

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch AA26-63-1HN(VERT)

Location SEC25 T6N R63W

State COLORADO

County WELD

Country USA

Rig Number H&P 322

API Number 05-123-37566

Region DJ BASIN

Field WATTENBERG

Spud Date 10/15/2013

Drilling Completed 10/23/2013

Surface Coordinates 1749' FSL
153' FWL
LAT 40.45485°N
LONG 104.39410°W

Bottom Hole Coordinates 150' FWL
1320' FSL
LAT 40.45386°N
LONG 104.41314°W

Ground Elevation 4790'

K.B. Elevation 4814'

Logged Interval 1000' **To** 5992

Total Depth 5992

Formation NIOBRARA C CHALK

Type of Drilling Fluid FW LSND

Operator

Company Noble Energy Inc

Address 1625 BROADWAY
DENVER, CO 80202
(303) 228-4000

Geologist

Name JOEY LUCE, MIKE GREENE

Company COLUMBINE LOGGING, INC.

Address 2385 S. LIPAN ST
DENVER, COLORADO 80223
(303) 289-7764

Rock Types

| | | | |
|-----------------|----------------------|-------------------|-----------------|
| UNKNOWN | COAL | METAMORPHIC | SHALY SILTSTONE |
| ANHYDRITE | CONGLOMERATE | NO SAMPLE | SILTSTONE |
| BENTONITE | DOLOMITE | SALT | SILTY SHALE |
| BRECCIA | GRANITE | SALT- PEPPER SAND | TILL |
| CEMENT | GYPSUM | SANDSTONE | TUFF |
| CHALK | IGNEOUS | SHALE | WELDED TUFF |
| CHERT | LIMESTONE | SHALE COLORED | |
| CLAY CHOKE SAND | SIDERITE or LIMONITE | SHALE GRAY | |
| CLAYSTONE | MARLSTONE | SHALY SANDSTONE | |

Accessories

Fossils

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

Fossils

| |
|----------------|
| 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 |

Other Symbols

Oil Show

| |
|------------------|
| DEAD |
| EVEN |
| QUESTIONABLE |
| SPOTTED STAINING |

Porosity

| |
|--------------------|
| E EARTHY |
| F FENESTRAL |
| F FRACTURE |
| X INTERCRYSTALLINE |
| ◇ INTEROOLITIC |

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 |
| 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

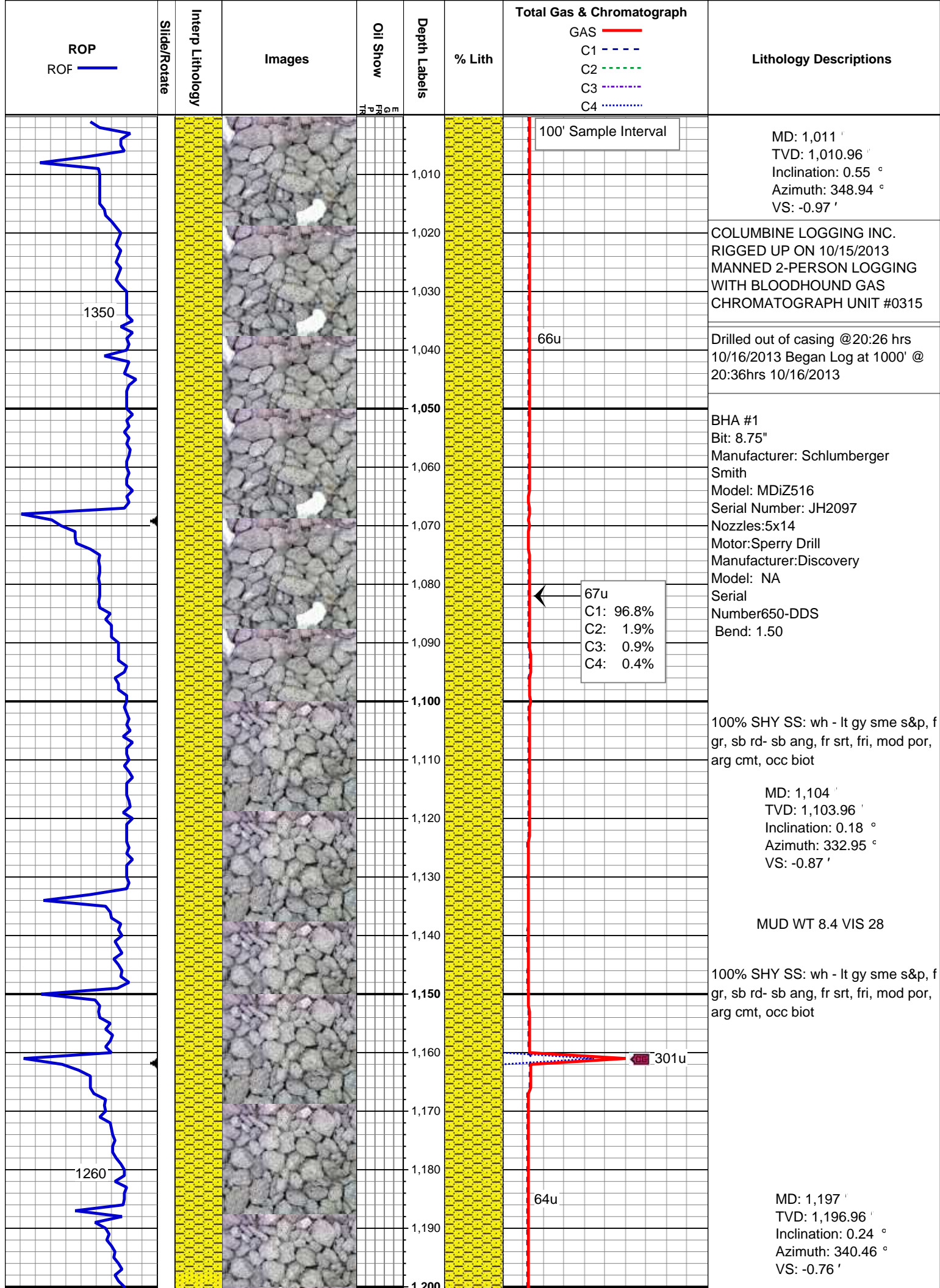
| |
|------------|
| BOUNDSTONE |
| CHALKY |
| CRYPTOXLN |

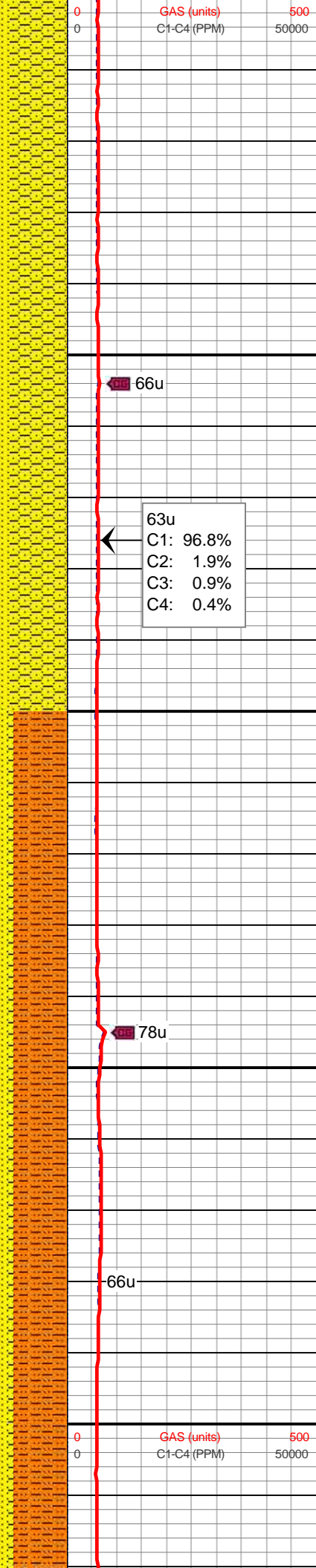
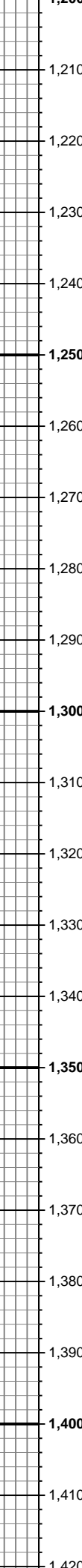
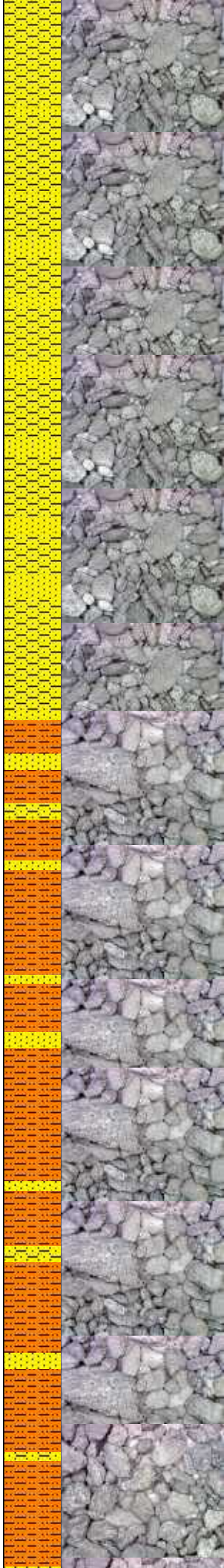
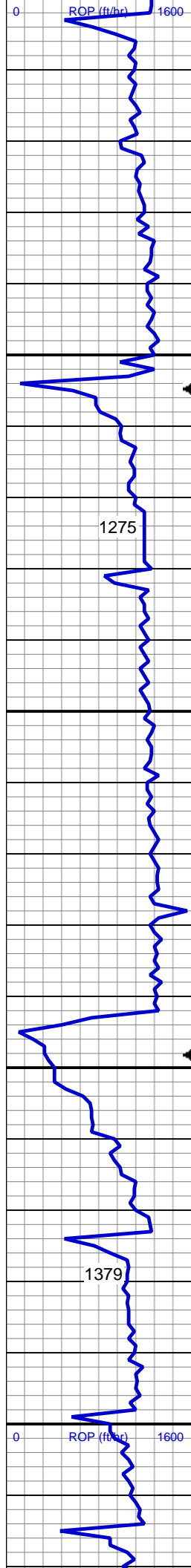
E Earthy

| |
|----------------|
| FINELYXLN |
| GRAINSTONE |
| L LITHOGRAPHIC |
| MX MICROXLN |
| MS MUDSTONE |
| PS PACKSTONE |
| WS WACKESTONE |

