

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Five Rivers K07-65-1HN

**Location** SEC 8 T4N R66W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** H&P 315

**API Number** 05-123-39478

**AFE #** 200350

**Region** DJ BASIN

**Field** WATTENBERG

**Spud Date** 8/30/2014

**Surface Coordinates** NESE SEC 8 T4N R66W  
2,189' FSL; 58' FEL

LAT/LON: 40.32493/-104.79277

**Bottom Hole Coordinates** SEC 7 T4N R66W  
2,310' FSL; 535' FWL

**Ground Elevation** 4,700'

**K.B. Elevation** 4,724'

**Logged Interval** 2,000 To 6,467'

**Formation** NIOBRARA C CHALK

**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
- MX 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

 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


 HEAVY MINERAL

 GLAUCONITE

 GYPSIFEROUS

 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






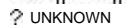



 MARLSTONE (DOL) STRG


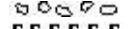
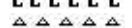

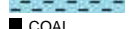
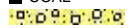



 SANDSTONE STRINGER

 SHALE STRINGER

 SILTSTONE STRINGER

## Rock Types

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

 BENTONITE  
 BRECCIA  
 CEMENT  
 CHERT  
 CLAY CHOKESAND  
 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

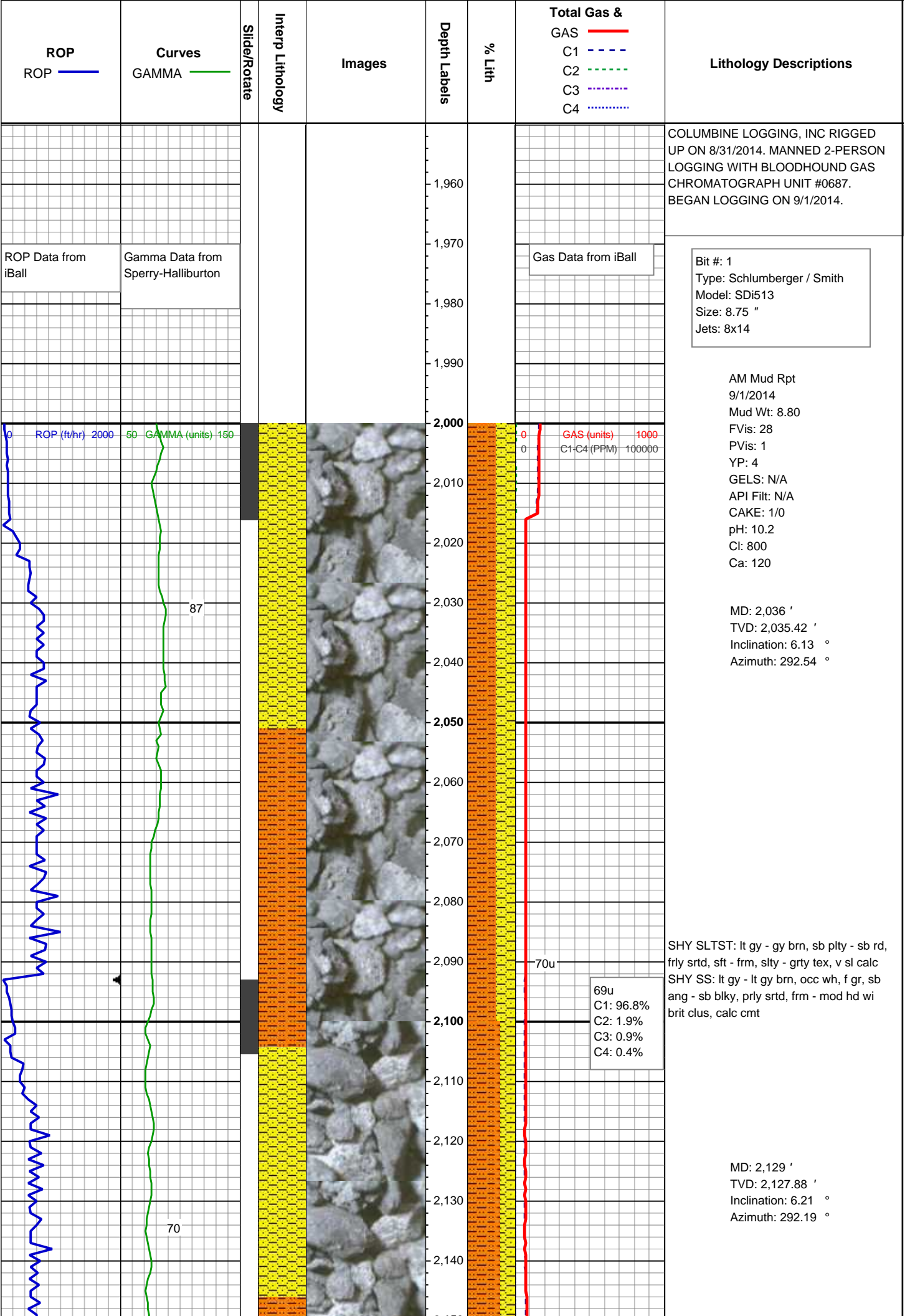
**Name** NATHAN MURPHY; ZACH UBER

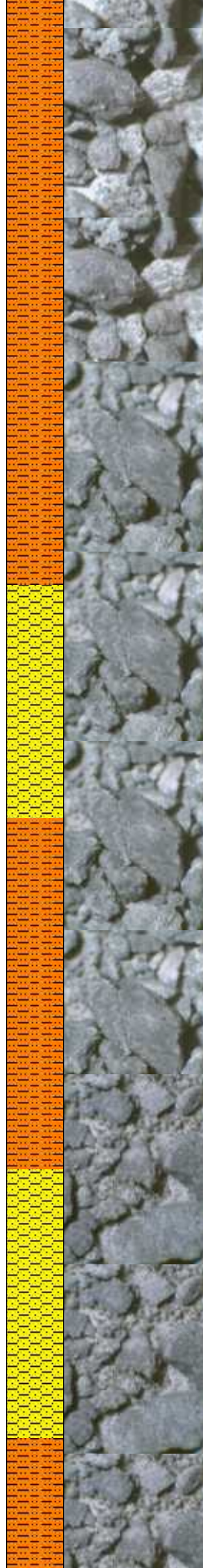
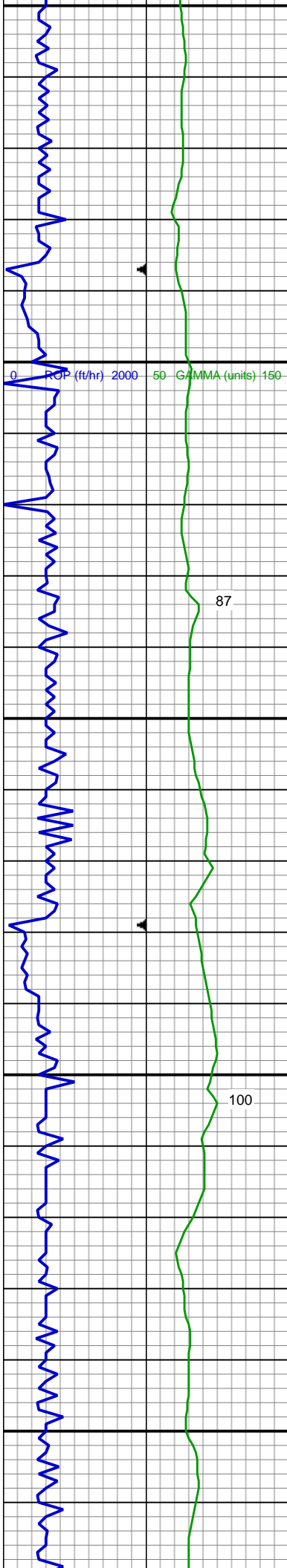
**Company** COLUMBINE LOGGING, INC

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

## Zone Color Coding

 Oil	 Condensate	 Gas
 Note	 Core	 Pressure
 Error	 Water	 Seal





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  
2,290  
2,300  
2,310  
2,320  
2,330  
2,340  
2,350  
2,360

340u

GAS (units) 1000  
C1-C4 (PPM) 100000

206u

257u

122u  
C1: 95.3%  
C2: 3.0%  
C3: 1.6%  
C4: 0.0%

224u

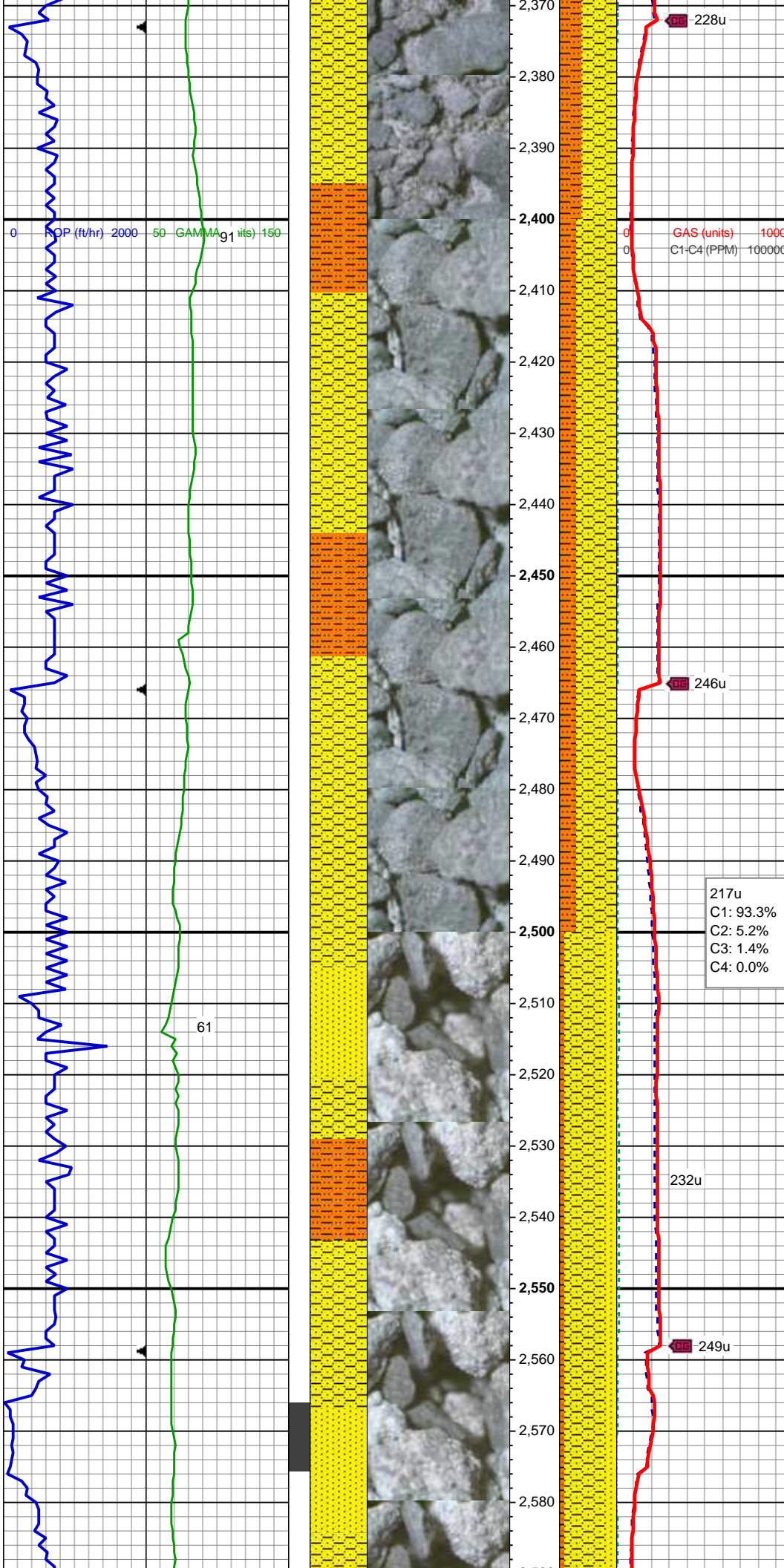
SHY SLTST: lt gy - gy brn, sb plty - sb rd,  
frly srtd, sft - frm, slty - grty tex, v sl calc  
SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blk, prly srtd, frm - mod hd wi  
brit clus, calc cmt

