

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Heartland G25-72-1HN

Location SESE SEC25 T4N R65W

State COLORADO

County WELD

Country USA

Rig Number PRECISION 828

API Number 05-123-39557

AFE # 141938

Region DENVER-JULESBURG BASIN

Field WATTENBERG

Spud Date 7/25/2014

Drilling Completed 8/4/2014

Surface Coordinates 282' FSL, 365' FEL

Lat/Long: 40.27673/-104.60365

Ground Elevation 4842'

K.B. Elevation 4858'

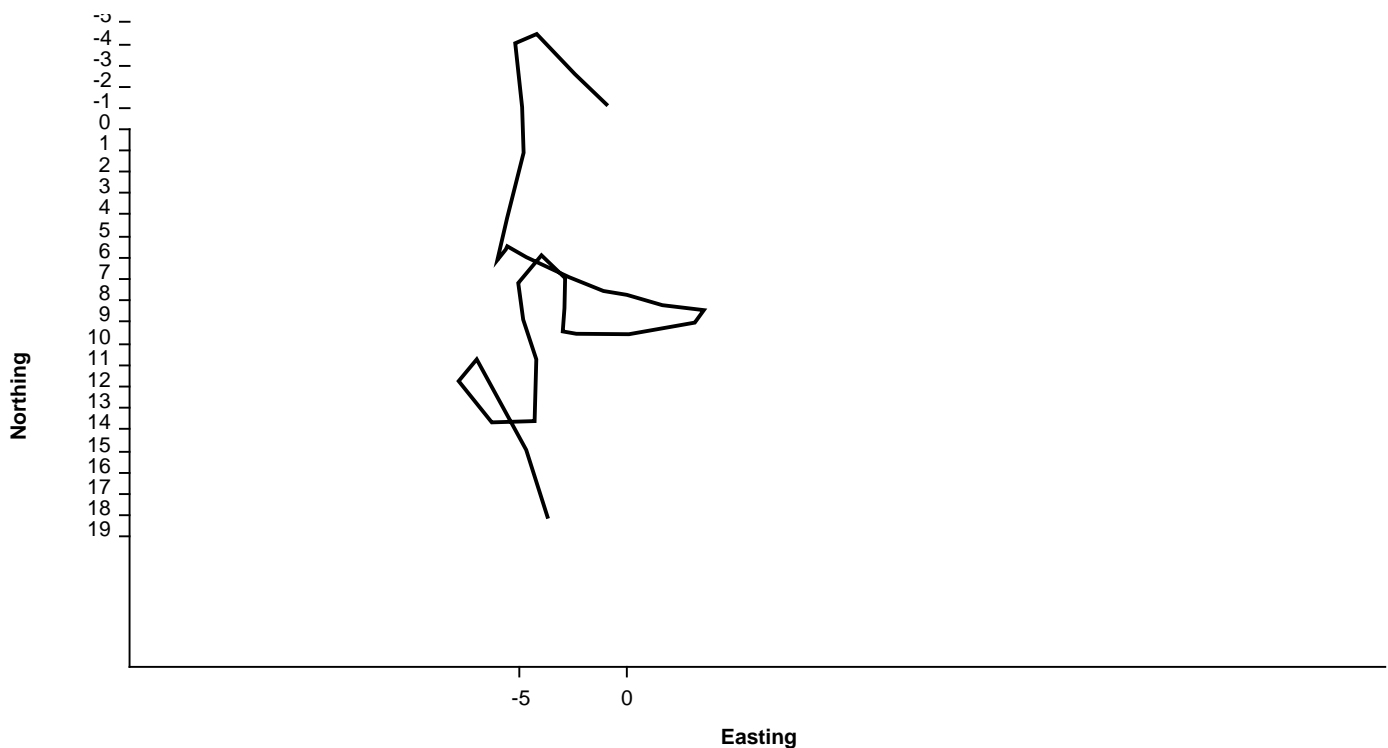
Logged Interval 718' **To** 6,300'

Total Depth 16939'

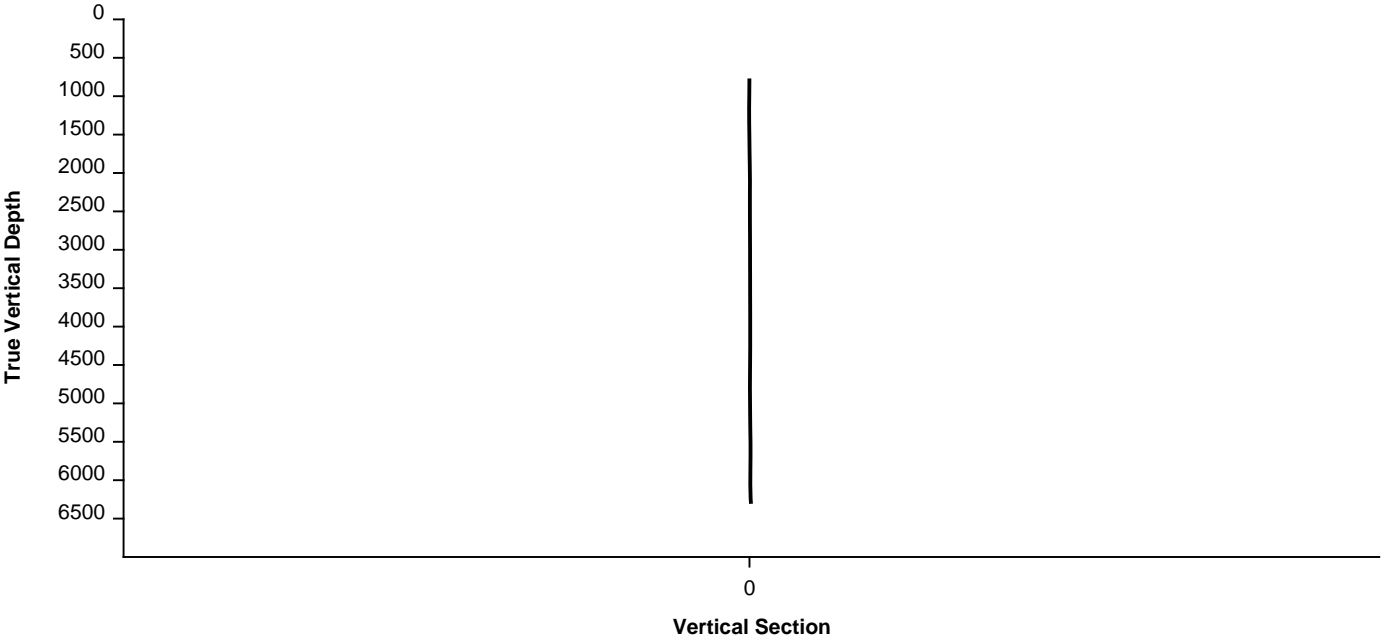
Formation FOX HILLS, PIERRE (PARKMAN, SUSSEX, SHANNON, SHARON SPRINGS, TEEPEE BUTTES)

Type of Drilling Fluid FRESH WATER, LSND

Survey Plan



Survey Elevation



Other

WELLSITE GEOLOGISTS: MARK COLE, ELIZABETH VAN DIEPEN, GARY MYERS
GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC.
LOG CONTINUES ON FILE: Heartland G25-72-1HN Horiz.mplot

Operator

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

Rock Types



 SILTY SHALE  SHALY SILTSTONE  SHALY SANDSTONE  SANDSTONE

Geologist



Name MELANIE PETERSON
Company NOBLE ENERGY, INC.

