

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch USX AA27-65-1HN (VERT)

Location Sec 27, T6N, R63W

State COLORADO

County WELD

Country UNITED STATES

Rig Number H&P 322

API Number 05-123--37140-0000

AFE # 140421

Field Wattenberg

Spud Date 8/27/2013

Drilling Completed 9/2/2013

Surface Coordinates 1539' FSL
221' FWL
40.454410 LAT
-104.431780 LON

Bottom Hole Coordinates 2310' FSL
150' FEL

Ground Elevation 4795'

K.B. Elevation 4819'

Logged Interval 1000' **To** 11462

Total Depth 11462

Formation PARKMAN, SUSSEX, SHANNON, TEEPEE BUTTES

Type of Drilling Fluid Water;Mud;Poly

Operator

Company Noble Energy Inc

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

Geologist

Name CHRISTIAN VENTURINO, MIKE GREENE

Company COLUMBINE LOGGING

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

Rock Types

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

Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOIPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

Fossils

GASTROPOD
INOCERAMUS
OOLITE
OSTRACOD
PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

Minerals

ANHYDRITIC
ARGILLACEOUS
ARGILLITE GRAIN
BENTONITE
BITUMENOUS SUBSTANCE
BRECCIA FRAGMENTS
CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET

Minerals

FERRUGINOUS
GLAUCONITE
GYPSIFEROUS
HEAVY MINERAL
KAOLIN
MARLSTONE
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

Minerals

TUFFACEOUS
ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Stringer

Other Symbols

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

EARTHY
FENESTRAL
FRACTURE
INTERCRYSTALLINE
INTEROOLITIC

Oil Show

MOLDIC
ORGANIC
PINPOINT
VUGGY

Engineering

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

Other Symbols

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

Other Symbols

WIRELINE TESTED - LEFT
WIRELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

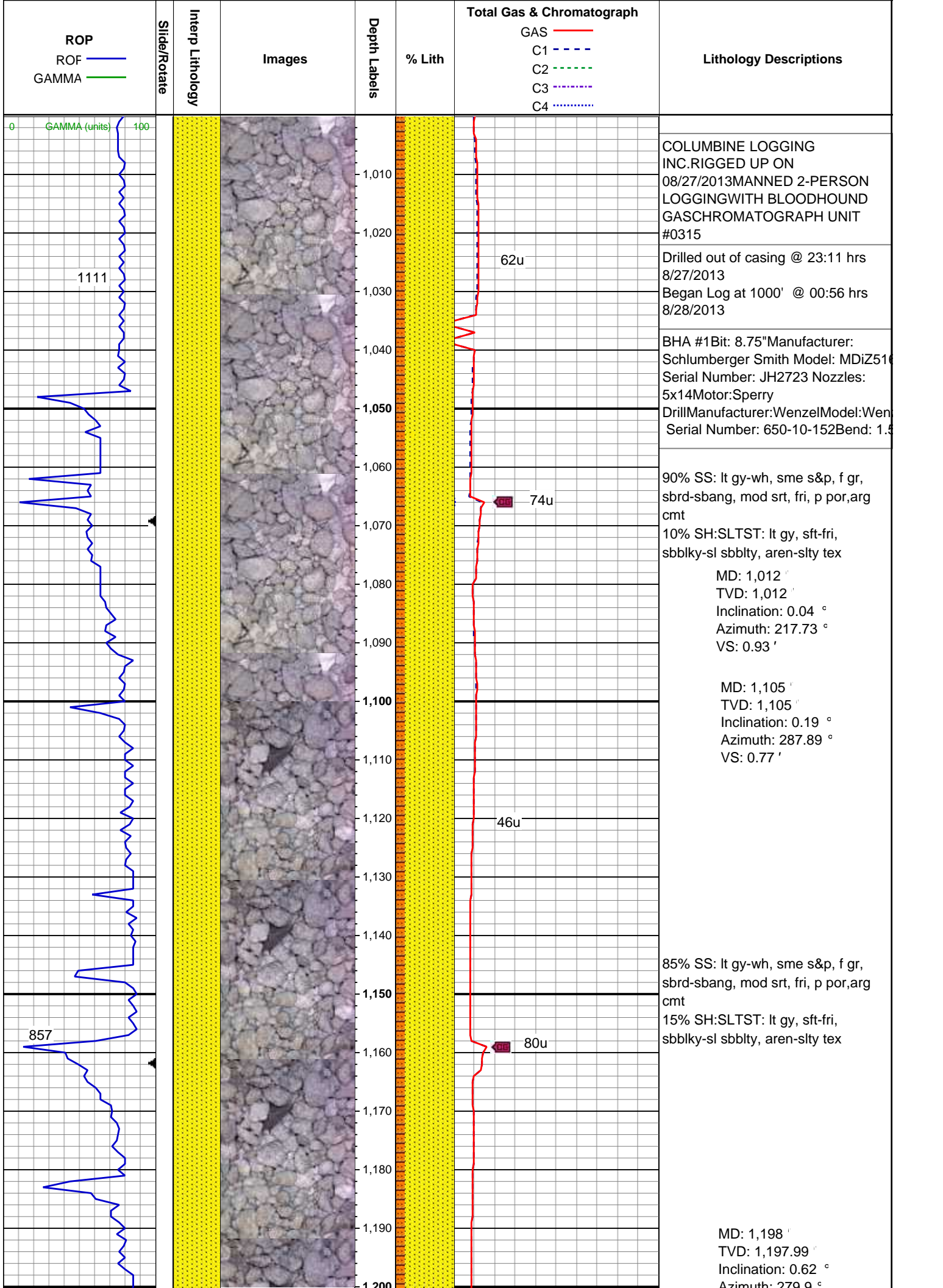
BOUNDSTONE
CHALKY
CRYPTOXLN

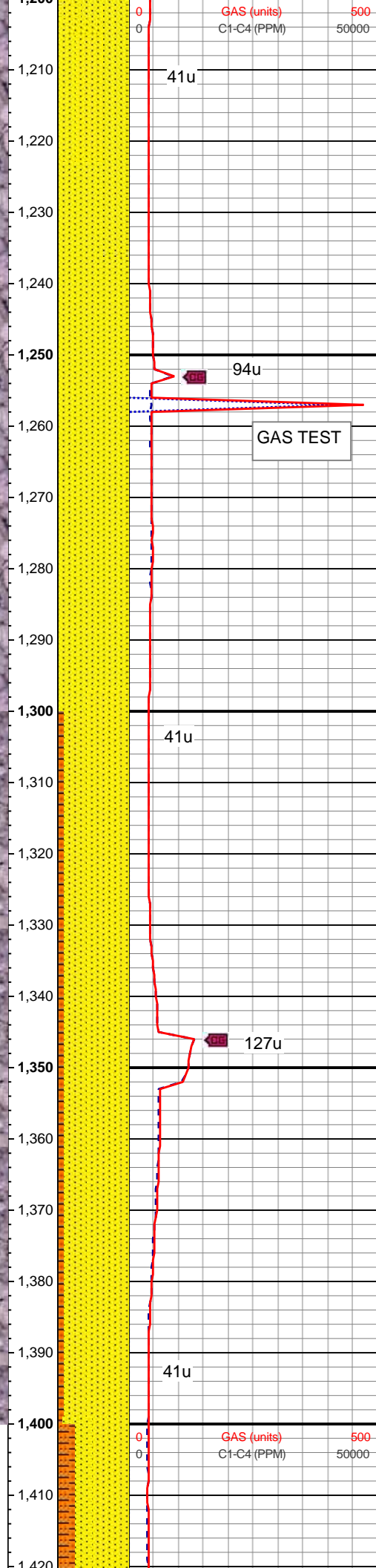
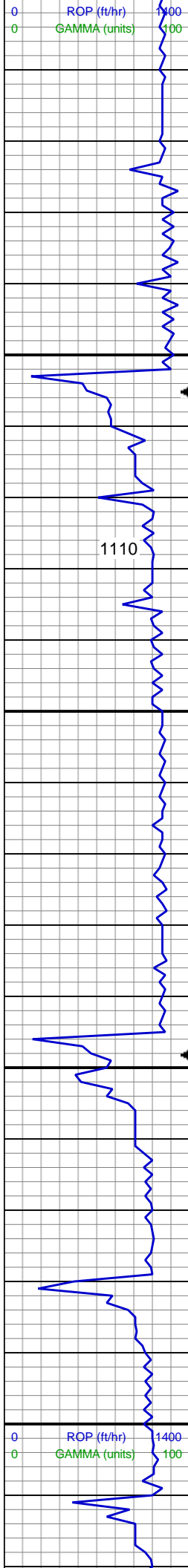
Other Symbols

EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL





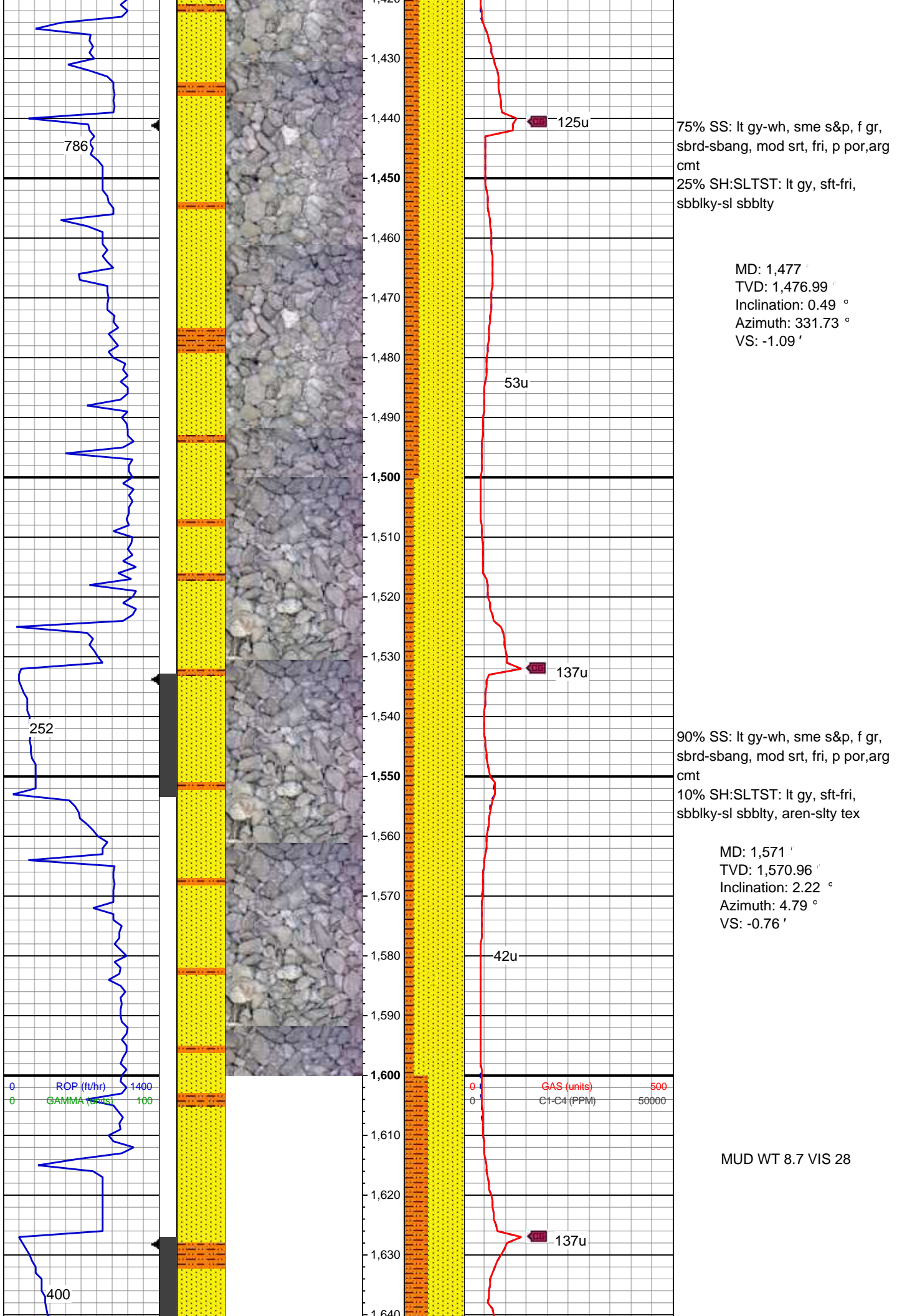
Azimuth: 279.9
VS: 0.16'

