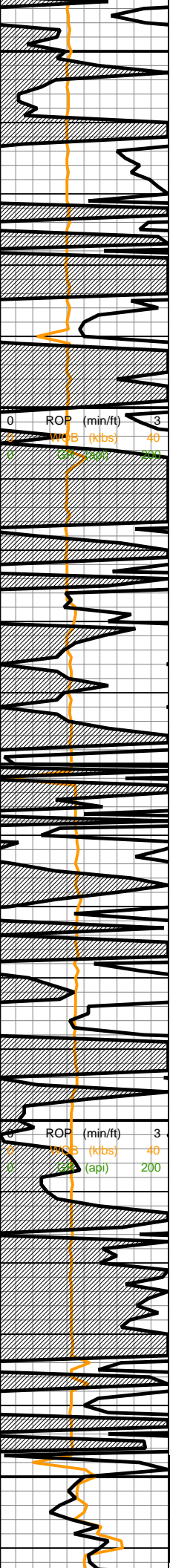
2640 - 2670: SLTST: v/ltGy - meddkGy, occ brn, frm to f occ fh, v/fn grn, w srted, predy sil to tr calc cmt, imbd MICA com, f sandy ip, occ ss & sh intbds, tt - tr pp por, no stn, min flor, no o flor, no cut, fnt paYI rng.

2670 - 2700: SS: Wh, lsey to un cons, fn to crs grn, ang subang, mody srted, pred sil to occ arg cmt, occ imbd FL abnt free QTZ & tr free PYR, tt - fr intrgr por, no stn, no n flor, no o flor, no cut, paYI rng. SH: GrnltGy - med dk gy blkly to subblkly, med to slty txt, frm to occ brit, silty ip, gr to slst ip.

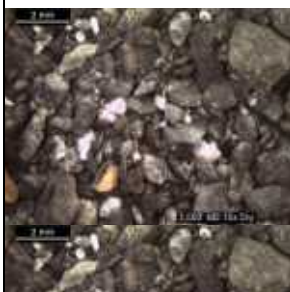
2700 - 2730: SS: Wh - Opq, un cons, fn to med to tr crs grn, subang to ang, mody to w srted, none to possible arg cmt, scat free MICA & fld, tr coal frags, minor sh & slst intbds, fr - g intrgr por, no stn, no min flor, no o flor, no cu no rng.







2,950  
2,960  
2,970  
2,980  
2,990  
3,000  
3,010  
3,020  
3,030  
3,040  
3,050  
3,060  
3,070  
3,080  
3,090  
3,100  
3,110  
3,120  
3,130  
3,140  
3,150  
3,160



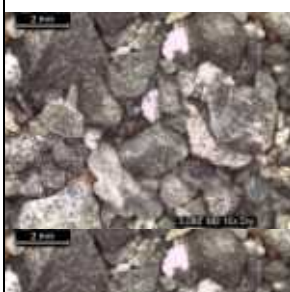
**MD: 2,997 '**  
**Inclination: 4.48 °**  
**Azimuth: 106.5 °**

WOB: 15.5 klb  
ROT: 155 rpm  
PP: 2122 psi  
SPM: #1 142  
ROP: 39.3ft/hr

Lag Depth: 3,000  
Min.: 27.02  
Strokes: 3,510

**Mud data**

3,029' MD  
WT: 9.2 ppg  
FV: 47  
pH: 9.2  
3,031' - Pump #2



3,051' - Pump #1

**Mud data**

3,051' MD  
WT: 9.2 ppg  
FV: 47  
Solids: 4 %  
Cake: 2  
pH: 9  
Cl: 900 mg/l

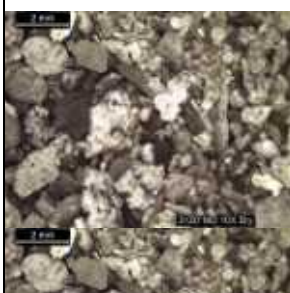
**MD: 3,060 '**  
**TVD: 3,060 '**  
**Inclination: 4.04 °**  
**Azimuth: 107.7 °**

3,077' - Pump #2

**Mud data**

3,090' MD  
WT: 9.2 ppg  
FV: 47  
pH: 9.4

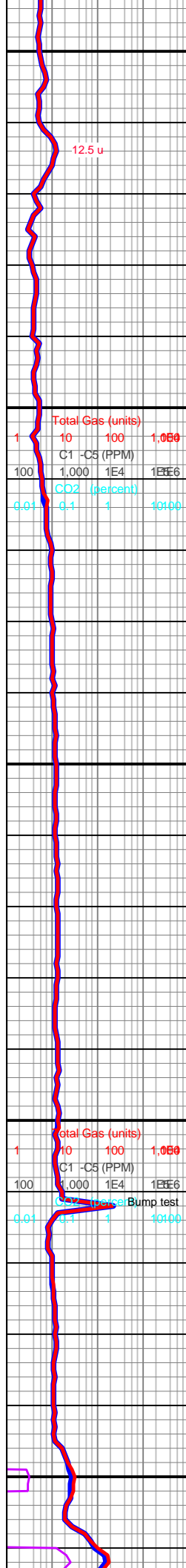
WOB: 16.9 klb  
ROT: 155 rpm  
PP: 2018 psi  
SPM: #2 141  
ROP: 18.5ft/hr



**MD: 3,123 '**  
**TVD: 3,123 '**  
**Inclination: 3.79 °**  
**Azimuth: 110.5 °**

19:20 hrs 7/3/15:  
TOOH to change BHA  
and add directional  
tools. BOB at 14:20 hrs  
7/4/15  
**MINDEPTH: 7/4/2015**

**Bit #: 3**  
**Size: 12.25 "**  
**Manufacture: REED**  
**Serial #: A160865**  
**Depth In: 3147' MD**



**Total Gas (units)**  
1 10 100 1,000  
**C1 -C5 (PPM)**  
100 1,000 1E4 1E6  
**CO2 (percent)**  
0.01 0.1 1 10100

**Total Gas (units)**  
1 10 100 1,000  
**C1 -C5 (PPM)**  
100 1,000 1E4 1E6  
**CO2 (percent)**  
0.01 0.1 1 10100

**Bump test**

MICA, free MICA, intrgr por, no stn, no min flor, no o flor,  
slow strmg cut. SLTST: ltGy, fri, fn grn, w srtd, calc cmt  
imbd MICA, free MICA, tt por, no stn, no min flor, no o fl  
strmg cut, mod brnYl rng. SH: medGy, blkly, grty txt, frm,  
imbd COAL.

2970 - 3000: SH: medGy - meddkGy, subblky, med txt,  
to brit, silty ip, scat carb lams, tr imbd pyr, tr coal frags.  
SLTST: ltGy - occ med brn, fri, fn grn, w srtd, calc - sil  
cmt, f sandy ip, occ imbd MICA, scat wispy carb lams, tt  
por, no stn, no min flor, no o flor, wk strmg cut, lt brnYl rng  
SS: Wh - v/ltGy, un to lsey cons, fn to med grn, scat c g  
subang to rnd, w srtd, pred sil to tr calc cmt, occ imbd  
MICA, tr free mica, intrgr por, no stn, no min flor, no o flor  
no cut, no rng.

3000 - 3030: SLTST: ltGy - occ med Gy brn, frm - fri, oc  
hd, fn grn, w srtd, predy calc - occ sil cmt, f sandy ip, occ  
imbd MICA, scat wispy carb lams, occ ss intbds, tt por, n  
stn, no min flor, no o flor, wk strmg cut, lt brnYl rng. SH:  
medGy - meddkGy, subblky, med txt, frm to brit, silty ip,  
scat carb lams, tr imbd pyr, tr coal frags.

3030 - 3060: SLTST: ltGy - occ med Gy brn, frm - fri, oc  
hd, fn grn, w srtd, predy calc - occ sil cmt, f sandy ip, occ  
imbd MICA, scat wispy carb lams, occ ss intbds, tt por, n  
stn, no min flor, no o flor, wk strmg cut, fnt PaYl rng. SS:  
Wh - v/ltGy, un to lsey cons, fn to med grn, scat c grn,  
subang to rnd, mod srtd, occ calc cmt, occ imbd MICA &  
frags, fr intrgr por, no stn, no min flor, no o flor, no cut, no  
rng.

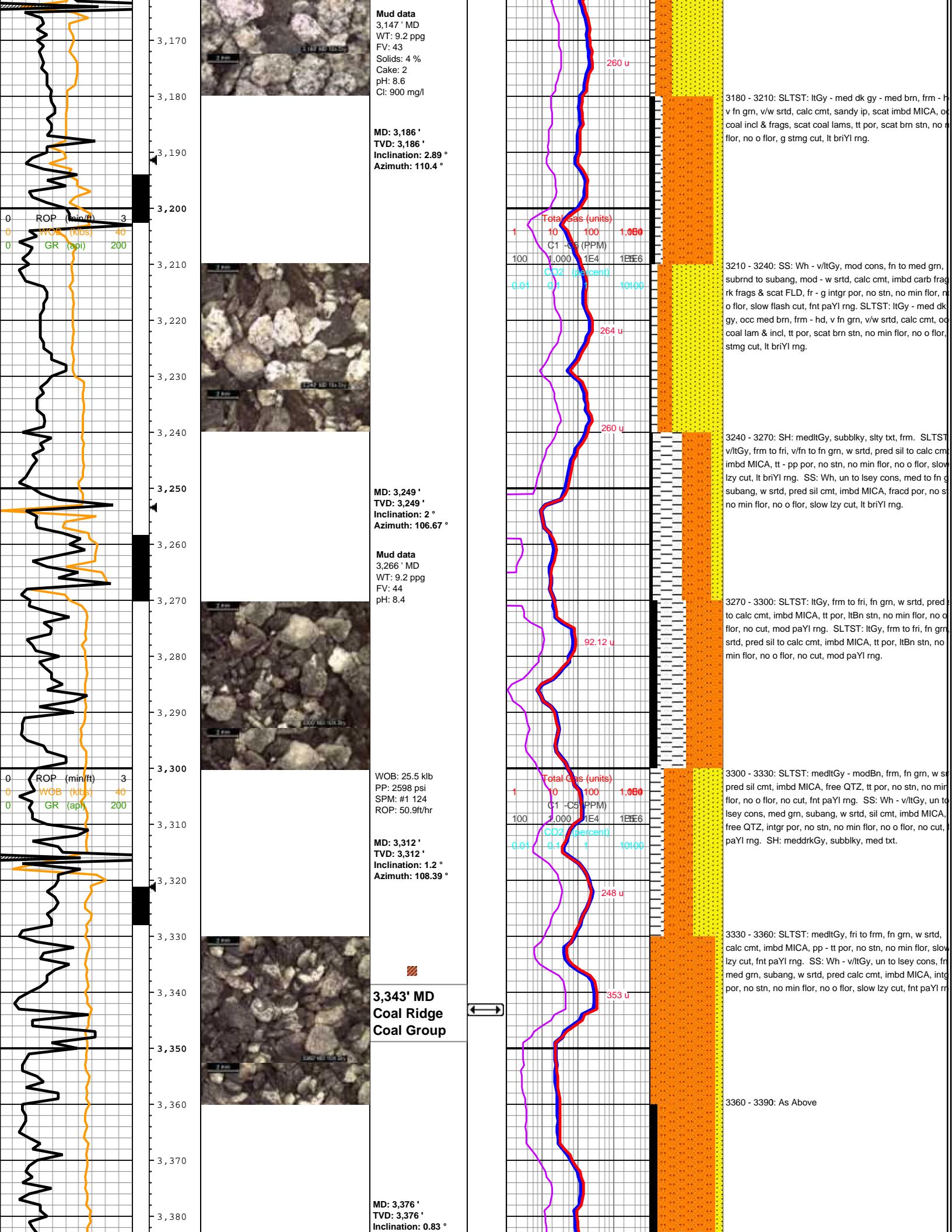
3060 - 3090: SLTST: as above. SS: Wh - v/ltGy, mod co  
fn to med grn, subang to subrnd, mod - w srtd, calc cmt,  
occ imbd MICA & rk frags, occ wispy carb lams and incl  
scat imbd pyr, tr frr co frags, silty ip, grdg to sltst ip, p - f  
intrgr por, no stn, no min flor, no o flor, no cut, no rng. SH:  
medGy - meddkGy, subblky, med txt, frm to brit, silty ip,  
scat carb lams.

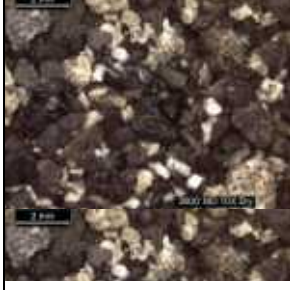
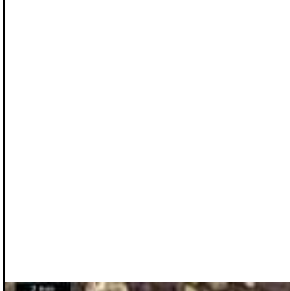
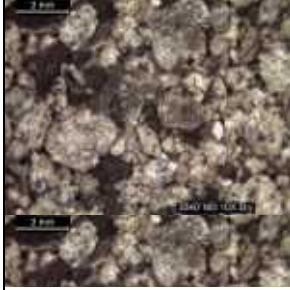
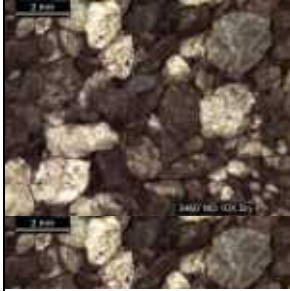
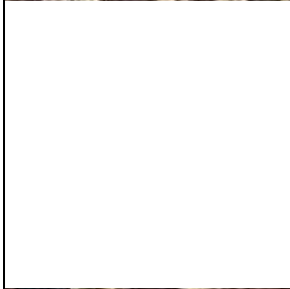
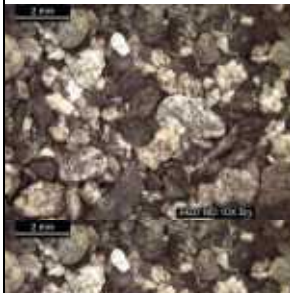
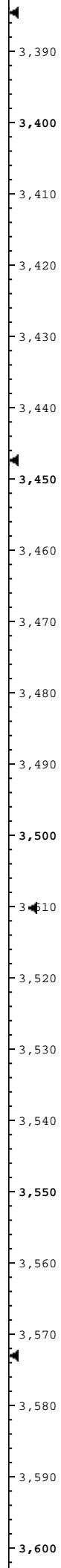
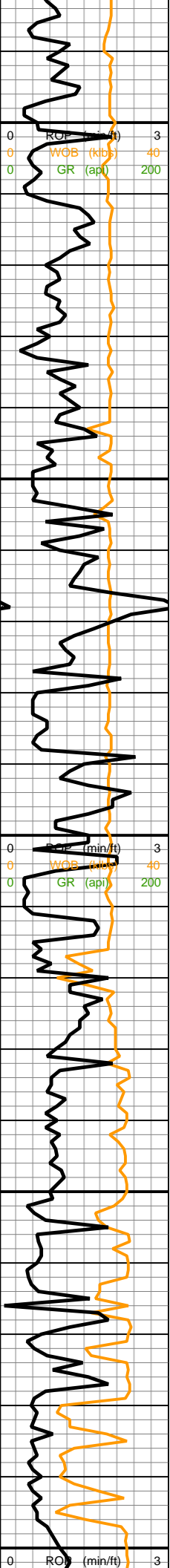
3090 - 3120: SS: Wh - v/ltGy, un to lsey cons, med grn,  
subang, w srtd, pred sil to tr calc cmt, imbd MICA, free  
PYR & free MICA, intrgr por, no stn, no min flor, no o flor,  
no cut, no rng. SLTST: ltGy, frm, fn grn, v/w srtd, pred s  
to tr calc cmt, imbd MICA, tt por, no stn, no min flor, no o  
flor, no cut, no rng. SH: meddkGy, blkly to subblky, grty  
txt, frm, imbd MICA.

3120 - 3150: SLTST: ltGy - med brn, frm - hd, v fn grn, v  
srtd, calc cmt, sandy ip, scat imbd MICA, scat coal frags  
scat coal lams, tt por, scat brn stn, no min flor, no o flor,  
stmg cut, fnt PaYl rng. SH: meddkGy, blkly to subblky,  
med txt, frm, imbd MICA, scat coal lam.

3150 - 3180: SS: Wh - v/ltGy, mod cons, fn to med grn,  
subrnd to subang, w srtd, calc cmt, imbd carb frags, rk  
frags & scat FLD, silty ip, fr intrgr por, no stn, no min flor,  
no o flor, slow flash cut, fnt paYl rng. SLTST: as above.