Sorting

| |
|------------|
| M MODERATE |
| P POOR |
| W WELL |



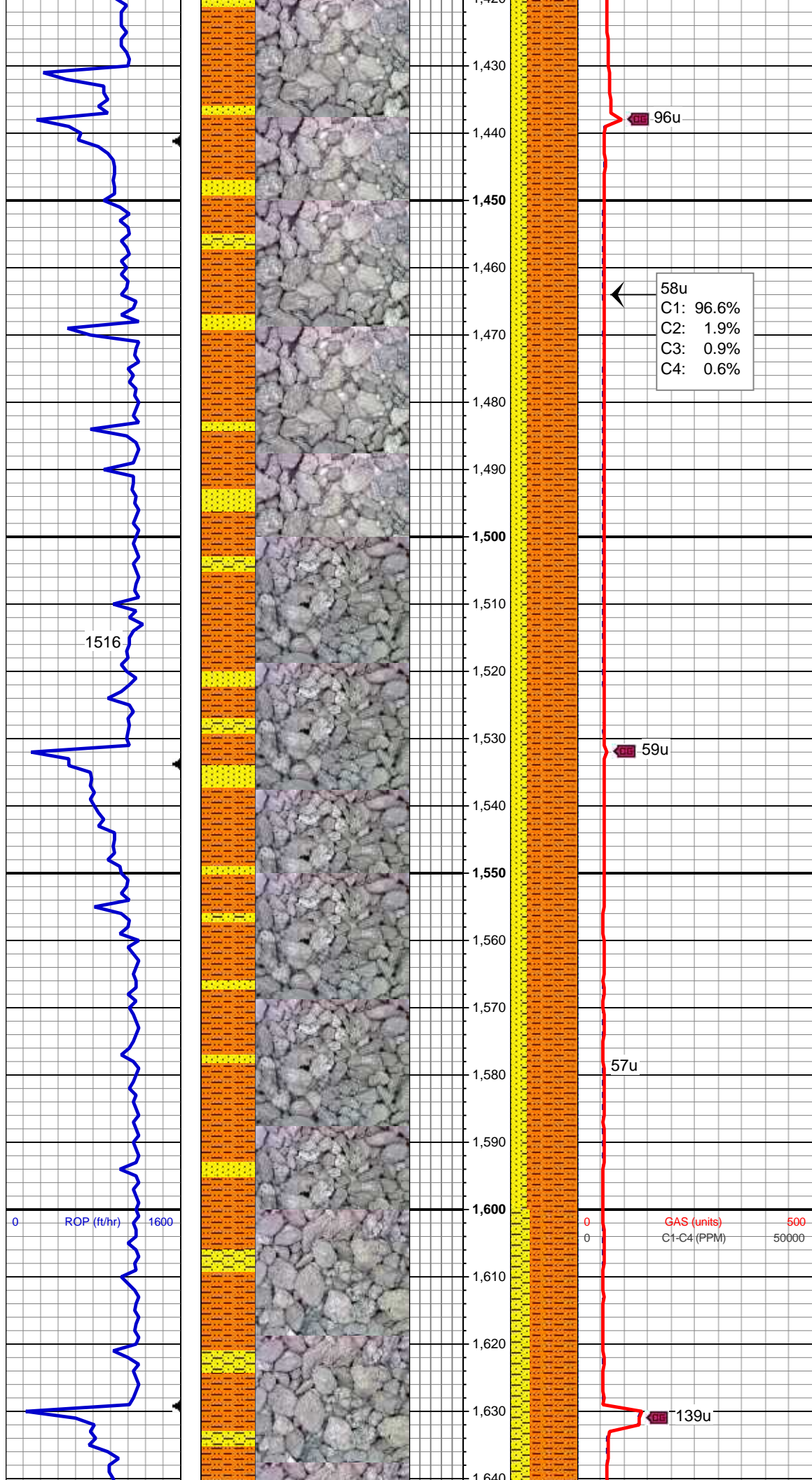


80% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
20% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt

MD: 1,290 '
TVD: 1,289.96 '
Inclination: 0.44 °
Azimuth: 353.73 °
VS: -0.7 '

75% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
10% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
15% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt

MD: 1,383 '
TVD: 1,382.96 '
Inclination: 0.68 °
Azimuth: 144.26 °
VS: -0.97 '



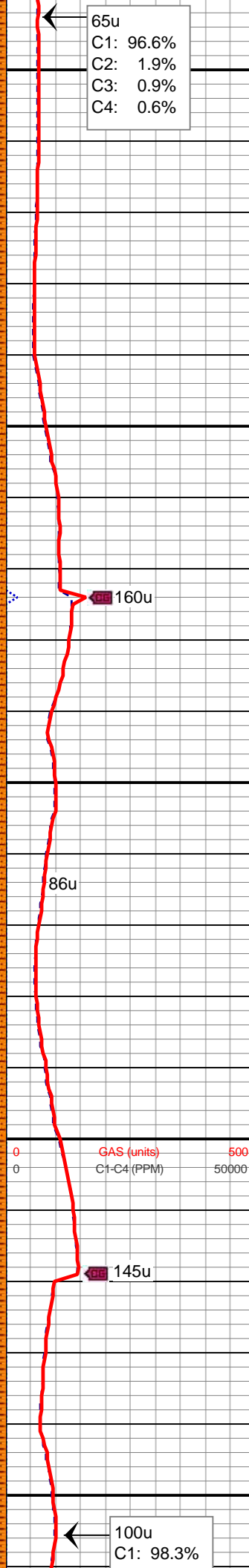
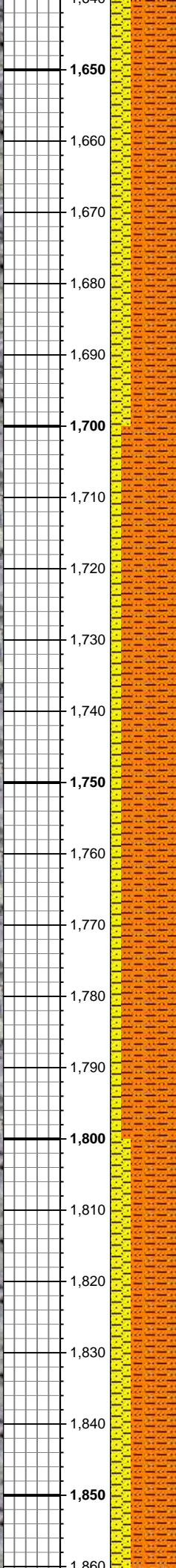
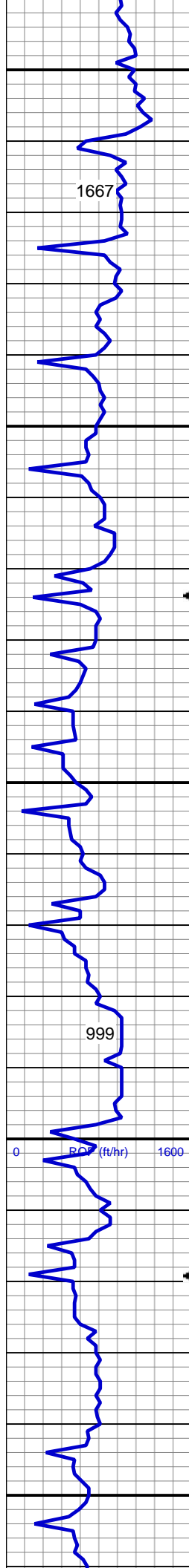
50% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
35% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
15% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt

MD: 1,476 '
TVD: 1,475.95 '
Inclination: 0.91 °
Azimuth: 143.11 °
VS: -1.65 '

75% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
10% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
15% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt

MD: 1,571 '
TVD: 1,570.94 '
Inclination: 1.01 °
Azimuth: 142.36 °
VS: -2.51 '

MUD WT 8.7 VIS 28



65u
C1: 96.6%
C2: 1.9%
C3: 0.9%
C4: 0.6%

70% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
30% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt

MD: 1,666 '
TVD: 1,665.92 '
Inclination: 1.12 °
Azimuth: 146.58 °
VS: -3.41 '

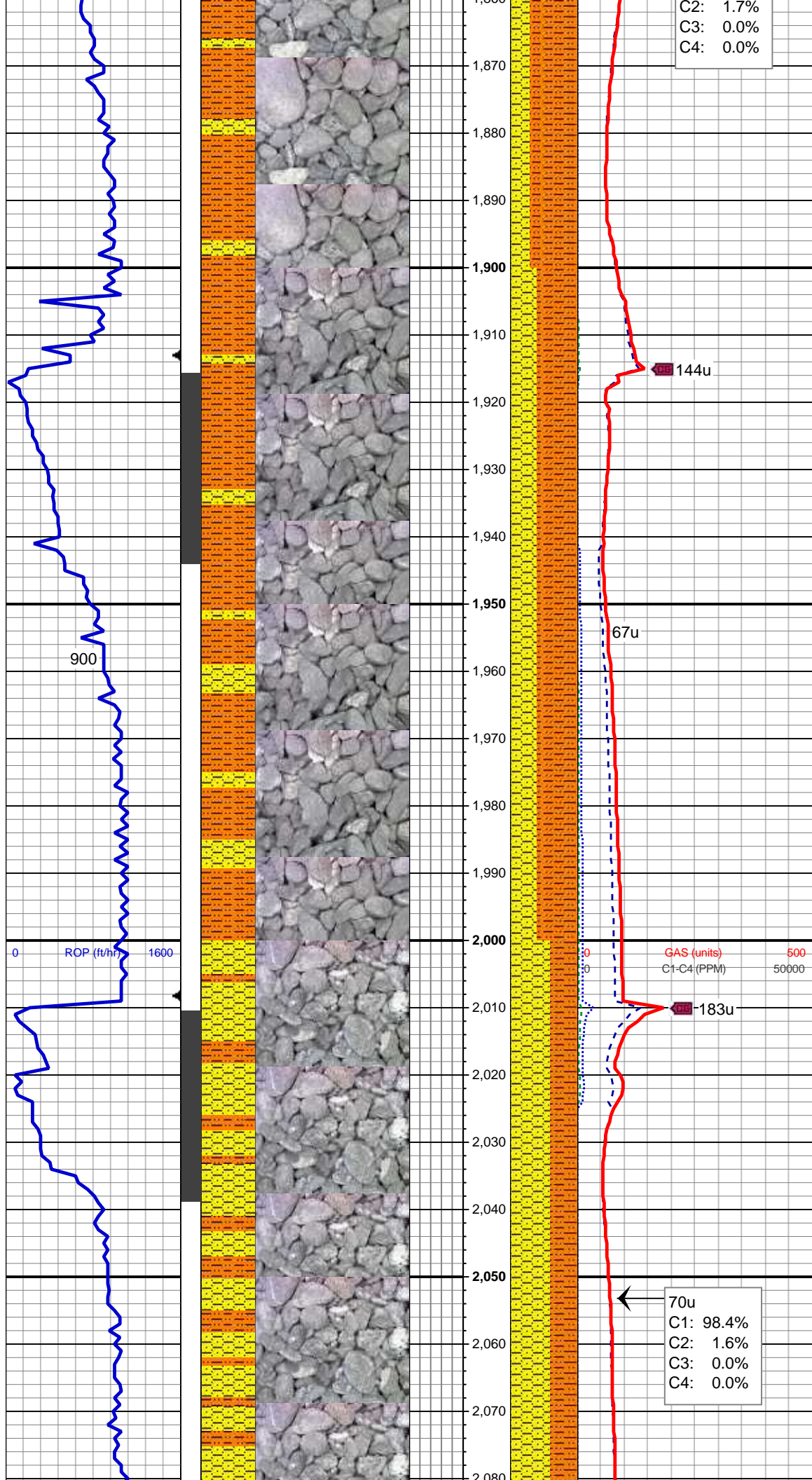
85% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
15% SHY SS: wh-lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por

MD: 1,761 '
TVD: 1,760.9 '
Inclination: 1.2 °
Azimuth: 160.76 °
VS: -4.11 '

0 500
0 50000
GAS (units)
C1-C4 (PPM)

100u
C1: 98.3%

70% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
30% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt,
MD: 1,855 '



C2: 1.7%
C3: 0.0%
C4: 0.0%

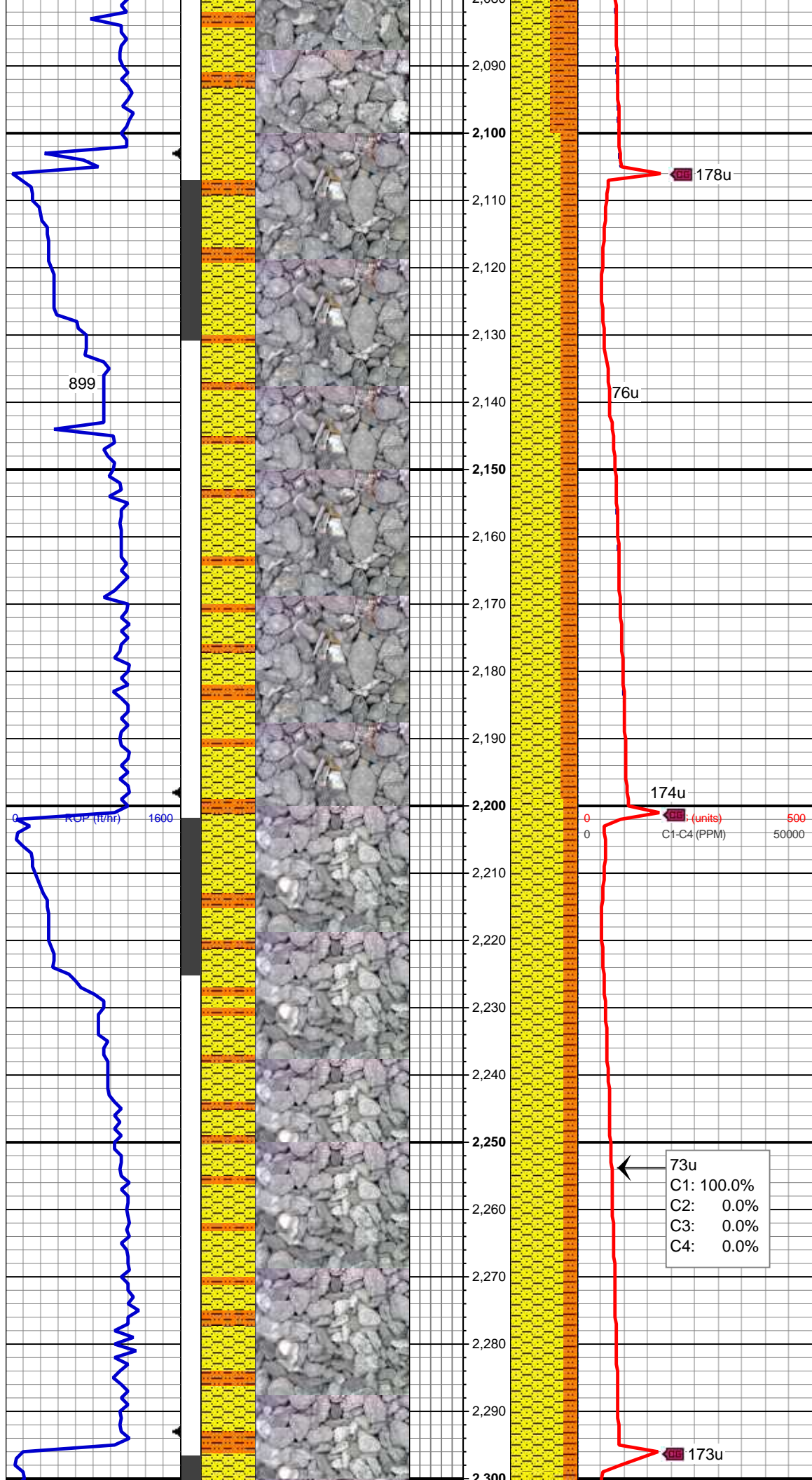
TVD: 1,854.89 '
Inclination: 0.65 °
Azimuth: 153.08 °
VS: -4.57 '