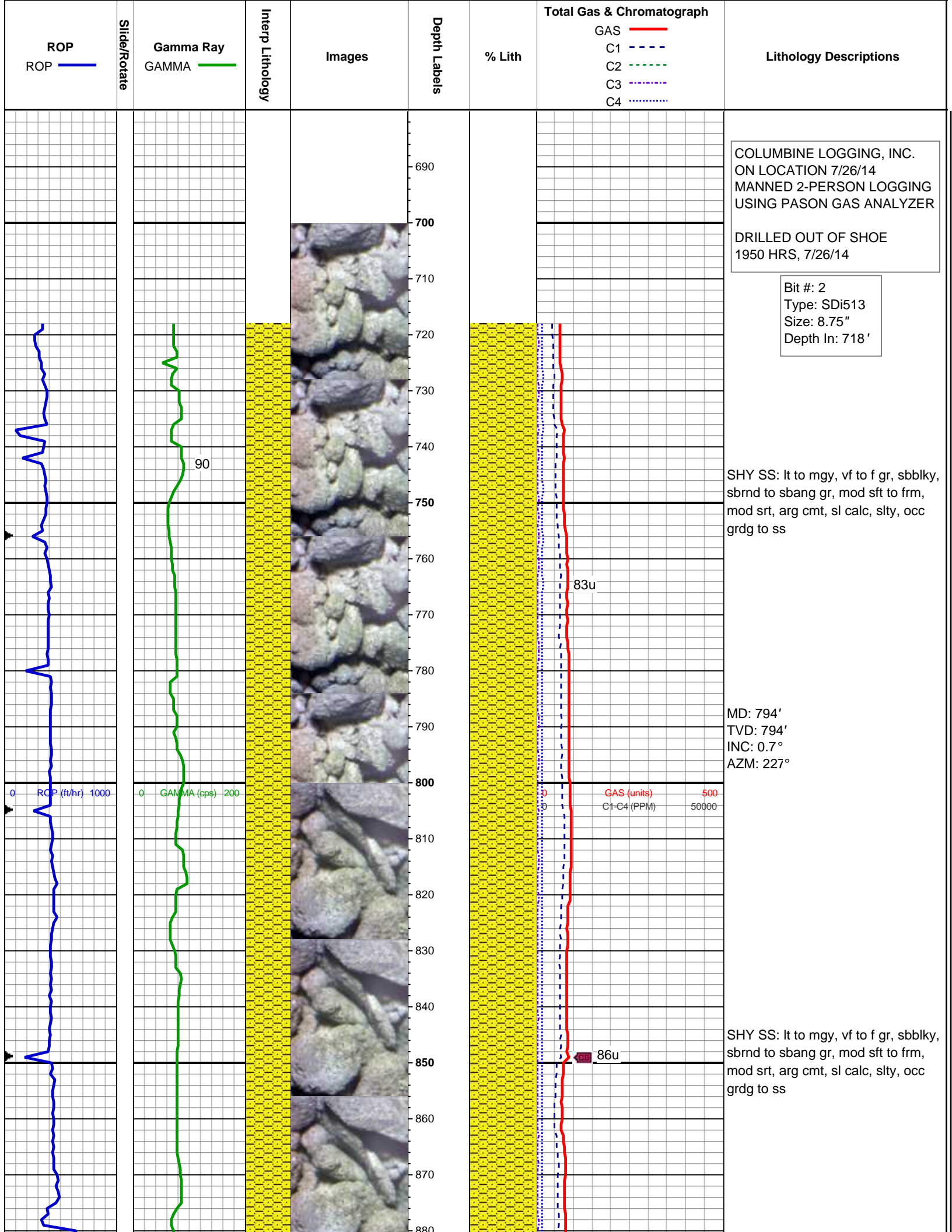
Other Symbols

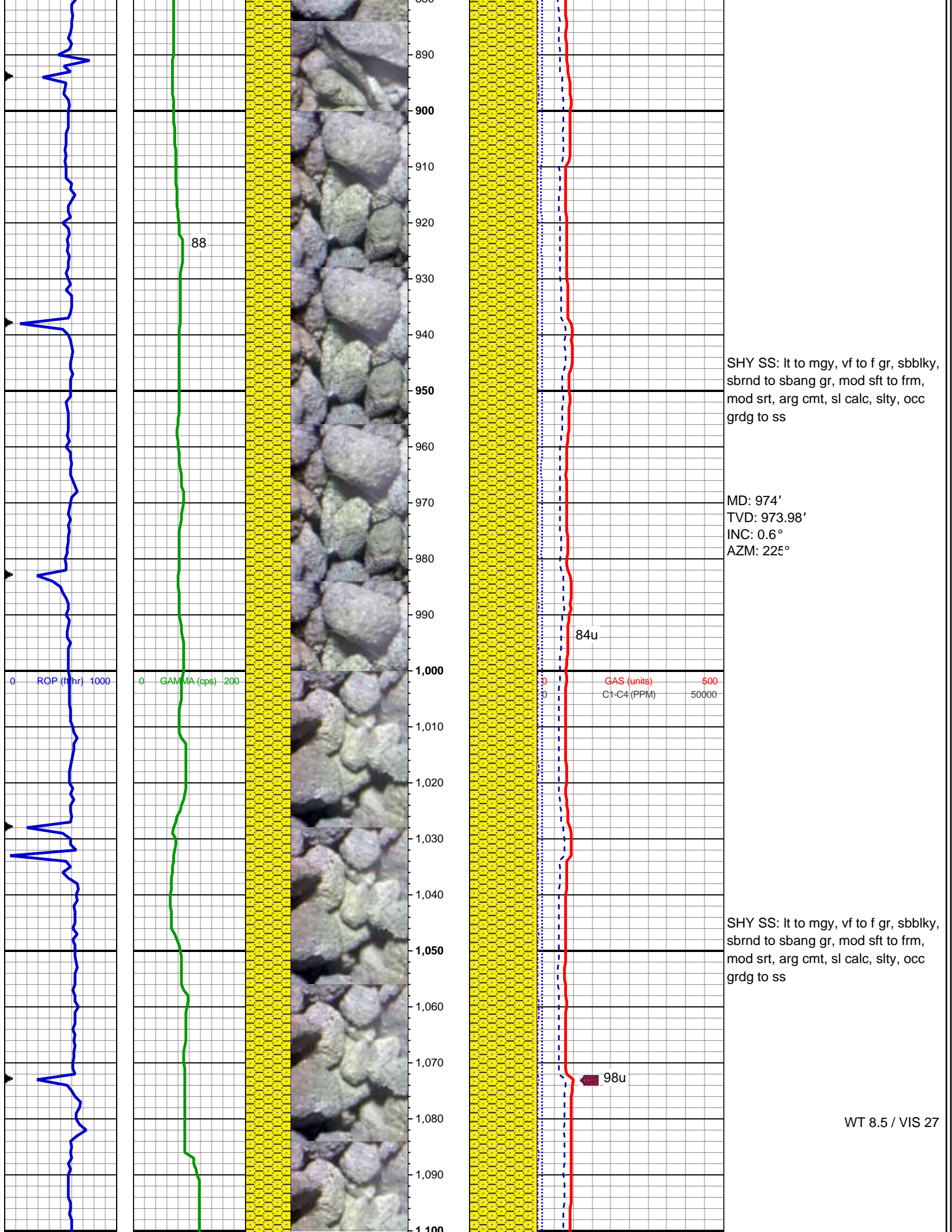
Engineering

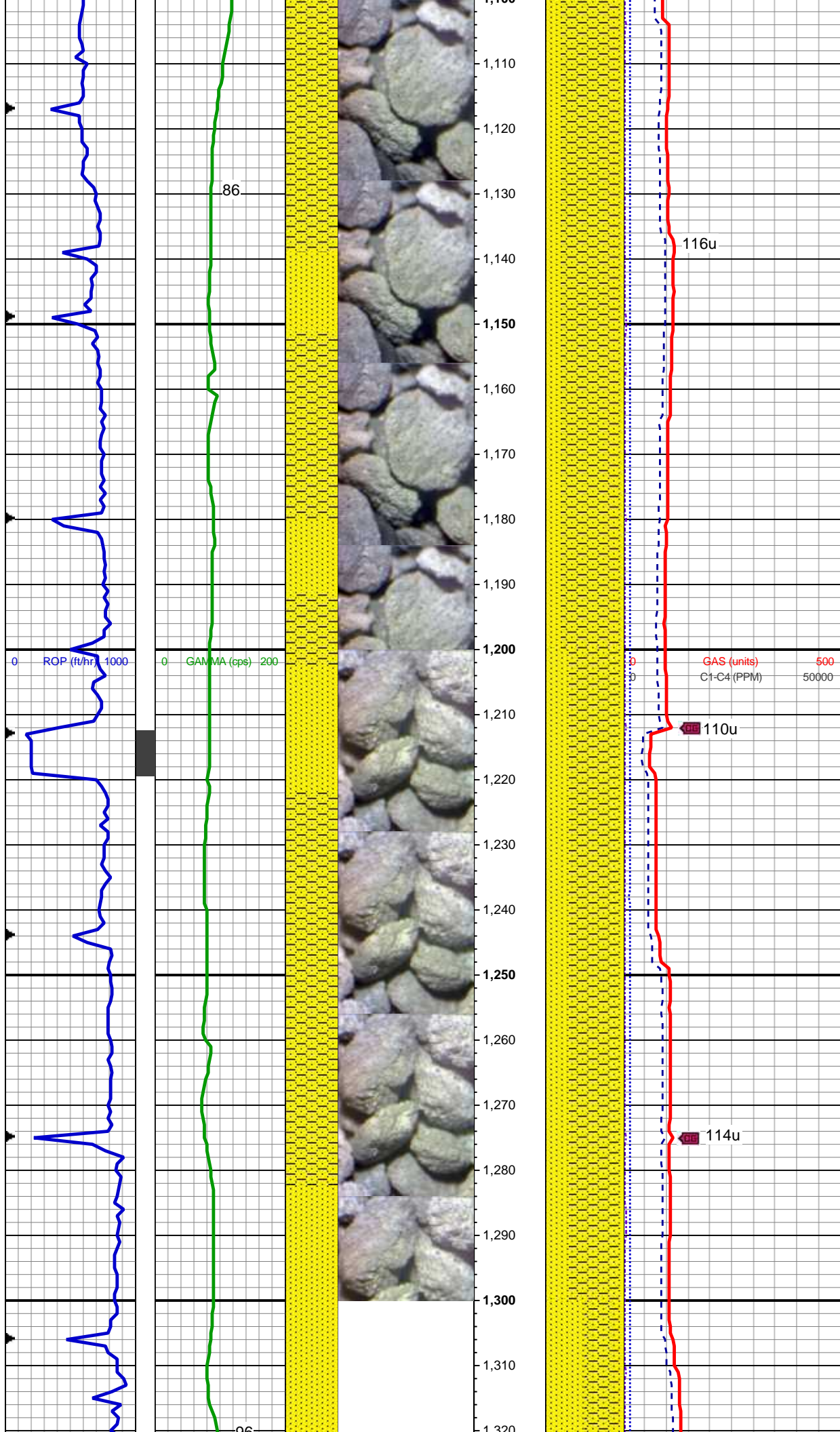
 CONNECTION (RIGHT)
 CONNECTION LOG

Address 1625 Broadway
Denver, CO 80202

 CONNECTION GAS
 MN DEPTH (RIGHT)