MD: 2,223 '  
TVD: 2,221.25 '  
Inclination: 7.16 °  
Azimuth: 283.47 °

MUD WT: 8.6/8.7  
VIS: 28/28 IN/OUT

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

MD: 2,315 '  
TVD: 2,312.59 '  
Inclination: 6.57 °  
Azimuth: 282.97 °



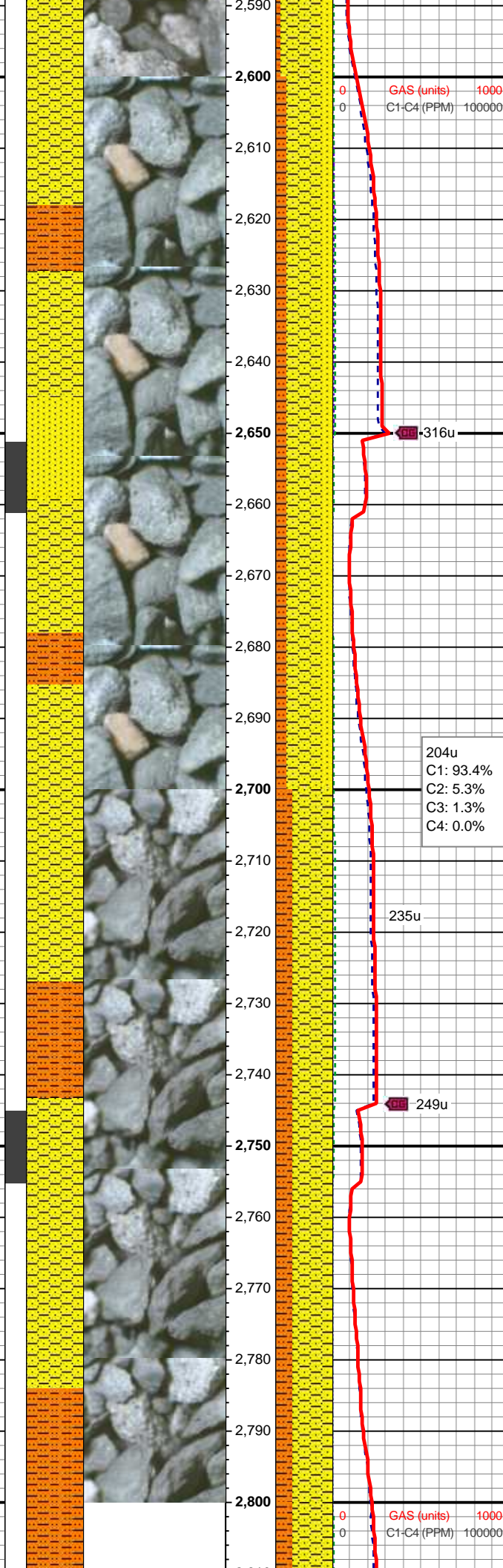
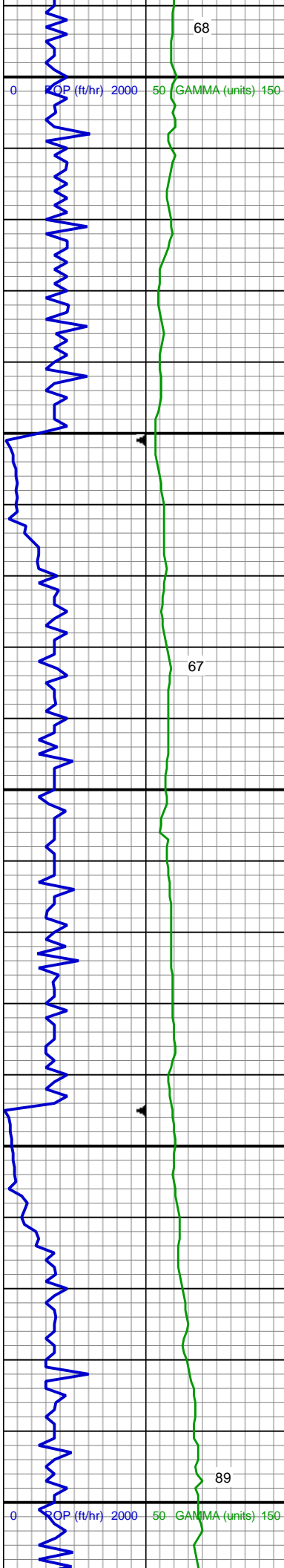
SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blk, prly srt, frm - mod hd wi  
brit clus, calc cmt  
SHY SLTST: lt gy - gy brn, sb plty - sb rd,  
frly srt, sft - frm, slty - grty tex, v sl calc

MD: 2,408 '  
TVD: 2,405.03 '  
Inclination: 6.01 °  
Azimuth: 282.4 °

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

MD: 2,500 '  
TVD: 2,496.5 '  
Inclination: 6.27 °  
Azimuth: 280.77 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blk, prly srt, frm - mod hd wi  
brit clus, calc cmt  
SS: wh, frn, trcl, srt, f gr, occ, sh, ang



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

MD: 2,593 '  
TVD: 2,588.98 '  
Inclination: 5.85 °  
Azimuth: 288.9 °

MUD WT: 8.7/8.8  
VIS: 28/28 IN/OUT

MD: 2,688 '  
TVD: 2,683.57 '  
Inclination: 4.79 °  
Azimuth: 296.89 °

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

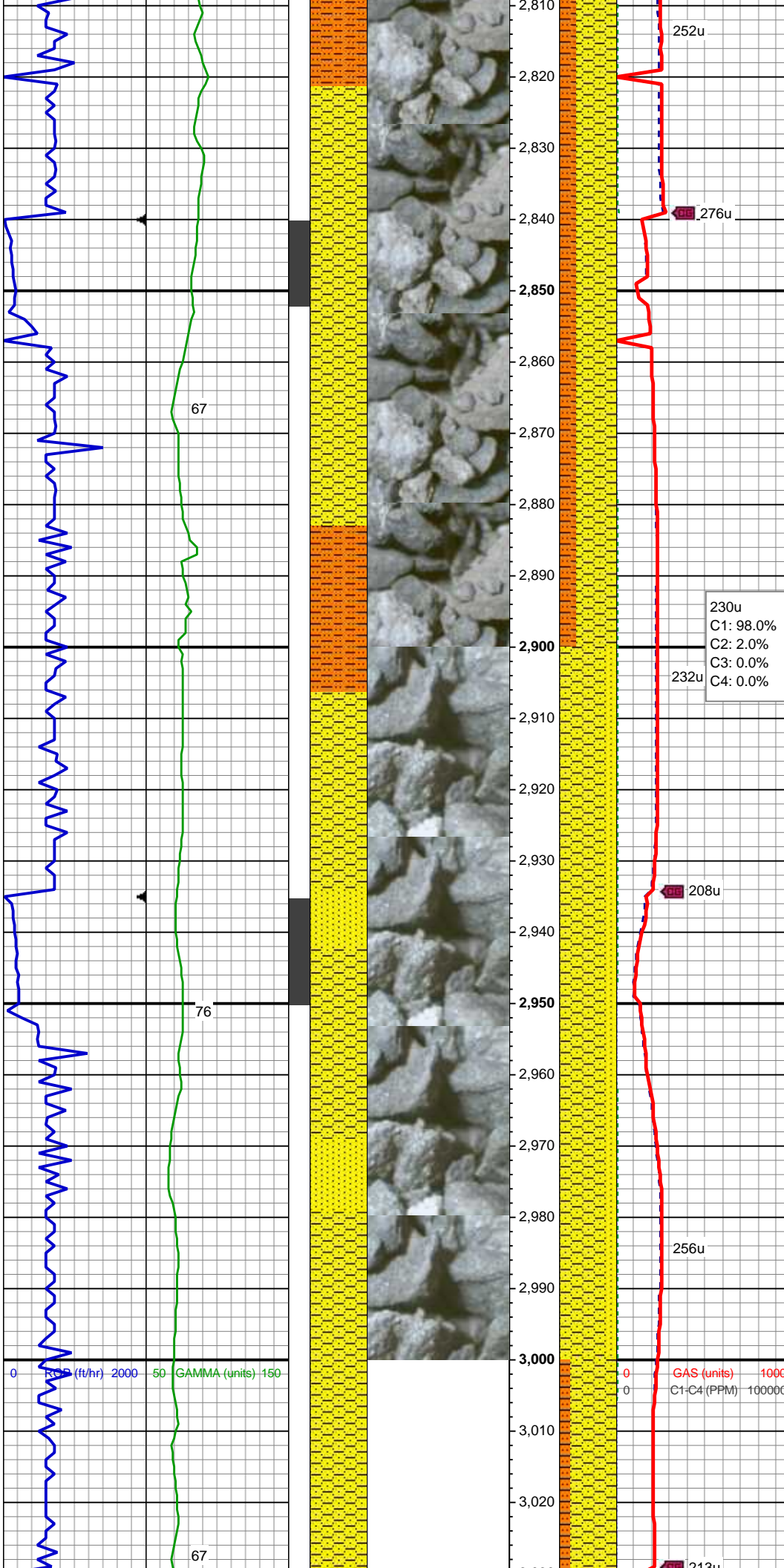
204u  
C1: 93.4%  
C2: 5.3%  
C3: 1.3%  
C4: 0.0%

235u

249u

MD: 2,782 '  
TVD: 2,777.3 '  
Inclination: 3.83 °  
Azimuth: 291.13 °

SHY SS: lt gy - lt gy brn, occ wh, 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