60% SHY SLTST: lt gy, sft-fri, blk, aren - slty tex
40% SHY SS: wh-lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
MD: 1,950 '
TVD: 1,949.83 '
Inclination: 3.16 °
Azimuth: 193.55 °
VS: -3.96 '

MD: 2,045 '
TVD: 2,044.58 '
Inclination: 5.07 °
Azimuth: 181.26 °
VS: -2.71 '

60% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
40% SHY SLTST: lt gy, sft-fri, sb blk - blk, aren - slty tex

70u
C1: 98.4%
C2: 1.6%
C3: 0.0%
C4: 0.0%

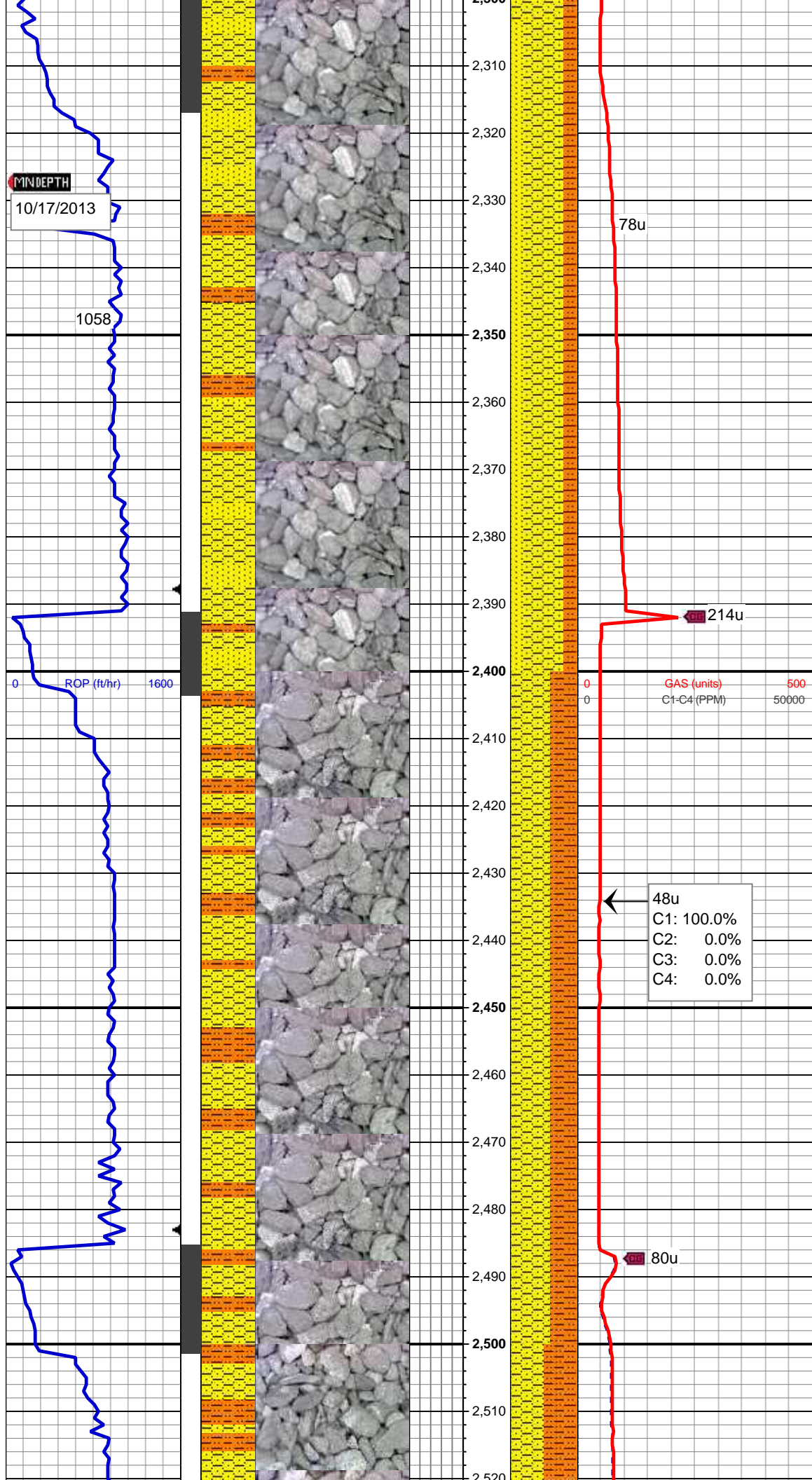


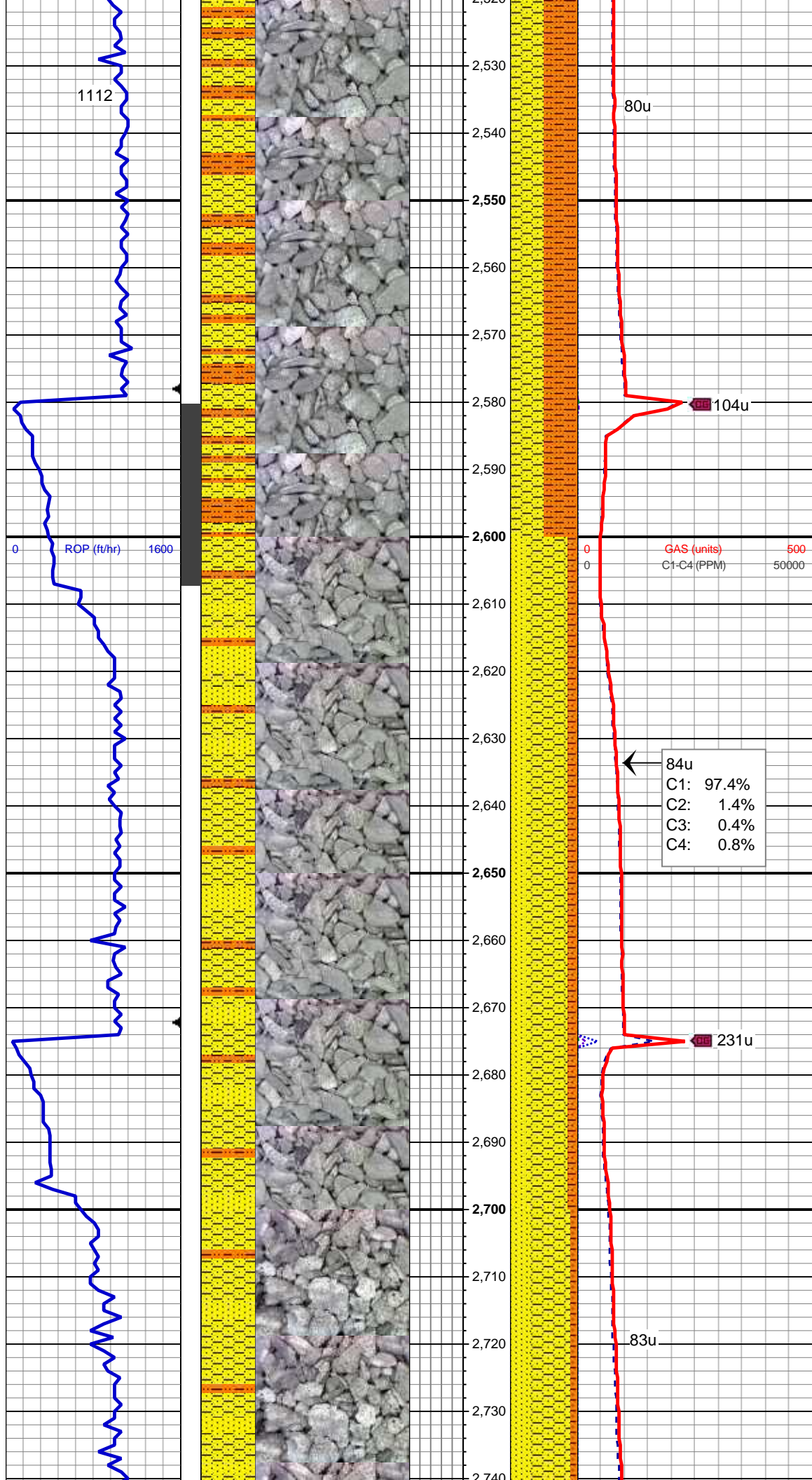
MD: 2,140 '
TVD: 2,139.03 '
Inclination: 7.21 °
Azimuth: 184.85 °
VS: -1.3 '

75% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
25% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex

MD: 2,235 '
TVD: 2,233.1 '
Inclination: 8.81 °
Azimuth: 193.84 °
VS: 1.98 '

80% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
20% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex





MD: 2,520 '
TVD: 2,514.4 '
Inclination: 9.02 °
Azimuth: 200.36 °
VS: 22.3 '

50% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex
50% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt

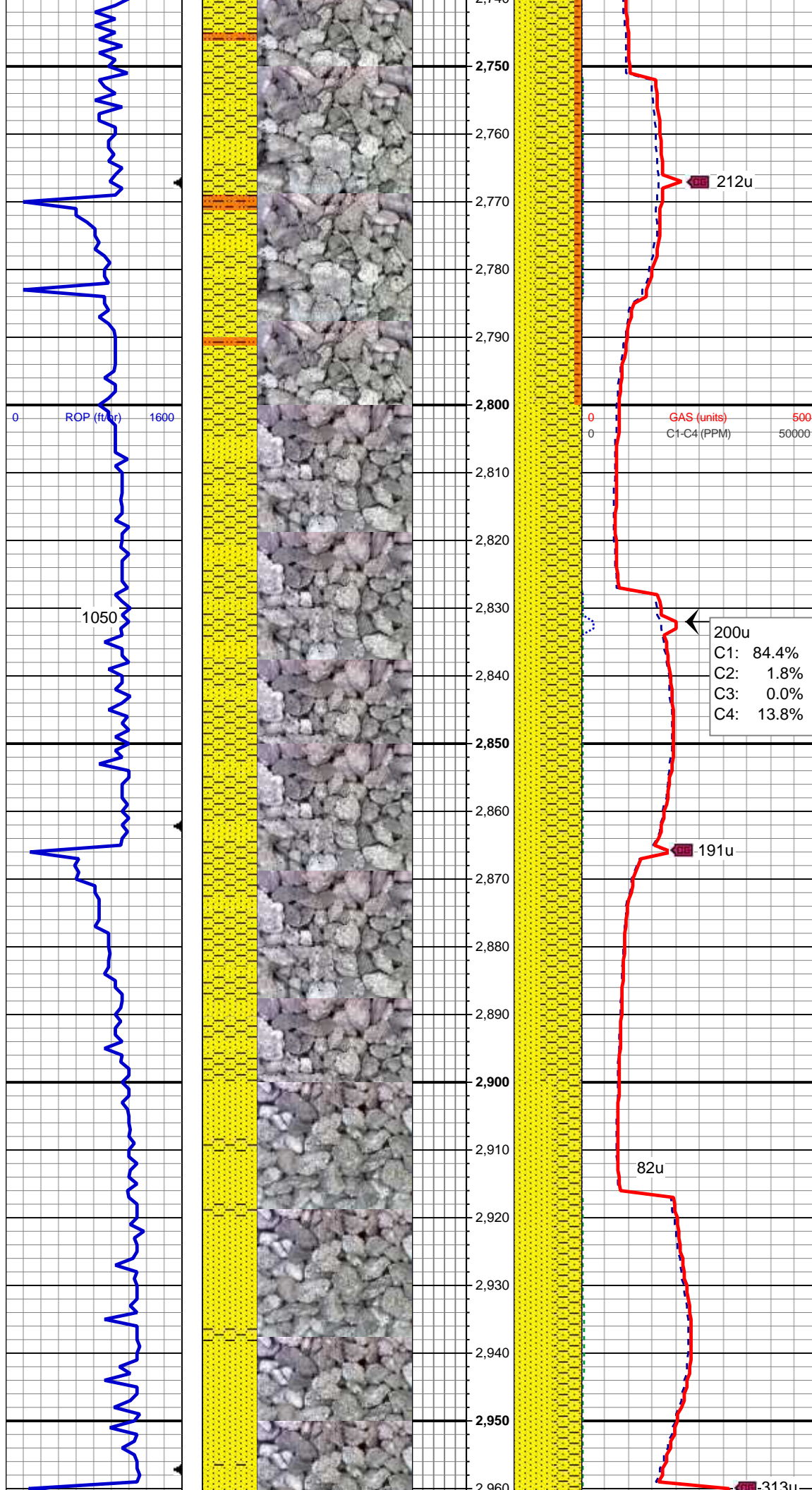
MD: 2,614 '
TVD: 2,607.02 '
Inclination: 10.66 °
Azimuth: 200.24 °
VS: 29.06 '

60% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
25% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por, arg
cmt
15% SHY SLTST: lt gy, sft-fri, sb
blky - blky, aren - slty tex

MUD WT 8.8 VIS 28

MD: 2,709 '
TVD: 2,700.11 '
Inclination: 12.33 °
Azimuth: 203.5 °
VS: 37.53 '

60% SHY SS: wh - lt gy sme s&p, f



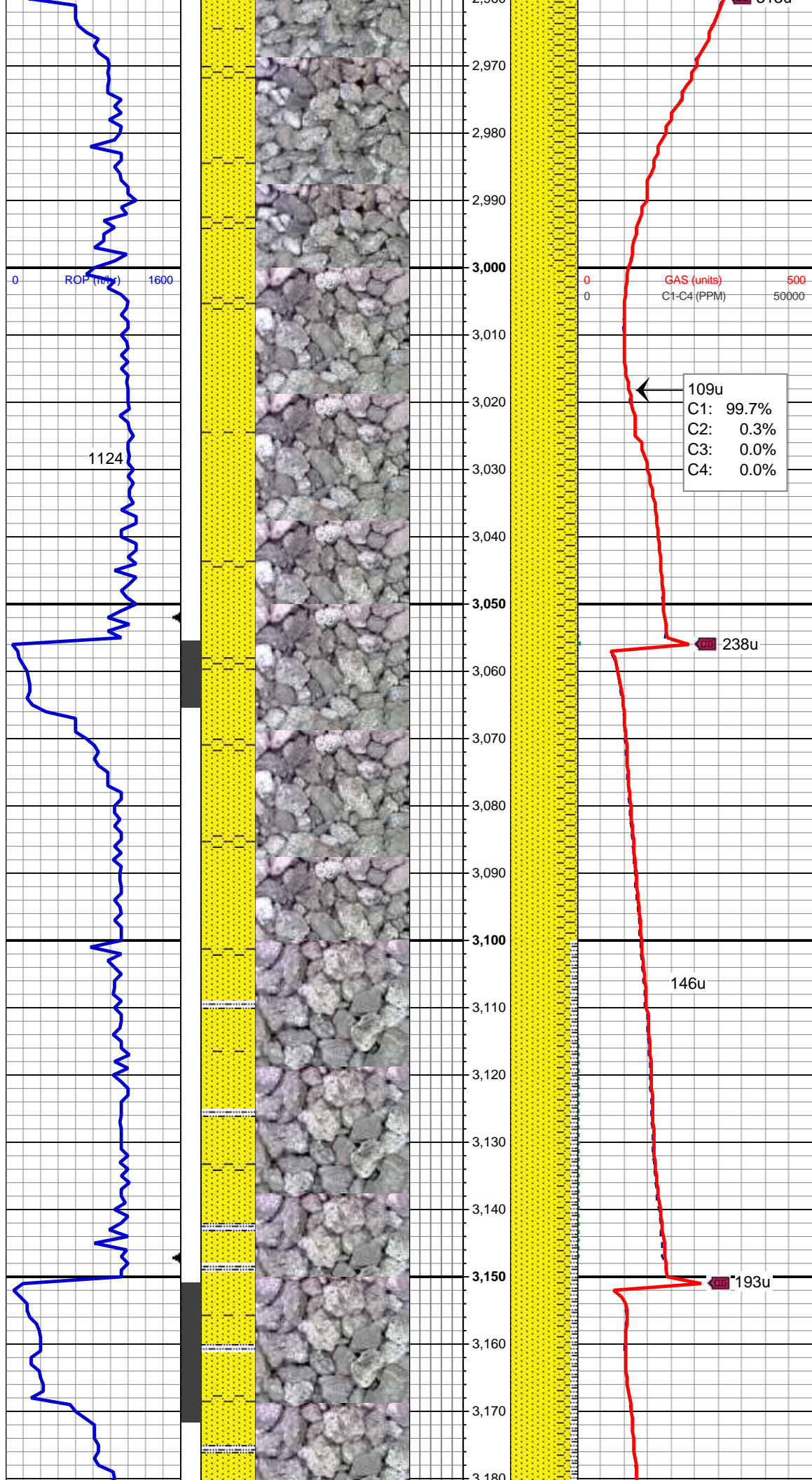
60% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
30% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
10% SHY SLTST: lt gy, sft-fri, sb blkly - blkly, aren - slty tex

MD: 2,804 '
TVD: 2,792.96 '
Inclination: 12.1 °
Azimuth: 201.8 °
VS: 46.74 '

60% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
40% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt

MD: 2,899 '
TVD: 2,885.84 '
Inclination: 12.14 °
Azimuth: 201.73 °
VS: 55.59 '

60% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
40% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt



MD: 2,994 '
TVD: 2,978.6 '
Inclination: 12.82 °
Azimuth: 202.06 °
VS: 64.75 '

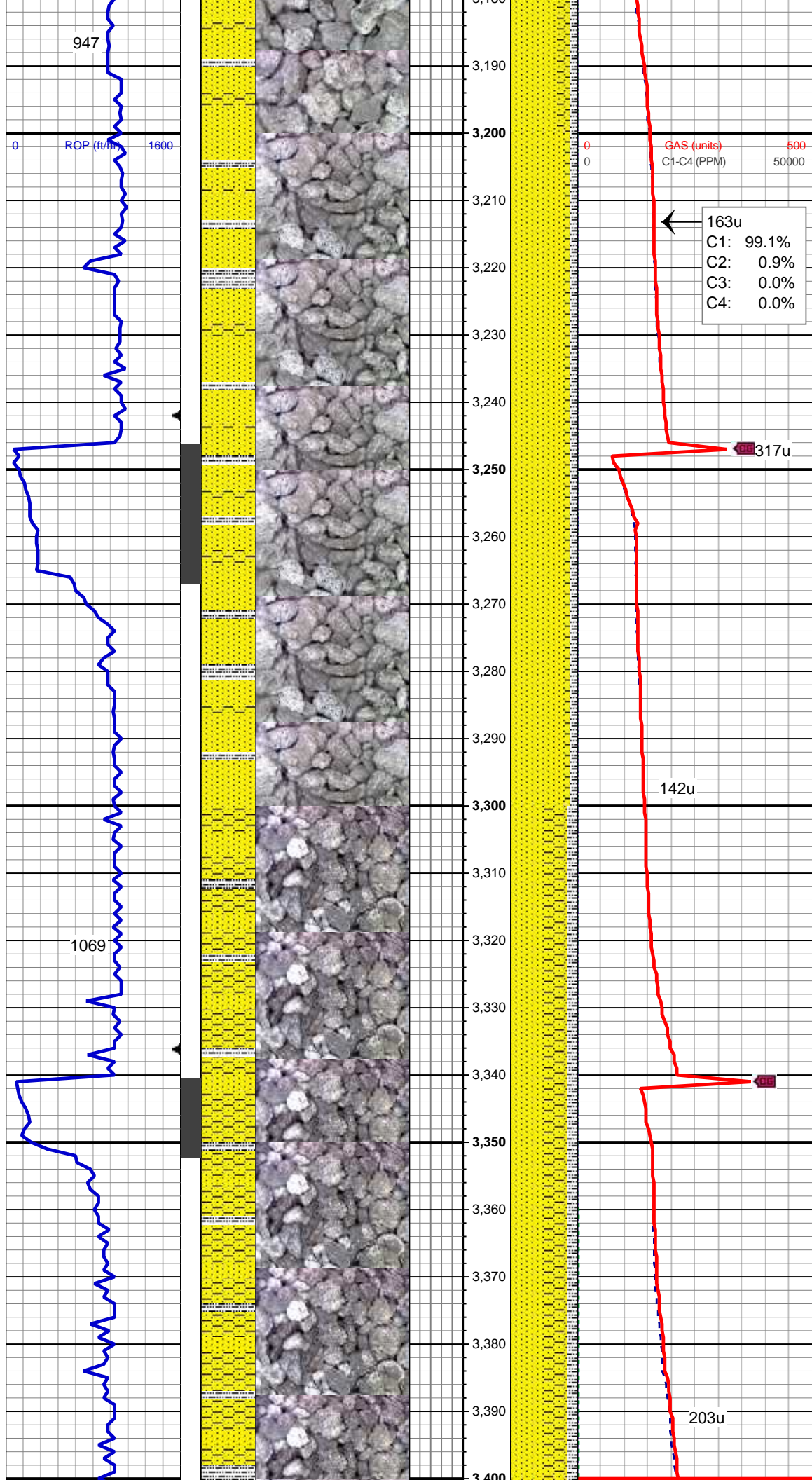
MUD WT 8.8 VIS 29

70% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
30% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt

MD: 3,089 '
TVD: 3,071.56 '
Inclination: 10.9 °
Azimuth: 203.36 °
VS: 73.69 '

70% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
20% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
10% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty

MD: 3,184 '
TVD: 3,164.78 '
Inclination: 11.39 °



Inclination: 193.85 °
Azimuth: 193.85 °
VS: 80.88 '