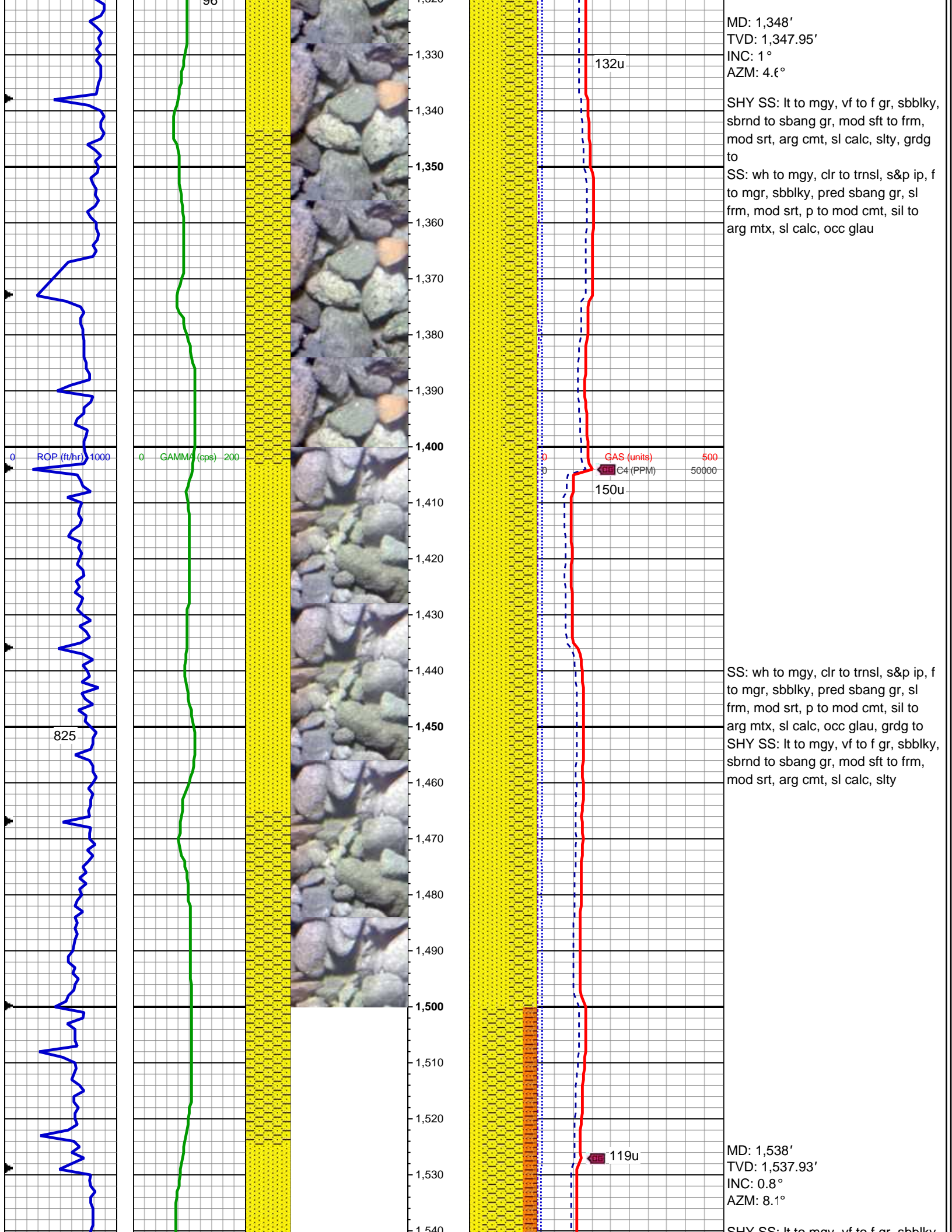


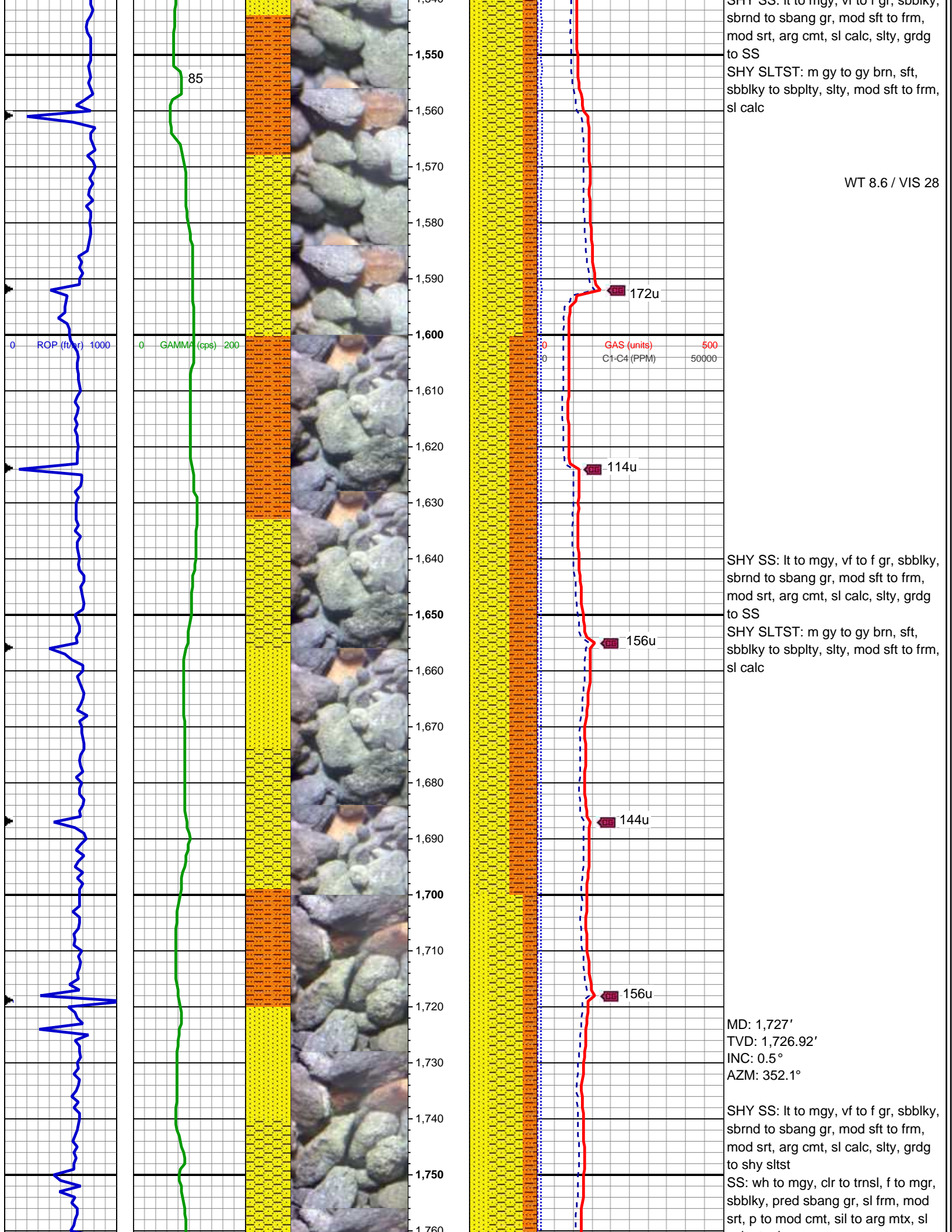
SHY SS: lt to mgy, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to SS

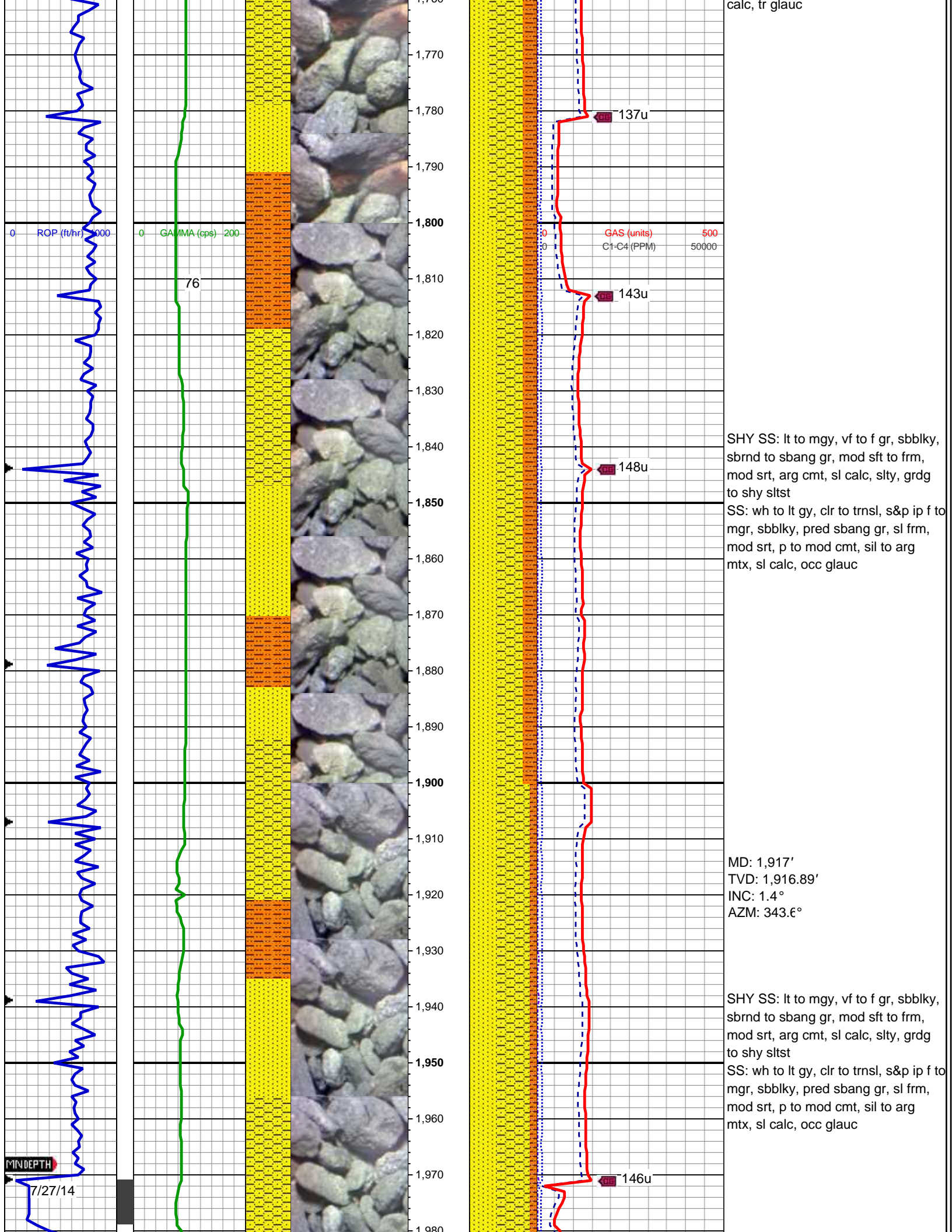
MD: 1,158'
TVD: 1,157.97'
INC: 1°
AZM: 222.8°

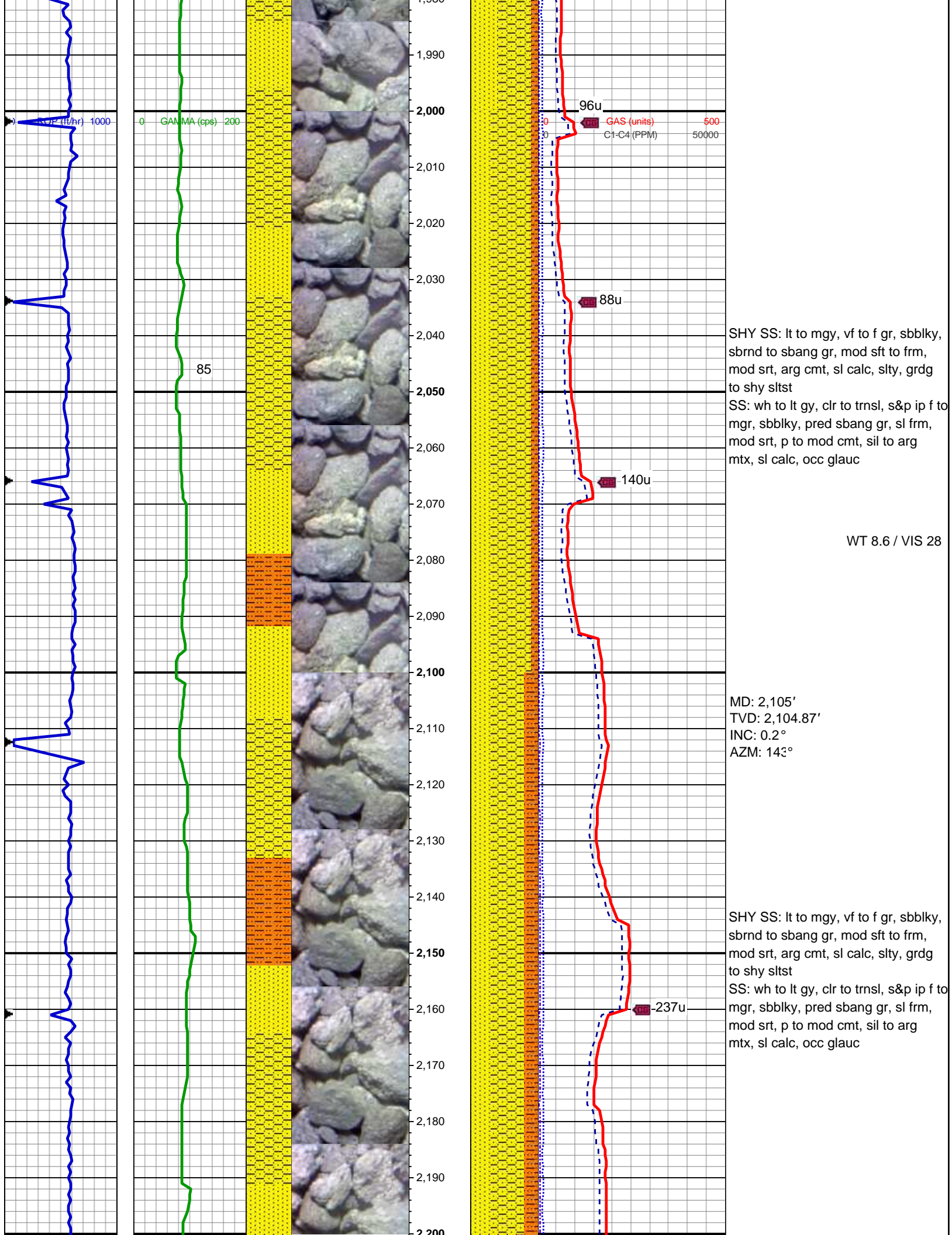
SHY SS: lt to mgy, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to

