

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Heartland C-30-79-1HN

**Location** SESE SEC25 T4N R65W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** PRECISION 828

**API Number** 05-123-39555

**AFE #** 200371

**Region** DENVER-JULESBURG BASIN

**Field** WATTENBERG

**Spud Date** 8/23/2014

**Drilling Completed** 9/6/2014

**Surface Coordinates** 282' FSL, 320' FEL

Lat/Long: 40.27673/-104.60348

**Ground Elevation** 4845'

**K.B. Elevation** 4861'

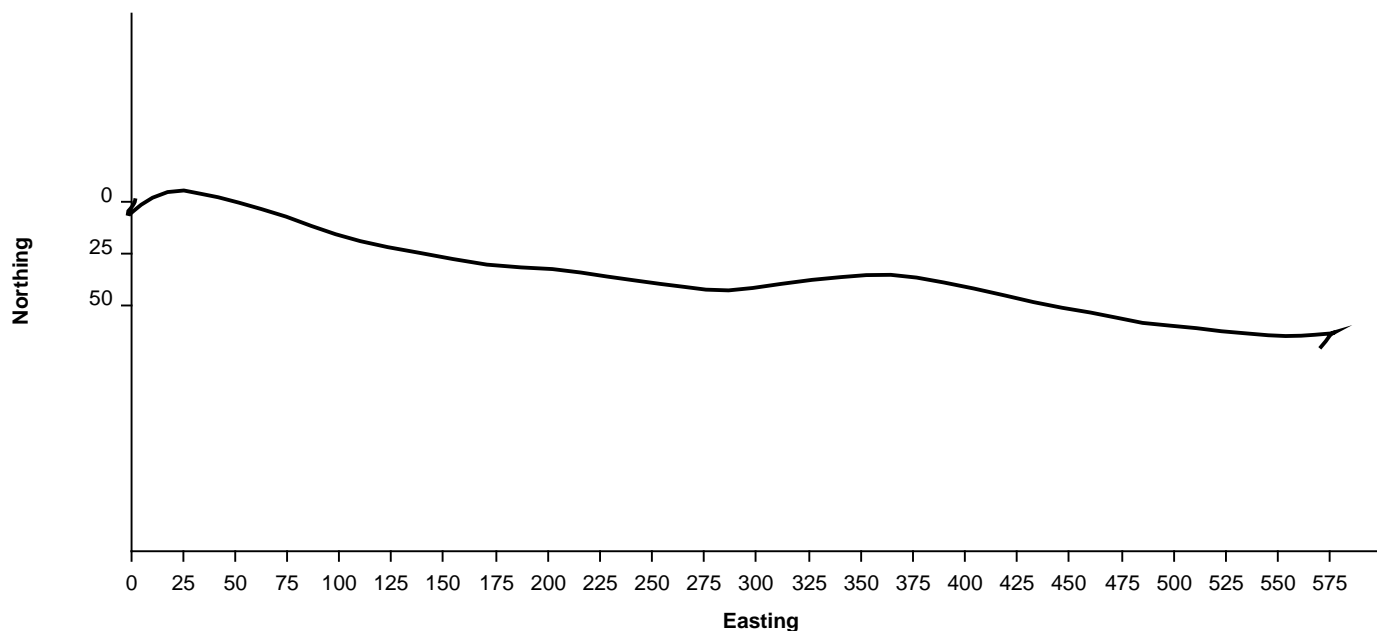
**Logged Interval** 717' **To** 6400'

**Total Depth** 16871'

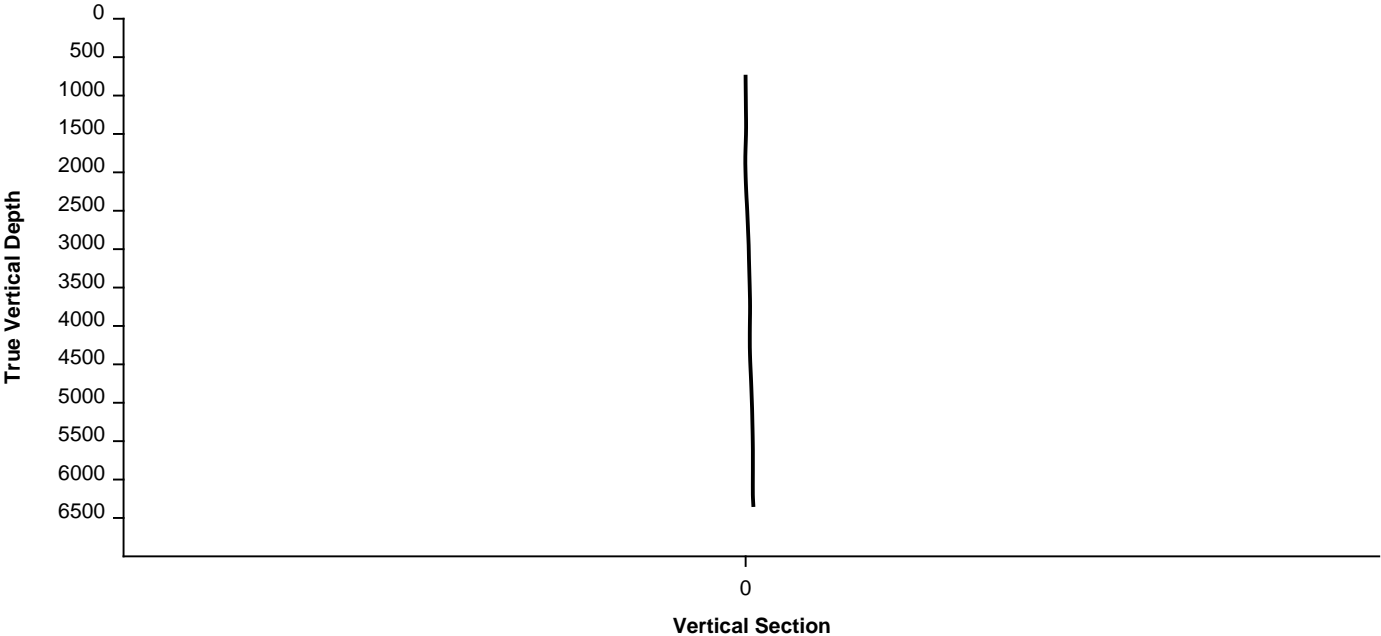
**Formation** FOX HILLS, PIERRE (PARKMAN, SUSSEX, SHANNON, TEEPEE BUTTES)

**Type of Drilling Fluid** FRESH WATER, LSND

## Survey Plan



Survey Elevation




Other

WELLSITE GEOLOGISTS: GARY MYERS, LIZ VAN DIEPEN  
GEOLOGY SERVICES PROVIDED BY COLUMBINE LOGGING, INC.  
LOG CONTINUTES ON FILE: Heartland C30-79-1HN Horiz.mplot

Operator

Company NOBLE ENERGY INC.  
Address 1625 Broadway  
Denver, CO 80202

Rock Types

 SANDSTONE  SHALY SANDSTONE  SHALY SILTSTONE  SILTY SHALE

Geologist

Name MELANIE PETERSON

Other Symbols

Engineering

**Company** NOBLE ENERGY, INC.

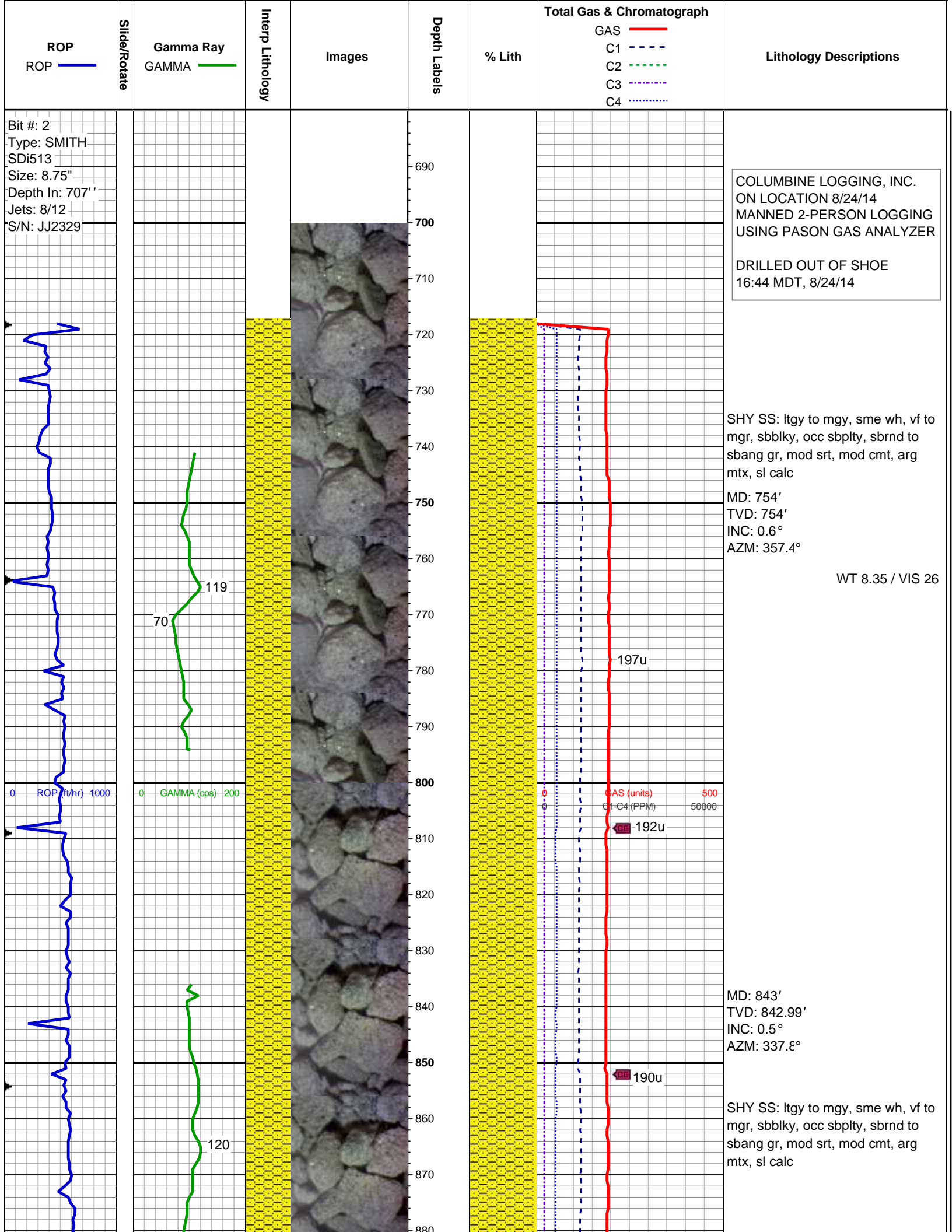
**Address** 1625 Broadway  
Denver, CO 80202

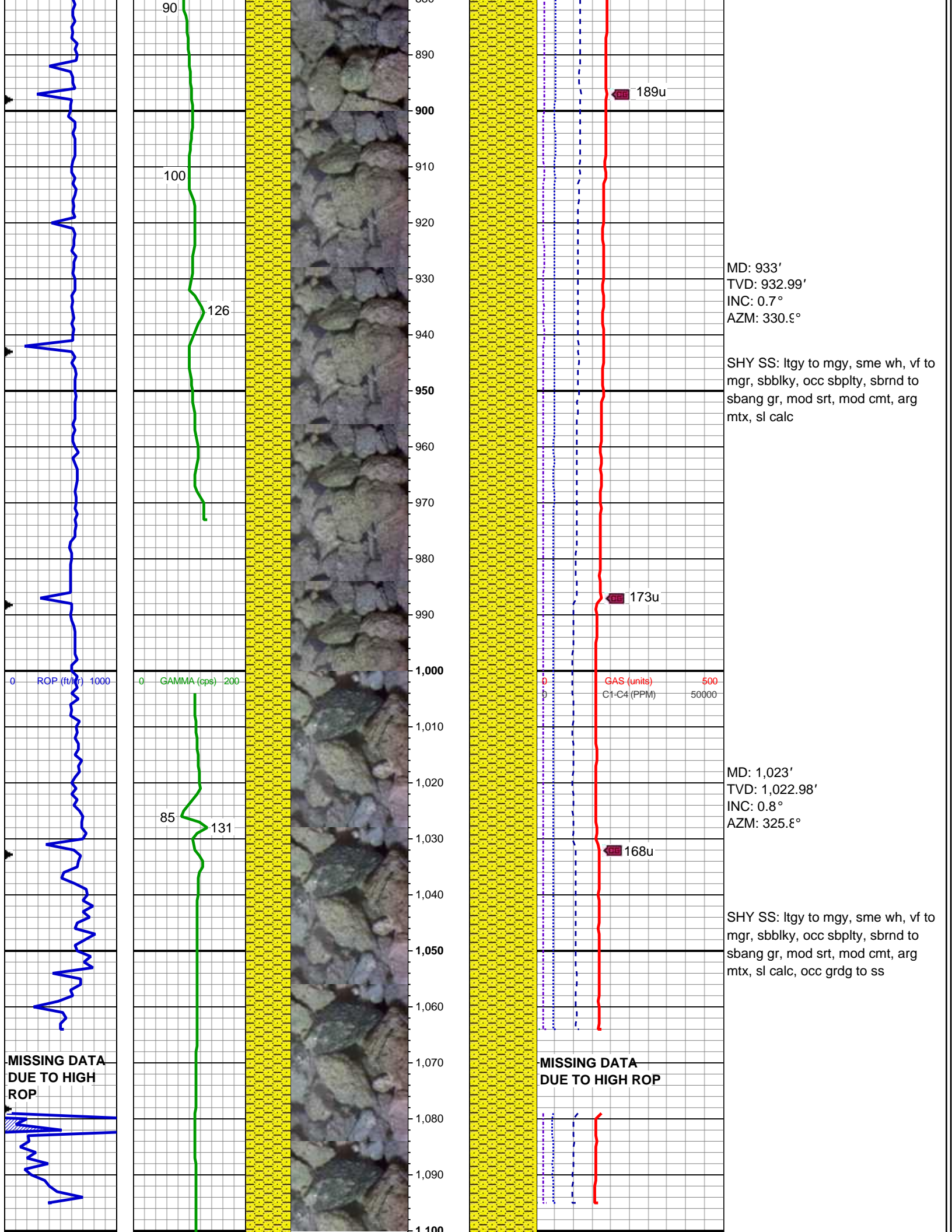
Engineering

▶ CONNECTION (RIGHT)

