

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Gutterson State DD17-79-1HN (Vert)

Rock Types

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

Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOIPOD
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
FERRUGINOUS
GLAUCONITE
GYPSIFEROUS

HEAVY MINERAL
KAOLIN
MARLSTONE
MICACEOUS
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

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

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

E EARTHY
F FENESTRAL
F FRACTURE
X INTERCRYSTALLINE

ORGANIC
P PINPOINT
V VUGGY

Engineering

BIT CHANGE
CONNECTION (LEFT)
CONNECTION (RIGHT)
CONNECTION GAS
TRIP GAS
DOWN TIME GAS
CORE - LOST

FAULT
FORMATION TOP
GAS SHOW
OIL SHOW
MN DEPTH
MN DEPTH (RIGHT)
NORMAL FAULT
OVERTURNED STRATA
REVERSE FAULT
CASING
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)

DRILL STEM TEST
WIRELINE TESTED - LEFT
WIRELINE TESTED - RT

Rounding

A ANGULAR
R ROUNDED
SUBANG
SUBRND

Textures

BOUNDSTONE

E EARTHY
FX FINELYXLN
GS GRAINSTONE
L LITHOGRAPHIC
MX MICROXLN
MS MUDSTONE
PS PACKSTONE
WS WACKESTONE

Sorting

M MODERATE
P POOR

INTEROOLITIC

MOLDIC

CORE - RECOVERED

DST INTERVAL

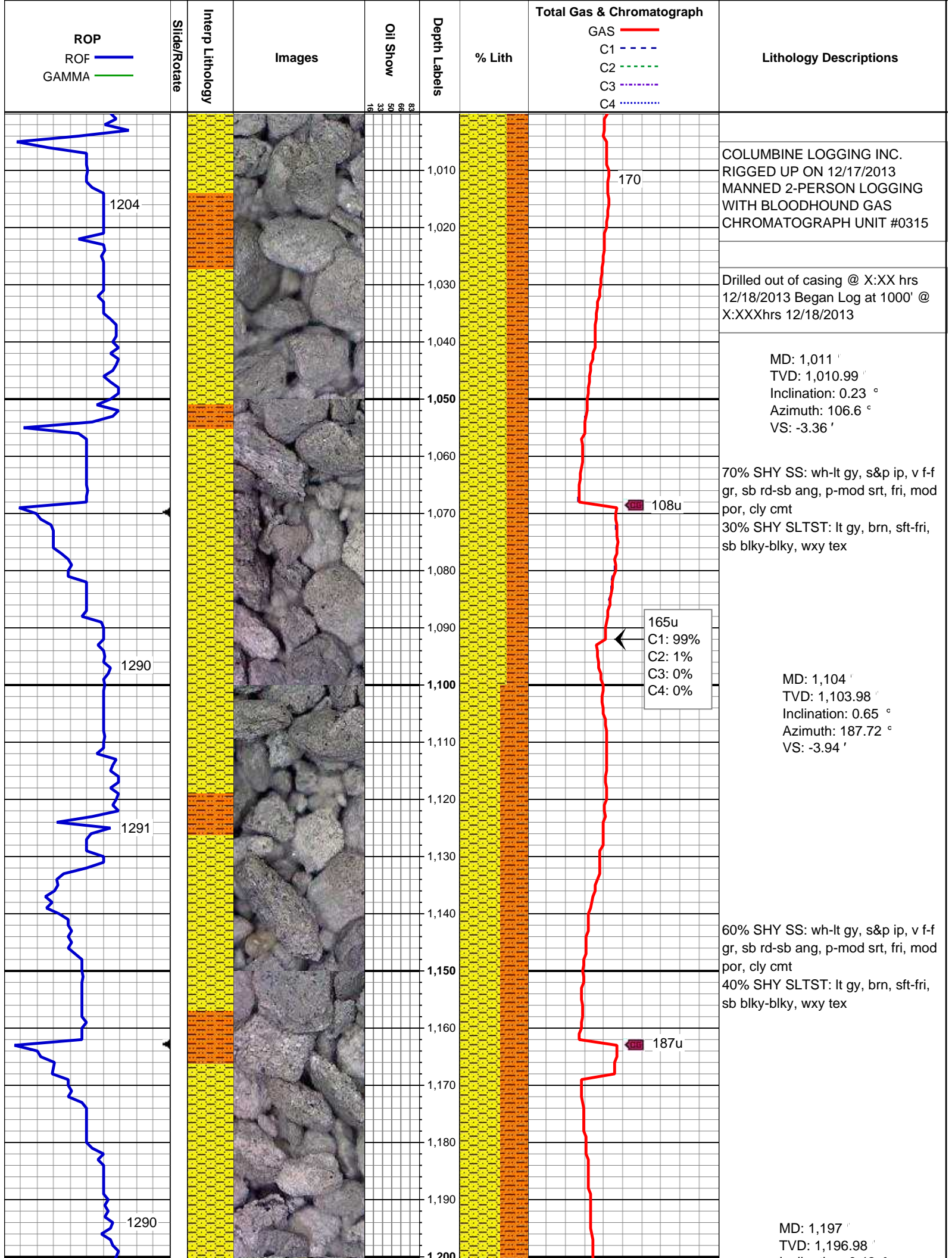
SLIDE

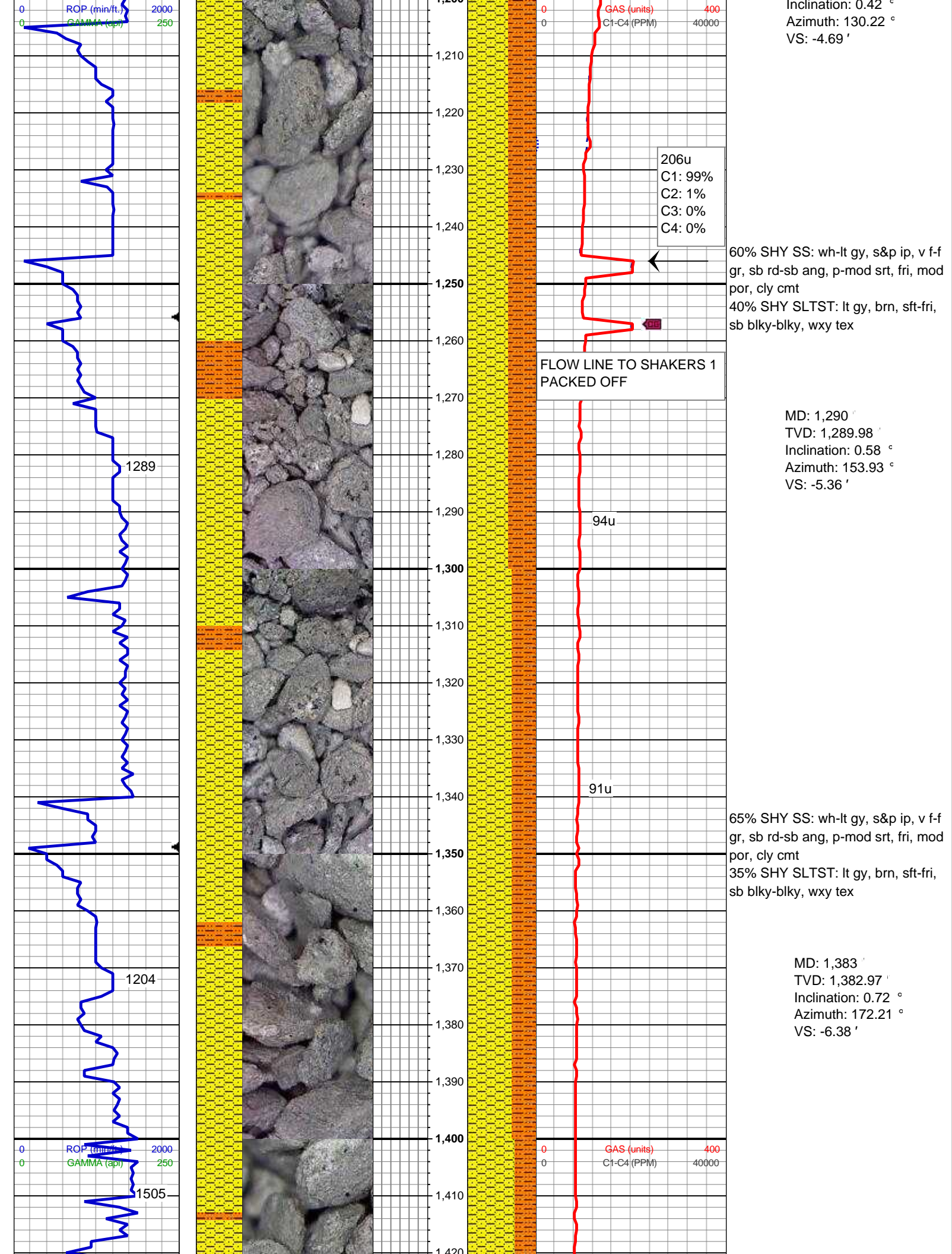
SURVEY

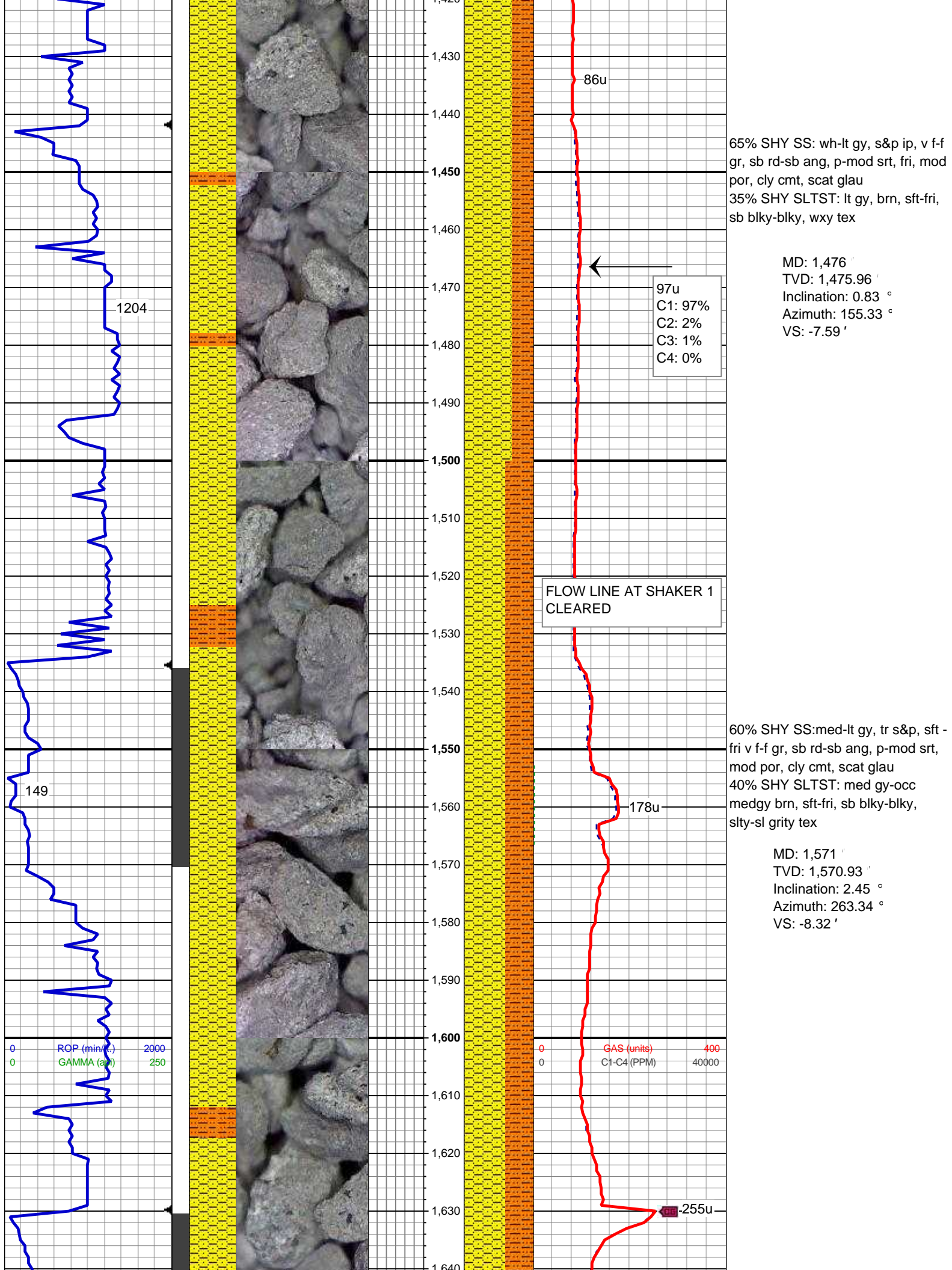
CHALKY

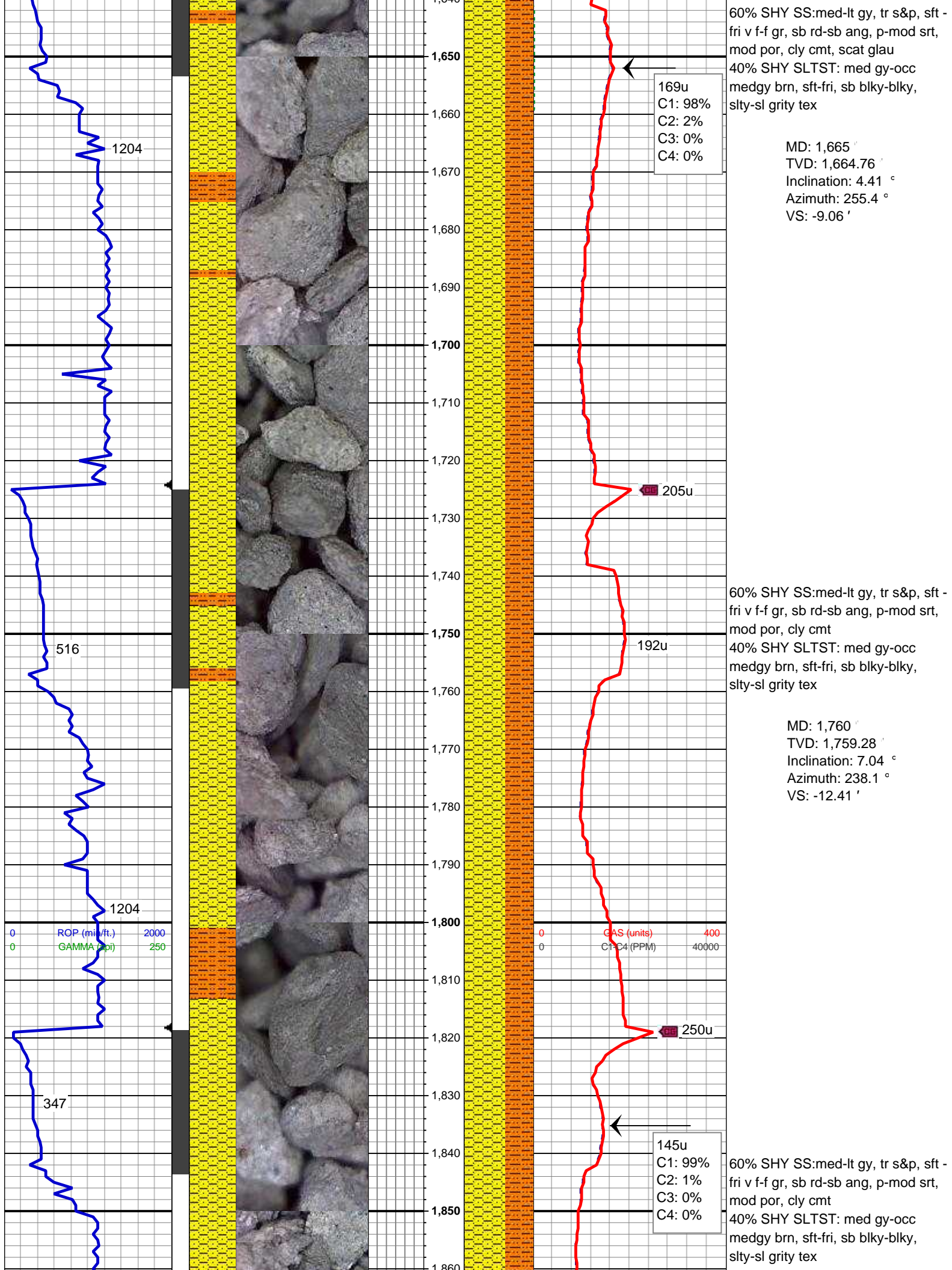
CRYPTOXLN

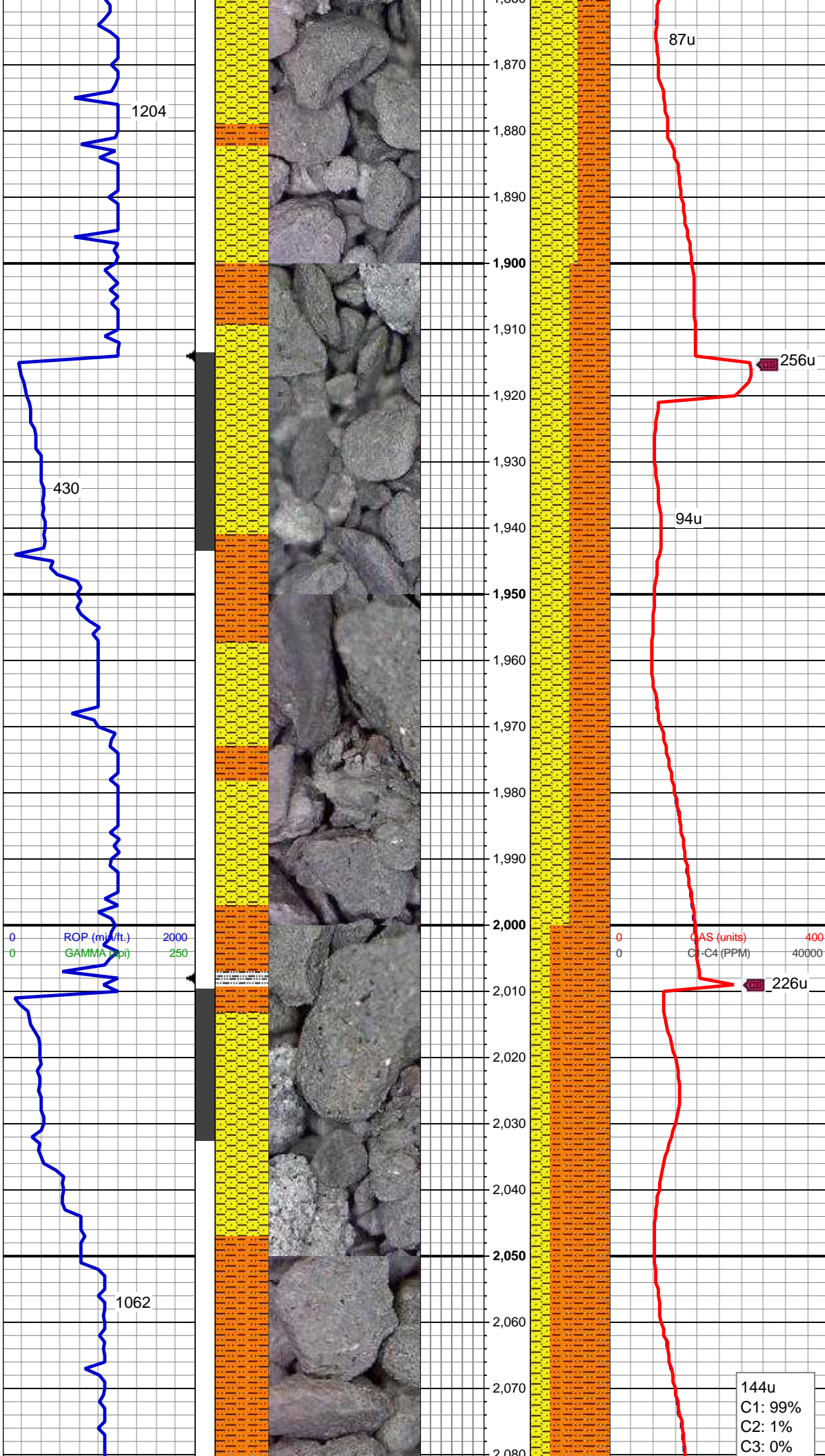
WELL











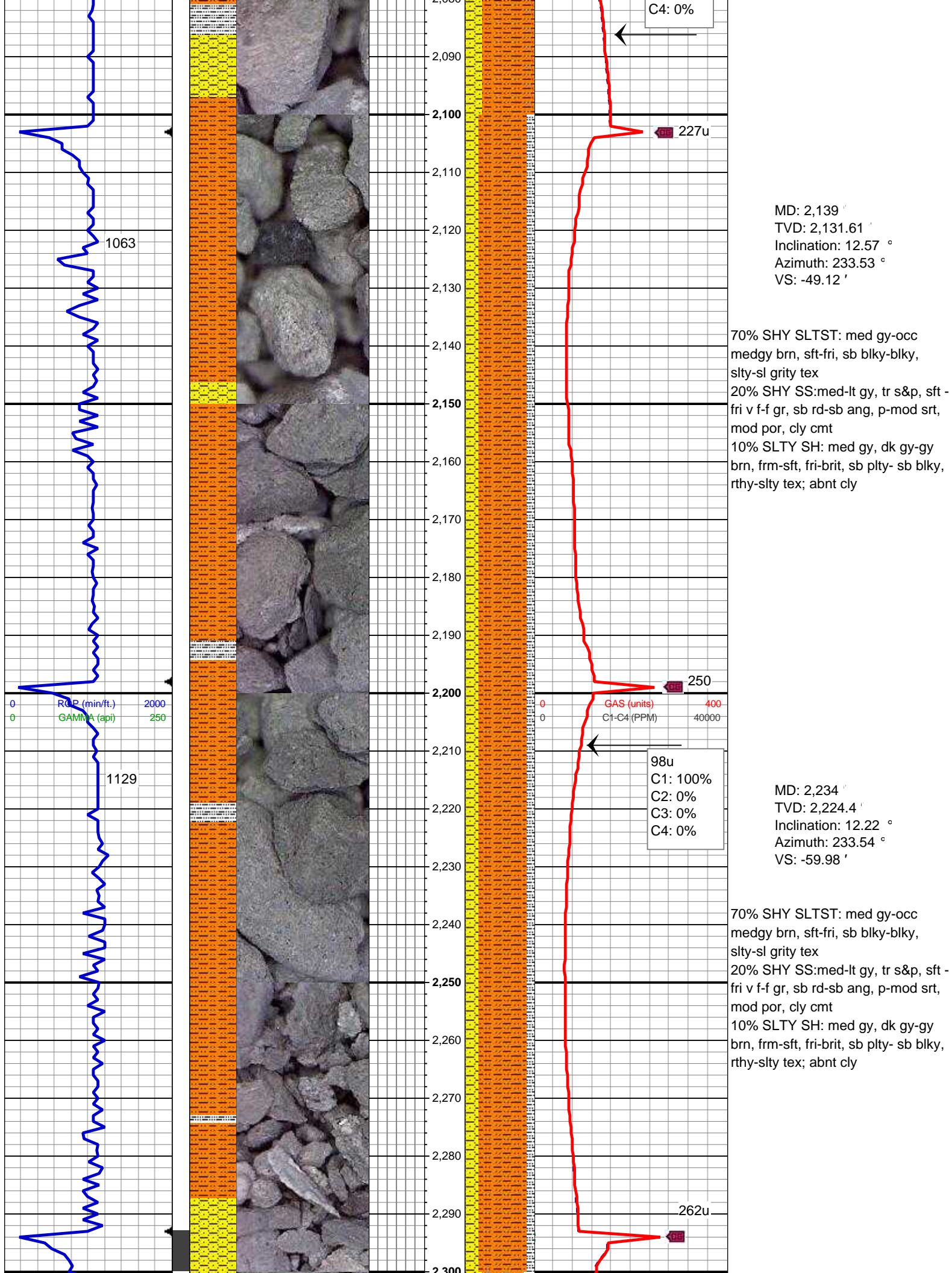
MD: 1,855 '
TVD: 1,853.35 '
Inclination: 9.04 °
Azimuth: 232.9 °
VS: -19.16 '