MUD WT: 8.8/8.95  
VIS: 28/28 IN/OUT

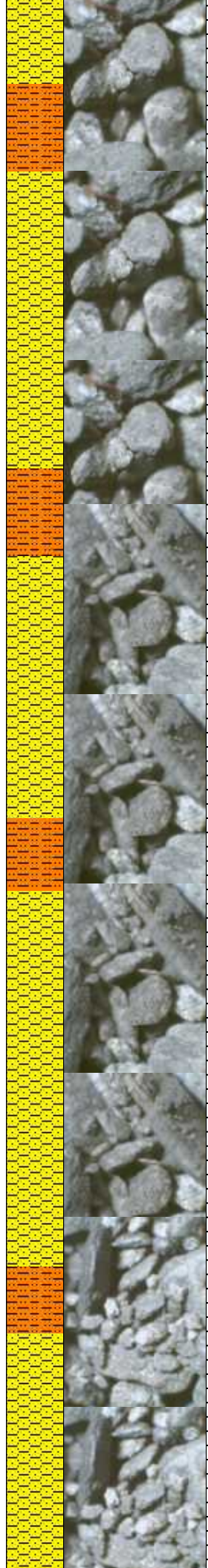
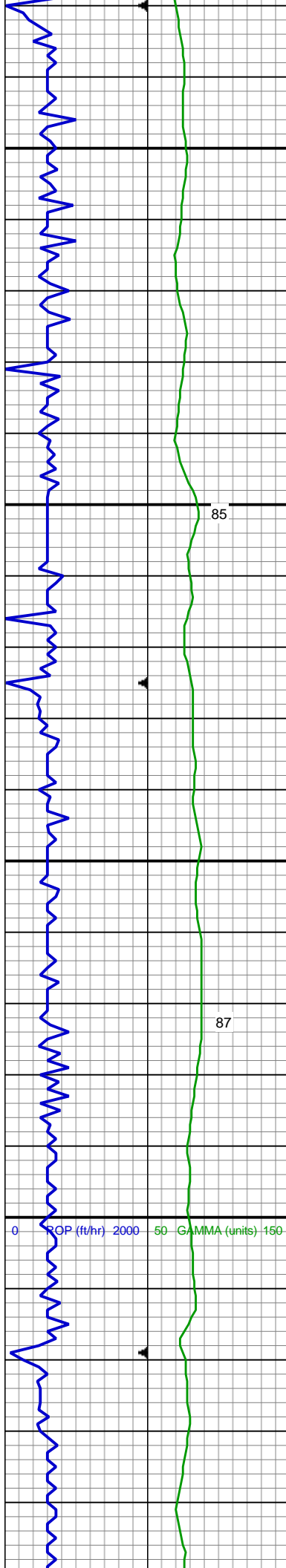
MD: 2,877 '  
TVD: 2,872.16 '  
Inclination: 2.41 °  
Azimuth: 295.76 °

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

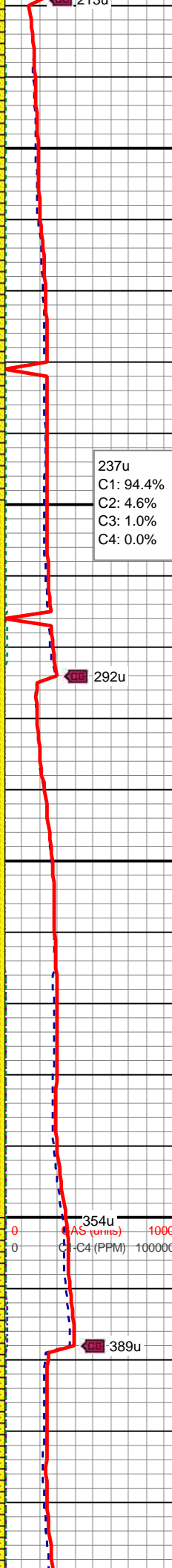
230u  
C1: 98.0%  
C2: 2.0%  
C3: 0.0%  
C4: 0.0%

MD: 2,972 '  
TVD: 2,967.12 '  
Inclination: 0.9 °  
Azimuth: 321.87 °

SHY SS: lt gy - lt gy brn, f gr, sb ang - sb  
rd, p srt, sft - mod hd wi brit clus, calc  
cmt  
SS: wh - ltgy, fros - trnsl, s&p, f gr, ang -  
sb ang, p srt, hd brit clus, v calc cmt



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  
3,170  
3,180  
3,190  
3,200  
3,210  
3,220  
3,230  
3,240



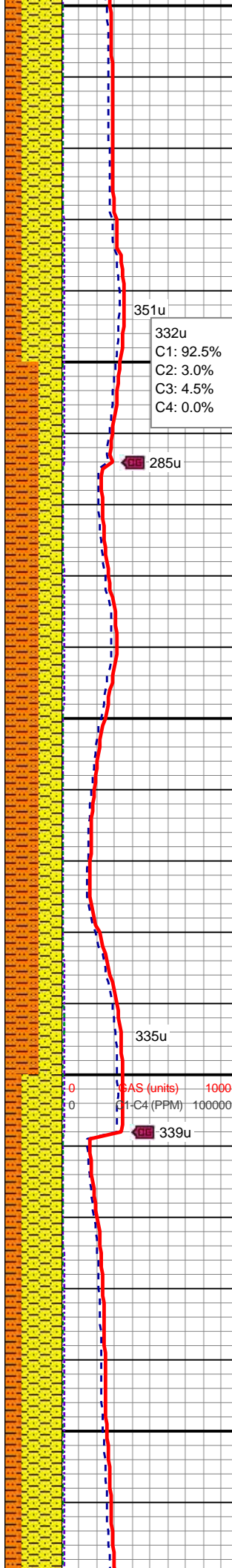
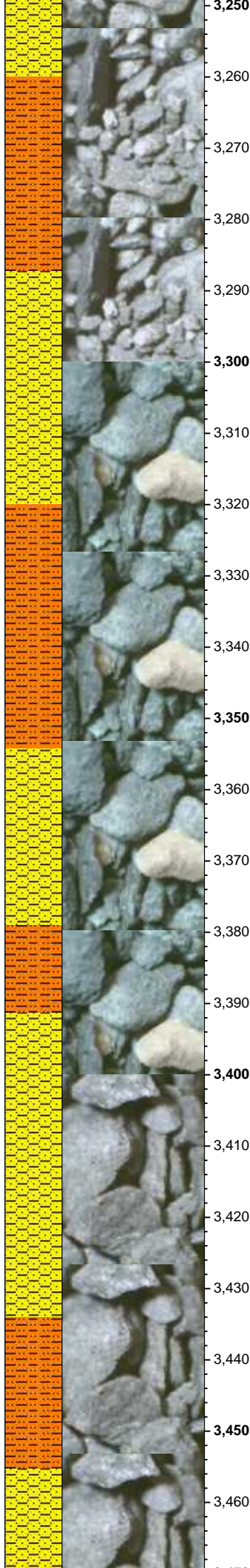
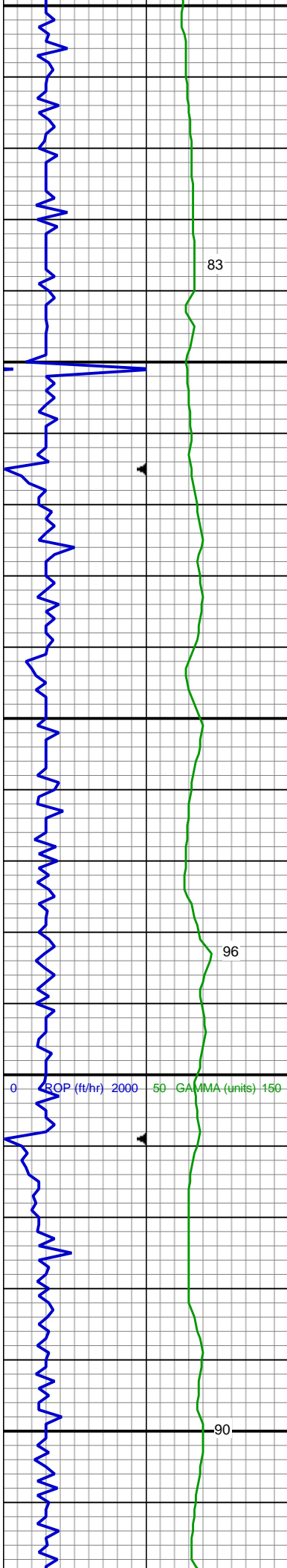
MD: 3,067 '  
TVD: 3,062.11 '  
Inclination: 0.95 °  
Azimuth: 312.29 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blk, prly srt, frm - mod hd wi  
brit clus, calc cmt  
SHY SLTST: lt gy - gy brn, sb plty - sb rd,  
fryl srt, sft - frm, slty - grty tex, v sl calc

MUD WT: 8.9/9.05  
VIS: 28/30 IN/OUT

MD: 3,162 '  
TVD: 3,157.09 '  
Inclination: 0.94 °  
Azimuth: 327.7 °

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



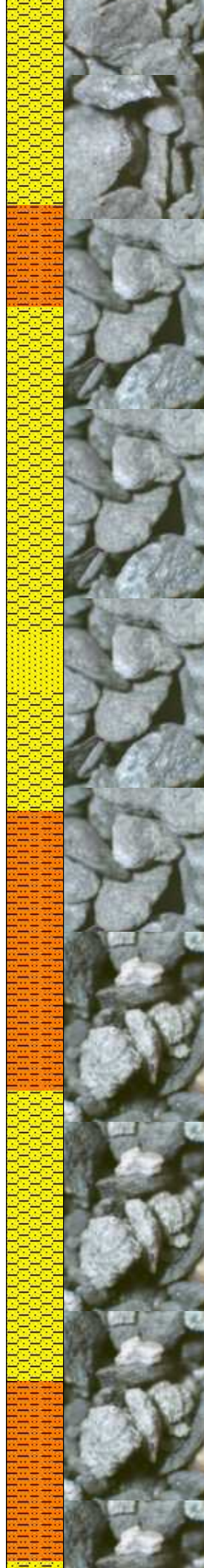
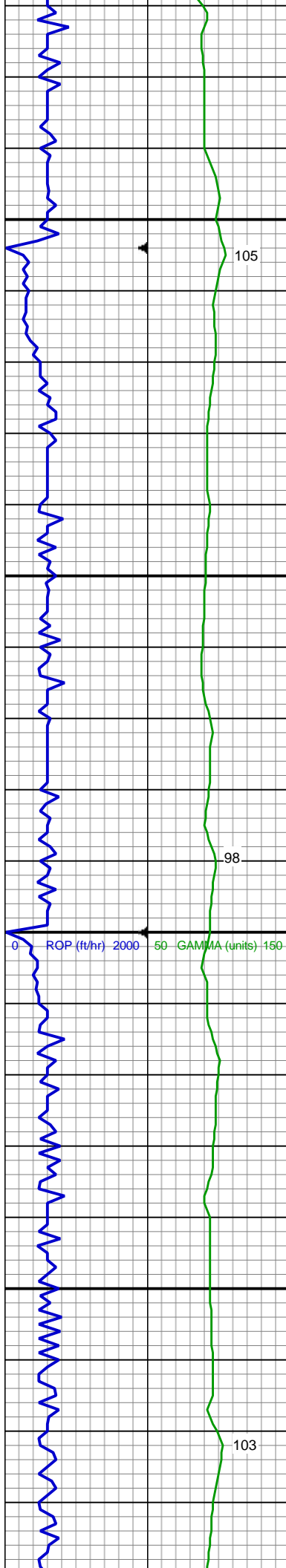
MD: 3,257 '   
 TVD: 3,252.08 '   
 Inclination: 0.81 °   
 Azimuth: 341.57 °