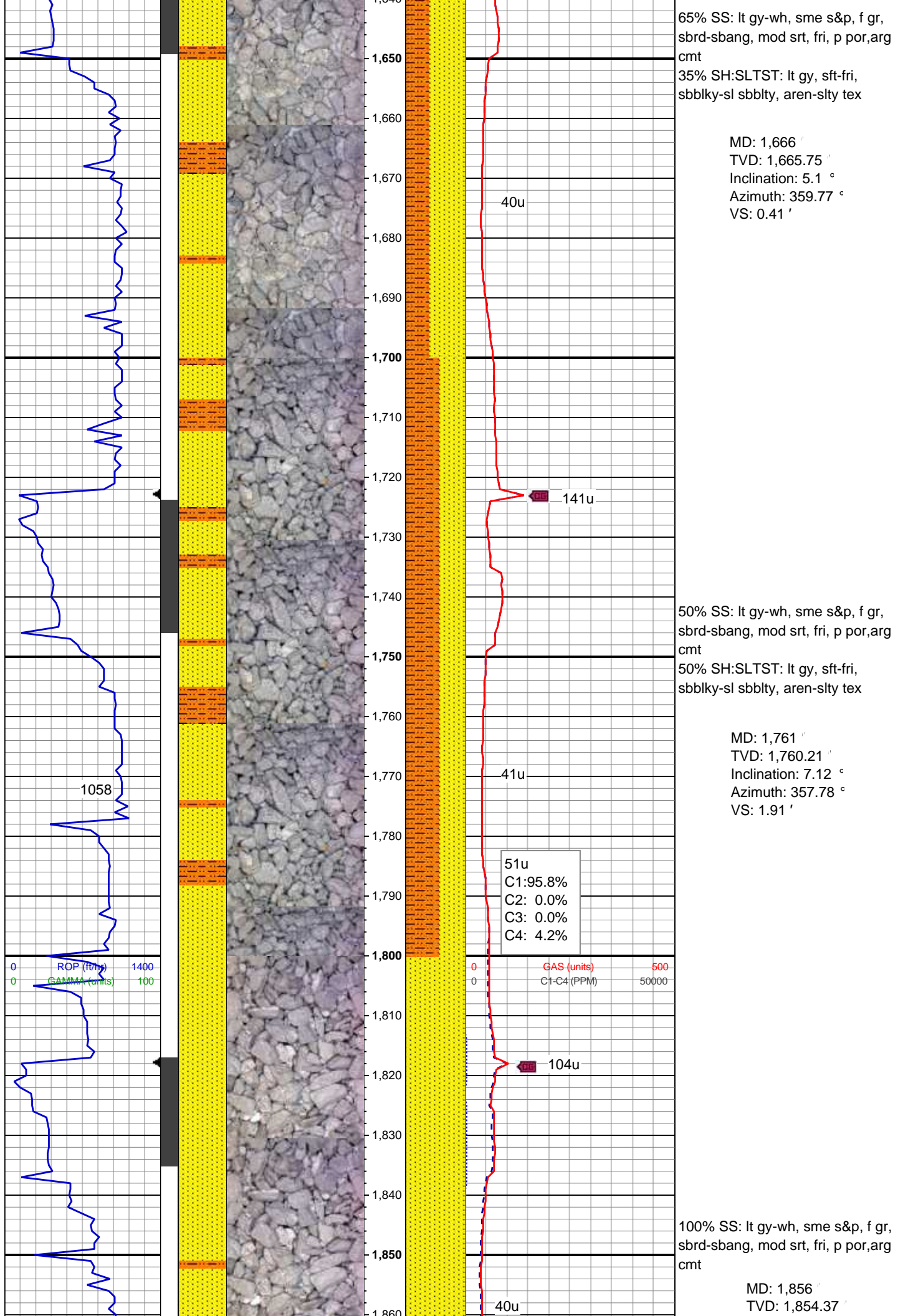
100% SS: lt gy-wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt

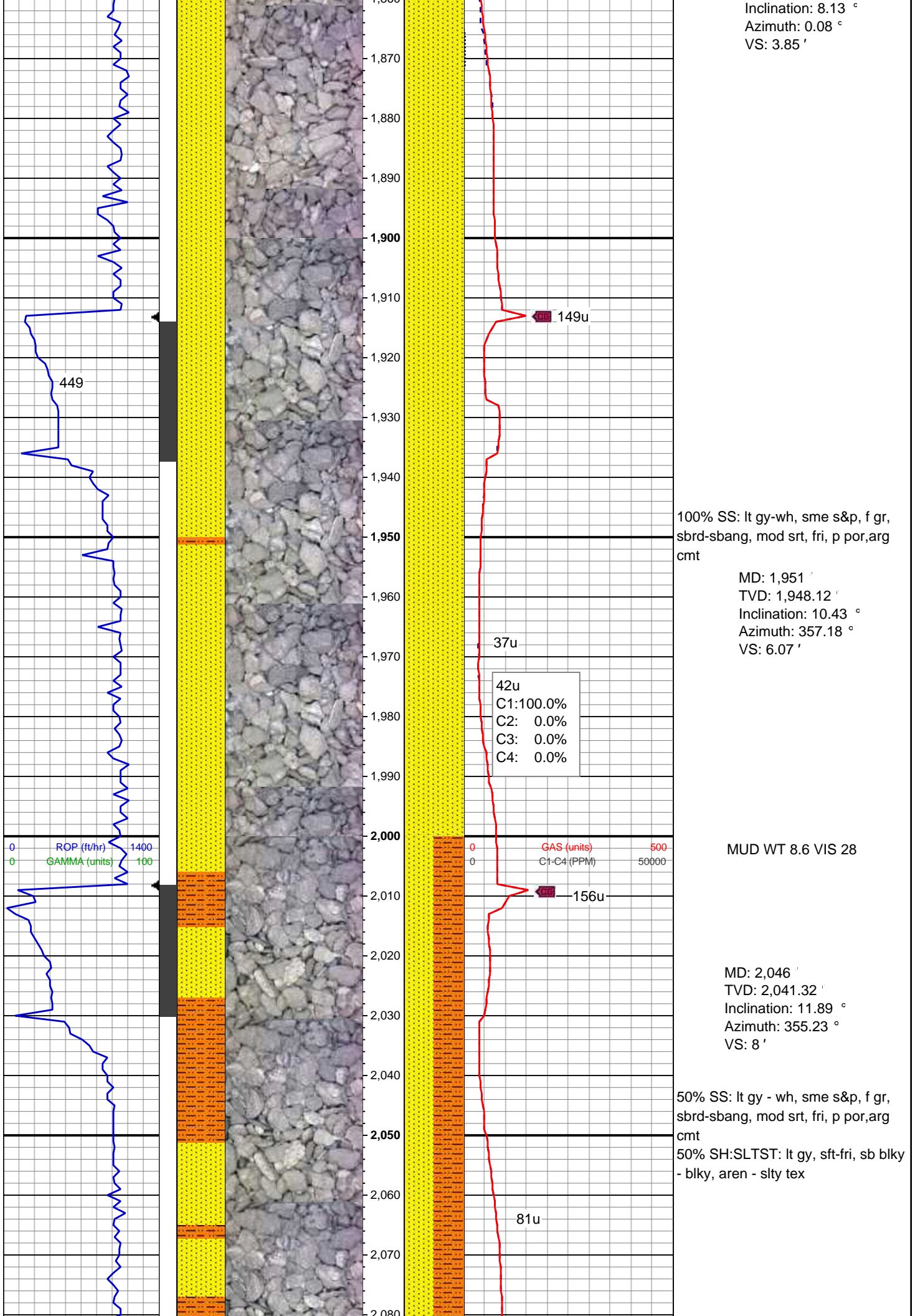
MD: 1,291'
TVD: 1,290.99'
Inclination: 0.25°
Azimuth: 356.95°
VS: -0.29'

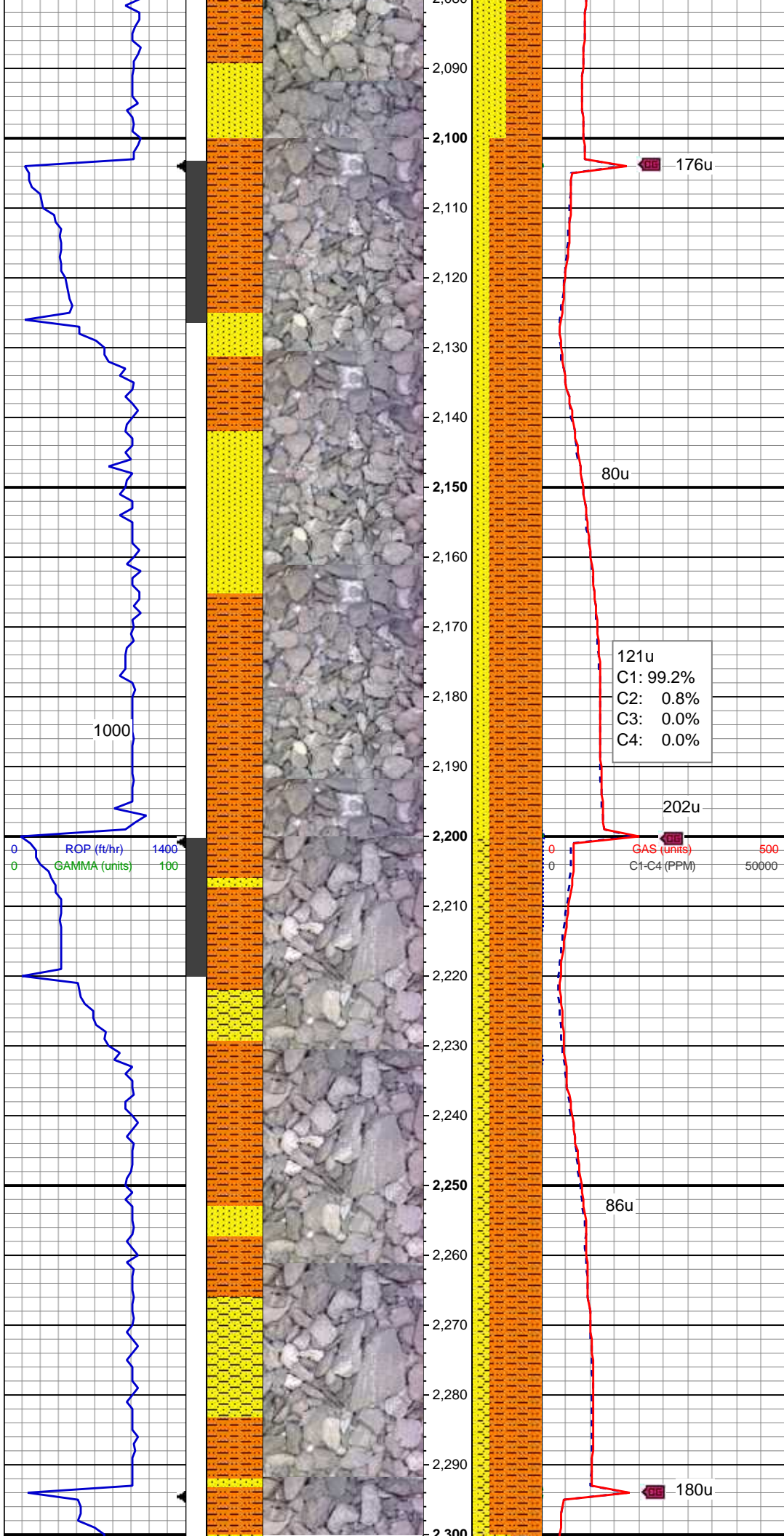
90% SS: lt gy-wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
10% SH:SLTST: lt gy, sft-fri, sbbiky-sl sbbly, aren-sltly tex