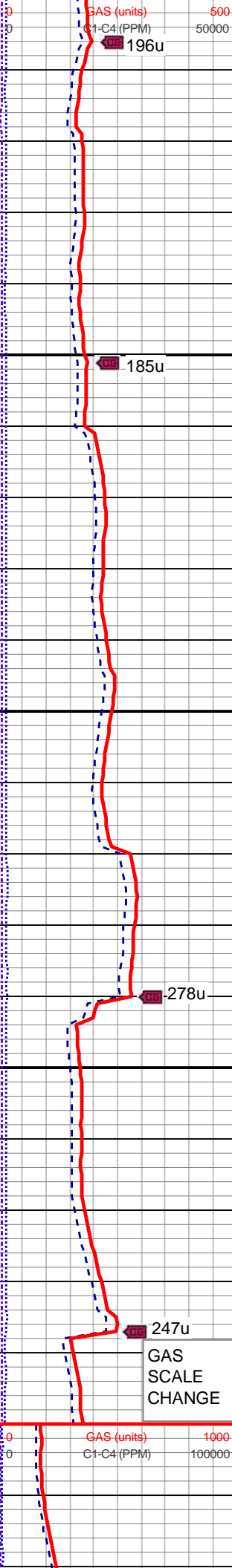
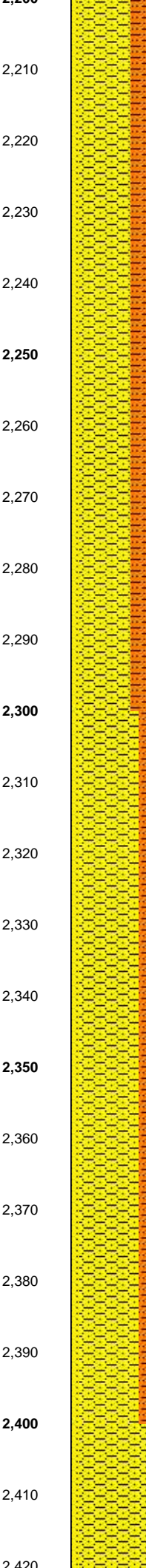
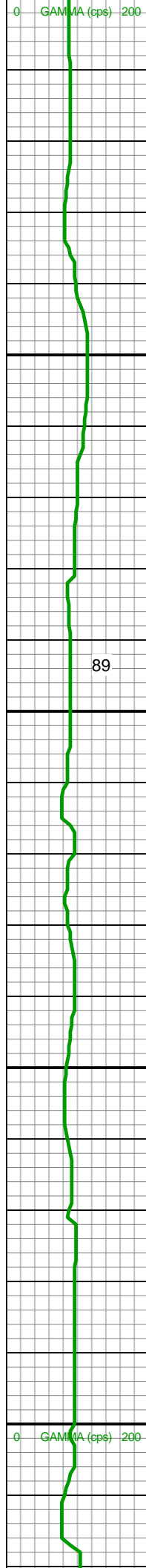
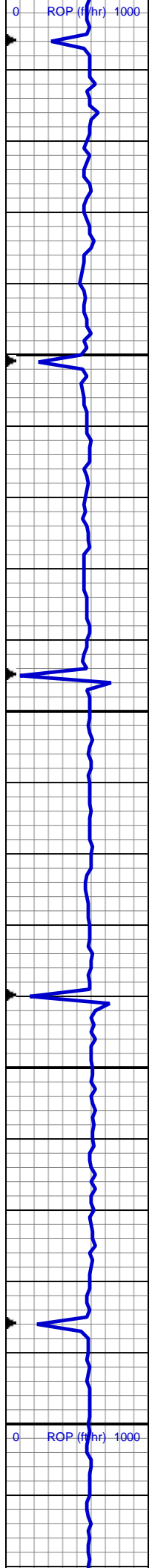
SS: wh to mgy, clr to trns, s&p ip, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc, occ glau









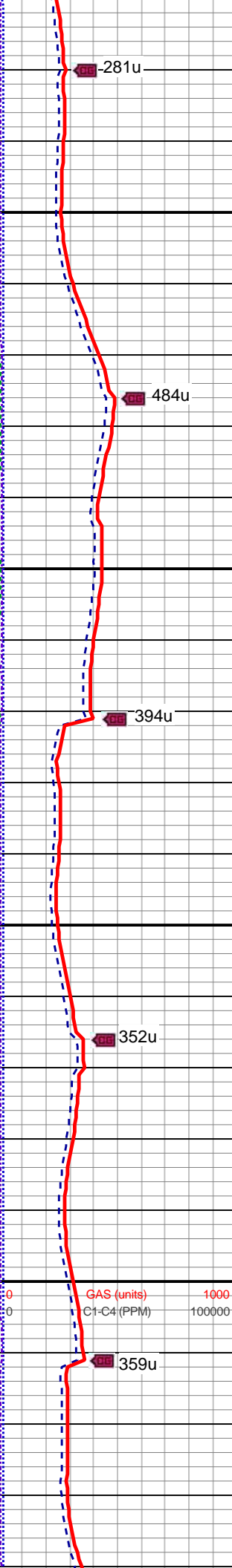
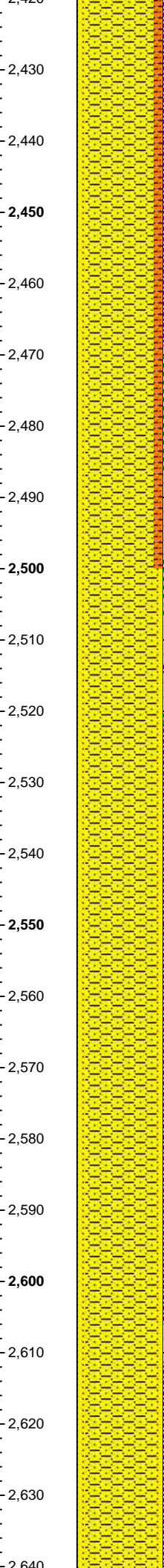
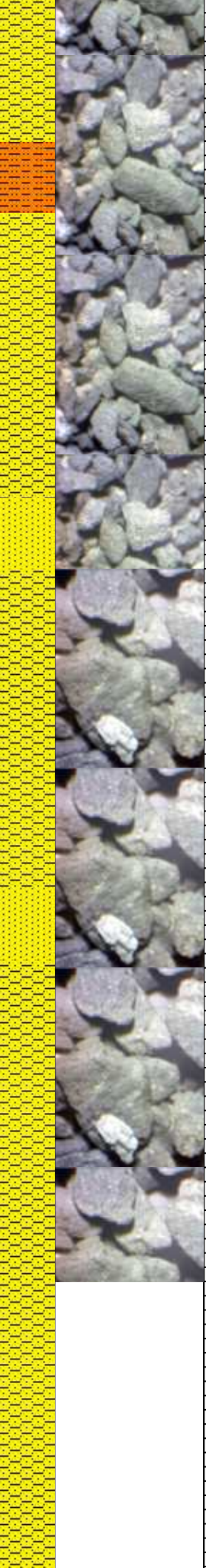
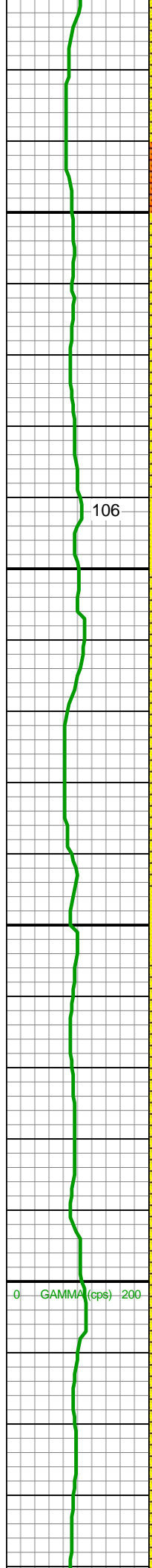
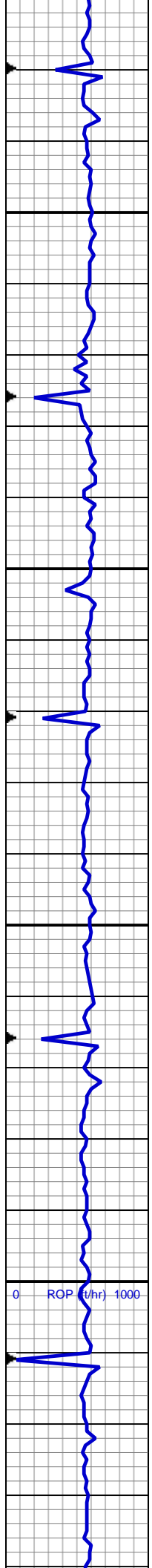


SHY SS: lt to mgy, vf to f gr, sbbiky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to SS
SHY SLTST: m gy, sbbiky to sbply, slty, mod sft, sl calc

MD: 2,285'
TVD: 2,284.87'
INC: 0.2°
AZM: 141.4°

SHY SS: lt to mgy, vf to f gr, sbbiky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to SS
SHY SLTST: m gy, sbbiky to sbply, slty, mod sft, sl calc

GAS
SCALE
CHANGE



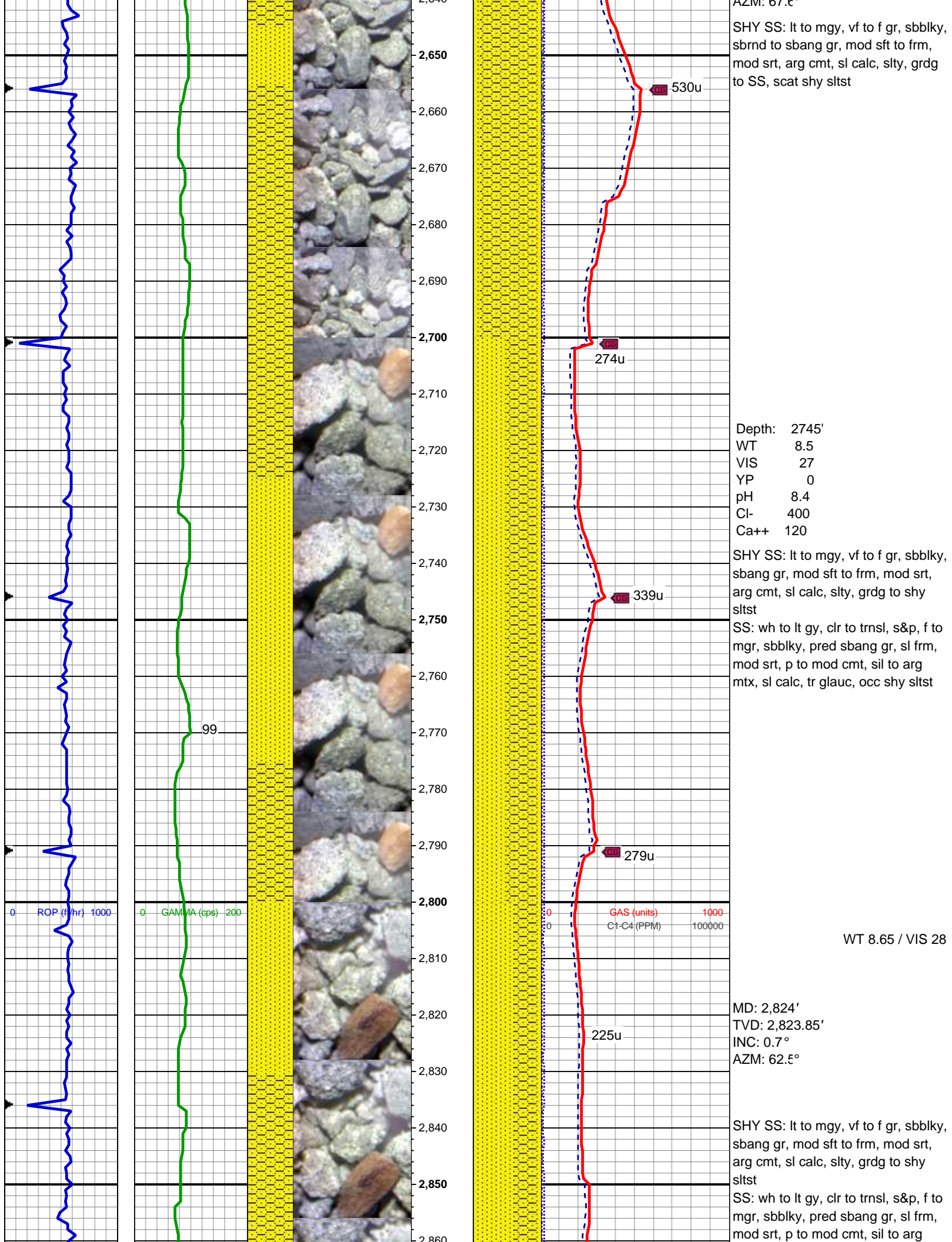
SHY SS: lt to mgy, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to SS