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

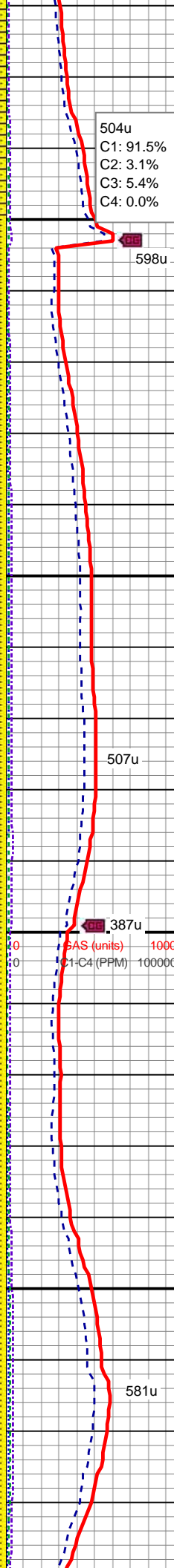
MD: 3,352 '   
 TVD: 3,347.07 '   
 Inclination: 0.81 °   
 Azimuth: 346.83 °

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

MD: 3,447 '   
 TVD: 3,442.07 '   
 Inclination: 0.67 °   
 Azimuth: 352.79 °



3,470  
3,480  
3,490  
3,500  
3,510  
3,520  
3,530  
3,540  
3,550  
3,560  
3,570  
3,580  
3,590  
3,600  
3,610  
3,620  
3,630  
3,640  
3,650  
3,660  
3,670  
3,680



SHY SS: lt gy - lt gy brn, occ wh, 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

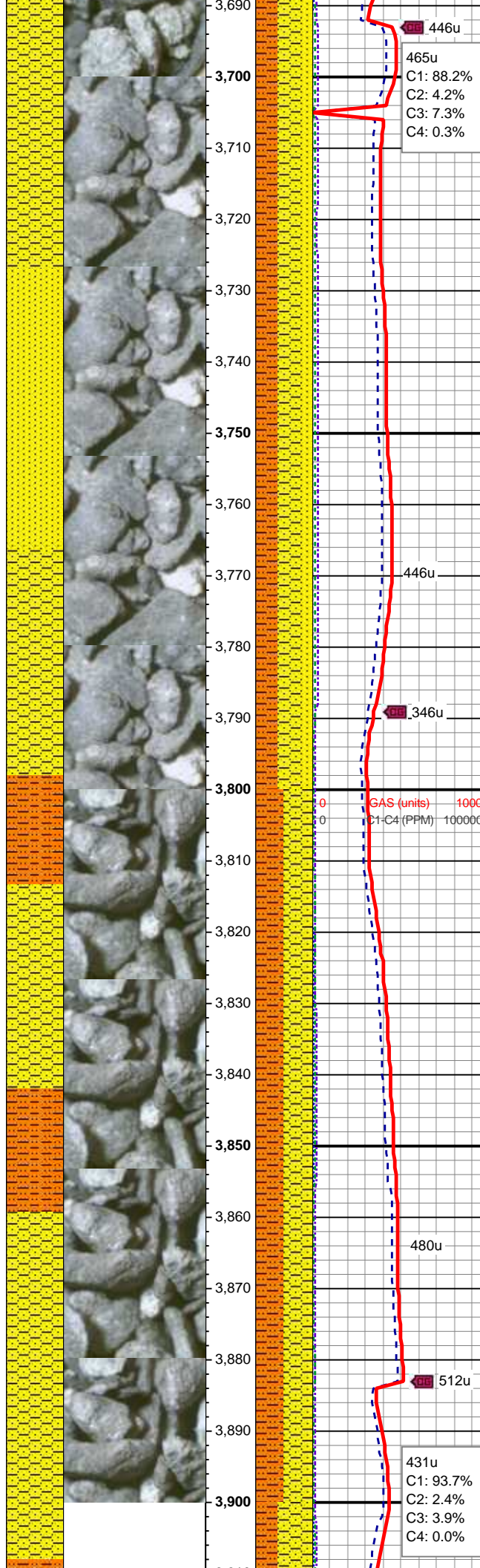
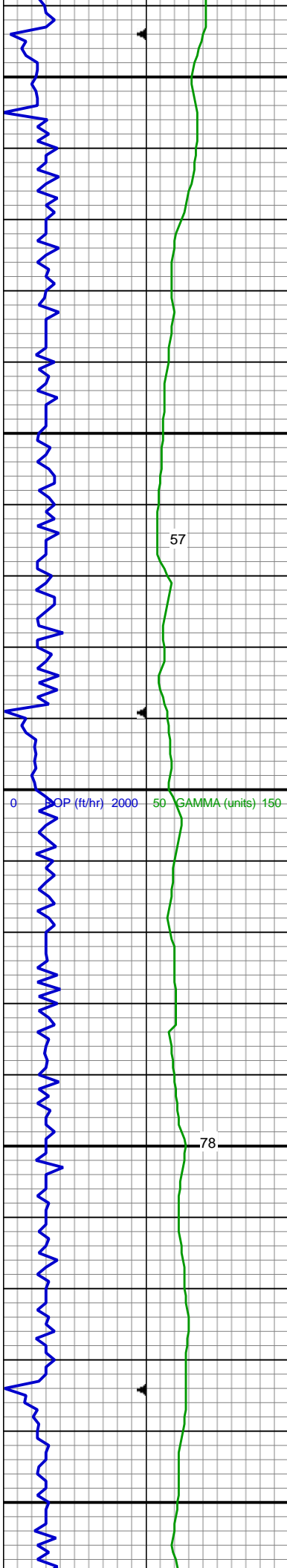
MD: 3,542 '  
TVD: 3,537.06 '  
Inclination: 0.59 °  
Azimuth: 321.37 °

SHY SS: lt gy - lt gy brn, occ wh, 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

Parkman Top @  
3,618' MD; 3,613' TVD

MD: 3,637 '  
TVD: 3,632.06 '  
Inclination: 0.65 °  
Azimuth: 350.57 °

SHY SS: lt gy - lt gy brn, occ wh, 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



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

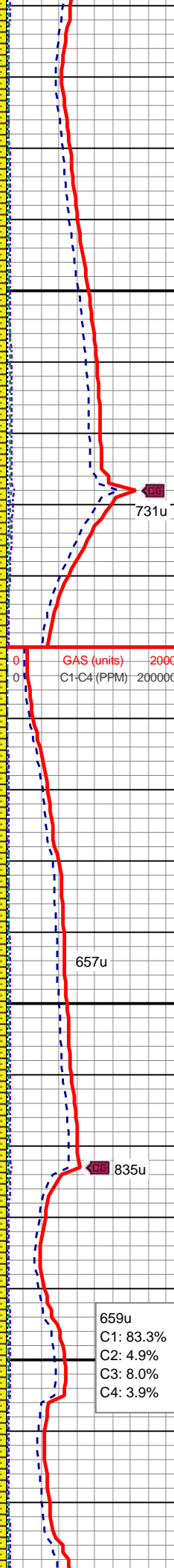
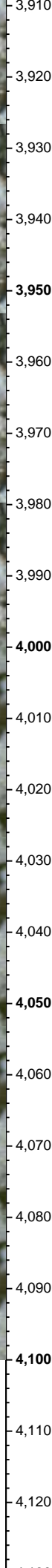
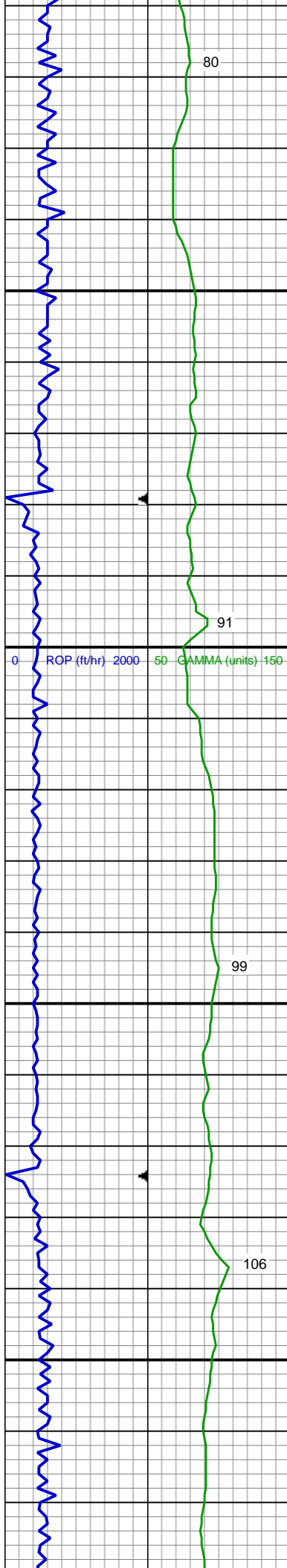
MD: 3,732 '  
TVD: 3,727.05 '  
Inclination: 1.05 °  
Azimuth: 358.87 °

MUD WT: 8.9/9.15  
VIS: 28/29 IN/OUT

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blkly, 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  
SS: wh, fros - trnsd, s&p, f gr, ang - sb ang,  
p srted, hd brit clus, v calc cmt

MD: 3,827 '  
TVD: 3,822.03 '  
Inclination: 1.25 °  
Azimuth: 358.67 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blkly, 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