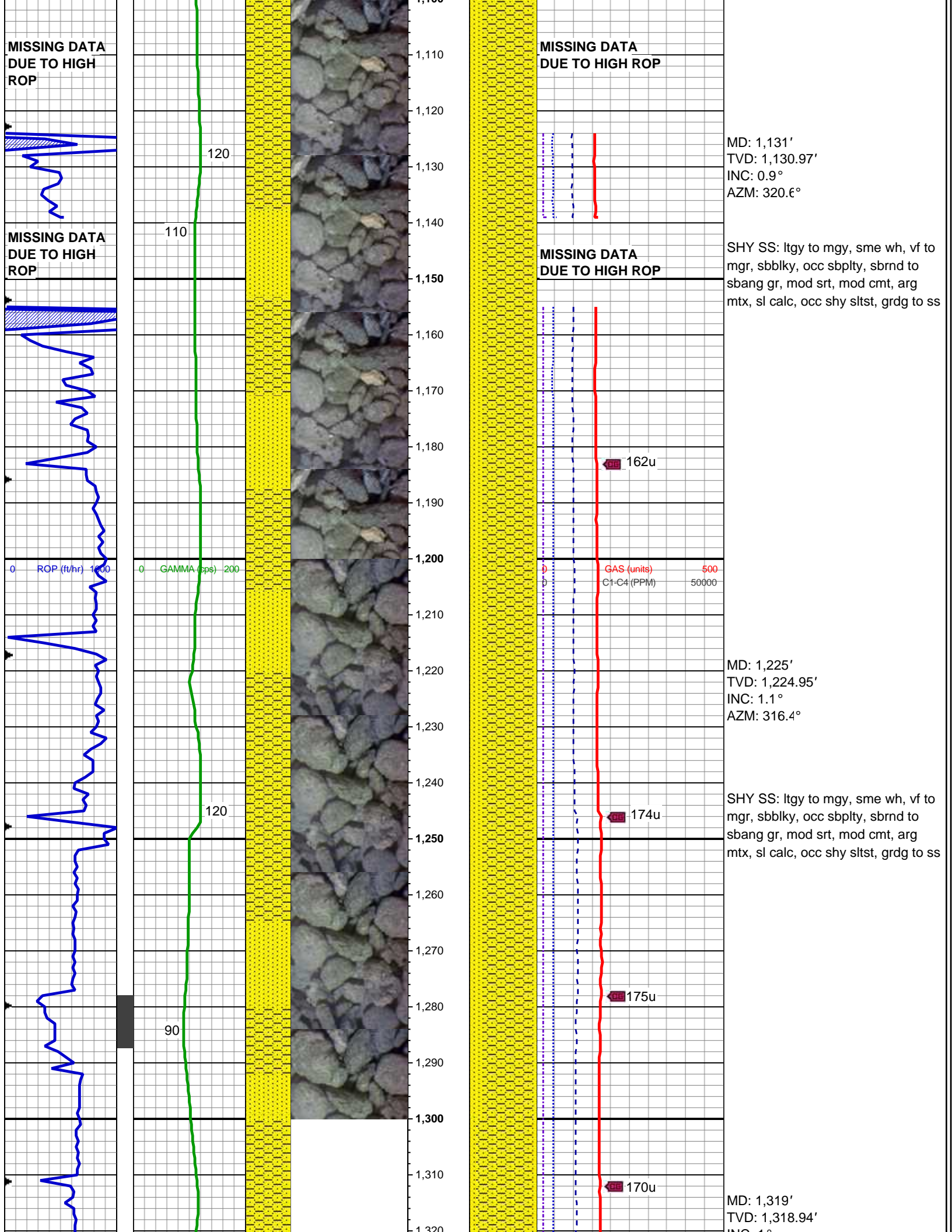
◀ DB CONNECTION GAS

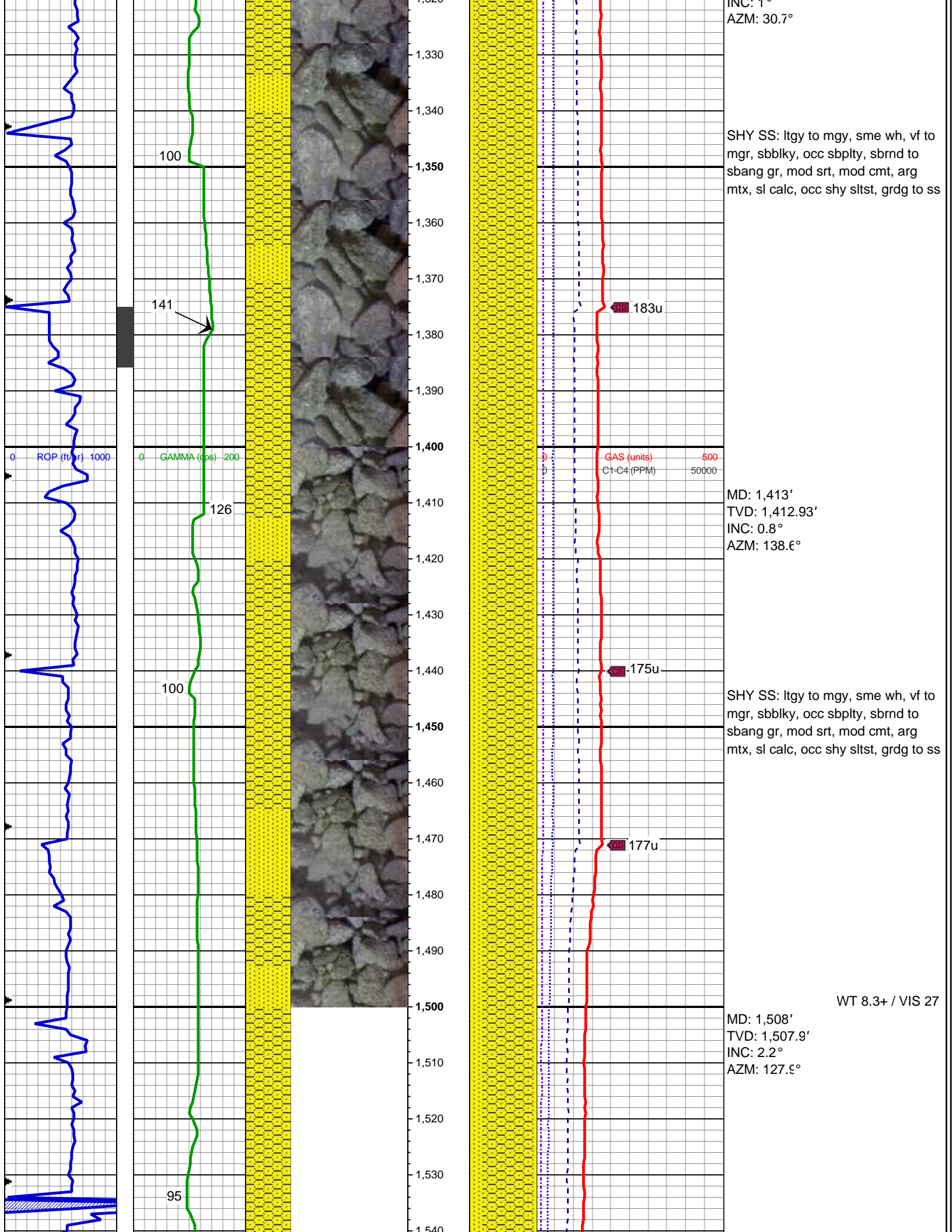
MNDEPTH MN DEPTH (RIGHT)