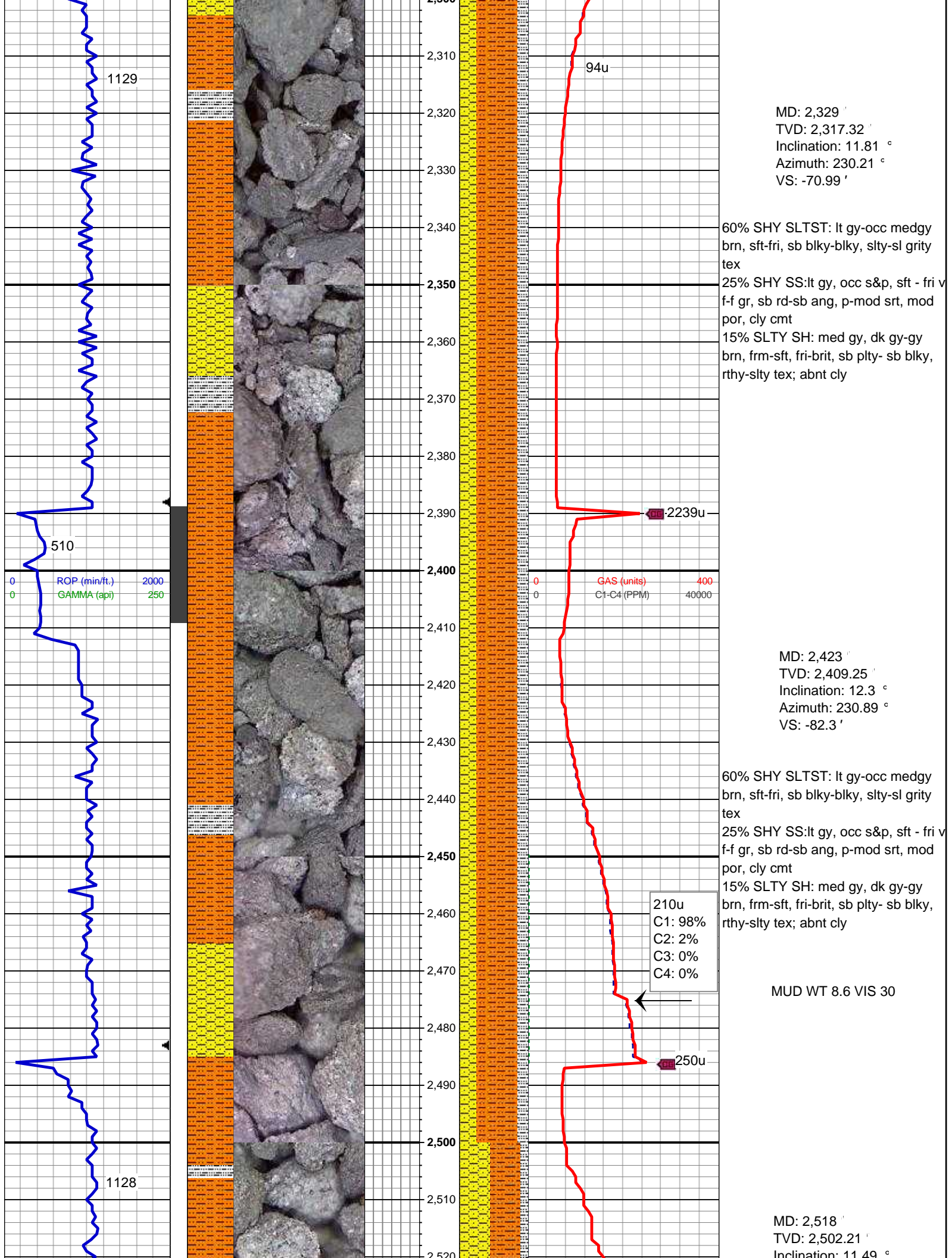
50% SHY SS: med-lt gy, tr s&p, sft - fri v f-f gr, sb rd-sb ang, p-mod srt, mod por, cly cmt
50% SHY SLTST: med gy-occ medgy brn, sft-fri, sb blkly-blky, slty-sl grity tex

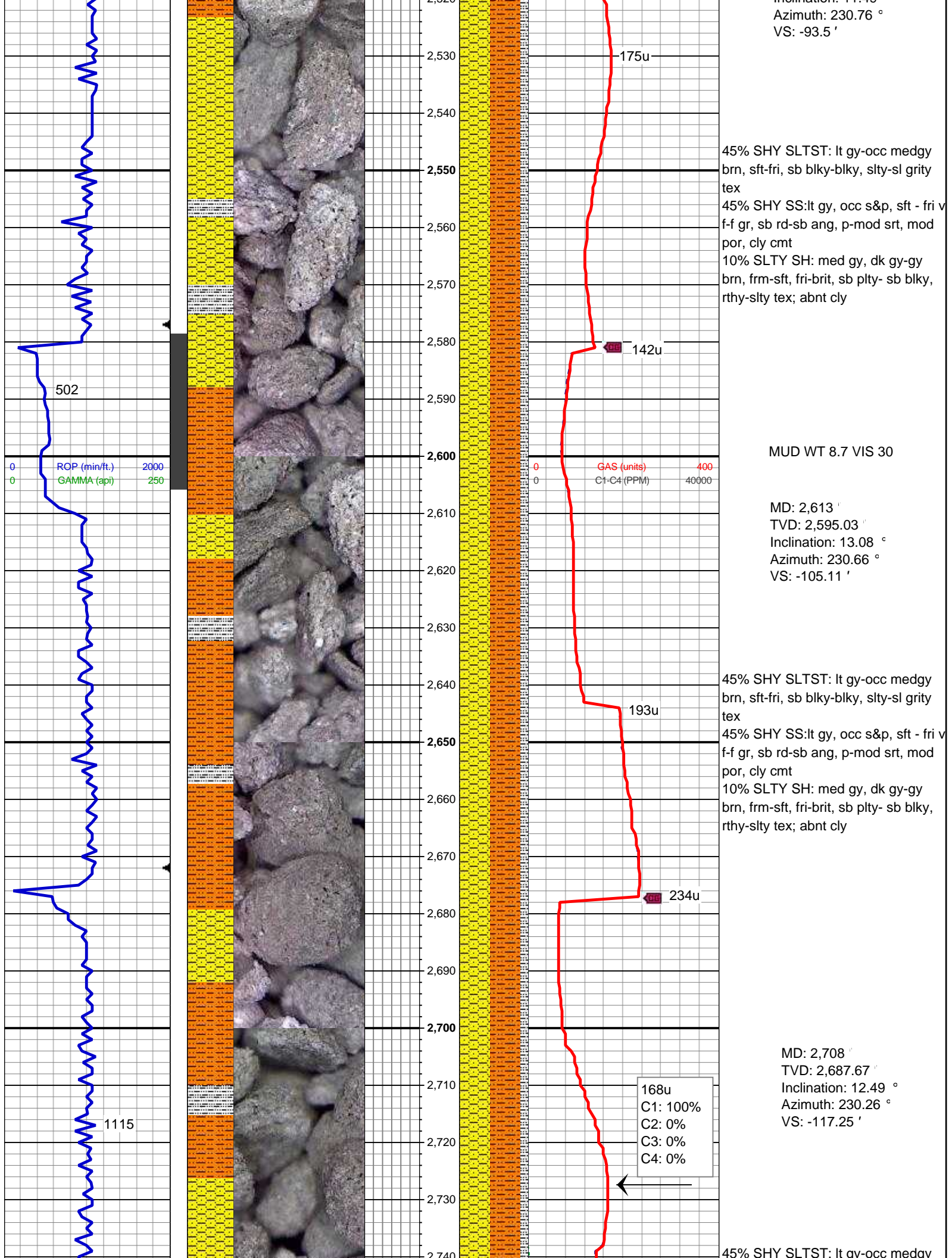
MD: 1,950 '
TVD: 1,946.92 '
Inclination: 10.82 °
Azimuth: 234.9 °
VS: -27.78 '

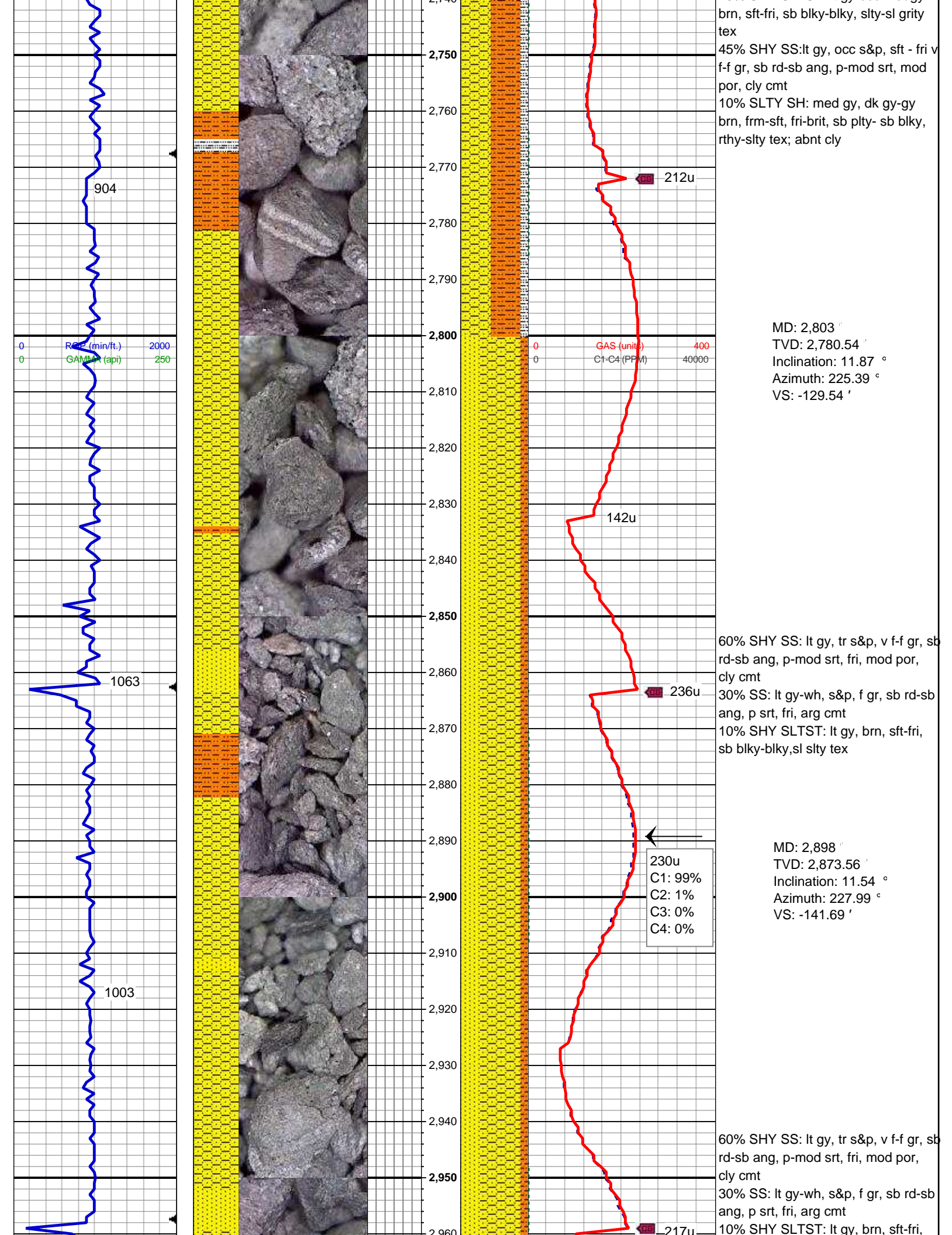
MD: 2,044 '
TVD: 2,038.93 '
Inclination: 12.79 °
Azimuth: 233 °
VS: -37.92 '

