

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Oscar Y10-74-1HC VERT

**Location** SEC 10 T2N R64W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** H&P 315

**API Number** 05-123-38204

**AFE #** 200199

**Region** DJ BASIN

**Field** WATTENBERG

**Spud Date** 11/16/2014

**Drilling Completed** 11/18/2014

**Surface Coordinates** NWSE SEC 10 T2N R64W  
2,380' FSL; 1,985' FEL

LAT/LON: 40.15223/-104.53520

**Bottom Hole Coordinates** NWNE SEC 3 T2N R64W  
75' FNL; 1,815' FEL

**Ground Elevation** 4,922'

**K.B. Elevation** 4,946'

**Logged Interval** 2,000' To 6,433'

**Total Depth** 6,433'

**Formation** CODELL

**Type of Drilling Fluid** LSND

## Other Symbols

### Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

### Porosity

- E EARTHY
- F FENESTRAL
- F FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC

- ORGANIC
- PINPOINT
- VUGGY

### Engineering

- BIT
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CONNECTION GAS DOWN...
- CONNECTION GAS DOWN
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL

- FAULT
- FORMATION TOP
- GAS SHOW
- MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- TRIP GAS
- WIRELINE TESTED - LEFT

- WIRELINE TESTED - RT

### Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

### Textures

- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- E EARTHY
- FINELYXLN

- GRAINSTONE
- L LITHOGRAPHIC
- MIX MICROXLN
- MS MUDSTONE
- PS PACKSTONE
- WS WACKSTONE

### Sorting

- M MODERATE
- P POOR
- W WELL

## Accessories

## Fossils

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

## F FOSSIL

- GASTROPOD
- INOCERAMUS
- 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

- SHALY SILTSTONE
- SHALY SANDSTONE
- SANDSTONE
- SILTY SHALE
- LIMESTONE
- CHALK
- MARLSTONE
- UNKNOWN
- ANHYDRITE

- BENTONITE
- BRECCIA
- CEMENT
- CHERT
- CLAY CHOKE SAND
- CLAYSTONE
- COAL
- CONGLOMERATE
- DOLOMITE

- GRANITE
- GYPSUM
- IGNEOUS
- SIDERITE or LIMONITE
- METAMORPHIC
- NO SAMPLE
- SALT
- SALT- PEPPER SAND
- SHALE

- SHALE COLORED
- SHALE GRAY
- SILTSTONE
- TILL
- TUFF
- WELDED TUFF

## Operator

**Company** Noble Energy Inc

**Address** 1625 BROADWAY SUITE 2200  
DENVER, CO 80202

## Geologist

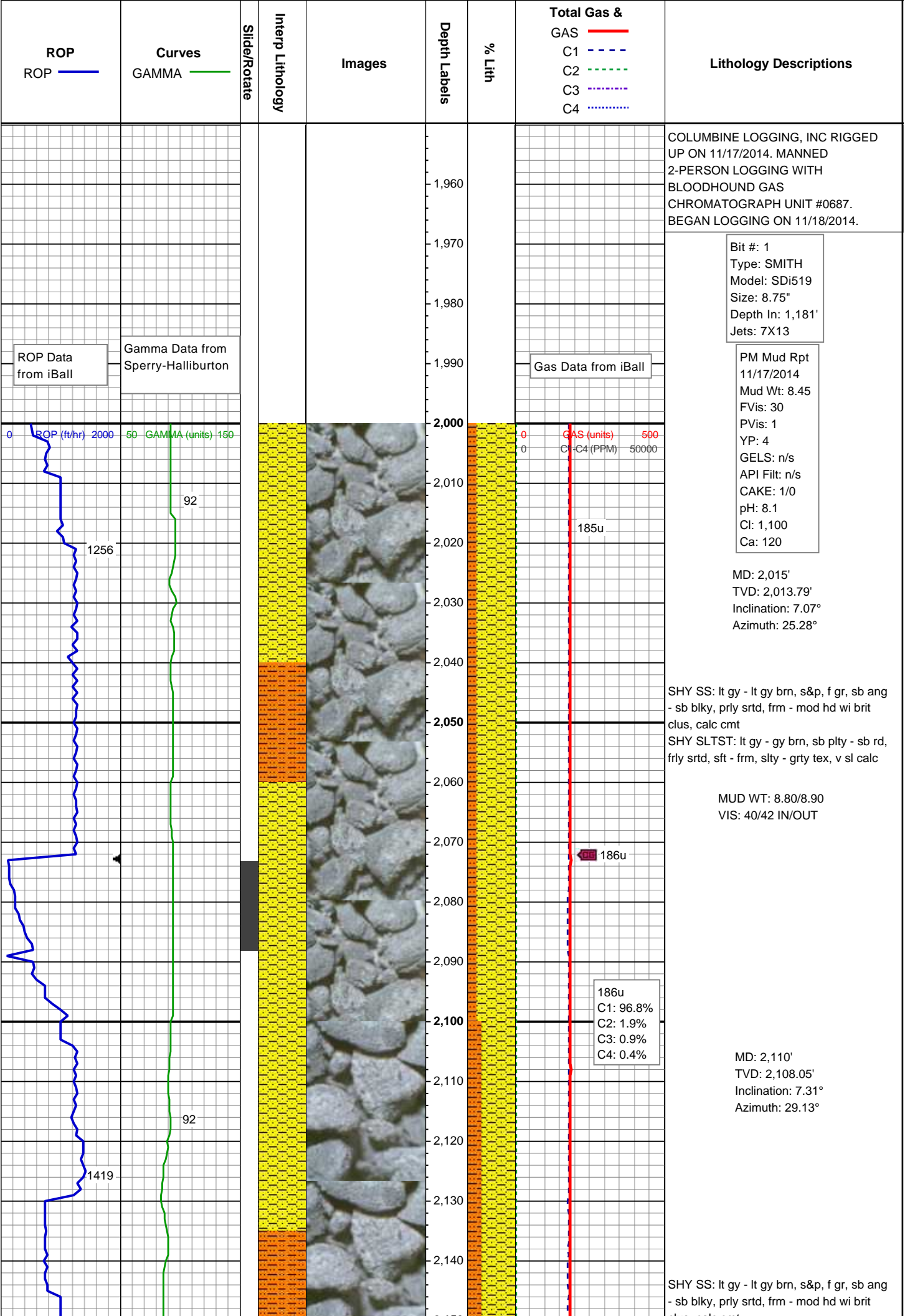
**Name** MARK COLE;ZACH UBER

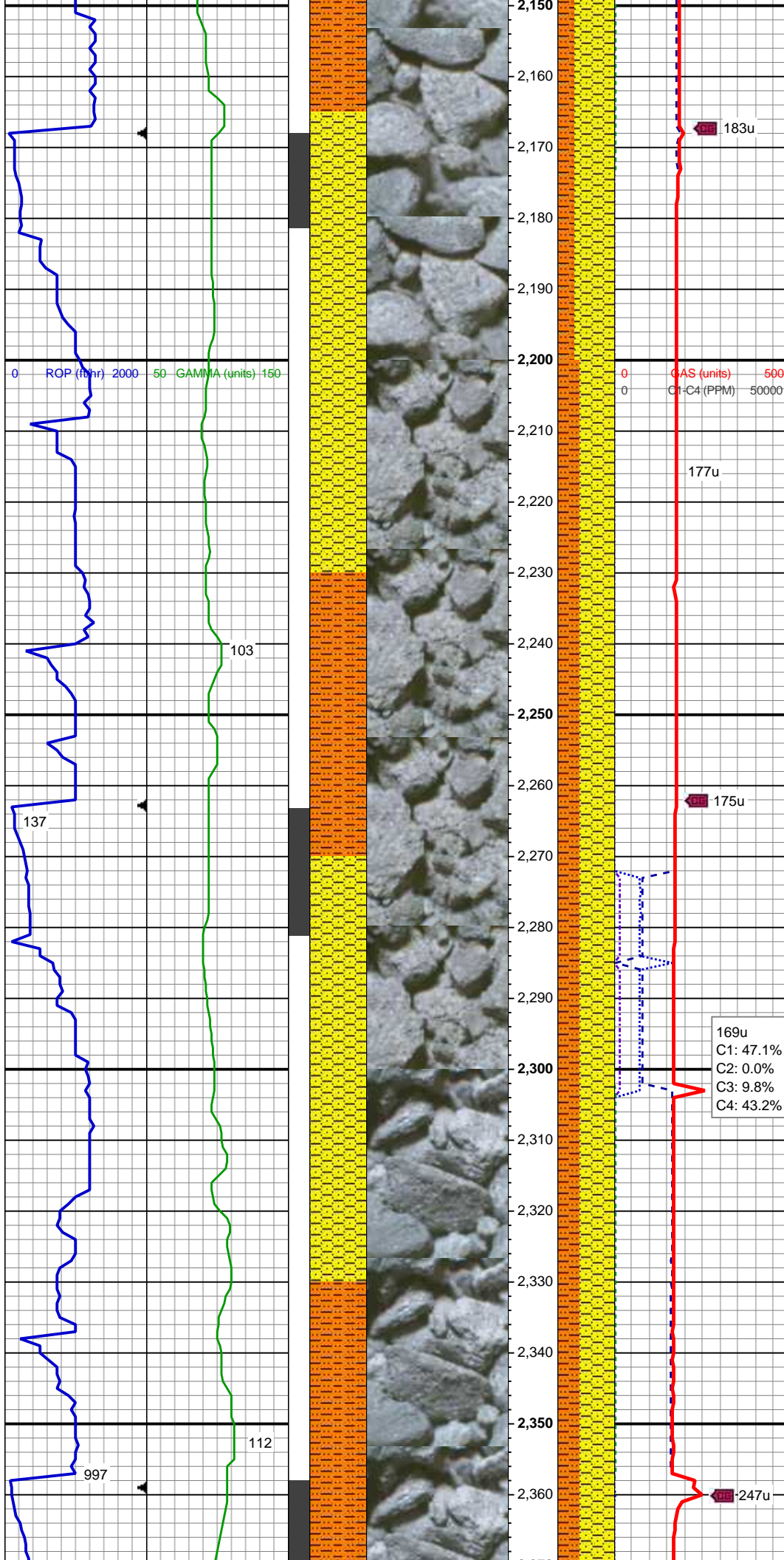
**Company** COLUMBINE LOGGING, INC

**Address** 2385 S LIPAN ST  
DENVER, CO 80223

## Zone Color Coding

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





clus, calc cmt  
SHY SLTST: lt gy - gy brn, sb plty - sb rd,  
frly srted, sft - frm, slty - grty tex, v sl calc