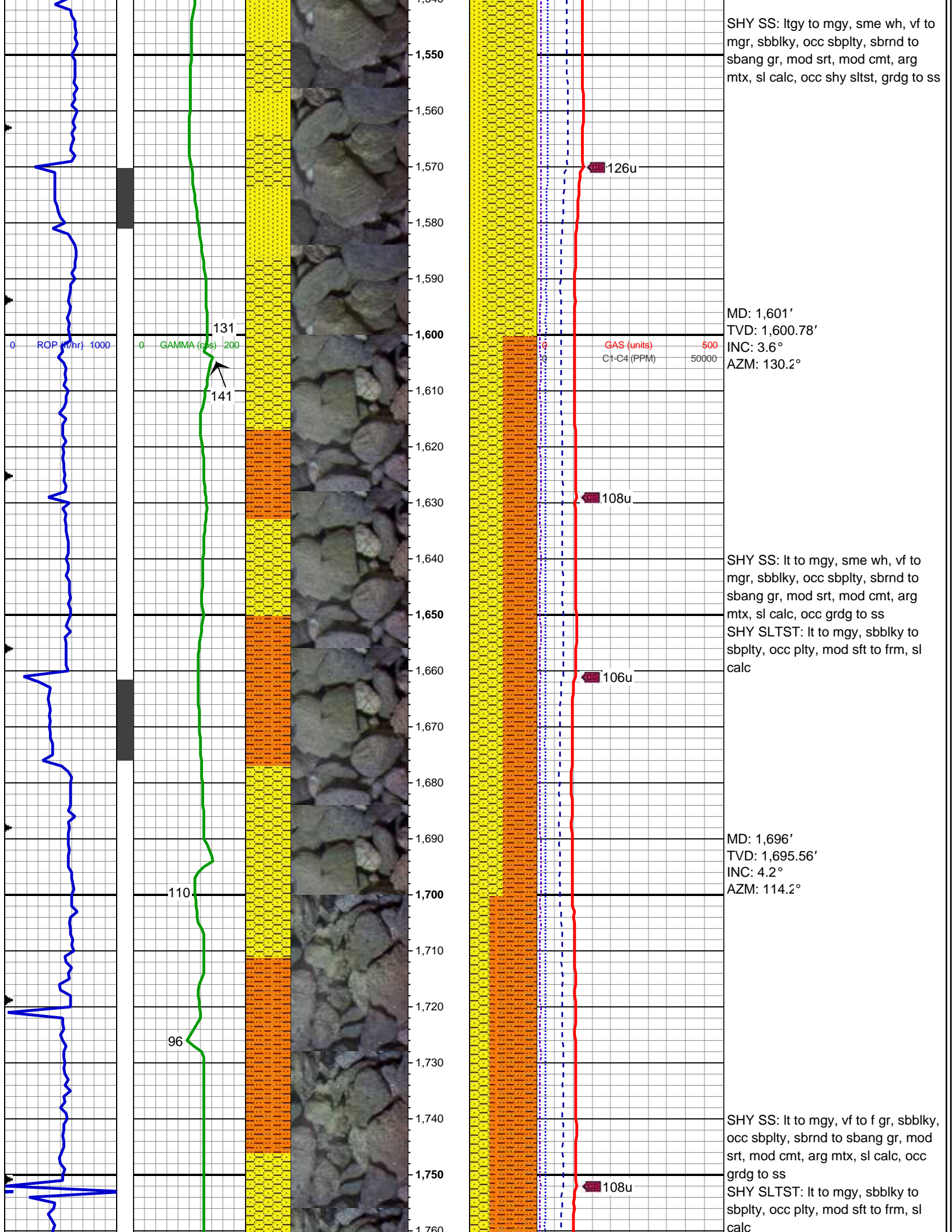




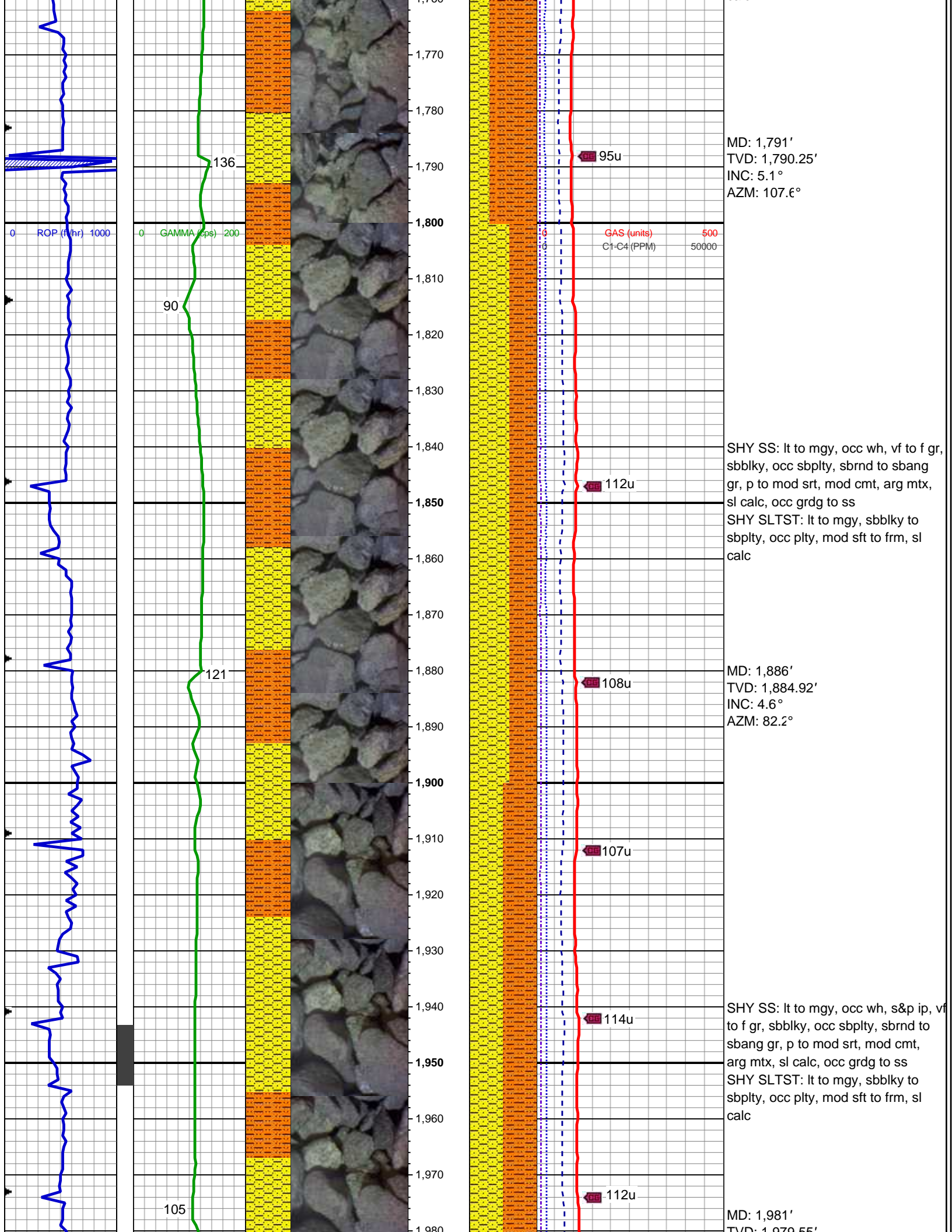


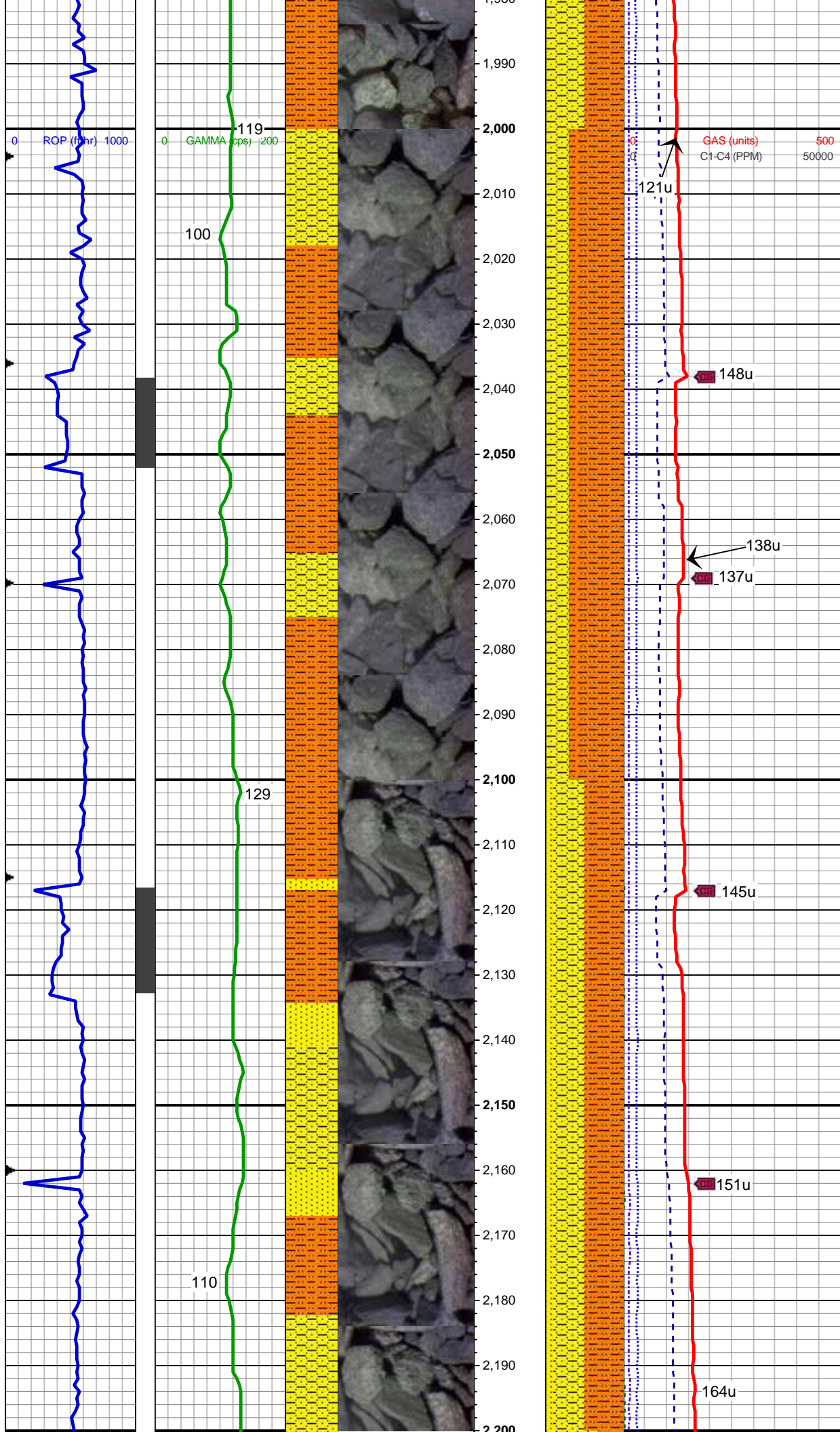












TVD: 1,979.33'  
INC: 5.5°  
AZM: 76.3°

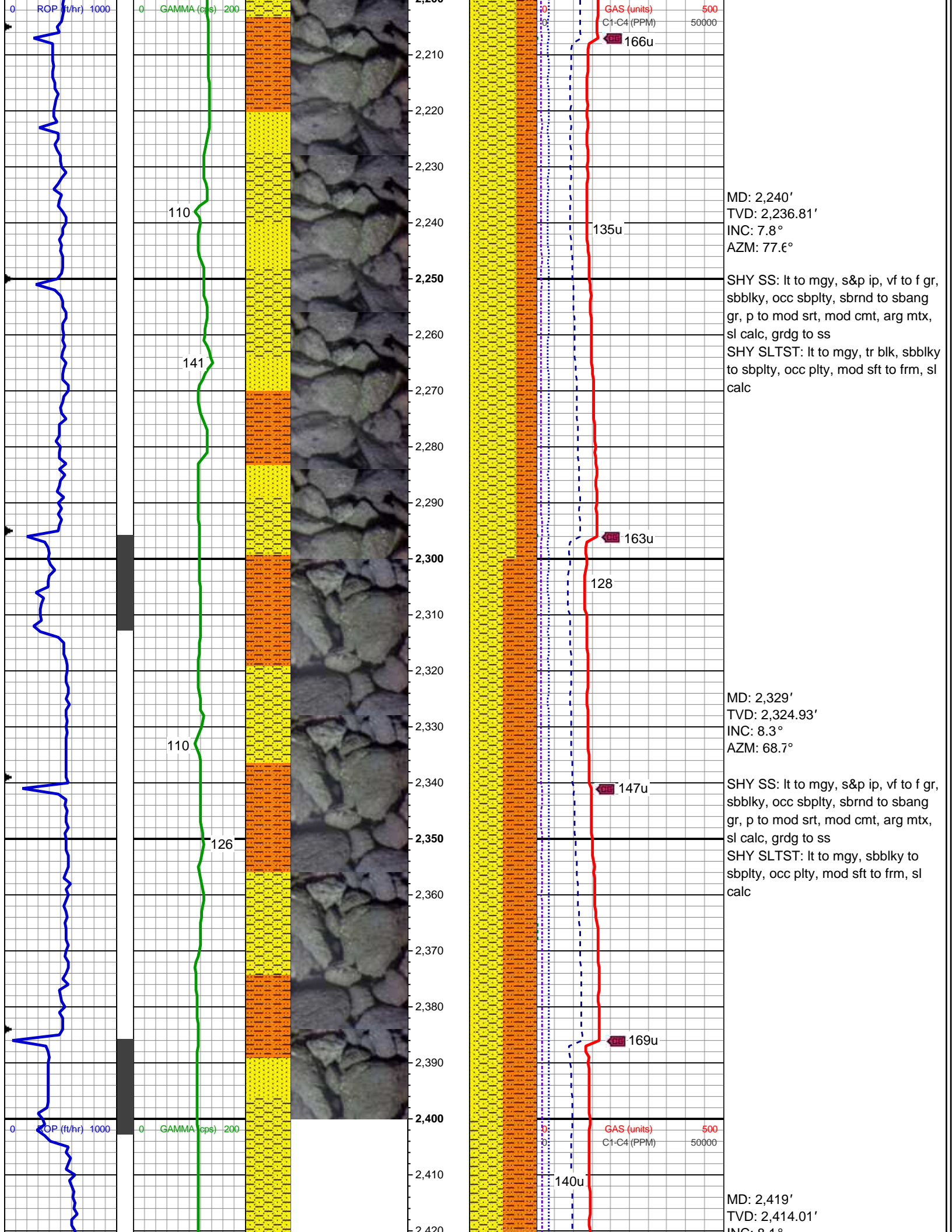
SHY SS: lt to mgy, vf to f gr, sbblky, occ sbplty, sbrnd to sbang gr, p to mod srt, mod cmt, arg mtx, sl calc  
SHY SLTST: lt to mgy, sbblky to sbplty, occ plty, mod sft to frm, sl calc

MD: 2,060'  
TVD: 2,058.1'  
INC: 6.7°  
AZM: 80.8°

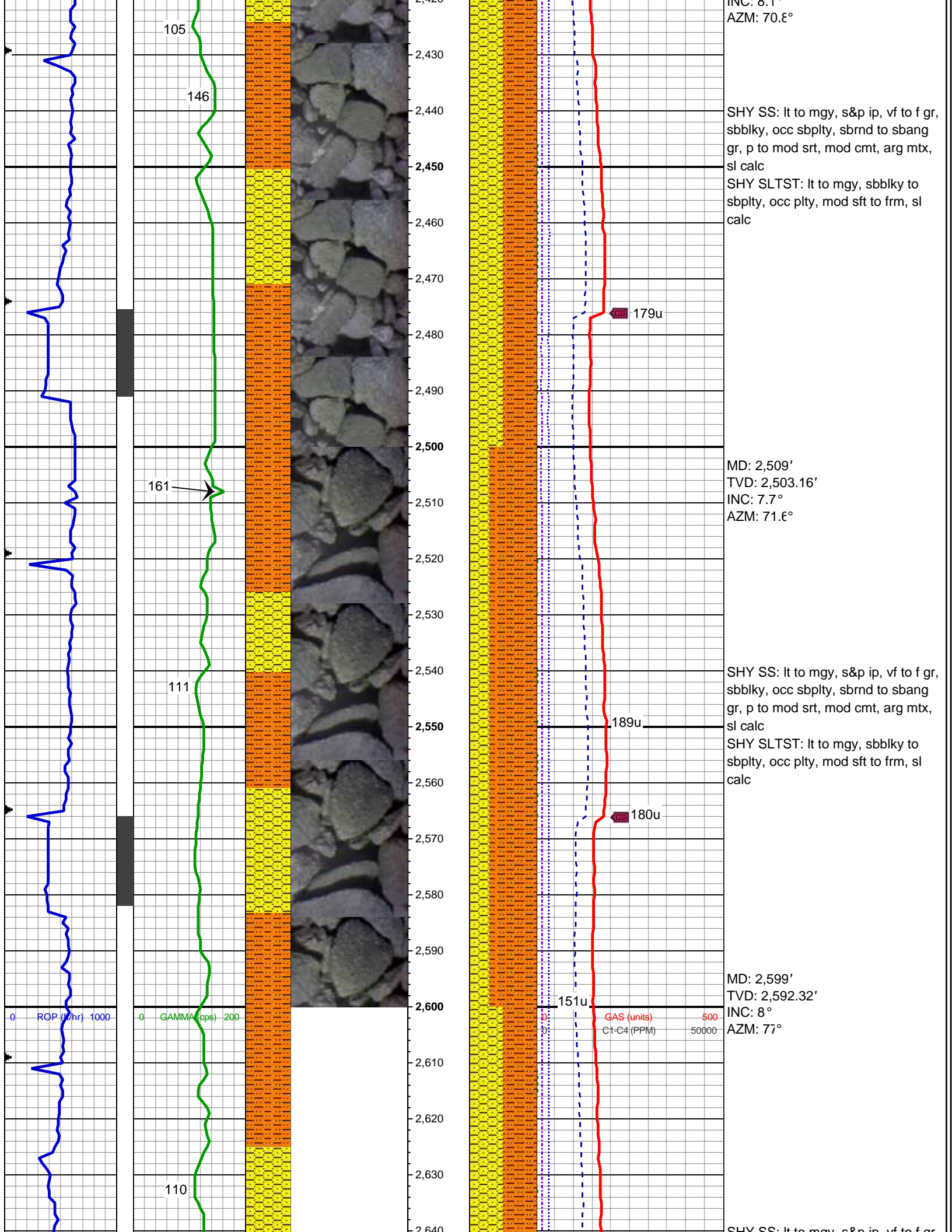
MD: 2,150'  
TVD: 2,147.51'  
INC: 6.5°  
AZM: 69.8°