MD: 1,384'
TVD: 1,383.99'
Inclination: 0.52°
Azimuth: 295.11°
VS: -0.62'









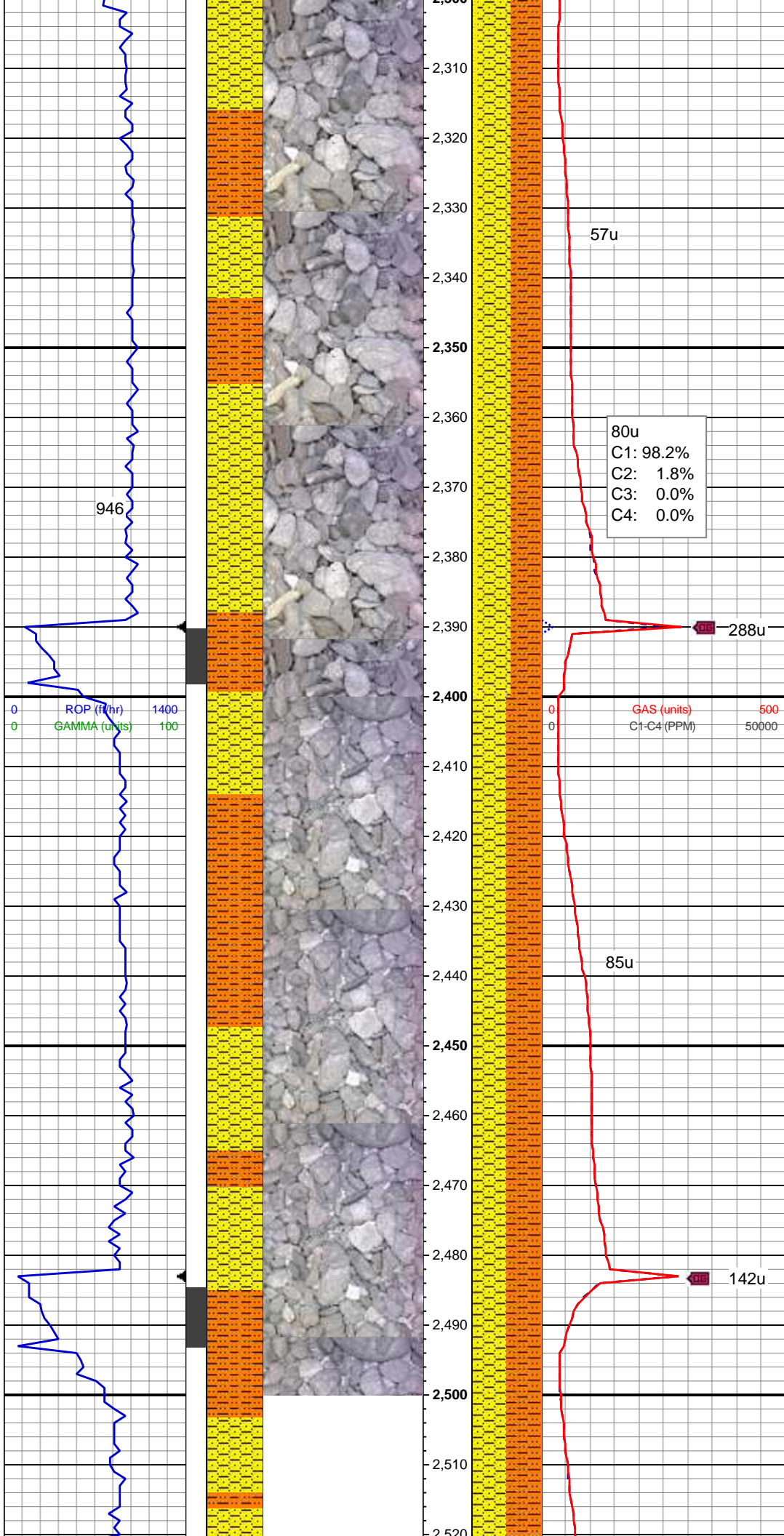
MD: 2,140 '
TVD: 2,132.97 '
Inclination: 13.78 °
Azimuth: 353.92 °
VS: 9.61 '

75% SH:SLTST: lt gy, sft-fri, sb blk
- blk, aren - slty tex
25% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por,arg
cmt

121u
C1: 99.2%
C2: 0.8%
C3: 0.0%
C4: 0.0%

MD: 2,235 '
TVD: 2,224.72 '
Inclination: 16.23 °
Azimuth: 350.82 °
VS: 10.52 '

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



MD: 2,330 '
TVD: 2,316.06 '
Inclination: 15.7 °
Azimuth: 349.51 °
VS: 10.54 '

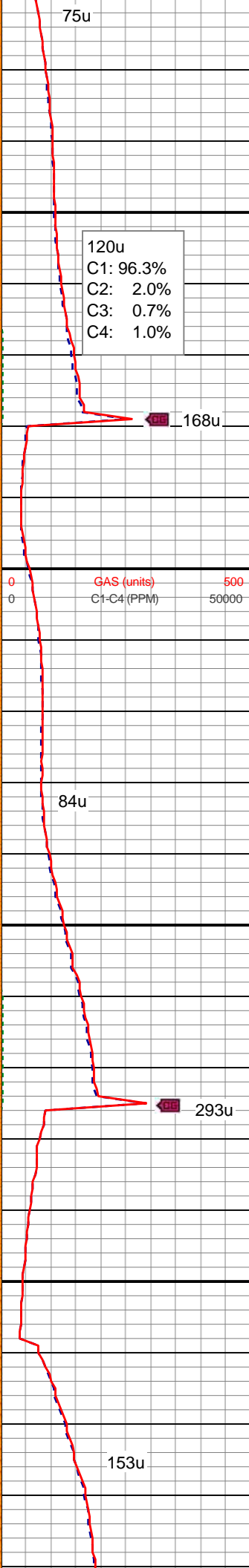
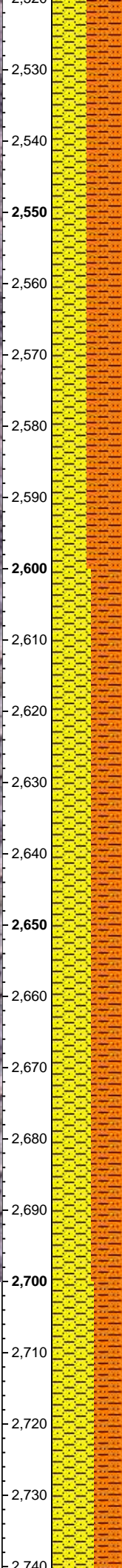
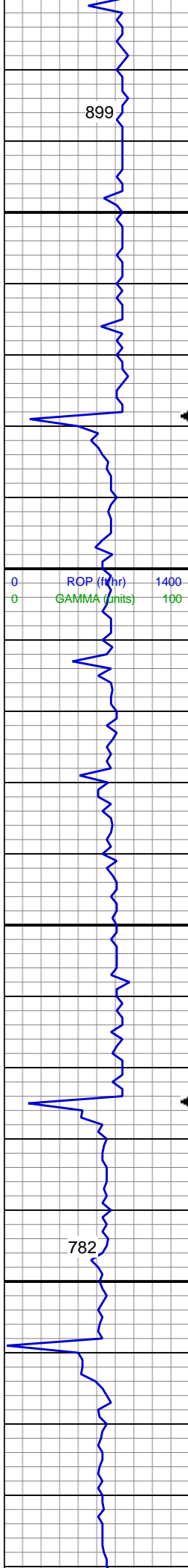
45% SH:SLTST: lt gy, sft-fri, sb blk
- blk, aren - slty tex
45% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot
10% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por, arg
cmt

80u
C1: 98.2%
C2: 1.8%
C3: 0.0%
C4: 0.0%

MD: 2,425 '
TVD: 2,407.55 '
Inclination: 15.56 °
Azimuth: 351.53 °
VS: 10.72 '

50% SH:SLTST: lt gy, sft-fri, sb blk
- blk, 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, occ biot, tr ss

MD: 2,520 '
TVD: 2,499.03 '
Inclination: 15.72 °
Azimuth: 355.31 °



VS: 12.2'

50% SH:SLTST: lt gy, sft-fri, sb blk
- blk, aren - slty tex

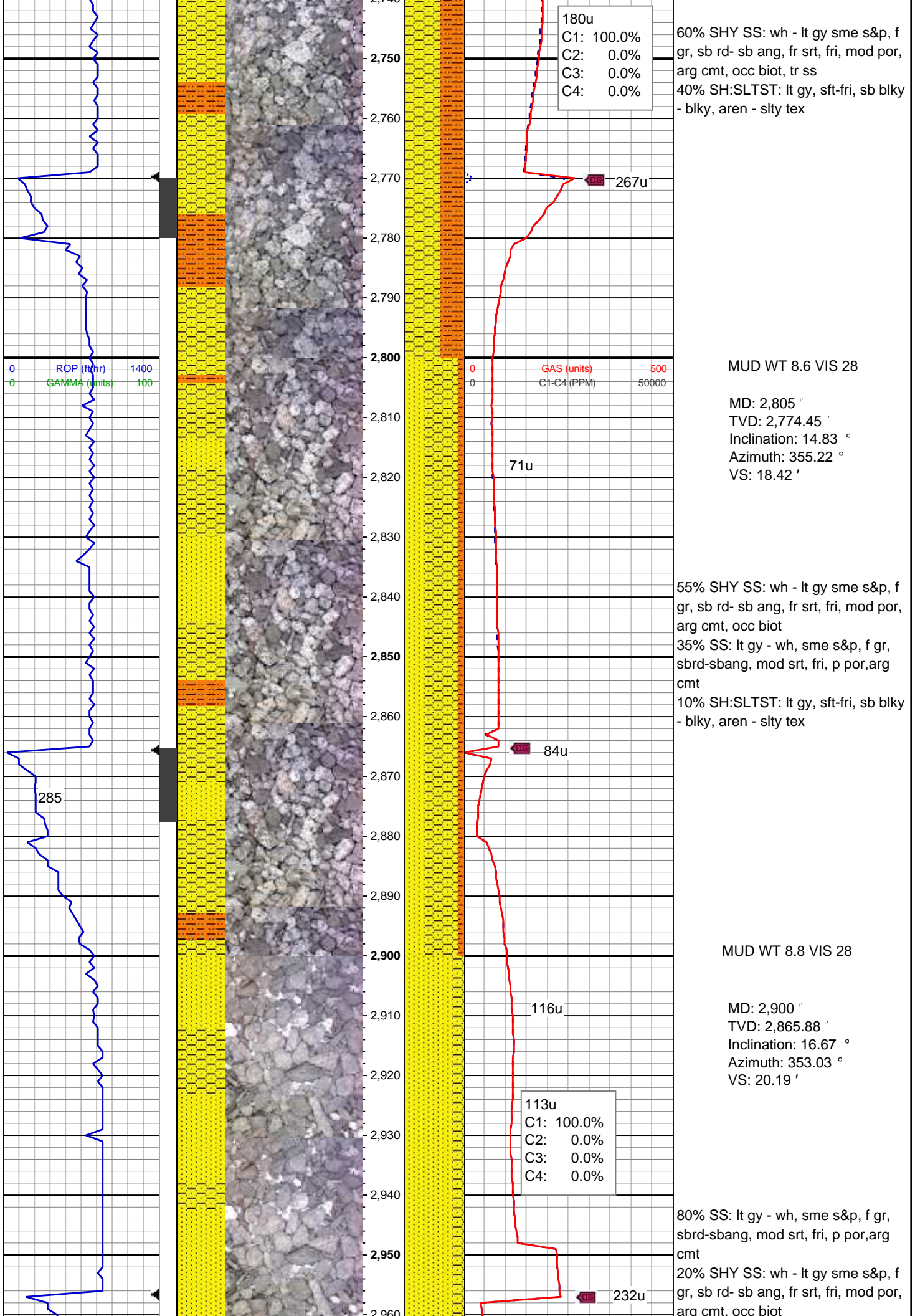
50% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot, tr ss