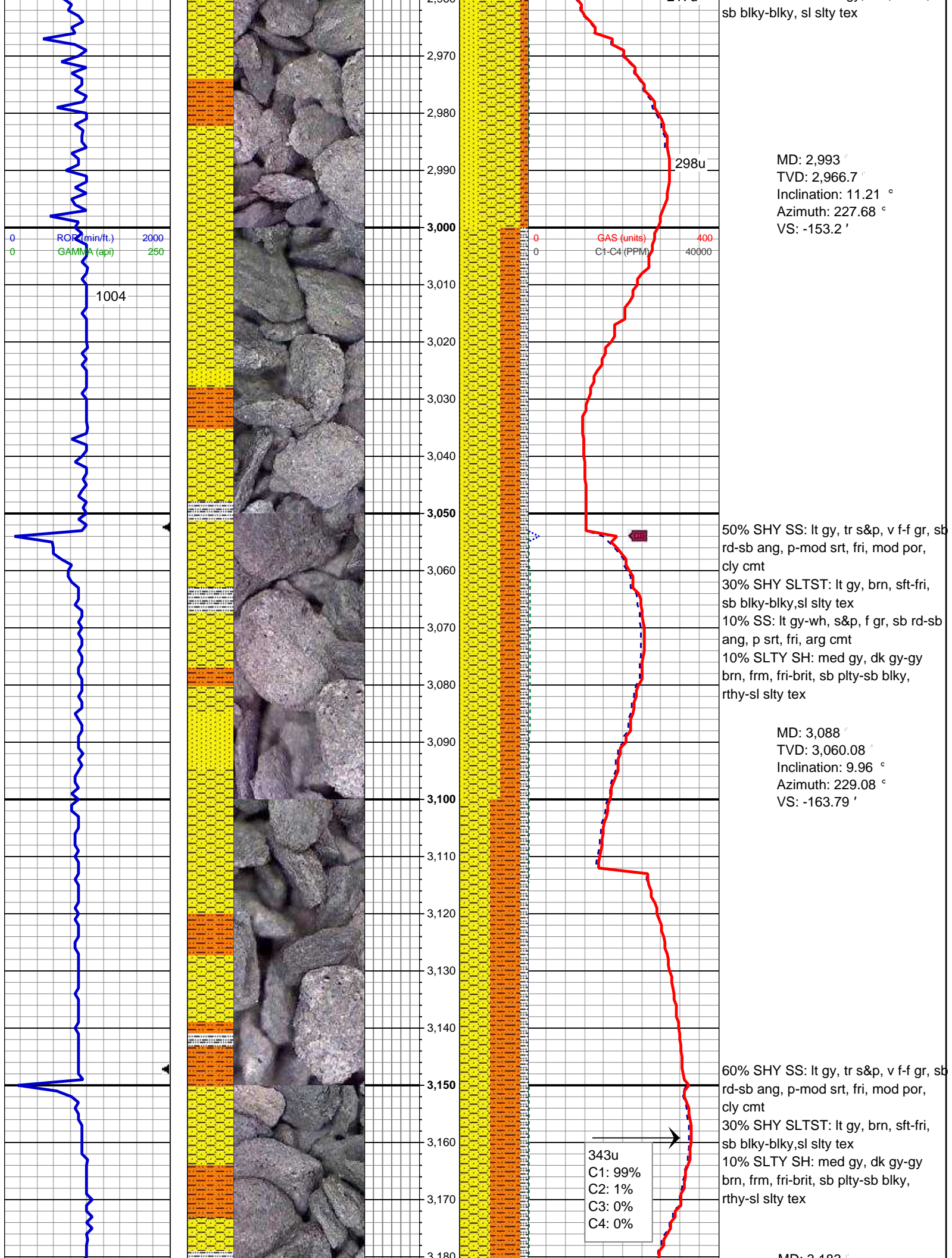
75% SHY SLTST: med gy-occ medgy brn, sft-fri, sb blkly-blky, slty-sl grity tex
25% SHY SS: med-lt gy, tr s&p, sft - fri v f-f gr, sb rd-sb ang, p-mod srt, mod por, cly cmt; abnt cly