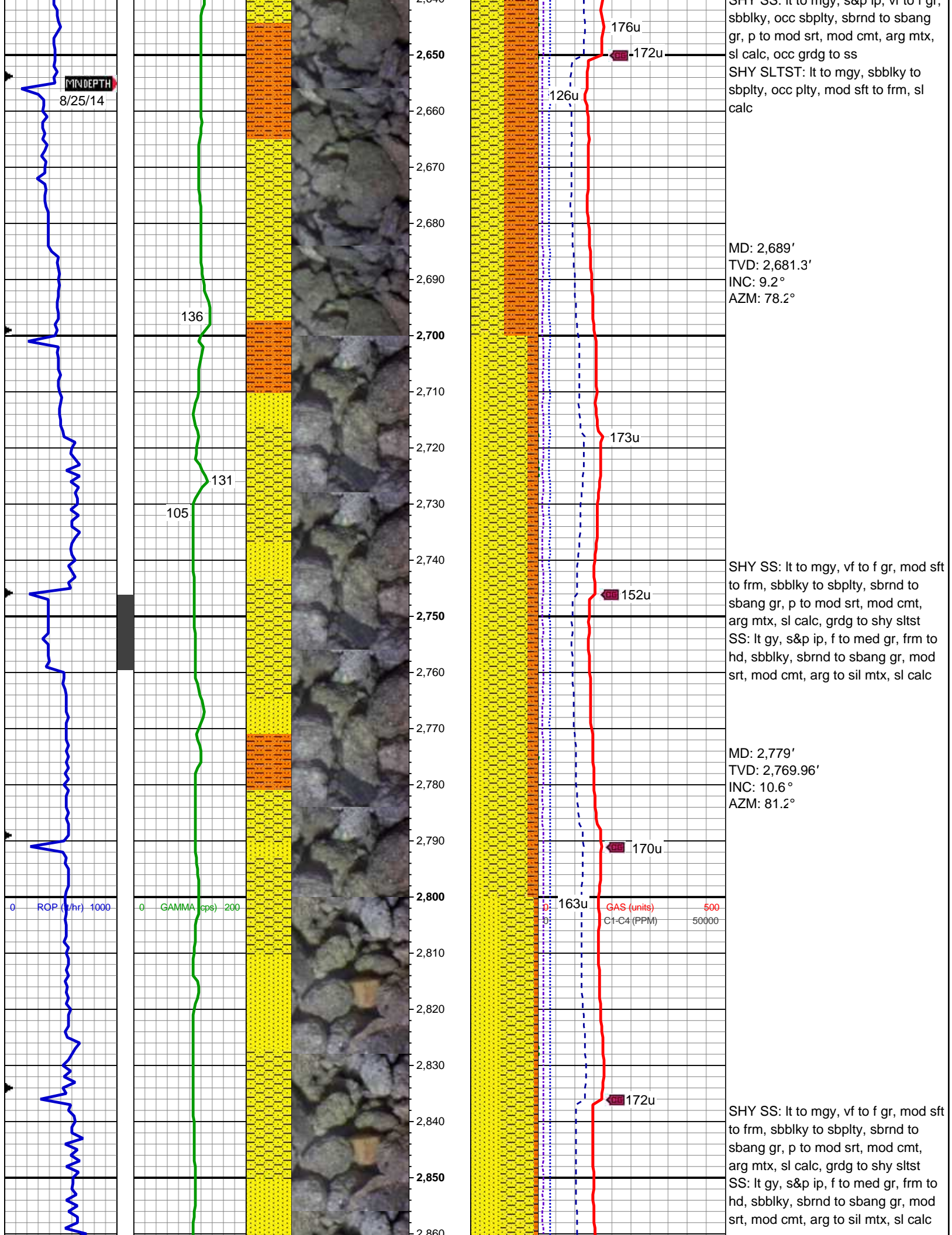
SHY SS: lt to mgy, s&p ip, vf to f gr, sbblky, occ sbplty, sbrnd to sbang gr, p to mod srt, mod cmt, arg mtx, sl calc, grdg to ss  
SHY SLTST: lt to mgy, sbblky to sbplty, occ plty, mod sft to frm, sl calc