MD: 2,205'  
TVD: 2,202.31'  
Inclination: 6.94°  
Azimuth: 26.77°

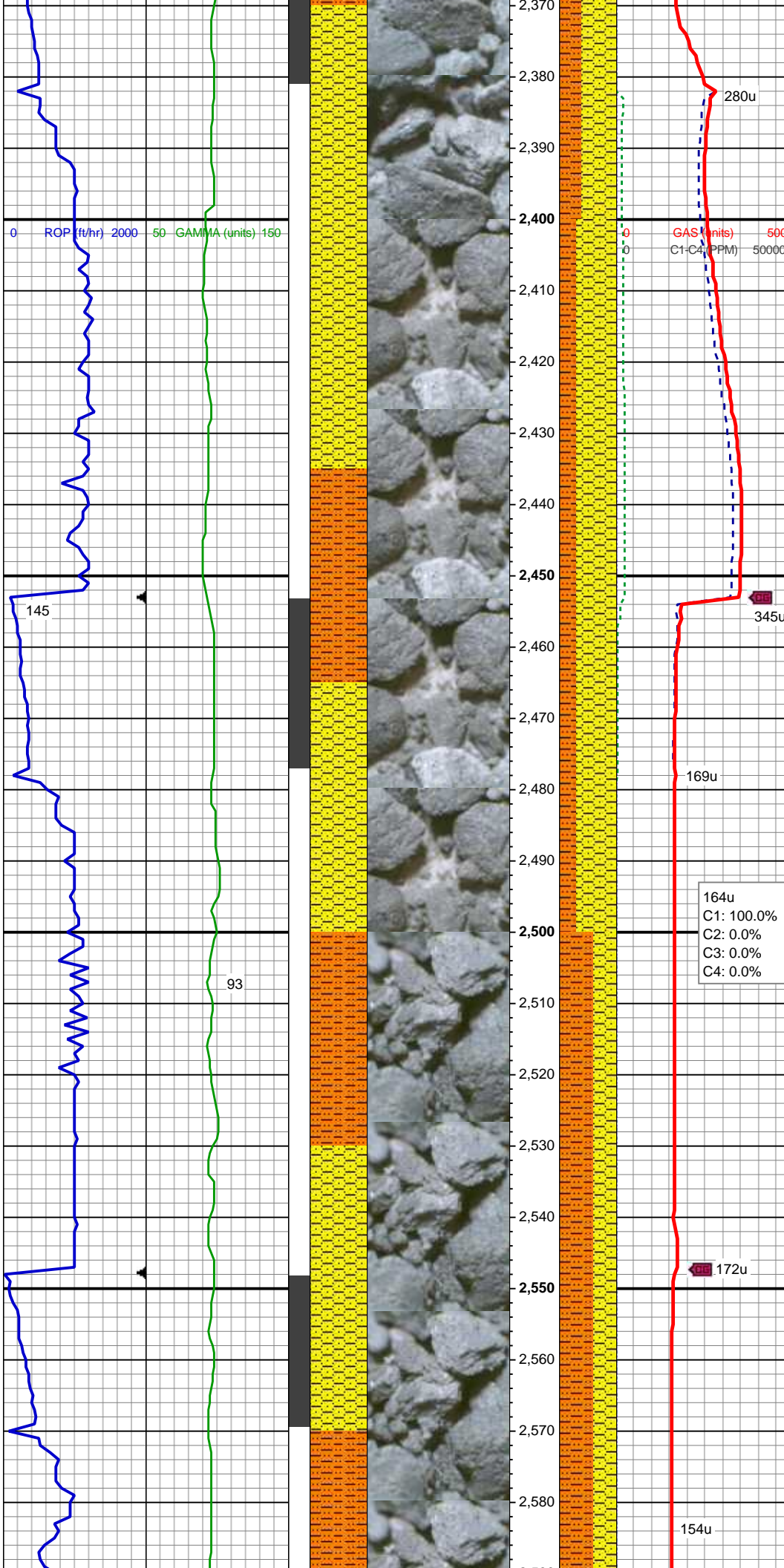
SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, frm - mod hd wi brit  
clus, calc cmt  
SHY SLTST: lt gy - gy brn, sb plty - sb rd,  
frly srted, sft - frm, slty - grty tex, v sl calc

**AM Mud Rpt  
11/18/2014**  
Mud Wt: 8.80  
FVis: 39  
PVis: 10  
YP: 6  
GELS: 3/5/9  
API Filt: 6.8  
CAKE: 1/0  
pH: 10.4  
Cl: 1,100  
Ca: 120

MD: 2,300'  
TVD: 2,296.64'  
Inclination: 6.68°  
Azimuth: 33.18°

SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt  
SHY SLTST: lt gy, sb plty - sb rd, frly srted,  
sft - frm, slty - grty tex, v sl calc





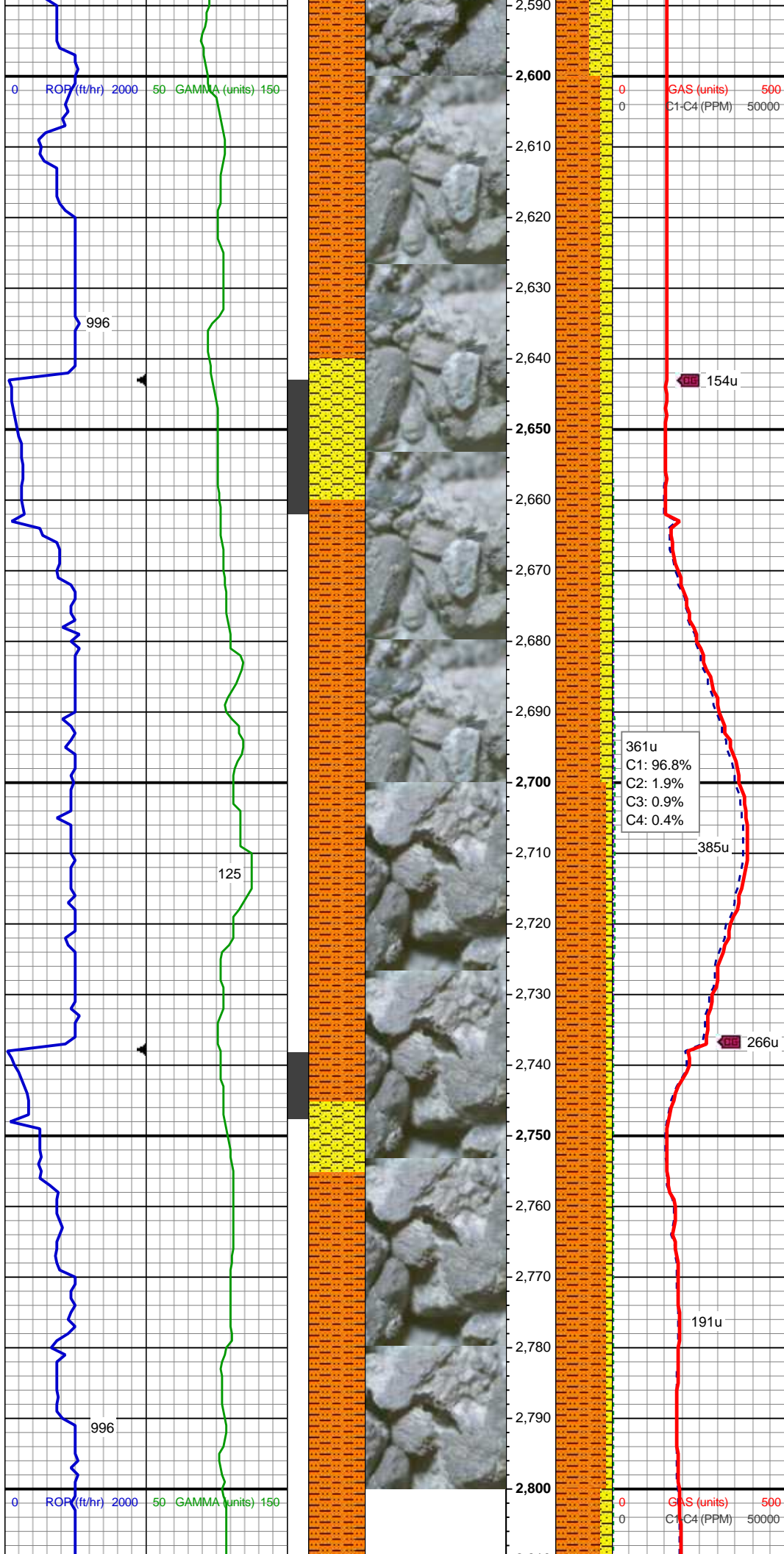
MD: 2,394'  
TVD: 2,390.04'  
Inclination: 6.34°  
Azimuth: 31.67°

SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt  
SHY SLTST: lt gy, sb plty - sb rd, frly srted,  
sft - frm, slty - grty tex, v sl calc

MD: 2,489'  
TVD: 2,484.36'  
Inclination: 7.33°  
Azimuth: 29.41°

SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt

MD: 2,584'  
TVD: 2,578.53'  
Inclination: 7.84°  
Azimuth: 26.75°



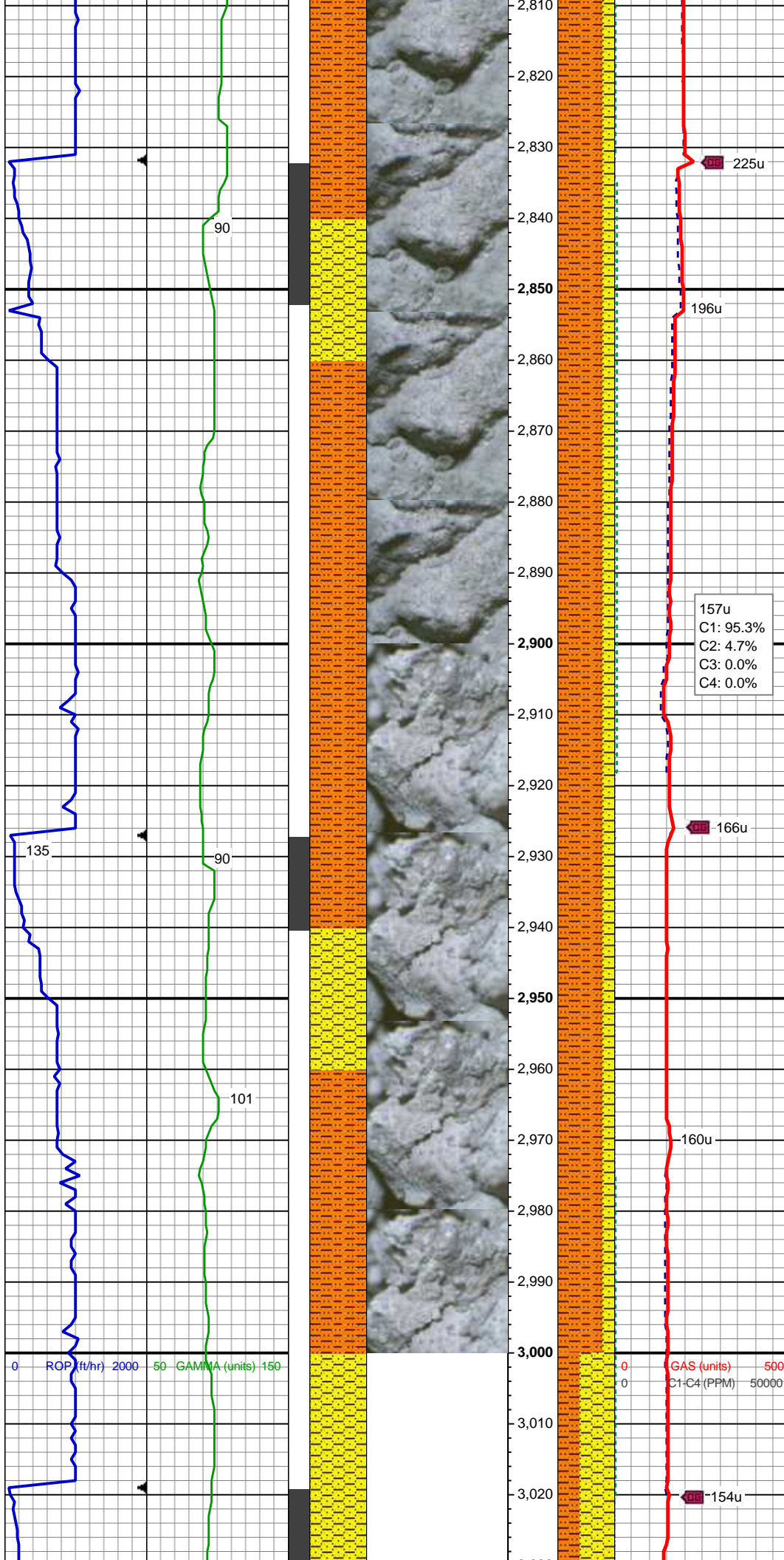
SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt