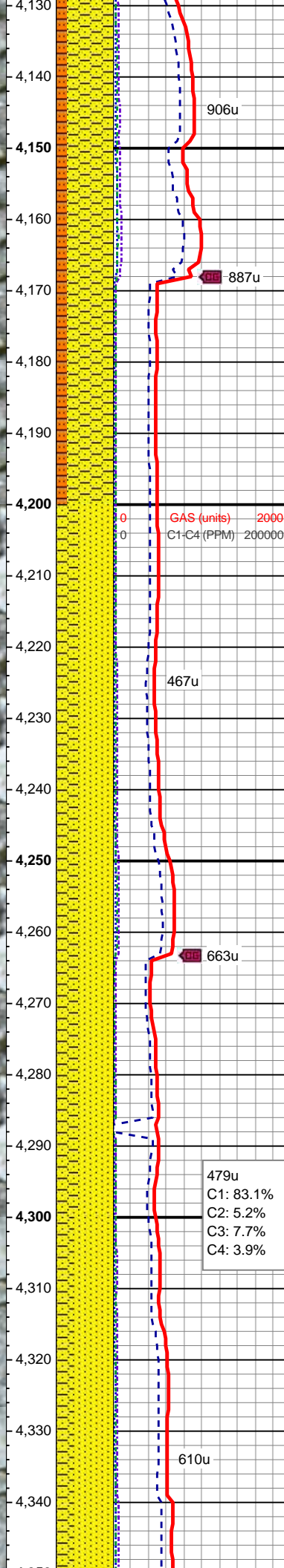
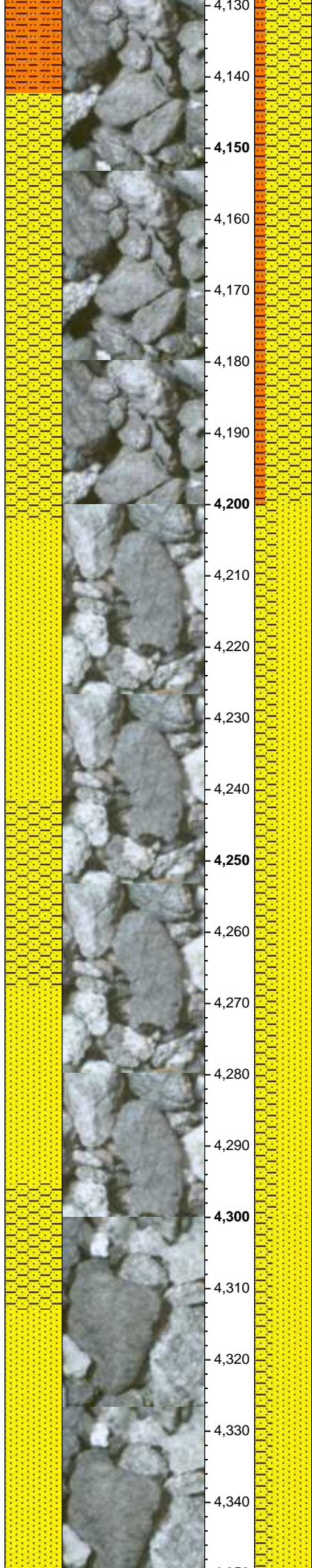
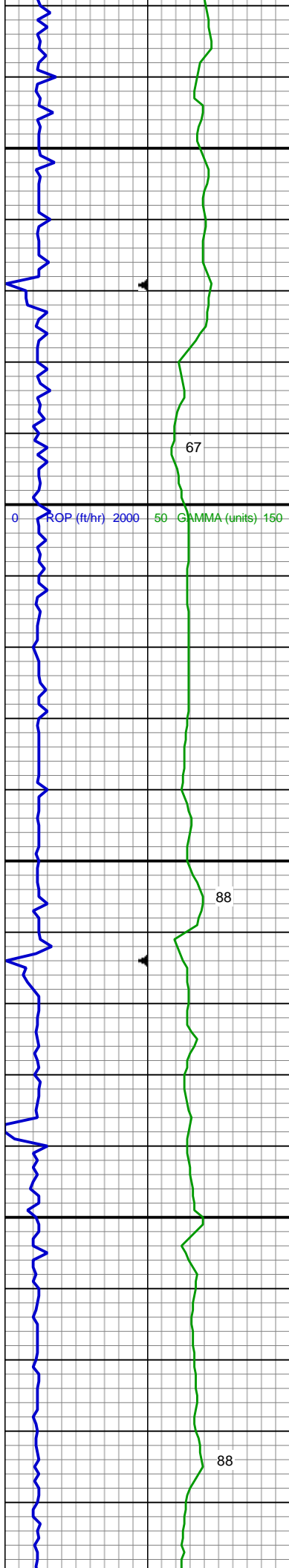
MD: 3,922 '  
TVD: 3,917.01 '  
Inclination: 1.11 °  
Azimuth: 359.35 °

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

MD: 4,017 '  
TVD: 4,011.99 '  
Inclination: 0.96 °  
Azimuth: 345.49 °

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

MD: 4,112 '  
TVD: 4,106.98 '  
Inclination: 0.71 °  
Azimuth: 334.11 °



SHY SS: lt gy - lt gy brn, occ wh, 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,  
fryl srted, sft - frm, slty - grty tex, v sl calc

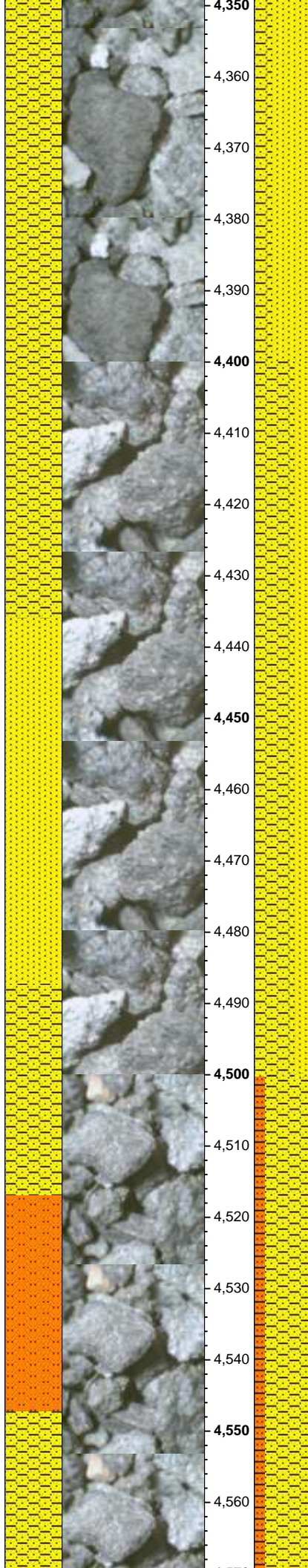
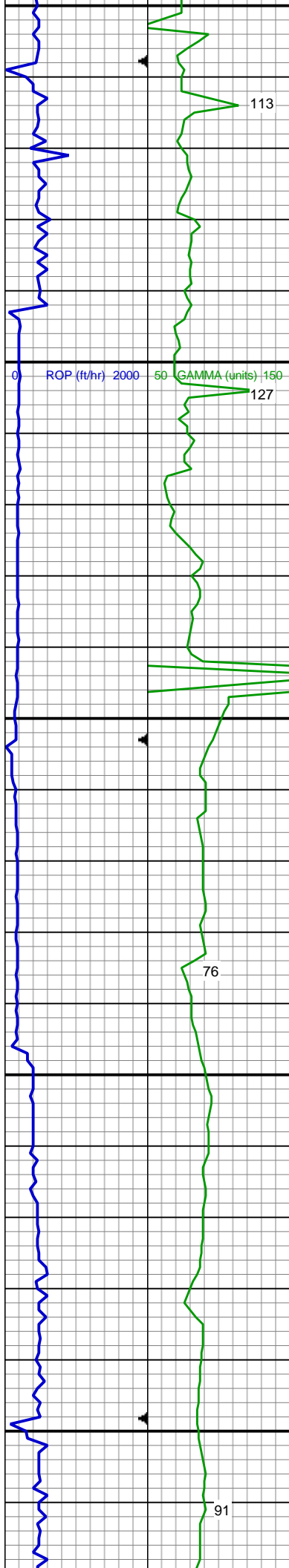
MD: 4,207 '  
TVD: 4,201.97 '  
Inclination: 0.66 °  
Azimuth: 323.02 °

Sussex Top @  
4,301' MD; 4,295' TVD

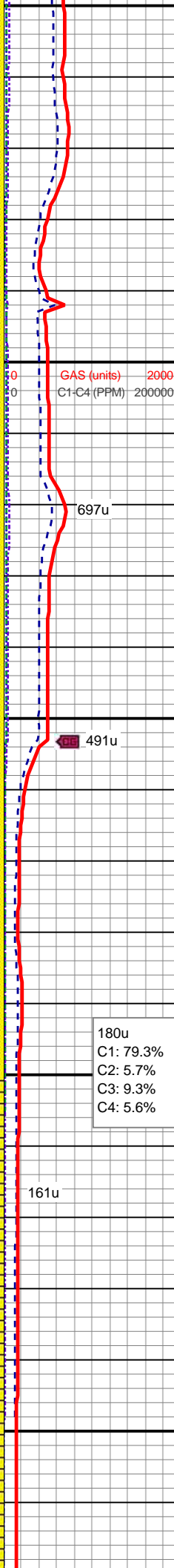
SS: wh - ltgy, fros - trns, s&p, f gr, ang -  
sb ang, p srted, hd brit clus, v calc cmt  
SHY SS: lt gy - lt gy brn, f gr, sb ang - sb  
rd, p srted, sft - mod hd wi brit clus, calc  
cmt

MD: 4,301 '  
TVD: 4,295.97 '  
Inclination: 0.53 °  
Azimuth: 258 °

479u  
C1: 83.1%  
C2: 5.2%  
C3: 7.7%  
C4: 3.9%



4,350  
4,360  
4,370  
4,380  
4,390  
4,400  
4,410  
4,420  
4,430  
4,440  
4,450  
4,460  
4,470  
4,480  
4,490  
4,500  
4,510  
4,520  
4,530  
4,540  
4,550  
4,560

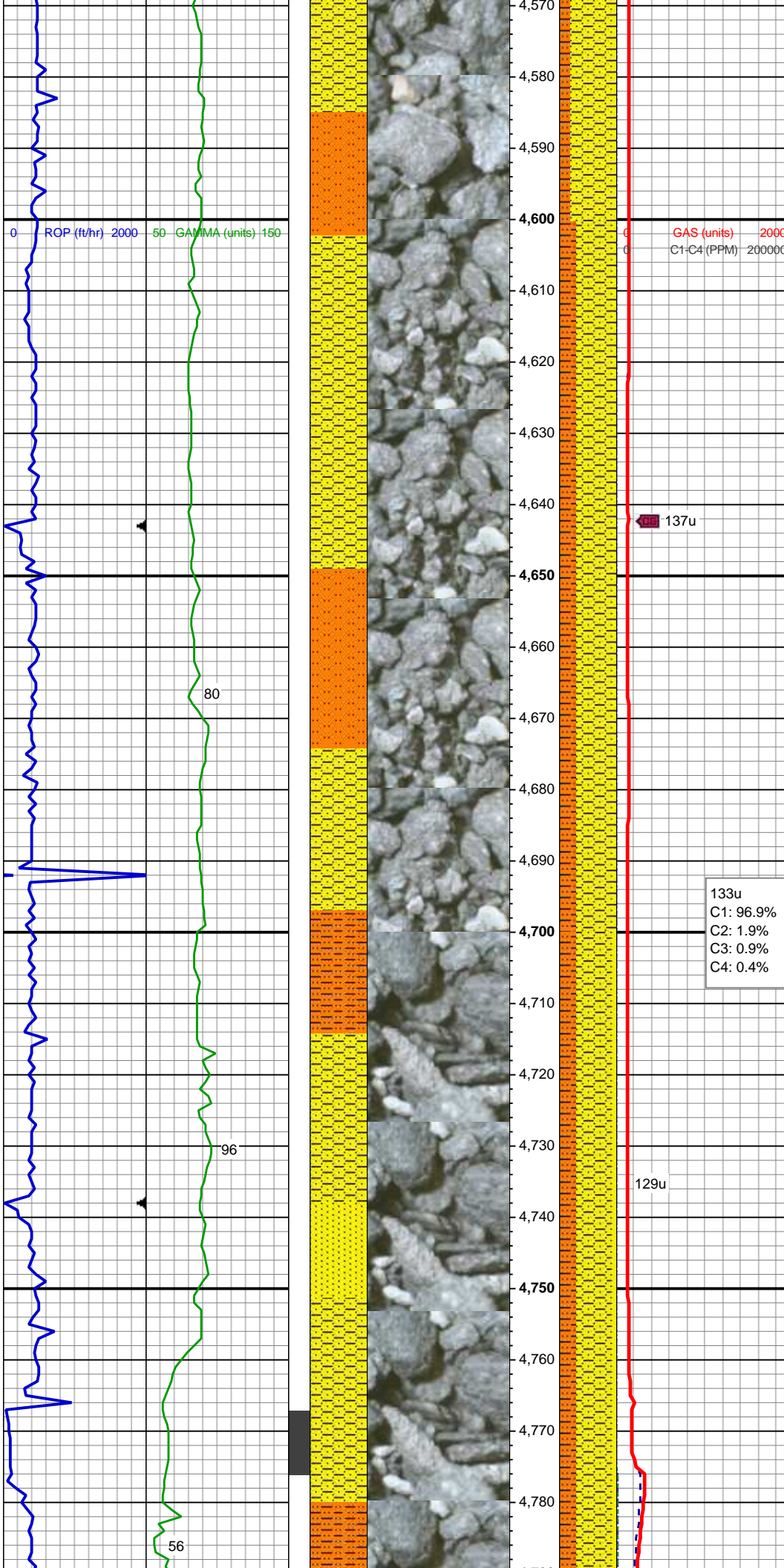


SS: wh - ltgy, fros - trnsl, s&p, f gr, ang - sb ang, p srted, hd brit clus, v calc cmt  
SHY SS: lt gy - lt gy brn, f gr, sb ang - sb rd, p srted, sft - mod hd wi brit clus, calc cmt