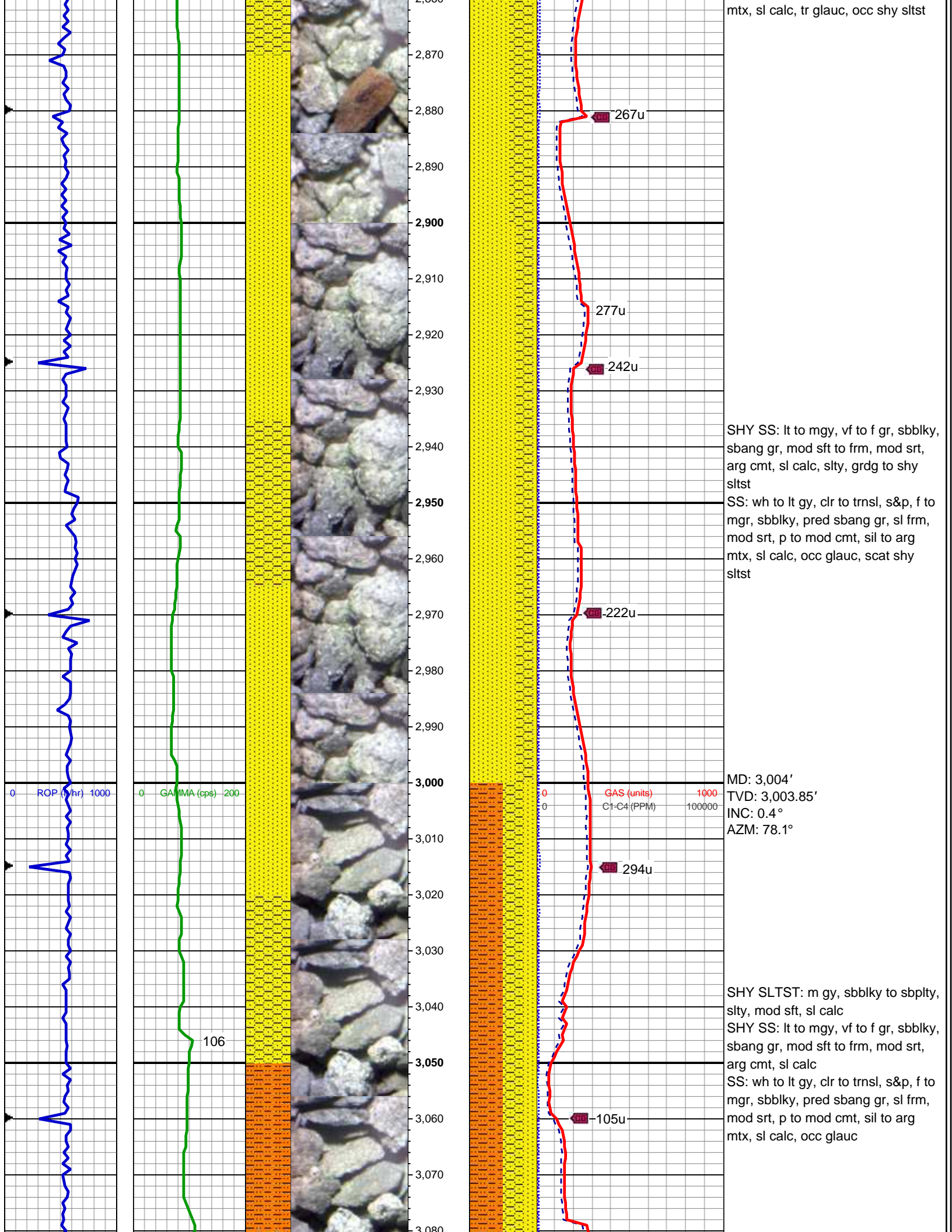
SHY SLTST: m gy, sbblky to sbply, slty, mod sft, sl calc

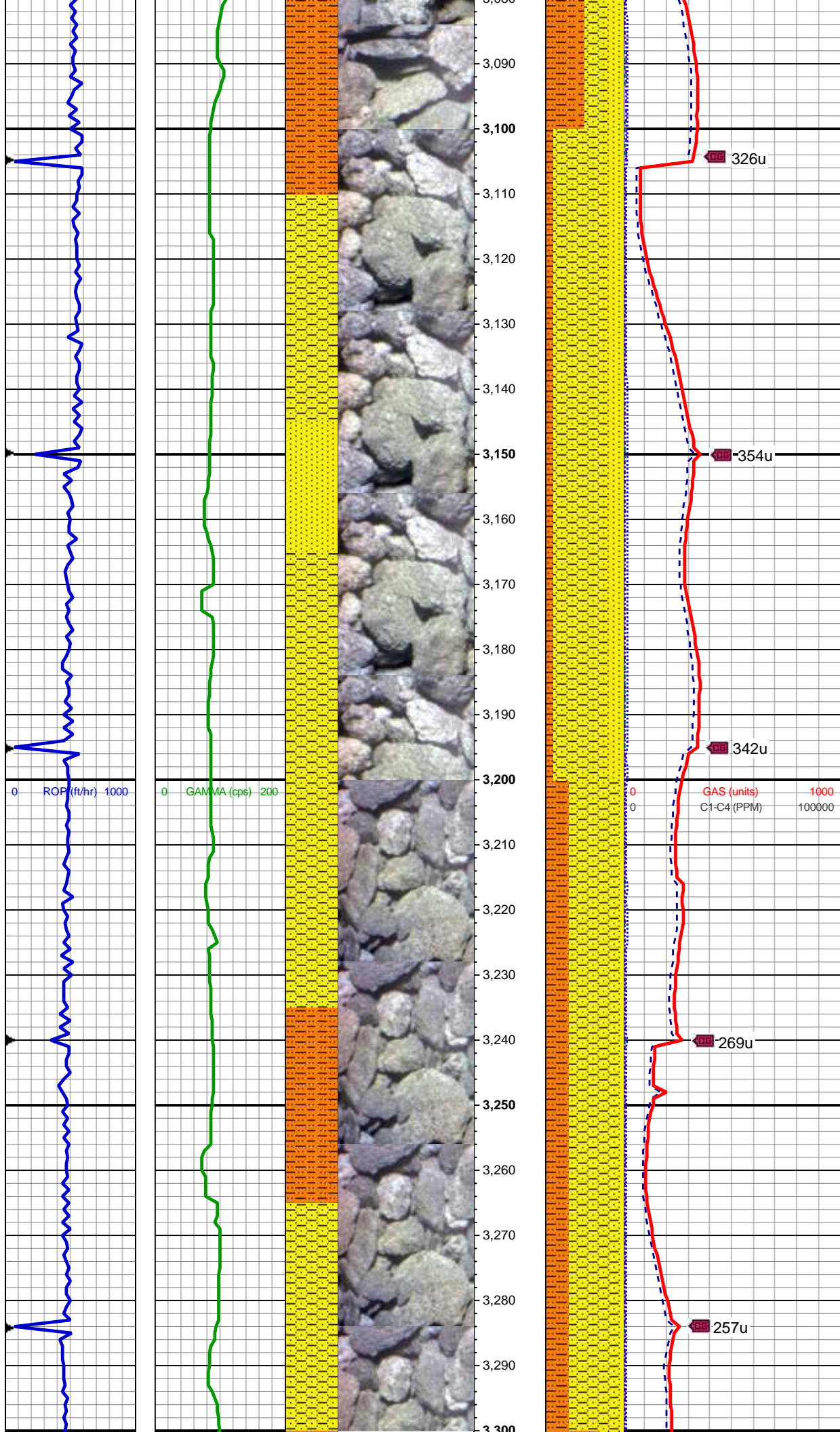
MD: 2,465'
TVD: 2,464.87'
INC: 0.1°
AZM: 309.1°

SHY SS: lt to mgy, vf to f gr, sbblky, sbrnd to sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, slty, grdg to SS, occ shy sltst

MD: 2,644'
TVD: 2,643.87'
INC: 0.7°
AZM: 67.6°







SHY SS: lt to mgy, vf to f gr, sbbiky, sbang gr, mod sft to frm, mod srt, arg cmt, sl calc

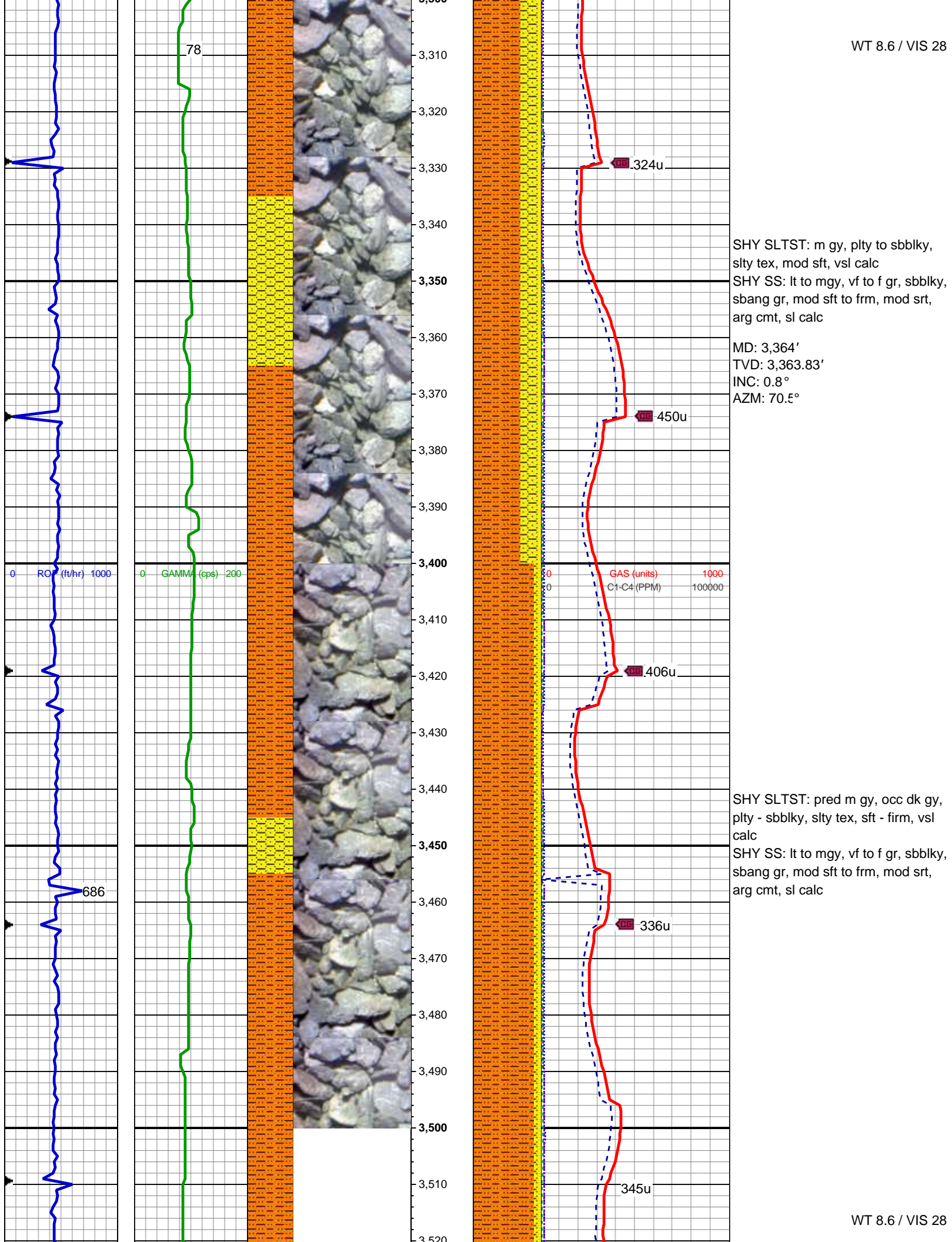
SS: wh to lt gy, clr to trns, s&p, f to mgr, sbbiky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc, occ glauc