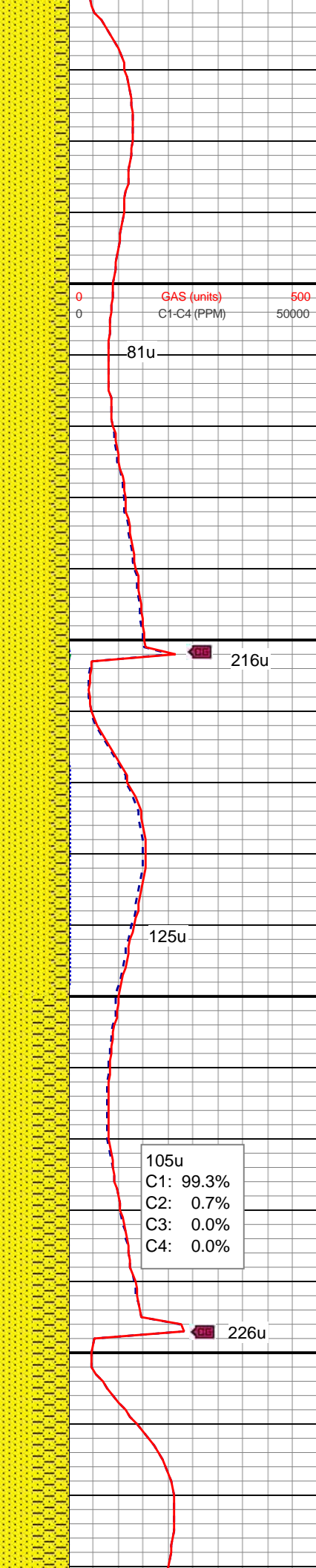
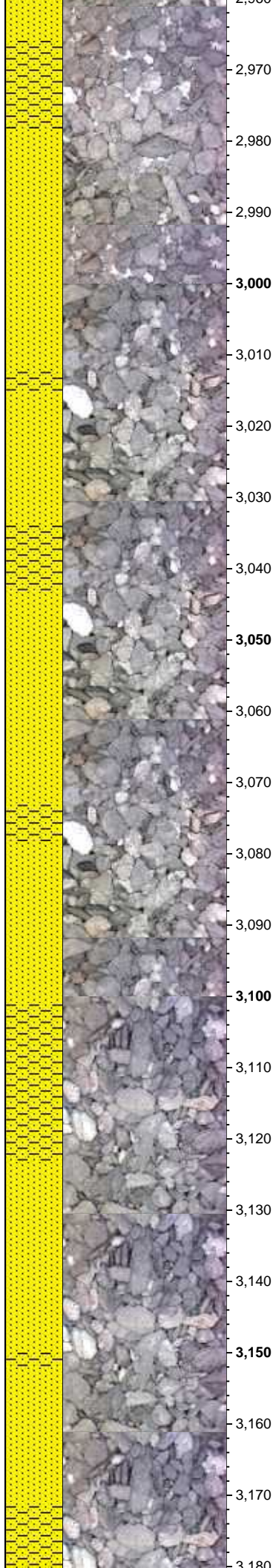
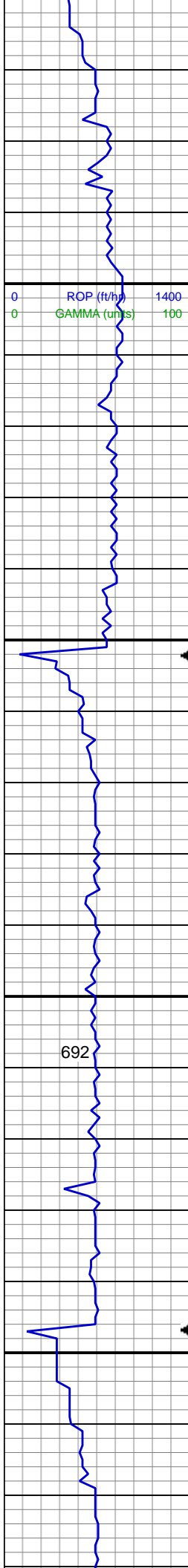
MD: 2,615'
TVD: 2,590.59'
Inclination: 15.19°
Azimuth: 355.31°
VS: 14.49'

55% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot, tr ss

45% SH:SLTST: lt gy, sft-fri, sb blk
- blk, aren - slty tex

MD: 2,710'
TVD: 2,682.48'
Inclination: 14.21°
Azimuth: 354.34°
VS: 16.48'





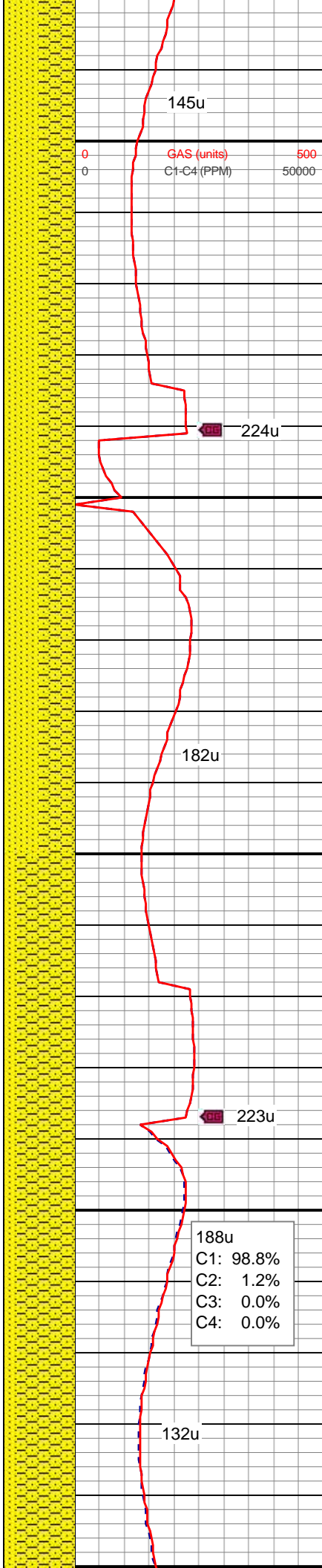
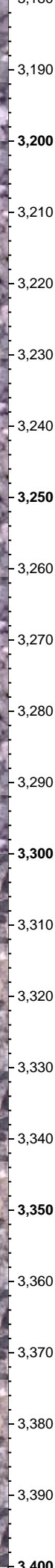
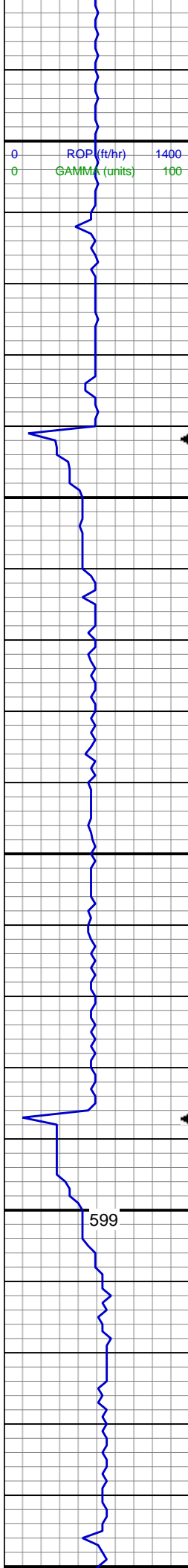
MD: 2,995 '
TVD: 2,956.64 '
Inclination: 17.66 °
Azimuth: 353.25 °
VS: 21.67 '

75% SS: lt gy - wh, sme s&p, f gr, sb rd-sb ang, fr srt, fri, mod por, arg cmt
25% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot

MD: 3,090 '
TVD: 3,047.19 '
Inclination: 17.57 °
Azimuth: 353.46 °
VS: 23.29 '

50% SS: lt gy - wh, sme s&p, f gr, sb rd-sb ang, fr srt, fri, mod por, arg cmt
50% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot

MD: 3,185 '



TVD: 3,137.81 '
Inclination: 17.38 °
Azimuth: 353.31 °
VS: 24.92 '