163u
C1: 99.1%
C2: 0.9%
C3: 0.0%
C4: 0.0%

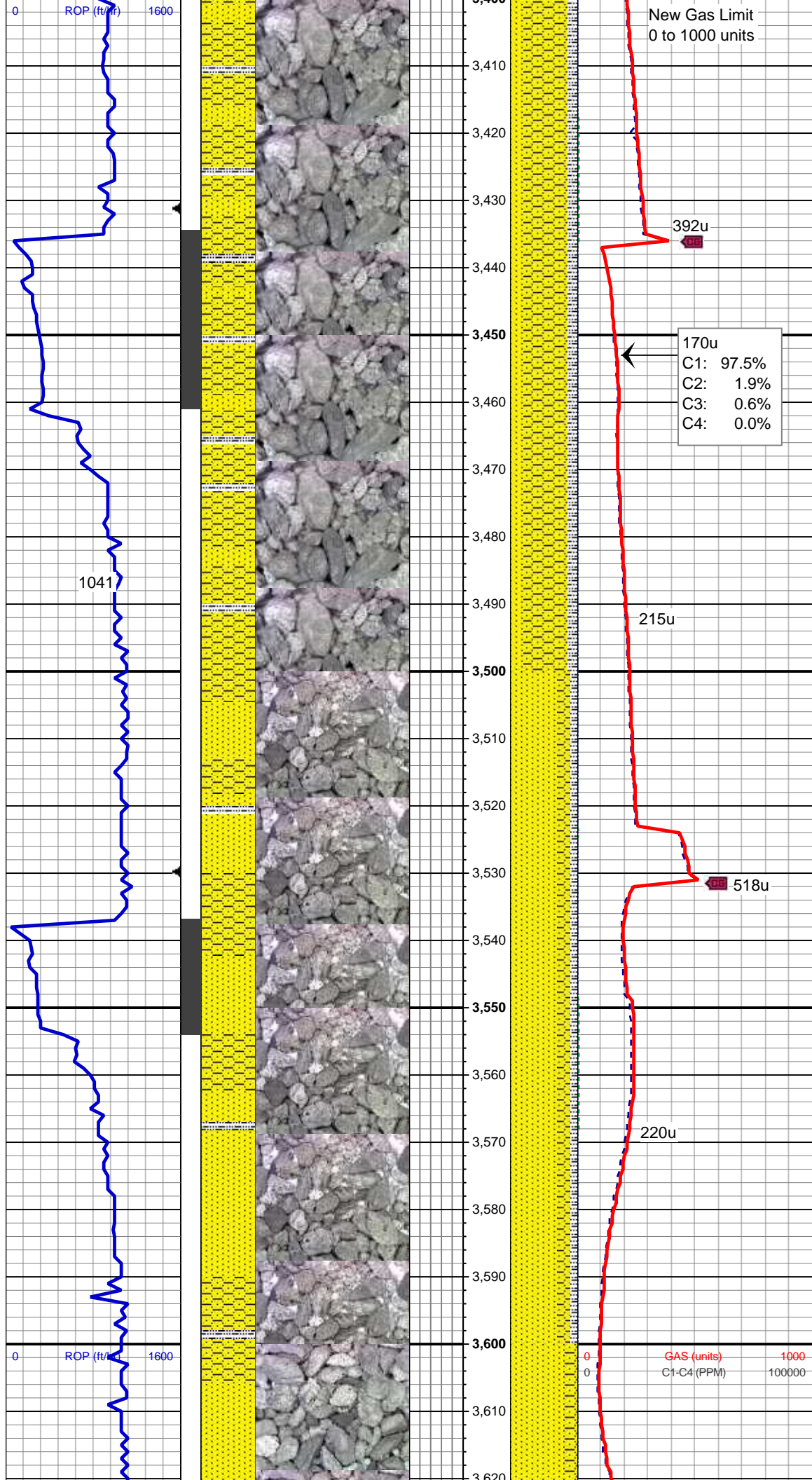
80% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
10% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
10% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty

MD: 3,278 '
TVD: 3,256.81 '
Inclination: 12.09 °
Azimuth: 197.63 °
VS: 87.54 '

50% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
35% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
15% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty

MD: 3,373 '
TVD: 3,350.03 '
Inclination: 10.12 °
Azimuth: 201.83 °
VS: 95.02 '

MUD WT 8.9 VIS 28

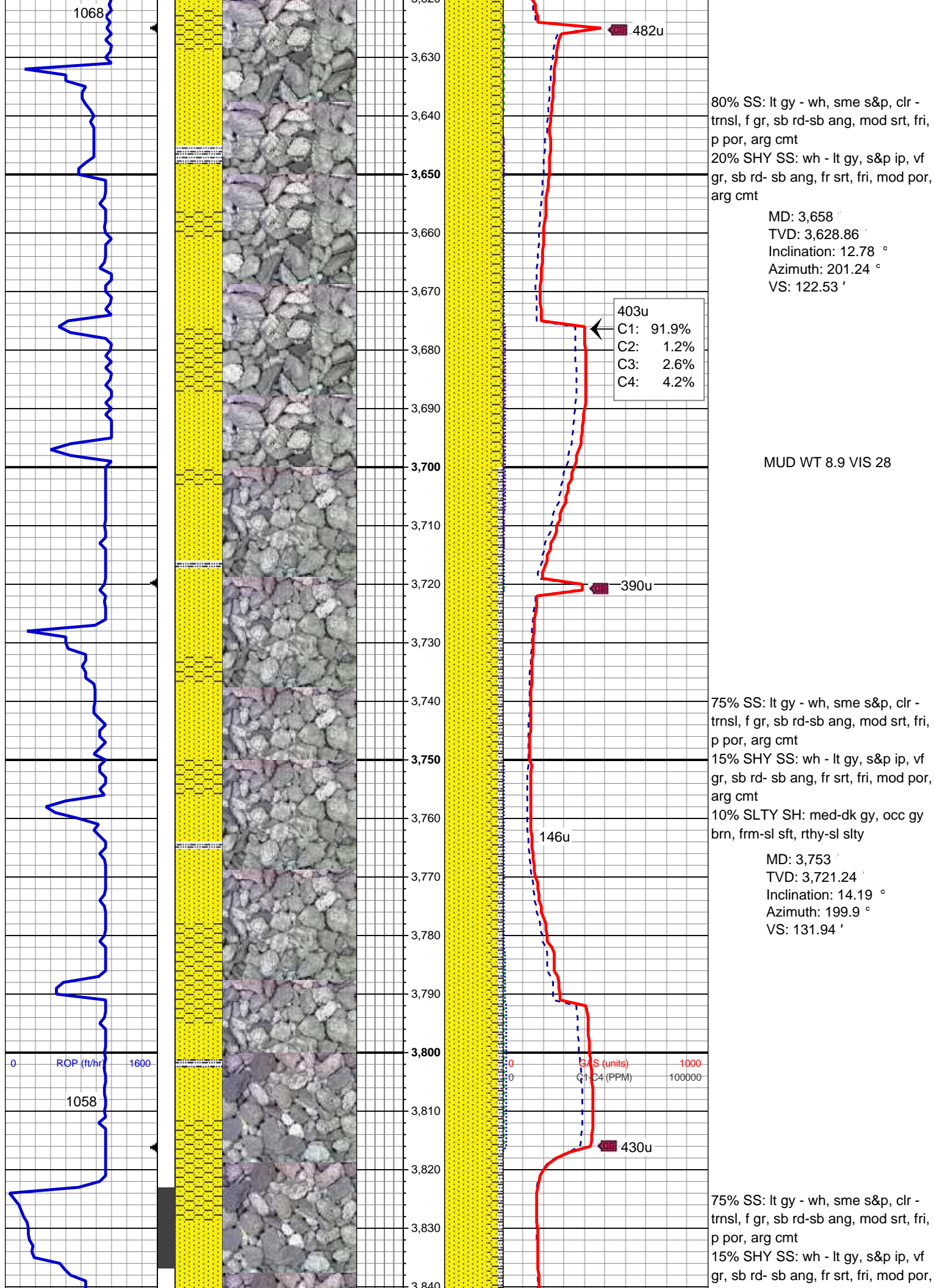


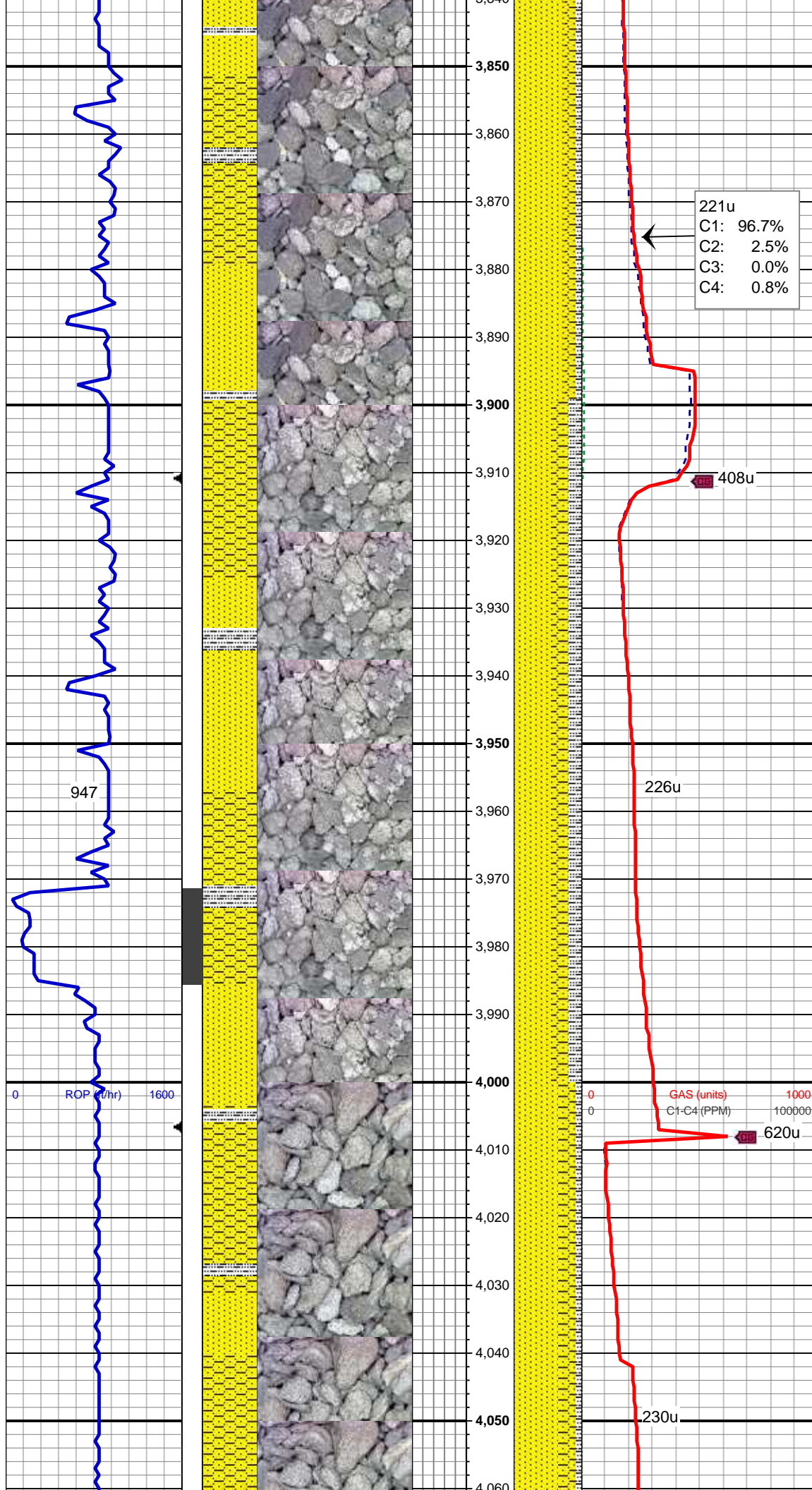
65% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
20% SS: lt gy - wh, sme s&p, f gr, sb rd-sbang, mod srt, fri, p por, arg cmt
15% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty

MD: 3,468 '
TVD: 3,443.26 '
Inclination: 12.03 °
Azimuth: 205.73 °
VS: 103.74 '

70% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
20% SHY SS: wh - lt gy, s&p ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
10% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

MD: 3,563 '
TVD: 3,536.13 '
Inclination: 12.29 °
Azimuth: 202.49 °
VS: 113.35 '





arg cmt
10% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty

MD: 3,848 '
TVD: 3,813.48 '
Inclination: 13.5 °
Azimuth: 202.48 °
VS: 141.81 '