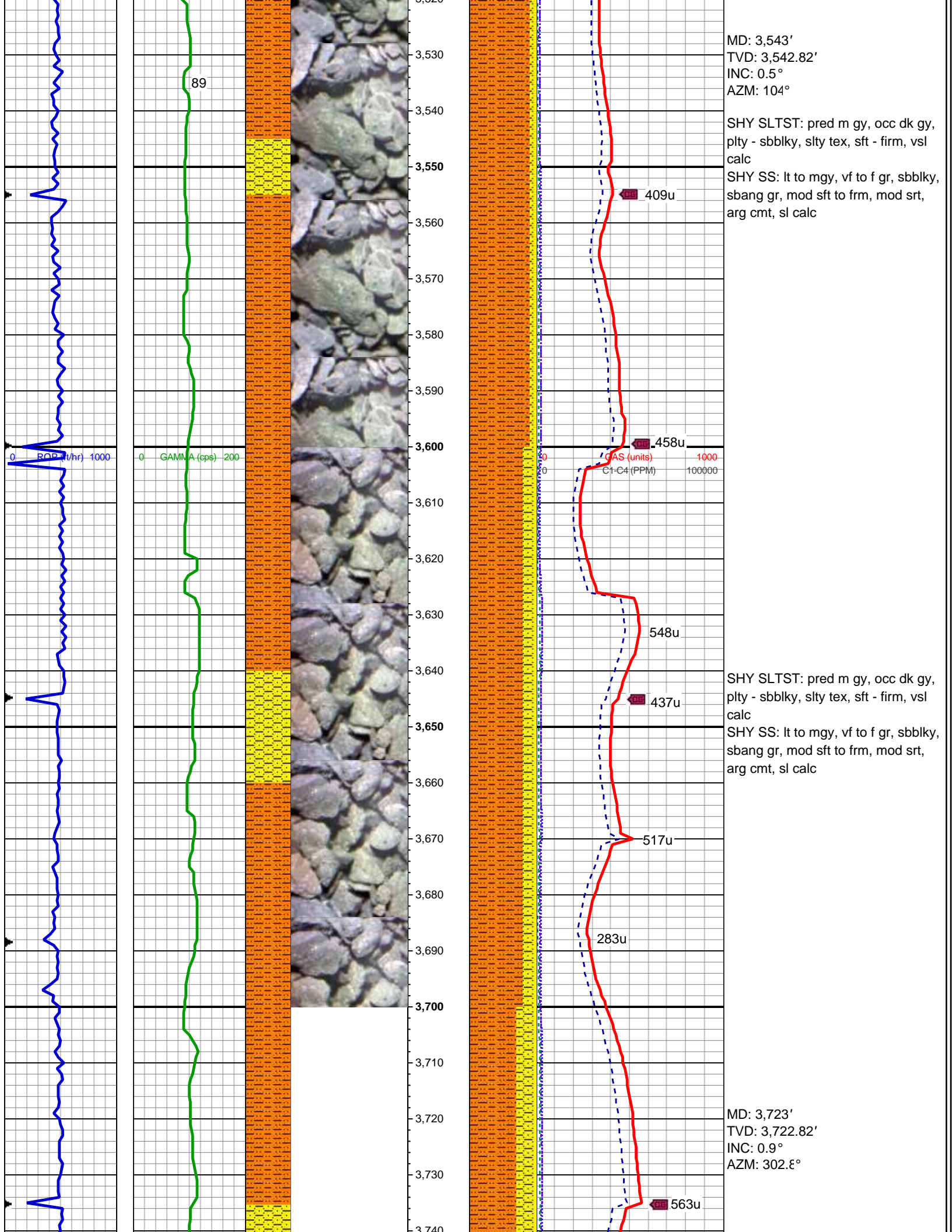
SHY SLTST: m gy, sbbiky to sbply, slty, mod sft, sl calc

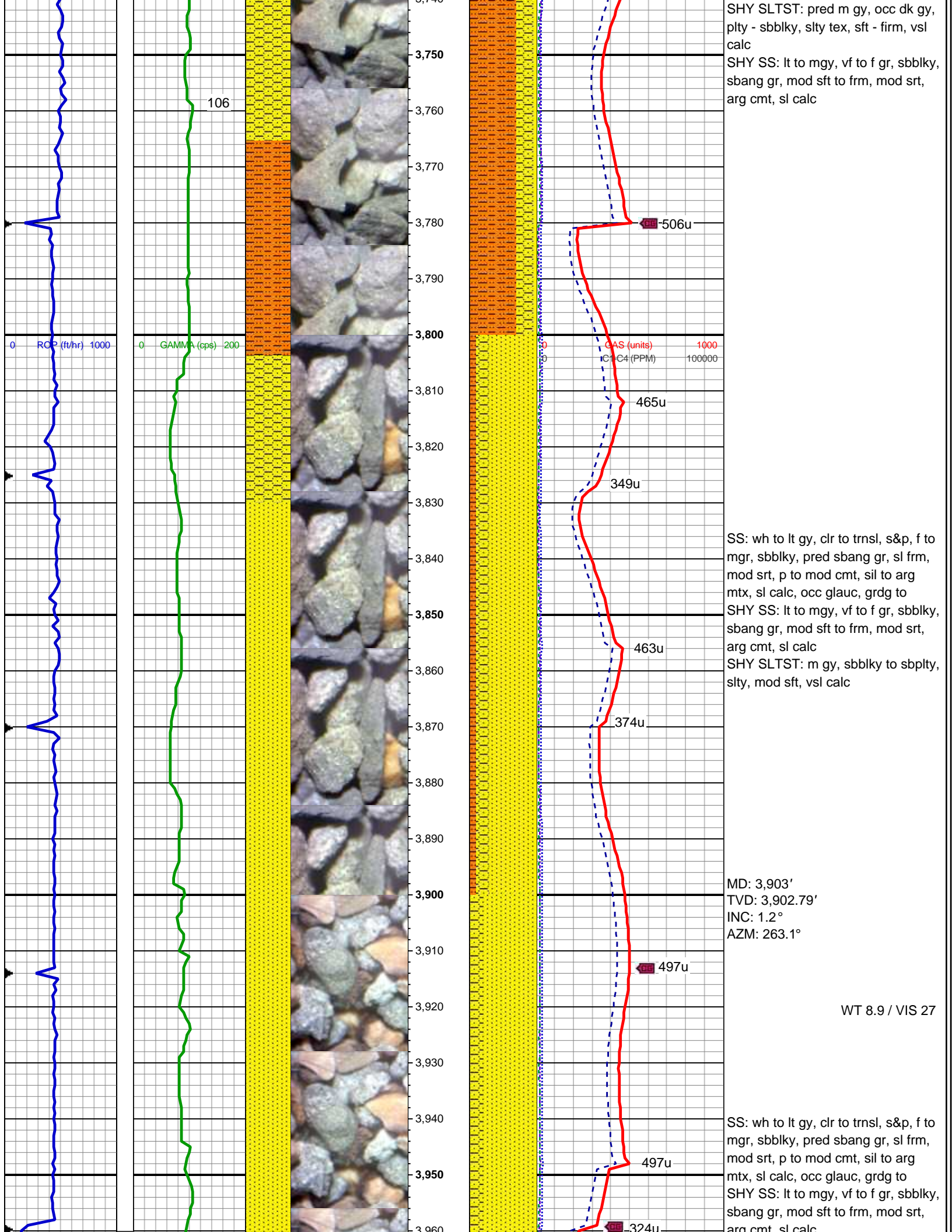
MD: 3,184'
TVD: 3,183.84'
INC: 0.3°
AZM: 83°

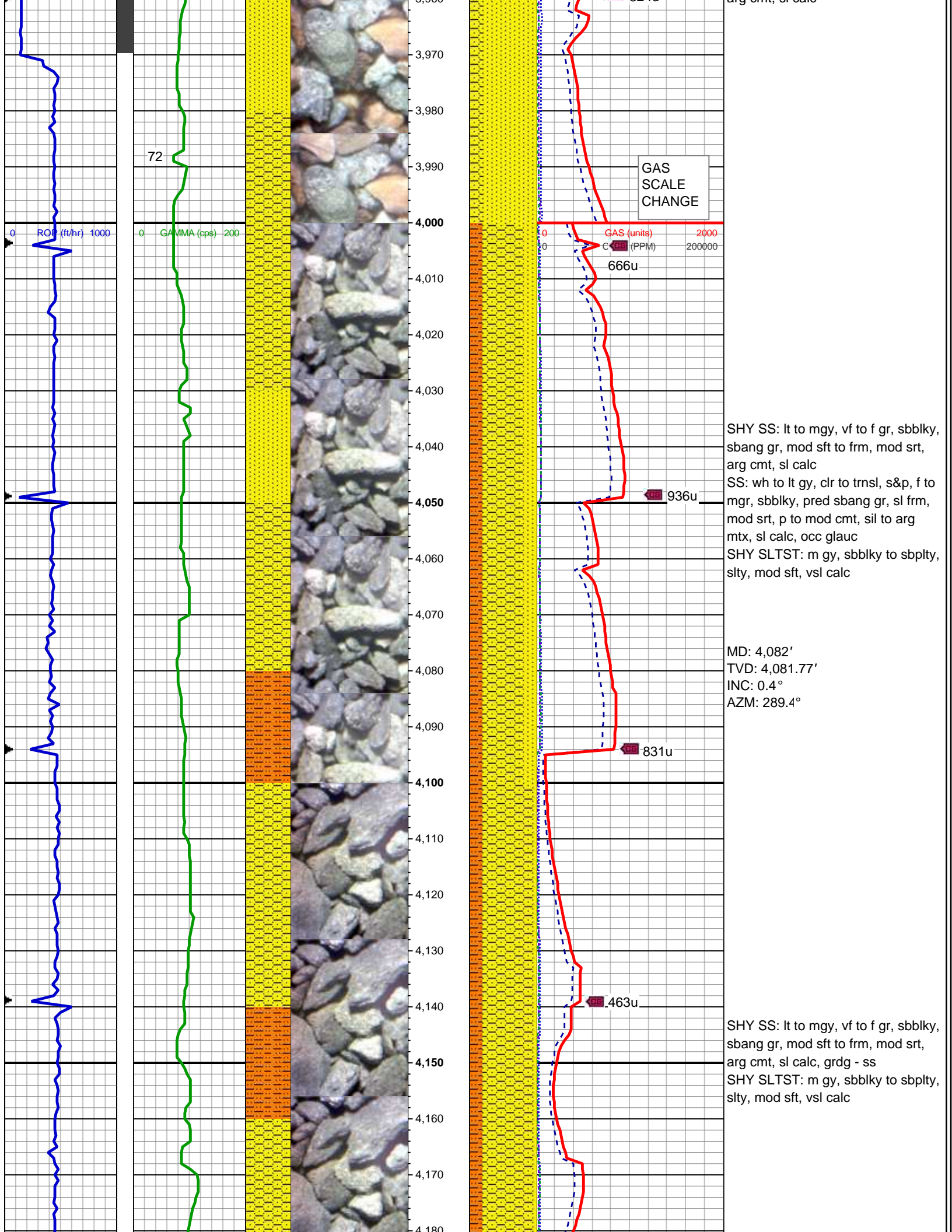
SHY SS: lt to mgy, vf to f gr, sbbiky, sbang gr, mod sft to frm, mod srt, arg cmt, sl calc, grdg to ss