MD: 2,679'  
TVD: 2,672.62'  
Inclination: 8.05°  
Azimuth: 30.61°

SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt

MD: 2,774'  
TVD: 2,766.76'  
Inclination: 7.32°  
Azimuth: 31.67°





SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

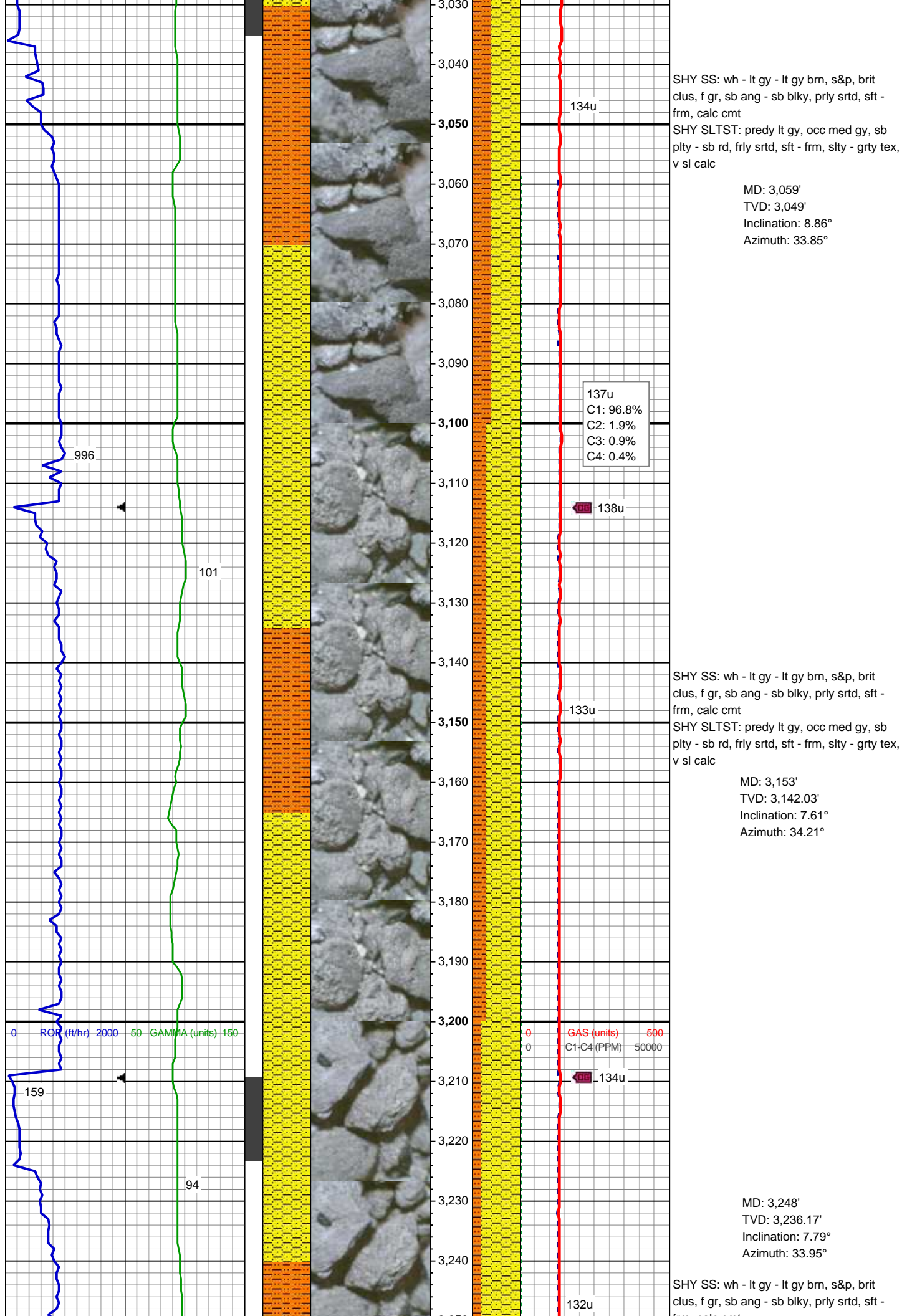
SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt

MD: 2,869'  
TVD: 2,860.97'  
Inclination: 7.47°  
Azimuth: 30.68°

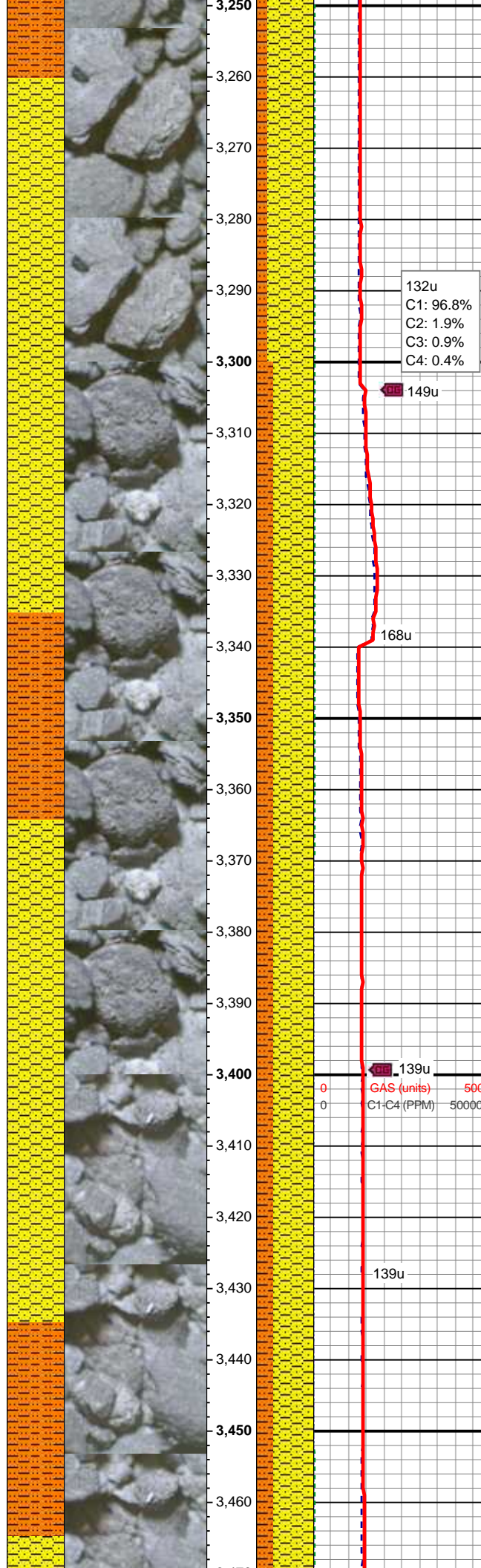
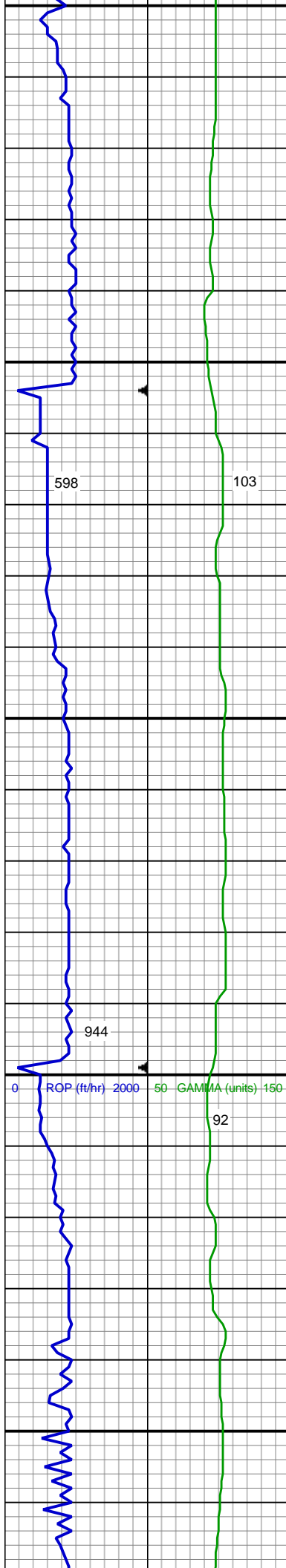
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

SHY SS: lt gy - lt gy brn, s&p, f gr, sb ang  
- sb blk, prly srted, sft - frm, calc cmt