MD: 4,396 '  
TVD: 4,390.96 '  
Inclination: 0.88 °  
Azimuth: 249.53 °

SHY SS: lt gy - lt gy brn, f gr, sb ang - sb rd, p srted, sft - mod hd wi brit clus, calc cmt  
SS: wh - ltgy, fros - trnsl, s&p, f gr, ang - sb ang, p srted, hd brit clus, v calc cmt

MD: 4,491 '  
TVD: 4,485.95 '  
Inclination: 0.96 °  
Azimuth: 240.91 °



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

PM Mud Rpt  
9/1/2014  
Mud Wt: 9.55  
FVis: 30  
PVis: 6  
YP: 6  
GELS: 2/4/7  
API Filt: 18.0  
CAKE: 1/0  
pH: 9.6  
Cl: 800  
Ca: 160

MD: 4,681 '  
TVD: 4,675.91 '  
Inclination: 1.45 °  
Azimuth: 280.67 °

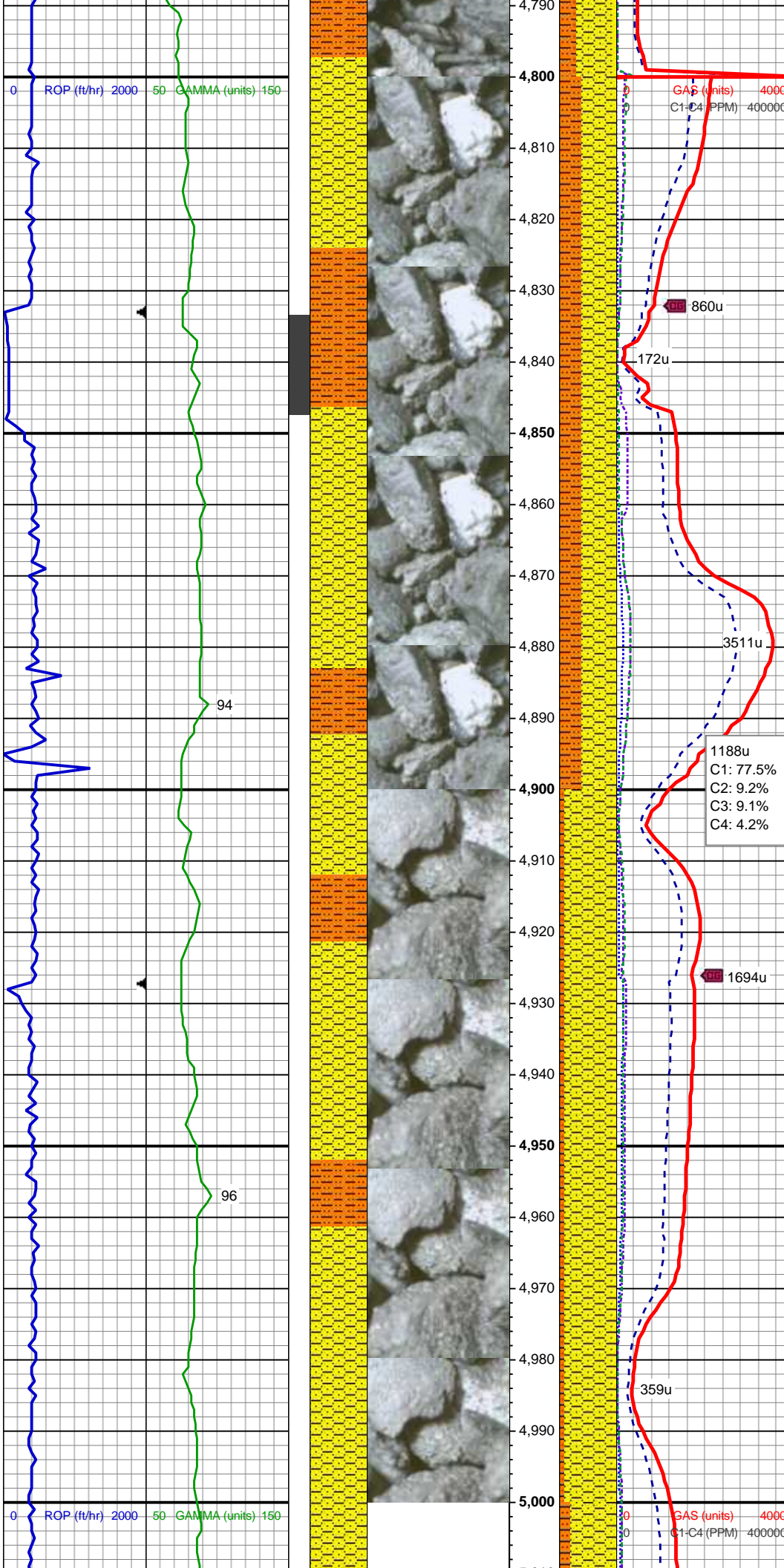
SHY SS: lt gy - lt gy brn, f gr, sb ang - sb  
rd, p srted, sft - mod hd wi brit clus, calc  
cmt  
SHY SLTST: ltgy, sb plty - sb rd, fr srted,  
sft - frm, slty - grty tex, v sl calc

133u  
C1: 96.9%  
C2: 1.9%  
C3: 0.9%  
C4: 0.4%

Shannon Top @  
4,757' MD; 4,752' TVD

MD: 4,776 '  
TVD: 4,770.88 '  
Inclination: 1.2 °  
Azimuth: 284.62 °

SHY SS: lt gy - lt gy brn, f gr, sb ang - sb  
rd, p srted, sft - mod hd wi brit clus, calc  
cmt;  
SHY SLTST: ltgy, sb plty - sb rd, fr srted,



SS: wh - ltgy, fros - trnsl, s&p, f gr, ang - sb ang, p srted, hd brit clus, v calc cmt

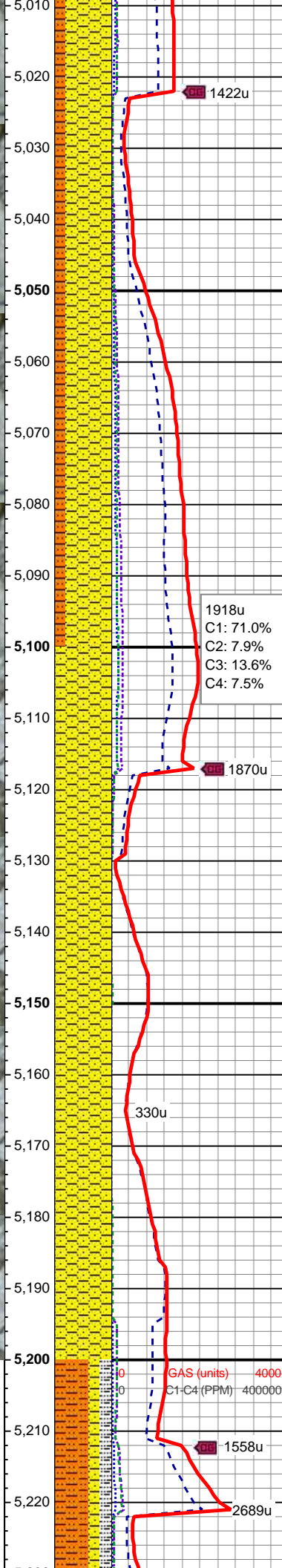
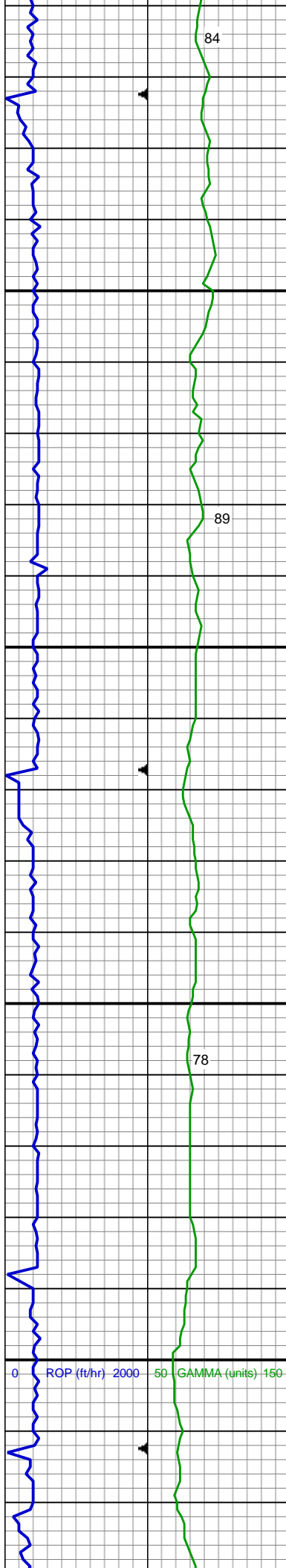
MUD WT: 9.6/9.65  
VIS: 32/31 IN/OUT

MD: 4,870 '  
TVD: 4,864.87 '  
Inclination: 0.93 °  
Azimuth: 184.86 °

SHY SS: lt gy - lt gy brn, occ wh, 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

MD: 4,965 '  
TVD: 4,959.86 '  
Inclination: 1.01 °  
Azimuth: 195.46 °

SHY SS: lt gy - lt gy brn, occ wh, 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