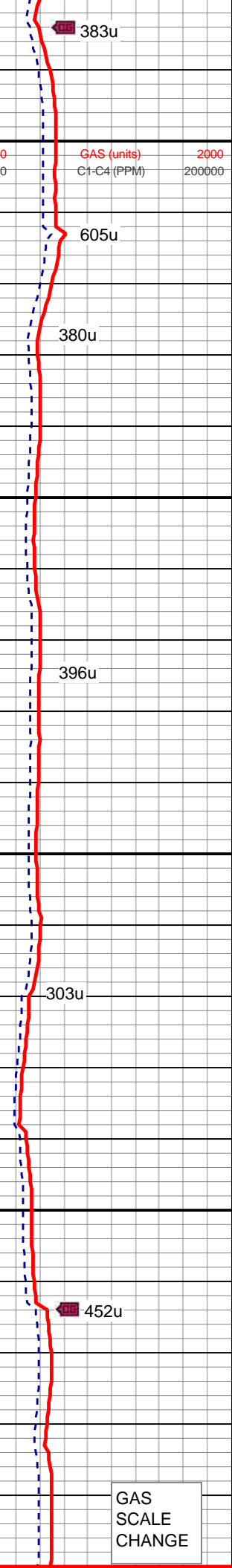
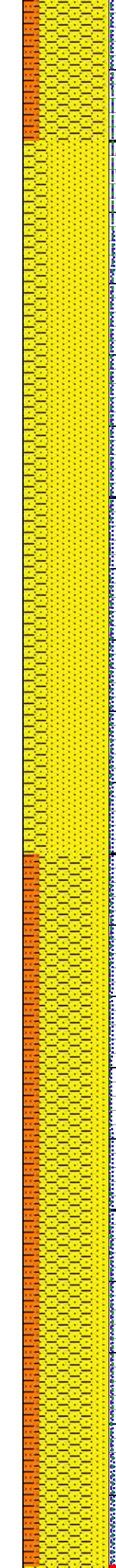
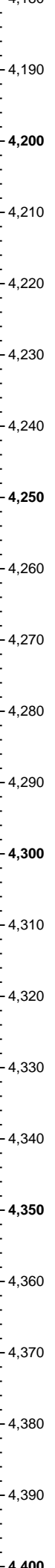
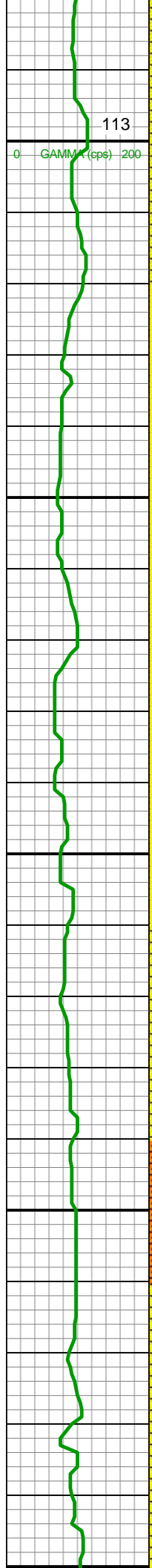
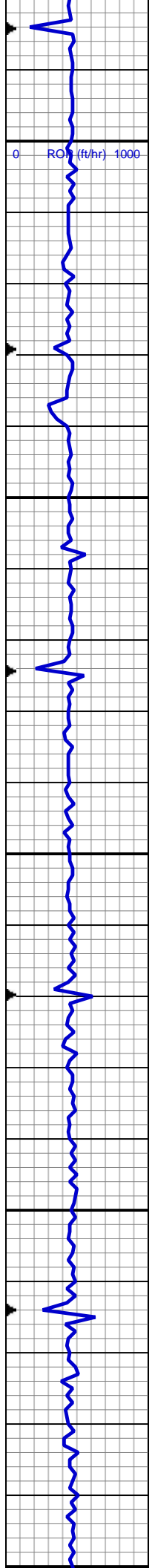
SHY SLTST: m gy, sbbiky to sbply, slty, mod sft, sl calc











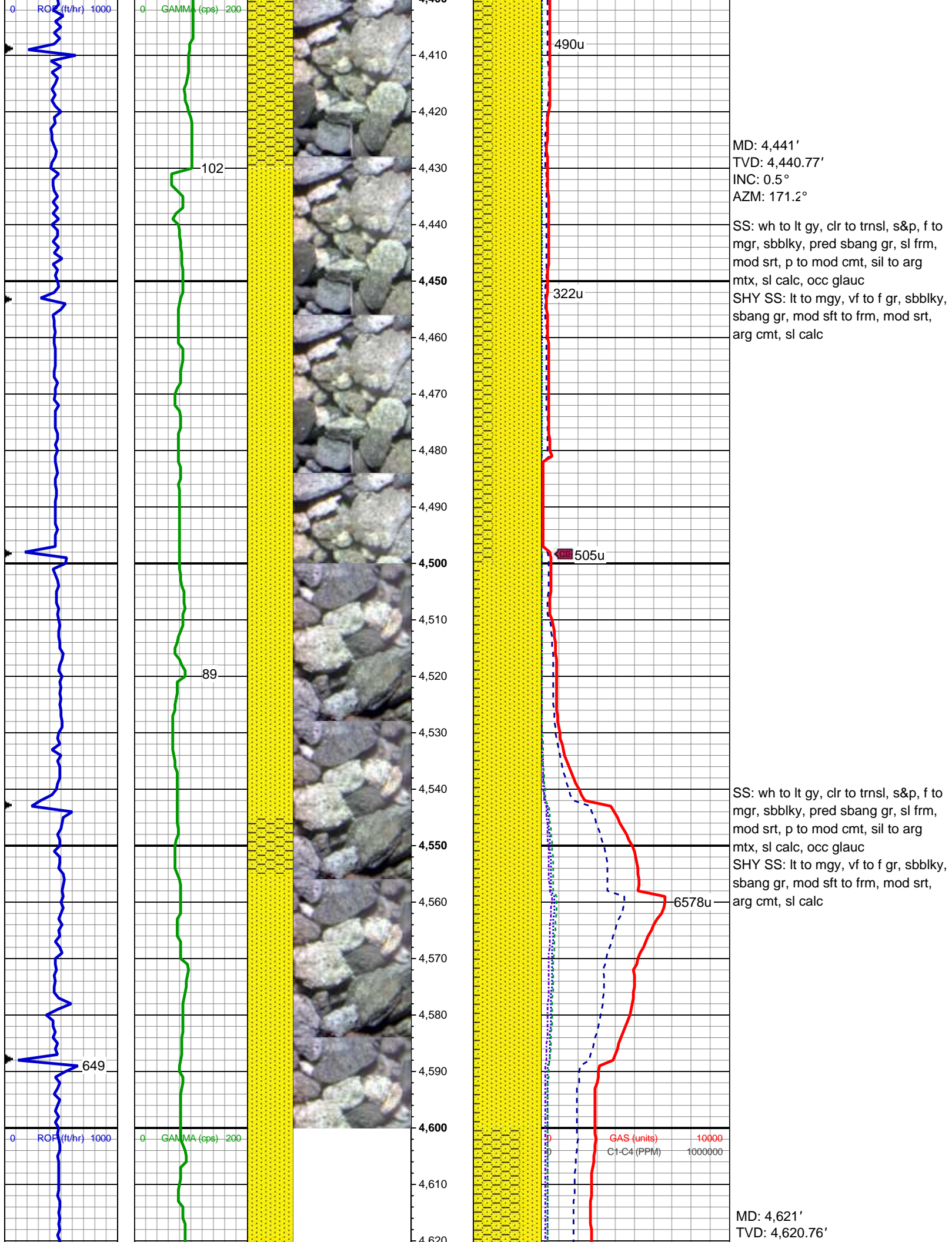
WT 8.8 / VIS 26

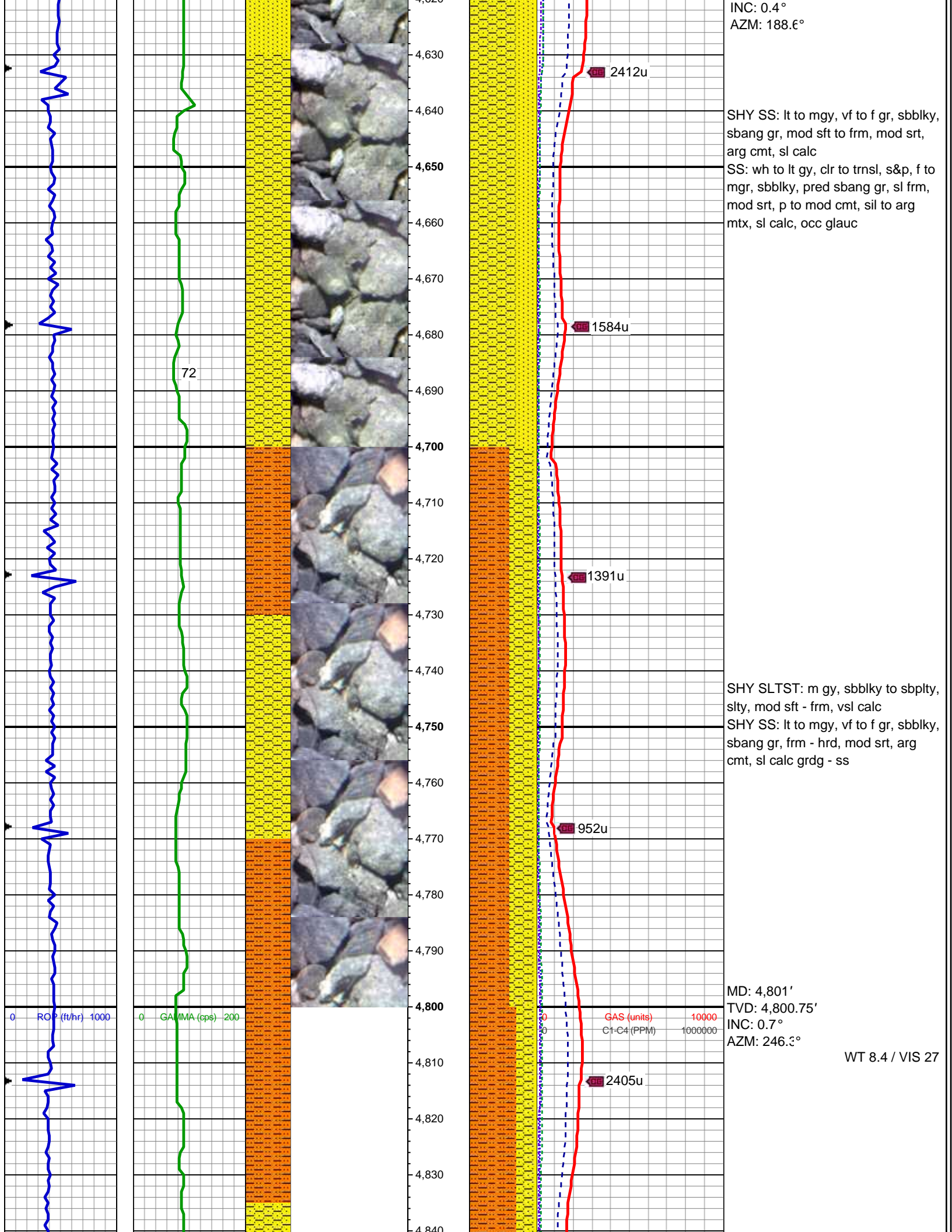
SS: wh to lt gy, clr to trnsl, s&p, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc, occ glauc
SHY SS: lt to mgy, vf to f gr, sbblky, sbang gr, mod sft to frm, mod srt, arg cmt, sl calc