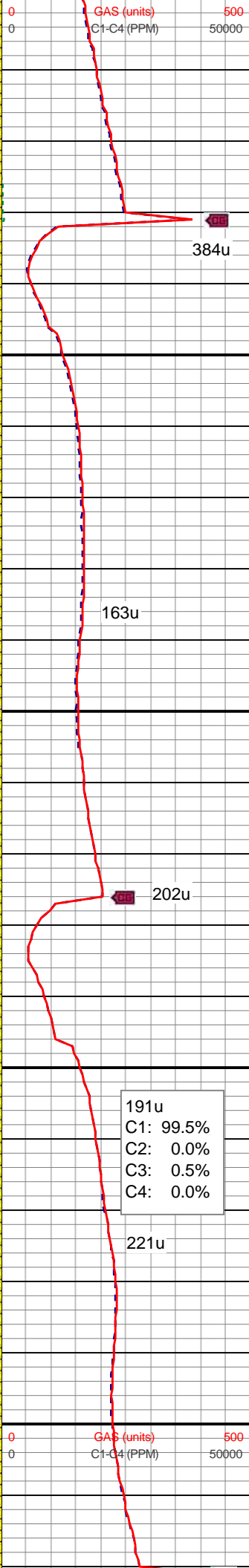
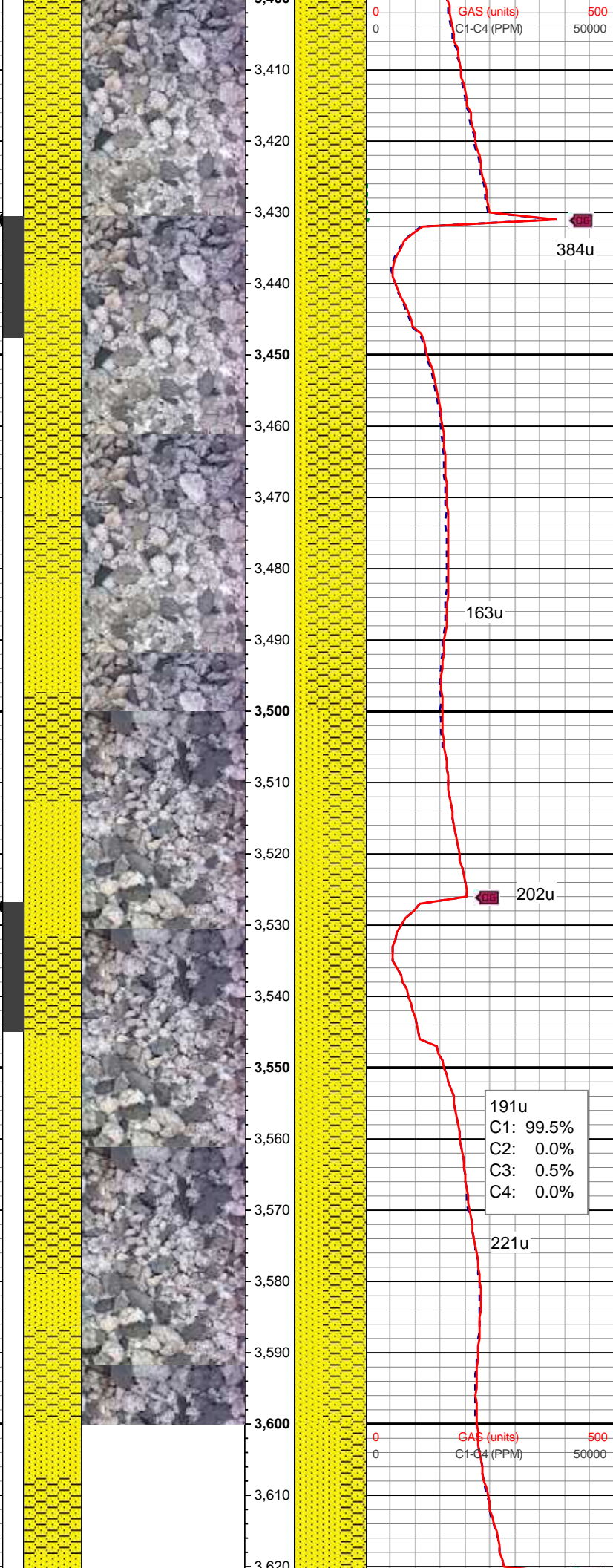
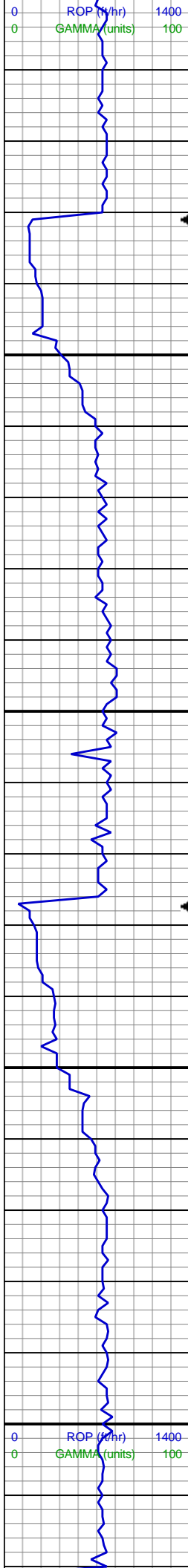
MUD WT 8.8 VIS 28

50% SS: lt gy - wh, sme s&p, f gr, sb rd-sb ang, mod srt, fri, p por, arg cmt
50% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot

MD: 3,279 '
TVD: 3,227.48 '
Inclination: 17.53 °
Azimuth: 353.04 °
VS: 26.42 '

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

MD: 3,374 '
TVD: 3,318.61 '
Inclination: 15.24 °
Azimuth: 351.95 °
VS: 27.55 '



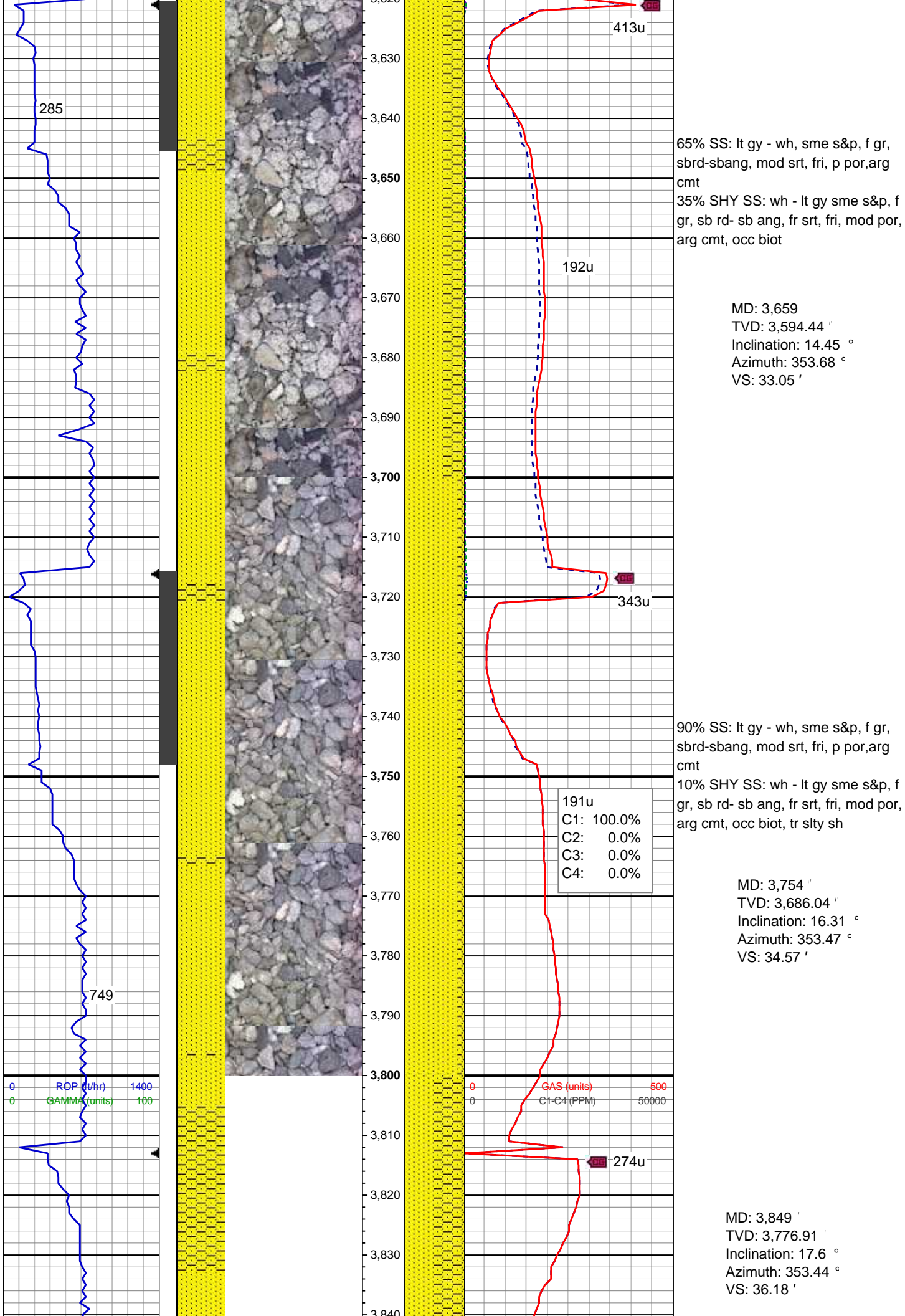
80% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot
20% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por, arg
cmt

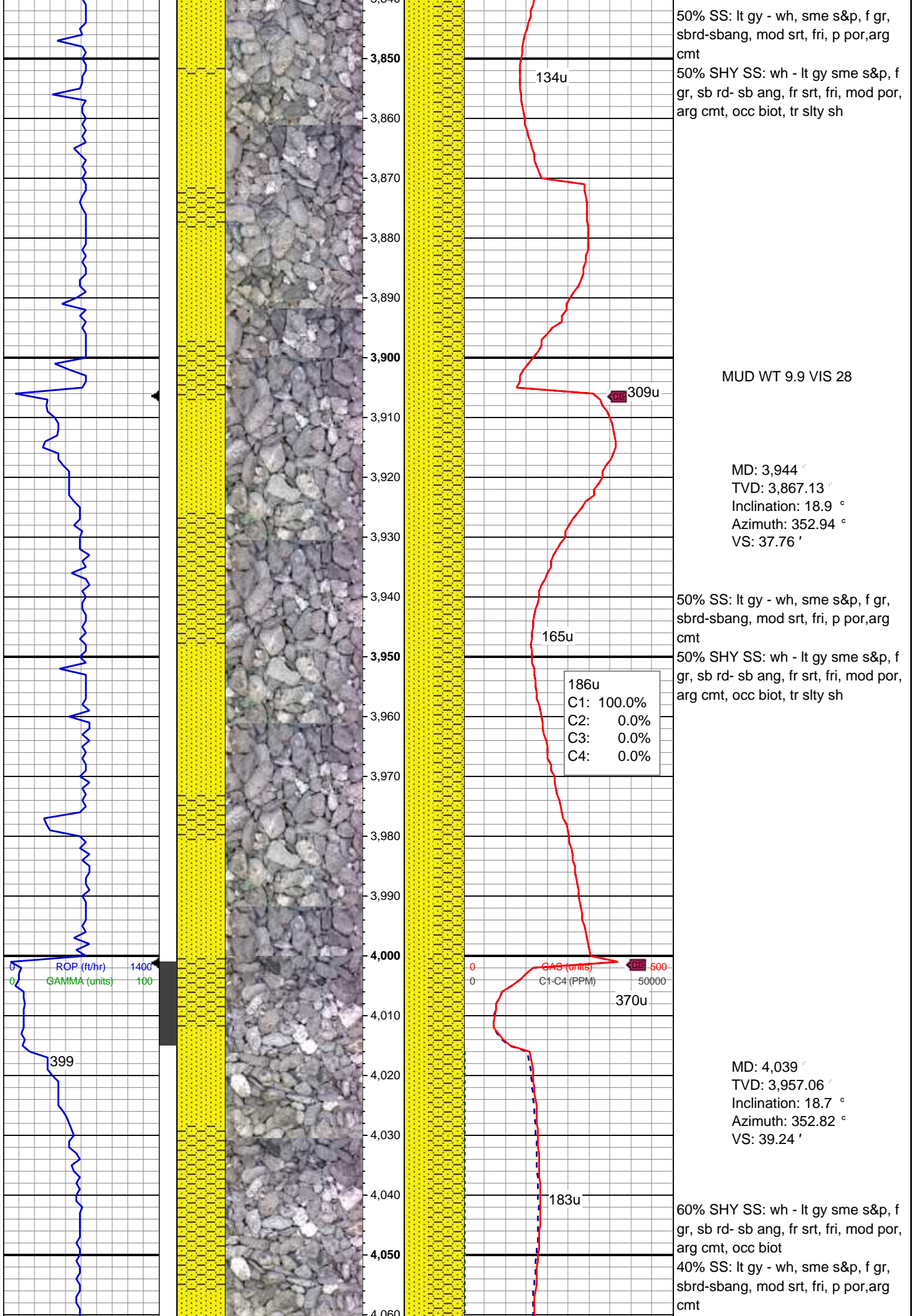
MD: 3,469 '
TVD: 3,410.43 '
Inclination: 14.53 °
Azimuth: 353.48 °
VS: 28.65 '