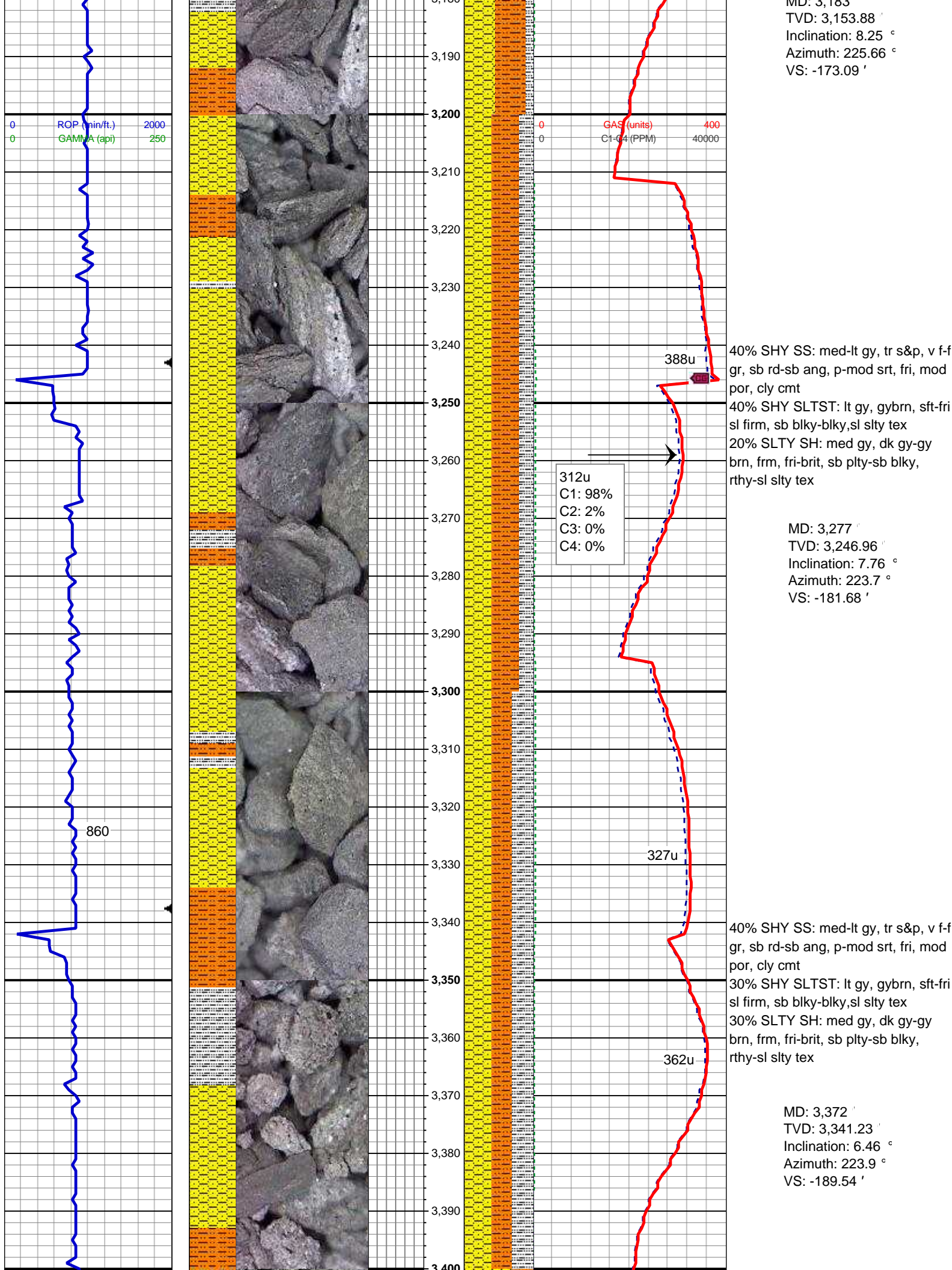


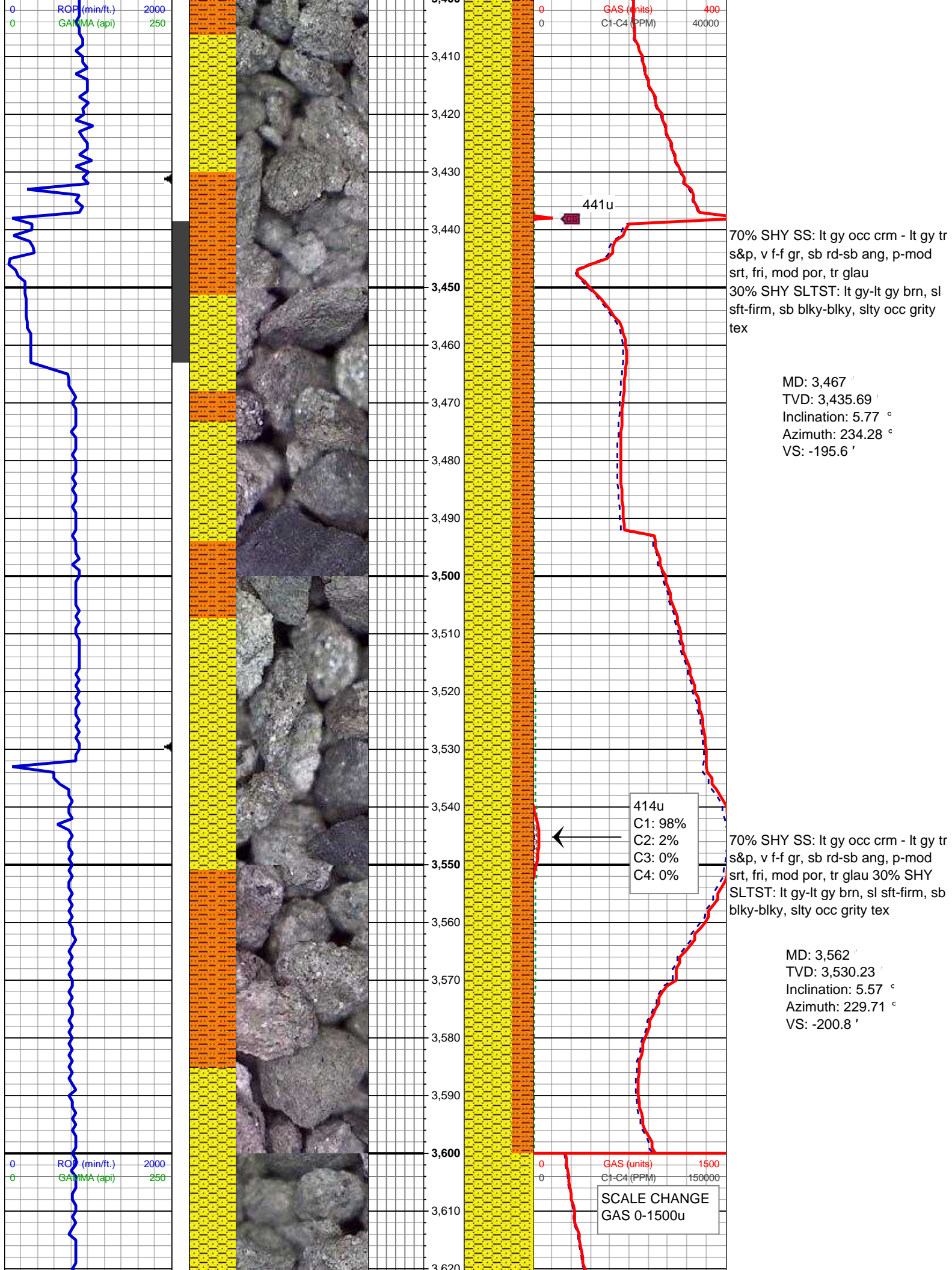


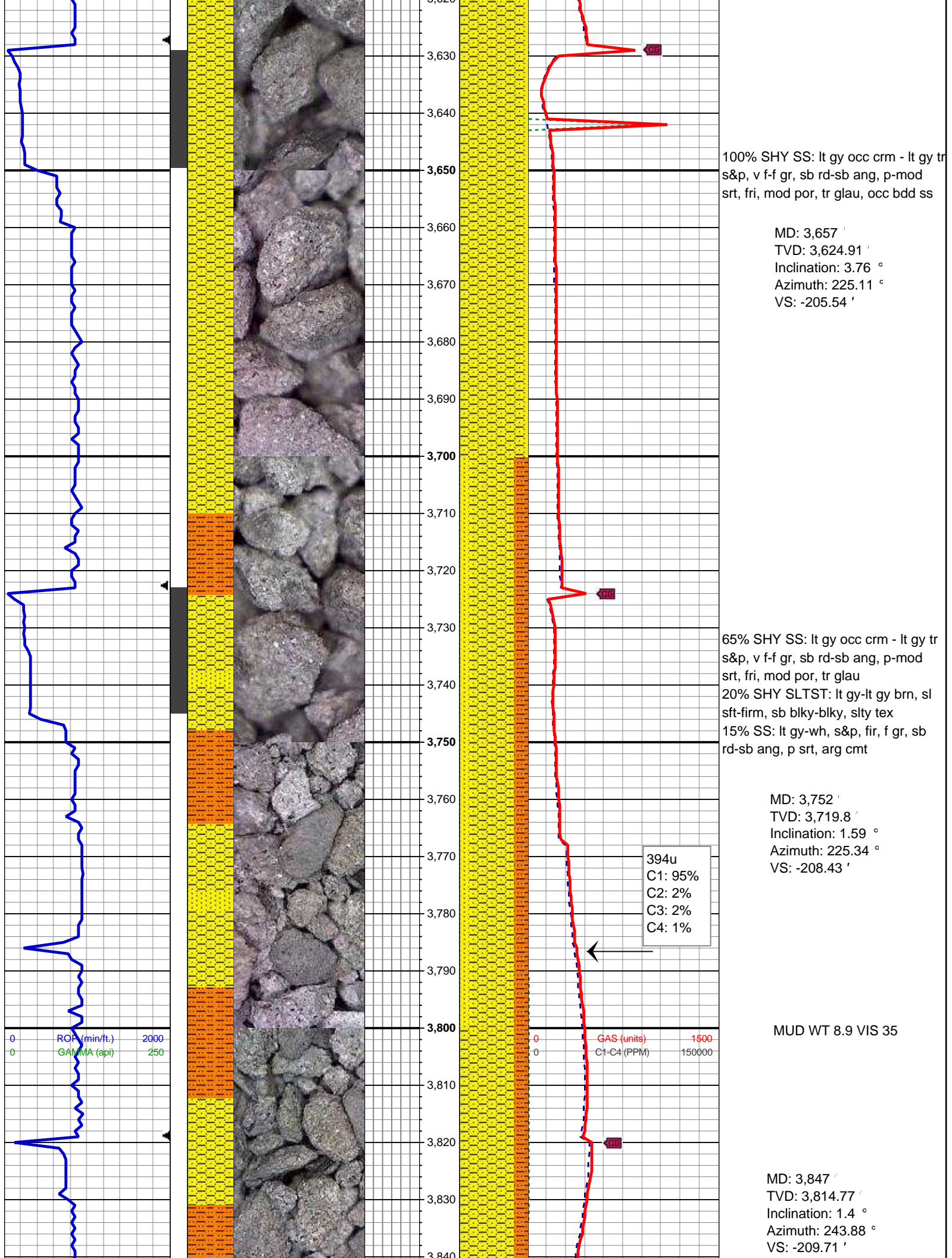


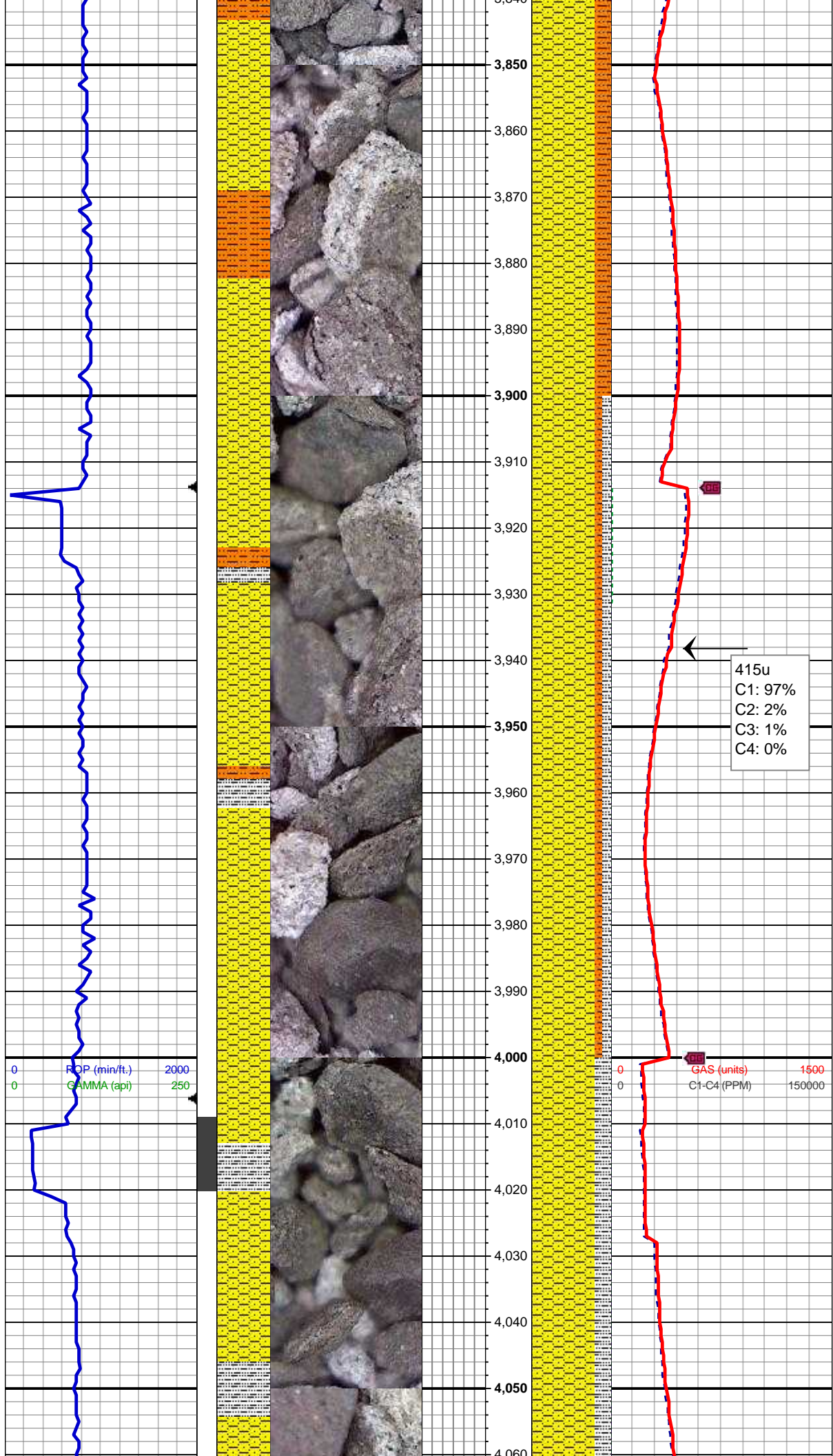