221u
C1: 96.7%
C2: 2.5%
C3: 0.0%
C4: 0.8%

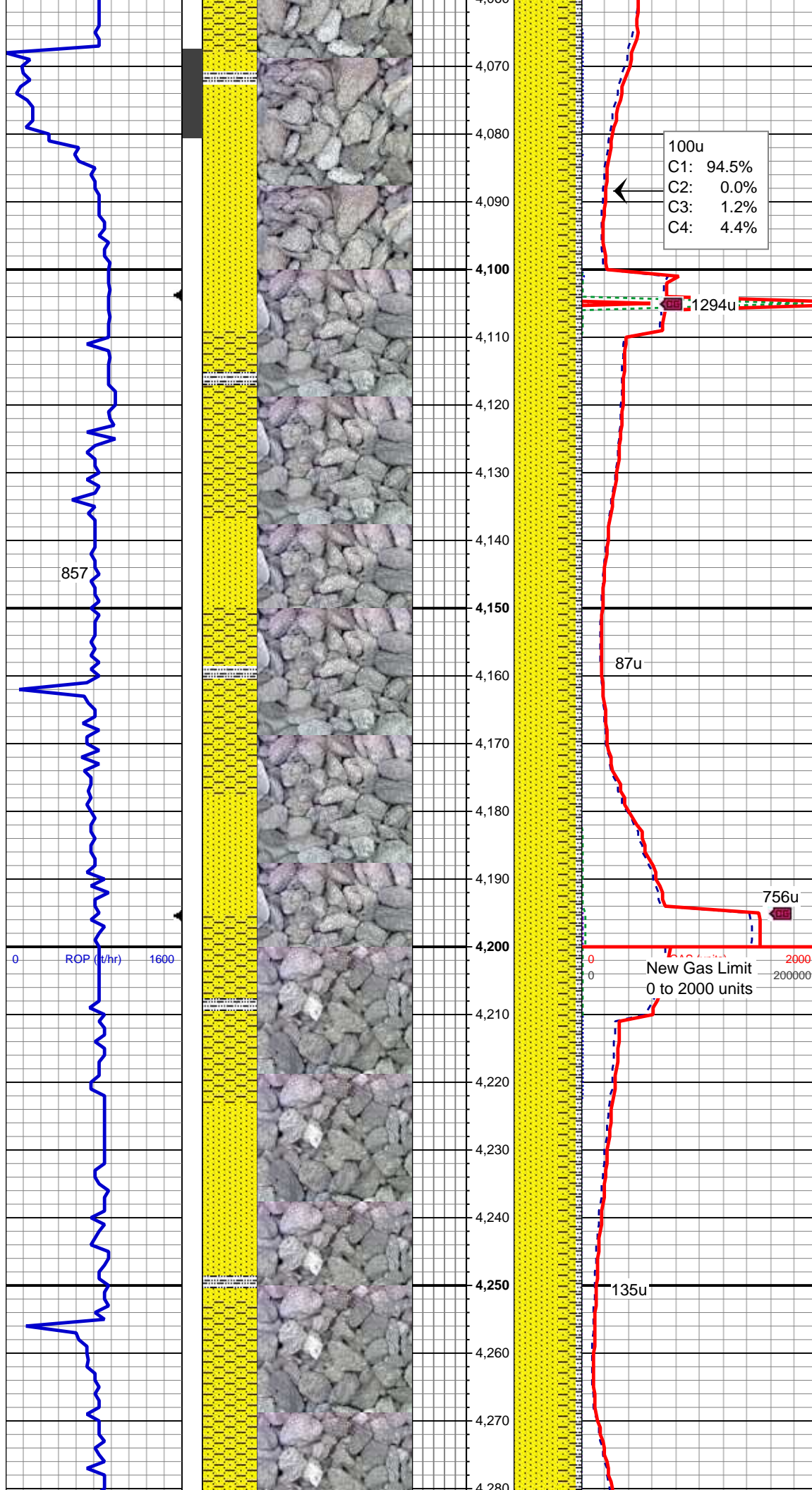
MD: 3,942 '
TVD: 3,904.99 '
Inclination: 12.93 °
Azimuth: 205.79 °
VS: 152.13 '

55% SS: lt gy - wh, sme s&p, clr -
trnsl, f gr, sb rd-sb ang, mod srt, fri,
p por, arg cmt
25% SHY SS: wh - lt gy, s&p ip, vf
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
20% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty

MUD WT 9.0 VIS 29

MD: 4,037 '
TVD: 3,997.96 '
Inclination: 10.79 °
Azimuth: 206.2 °
VS: 162.06 '

65% SS: lt gy - wh, sme s&p, clr -
trnsl, f gr, sb rd-sb ang, mod srt, fri,
p por, arg cmt
25% SHY SS: wh - lt gy, s&p ip, vf
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt
10% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty

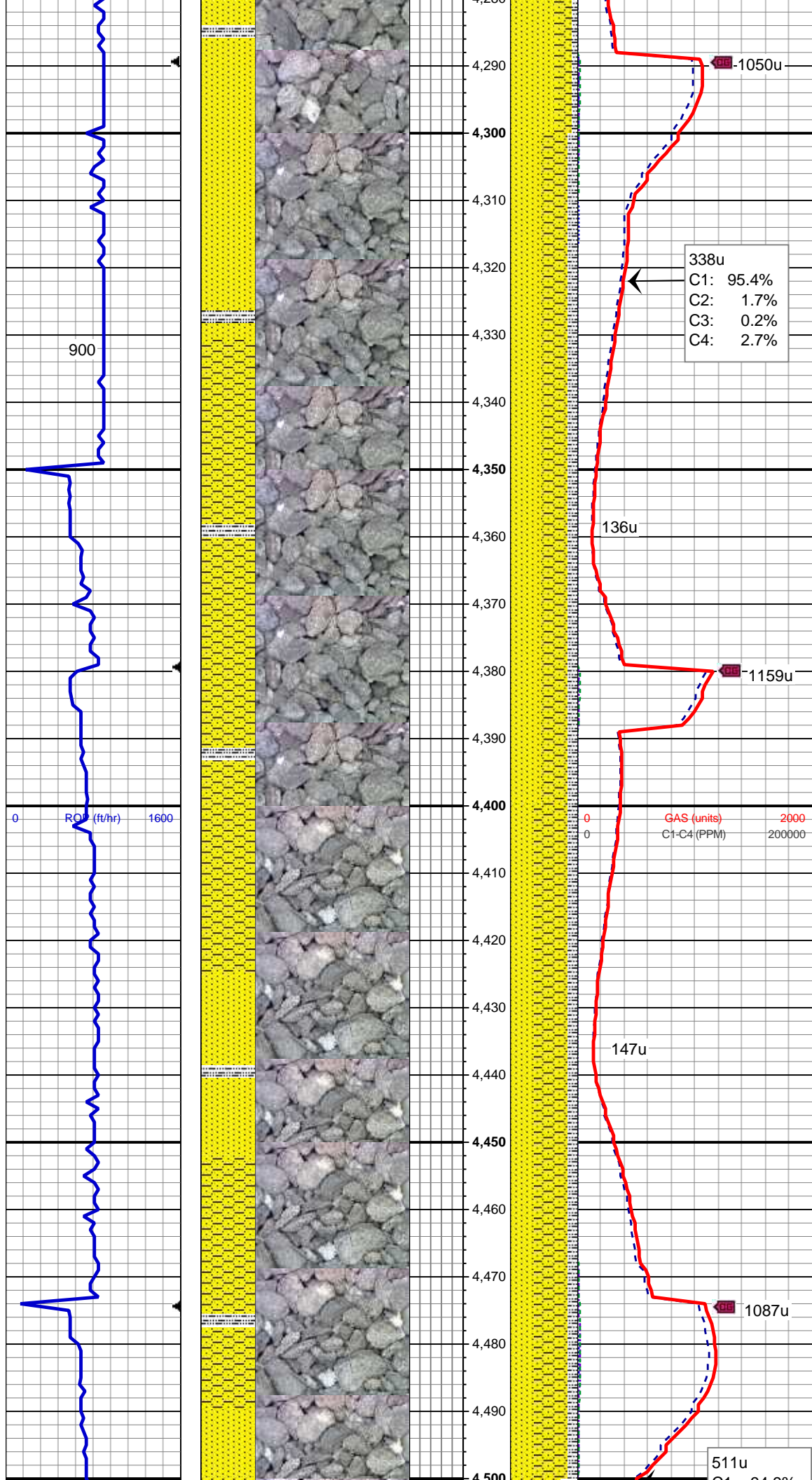


MD: 4,132 '
TVD: 4,091.47 '
Inclination: 9.53 °
Azimuth: 205.95 °
VS: 170.61 '

65% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
25% SHY SS: wh - lt gy, s&p ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
10% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

MD: 4,226 '
TVD: 4,184.34 '
Inclination: 8.24 °
Azimuth: 202.79 °
VS: 177.67 '

65% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
25% SHY SS: wh - lt gy, s&p ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
10% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

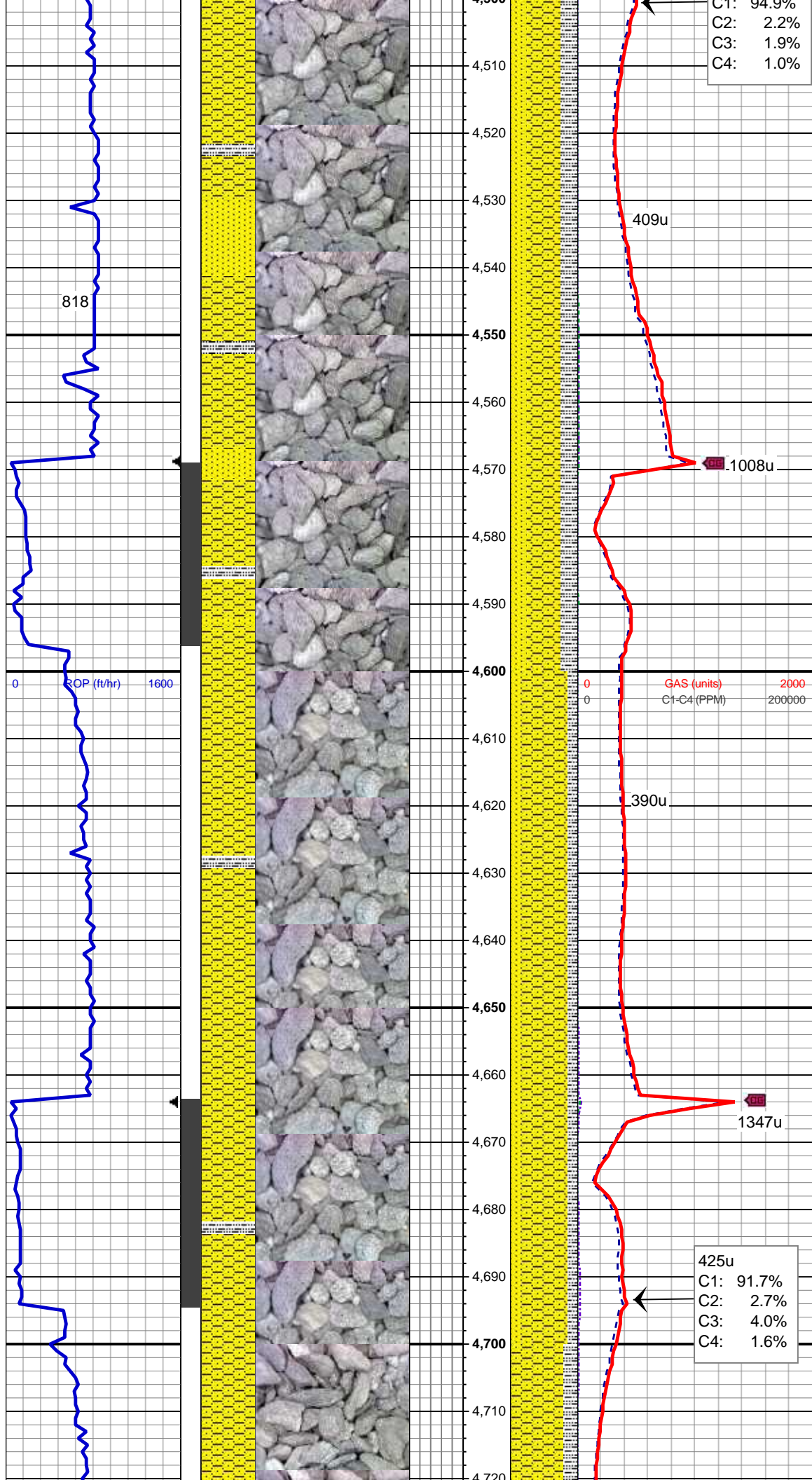


MD: 4,321 '
TVD: 4,278.53 '
Inclination: 6.68 °
Azimuth: 199.32 °
VS: 183.04 '

45% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
40% SHY SS: wh - lt gy, s&p ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
15% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

MD: 4,416 '
TVD: 4,373.01 '
Inclination: 5.3 °
Azimuth: 194.38 °
VS: 186.71 '

50% SHY SS: wh - lt gy, s&p ip, med gy-brn ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
35% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
15% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty



MUD WT 9.0 VIS 29

MD: 4,511 '
TVD: 4,467.59 '
Inclination: 5.53 °
Azimuth: 198.38 °
VS: 189.93 '