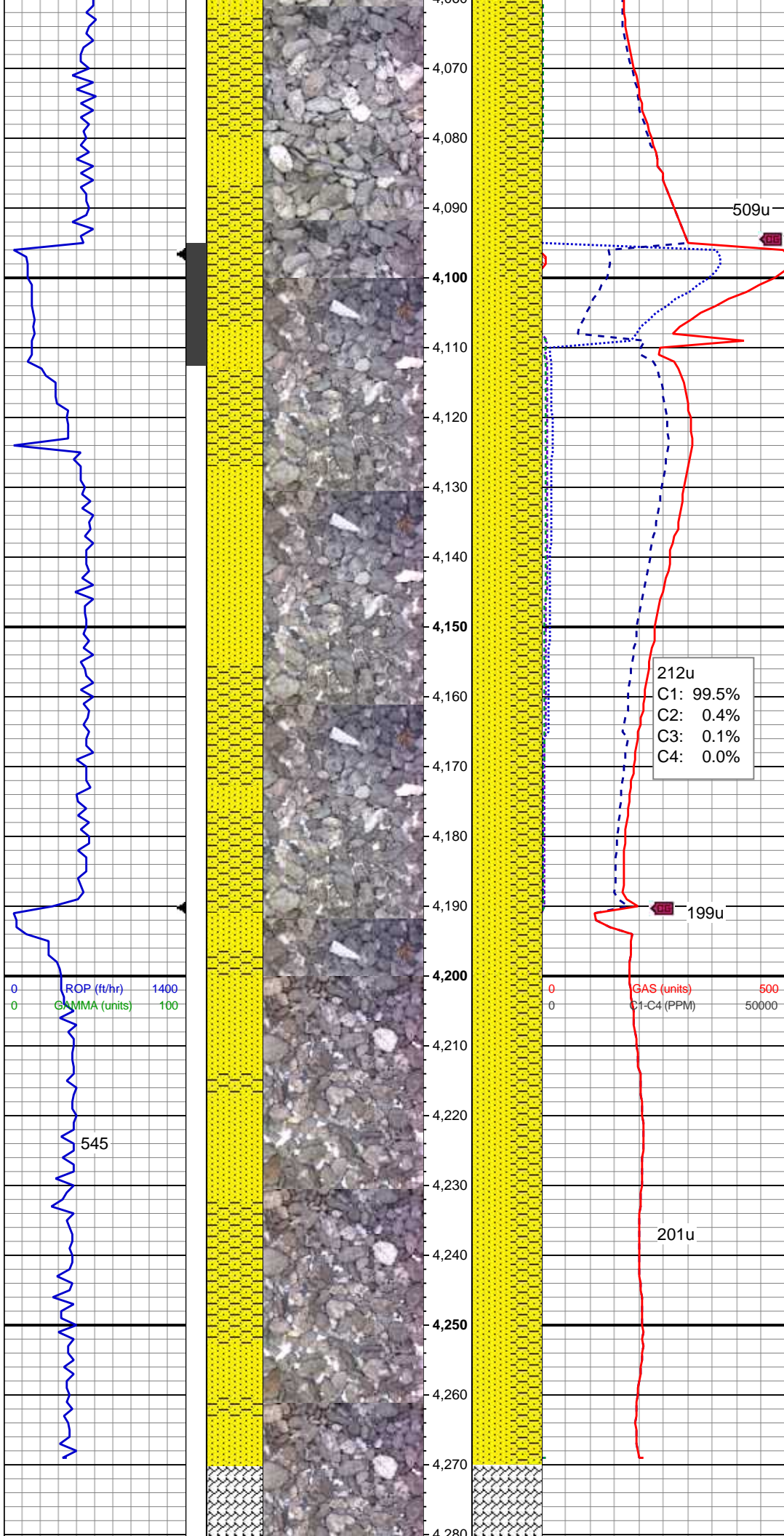
60% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot
40% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por, arg
cmt

MD: 3,564 '
TVD: 3,502.43 '
Inclination: 14.35 °
Azimuth: 357.37 °
VS: 30.83 '

MUD WT 8.9 VIS 28







MD: 4,134 '
TVD: 4,047.46 '
Inclination: 17.08 °
Azimuth: 351.36 °
VS: 40.26 '

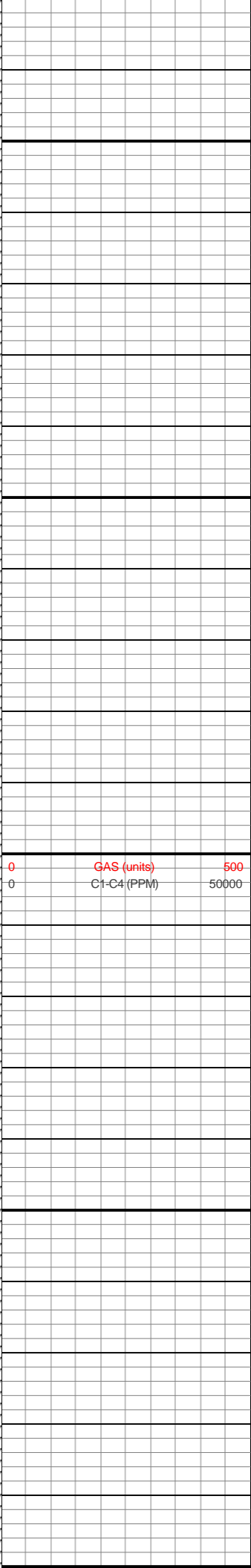
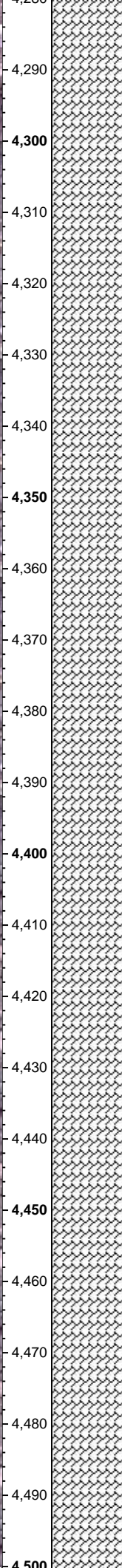
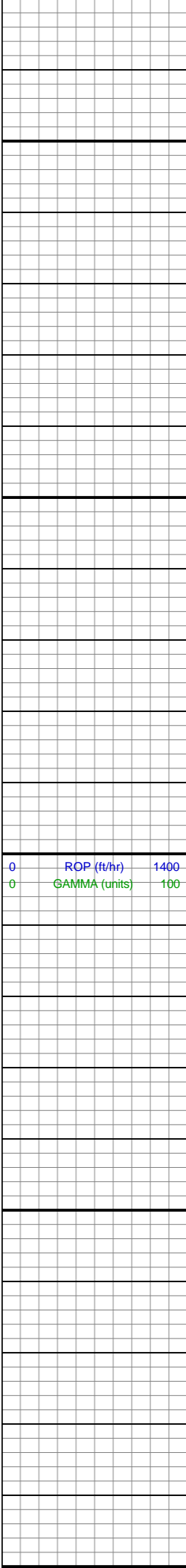
55% SS: lt gy - wh, sme s&p, f gr, sb rd-sbang, mod srt, fri, p por, arg cmt
45% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot

MUD WT 8.9 VIS 28

MUD WT 8.9 VIS 28

MD: 4,229 '
TVD: 4,138.36 '
Inclination: 16.7 °
Azimuth: 352.47 °
VS: 41.12 '

LOSS OF DATA DUE TO EXTENDED POWER OUTAGE TO FIX TRAILERS



MD: 4,323 '
TVD: 4,228.55 '
Inclination: 16.05 °
Azimuth: 352.6 °
VS: 42.24 '

LOSS OF DATA DUE TO
EXTENDED POWER OUTAGE TO
FIX TRAILERS

MD: 4,418 '
TVD: 4,320.11 '
Inclination: 14.84 °
Azimuth: 351.8 °
VS: 43.16 '

LOSS OF DATA DUE TO
EXTENDED POWER OUTAGE TO
FIX TRAILERS

MD: 4,513 '
TVD: 4,412.12 '
Inclination: 14 °
Azimuth: 353.52 °
VS: 44.2 '

LOSS OF DATA DUE TO
EXTENDED POWER OUTAGE TO
FIX TRAILERS

MD: 4,608 '
TVD: 4,504.5 '
Inclination: 13 °
Azimuth: 350.87 °
VS: 45.02 '

LOSS OF DATA DUE TO
EXTENDED POWER OUTAGE TO
FIX TRAILERS

MD: 4,703 '
TVD: 4,597.43 '
Inclination: 10.96 °
Azimuth: 351.38 °
VS: 45.36 '