MD: 2,964'  
TVD: 2,955.07'  
Inclination: 8.35°  
Azimuth: 35.81°







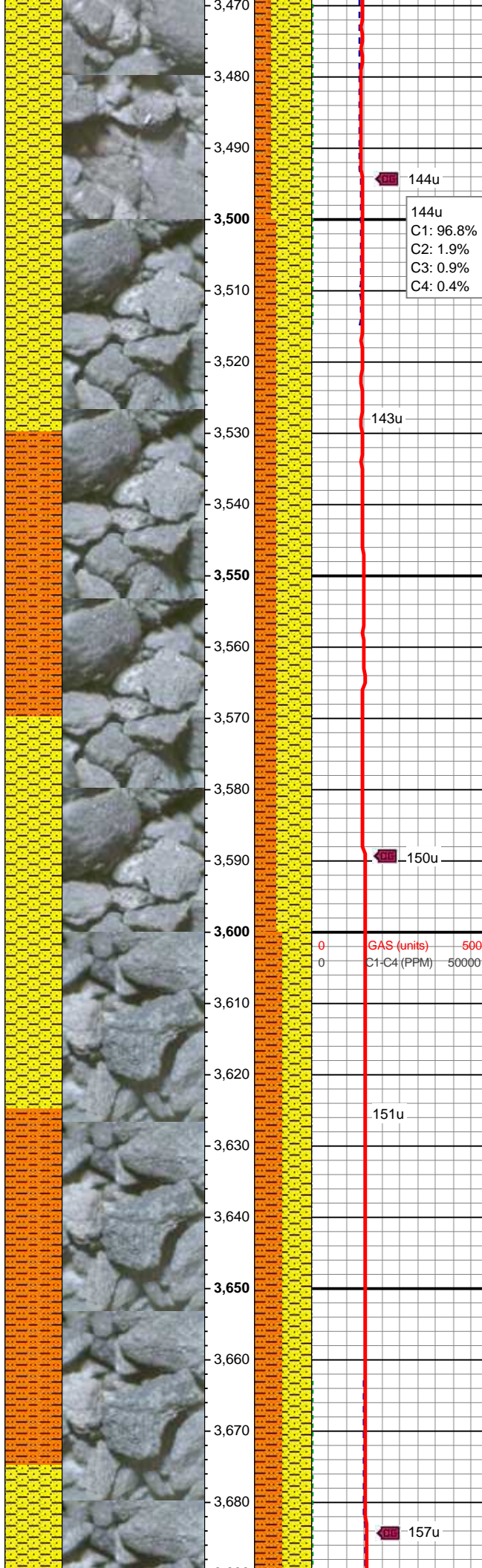
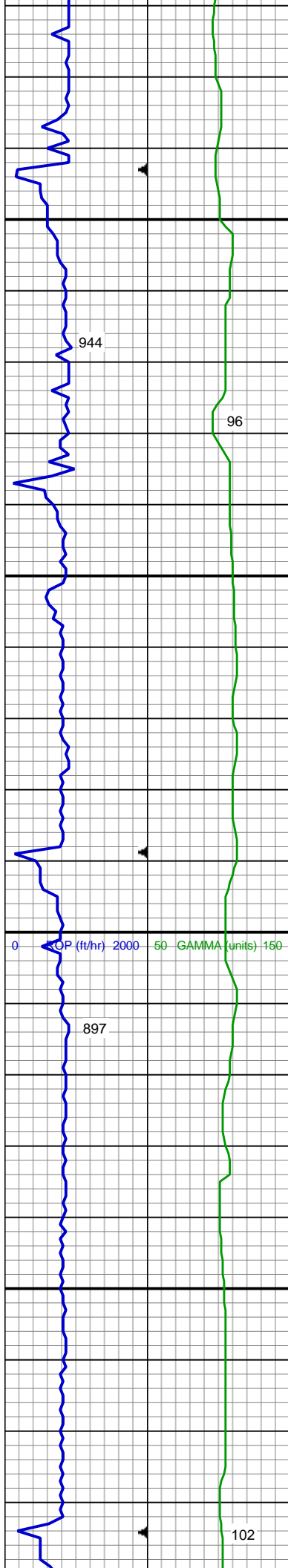
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 3,343'  
TVD: 3,330.47'  
Inclination: 6.11°  
Azimuth: 33.79°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 3,438'  
TVD: 3,425.02'  
Inclination: 5.1°  
Azimuth: 33.76°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

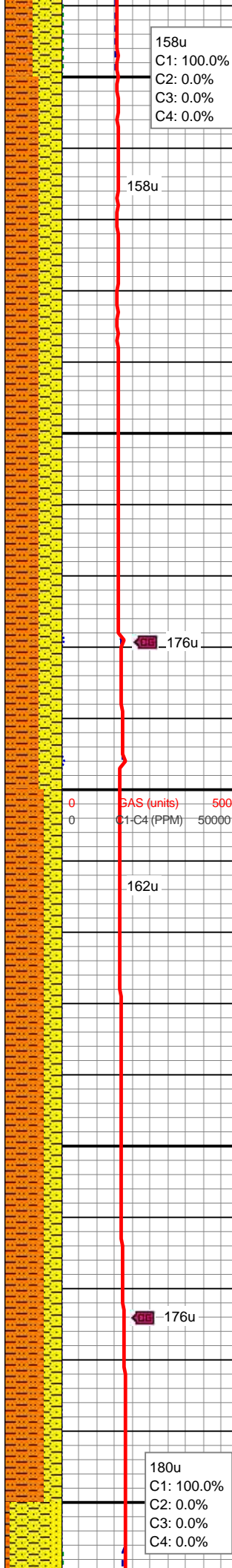
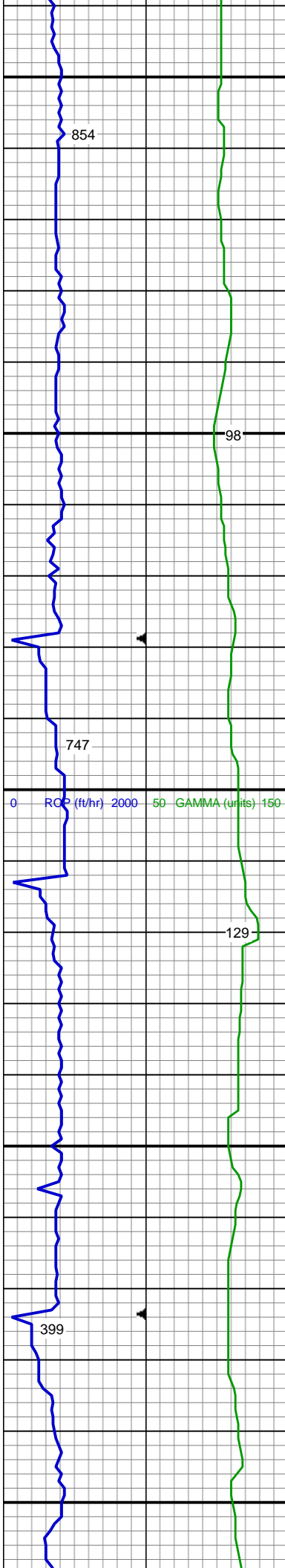


SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 3,628'  
TVD: 3,614.64'  
Inclination: 1.89°  
Azimuth: 33.89°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc





MD: 3,723'  
TVD: 3,709.6'  
Inclination: 1.27°  
Azimuth: 36.36°

SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt

MD: 3,818'  
TVD: 3,804.59'  
Inclination: 0.57°  
Azimuth: 359.92°

SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt



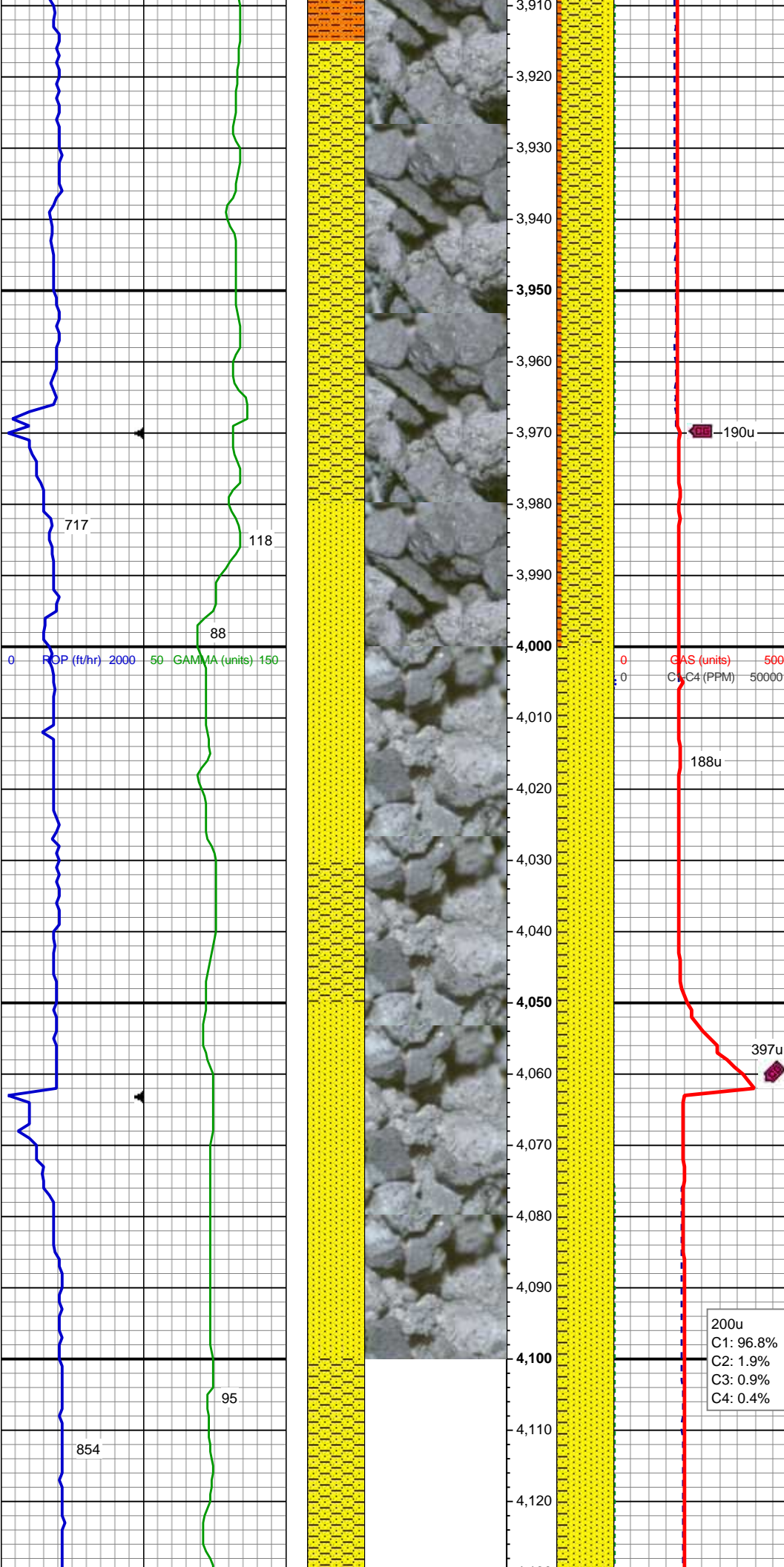
**PARKMAN TOP @**  
**3,915' MD; 3,899' TVD**