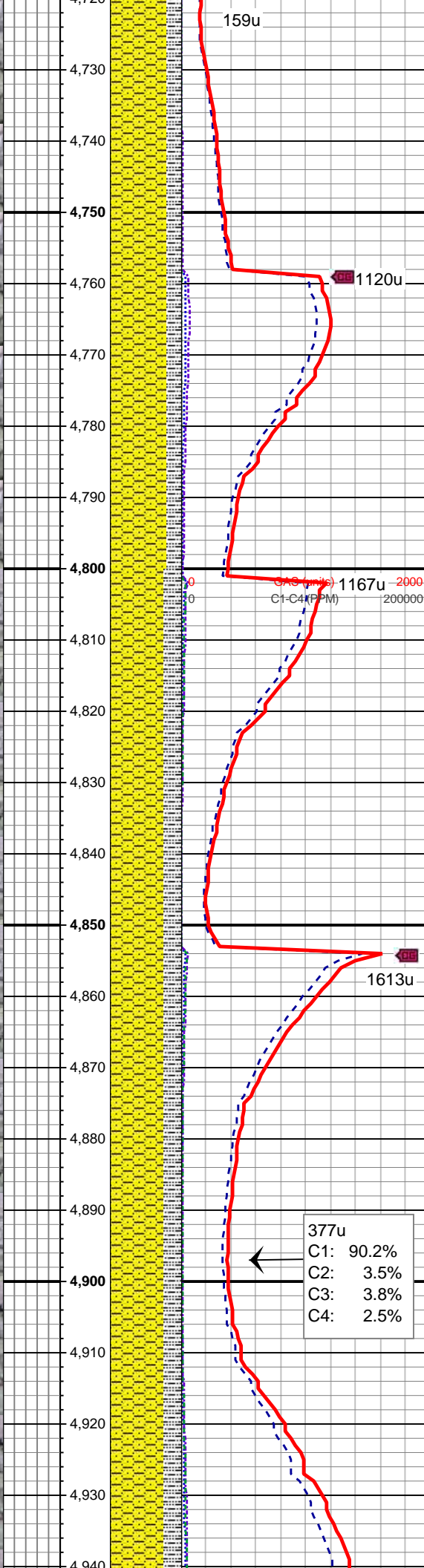
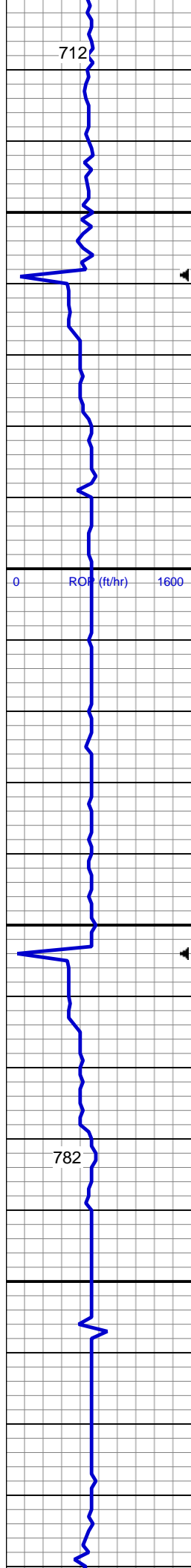
50% SHY SS: wh - lt gy, s&p ip, med gy-brn ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
25% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
25% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

MD: 4,606 '
TVD: 4,562.29 '
Inclination: 3.43 °
Azimuth: 197.74 °
VS: 192.79 '

70% SHY SS: wh - lt gy, s&p ip, med gy-brn ip, vf gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt
15% SS: lt gy - wh, sme s&p, clr - trnsl, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
15% SLTY SH: med-dk gy, occ gy brn, frm-sl sft, rthy-sl slty

MUD WT 9.0 VIS 29

MD: 4,701 '
TVD: 4,657.2 '
Inclination: 1.37 °
Azimuth: 175.94 °
VS: 193.88 '



80% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
20% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

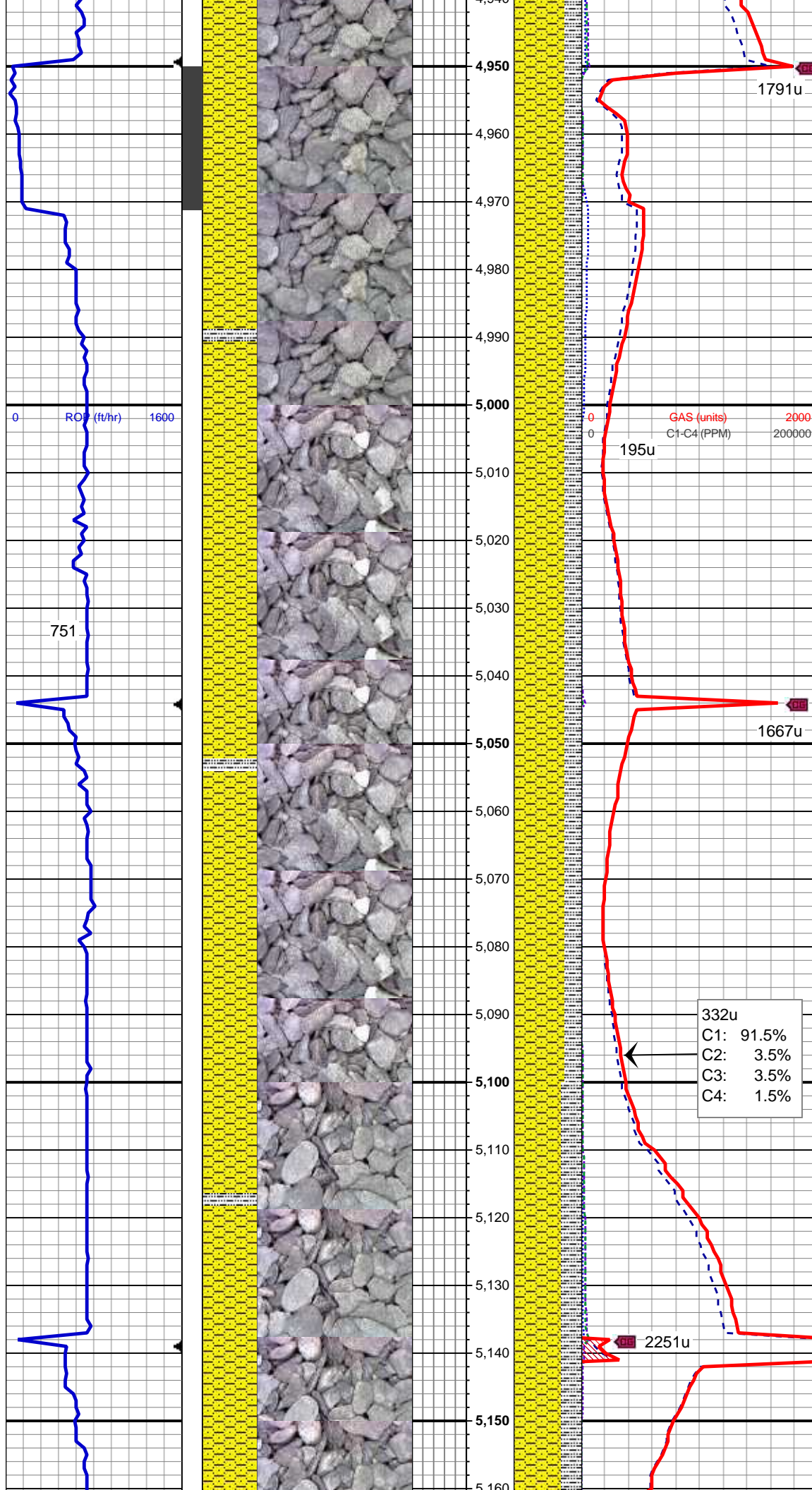
MD: 4,796 '
TVD: 4,752.18 '
Inclination: 1.37 °
Azimuth: 152.92 °
VS: 193.46 '

75% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
25% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

MD: 4,890 '
TVD: 4,846.15 '
Inclination: 1.49 °
Azimuth: 144.45 °
VS: 192.4 '

MUD WT 9.0 VIS 30

75% SHY SS: wh - lt gy, s&p ip,



med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
25% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

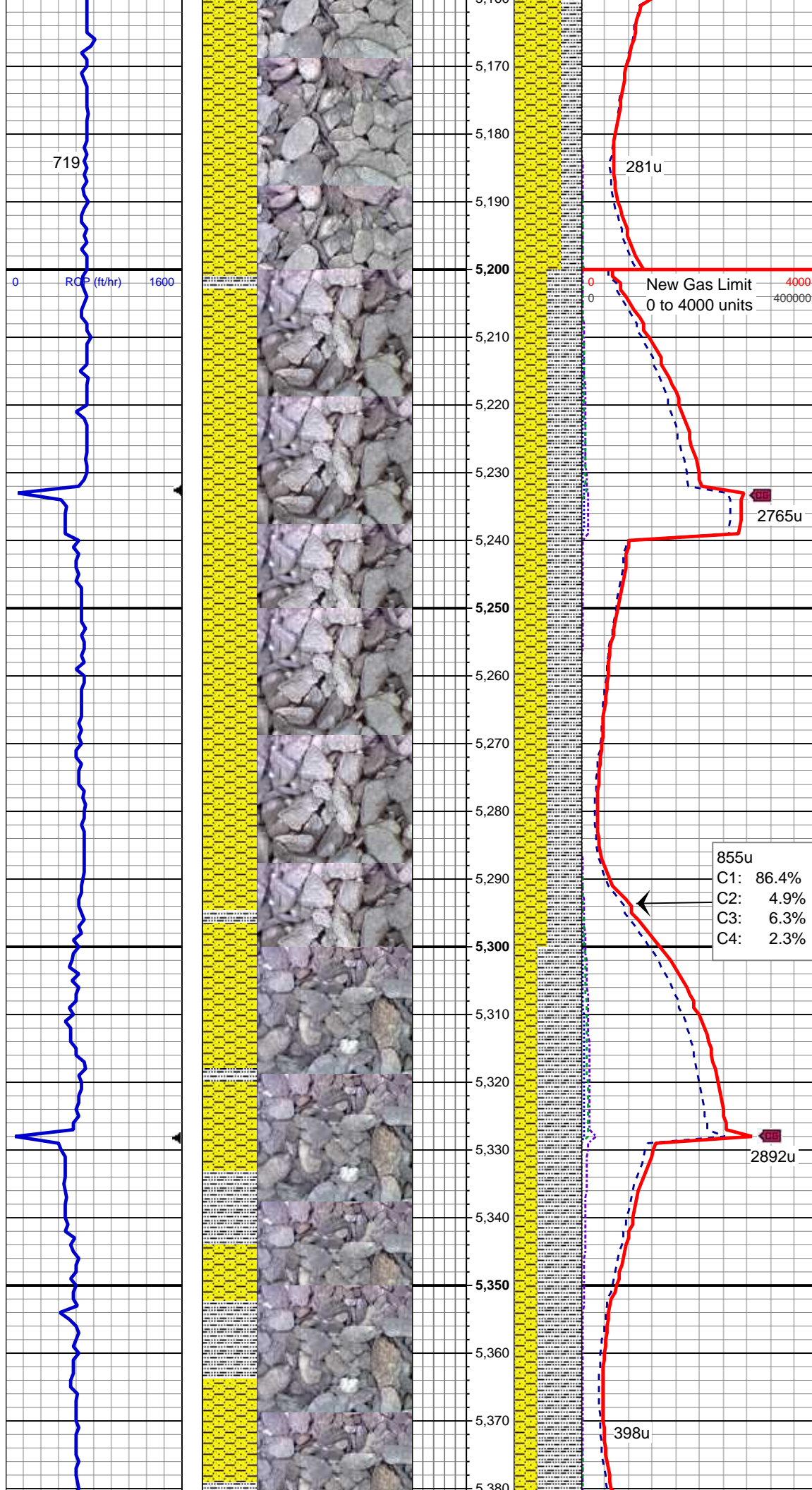
MD: 4,986 '
TVD: 4,942.13 '
Inclination: 0.3 °
Azimuth: 104.09 °
VS: 191.52 '

75% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
25% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

MD: 5,081 '
TVD: 5,037.13 '
Inclination: 0.26 °
Azimuth: 113.63 °
VS: 191.09 '

70% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
30% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