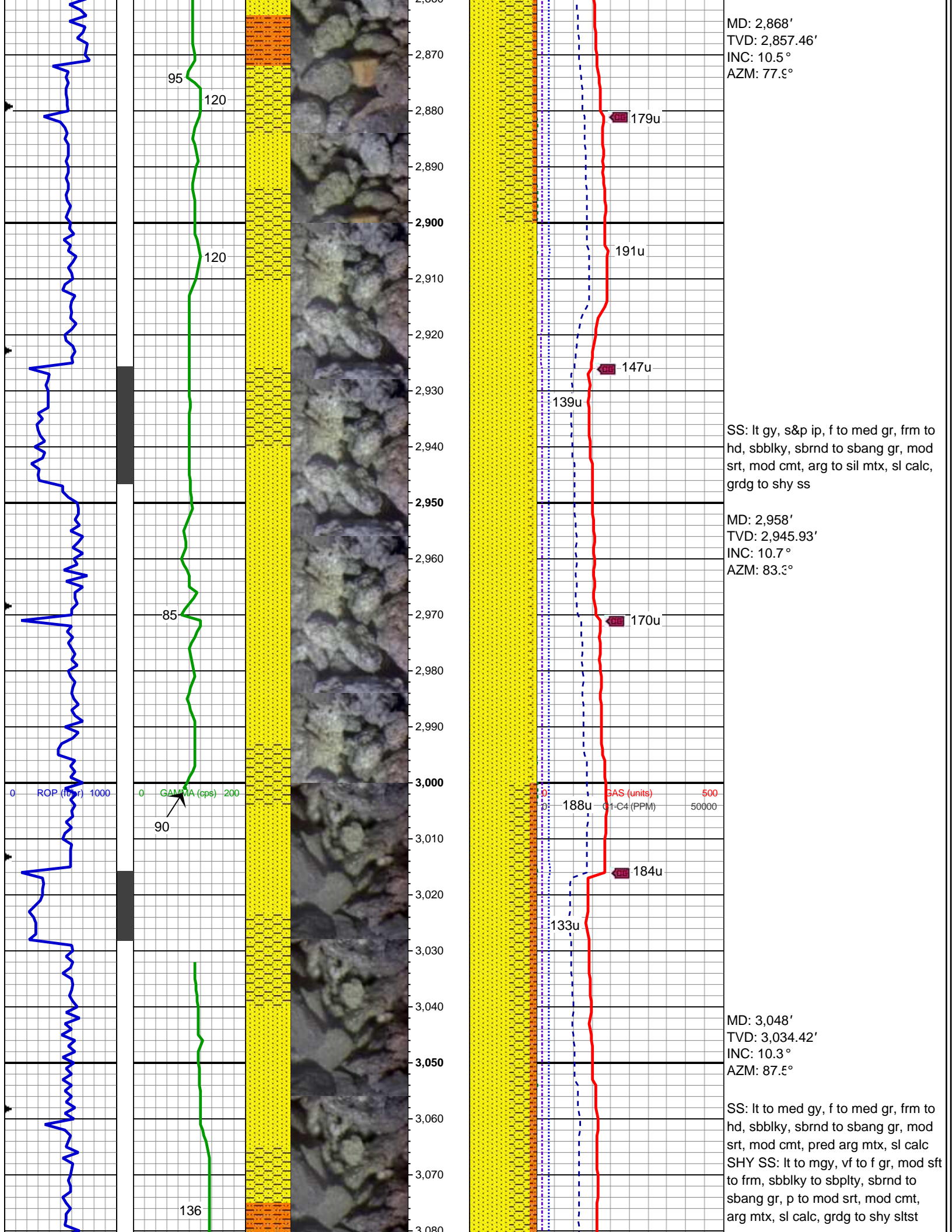




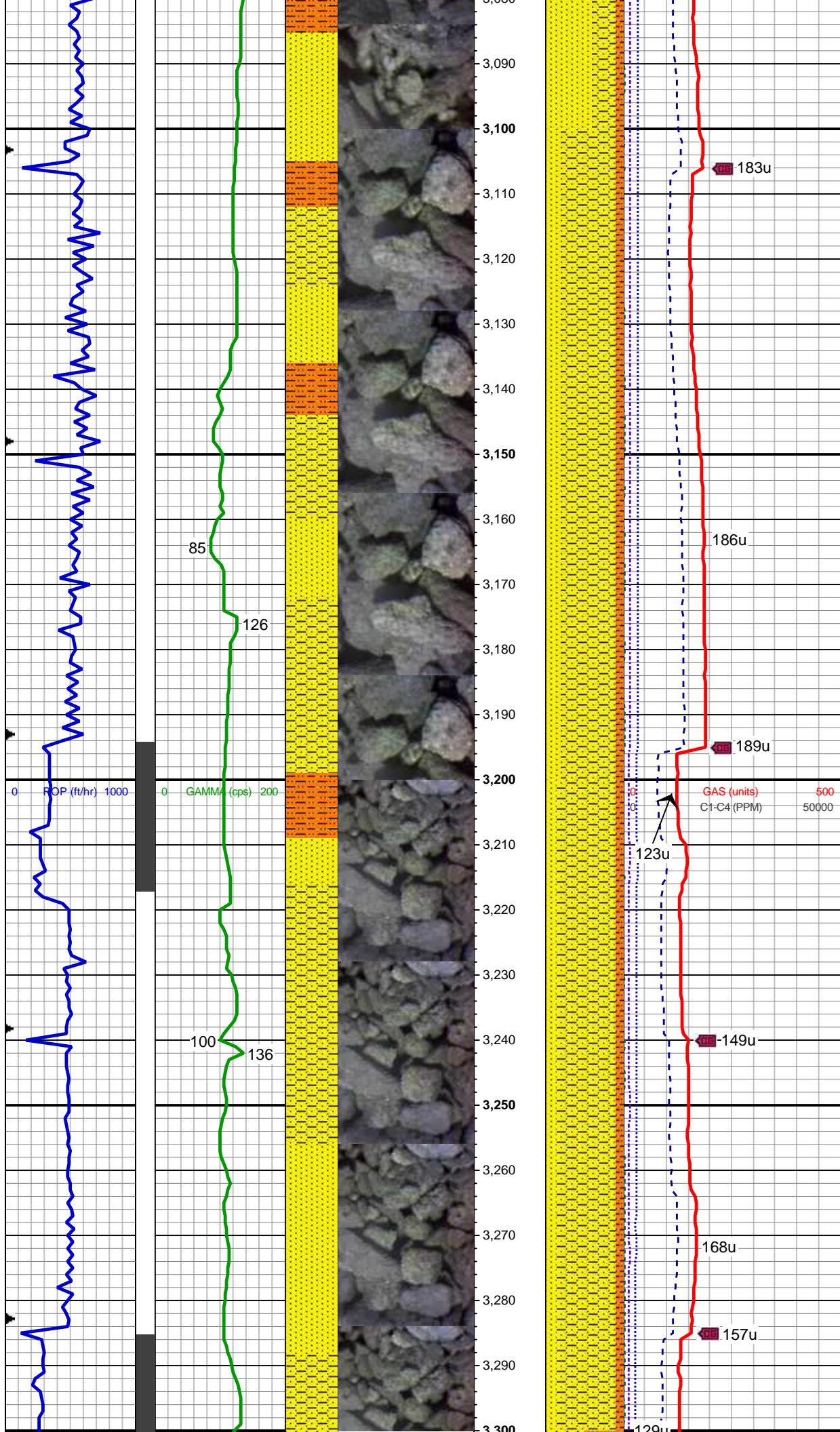












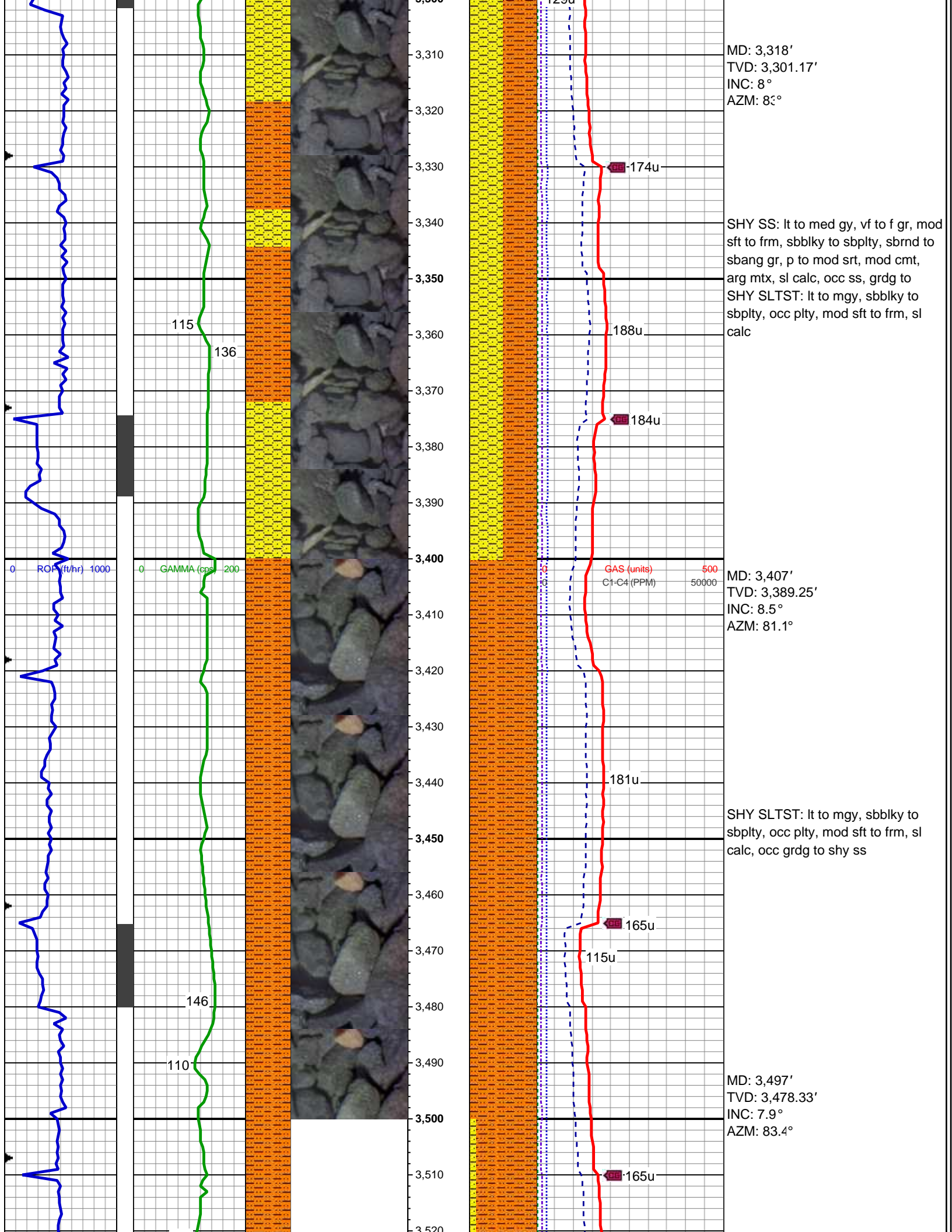
MD: 3,138'  
TVD: 3,123.14'  
INC: 9°  
AZM: 86.2°

SS: It to med gy, f to med gr, frm to hd, sbbly, sbrnd to sbang gr, mod srt, mod cmt, pred arg mtx, sl calc  
SHY SS: It to mgy, vf to f gr, mod sft to frm, sbbly to sbply, sbrnd to sbang gr, p to mod srt, mod cmt, arg mtx, sl calc, grdg to shy sltst

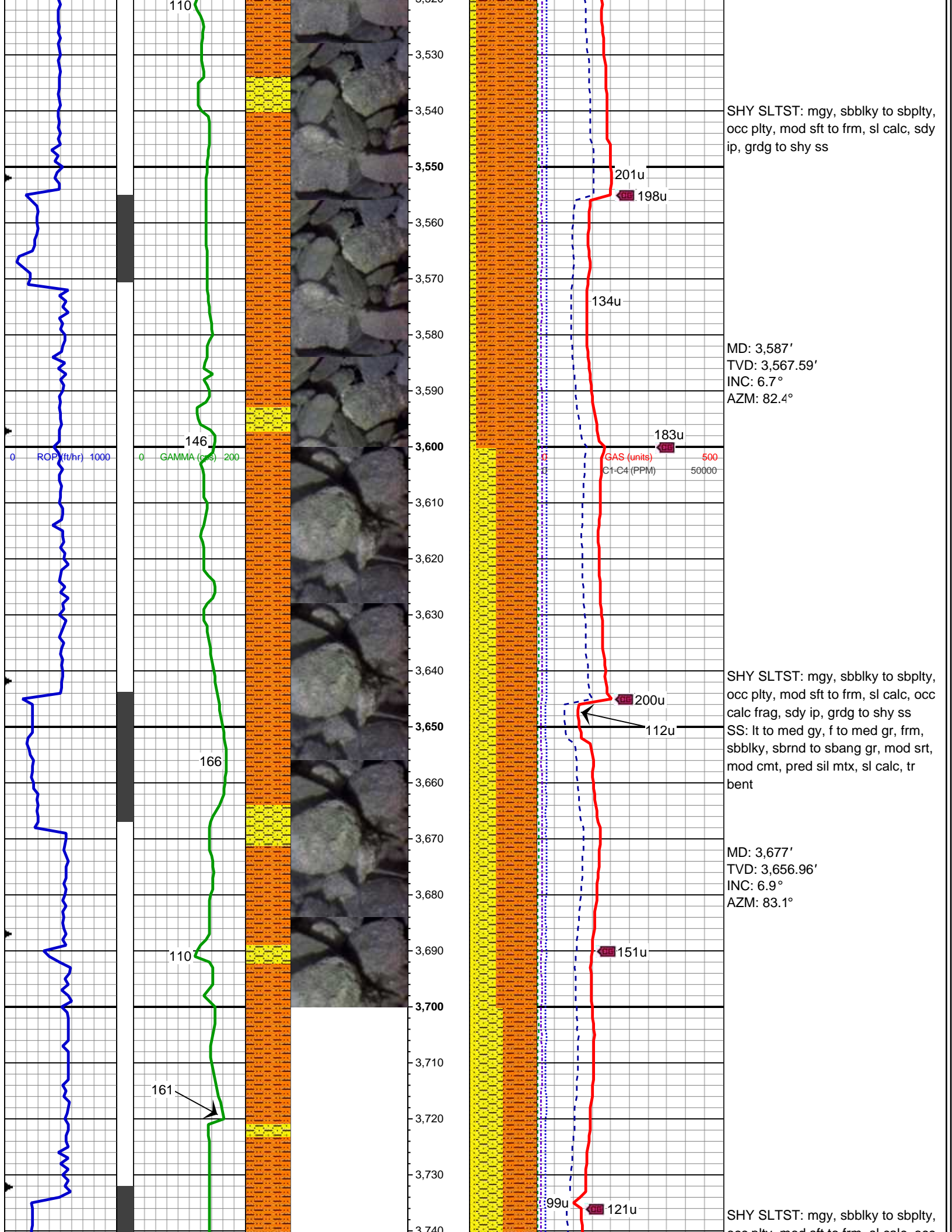
GAS (units)  
C1-C4 (PPM)

MD: 3,228'  
TVD: 3,212.1'  
INC: 8.5°  
AZM: 79.6°

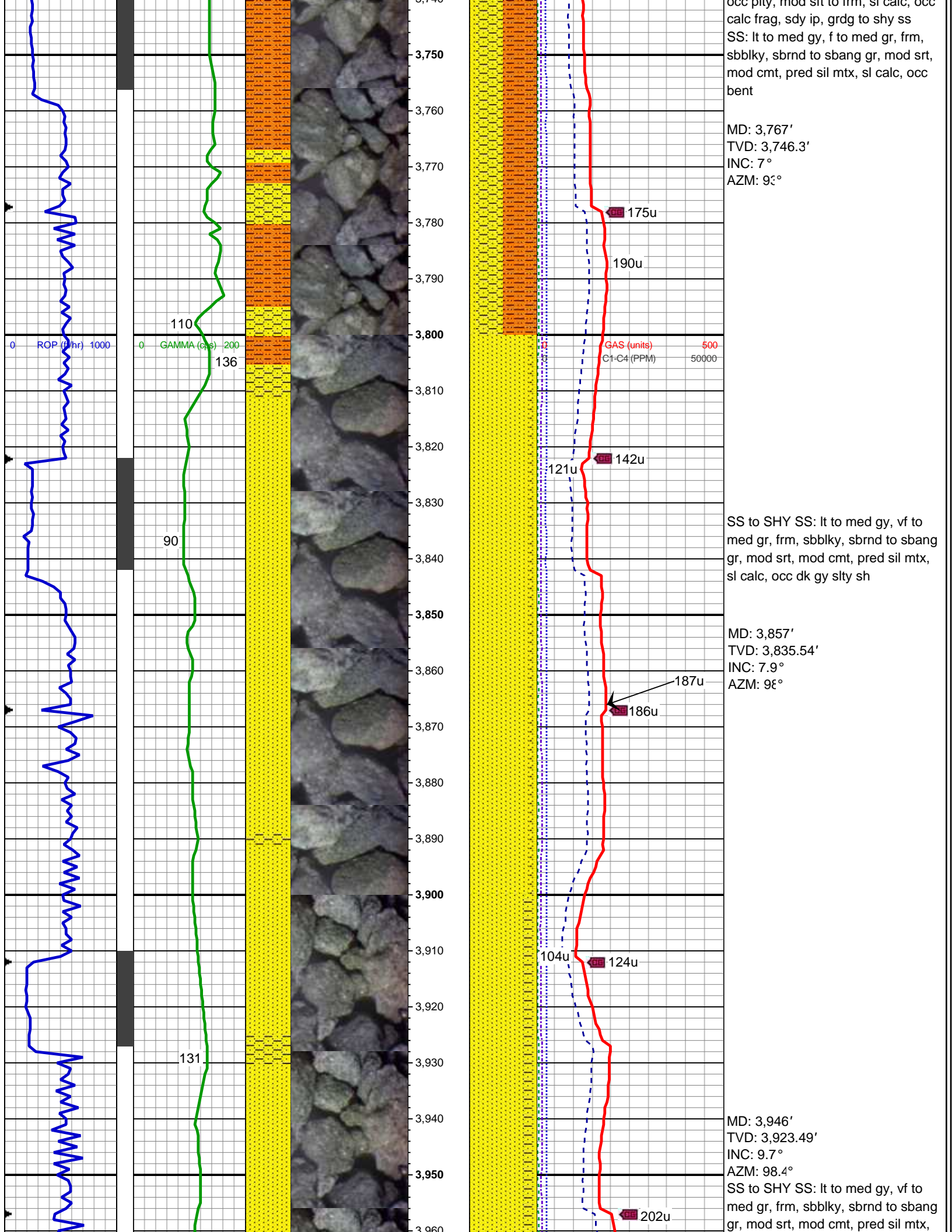
SHY SS: It to med gy, vf to f gr, mod sft to frm, sbbly to sbply, sbrnd to sbang gr, p to mod srt, mod cmt, arg mtx, sl calc, grdg to shy sltst  
SS: It to med gy, f to med gr, frm to hd, sbbly, sbrnd to sbang gr, mod srt, mod cmt, arg to sil mtx, sl calc