Azimuth: 129.4 °

WOB: 25.5 kib  
PP: 2573 psi  
SPM: #1 121  
ROP: 144.4ft/hr

MD: 3,439 '  
TVD: 3,439 '  
Inclination: 0.76 °  
Azimuth: 150.23 °

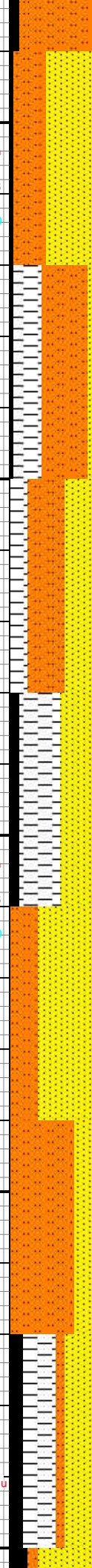
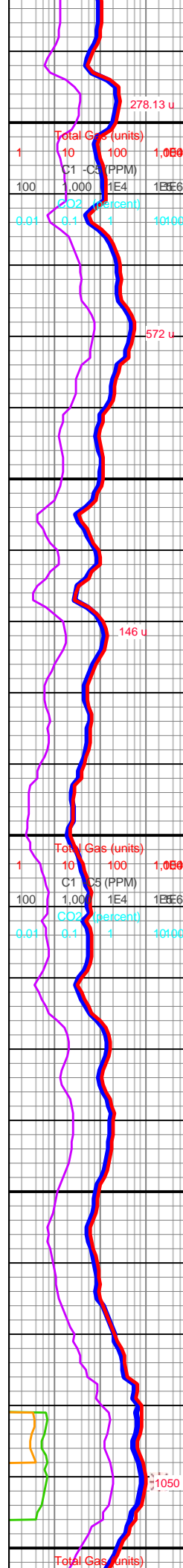
Lag Depth: 3,500  
Min: 40.0'  
Strokes: 4,110

WOB: 26.5 kib  
PP: 2929 psi  
SPM: #1 133  
ROP: 111.5ft/hr

MD: 3,502 '  
TVD: 3,502 '  
Inclination: 0.77 °  
Azimuth: 160.64 °

MD: 3,565 '  
TVD: 3,565 '  
Inclination: 0.57 °  
Azimuth: 149.42 °

WOB: 30.0 kib



3390 - 3420: SS: Wh - v/lGy, un to lsey cons, fn to med grn, subang, w srtd, pred calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, slow lzy cut, fnt paYl rng. SLTST: medltGy - medGy, frm, fn grn, w srtd, pred calc cmt, tt por, no stn, no min flor, no o flor, slow lzy cut, fnt paYl mg.

3420 - 3450: SLTST: ltGy, frm, fn grn, w srtd, calc cmt, imbd MICA, tt por, no stn, no min flor, no o flor, no cut, no rng. SH: meddrkGy, blkly to subblky, grty txt, frm, imbd COAL. SS: Wh - v/lGy, lsey to un cons, fn grn, rnd to subang, w srtd, calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, no cut, no rng.

3450 - 3480: SS: Wh - v/lGy, lsey to un cons, fn grn, rnd to subang, w srtd, calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, slow lzy cut, fnt paYl mg. SLTST: ltGy, frm to fri, fn grn, w srtd, calc cmt, imbd MICA, tt por, no stn, no min flor, no o flor, slow lzy cut, fnt paYl mg. SH: medGy, blkly to subblky, grty to slty txt, brit, imbd COAL.

3480 - 3510: SH: dskyBn - drkGy, blkly, grty txt, frm, imbd COAL. SS: Wh - v/lGy, pred lsey to un cons, fn to med grn, subang, w srtd, calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, slow lzy cut, fnt briYl mg.

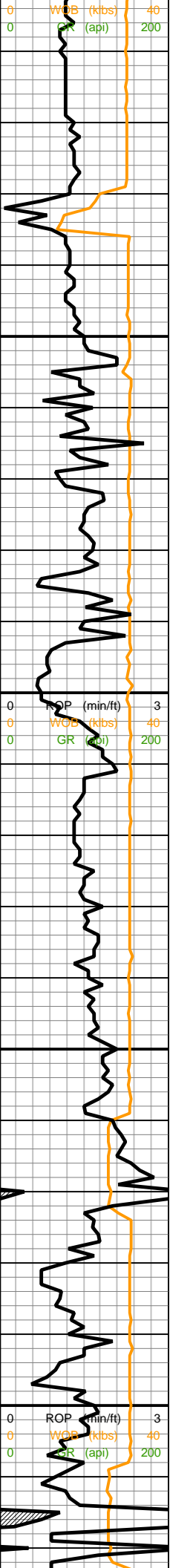
3510 - 3540: SS: Wh - v/lGy, pred lsey to un cons, fn to med grn, subang, w srtd, calc cmt, imbd MICA & PYR, fnt MICA & free QTZ, intr por, no stn, no min flor, no o flor, slow lzy cut, lt briYl rng. SLTST: ltBn, frm, fn grn, w srtd, calc cmt, imbd MICA, tt por, no stn, no min flor, no o flor, slow lzy cut, fnt briYl rng.

3540 - 3570: SLTST: meddrkGy - modBn, hd to frm, fn grn, w srtd, calc cmt, tt por, no stn, no min flor, no o flor, fast cut, briYl mg. SS: v/lGy, un to lsey cons, fn to med grn, subang to rnd, w srtd, calc cmt, imbd MICA, free QTZ, intr por, no stn, no min flor, no o flor, fast lzy cut, fnt briYl rng.

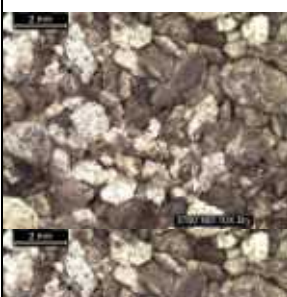
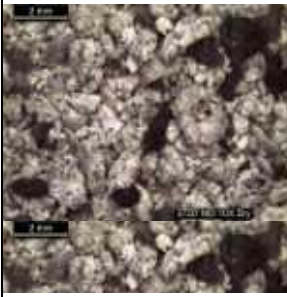
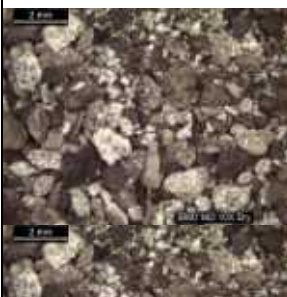
3570 - 3600: SS: v/lGy, un to lsey cons, fn to med grn, subang to rnd, w srtd, pred sil to tr calc cmt, imbd MICA, free QTZ, intr por, no stn, no min flor, no o flor, slow lzy cut, fnt no rng. SH: medGy, blkly to subblky, grty to slty txt, brit, imbd COAL. SLTST: modBn, frm, fn grn, w srtd, pred sil to tr calc cmt, tt por, no stn, no min flor, no o flor, slow lzy cut, no rng.

3600 - 3630: SS: Wh - v/lGy, lsey cons, pred med to fn grn, subang to rnd, w srtd, pred sil to tr calc cmt, imbd





3,610  
3,620  
3,630  
3,640  
3,650  
3,660  
3,670  
3,680  
3,690  
3,700  
3,710  
3,720  
3,730  
3,740  
3,750  
3,760  
3,770  
3,780  
3,790  
3,800  
3,810  
3,820



PP: 3195 psi  
SPM: #1 142  
ROP: 54.2ft/hr

3,624' 7/5/2015  
MINDEPTH

MD: 3,628 '  
TVD: 3,628 '  
Inclination: 0.6 °  
Azimuth: 148.97 °

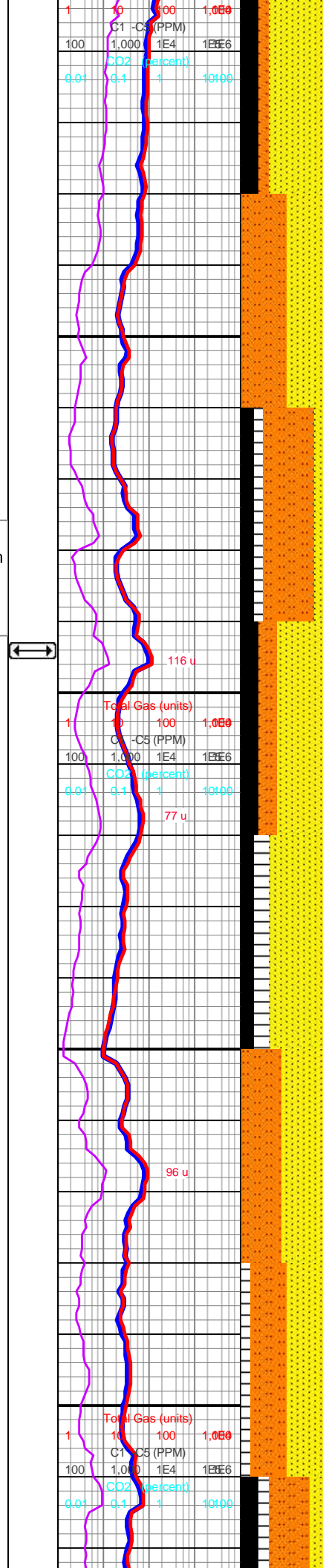
3,693' MD  
South Canyon  
Group (V  
seam)

TMD: 3,692 '  
TVD: 3,692 '  
Inclination: 0.59 °  
Azimuth: 157.45 °

WOB: 30.3 klb  
PP: 3282 psi  
SPM: #1 139  
ROP: 84.6ft/hr

MD: 3,755 '  
TVD: 3,755 '  
Inclination: 0.68 °  
Azimuth: 152.44 °

WOB: 30.7 klb  
PP: 3169 psi  
SPM: #2 81  
ROP: 39.9ft/hr



grn, subang to md, w srt, pred sil to tr calc cmt, imbd MICA, free QTZ, intr por, no stn, fnt ltOr min flor, no o flor, fast strmg cut, lt briYl rng. SLTST: bnshBlk, frm, fn grn, w srt, pred sil to tr calc cmt, tt por, no stn, fnt ltOr min flor, no o flor, fast strmg cut, lt briYl rng.

3630 - 3660: SLTST: modOrPk - ltGy, fri to frm, fn grn, w srt, calc cmt, imbd MICA, tt por, no stn, no min flor, no o flor, no cut, fnt briYl rng. SS: Wh - v/ltGy, lsey cons, pred fn to med grn, subang to rnd, w srt, pred sil to tr calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, no cut, fnt briYl rng.

3660 - 3690: SLTST: medGy, hd to frm, fn grn, w srt, pred calc cmt, imbd MICA, tt por, no stn, no min flor, no o flor, fast lzy cut, fnt paYl rng. SS: Wh - v/ltGy, lsey to un cons, fn grn, rnd to subang, w srt, pred calc to sil cmt, imbd MICA, intr por, no stn, no min flor, no o flor, fast lzy cut, fnt paYl rng. SH: medGy, subblky, grty txt, frm, imbd COAL.

3690 - 3720: SS: Wh, un to mod cons, med to fn grn, subang, mody srt, pred sil to occ calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, weak lzy cut, fnt paYl rng. SLTST: dskyBn - modBn, frm to fri, fn grn, w srt, pred calc cmt, tt por, no stn, no min flor, no o flor, weak lzy cut, fnt paYl rng.

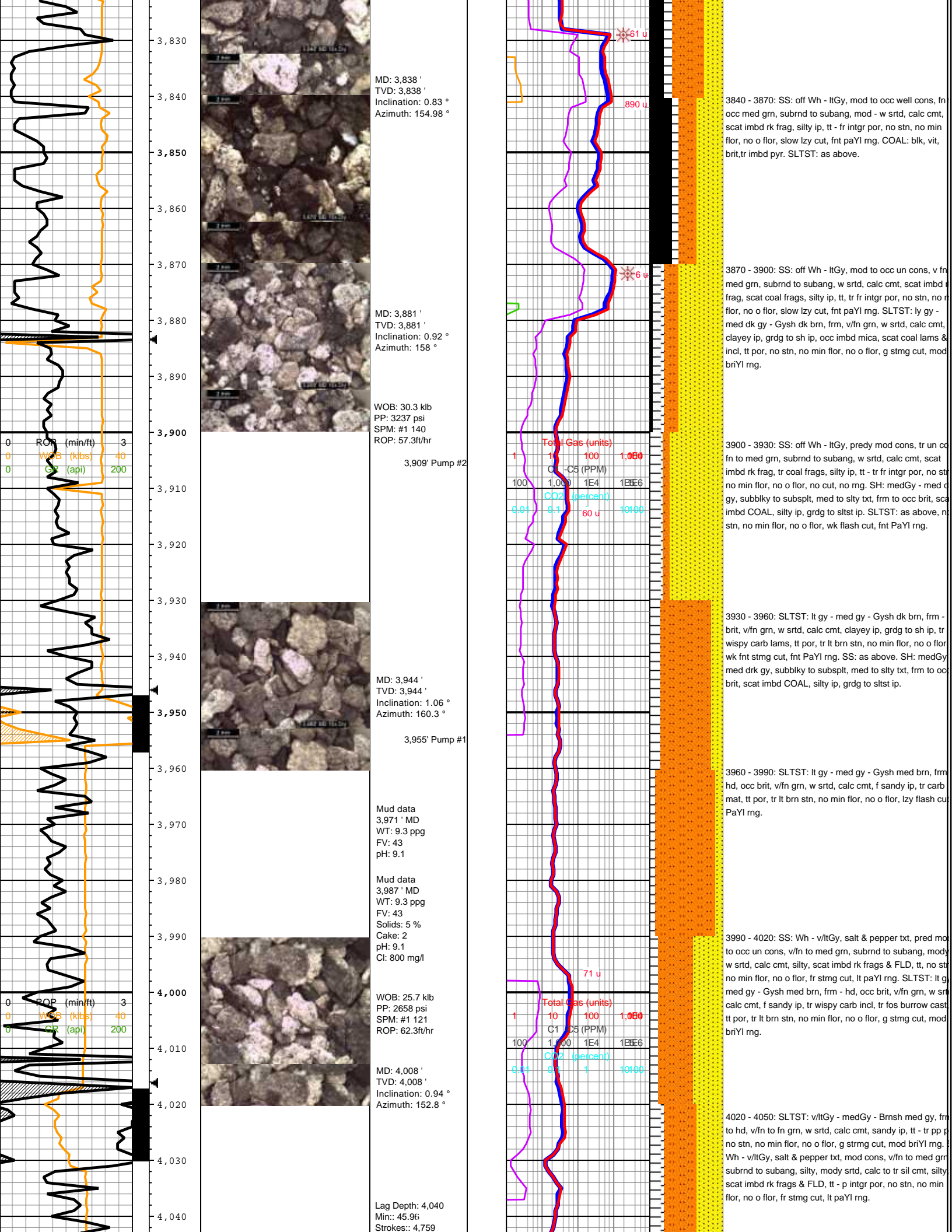
3720 - 3750: SS: Wh - v/ltGy, un to lsey cons, fn grn, subang, w srt, calc cmt, imbd MICA & PYR, free QTZ & free PYR, intr por, no stn, no min flor, no o flor, no cut, fnt paYl rng. SH: modBn - meddrkGy, subblky to split, grty to brit, imbd COAL.

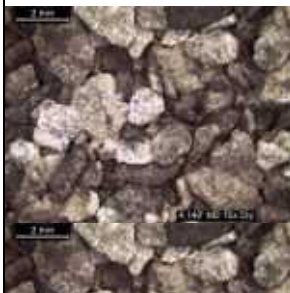
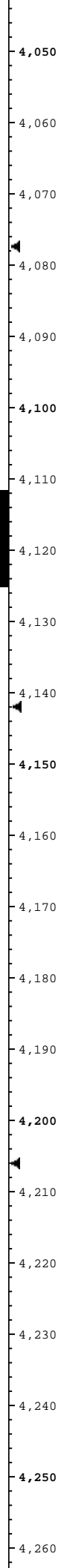
3750 - 3780: SS: v/ltGy - ltGy, lsey to mod cons, fn grn, to subang, w srt, pred calc cmt, imbd MICA, intr por, no stn, no min flor, no o flor, slow lzy cut, mod paYl rng. SLTST: bnshBlk, frm, v/fn grn, w srt, calc cmt, tt por, no stn, no min flor, no o flor, slow lzy cut, mod paYl rng.