ROP (ft/hr) 1400
GAMMA (units) 100

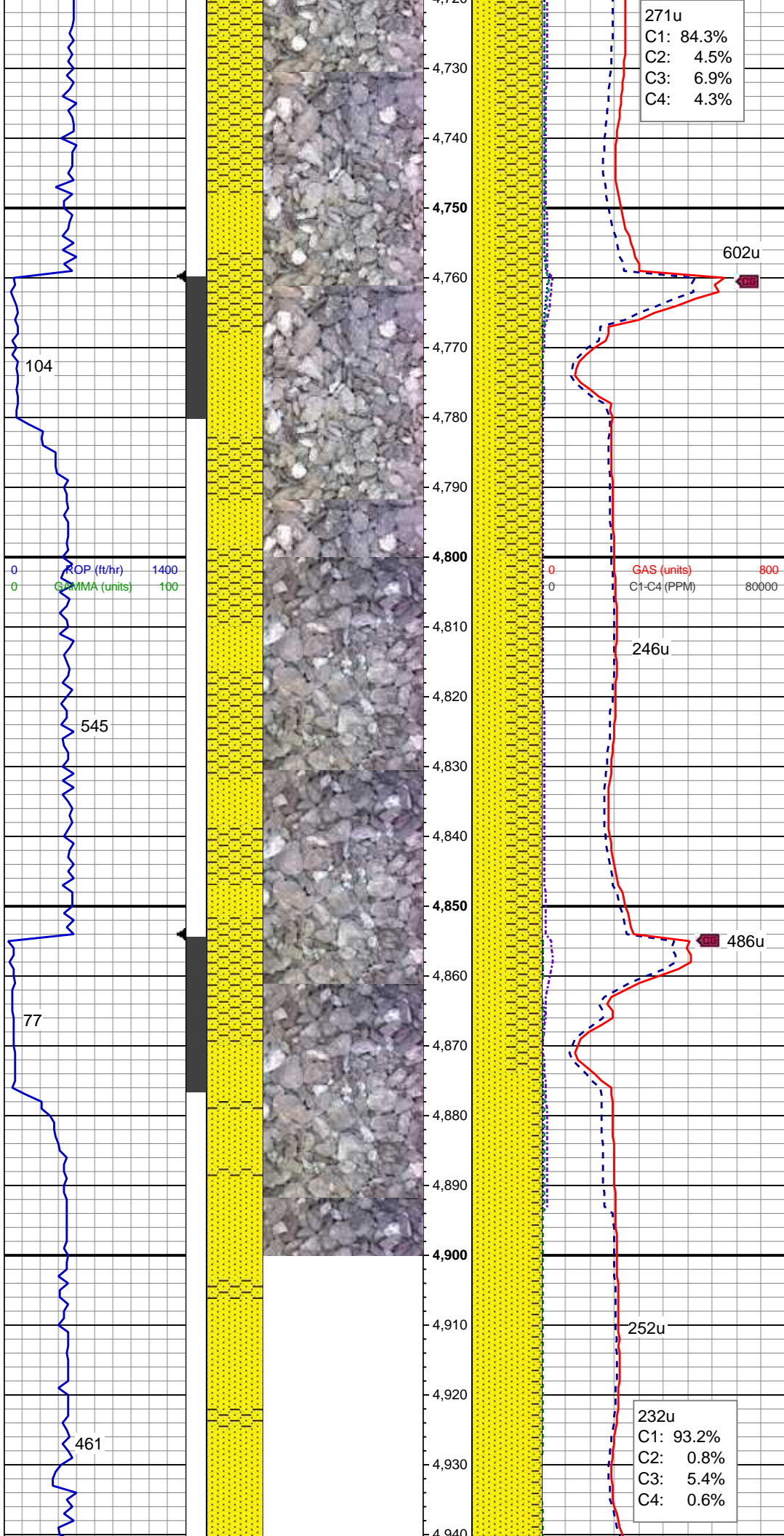
GAS (units) 800
C1-C4 (PPM) 80000

GAS SCALE
CHANGE

507u

545

277u



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

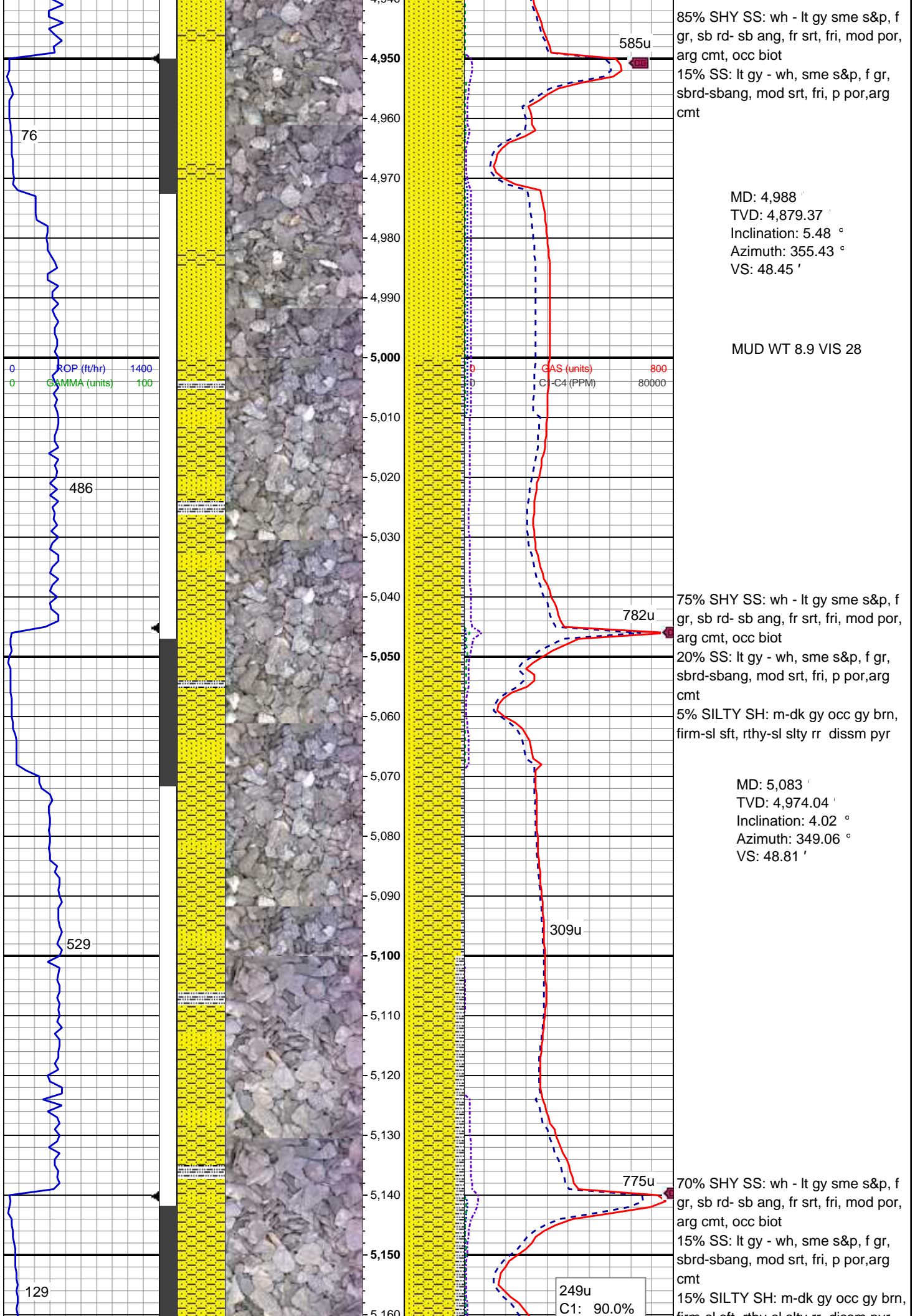
MD: 4,798 '
TVD: 4,691.01 '
Inclination: 8.81 °
Azimuth: 351.54 °
VS: 45.74 '

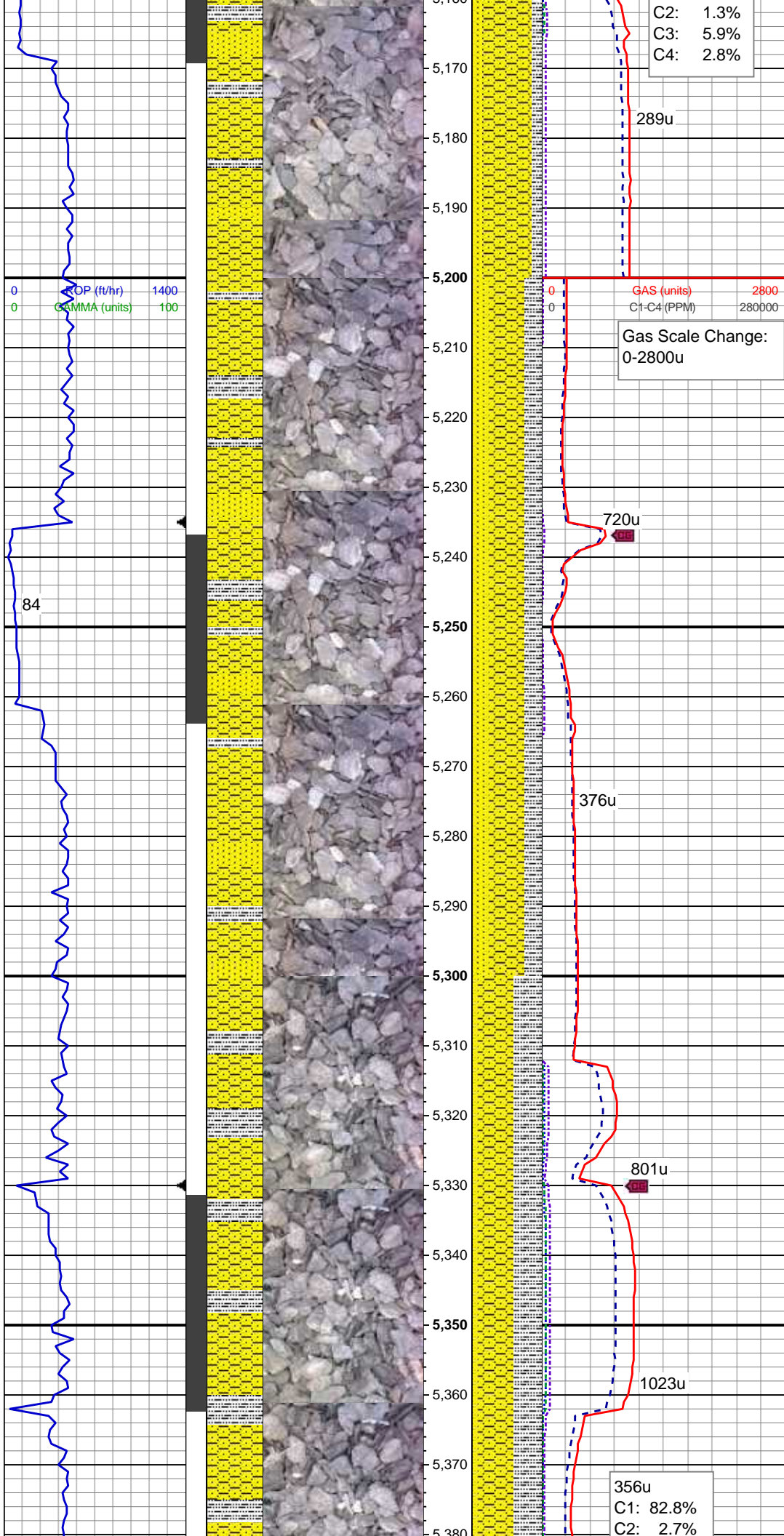
MUD WT 9.0 VIS 28

50% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot
50% SS: lt gy - wh, sme s&p, f gr,
sbrd-sbang, mod srt, fri, p por, arg
cmt

MD: 4,893 '
TVD: 4,785.01 '
Inclination: 7.81 °
Azimuth: 359.53 °
VS: 46.97 '

232u
C1: 93.2%
C2: 0.8%
C3: 5.4%
C4: 0.6%





C2: 1.3%
C3: 5.9%
C4: 2.8%

MD: 5,178 '
TVD: 5,068.88 '
Inclination: 2.96 °
Azimuth: 313.74 °
VS: 47.29 '

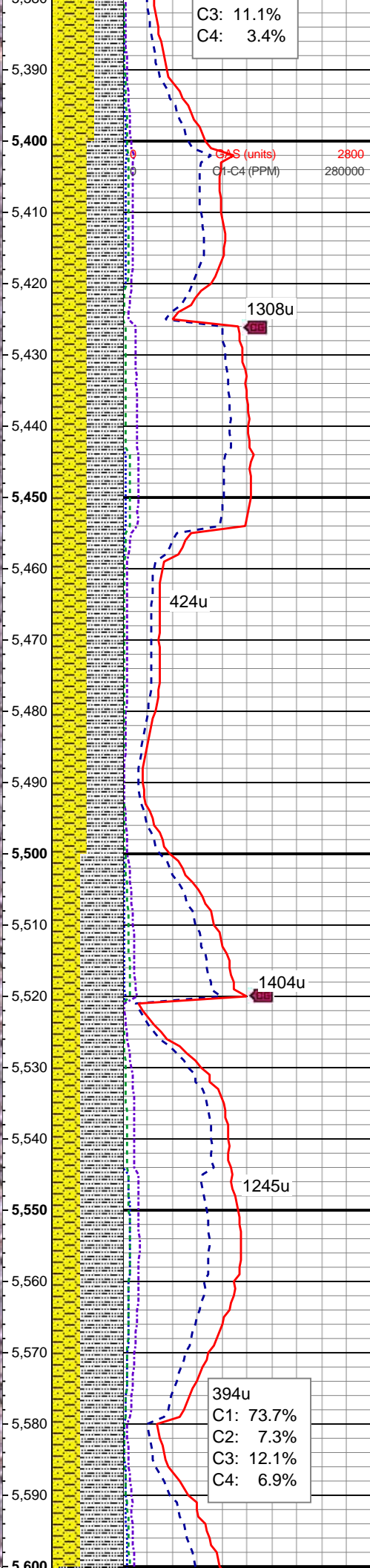
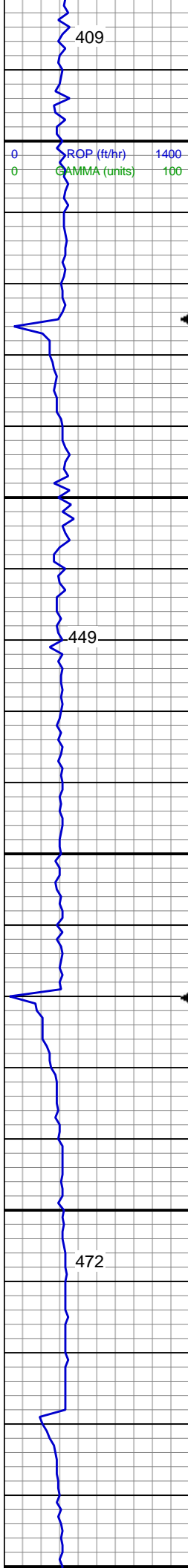
MUD WT 8.9 VIS 28

50% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot
25% SS: lt gy - wh, sme s&p, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt
25% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty rr dissim pyr

MD: 5,273 '
TVD: 5,163.8 '
Inclination: 1.6 °
Azimuth: 311.87 °
VS: 45.02 '

50% SHY SS: wh - lt gy sme s&p, f gr, sb rd- sb ang, fr srt, fri, mod por, arg cmt, occ biot
40% SILTY SH: m-dk gy occ gy brn, firm-sl sft, rthy-sl slty rr
10% SS: lt gy-wh, f gr, sbrd-sbang, mod srt, fri, p por, arg cmt

MD: 5,368 '
TVD: 5,258.76 '
Inclination: 1.48 °
Azimuth: 294.96 °
VS: 42.12 '



VS: 43.19'

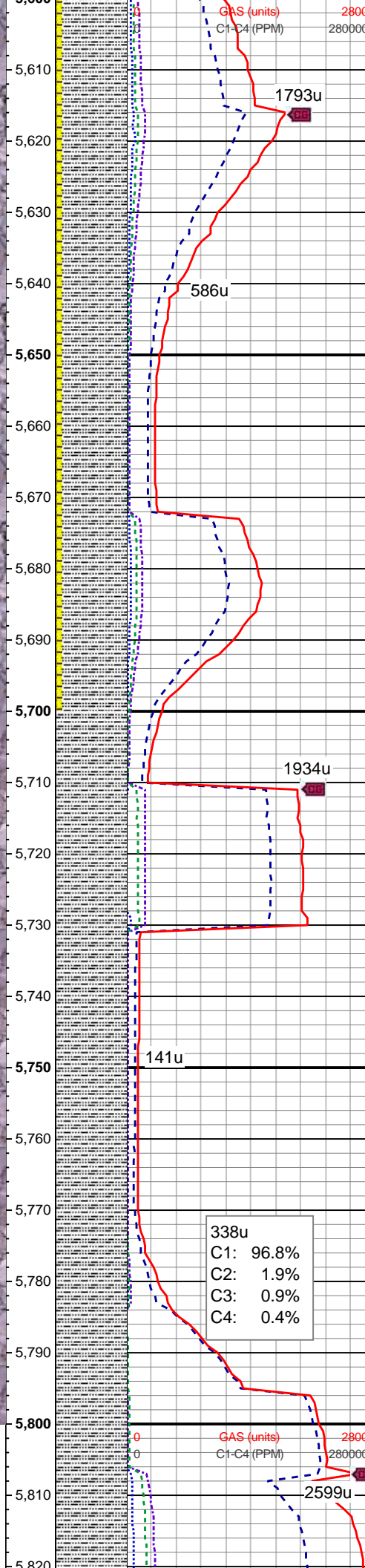
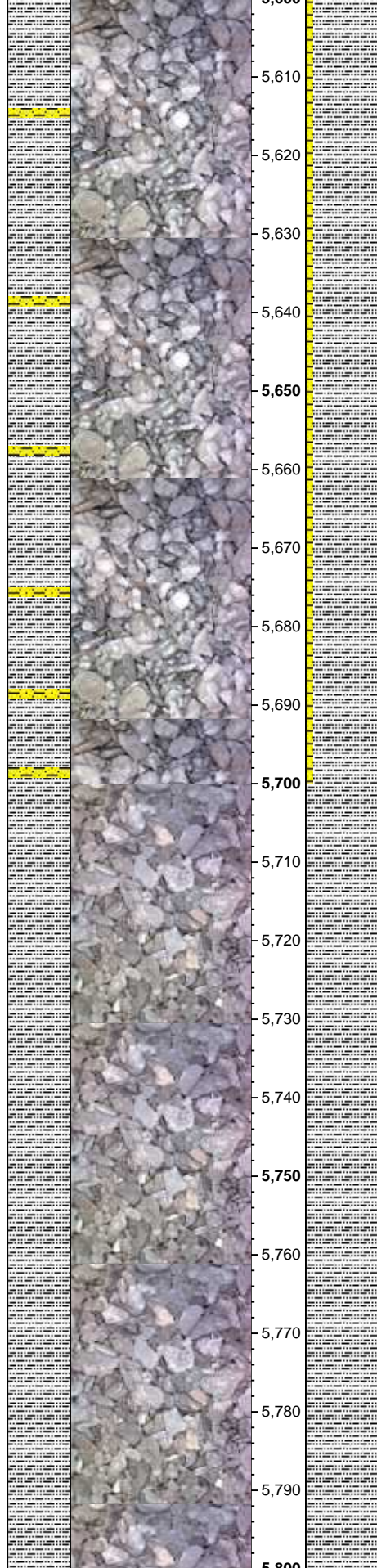
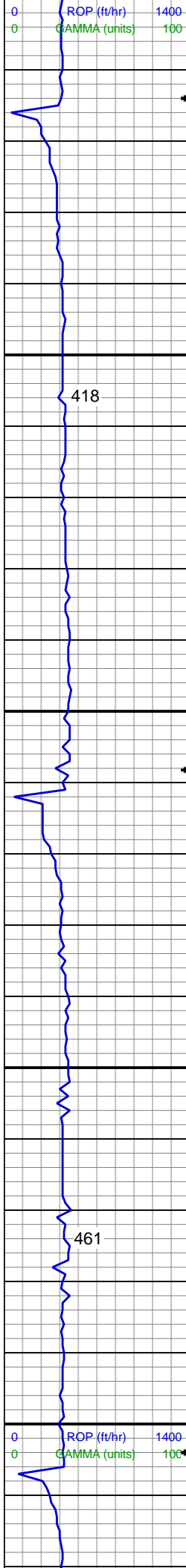
50% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot
50% SILTY SH: m-dk gy occ gy brn,
firm-sl sft, rthy-sl slty rr

MD: 5,463'
TVD: 5,353.75'
Inclination: 0.32°
Azimuth: 356.45°
VS: 42.21'

MUD WT 8.9 VIS 28

60% SILTY SH: med-dk gy occ
gy-brn, firm-sl sft, rthy-slty
40% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt

MD: 5,557'
TVD: 5,447.75'
Inclination: 0.49°
Azimuth: 156.52°
VS: 42.33'

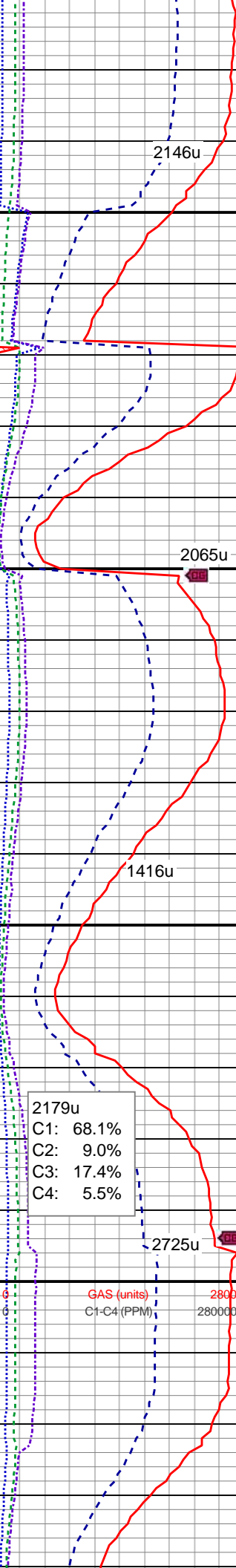
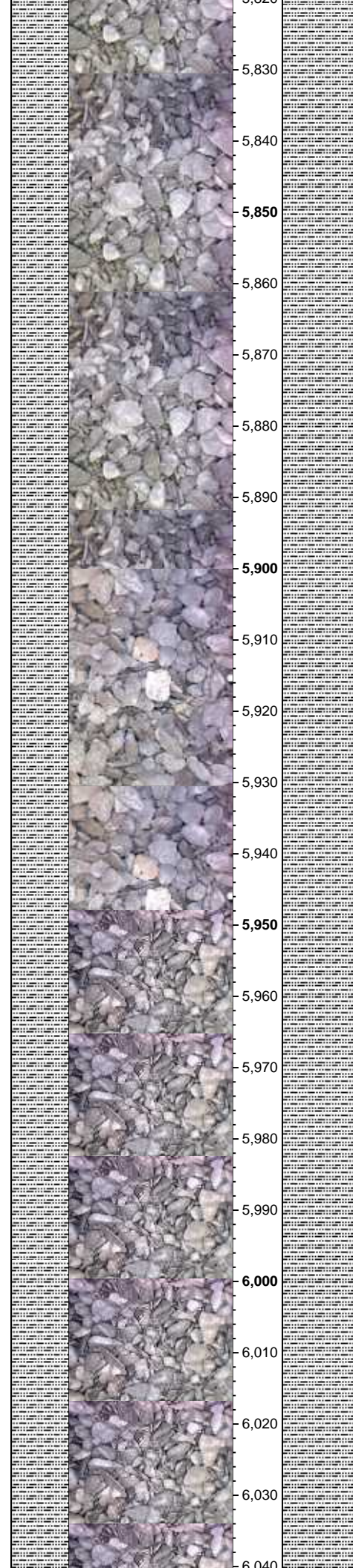
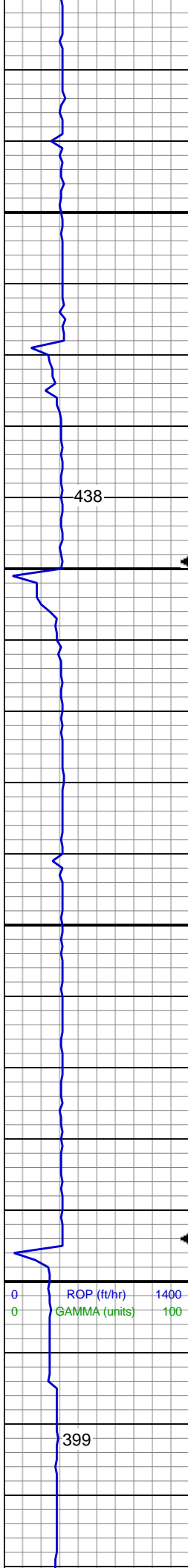


90% SILTY SH: med-dk gy occ
gy-brn, firm-sl sft, rthy-silty
10% SHY SS: wh - lt gy sme s&p, f
gr, sb rd- sb ang, fr srt, fri, mod por,
arg cmt, occ biot

MD: 5,652 '
TVD: 5,542.75 '
Inclination: 0.13 °
Azimuth: 216.85 °
VS: 42.35 '

MD: 5,747 '
TVD: 5,637.75 '
Inclination: 0.71 °
Azimuth: 117.48 °
VS: 42.74 '

100% SILTY SH: med gy - gy, occ dk
gy, mod sft - mod firm, sb plty - sb
blky, shy - silty tex, non calc, tr bent



MD: 5,842 '
TVD: 5,732.74 '
Inclination: 0.96 °
Azimuth: 155.45 °
VS: 43.41 '

100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb plty - sb blkly, shy - sily tex, non calc, tr bent

MD: 5,937 '
TVD: 5,827.73 '
Inclination: 0.86 °
Azimuth: 123.94 °
VS: 44.12 '

100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb plty - sb blkly, shy - sily tex, non calc, tr bent

MD: 5,991 '
TVD: 5,881.72 '
Inclination: 0.94 °
Azimuth: 94.87 °
VS: 44.84 '

100% SILTY SH: med gy - gy, occ dk

08/29/2013

08/29/2013

blky, shy - slty tex, non calc, tr bent

TOOH @ 6048 MD 20:55 hrs
8/28/2013

Log Continued On:WELLS
RANCH USX
AA27-65-1HN(HORZ).Mplot

Thank you for choosing Columbine Logging Inc.