MUD WT 9.0 VIS 30

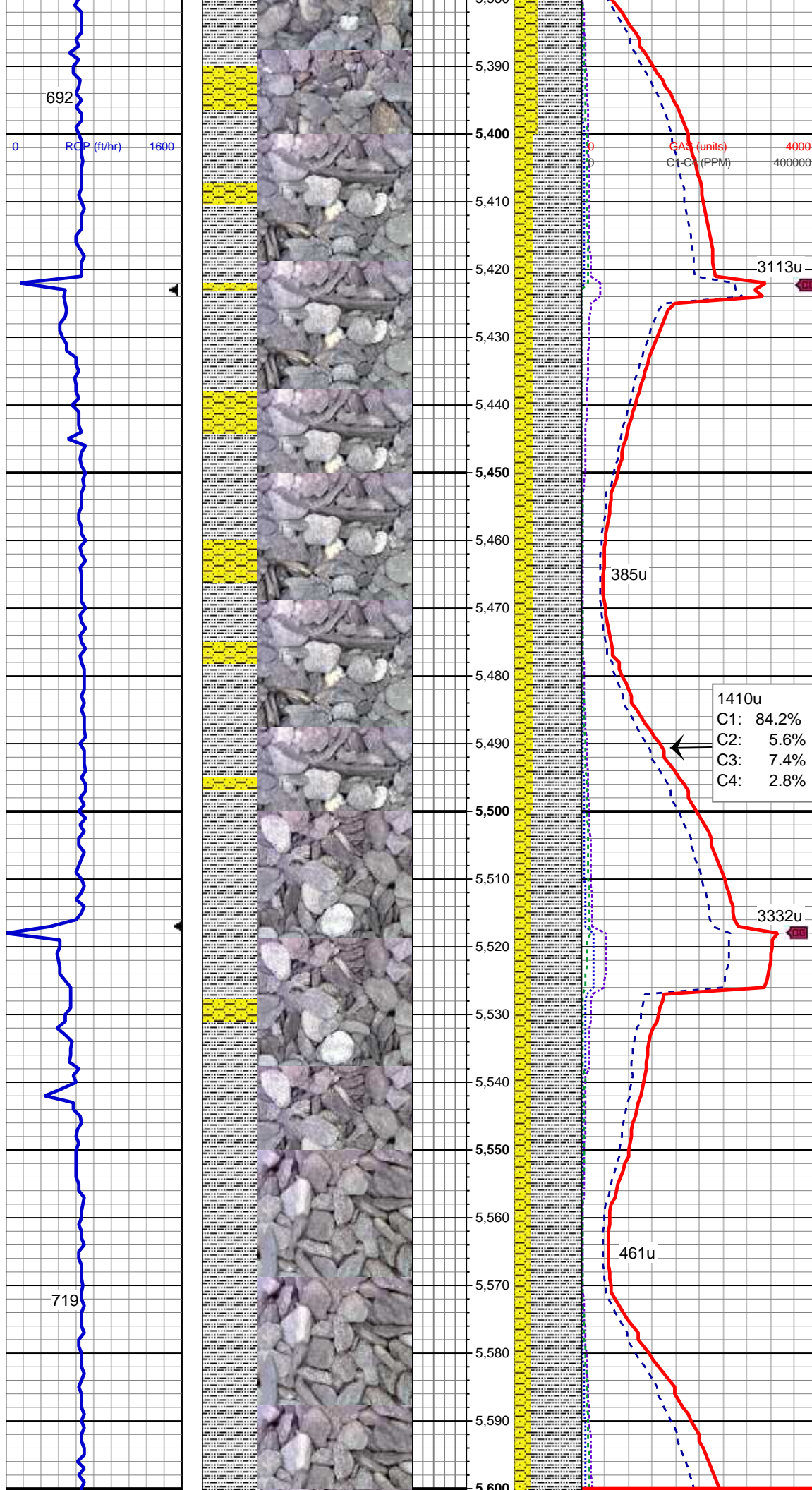


MD: 5,176 '
TVD: 5,132.13 '
Inclination: 0.75 °
Azimuth: 105.51 °
VS: 190.31 '

50% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns
50% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky

MD: 5,271 '
TVD: 5,227.12 '
Inclination: 1.12 °
Azimuth: 90.76 °
VS: 188.81 '

MD: 5,366 '
TVD: 5,322.1 '
Inclination: 1.12 °
Azimuth: 92.53 °
VS: 186.96 '
65% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
35% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt, tr sd
grns



MUD WT 9.1 VIS 30

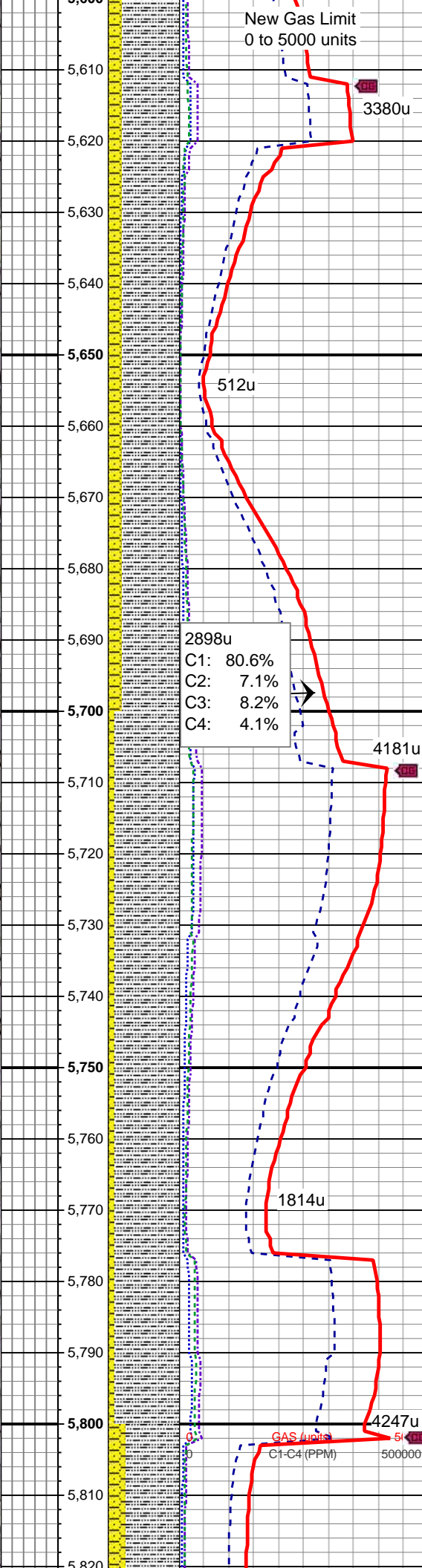
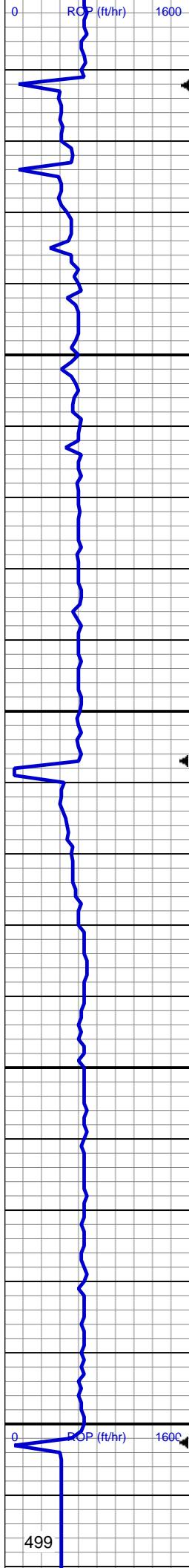
70% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
30% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt

MD: 5,460 '
TVD: 5,416.07 '
Inclination: 1.57 °
Azimuth: 92.78 °
VS: 184.77 '

1410u
C1: 84.2%
C2: 5.6%
C3: 7.4%
C4: 2.8%

MD: 5,555 '
TVD: 5,511.04 '
Inclination: 1.43 °
Azimuth: 71.12 °
VS: 182.33 '

75% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
25% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt



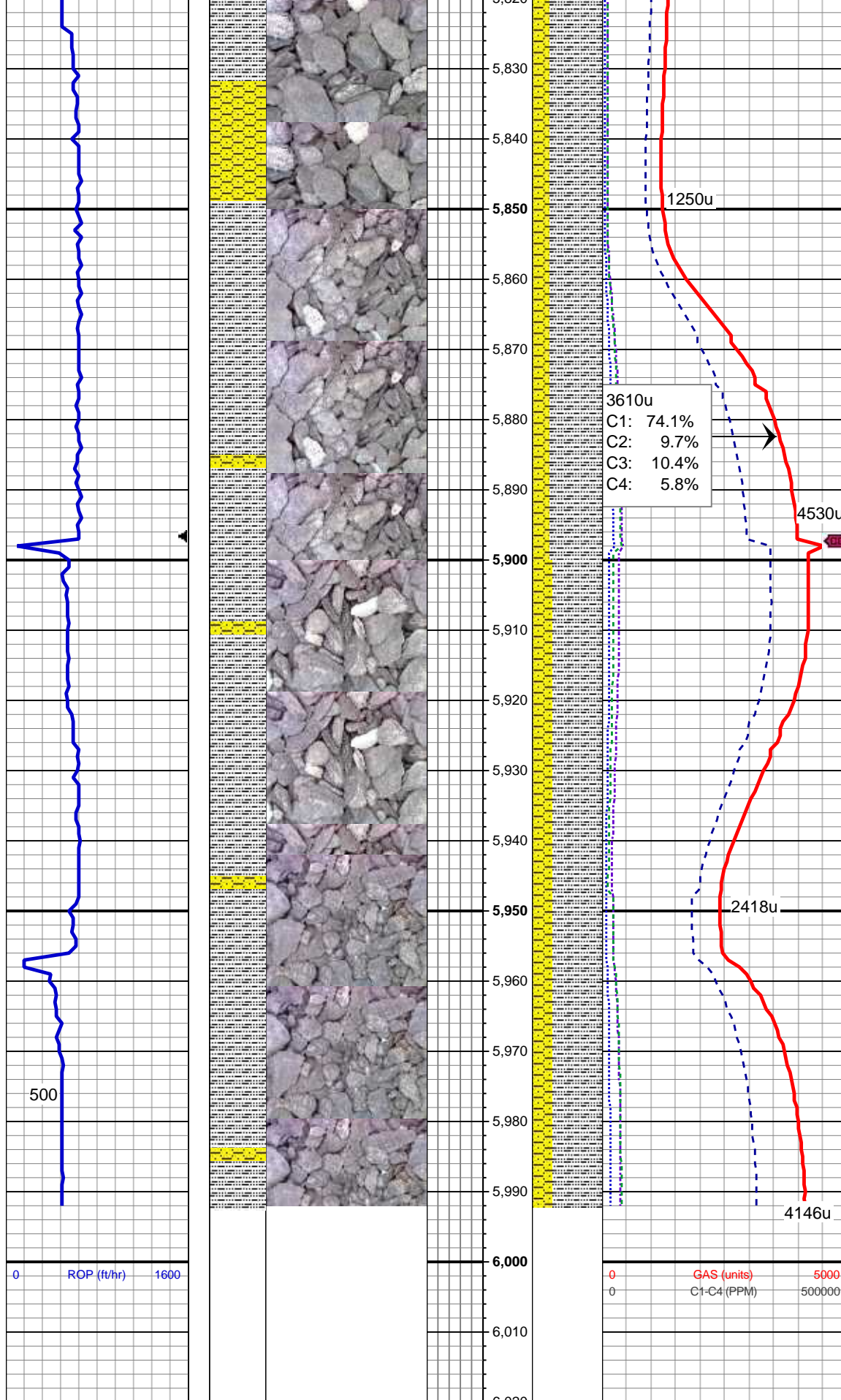
MUD WT 9.1 VIS 30

MD: 5,650 '
TVD: 5,606.02 '
Inclination: 1.17 °
Azimuth: 66.37 °
VS: 180.26 '

80% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
20% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt

MD: 5,745 '
TVD: 5,700.99 '
Inclination: 1.38 °
Azimuth: 79.43 °
VS: 178.2 '

90% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
10% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt



MD: 5,840 '
TVD: 5,795.97 '
Inclination: 1.15 °
Azimuth: 68.81 °
VS: 176.15 '

75% SLTY SH: med-dk gy, occ gy
brn, frm-sl sft, rthy-sl slty, plty-sb
blky
25% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt

1250u

3610u
C1: 74.1%
C2: 9.7%
C3: 10.4%
C4: 5.8%

4530u

MD: 5,935 '
TVD: 5,890.95 '
Inclination: 1.2 °
Azimuth: 58.2 °
VS: 174.35 '

70% SLTY SH: lt-med gy, gy brn ip,
frm-sl sft, rthy-sl slty, plty-sb blky
30% SHY SS: wh - lt gy, s&p ip,
med gy-brn ip, vf gr, sb rd- sb ang,
fr srt, fri, mod por, arg cmt

2418u

4146u

MUD WT 9.2 VIS 30

TD Vertical @ 5992' MD
11:41 hrs 10/17/2013
TOOH for Directional BHA

Thank You For Choosing
Columbine Logging Inc.