3780 - 3810: SS: off Wh - ltGy, mod to occ well cons, fn to occ med grn, subrnd to subang, w srt, calc cmt, imbd MICA, tt - fr intr por, no stn, no min flor, no o flor, slow lzy cut, mod paYl rng. SLTST: med dk gy to GyshBlk, frm, v/fn grn, w srt, calc cmt, clayey ip, grdg to sh ip, tt por, no stn, no min flor, no o flor, g stmg cut, mod briYl rng.

3810 - 3840: SLTST: med dk gy - Gysh dk brn, occ lt gy to frm, v/fn grn, w srt, calc cmt, clayey ip, grdg to sh ip, occ imbd mica, scat imbd pyr, tt por, no stn, no min flor, no o flor, g stmg cut, mod briYl rng. SS: as above. COAL: blk vit, brit, tr imbd pyr.







WOB: 25.8 klb  
ROT: 137 rpm  
PP: 2694 psi  
SPM: #1 124  
ROP: 33.9ft/hr

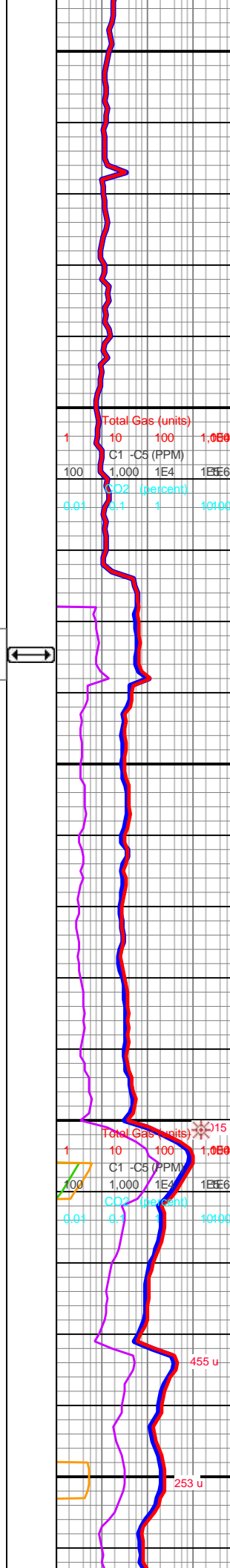
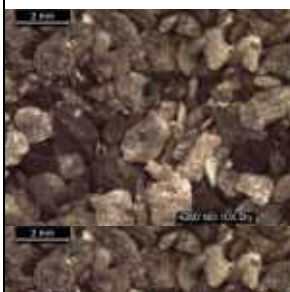
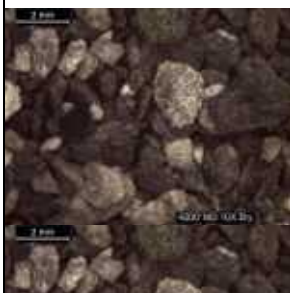
**Mud data**  
4,116 ' MD  
WT: 9.3 ppg  
FV: 45  
pH: 9.5

**4,135' MD  
Cameo Top**

**Mud data**  
4,168 ' MD  
WT: 9.2 ppg  
FV: 45  
pH: 9.5

MD: 4,197 '  
TVD: 4,197 '  
Inclination: 0.43 °  
Azimuth: 30.78 °

WOB: 30.1 klb  
PP: 2837 psi  
SPM: #1 126  
ROP: 52.6ft/hr



4080 - 4110: SLTST: ltGy - medGy - Brnsh med gy, frm  
hd, v/fn to fn grn, w srtd, calc cmt, occ sandy, clayey ip,  
grdg to sh ip, rr free coal frags, tt, no stn, no min flr, no  
flr, wk lazy flash cut, fnt paYl rng. SH: medGy - med dr  
gy, subbly to subsplt, slty txt, frm to occ brit, silty, occ  
grdg to sltst.

4110 - 4140: SLTST: medGy - Brnsh med gy, frm to hd,  
vfn to fn grn, w srtld, calc cmt, occ sandy, tr free coal  
frags, tt, no stn, no min flr, no o flr, wk stmg cut, lt paY  
rng. SS: v ltGy, mod cons, fn grn, subrnd, silty, w srtld, c  
cmt, tt, no stn, no min flr, no o flr, slow flash cut, lt paY  
rng.

4140 - 4170: SLTST: v/lTgY - medGy, frm to hd, v/fn to fr  
grn, w srted, calc cmt, tt - tr pp por, no stn, no min flor, no  
flor, slow lzy cut, mod briYl rng. SS: Wh - v/lTgY, lsey  
cons, fn grn, rnd, w srted, calc cmt, imbd MICA, intgr por,  
no stn, no min flor, no o flor, slow strmg cut, mod briYl m

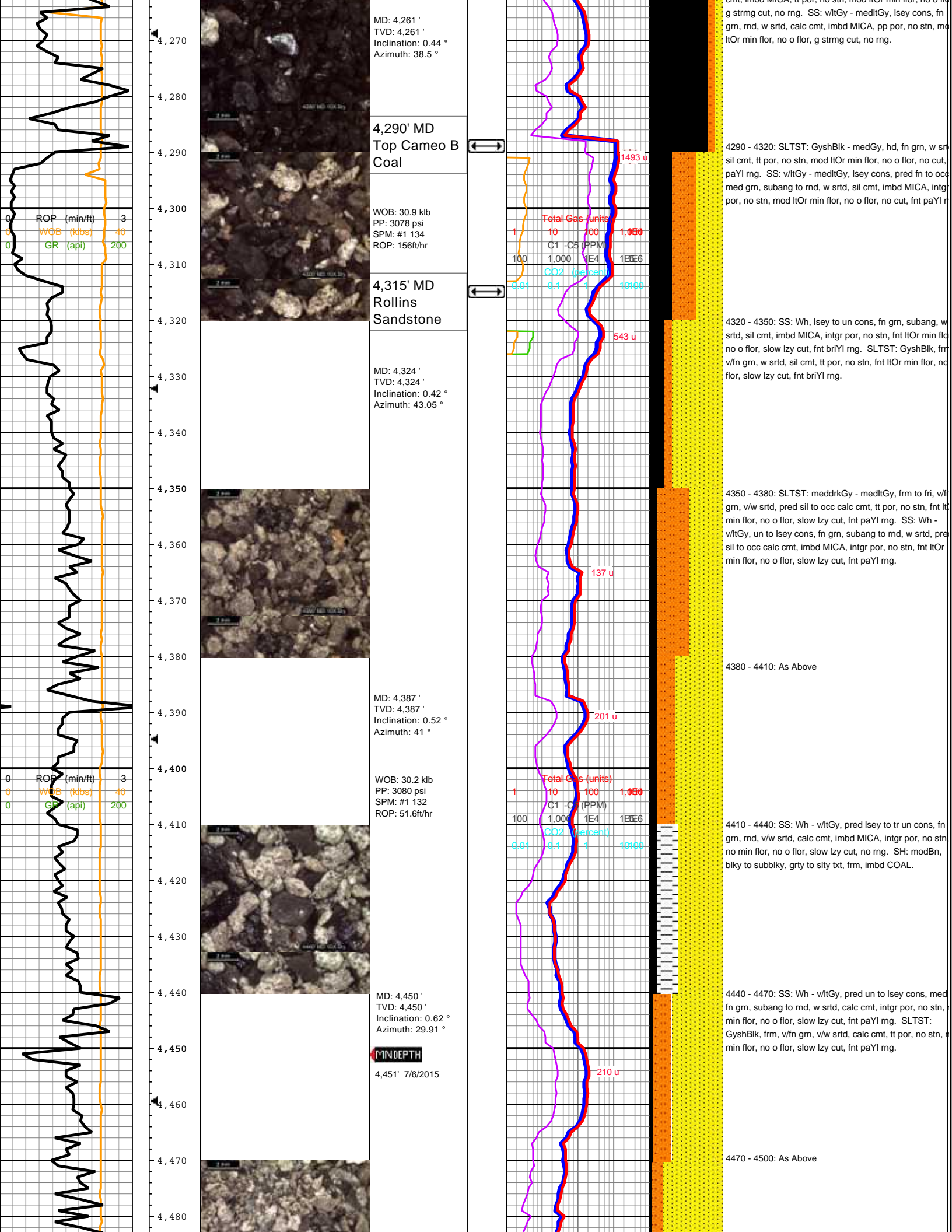
4170 - 4200: As Above

4200 - 4230: SLTST: drkGy - meddrkGy, frm to fri, fn grn  
w srtd, calc cmt, tt por, no stn, mod ltOr min flwr, no o flr  
slow lzy cut, brYl rng. SS: Wh - vltGy, lsey to un cons, f  
grn, rnd, w srtd, calc cmt, imbd PYR & MICA, intrgr por, n  
stn, mod ltOr min flwr, no o flwr, slow strmg cut, mod brYl  
rng.

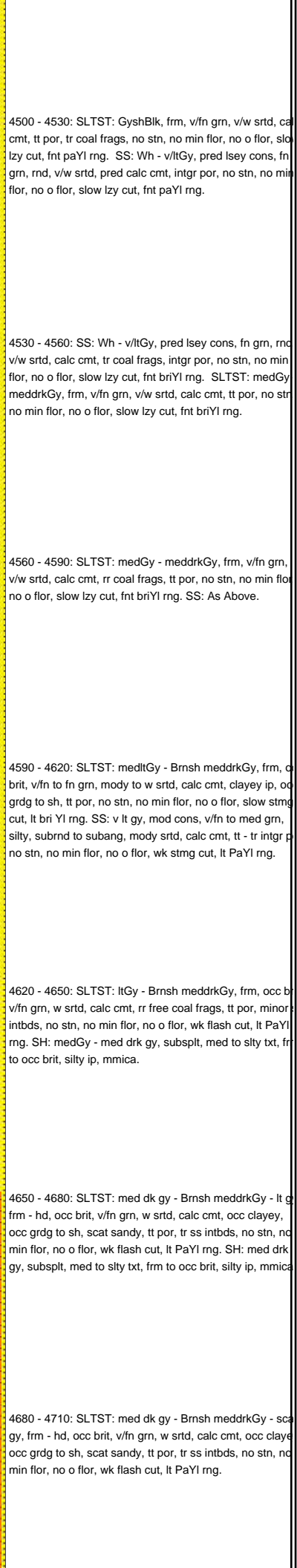
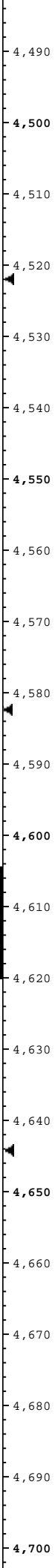
4230 - 4260: SLTST: medGy - medItGy, frm, fn grn, w s  
calc cmt, tt por, no stn, mod ltOr min flor, no o flor, slow  
cut, mod brIyI rng. SH: dskyBn, subbly, grty txt, frm,  
imbd COAL. SS: Wh - vItGy, lsey to un cons, fn grn, rn  
w strd, calc cmt, imbd PYR & MICA, intgr por, no stn, m  
ltOr min flor, no o flor, slow strng cut, mod brIyI rng.

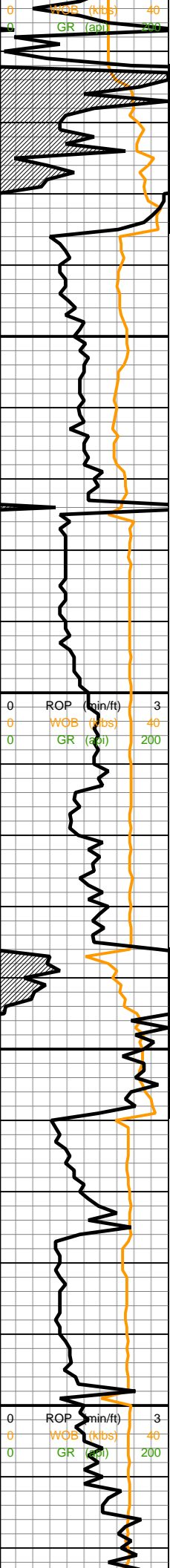
4260 - 4290: SLTST: GyshBlk, frm, fn grn, w srtd, calc  
cmt, imbd MICA, tt per, no str, mod ltOr min flr, no o flr



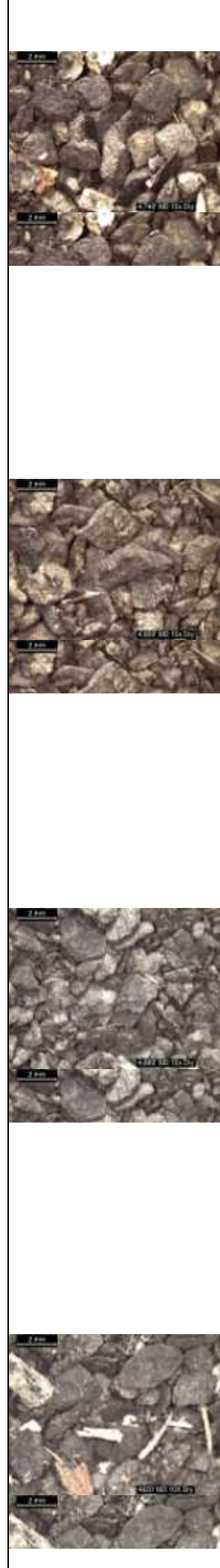








4,710  
4,720  
4,730  
4,740  
4,750  
4,760  
4,770  
4,780  
4,790  
4,800  
4,810  
4,820  
4,830  
4,840  
4,850  
4,860  
4,870  
4,880  
4,890  
4,900  
4,910  
4,920



ROT: 150 rpm  
PP: 2704 psi  
SPM: #1 125  
ROP: 34.7f/hr

MD: 4,704 '  
TVD: 4,703.99 '  
Inclination: 0.72 °  
Azimuth: 129.8 °

Mud data  
4,717 ' MD  
WT: 9.25 ppg  
FV: 45  
Solids: 4.5 %  
Cake: 2  
pH: 9  
Cl: 800 mg/l

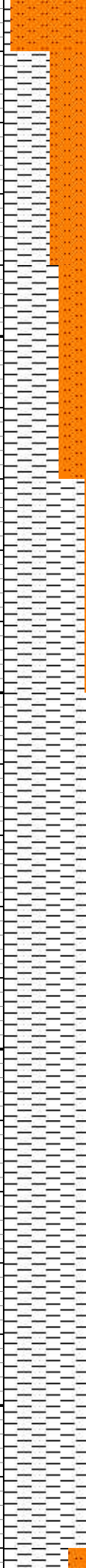
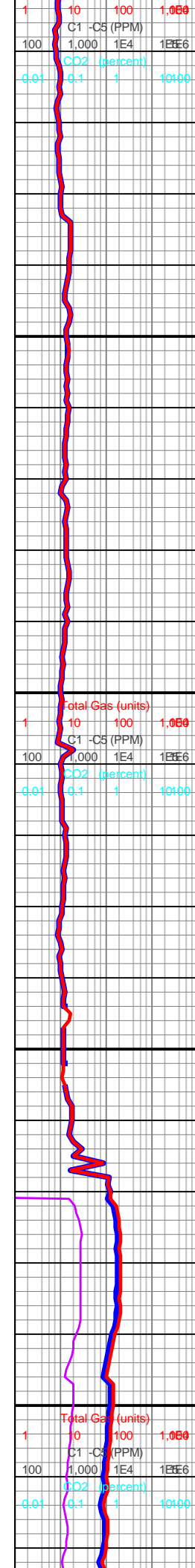
MD: 4,767 '  
TVD: 4,767 '  
Inclination: 0.7 °  
Azimuth: 174.6 °

Mud data  
4,812 ' MD  
WT: 9.2 ppg  
FV: 45  
pH: 9.5

MD: 4,830 '  
TVD: 4,830 '  
Inclination: 0.5 °  
Azimuth: 232.8 °

MD: 4,893 '  
TVD: 4,893 '  
Inclination: 0.79 °  
Azimuth: 307.91 °

Mud data  
4,923 ' MD  
WT: 9.2 ppg



4710 - 4740: SH: med drk gy - dk gy, subsplt to subblky, med to silty txt, frm to occ brit, silty ip, occ mmica. SLTST: med dk gy - Brnsh meddrkGy, frm - hd, occ brit, v/fn grn srted, calc cmt, occ clayey, occ grdg to sh, tt por, rr ss intbds, no stn, no min flor, no o flor, wk fnt flash cut, fnt PaYl mg.

4740 - 4770 SH: med drk gy - dk gy, subsplt to subblky, med to silty txt, frm to occ brit, calc, silty, mmica. SLTST: med dk gy - Brnsh meddrkGy, frm - hd, occ brit, v/fn grn srted, calc cmt, occ clayey, occ grdg to sh, tt por, rr ss intbds, no stn, no min flor, no o flor, wk flash cut, fnt PaYl mg.