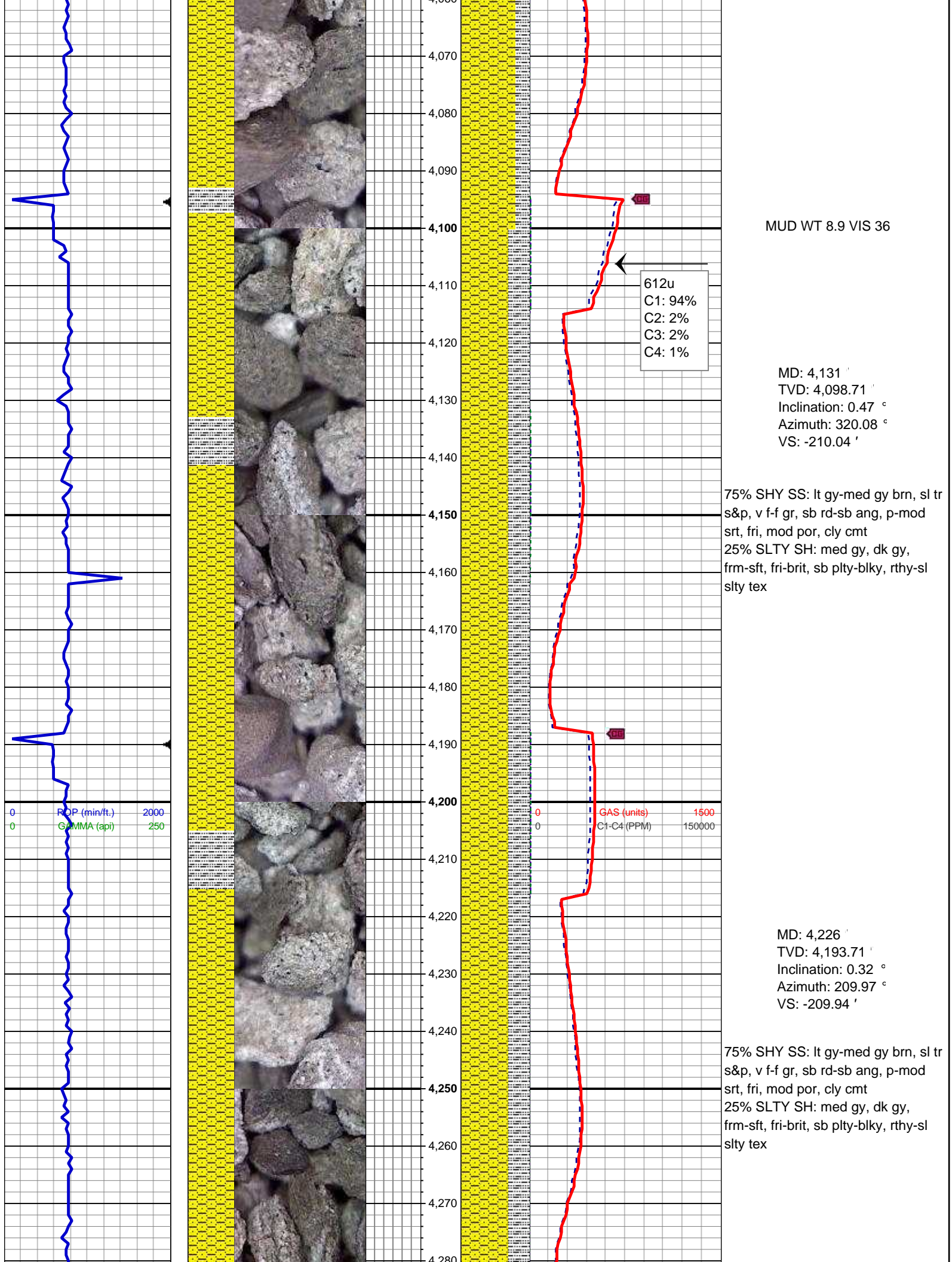
80% SHY SS: lt gy occ crm - lt gy tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, tr glau
20% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blkly-blky, slty tex