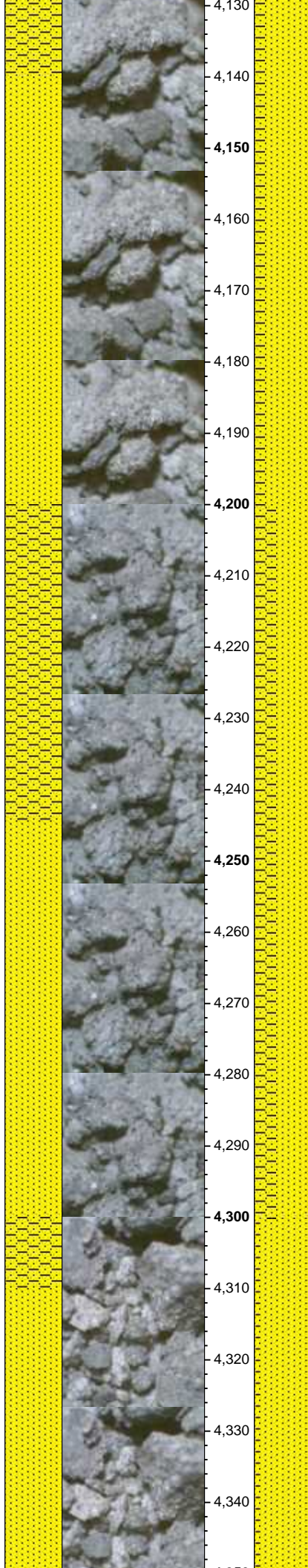
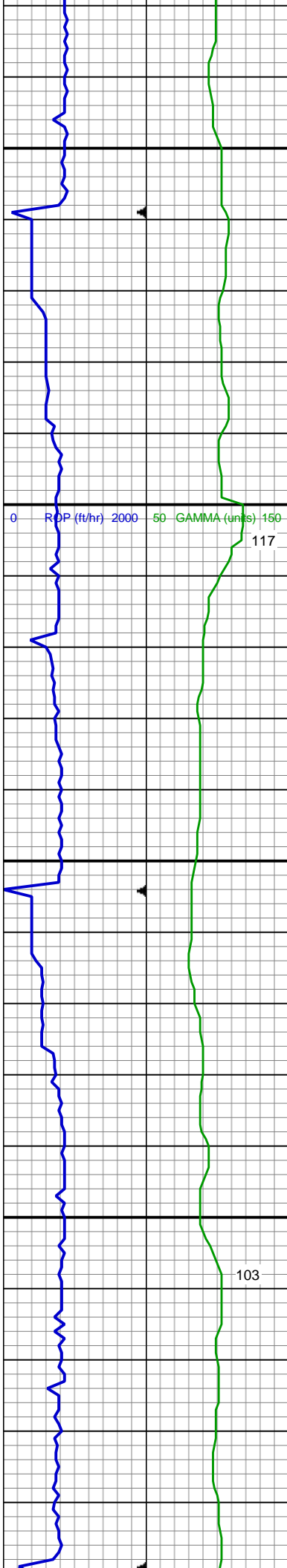
SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blkly, prly srted, sft -  
frm, calc cmt  
SS: wh - v lt gy, s&p, brit clus, pred sb  
ang, sme sb blkly, prly srted, mod hd - hd, v  
calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 4,008'  
TVD: 3,994.58'  
Inclination: 0.78°  
Azimuth: 220.73°

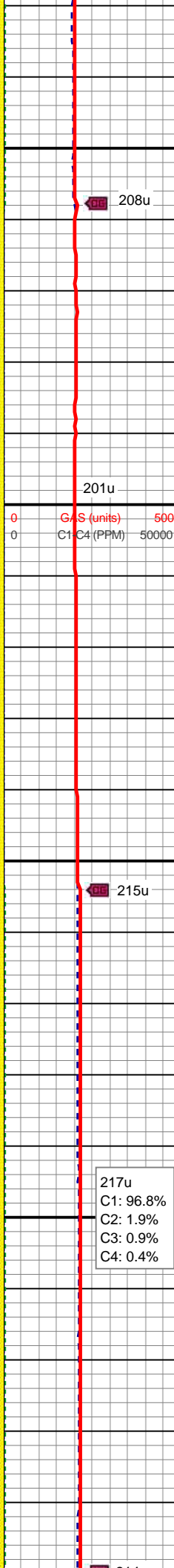
SS: wh - v lt gy, s&p, brit clus, pred sb  
ang, sme sb blkly, prly srted, mod hd - hd, v  
calc cmt  
SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blkly, prly srted, sft -  
frm, calc cmt

MD: 4,103'  
TVD: 4,089.57'  
Inclination: 1.18°  
Azimuth: 222.35°





4,130  
4,140  
4,150  
4,160  
4,170  
4,180  
4,190  
4,200  
4,210  
4,220  
4,230  
4,240  
4,250  
4,260  
4,270  
4,280  
4,290  
4,300  
4,310  
4,320  
4,330  
4,340



SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt  
SHY SS: wh - lt gy - lt gy brn, s&p, brit clus, f gr, sb ang - sb blkly, prly srted, sft - frm, calc cmt

MD: 4,198'  
TVD: 4,184.55'  
Inclination: 1.13°  
Azimuth: 241°

**SUSSEX TOP @  
4,244' MD; 4,230' TVD**

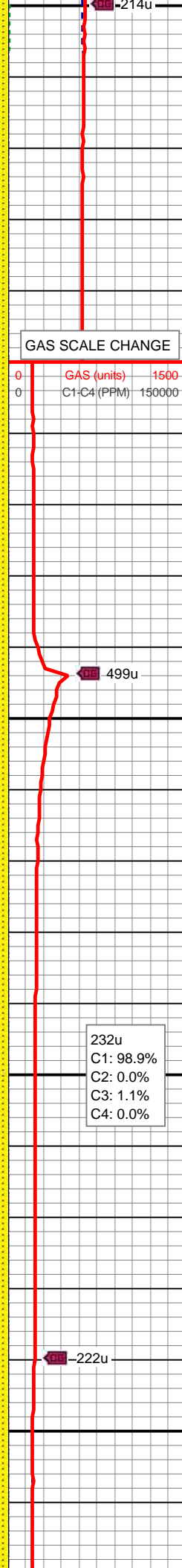
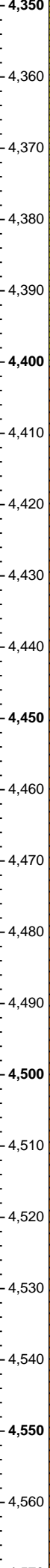
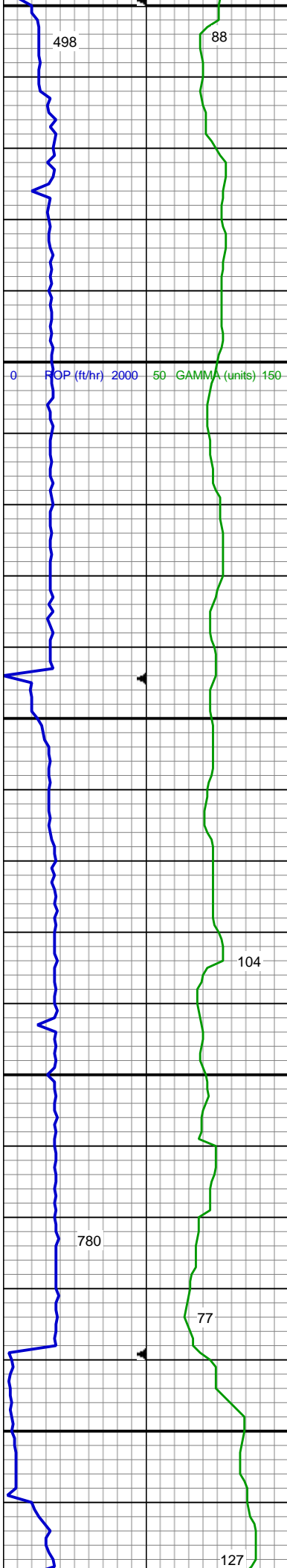
SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt  
SHY SS: wh - lt gy - lt gy brn, s&p, brit clus, f gr, sb ang - sb blkly, prly srted, sft - frm, calc cmt

MD: 4,292'  
TVD: 4,278.53'  
Inclination: 1.46°  
Azimuth: 261.31°

217u  
C1: 96.8%  
C2: 1.9%  
C3: 0.9%  
C4: 0.4%

SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt





SHY SS: wh - lt gy - lt gy brn, s&p, brit clus, f gr, sb ang - sb blkly, prly srted, sft - frm, calc cmt

MD: 4,387'  
TVD: 4,373.49'  
Inclination: 1.57°  
Azimuth: 262.56°

SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt

SHY SS: wh - lt gy - lt gy brn, s&p, brit clus, f gr, sb ang - sb blkly, prly srted, sft - frm, calc cmt

SHY SLTST: predy lt gy, occ med gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, v sl calc

MUD WT: 9.25/9.35  
VIS: 65/74 IN/OUT

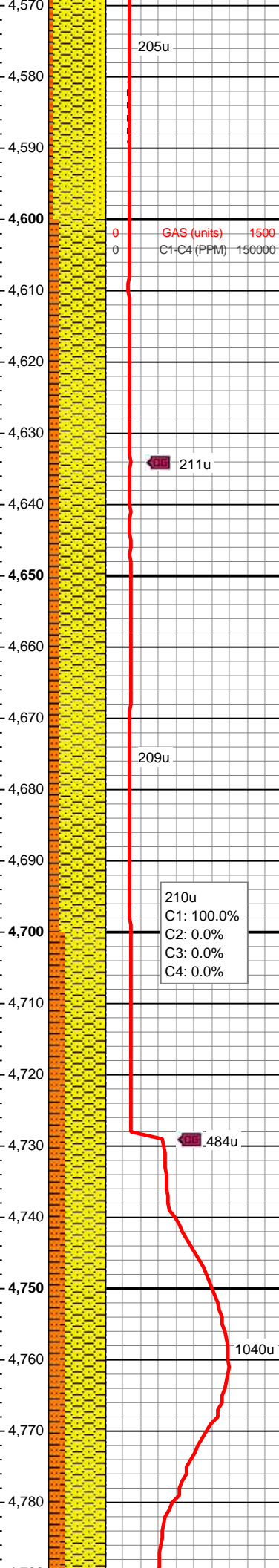
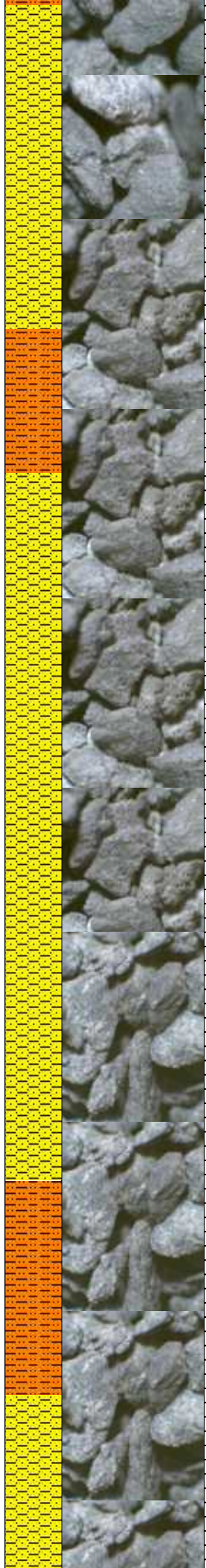
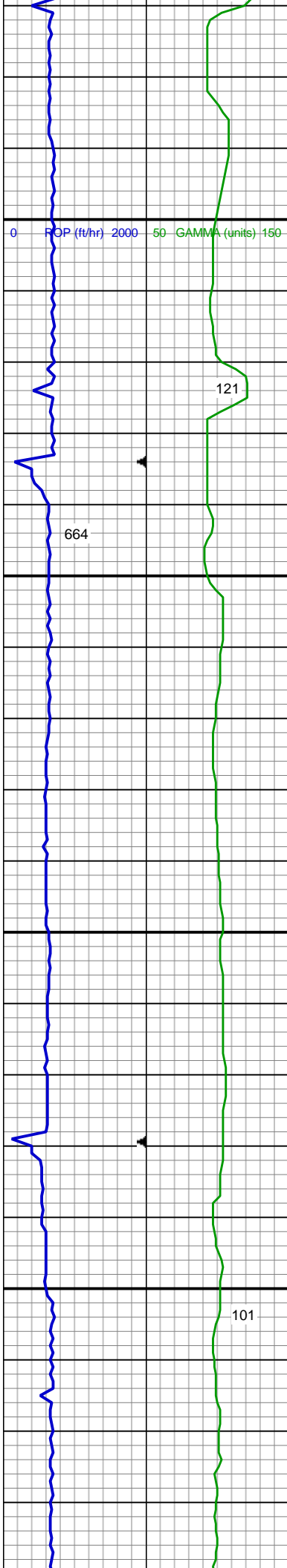
MD: 4,482'  
TVD: 4,468.45'  
Inclination: 1.8°  
Azimuth: 267.56°