4770 - 4800: SH: med drk gy - dk gy, subsplt to subblky, med to silty txt, frm, calc, silty, scat imbd mica. SLTST: a above.

4800 - 4830: SH: med drk gy - dk gy, scat brnsh gy, subsplt to subblky, med to silty txt, frm, calc, silty, scat imbd mcxln pyr, scat imbd mica.

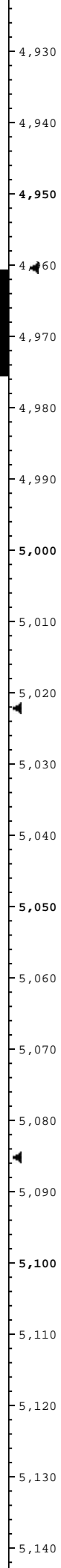
4830 - 4860: SH: med drk gy - dk gy, scat brnsh gy, subsplt to subblky, med to silty txt, frm, calc, silty, scat grdg to sltst, scat imbd mcxln pyr, scat imbd mica, tr intb ss, rr free cal (frac fill).

4860 - 4890: SH: med drk gy - dk gy, scat brnsh gy, subsplt to subblky, med to silty txt, frm, calc, silty, scat grdg to sltst, scat imbd mcxln pyr, scat imbd mica, rr free cal (frac fill).

4890 - 4920: SH: meddrkGy - drkGy, blkly to subblky, grt txt, brit to frm, imbd calc flk. SLTST: medGy, frm, v/fn gr v/w srted, calc cmt, tt por, no stn, no min flor, no o flor, no cut, no mg.

4920 - 4950: SH: drkGy, subblky, silty txt, sft to frm, occ brit, occ mmica, silty ip. SLTST: medGy, frm, v/fn grn, w





MD: 4,956 '  
TVD: 4,956 '  
Inclination: 0.79 °  
Azimuth: 329.09 °

WOB: 31.0 klb  
PP: 2771 psi  
SPM: #1122  
ROP: 27.9ft/hr

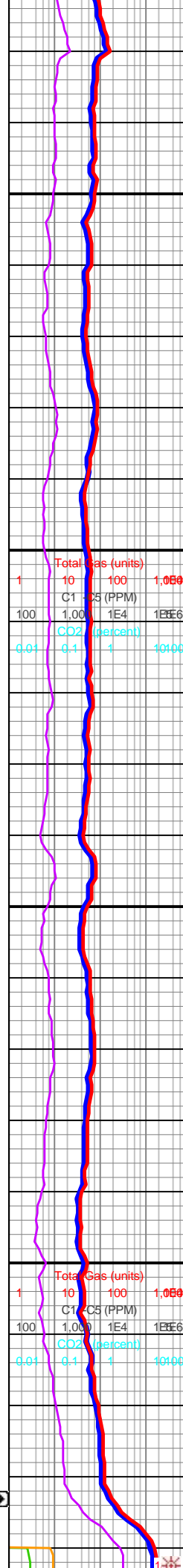
Lag Depth: 5,000  
Min:: 49.59  
Strokes:: 5,911

MD: 5,019 '  
TVD: 5,019 '  
Inclination: 0.68 °  
Azimuth: 7.16 °

MD: 5,082 '  
TVD: 5,082 '  
Inclination: 0.51 °  
Azimuth: 24.4 °

WOB: 30.4 klb  
PP: 2857 psi  
SPM: #1 122  
ROP: 30.5ft/hr

5,133' MD  
Cozette



srted, calc cmt, clayey ip, tt por, no stn, no min flor, no o f  
no cut, no rng.

4950 - 4980: SH: drkGy, subblky, slty txt, sft to frm, occ  
brit, occ mmica, silty ip, tr free cal. SLTST: medGy, frm,  
v/fn grn, w srtd, calc cmt, clayey ip, occ grdg to sh, tt po  
no stn, no min flor, no o flor, no cut, no rng.

4980 - 5010: SLTST: ltGy - meddrkGy, fri, v/fn grn, v/w  
srtd, calc cmt, tt por, no stn, no min flor, no o flor, no cut  
paYl rng. SH: GyshBlk, subblky, slty txt, frm.

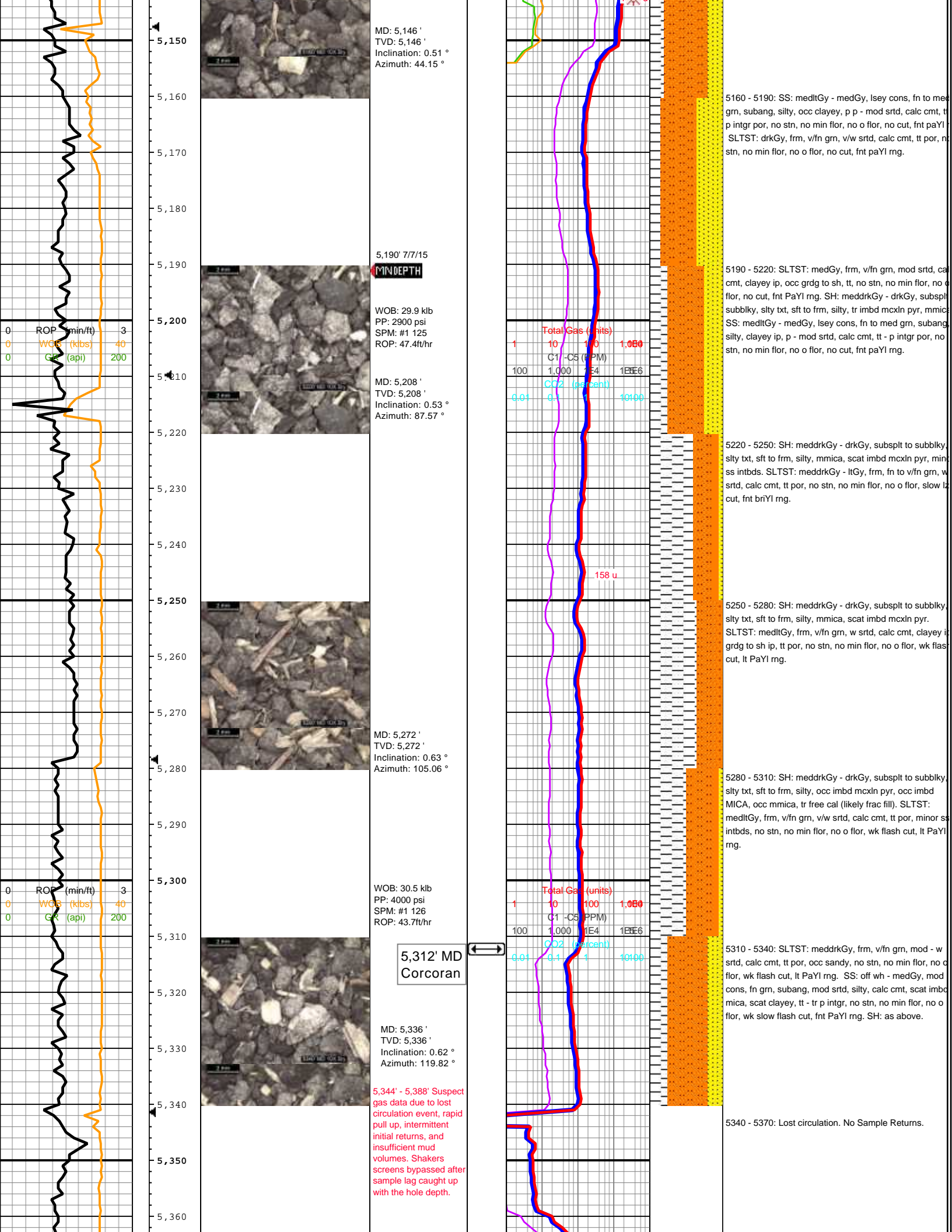
5010 - 5040: SH: meddrkGy - drkGy, subplit to subblky,  
med - silty txt, sft to frm, silty, occ mmica, calc. SLTST:  
medltGy - meddrkGy, frm, v/fn grn, mod srted, calc cmt, d  
clayey, grdg to sh ip, tt por, no stn, no min flor, no o flor,  
cut, no rng.

5040 - 5070: SH: meddrkGy - drkGy, subplit to subblky,  
med - slty txt, sft to frm, silty, occ mmica, calc. SLTST:  
medltGy - meddrkGy, frm, v/fn grn, mod srted, calc cmt, d  
clayey, grdg to sh ip, tt por, no stn, no min flr, no o flr,  
cut, no rng.

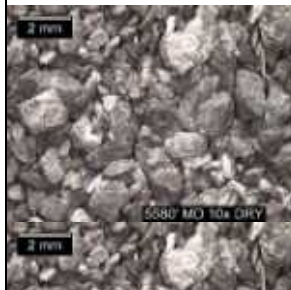
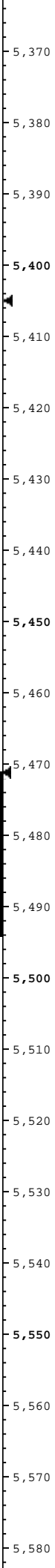
5070 - 5100: SH: meddrkGy - drkGy, subplst to subblky,  
med - slty txt, sft to frm, silty, mmica, calc. SLTST: medG  
- meddrkGy, frm, v/fn grn, mod srted, calc cmt, occ clayey  
occ grgd to sh, minor ss intbds, tt por, no strn, no min flr  
no o flor, no cut, fnt briYl rng.

5100 - 5130: SH: meddrkGy - drkGy, subsplnt to subblky,  
med - slty txt, sft to frm, silty, mmica, calc. SLTST: medG  
- meddrkGy, frm, w/fn grn, w srted, calc cmt, clayey ip, grd  
to sh. tt por. no stn. no min flor. no o flor. no cut. paYl rnt

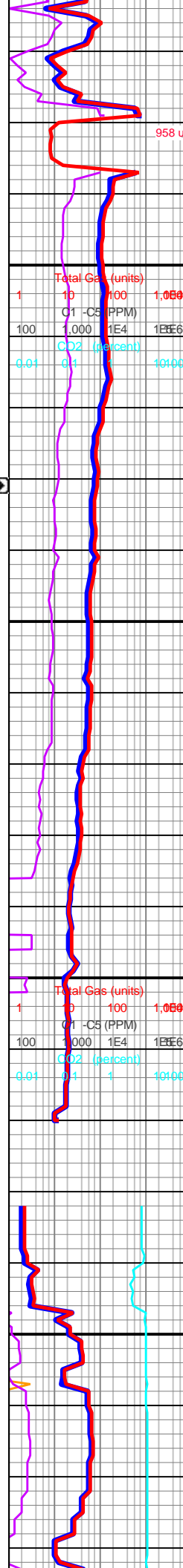
5130 - 5160: SLTST: drkGy, frm, fn grn, w srtcd, calc cmt, imbd CAL, tt por, no stn, no min flwr, no o flwr, slow lzy cut, fnt paYl rng. SS: Wh - v/tGy, lsey cons, fn to med grn, subang, w srtcd, calc cmt, intgr por, no stn, no min flwr, no flwr, slow lzy cut, fnt paYl rng.



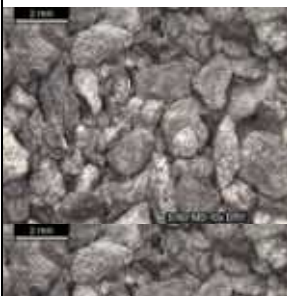
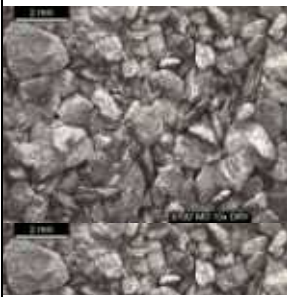
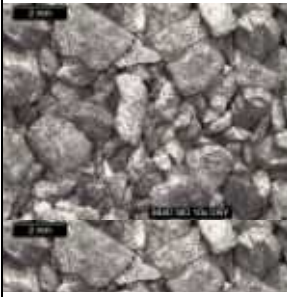
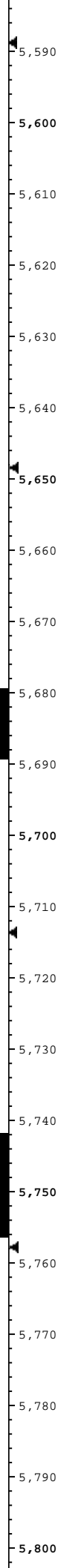
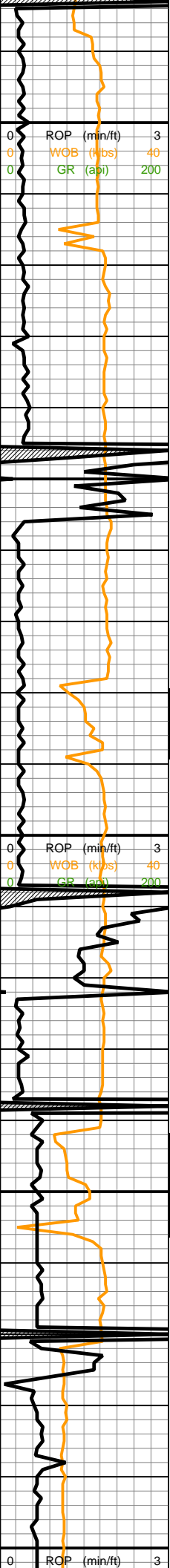




Bit #: 4  
Size: 8.5 "  
Manufacture: REED  
Serial #: A200368  
Type: PDC  
Depth In: 5532 ' MD



5580 - 5610: SH: drkGy - med lt Gy, subblky to subspplt, med txt, frm to brit, imbd MICA. SS: Op - v/ltGy, mod co v/fn to fn grn rnd w srtld sil cmt no stp no min flwr no



MD: 5,592 '  
TVD: 5,592 '  
Inclination: 1.02 °  
Azimuth: 152.58 °

WOB: 23.5 klb  
PP: 2535 psi  
SPM: 130  
ROP: 159.5ft/hr

Mud data  
5,640 ' MD  
WT: 8.9 ppg  
FV: 45  
pH: 9.6

MD: 5,652 '  
TVD: 5,652 '  
Inclination: 1.33 °  
Azimuth: 154.16 °

WOB: 23 klb  
PP: 2490 psi  
SPM: 129  
ROP: 158ft/hr

Mud data  
5,710 ' MD  
WT: 9 ppg  
FV: 39  
pH: 9.3

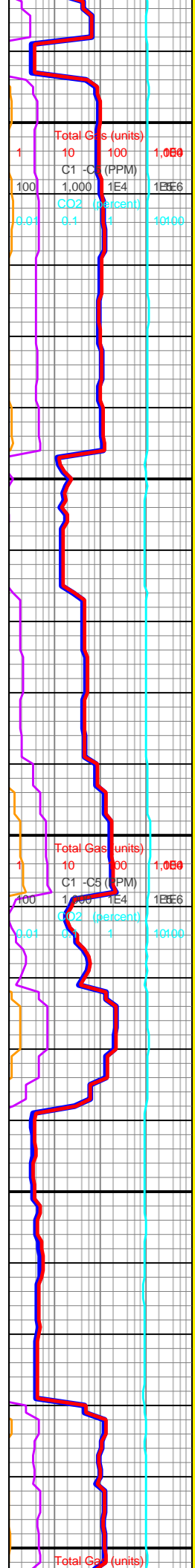
Pumped pill at 5730'

Electrical breaker failure

MD: 5,751 '  
TVD: 5,751 '  
Inclination: 0.91 °  
Azimuth: 167.12 °

MD: 5,778.68 '  
TVD: 5,778.68 '  
Inclination: 0.68 °  
Azimuth: 196.14 °

WOB: 14 klb  
ROT: 48 rpm  
PP: 1838 psi  
SPM: 109  
ROP: 92.8ft/hr



flor, no cut, lt yel rng.

5610 - 5640: SH: dk Gy - med lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, scat intbd ss. Tr SS: Op - v/ltGy, mod cons, v/fn to fn grn, rnd, w srtd, sil cmt, no stn, no min flor, no o flor, no cut, lt yel rng.

5640 - 5670: SH: dk Gy - med lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, scat intbd ss, no stn, no min flor, no o flor, no cut, lt yel rng.

5670 - 5700: SH: Gy - med lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, scat intbd ss, no stn, no min flor, no o flor, slow strn cut, lt yel rng.