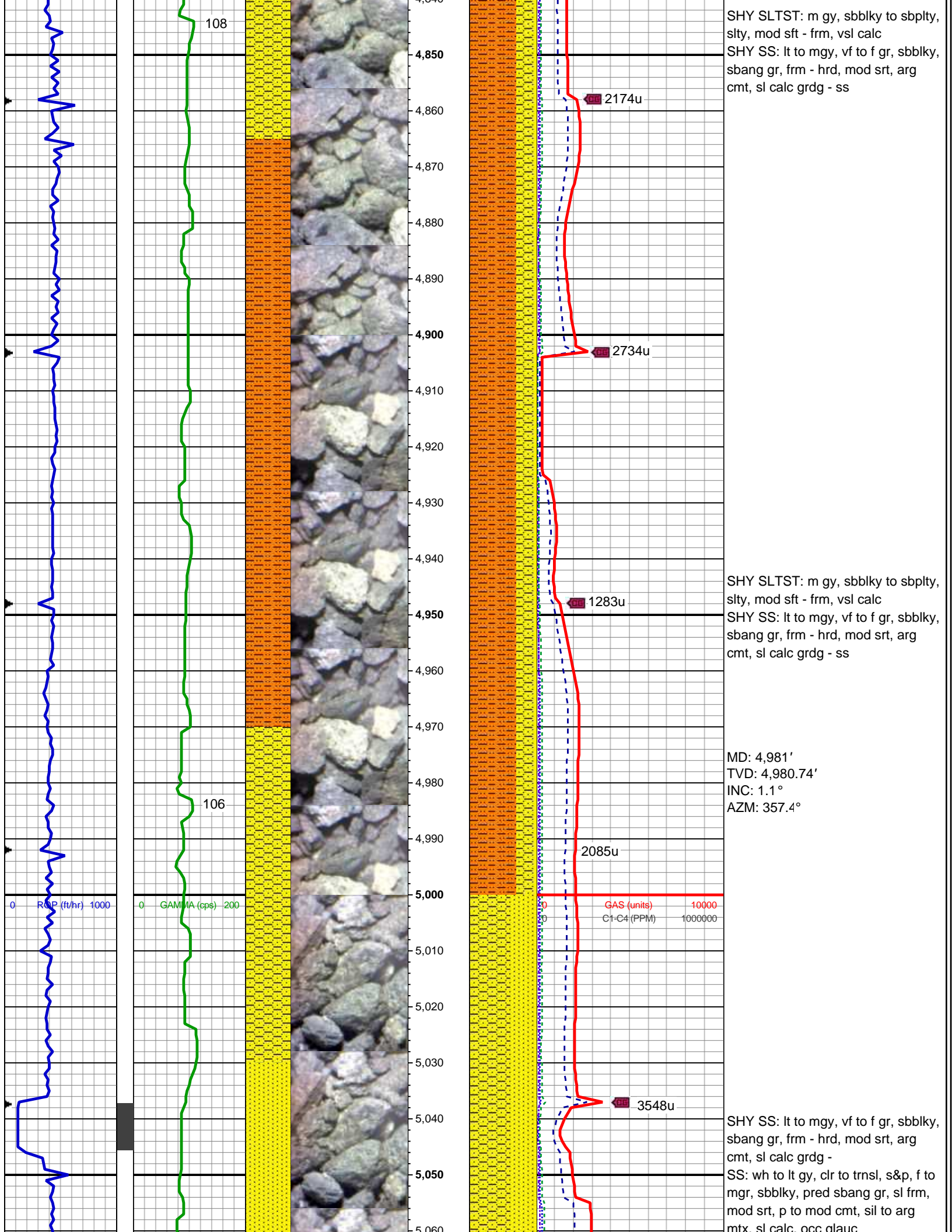
MD: 4,262'
TVD: 4,261.77'
INC: 0.2°
AZM: 186.5°

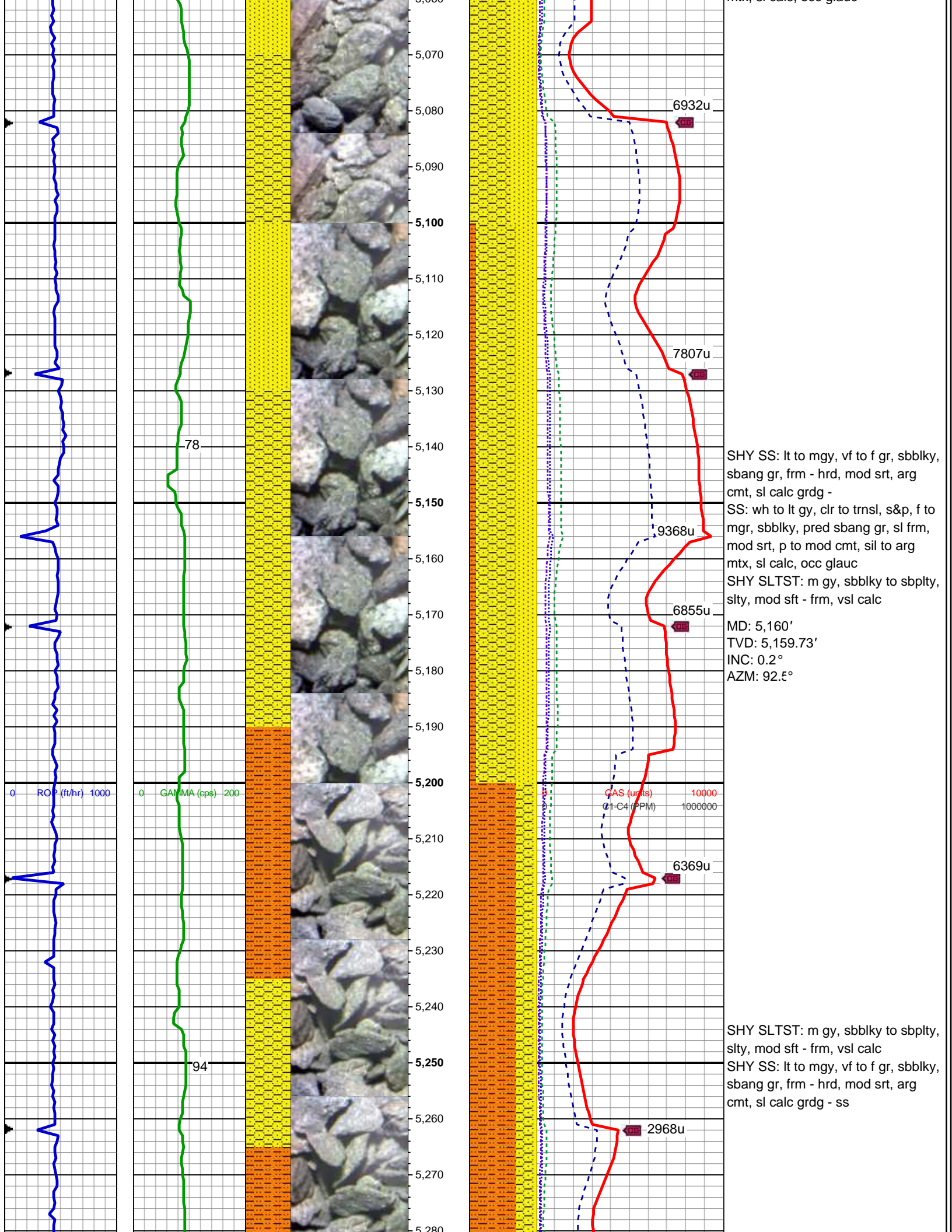
SS: wh to lt gy, clr to trnsl, s&p, f to mgr, sbblky, pred sbang gr, sl frm, mod srt, p to mod cmt, sil to arg mtx, sl calc, occ glauc
SHY SS: lt to mgy, vf to f gr, sbblky, sbang gr, mod sft to frm, mod srt, arg cmt, sl calc
SHY SLTST: m gy, sbblky to sbply, slty, mod sft, vsl calc

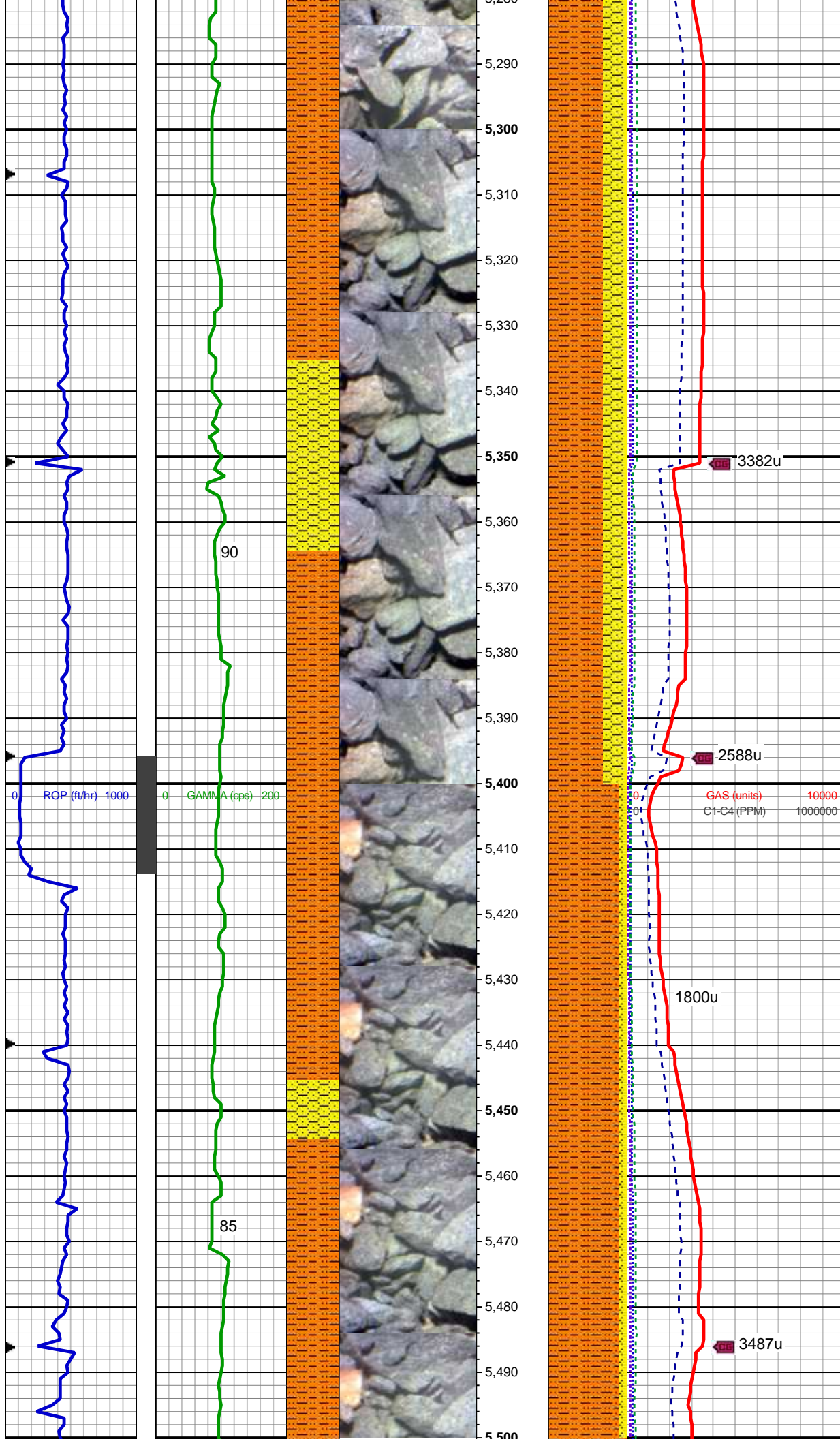
GAS SCALE CHANGE











MD: 5,340'
TVD: 5,339.71'
INC: 1.2°
AZM: 9.1°

SHY SLTST: m gy, sbblky to sbply,
sly, mod sft - frm, vsl calc
SHY SS: lt to mgy, vf to f gr, sbblky,
sbang gr, frm - hrd, mod srt, arg
cmt, sl calc grdg - ss

Depth: 5396'
WT 8.9
VIS 29
YP 1
pH 8.9
Cl- 600
Ca++ 120

SHY SLTST: m gy, sbblky to sbply,
sly, mod sft - frm, vsl calc
SHY SS: lt to mgy, vf to f gr, sbblky,
sbang gr, frm - hrd, mod srt, arg
cmt, sl calc grdg - ss