SHY SS: wh - lt gy - lt gy brn, s&p, brit clus, f gr, sb ang - sb blkly, prly srted, sft - frm, calc cmt

SS: wh - v lt gy, s&p, brit clus, pred sb ang, sme sb blkly, prly srted, mod hd - hd, v calc cmt

SHY SLTST: predy lt gy, occ med gy, sb plty - sb rd, frly srted, sft - frm, slty - grty tex, v sl calc





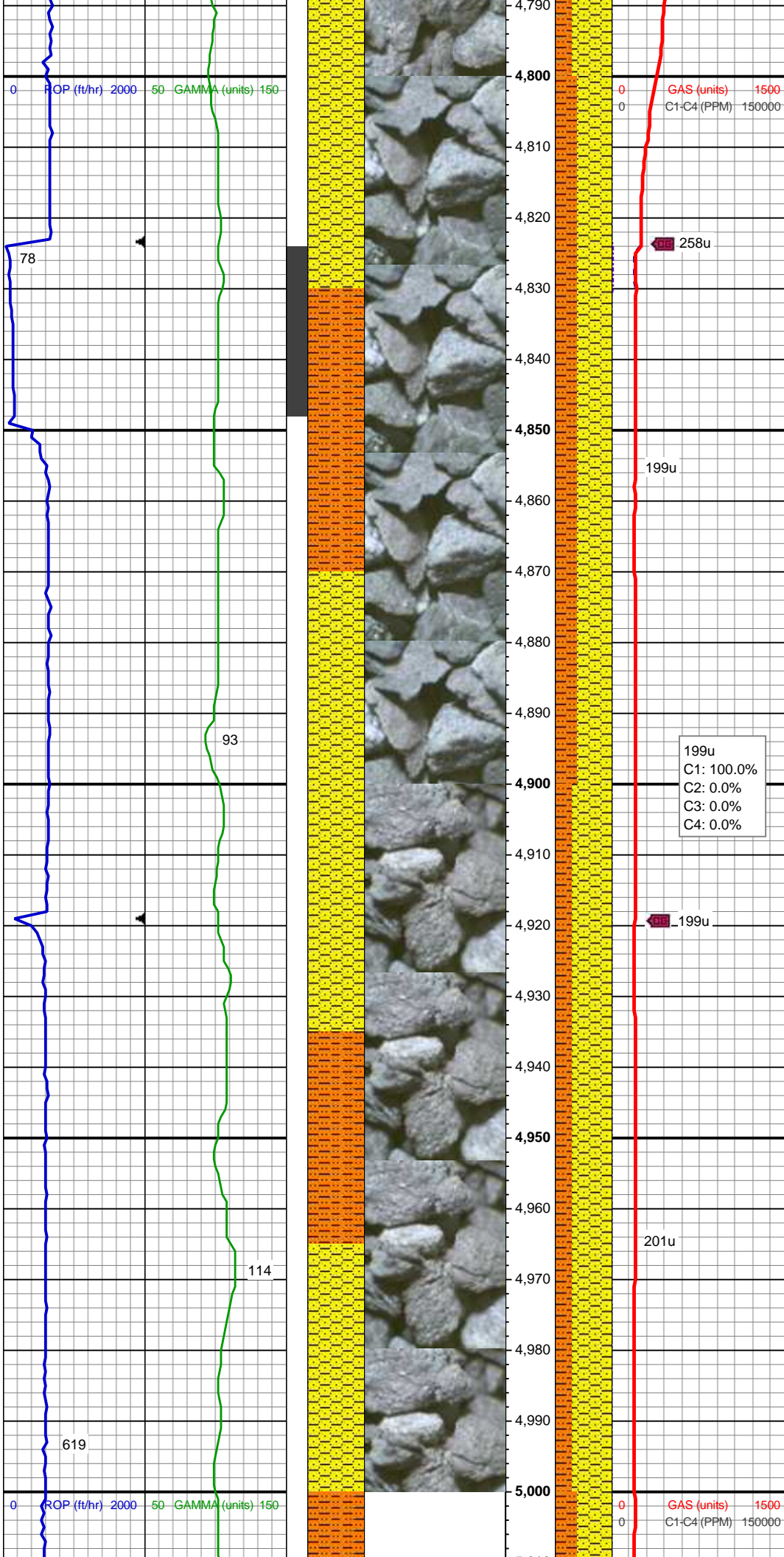
MD: 4,577'  
TVD: 4,563.42'  
Inclination: 1.36°  
Azimuth: 292.83°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

MD: 4,672'  
TVD: 4,658.39'  
Inclination: 1.2°  
Azimuth: 280.63°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

MD: 4,767'  
TVD: 4,753.37'  
Inclination: 1.54°  
Azimuth: 262.53°



SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt

SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

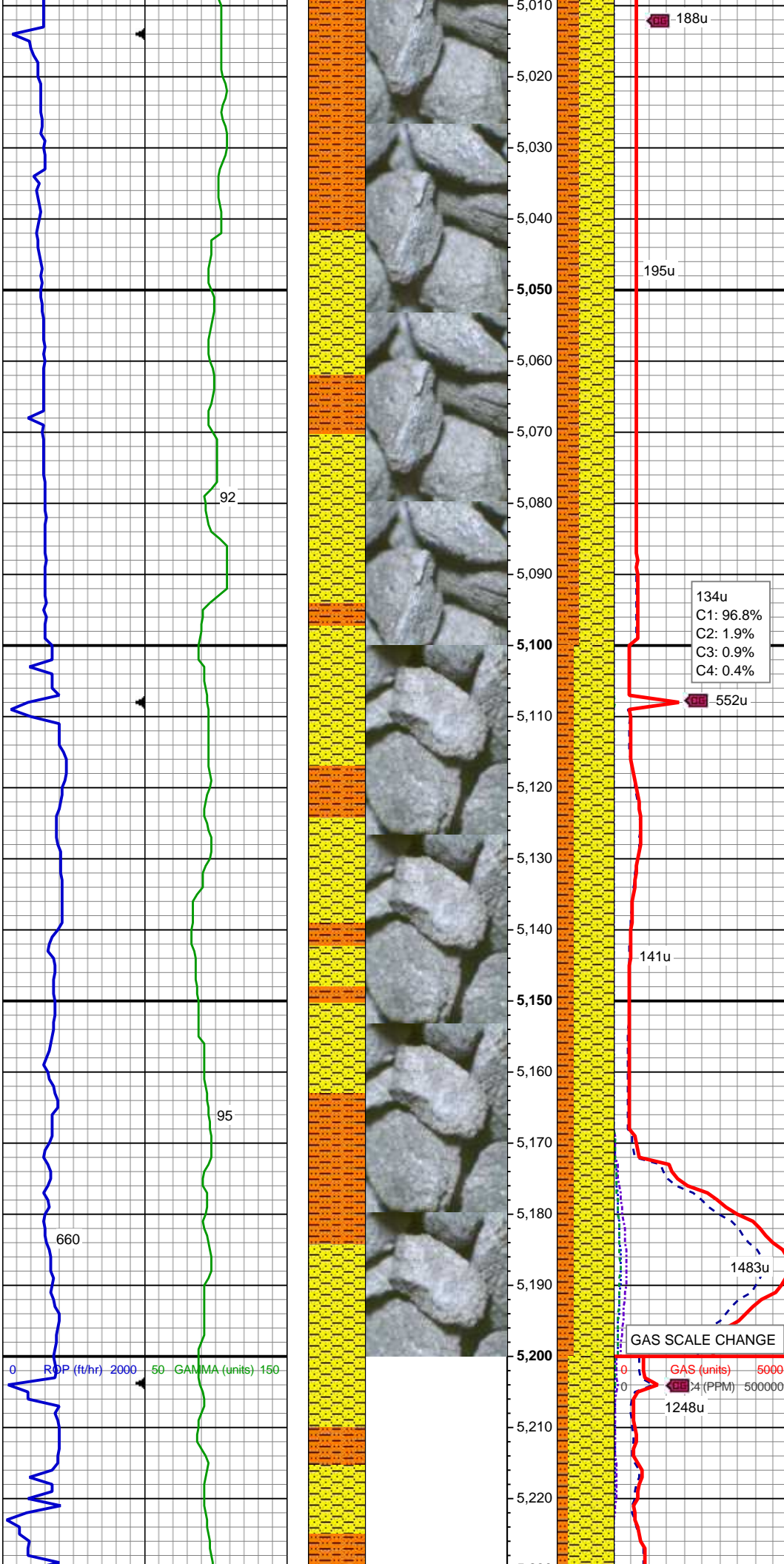
MD: 4,862'  
TVD: 4,848.35'  
Inclination: 0.98°  
Azimuth: 22.09°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt

SHY SLTST: predy lt gy, occ med gy, sb  
ply - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