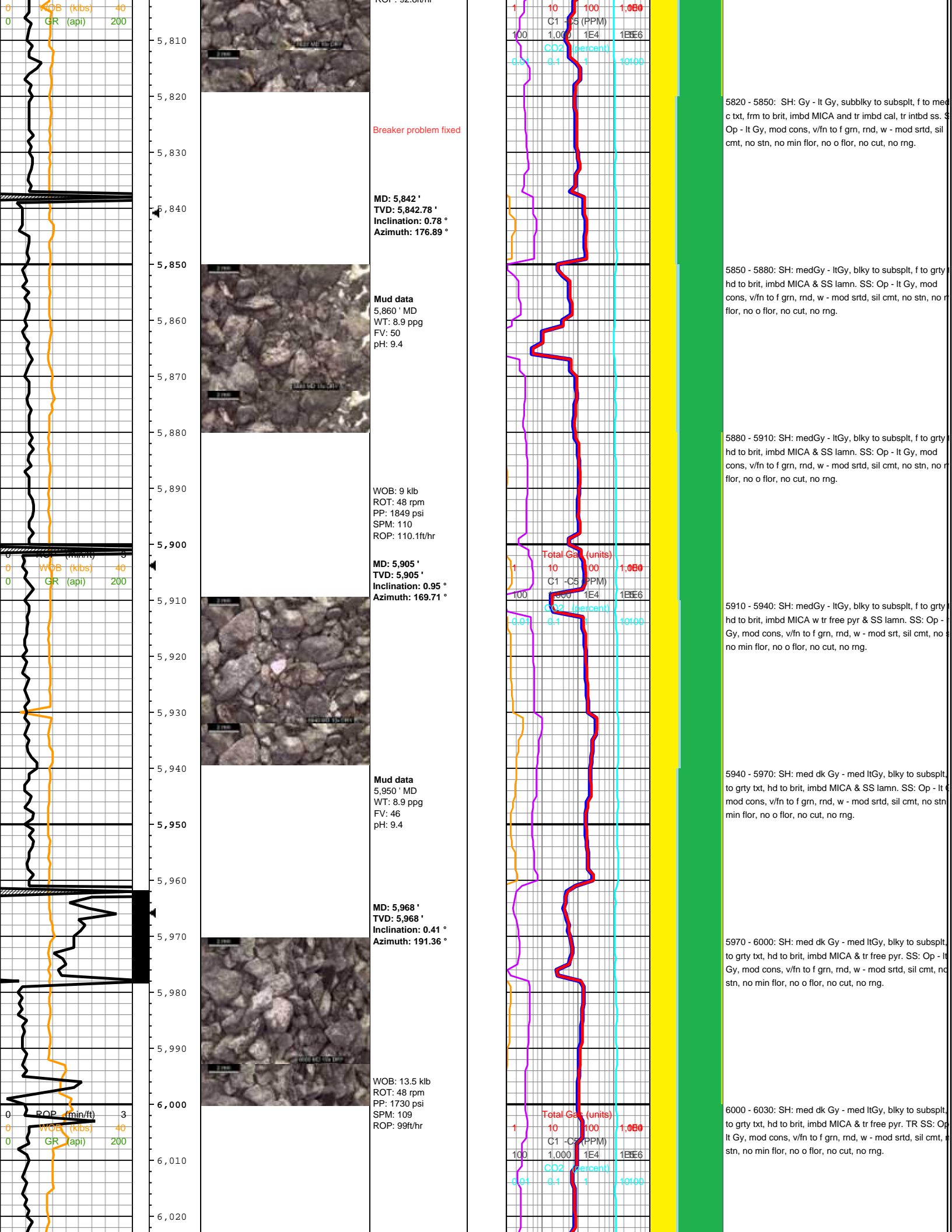
5700 - 5730: SH: Gy - med lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA. Tr SS: Op - v/ltGy, mod cons, v/fn to med grn, rnd, w - mod srtd, sil cmt, no stn, min flor, no o flor, no cut, lt yel rng.

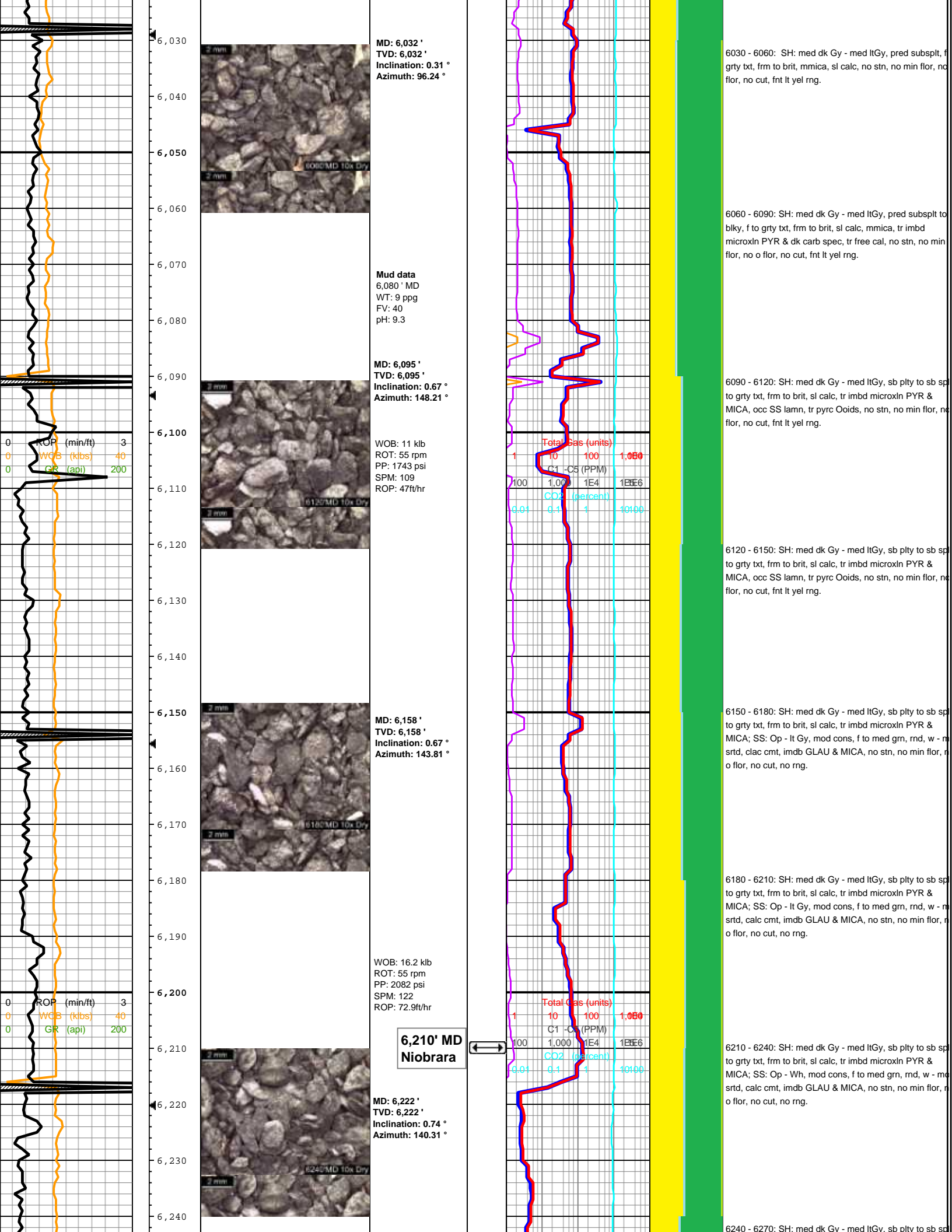
5730 - 5760: SH: Gy - lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, occ intbd ss. SS: Op - ltGy, mod cons, v/fn to med grn, rnd, w - mod srtd, sil cmt, no stn, no min flor, no o flor, no cut, lt yel rng.

5760 - 5790: SH: Gy - lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, free pyr & tr cal, scat intbd ss. SS: Op - ltGy, mod cons, v/fn to med grn, rnd, w - mod srtd, sil cmt, no stn, no min flor, no o flor, no cut, lt yel rng.

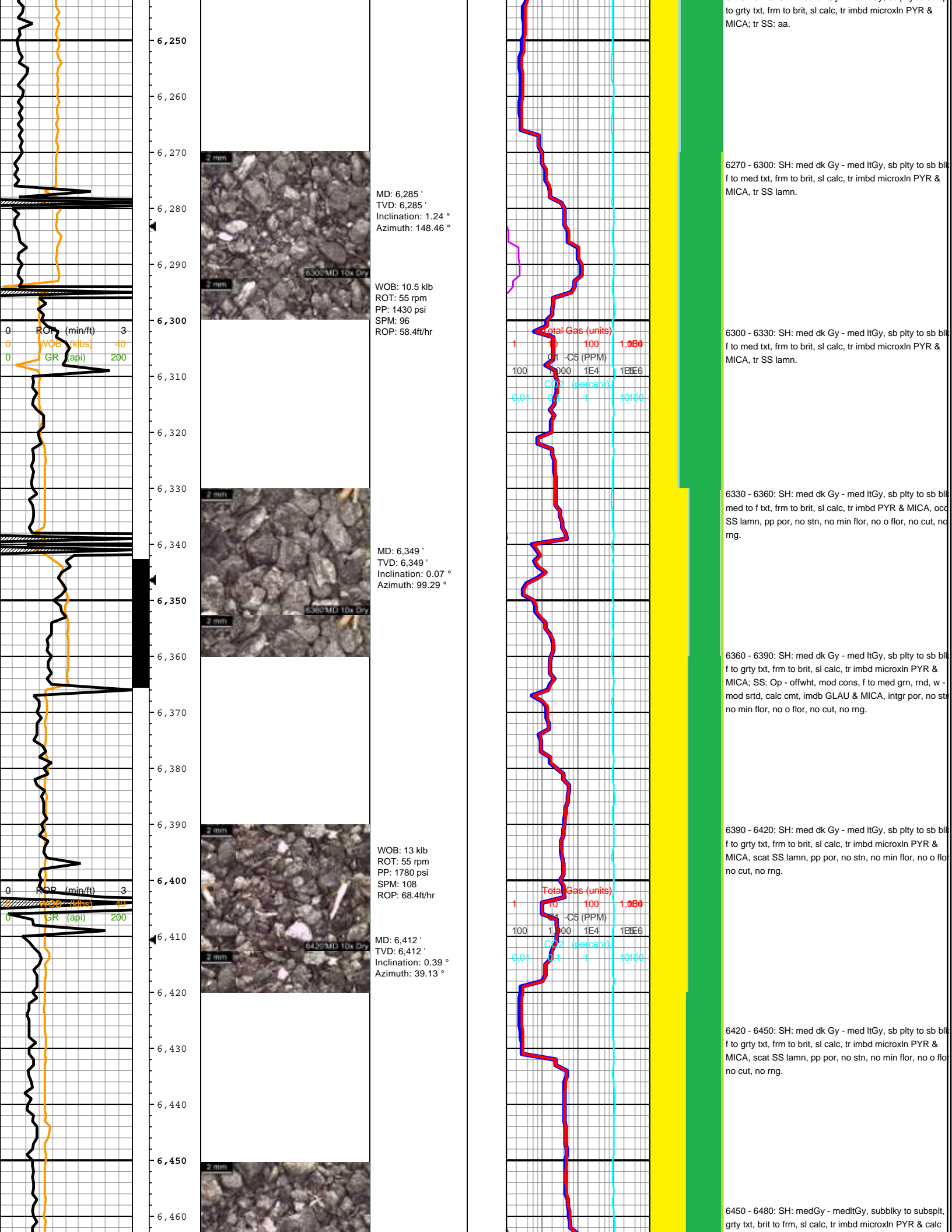
5790 - 5820: SH: Gy - lt Gy, subblky to subsplt, f to med txt, frm to brit, imbd MICA, scat intbd ss. SS: Op - lt Gy, mod cons, v/fn to f grn, rnd, w - mod srtd, sil cmt, no stn, min flor, no o flor, v slow strn cut, lt yel rng.

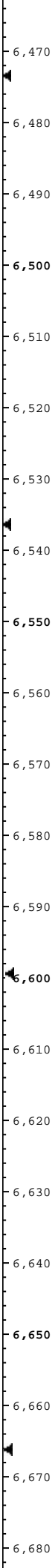




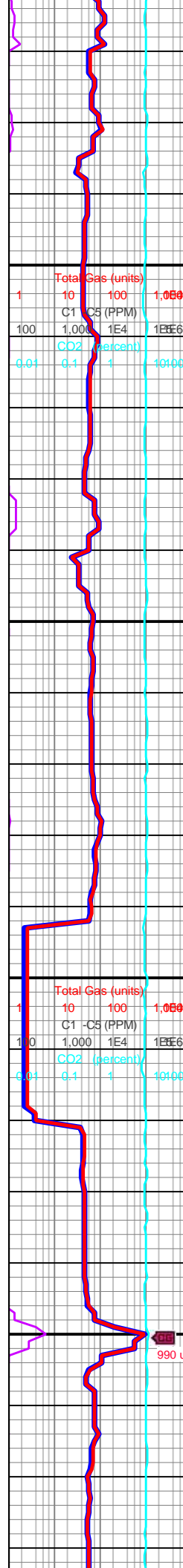






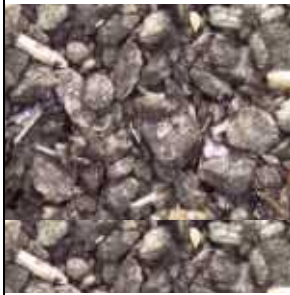
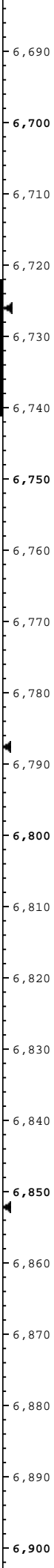


**Mud data**  
6,670 ' MD  
WT: 8.9/8.8 ppg  
FV: 43/37  
pH: 9.3/9.2



6660 - 6690: SH: Gysh Blk - med lt Gy, blkly to subblky, slty to grty txt, frm to brit, imbd MICA & microxln PYR, scat intbnd ss. SS: v/ltGy - Mkly, mod cons, fn grn, rnd, c cmt, mody srtd, no stn, no min flor, no o flor, no cut, no m



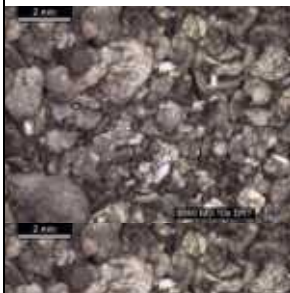


MD: 6,727 '  
TVD: 6,727.28 '  
Inclination: 0.4 °  
Azimuth: 86.63 °

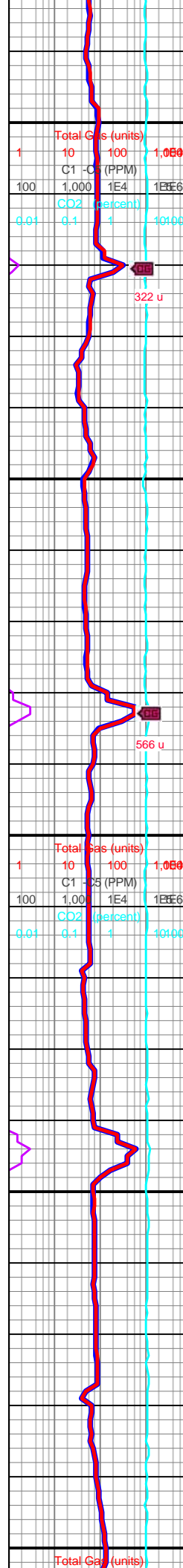


WOB: 9 klb  
ROT: 56 rpm  
PP: 1542 psi  
SPM: 103  
ROP: 47ft/hr

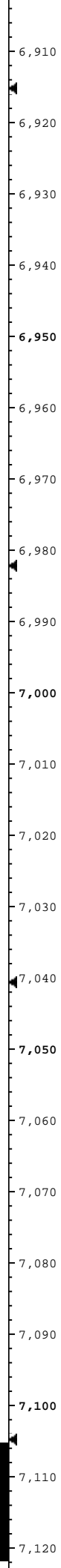
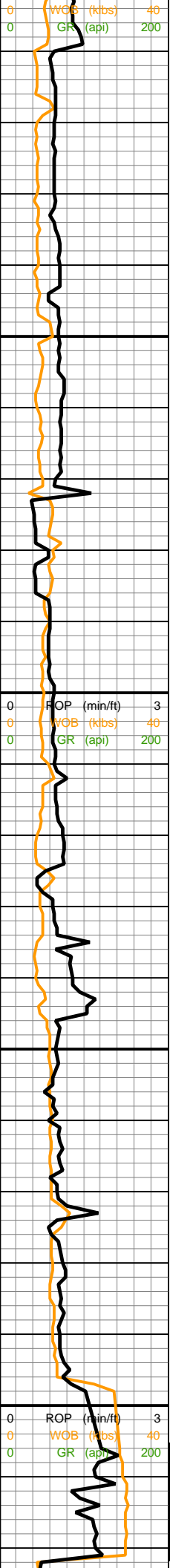
**Mud data**  
6,813 ' MD  
WT: 8.8/8.8 ppg  
FV: 54/42  
pH: 8.8/8.9