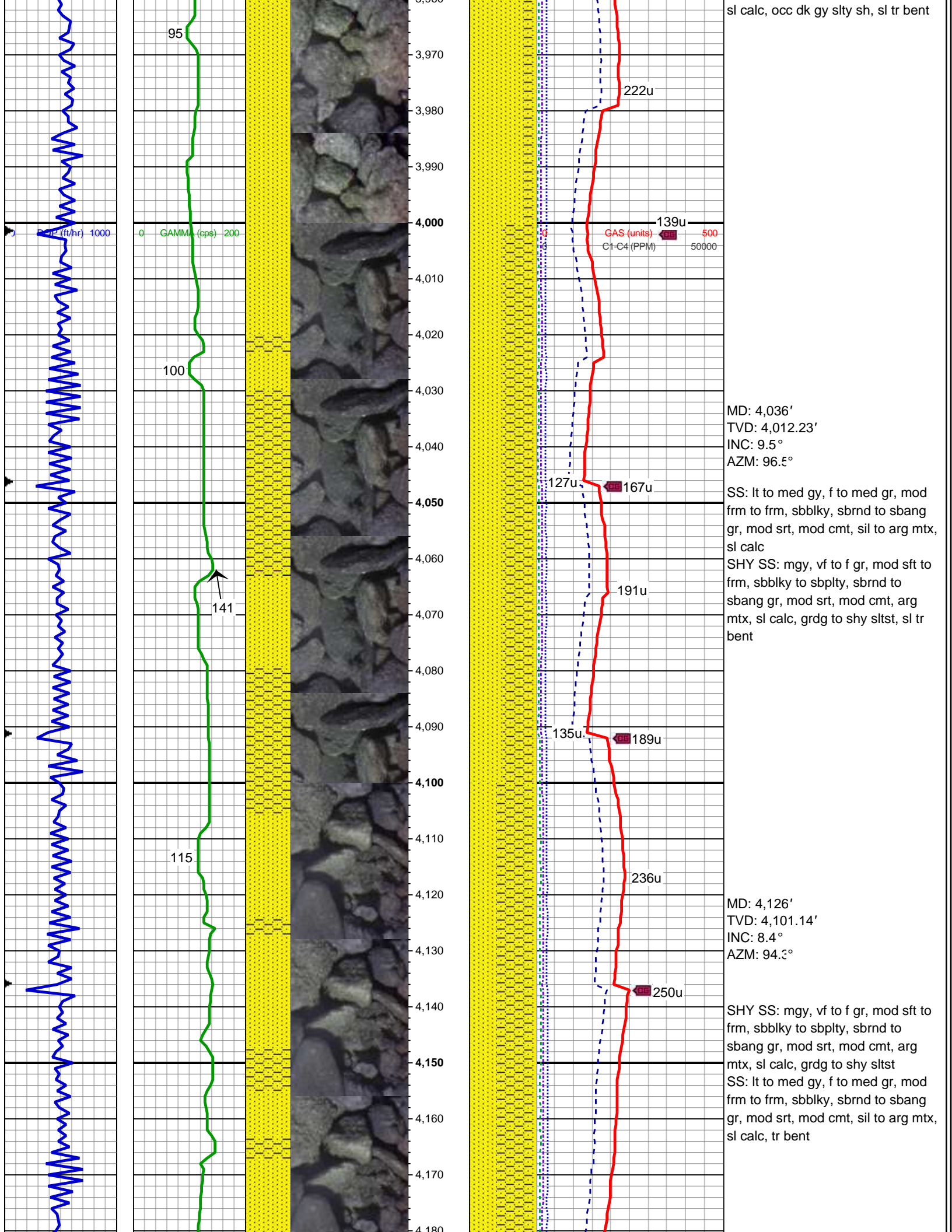




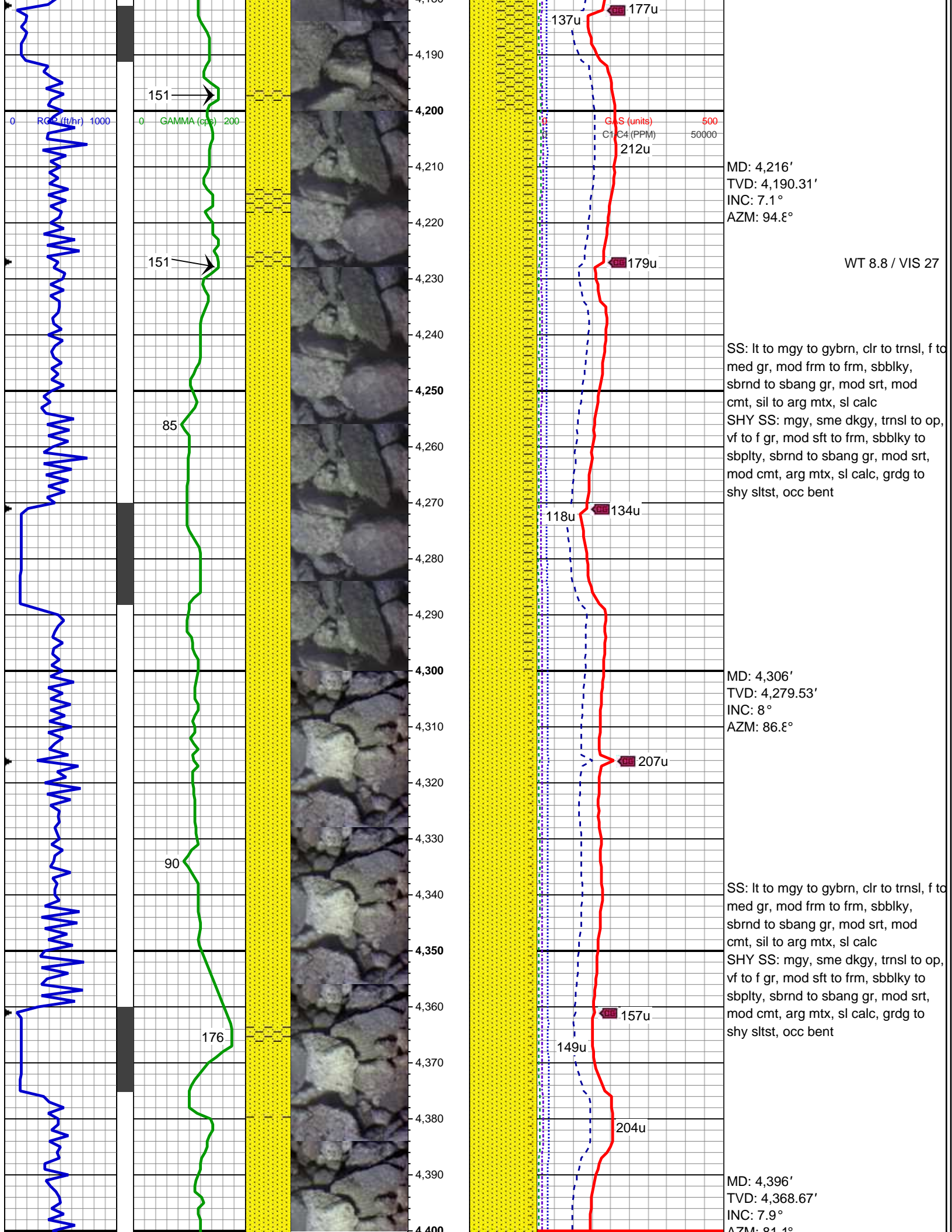


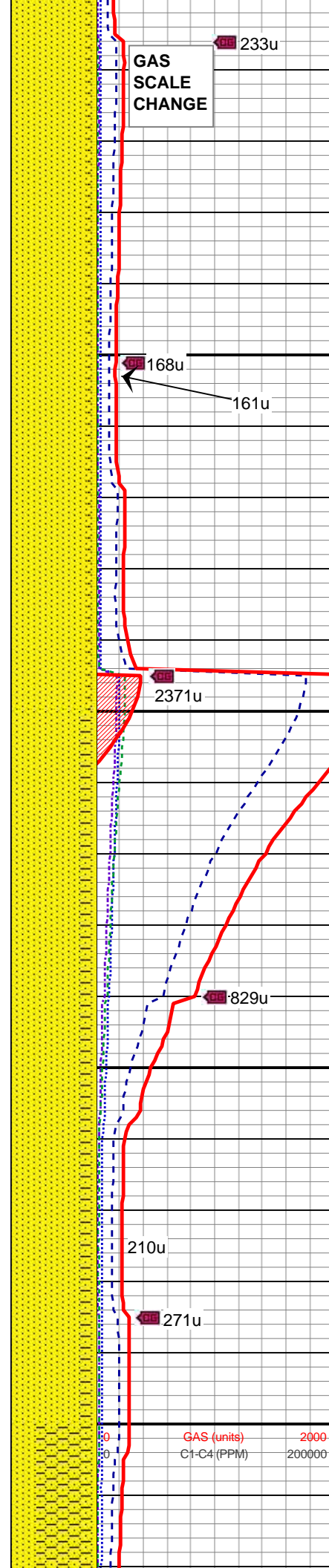
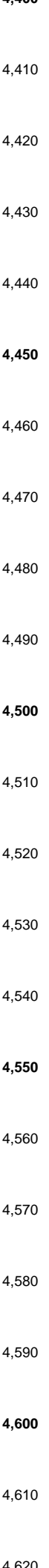
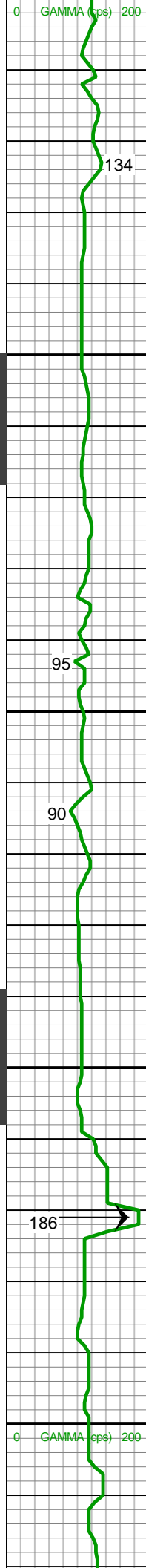
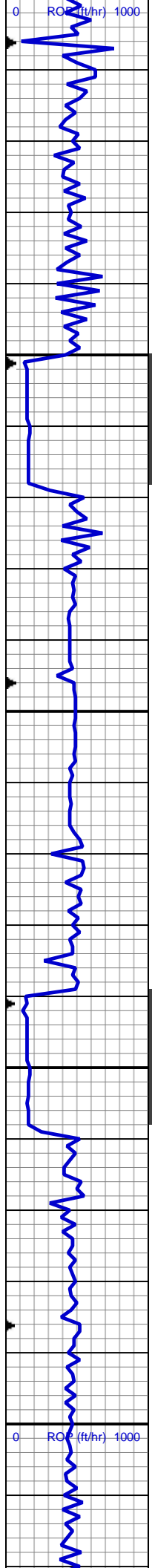












AZIM: 81.1

WT 8.8 / VIS 27

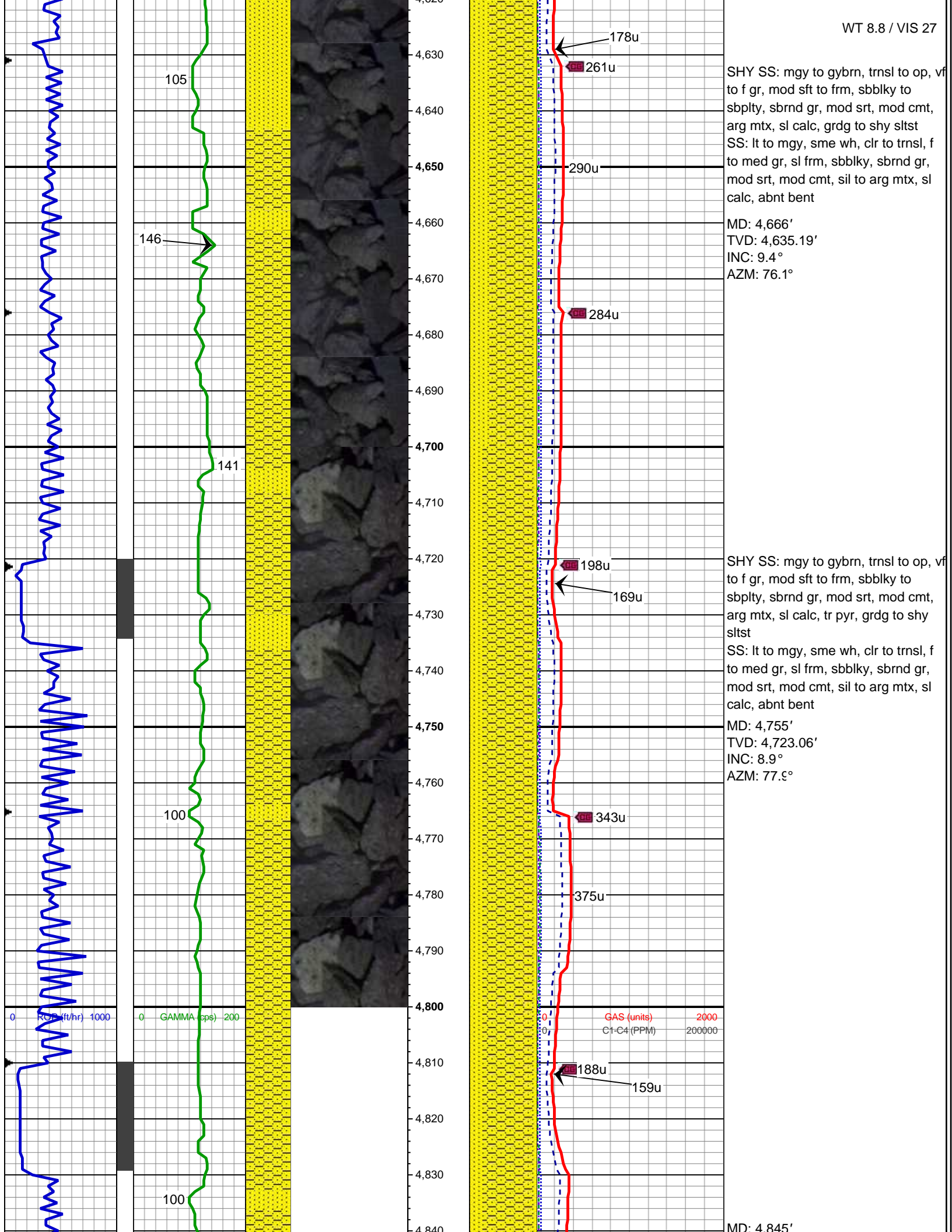
SS: lt to mgy, clr to trnsl, f to med gr, sl frm, sbblky, pred sbrnd gr, mod srt, mod cmt, sil to arg mtx, sl calc  
SHY SS: mgy, sme dkgy, trnsl to op, vf to f gr, mod sft to frm, sbblky to sbply, sbrnd to sbang gr, mod srt, mod cmt, arg mtx, sl calc, grdg to shy sltst, scat bent