MD: 4,956'  
TVD: 4,942.35'  
Inclination: 0.64°  
Azimuth: 52.76°





**SHANNON TOP @**  
**5,042' MD; 5,025' TVD**

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

MD: 5,051'  
TVD: 5,037.33'  
Inclination: 1.29°  
Azimuth: 99.03°

MUD WT: 9.15/9.20  
VIS: 52/62 IN/OUT

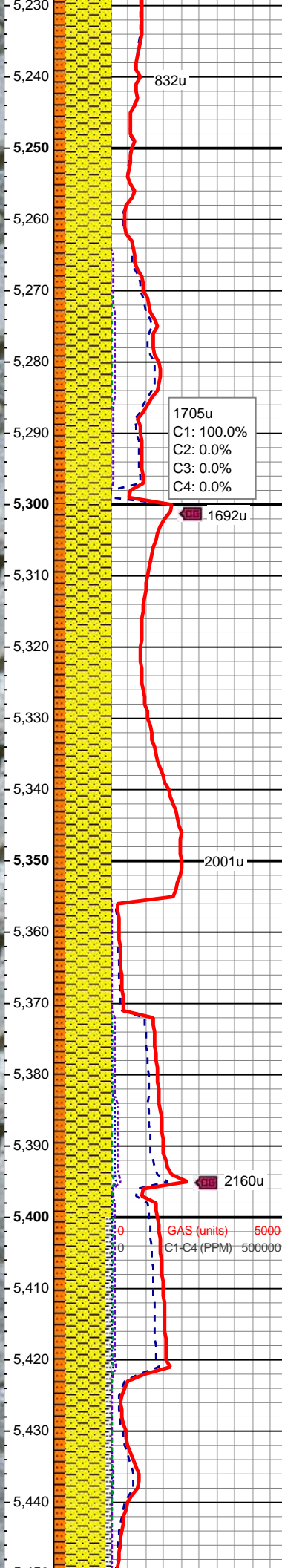
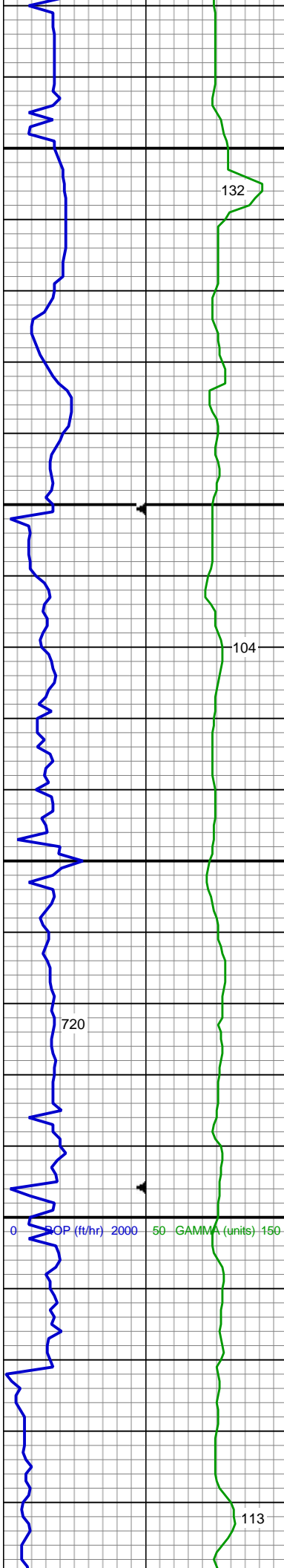
MD: 5,146'  
TVD: 5,132.31'  
Inclination: 1.23°  
Azimuth: 87.23°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srt, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srt, sft - frm, slty - grty tex,  
v sl calc

**PM Mud Rpt**  
**11/18/2014**  
Mud Wt: 9.10  
FVis: 48  
PVis: 8  
YP: 11  
GELS: 3/7/13  
API Filt: 5.7  
CAKE: 1/0  
pH: 9.2  
Cl: 1,100  
Ca: 120

MD: 5,241'





MD: 5,327.29'  
TVD: 5,227.29'  
Inclination: 0.78°  
Azimuth: 90.74°

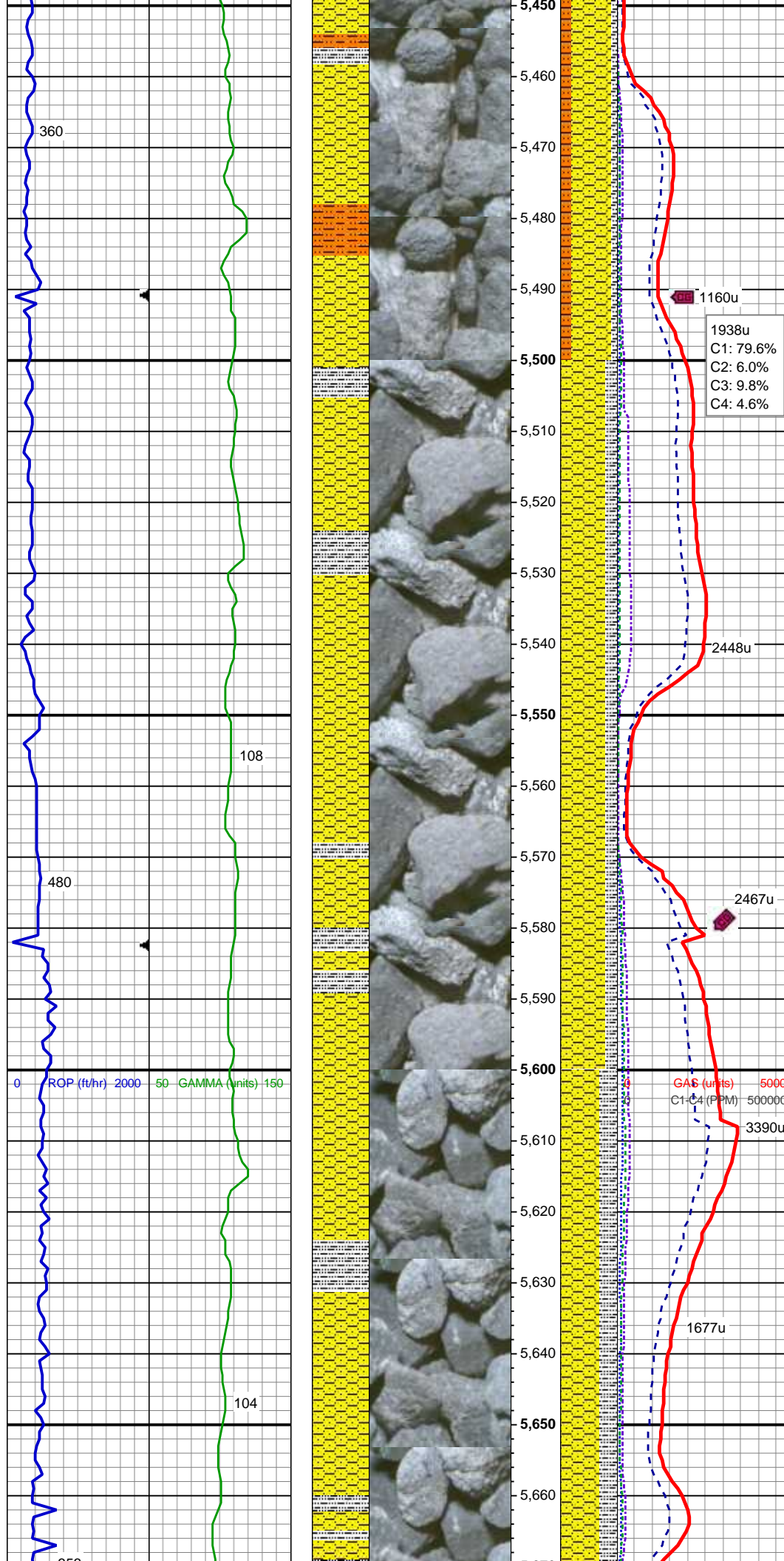
SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 5,336'  
TVD: 5,322.29'  
Inclination: 0.49°  
Azimuth: 84.12°

SHY SS: wh - lt gy - lt gy brn, s&p, brit  
clus, f gr, sb ang - sb blk, prly srted, sft -  
frm, calc cmt  
SHY SLTST: predy lt gy, occ med gy, sb  
plty - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc

MD: 5,430'  
TVD: 5,416.29'  
Inclination: 0.51°  
Azimuth: 94.56°

SHY SS: lt gy - lt gy brn, sme wh, s&p, f  
gr, sb ang - sb blk, prly srted, frm - mod hd  
wi brit clus, calc cmt



SHY SLT SH: predy lt gy, occ med gy, sb  
ply - sb rd, frly srted, sft - frm, slty - grty tex,  
v sl calc  
SLTY SH: lt - med gy, frm, ply - sb ply,  
occ sb blkly, slty - grty tex, v sl calc

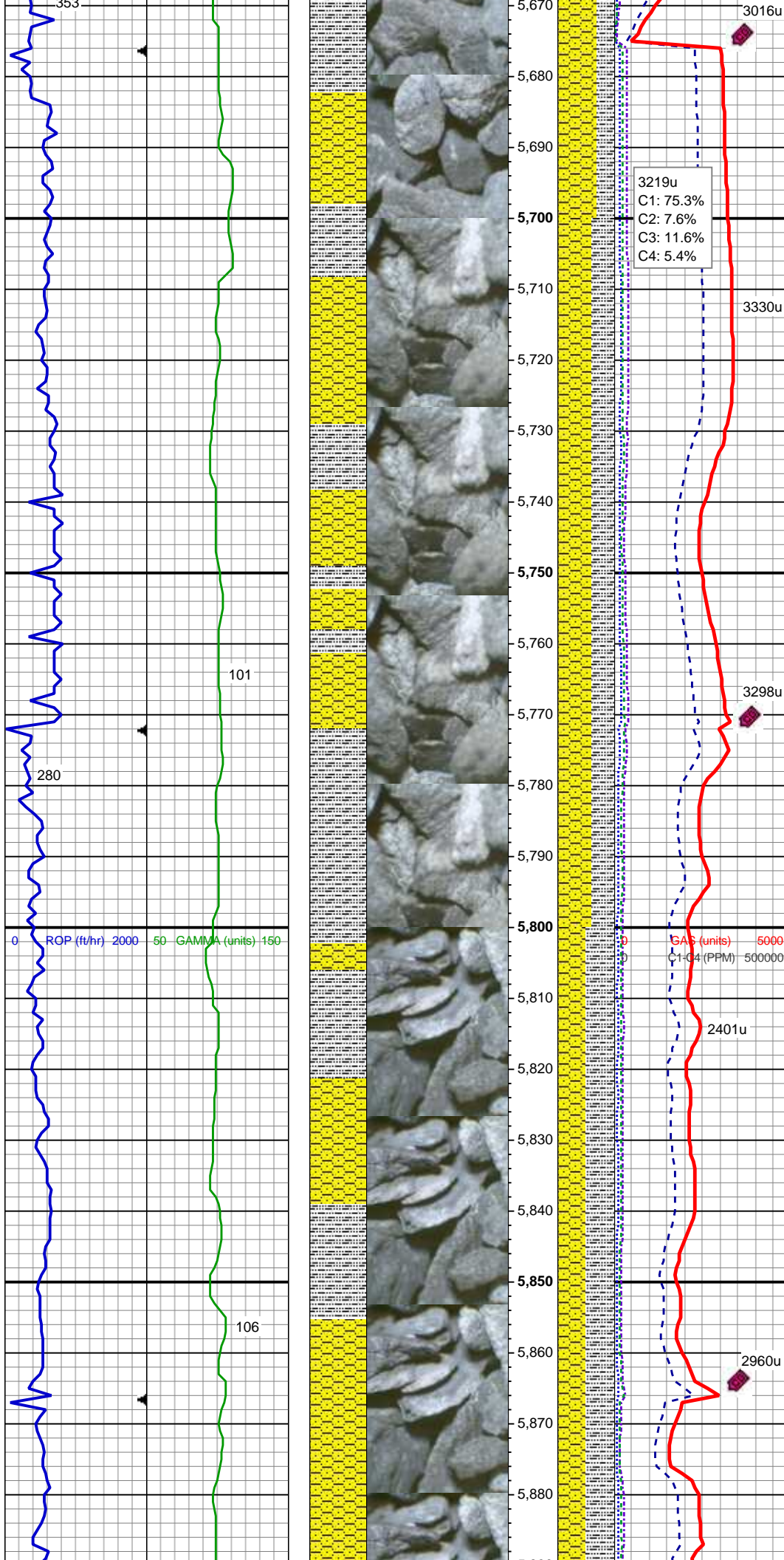
MD: 5,525'  
TVD: 5,511.28'  
Inclination: 0.48°  
Azimuth: 69.12°