WOB: 11.5 klb  
ROT: 56 rpm  
PP: 1550 psi  
SPM: 98  
ROP: 40ft/hr



6900 - 6930: SH: drkGy - medGy - scat medItGy, pred  
subblky, f txt, hd to brit, sl calc, imbd microxln PYR &  
MICA



**Mud data**  
6,910 ' MD  
WT: 8.8/8.7 ppg  
FV: 53/57  
pH: 8.8/8.9

**MD: 6,917 '**  
**TVD: 6,917 '**  
**Inclination: 0.66 °**  
**Azimuth: 114.46 °**

**Mud data**  
6,980 ' MD  
WT: 8.8/8.6 ppg  
FV: 60/55  
pH: 9.1/9.1

**MD: 6,981 '**  
**TVD: 6,981 '**  
**Inclination: 0.69 °**  
**Azimuth: 136.67 °**

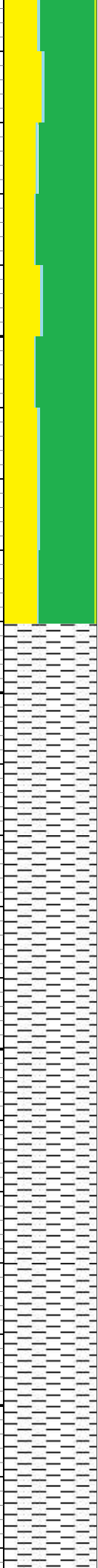
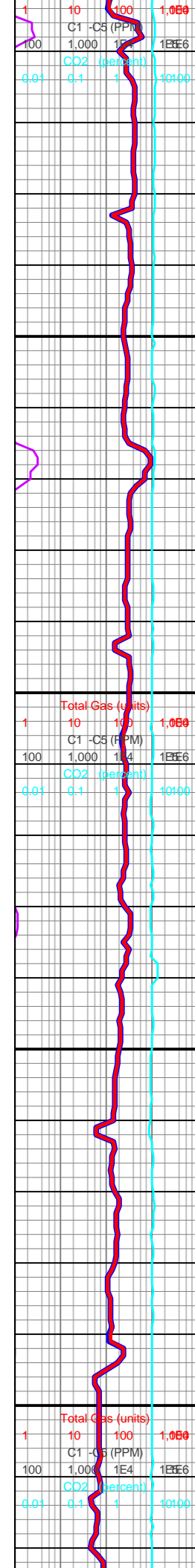
WOB: 9 klb  
ROT: 56 rpm  
PP: 1538 psi  
SPM: 94  
ROP: 61.4ft/hr

**Mud data**  
7,000 ' MD  
WT: 8.9 ppg  
FV: 60  
pH: 10.2

**MD: 7,044 '**  
**TVD: 7,044 '**  
**Inclination: 0.98 °**  
**Azimuth: 137.41 °**

**Mud data**  
7,080 ' MD  
WT: 8.9 ppg  
FV: 49  
pH: 9.8

WOB: 21.9 klb  
ROT: 56 rpm  
PP: 1507 psi  
SPM: 96  
ROP: 8.8ft/hr



6930 - 6960: SH: drkGy - medGy - scat medltGy, pred subblky, f txt, hd to brit, sl calc, imbd microxln PYR & MICA.

6960 - 6990: SH: drkGy - medGy, pred sb blkly to tr sb s f txt, frm to brit, sl calc, imbd microxln PYR & MICA, no stn, no min flor, no cut.

6990 - 7020: SH: drkGy, pred sb blkly, f txt, frm to brit, s calc, imbd microxln PYR, tr free PYR, no stn, no min flor, no cut.

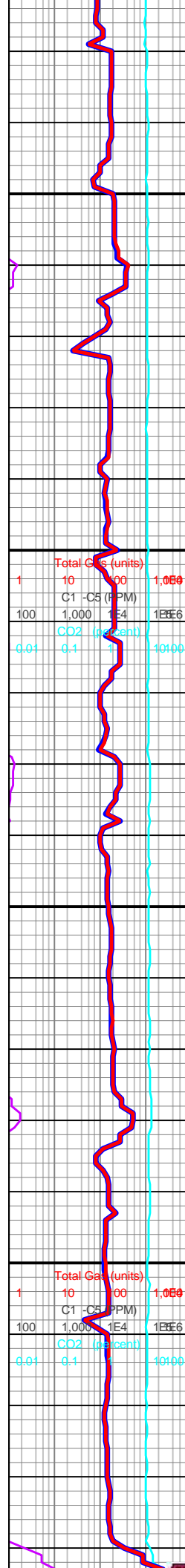
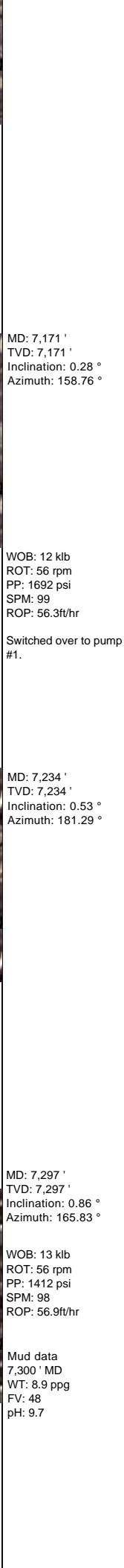
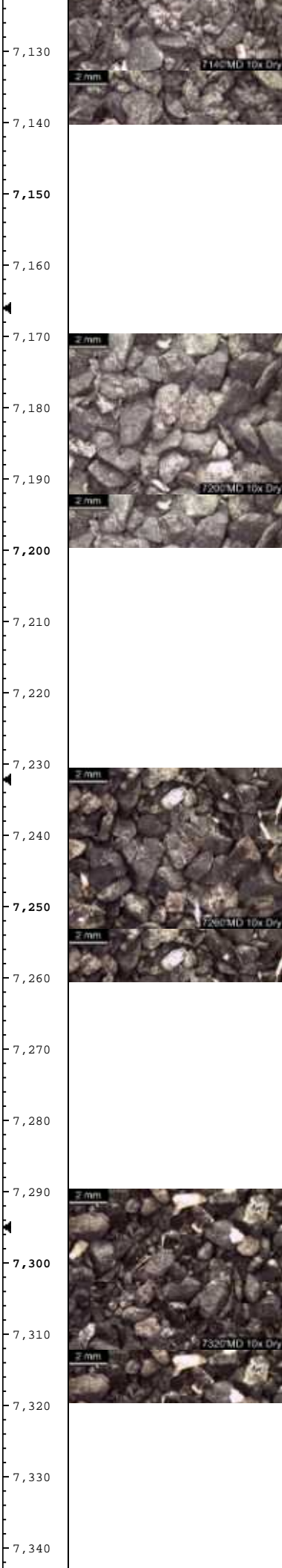
7020 - 7050: SH: drkGy, pred sb blkly to sb plty, f txt, frm hd, brit ip, sl calc, arg ip, imbd microxln PYR; tr CLYST: drkYlshOr - lt brn, blkly, wxy txt, stf, lt org min flor, no por, no stn, no min flor, no cut.

7050 - 7080: SH: drkGy, pred sb blkly to sb plty, f txt, frm hd, brit ip, sl calc, arg ip, imbd microxln PYR, tt por, no r flor, no stn, no min flor, no cut.

7080 - 7110: SH: drkGy, pred sb blkly to sb plty, f txt, frm to hd, brit ip, sl calc, arg, tr imbd calc lamn, tt por, no min flor, no stn, no min flor, no cut.

7110 - 7140: SH: drkGy, pred sb blkly to sb plty, f txt, frm hd, sl calc, arg, tt por, no min flor, no stn, no min flor, no cut.





7140 - 7170: SH: drkGy - medGy, pred sb blkly to blkly, f  
txt, slty ip, frm to hd, sl calc, arg, tt por, no min flor, no st  
no min flor, no cut.

7170 - 7200: SH: drkGy - medGy, pred sb blkly to blkly, f  
txt, slty ip, frm to hd, sl calc, arg, tt por, no min flor, no st  
no min flor, no cut.

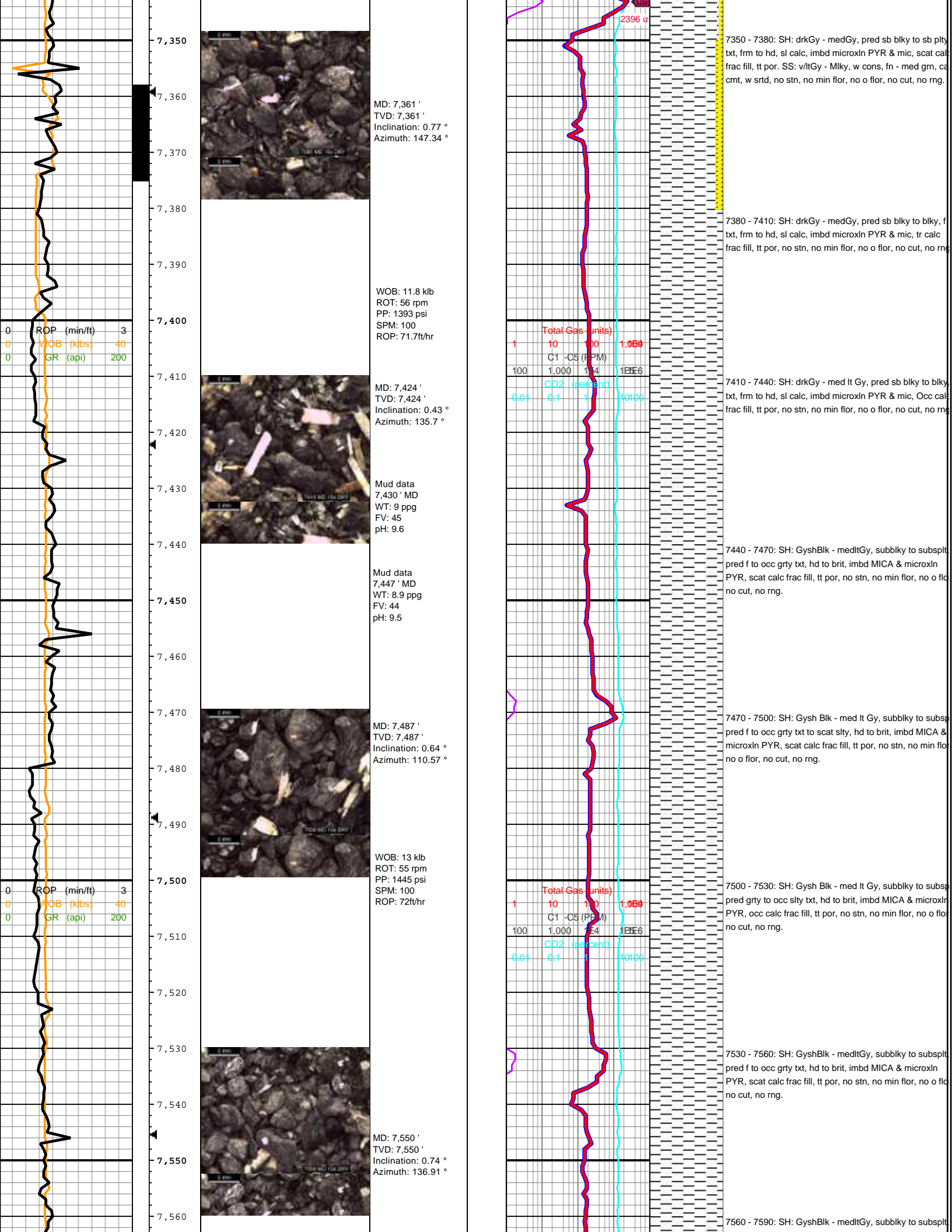
7200 - 7230: SH: drkGy - medGy, pred sb blkly to blkly, f  
txt, frm to hd, sl calc, arg, tt por, no min flor, no stn, no m  
flor, no cut.

7230 - 7260: SH: drkGy - medGy, pred sb blkly to sb plt, txt, frm to hd, sl calc, arg ip, tt por, no min flor, no stn, no min flor, no cut.

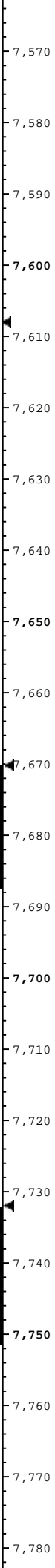
7260 - 7290: SH: drkGy - medGy, pred sb blkly to sb pty  
txt, frm to hd, sl calc, arg ip, imbd microxln PYR, tt por, n  
min flor, no stn, no min flor, no cut.

7290 - 7320: SH: drkGy - medGy, pred sb blkly to sb pty  
txt, frm to hd, sl calc, arg ip, imbd microxln PYR, tr calc  
frac fill, tt por, no min flor, no stn, no min flor, no cut.

7320 - 7350 SH: drkGy - medGy, pred sb blkly to sb plty  
txt, frm to hd, sl calc, arg ip, imbd microIn PYR, tr calc  
frac fill, tt por, free calc & PYR. tr SS: v/ltGy - Mlky, w  
cons, fn grm, calc cmt, w srtd, no stn, no min flor, no o flo  
no cut, no rng.



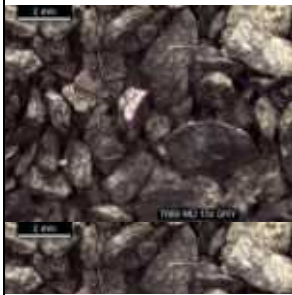




**Mud data**  
7,580' MD  
WT: 9 ppg  
FV: 45  
pH: 9.7

WOB: 13 klb  
ROT: 55 rpm  
PP: 1330 psi  
SPM: 97  
ROP: 52ft/hr

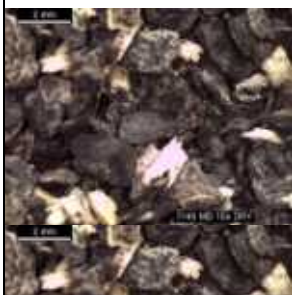
MD: 7,613 '  
TVD: 7,612.99 '  
Inclination: 1.2 °  
Azimuth: 128.7 °



MD: 7,677 '  
TVD: 7,676.99 '  
Inclination: 1.19 °  
Azimuth: 123.51 °

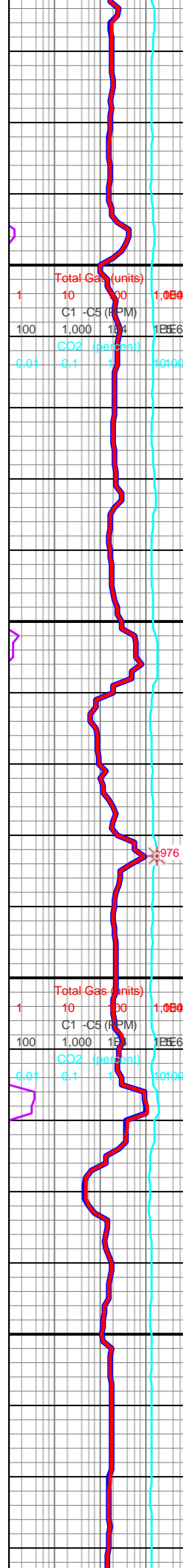
**Mud data**  
7,680' MD  
WT: 8.9 ppg  
FV: 53  
pH: 9.5

WOB: 13 klb  
ROT: 56 rpm  
PP: 1334 psi  
SPM: 96  
ROP: 68ft/hr



**Mud data**  
7,740 ' MD  
WT: 9.1 ppg  
FV: 42  
pH: 9.6

MD: 7,740 '  
TVD: 7,739.99 '  
Inclination: 0.7 °  
Azimuth: 133.52 °



pred f to occ grty - slty txt, hd to brit, imbd MICA &  
microxln PYR, tr calc frac fill, tt por, no stn, no min flor, n  
o flor, no cut, no rng.

7590 - 7620: SH: GyshBlk - medItGy, subblky to subspIt  
pred f to occ grty txt, hd to brit, imbd MICA & microIn  
PYR, scat calc frac fill, tr free pyr, tt por, no stn, no min  
flor, no o flor, no cut, no rng.