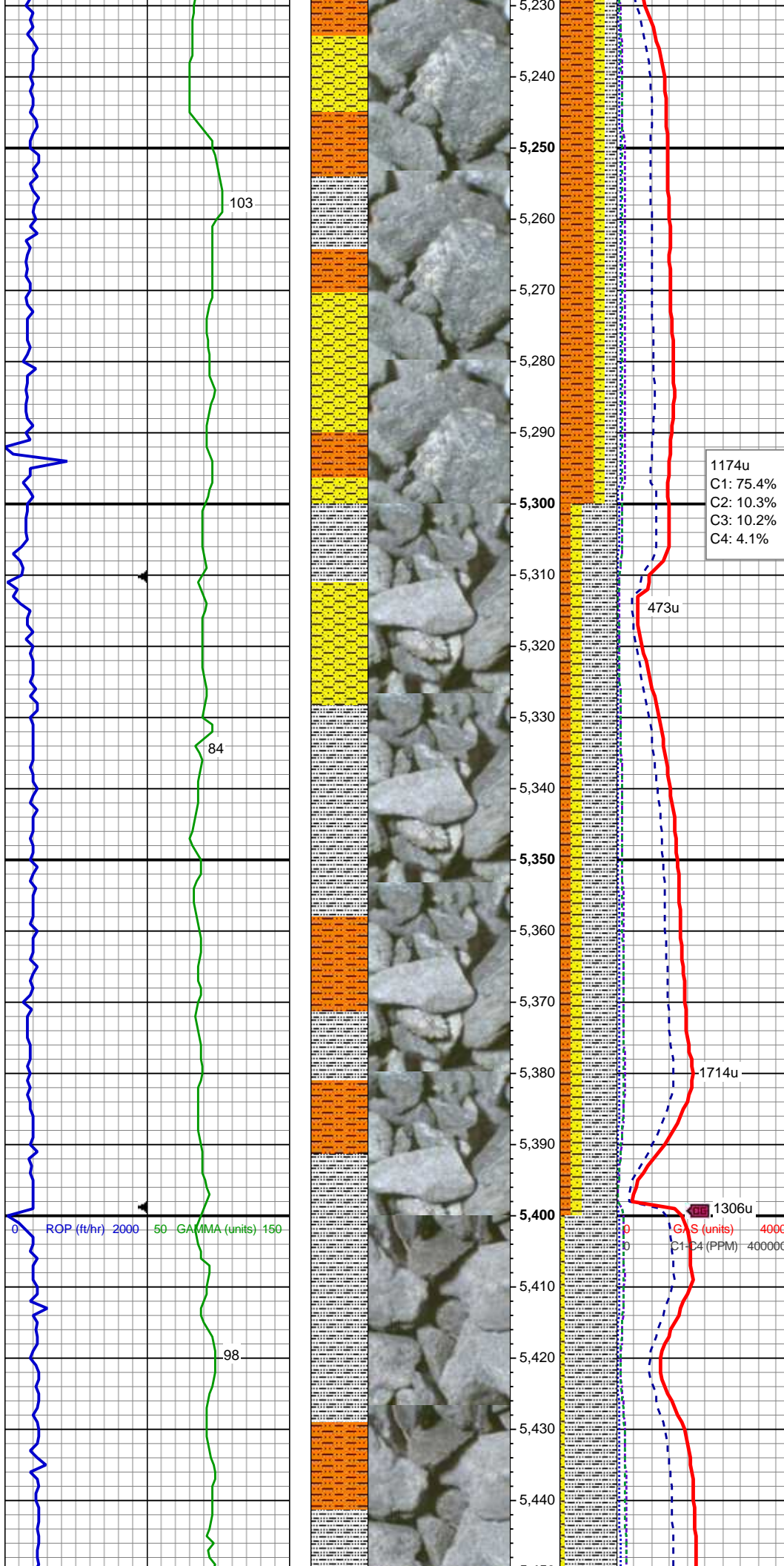
MUD WT: 9.6/9.7  
VIS: 34/34 IN/OUT

MD: 5,060 '  
TVD: 5,054.84 '  
Inclination: 0.83 °  
Azimuth: 192.47 °

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

MD: 5,155 '  
TVD: 5,149.84 '  
Inclination: 0.67 °  
Azimuth: 201.79 °

SHY SS: lt gy - lt gy brn, occ wh, f gr, sb  
ang - sb blk, prly srt, frm - mod hd wi  
brit clus, calc cmt



MD: 5,250 '  
TVD: 5,244.83 '  
Inclination: 0.54 °  
Azimuth: 196.46 °

SHY SLTST: ltgy, sb plty - sb rd, fr srtd,  
sft - frm, slty - grty tex, v sl calc  
SLTY SH: predy ltgy, occ med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

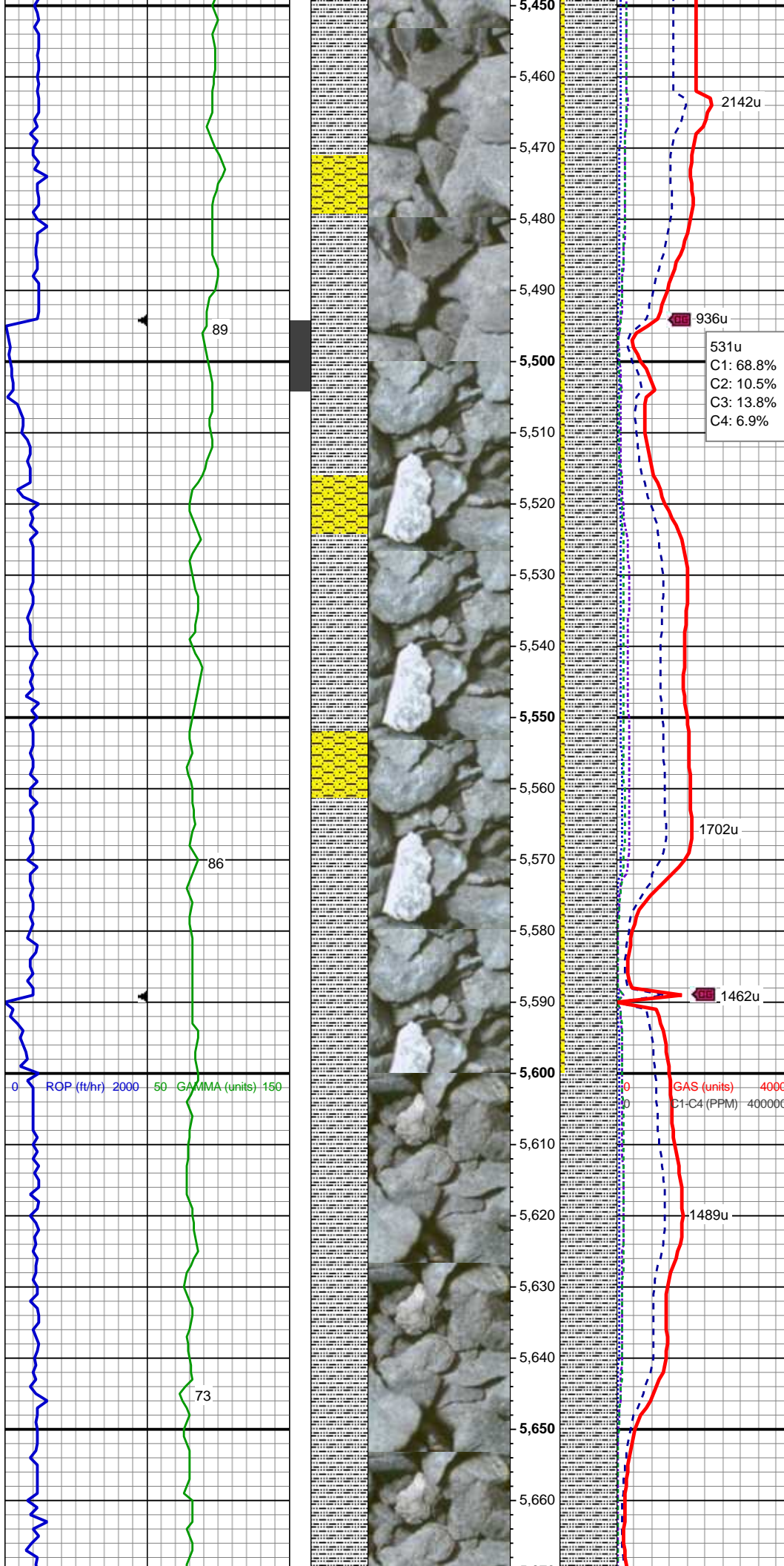
1174u  
C1: 75.4%  
C2: 10.3%  
C3: 10.2%  
C4: 4.1%

MD: 5,345 '  
TVD: 5,339.82 '  
Inclination: 0.75 °  
Azimuth: 206.82 °

MUD WT: 9.6+/9.8  
VIS: 36/33 IN/OUT

SLTY SH: predy ltgy, occ med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SLTST: ltgy, sb plty - sb rd, fr srtd,  
sft - frm, slty - grty tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 5,440 '  
TVD: 5,434.81 '  
Inclination: 1.09 °  
Azimuth: 186.76 °



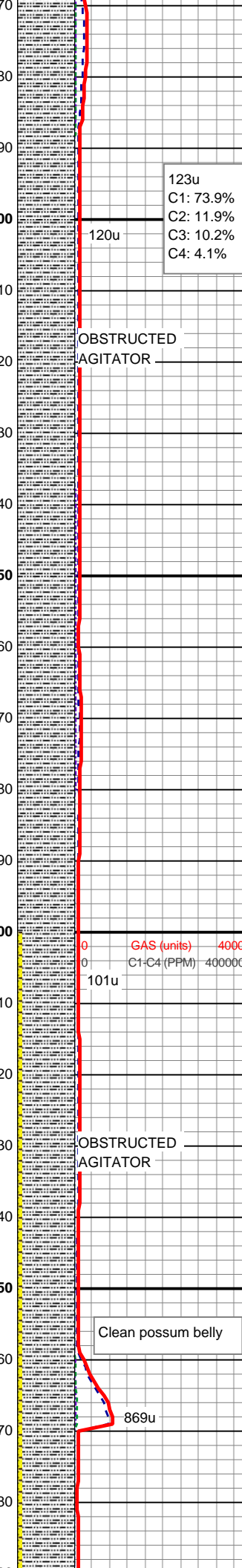
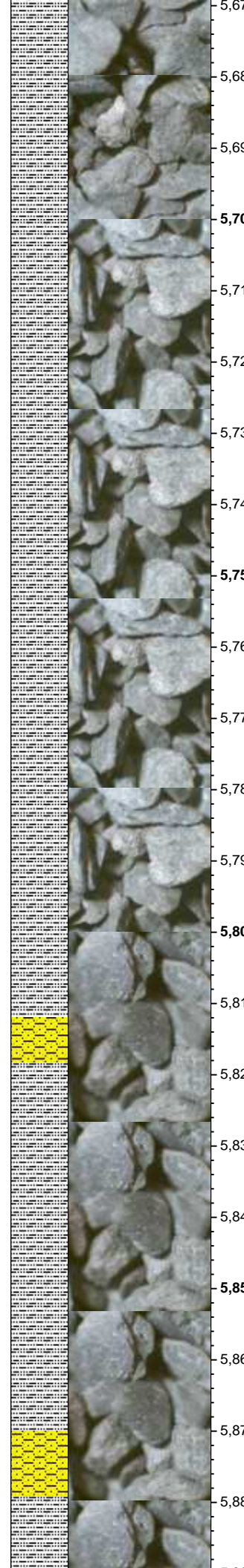
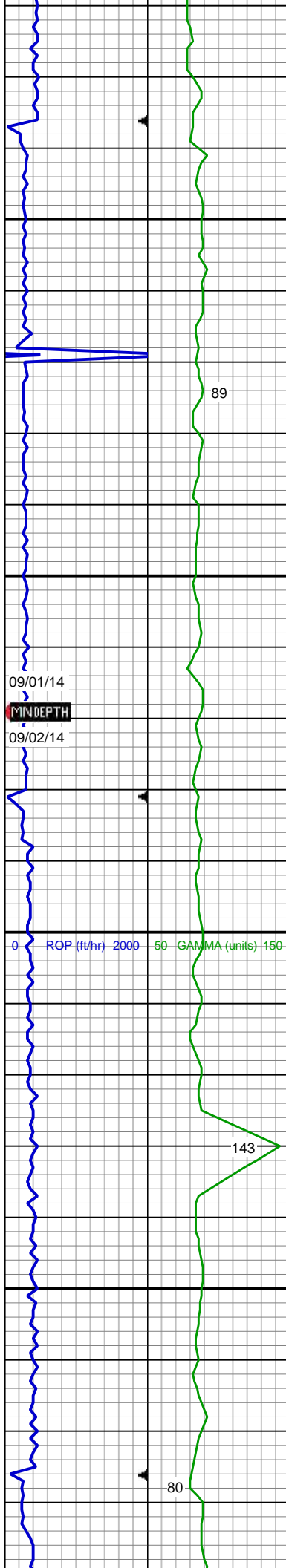
SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 5,535 '  
TVD: 5,529.8 '  
Inclination: 0.59 °  
Azimuth: 136.44 °