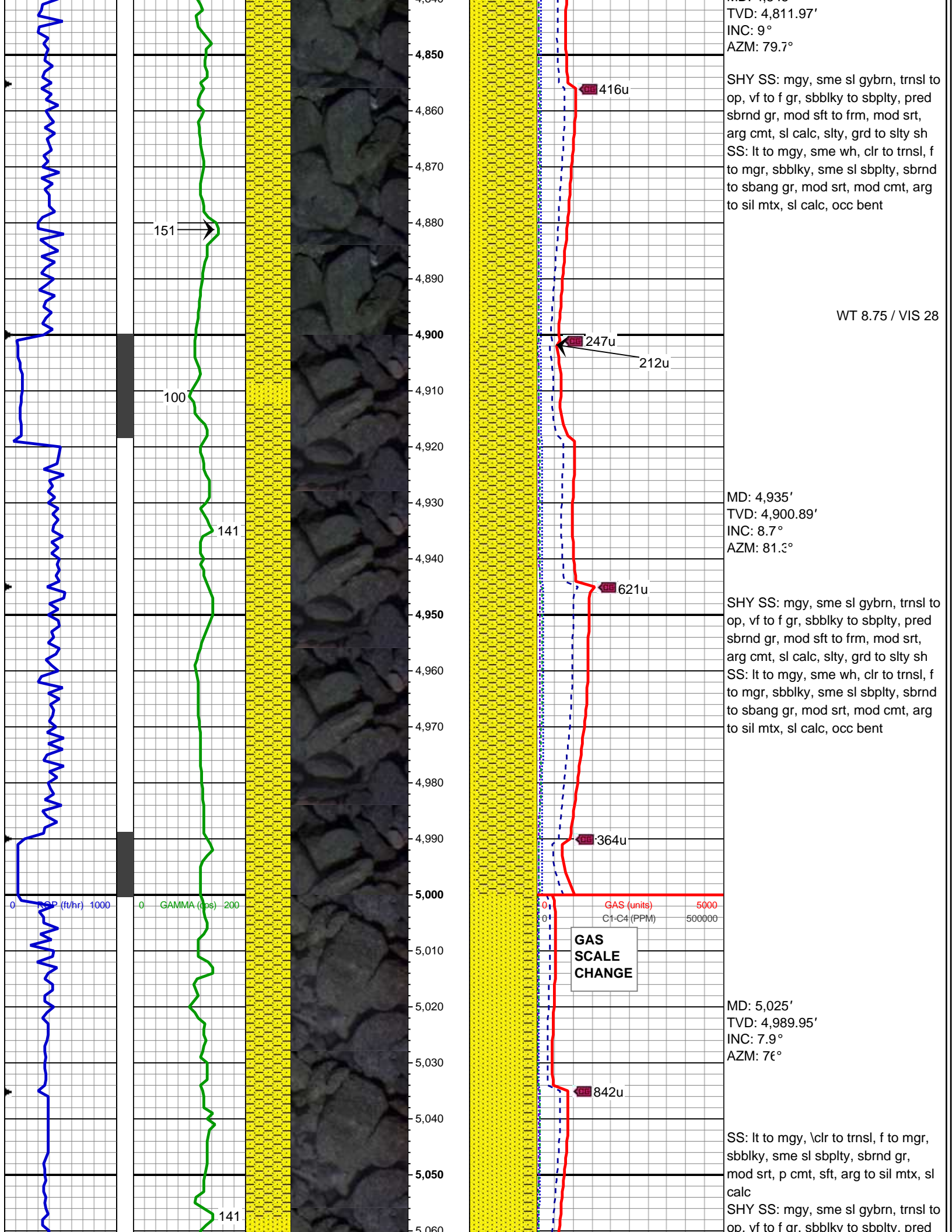
MD: 4,486'  
TVD: 4,457.7'  
INC: 8.9°  
AZM: 78.6°

SS: lt to mgy, clr to trnsl, f to med gr, sl frm, sbblky, pred sbrnd gr, mod srt, mod cmt, sil to arg mtx, sl calc  
SHY SS: mgy, sme dkgy, trnsl to op, vf to f gr, mod sft to frm, sbblky to sbply, sbrnd to sbang gr, mod srt, mod cmt, arg mtx, sl calc, grdg to shy sltst, abnt bent

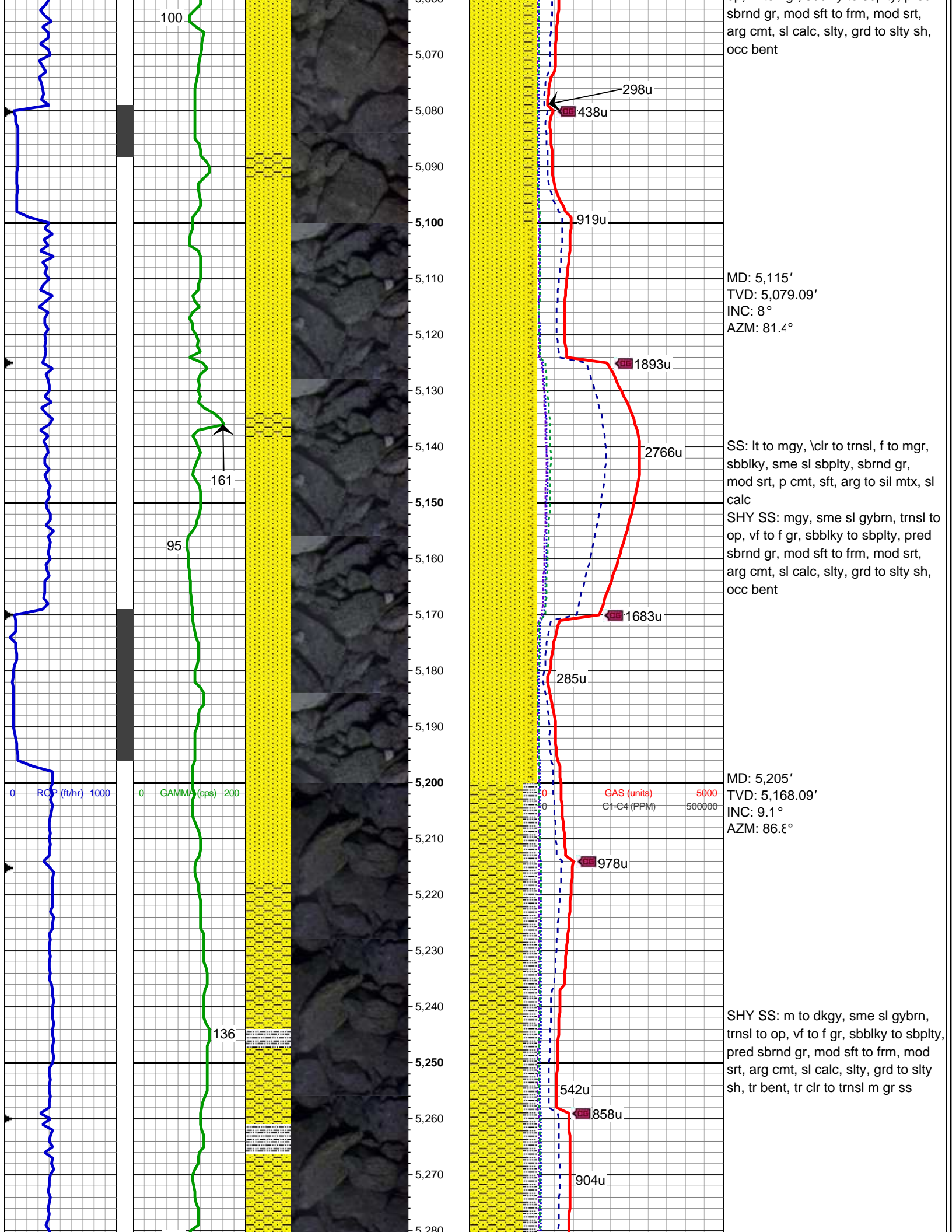
MD: 4,576'  
TVD: 4,546.48'  
INC: 10°  
AZM: 78.6°