7620 - 7650: SH: GyshBlk - medltGy, subblky to subspit  
pred f to occ grty txt, hd to brit, imbd MICA & microxln  
PYR, scat calc frac fill, tt por, no stn, no min flor, no o fld  
no cut, no rng.

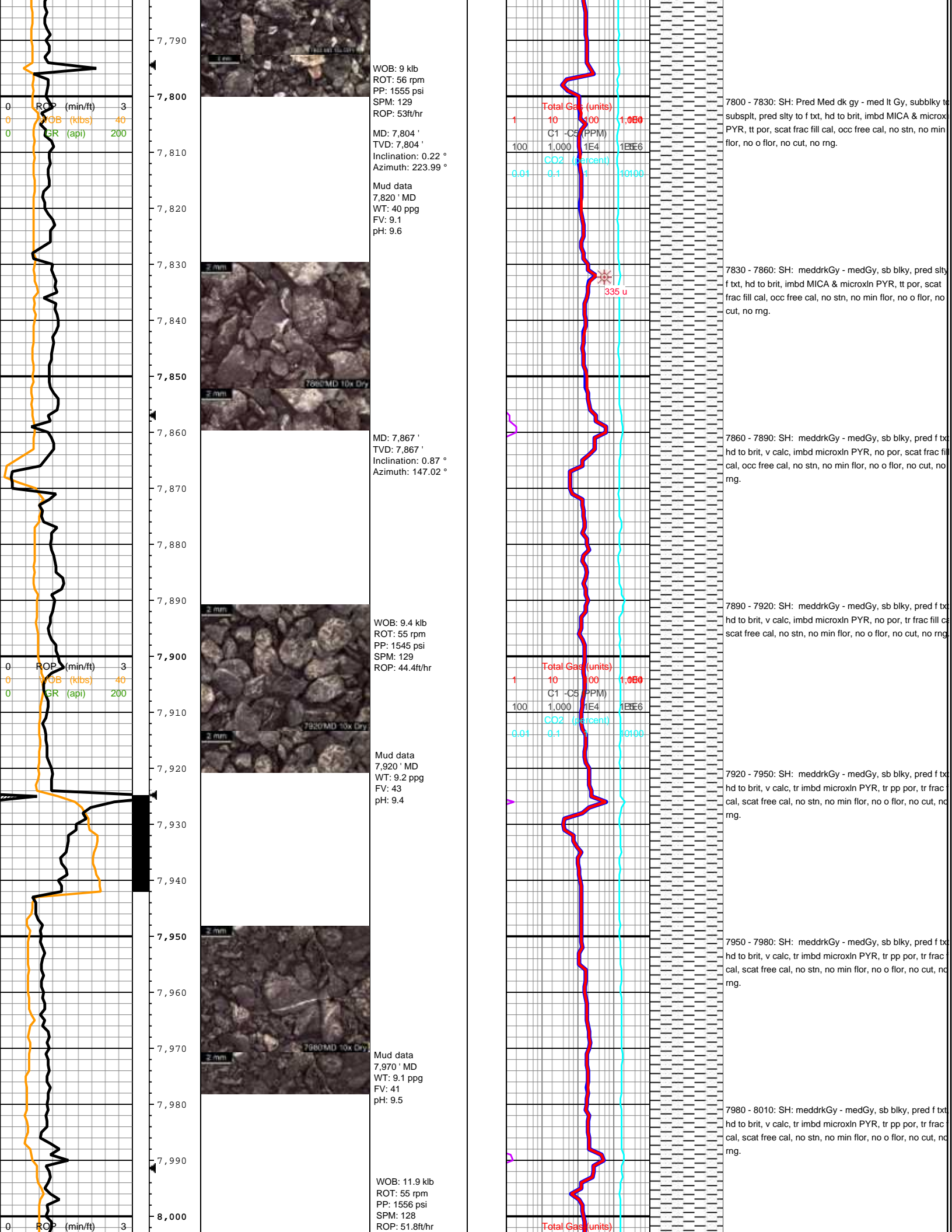
7650 - 7680: SH: Gysh Blk - med lt Gy, subblky to subspred silty to f to occ grty txt, hd to brit, imbd MICA & microXln PYR, tr calc frac fill, tt por, no strn, no min flor, no flor, no cut, no rng.

7680 - 7710: SH: Pred Med dk gy - med lt Gy, subblky to  
subsplnt, pred slty to f txt, hd to brit, imbd MICA & microx  
PYP, tt por, no stn, no min flwr, no o flwr, no cut, no rng.

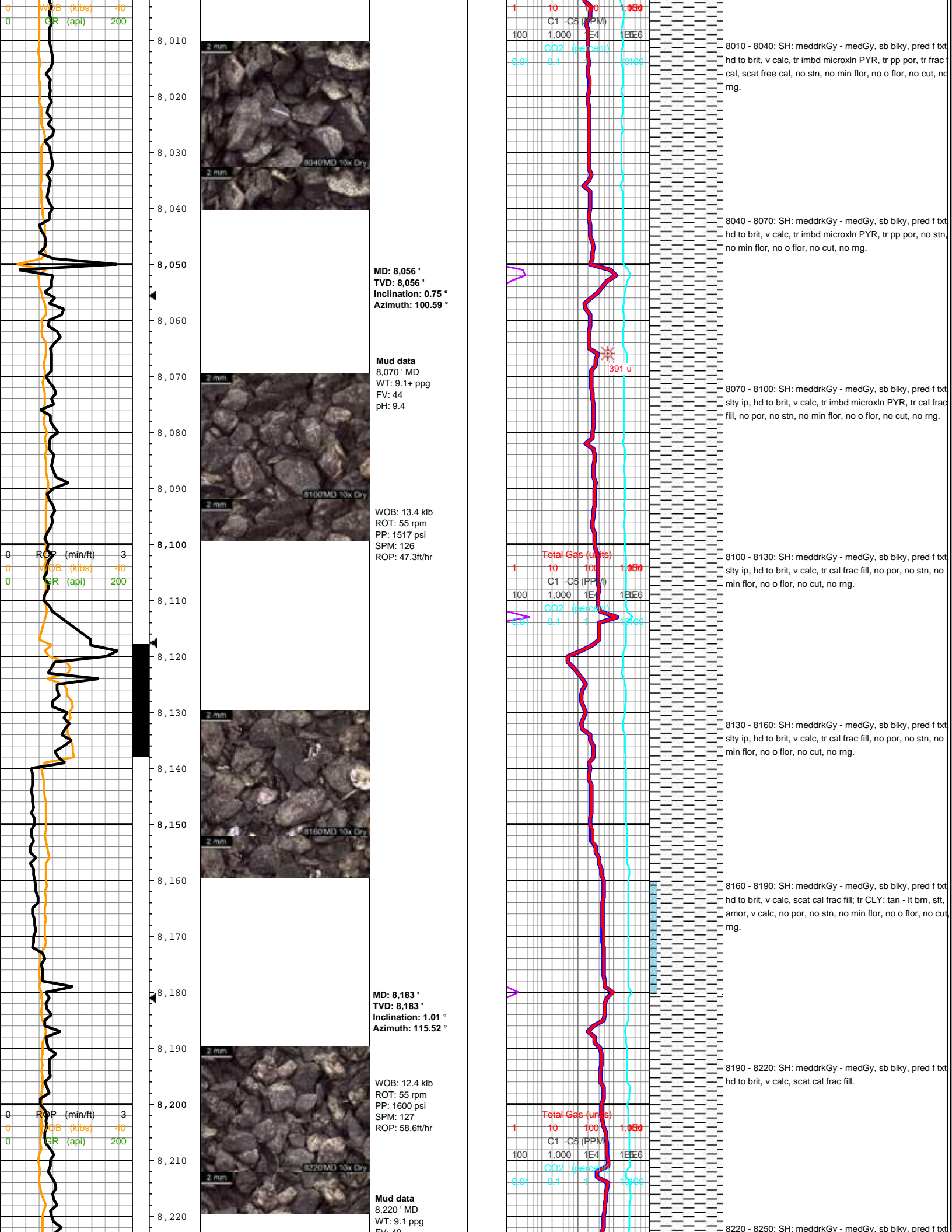
7710 - 7740: SH: Pred Med dk gy - med lt Gy, subblky  
subsplnt, pred slty to f txt, hd to brit, imbd MICA & microx  
PYR, tt por, no stn, no min flor, no o flor, no cut, no rng.  
SS: Wht - Opq, f- med grn, mod strt.

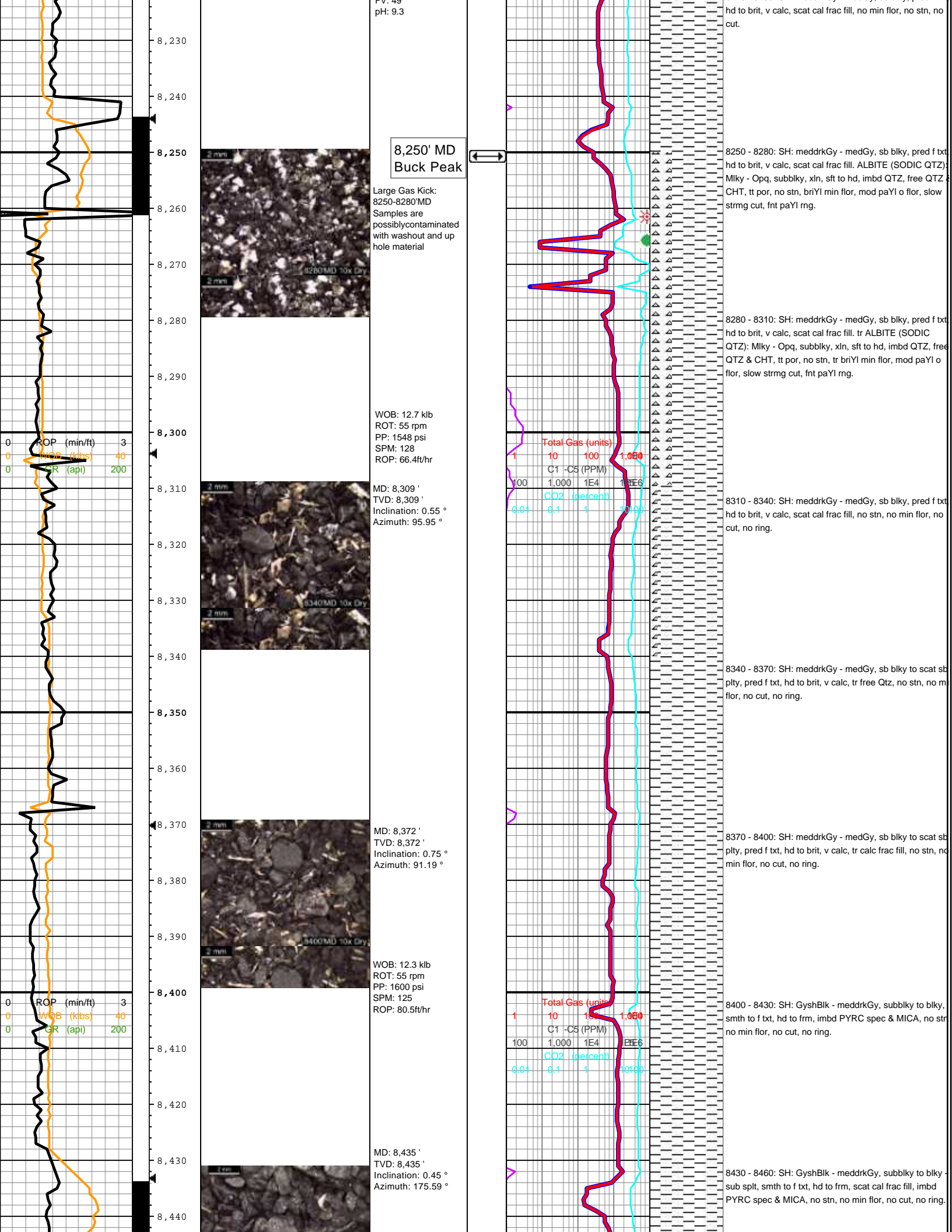
7740 - 7770: SH: Pred Med dk gy - med lt Gy, subblky to  
subsplnt, pred slty to f txt, hd to brit, imbd MICA & microx  
PYP, tt por, no stn, no min flwr, no o flwr, no cut, no rng.

7770 - 7800: SH: Pred Med dk gy - med lt Gy, subblyk to  
subsplnt, pred slty to f txt, hd to brit, imbd MICA & microx,  
PYR, tt por, scat frac fill cal, no stn, no min flor, no o flor  
no cut. no rna.