MUD WT: 9.6+/9.7  
VIS: 36/35 IN/OUT

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 5,629 '  
TVD: 5,623.8 '  
Inclination: 0.54 °  
Azimuth: 112.32 °



SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc

123u  
C1: 73.9%  
C2: 11.9%  
C3: 10.2%  
C4: 4.1%

120u

OBSTRUCTED  
AGITATOR

MD: 5,724 '  
TVD: 5,718.79 '  
Inclination: 0.82 °  
Azimuth: 91.17 °

AM Mud Rpt  
9/2/2014  
Mud Wt: 9.80  
FVis: 50  
PVis: 13  
YP: 15  
GELS: 5/12/25  
API Filt: 11.5  
CAKE: 1/0  
pH: 8.9  
Cl: 800  
Ca: 80

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc

0 GAS (units) 4000  
0 C1-C4 (PPM) 400000

101u

MD: 5,819 '  
TVD: 5,813.78 '  
Inclination: 0.85 °  
Azimuth: 90.87 °

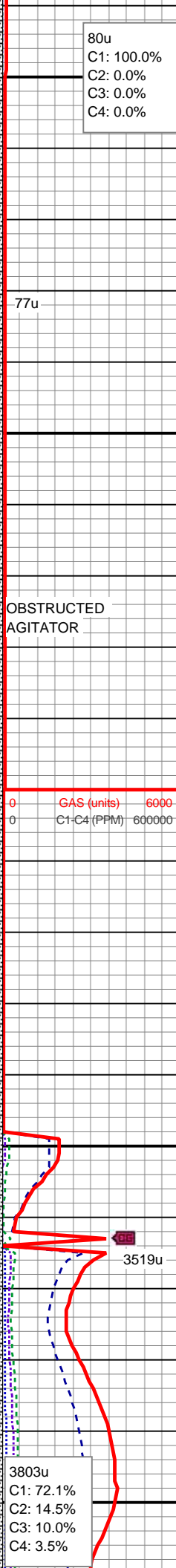
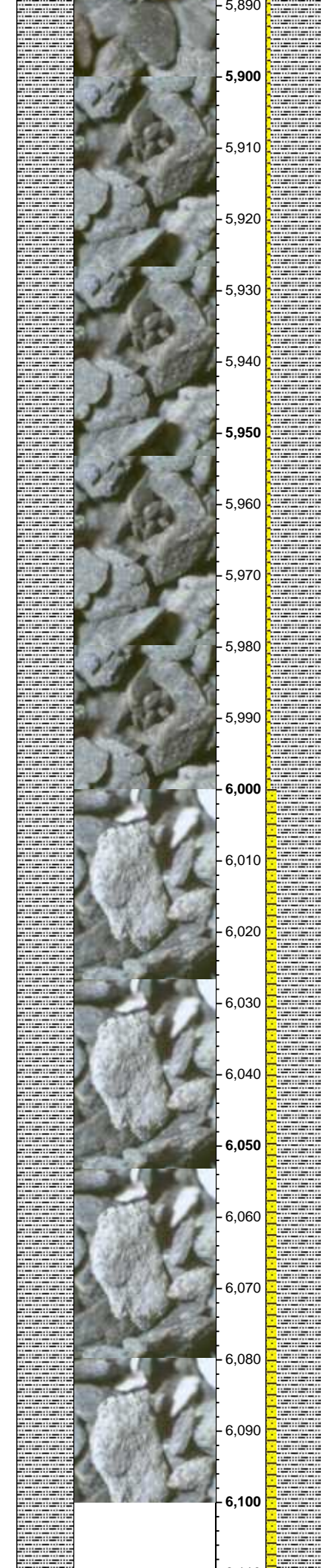
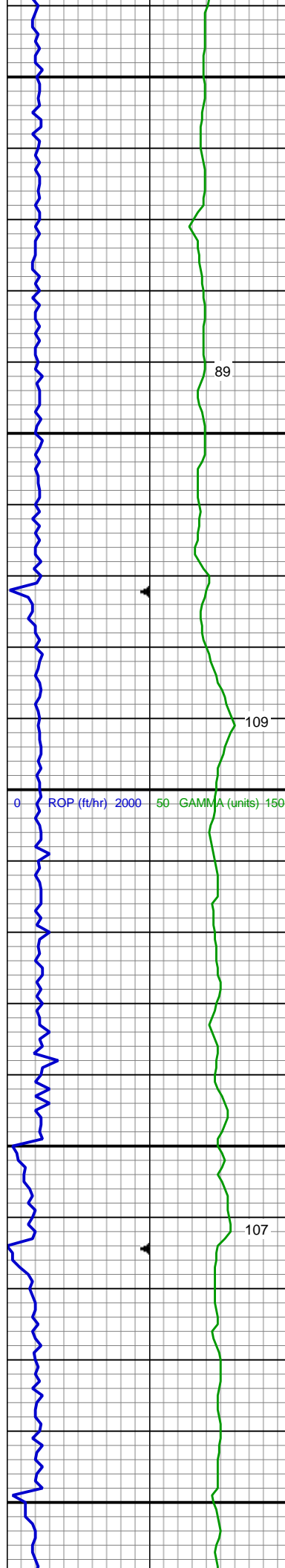
OBSTRUCTED  
AGITATOR

Clean possum belly

MUD WT: 9.6+/9.7+  
VIS: 38/38 IN/OUT

869u

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc



hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 5,914 '  
TVD: 5,908.77 '  
Inclination: 0.65 °  
Azimuth: 89.88 °

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 6,009 '  
TVD: 6,003.77 '  
Inclination: 0.76 °  
Azimuth: 93.17 °

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 6,104 '  
TVD: 6,098.76 '  
Inclination: 0.77 °

Azimuth: 97.5 °

Teepee Buttes Top @  
6,135' MD; 6,129' TVD

89

6,150

6,160

6,170

6,180

6,190

6,200

6,210

6,220

6,230

6,240

6,250

6,260

6,270

6,280

6,290

6,300

6,310

6,320

6,330

6,340

6,350

6,360

6,370

6,380

6,390

6,400

6,410

6,420

6,430

6,440

6,450

6,460

6,470

6,480

4059u

3831u

4537u

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

MD: 6,198 '  
TVD: 6,192.75 '  
Inclination: 0.88 °  
Azimuth: 90.71 °

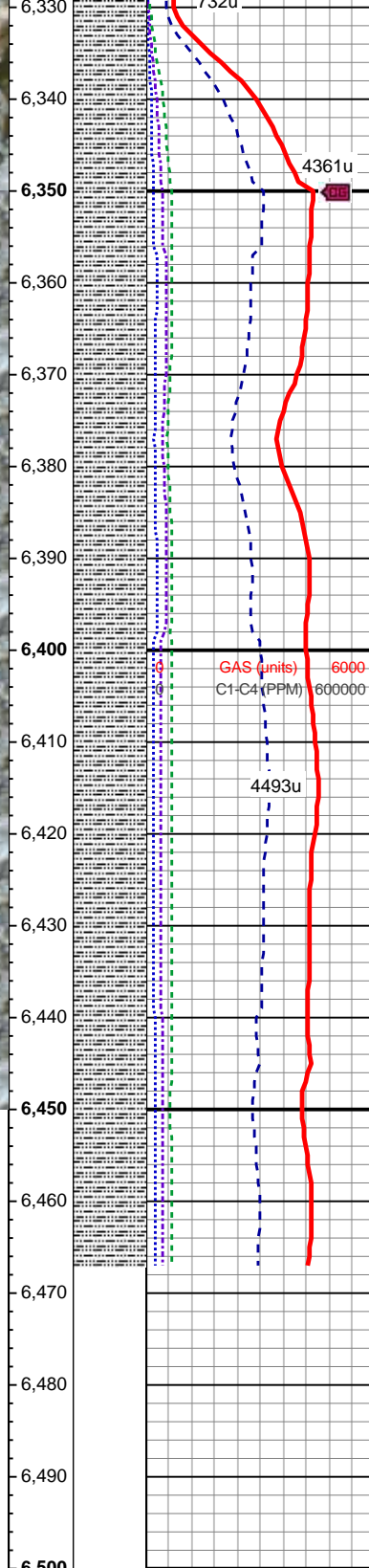
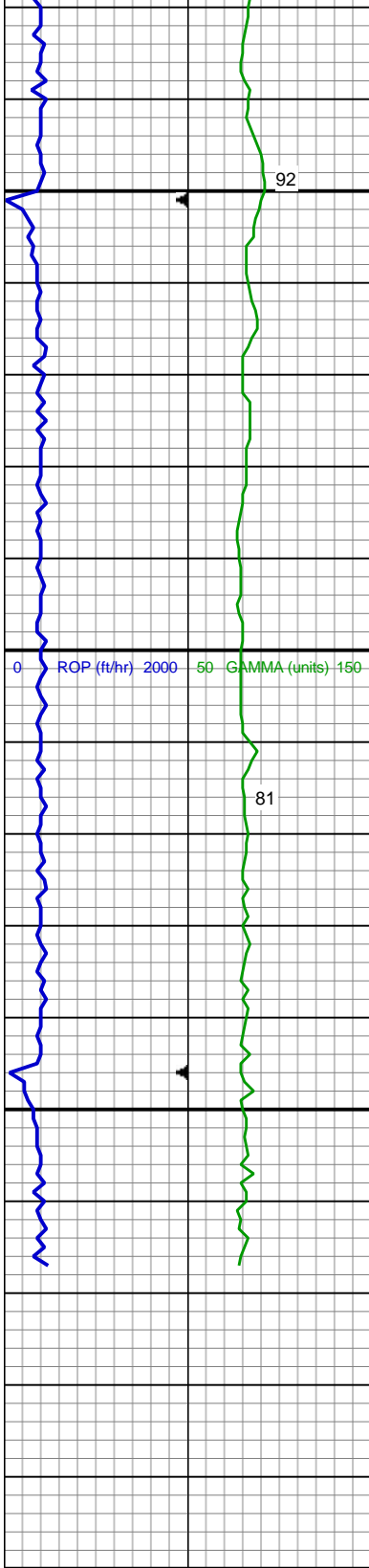
MUD WT: 9.80/9.85  
VIS: 45/45 IN/OUT

MD: 6,293 '  
TVD: 6,287.74 '  
Inclination: 0.83 °  
Azimuth: 91.24 °

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc  
SHY SS: lt gy, f gr, sb ang - sb rd, p srtd,  
sft - mod hd wi brit clus, calc cmt

3417u  
C1: 70.3%  
C2: 15.7%  
C3: 9.8%  
C4: 4.3%

722u



MD: 6,388 '  
TVD: 6,382.73 '  
Inclination: 0.75 °  
Azimuth: 79.16 °

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc

SLTY SH: predy ltgy, rrlly med gy, frm -  
hd, plty - sb plty, occ sb blkly, slty - grty  
tex, v sl calc