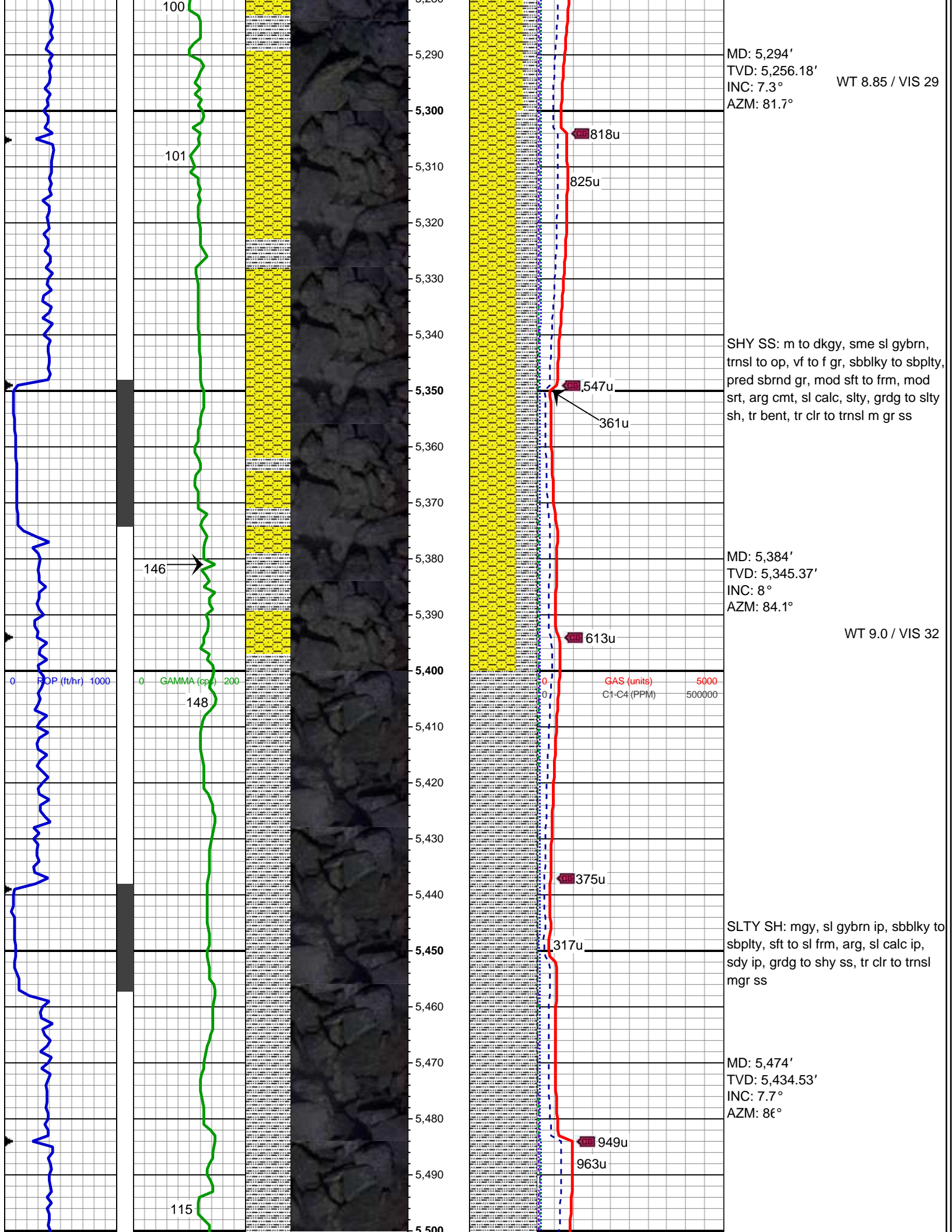




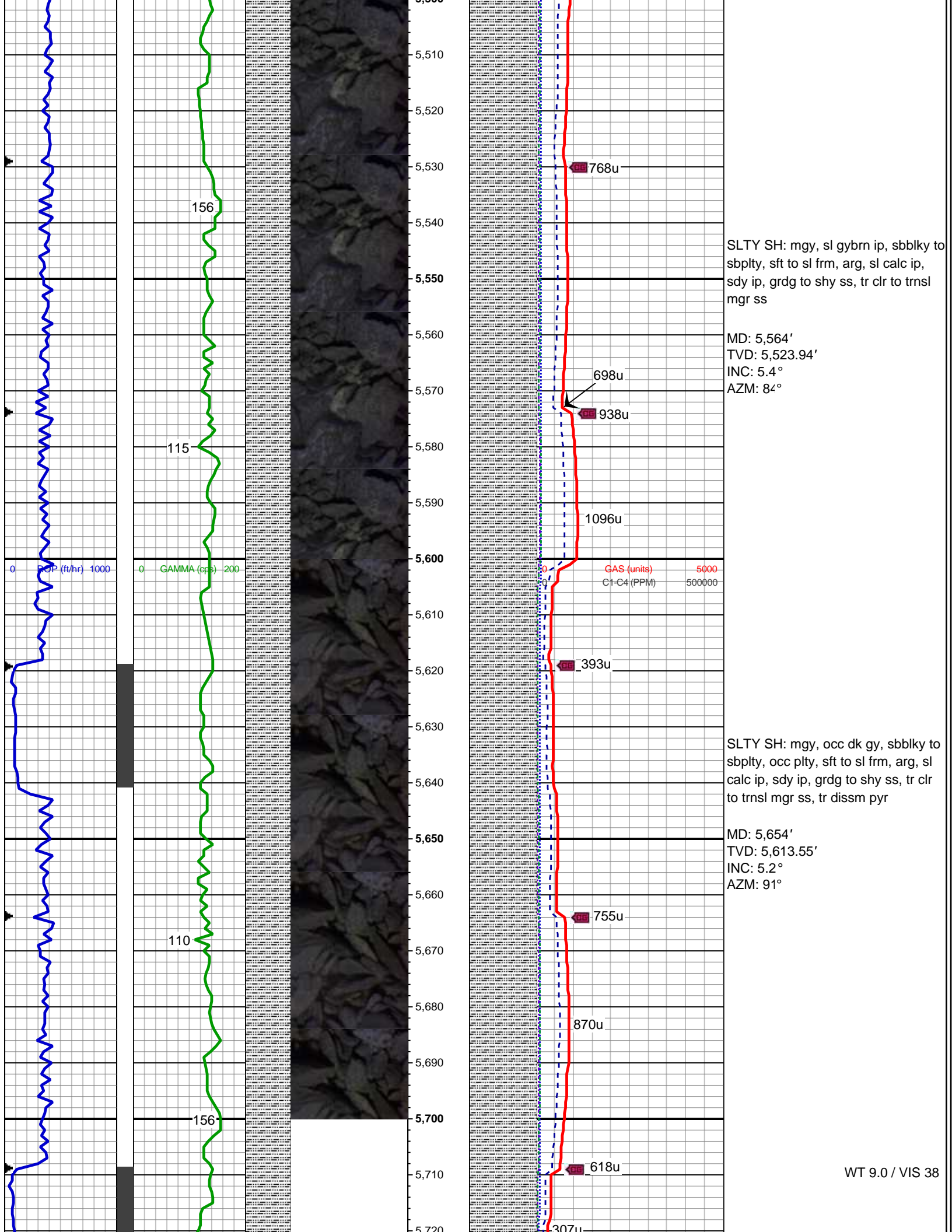










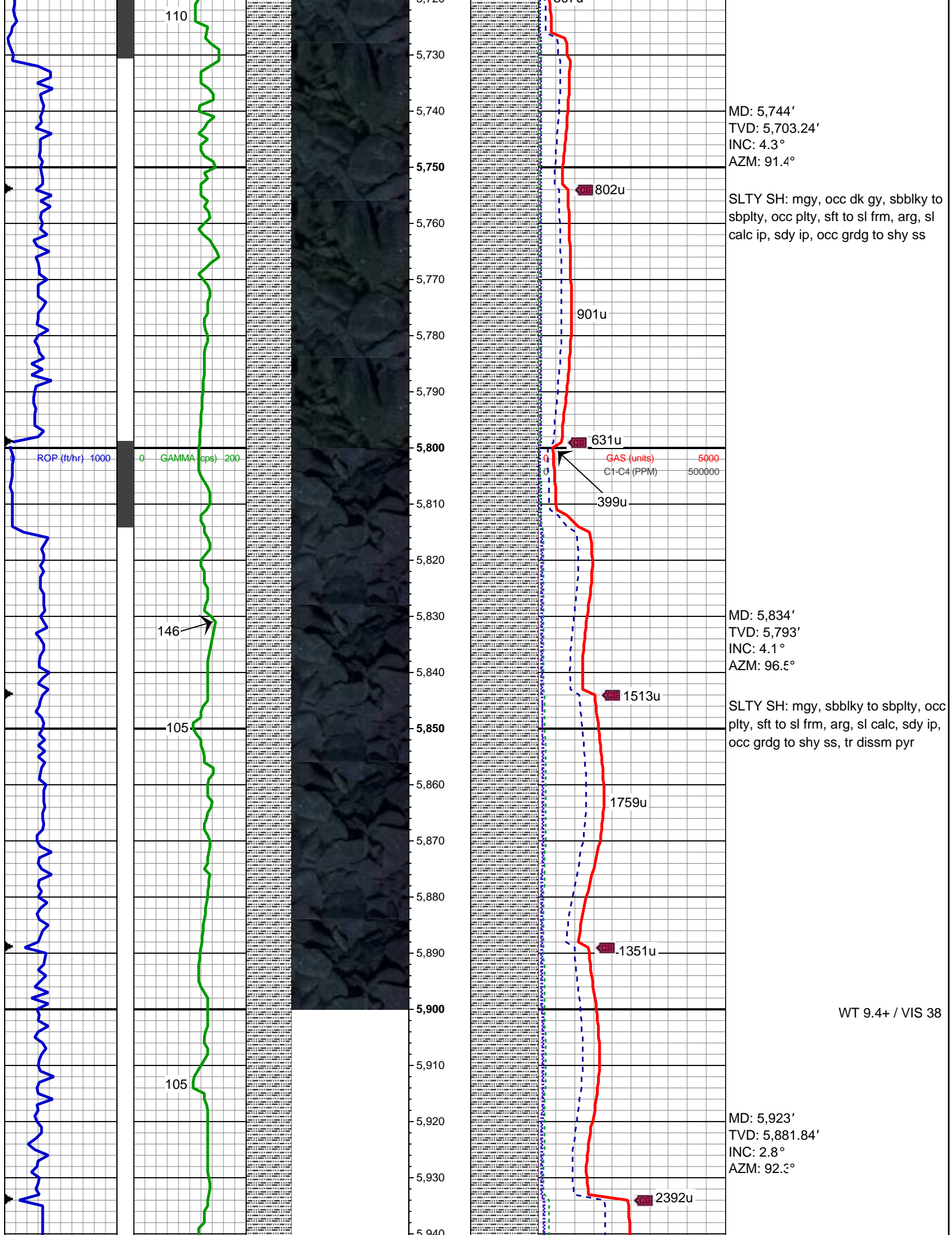


SLTY SH: mgy, sl gybrn ip, sbblky to  
sbplty, sft to sl frm, arg, sl calc ip,  
sdy ip, grdg to shy ss, tr clr to trnsi  
mgr ss

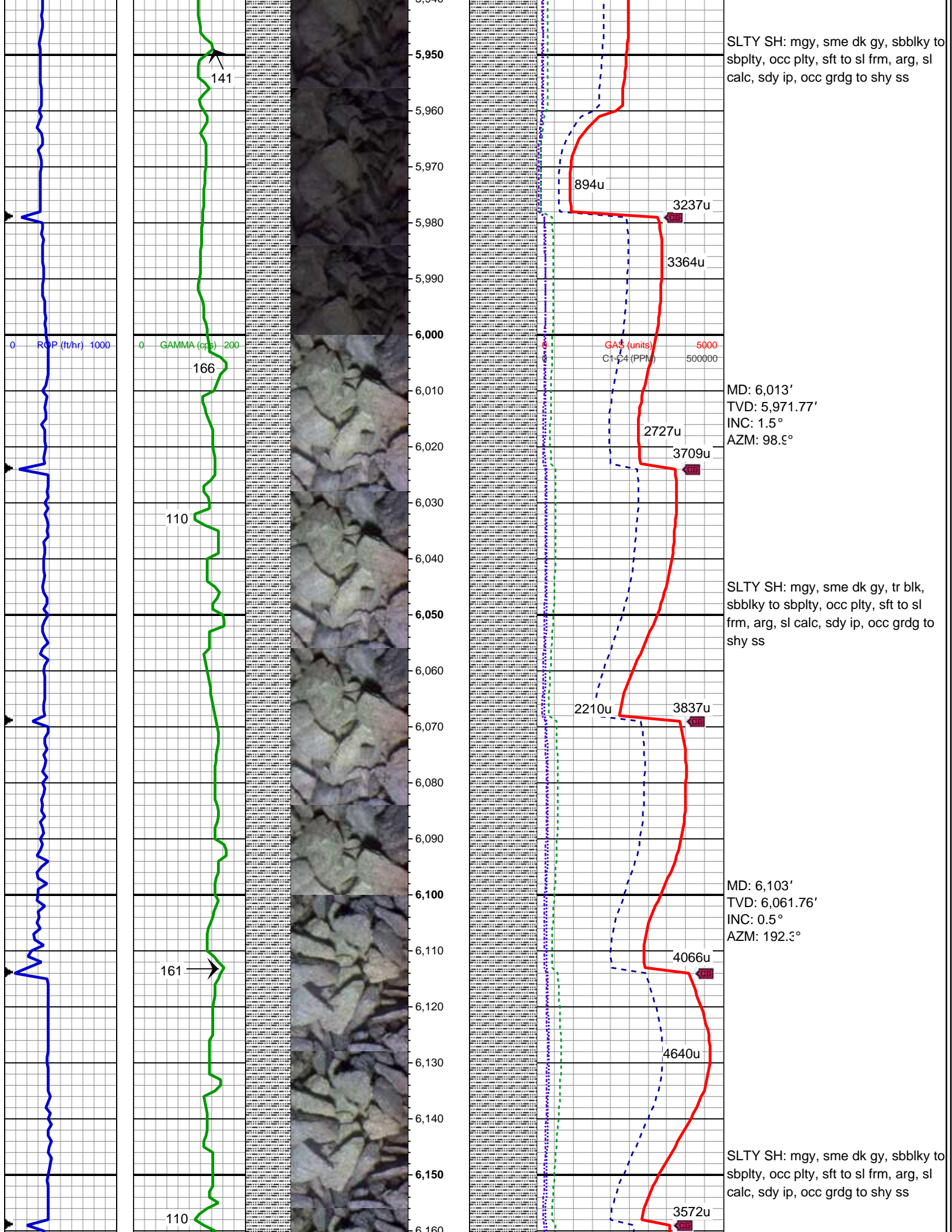
MD: 5,564'  
TVD: 5,523.94'  
INC: 5.4°  
AZM: 8°

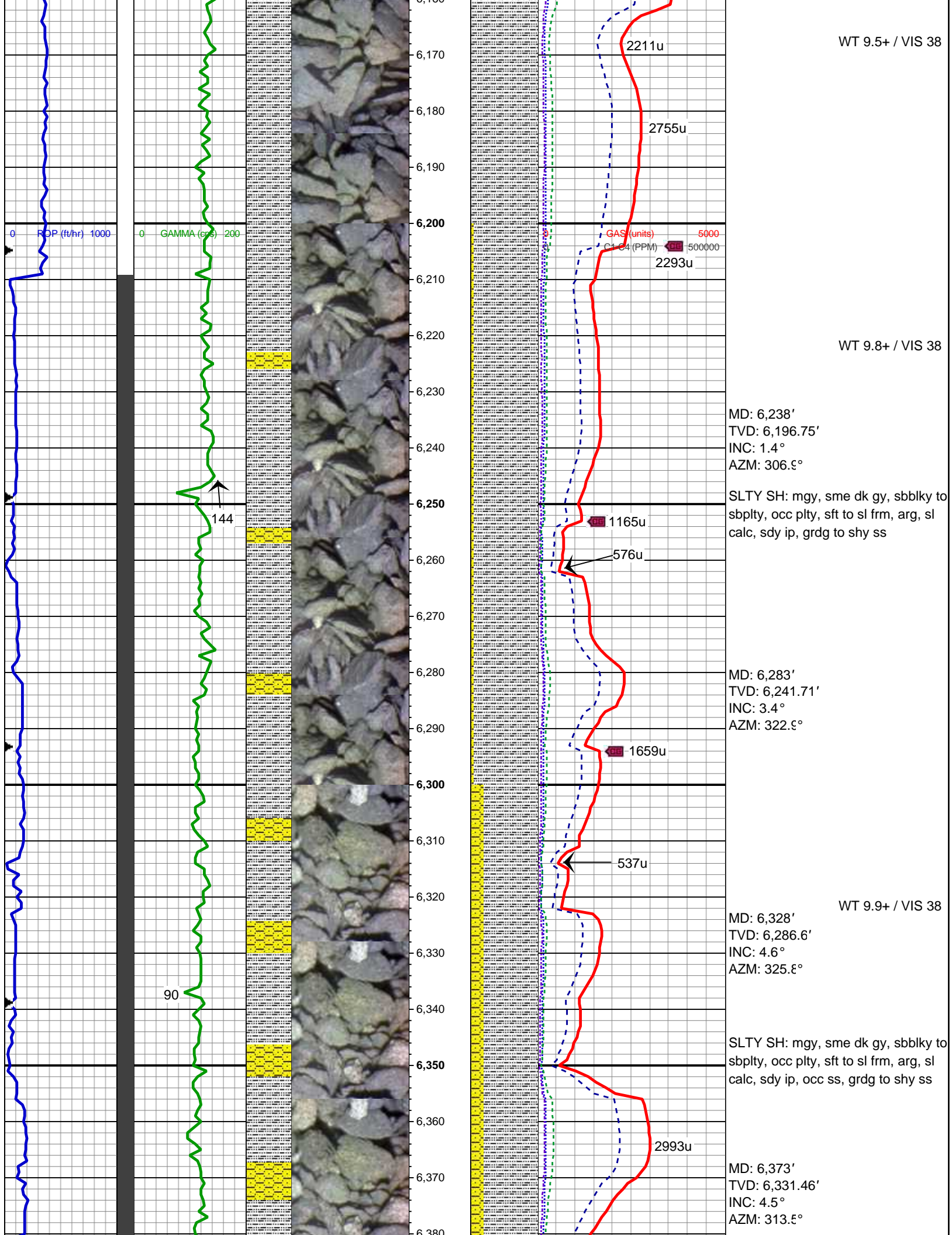
SLTY SH: mgy, occ dk gy, sbblky to  
sbplty, occ plty, sft to sl frm, arg, sl  
calc ip, sdy ip, grdg to shy ss, tr clr  
to trnsi mgr ss, tr dissim pyr

MD: 5,654'  
TVD: 5,613.55'  
INC: 5.2°  
AZM: 91°

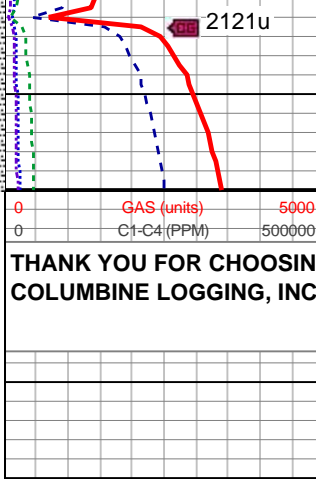
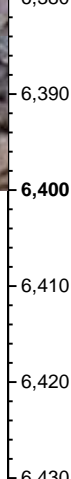
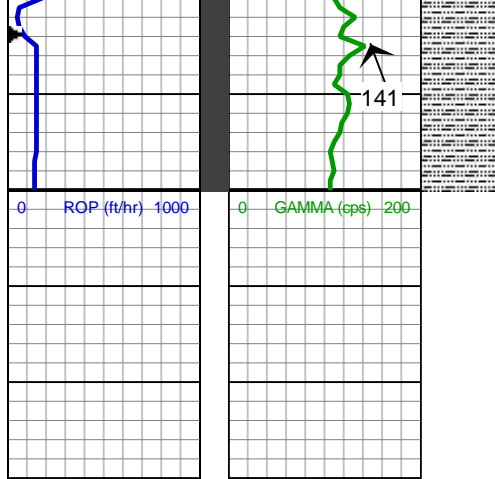












LOG CONTINUES ON FILE:  
Heartland C30-79-1HN Horiz.mplot