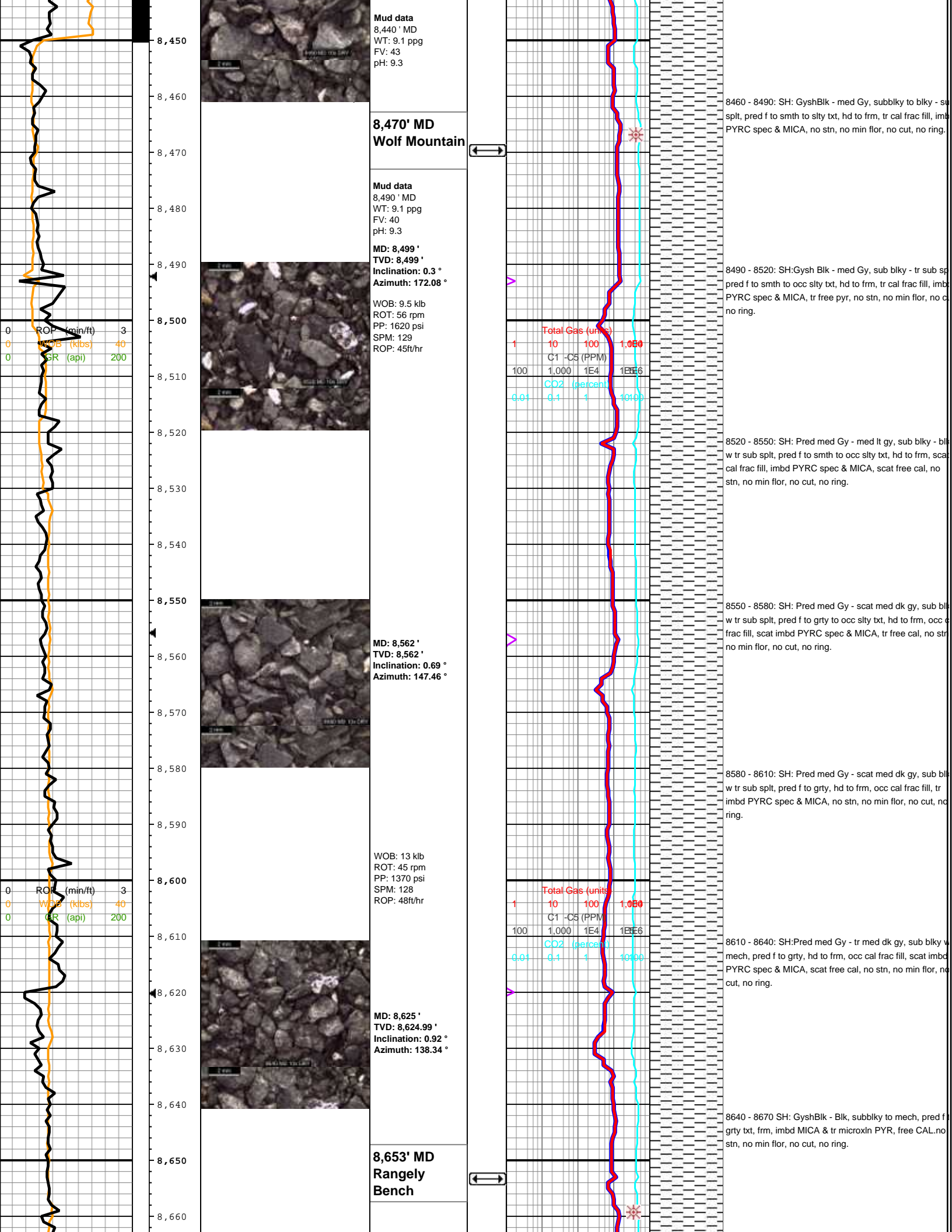


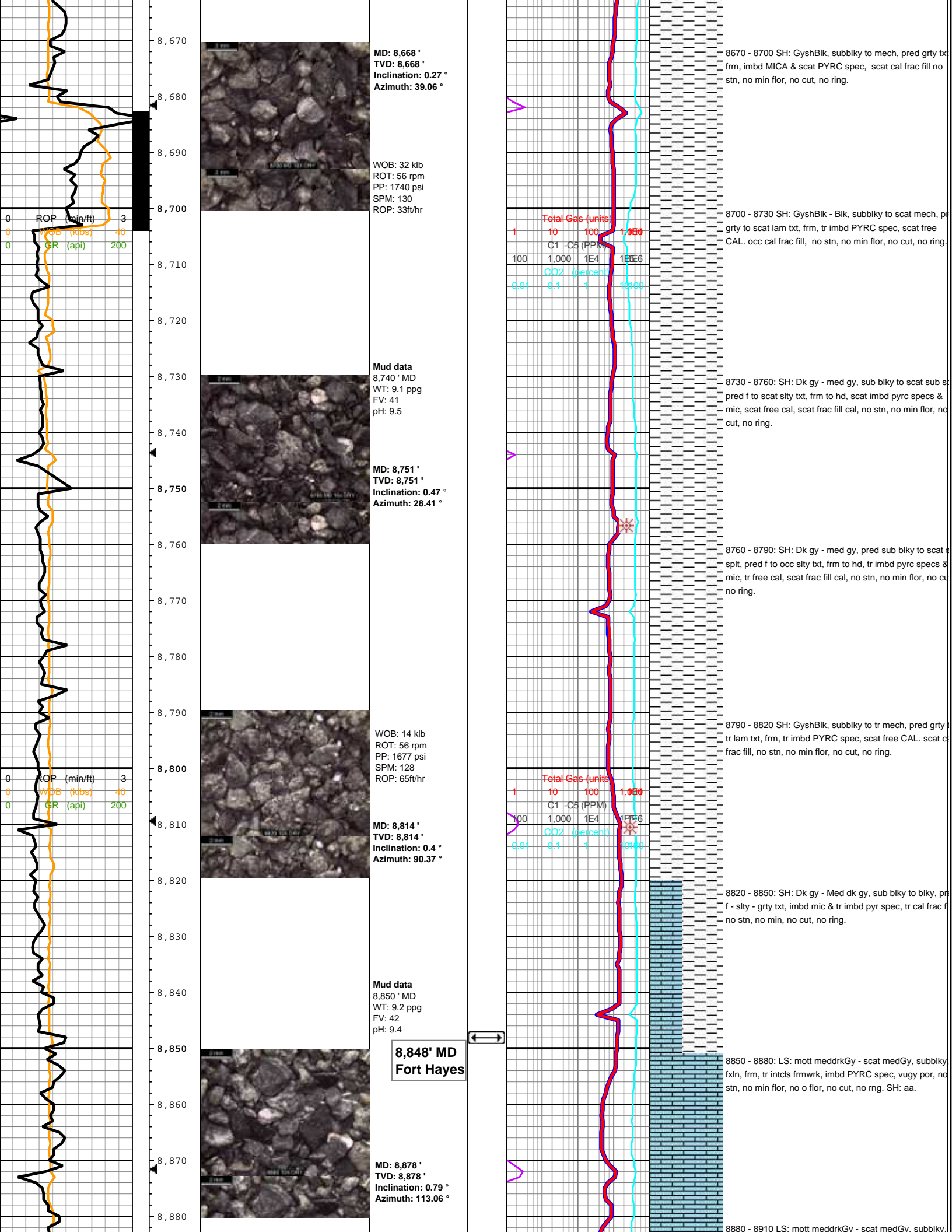




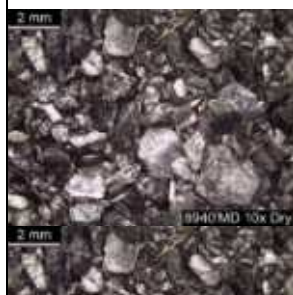
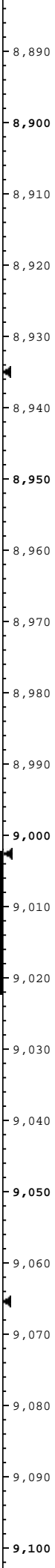












**Mud data**  
8,920' MD  
WT: 9.2 ppg  
FV: 42  
pH: 9.3

MD: 8,941 '  
TVD: 8,941 '  
Inclination: 1.29 °  
Azimuth: 123.74 °



WOB: 24 klb  
ROT: 55 rpm  
PP: 1712 psi  
SPM: 133  
ROP: 19.5ft/hr

**8,993' MD  
Frontier**

MD: 9,004 '  
TVD: 9,004 '  
Inclination: 0.77 °  
Azimuth: 159.11 °

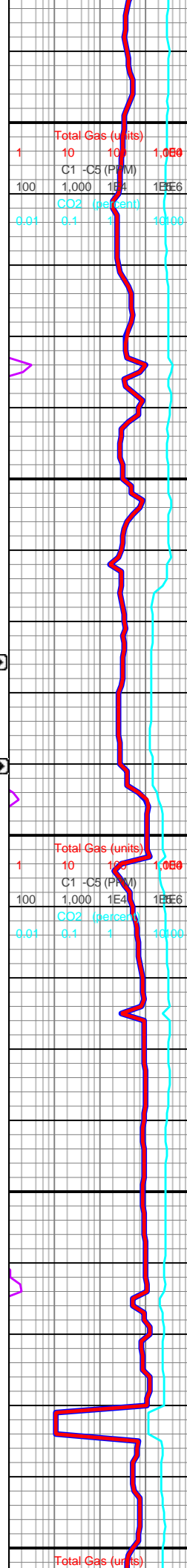
**Mud data**  
9,020 ' MD  
WT: 9.2 ppg  
FV: 43  
pH: 9.5



MD: 9,067 '  
TVD: 9,067 '  
Inclination: 1.21 °  
Azimuth: 156.55 °



WOB: 15.1 klb  
ROT: 55 rpm  
PP: 1780 psi  
SPM: 131  
ROP: 50.0 ft/hr

fxln, frm, tr intcls frmwrk, imbd PYRC spec, vugy por, no  
stn, no min flor, no o flor, no cut, no rng.

8910 - 8940: LS: mott meddrkGy - scat medGy, subblky  
fxln, frm, tr intcls frmwrk, imbd PYRC spec, vugy por, no  
stn. no min flor. no o flor. no cut. no rng.

8940 - 8970: SH: pred GysnBlk - drkGy, subblky, med to  
slyt txt, frm, imbd SLTST; LS: mott meddrkGy - scat  
medGy - scat medltGy, subblky, fx;n, frm to fri, tr chk  
frmrwk, imbd CAL, vugy por, no stn, no min flor, no o flor  
no cut, no rng.

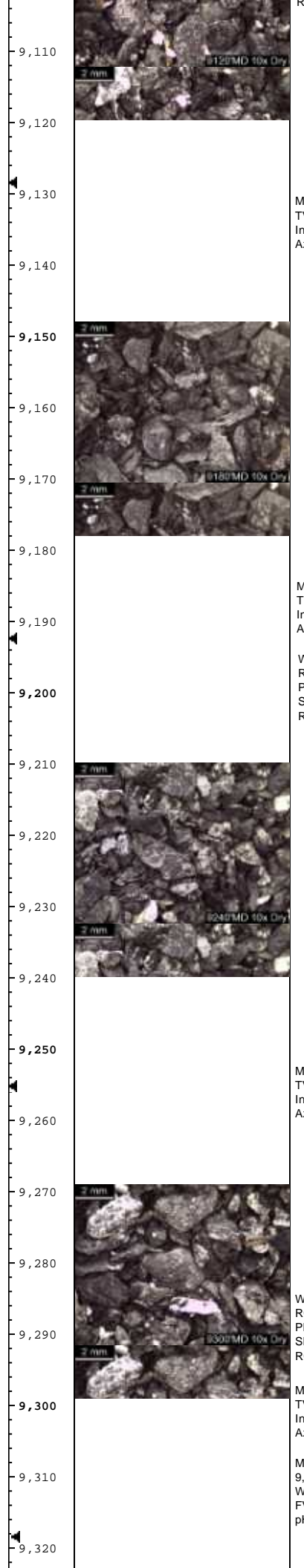
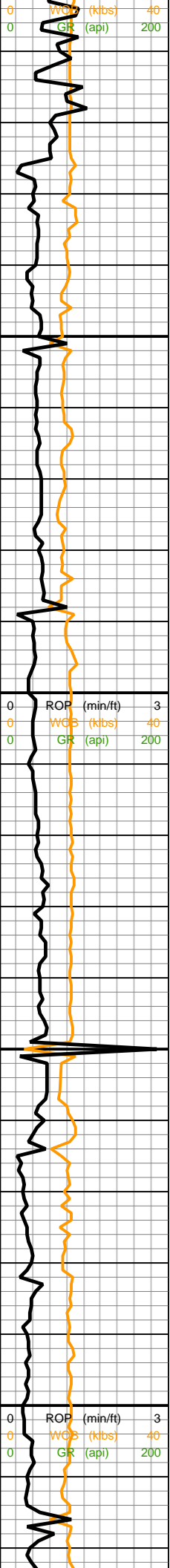
8970 - 9000: SH: pred GysHBlk - drkGy, subblky, med to  
slyt txt, frm, v calc, imbd SS, tr calc frac fill; LS: mott  
meddrkGy - scat medGy - scat medltGy, subblky, fx;ln, fr  
to fri, tr chk frmwrk, imbd CAL, vugy por, no stn, no min  
flor, no o flor, no cut, no rng.

9000 - 9030: SH: pred GyshtBlk - drkGy, sb blkly to sb pl  
f txt, frm, v calc, imbd calc flk & microxin PYR, tr calc fra  
fill; tr LS: Wh - v/tGy, blkly, chlkly, fri, chk frmwrk, imbd  
grnl PYR, free PYR, vugy por, no stn, no min flor, no o f  
no cut, no rng.

9030 - 9060: SH: pred GyshBk - drkGy, sb bkly to sb pl  
f txt, frm, v calc, imbd calc flk & microIn PYR, grdg to  
SLTST, occ SLTST lamn; SS/CALCARENITE: Wh -  
vltGy, w cons, fn grn, md, w srtd, calc cmt, imbd CAL &  
PYR, intrgr por, no stn, no min flr, no o flr, weak strmg  
cut. no md.

9060 - 9090: SH: pred GyshBlk - drkGy, sb plty, f to lstr  
ip, frm, v calc, imbd calc flk & microIn PYR, tr calc frac  
fill; SS/CALCARENITE: Wh - v/lGy, w cons, fn grn, md,  
w strd to mod strd, calc cmt, tr silc cmt, imbd CAL & PYR  
intbd SH, free QTZ, intpor por, no strn, no min flor, no o flo  
weak strng cmt, no rgn

9090 - 9120: SH: pred GyshBlk - drkGy, sb plty, f to lstr  
ip, frm, v calc, imbd calc flk & microxln PYR, tr calc frac  
fill, tr ox org to lt brn concs, free cal; LS/CALCARENITE  
medGy - Wh, subsplt, fxl, fri, scat chk to intcls frmwrk,  
imbd CAL, free CAL, vugy por, no str, no min flor, no o  
no cut, no rrg



ROP: 53.97/hr

MD: 9,131 '  
TVD: 9,131 '  
Inclination: 1.41 °  
Azimuth: 148.48 °

MD: 9,194 '  
TVD: 9,194 '  
Inclination: 1.44 °  
Azimuth: 128.3 °

WOB: 14.4 klb  
ROT: 55 rpm  
PP: 1854 psi  
SPM: 132  
ROP: 95ft/hr

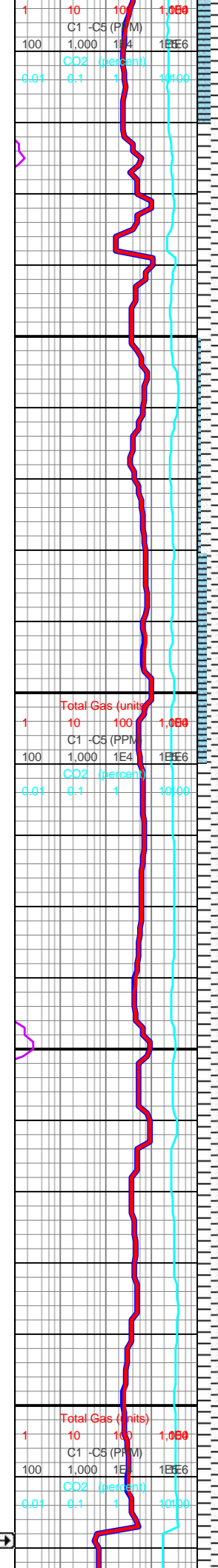
MD: 9,257 '  
TVD: 9,257 '  
Inclination: 1.58 °  
Azimuth: 93.98 °

WOB: 15.6 klb  
ROT: 55 rpm  
PP: 2223 psi  
SPM: 146  
ROP: 135.7ft/hr

MD: 9,303 '  
TVD: 9,303 '  
Inclination: 1.81 °  
Azimuth: 89.54 °

Mud data  
9,300 ' MD  
WT: 9.1 ppg  
FV: 40  
pH: 9.1

9,318' MD



9120 - 9150: SH: meddrkGy - tr drkGy, subspit to subblk  
pred f to tr lstr txt, brit, sl calc, imbd PYRC spec & calc flk  
no stn, no min flor, no o flor, no cut, no rng.

9150 - 9180: SH: meddrkGy - tr drkGy, subspit to subblk  
pred f to tr lstr txt, brit, sl calc, imbd PYRC spec & calc flk  
BENT: lt brn - tan, amor, sft, no stn, no min flor, no o flor, no cut, no rng.

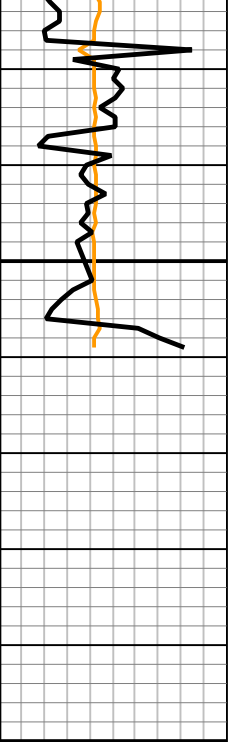
9180 - 9210: SH: drkGy, sb plty to sb blkly, pred f to tr lstr  
txt, brit, sl calc, imbd PYRC spec & tr calc flk; tr  
LS/CALCARENITE: medGy - Wh, subspit, fxln, fri, scat  
chk to intcls frmwrk, imbd CAL, free CAL, tr ox lt brn/org  
concs, vugy por, no stn, no min flor, no o flor, no cut, no  
rng.

9210 - 9240: SH: drkGy, sb plty to sb blkly, pred f to tr lstr  
frm to brit, sl calc, imbd PYRC spec, tr free cal.

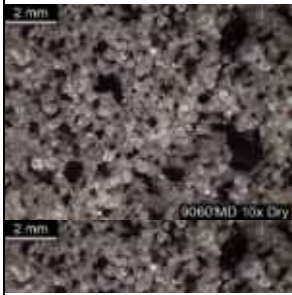
9240 - 9270: SH: drkGy - scat meddrkGy, sb splt to sb  
plty, f to fiss txt, brit, imbd PYRC spec & calc flk, free PY  
& free CAL.

9270 - 9300: SH: drkGy - scat meddrkGy, sb splt to sb  
plty, f to fiss txt, brit, imbd PYRC spec & calc flk, free PY  
nod & free CAL.

9300 - 9330: SS: Clr, un cons, v/fn grn, ang to subang, v  
srted, no cmt, free QTZ, no por, no stn, no min flor, no cut  
no rng. tr SH: aa.

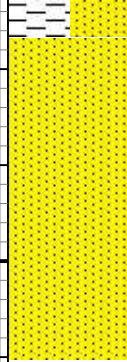
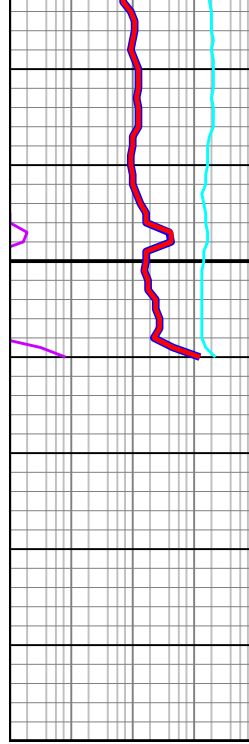


9,330  
9,340  
9,350  
9,360  
9,370  
9,380  
9,390  
9,400



Falcon Seaboard  
11-90-12 #3 Final  
vertical pilot hole depth  
of 9360' MD was  
reached on 7/24/15 @  
14:10 hrs. Thank you  
for choosing FieldGeo  
Services!

Dakota



9330 - 9360: SS: Clr, un cons, v/fn grn, ang to subang, v  
srtd, no cmt, free QTZ, no por, no stn, no min flor, no cu  
no mg.