SHY SS: lt gy - lt gy brn, sme wh, s&p, f  
gr, sb ang - sb blkly, prly srted, frm - mod  
hd wi brit clus, calc cmt SLTY SH: lt -  
med gy, frm, ply - sb ply, occ sb blkly,  
slty - grty tex, v sl calc

MD: 5,620'  
TVD: 5,606.28'  
Inclination: 0.43°  
Azimuth: 88.59°

SHY SS: lt gy - lt gy brn, sme wh, s&p, f  
gr, sb ang - sb blkly, prly srted, frm - mod  
hd wi brit clus, calc cmt  
SLTY SH: lt - med gy, frm, ply - sb ply,  
occ sb blkly, slty - grty tex, v sl calc





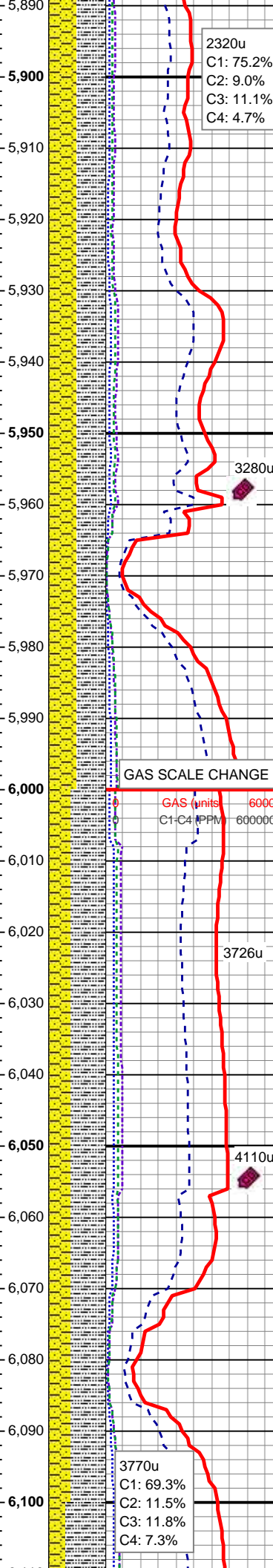
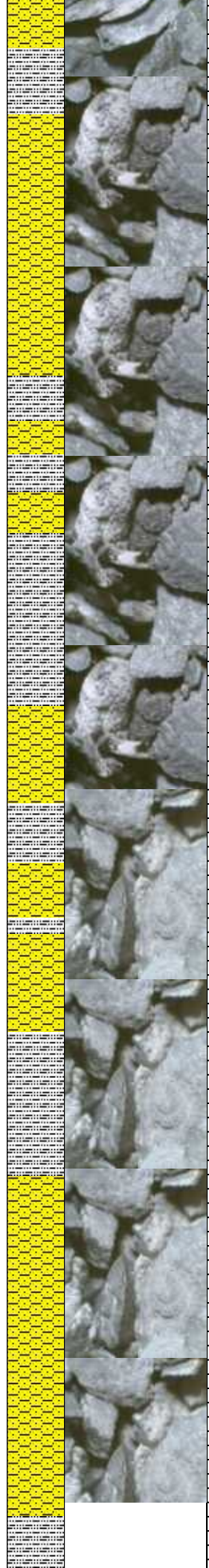
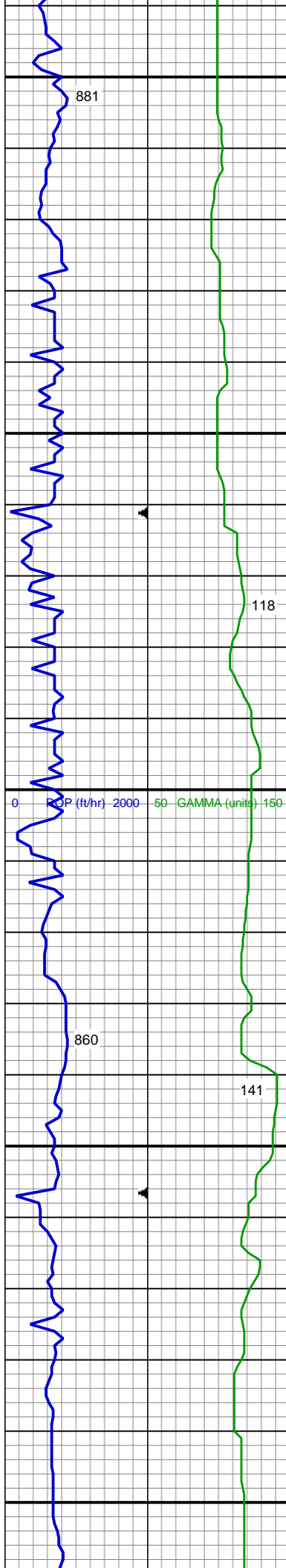
MD: 5,715'  
TVD: 5,701.27'  
Inclination: 0.68°  
Azimuth: 90.97°

SHY SS: lt gy - lt gy brn, sme wh, s&p, f  
gr, sb ang - sb blk, prly srted, frm - mod hd  
wi brit clus, calc cmt  
SLTY SH: lt - med gy, frm, plty - sb plty,  
occ sb blk, slty - grty tex, v sl calc

MD: 5,810'  
TVD: 5,796.27'  
Inclination: 0.72°  
Azimuth: 78.04°

SLTY SH: predy ltgy - ltgy brn, occ med  
gy, frm, plty - sb plty, occ sb blk, slty -  
grty tex, v sl calc  
SHY SS: lt gy, occ wh, s&p, f gr, sb ang -  
sb blk, prly srted, frm - mod hd wi brit  
clus, calc cmt





MD: 5,905'  
TVD: 5,891.26'  
Inclination: 0.9°  
Azimuth: 15.04°

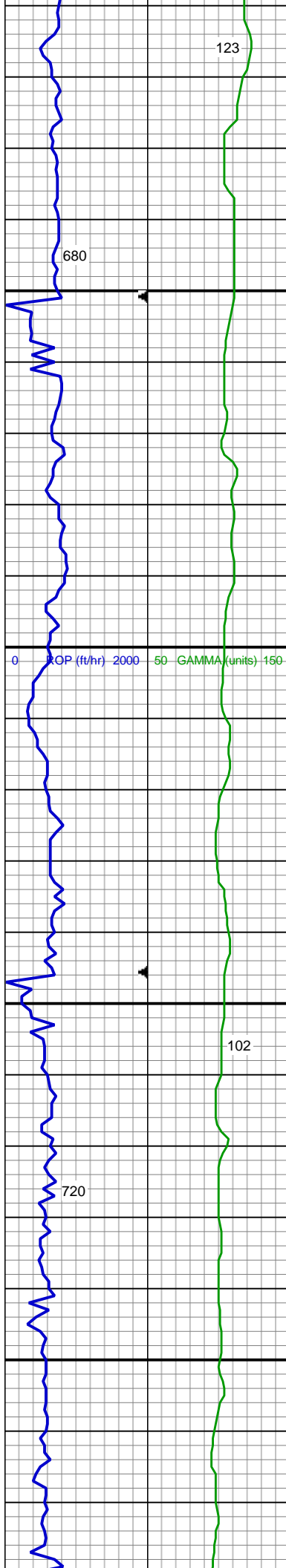
SLTY SH: predy ltgy - ltgy brn, occ med gy, frm, plty - sb plty, occ sb blkly, slty - grty tex, v sl calc  
SHY SS: lt gy, occ wh, s&p, f gr, sb ang - sb blkly, prly srted, frm - mod hd wi brit clus, calc cmt

MD: 5,999'  
TVD: 5,985.25'  
Inclination: 0.84°  
Azimuth: 19.53°

SLTY SH: predy ltgy - ltgy brn, occ med gy, frm, plty - sb plty, occ sb blkly, slty - grty tex, v sl calc  
SHY SS: lt gy, occ wh, s&p, f gr, sb ang - sb blkly, prly srted, frm - mod hd wi brit clus, calc cmt

**TEEPEE BUTTES TOP @  
6,051' MD; 6,038' TVD**

MD: 6,094'  
TVD: 6,080.24'  
Inclination: 0.75°  
Azimuth: 8.32°



123

680

102

720



4333u

C1: 64.8%  
C2: 13.9%  
C3: 13.4%  
C4: 7.9%

4231u

4102u

4037u

SLTY SH: predy ltgy - ltgy brn, occ med gy, frm, plty - sb plty, occ sb blkly, slty - grty tex, v sl calc  
SHY SS: lt gy, occ wh, s&p, f gr, sb ang - sb blkly, prly srted, frm - mod hd wi brit clus, calc cmt

MD: 6,189'  
TVD: 6,175.23'  
Inclination: 0.62°  
Azimuth: 348.13°

SLTY SH: predy ltgy - ltgy brn, occ med gy, frm, plty - sb plty, occ sb blkly, slty - grty tex, v sl calc  
SHY SS: lt gy, occ wh, s&p, f gr, sb ang - sb blkly, prly srted, frm - mod hd wi brit clus, calc cmt

MD: 6,284'  
TVD: 6,270.23'  
Inclination: 0.36°  
Azimuth: 41.19°