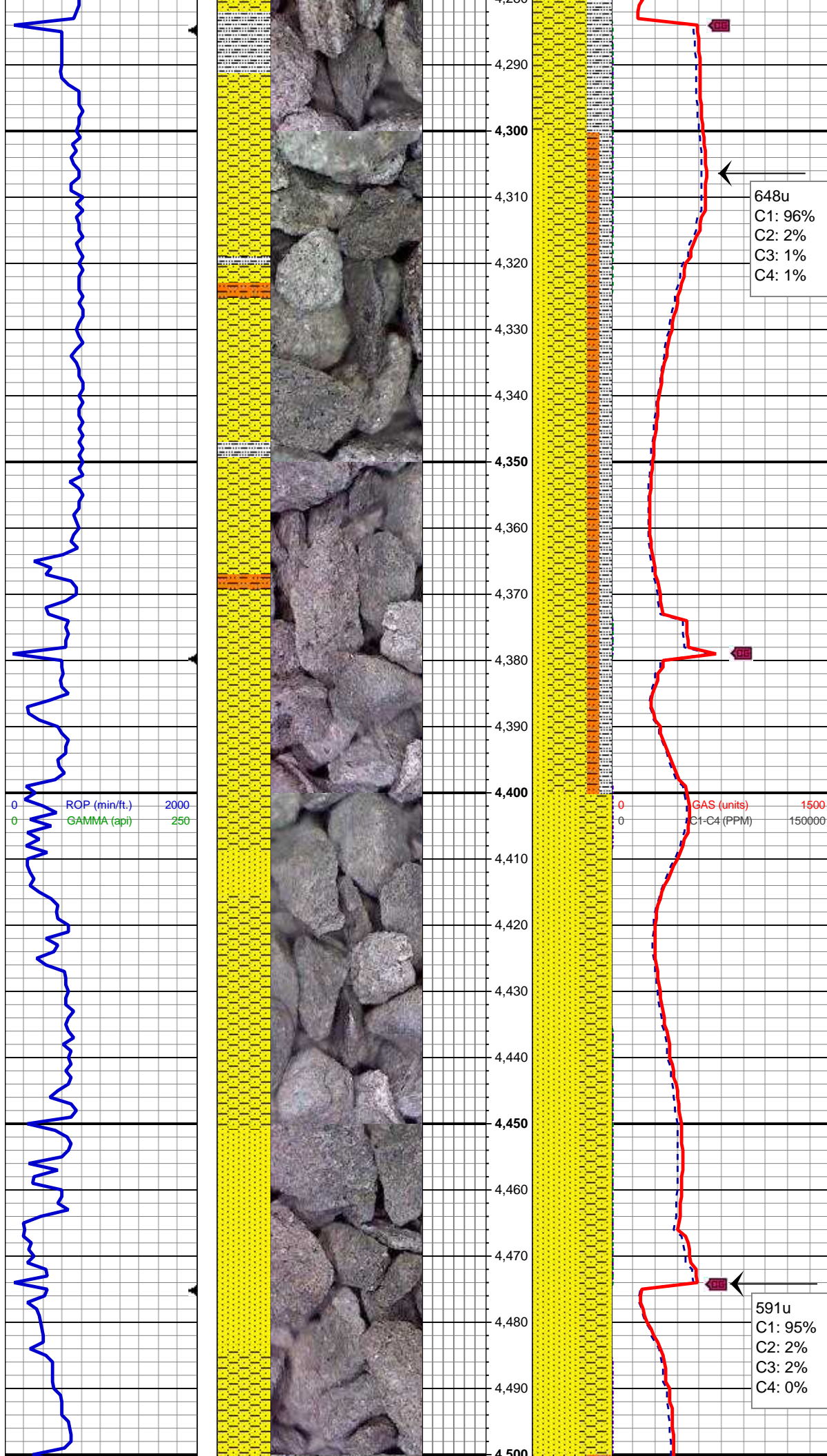
MD: 3,941 '
TVD: 3,908.74 '
Inclination: 1.54 °
Azimuth: 235.21 °
VS: -210.78 '

80% SHY SS: lt gy occ crm - lt gy tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, tr glau
10% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blkly-blky, slty tex
10% SLTY SH: med gy, dk gy-gy
brn, frm, fri-brit, sb plty-sb blkly,
rthy-sl slty tex

MD: 4,036 '
TVD: 4,003.72 '
Inclination: 0.96 °
Azimuth: 308.48 °
VS: -210.89 '

80% SHY SS: lt gy-med gy brn, sl tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, cly cmt
20% SLTY SH: med gy, dk gy,
frm-sft, fri-brit, sb plty-blky, rthy-sl
slty tex



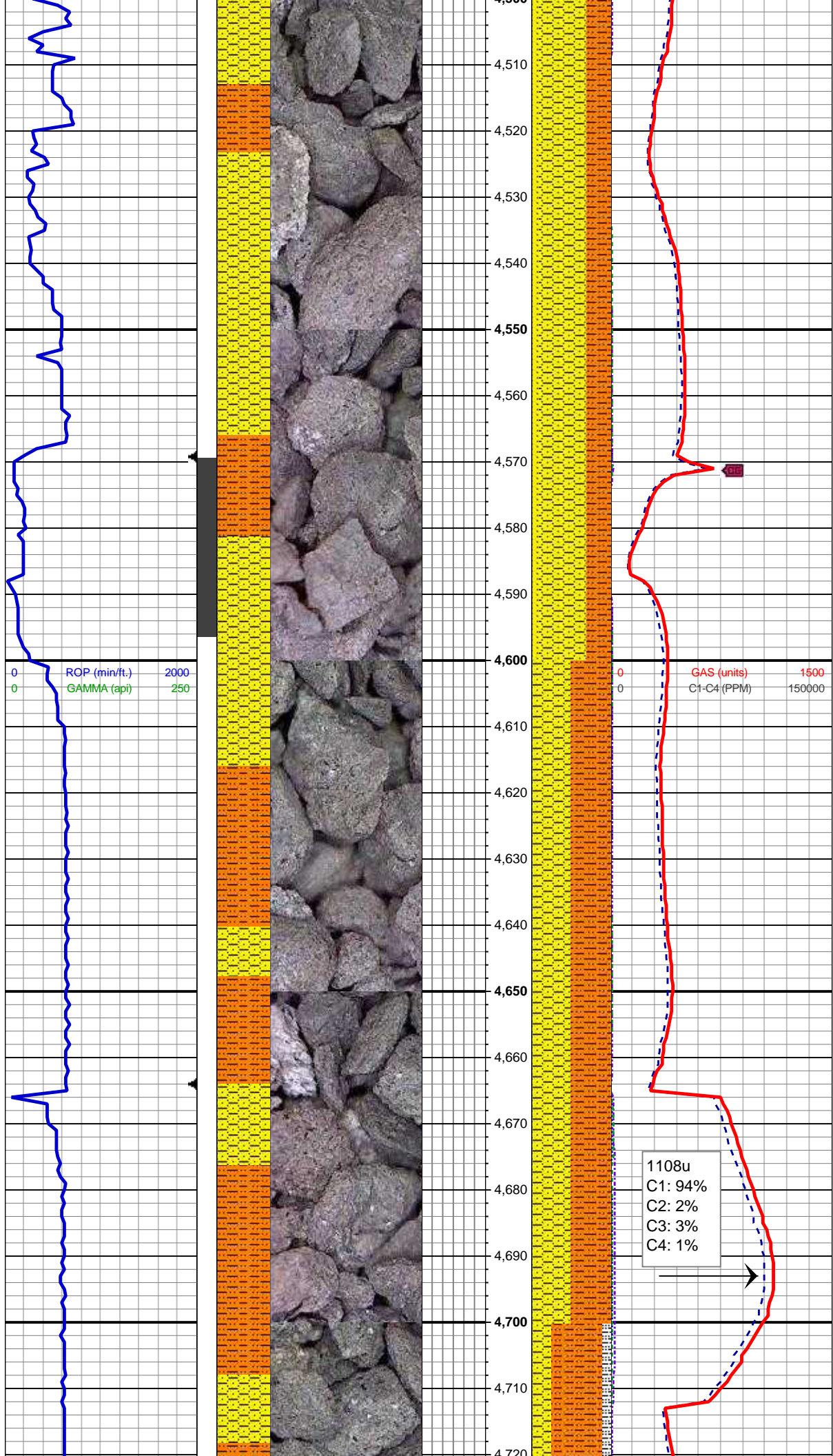


MD: 4,321 '
TVD: 4,288.71 '
Inclination: 0.79 °
Azimuth: 215.45 °
VS: -210.66 '

50% SHY SS: lt gy-med gy brn, sl tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, cly cmt
15% SLTY SH: med gy, dk gy,
frm-sft, fri-brit, sb plty-blky, rthy-sl
silty tex
15% SS: lt gy-wh, s&p, fir, f gr, sb
rd-sb ang, p srt, arg cmt

MD: 4,415 '
TVD: 4,382.7 '
Inclination: 0.71 °
Azimuth: 210.15 °
VS: -211.64 '

60% SHY SS: lt gy-med gy brn, sl tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por
40% SS: lt gy-wh, s&p, fri, f gr, sb
rd-sb ang, p srt, arg cmt



MD: 4,510 '
TVD: 4,477.69 '
Inclination: 0.83 °
Azimuth: 188.78 °
VS: -212.8 '

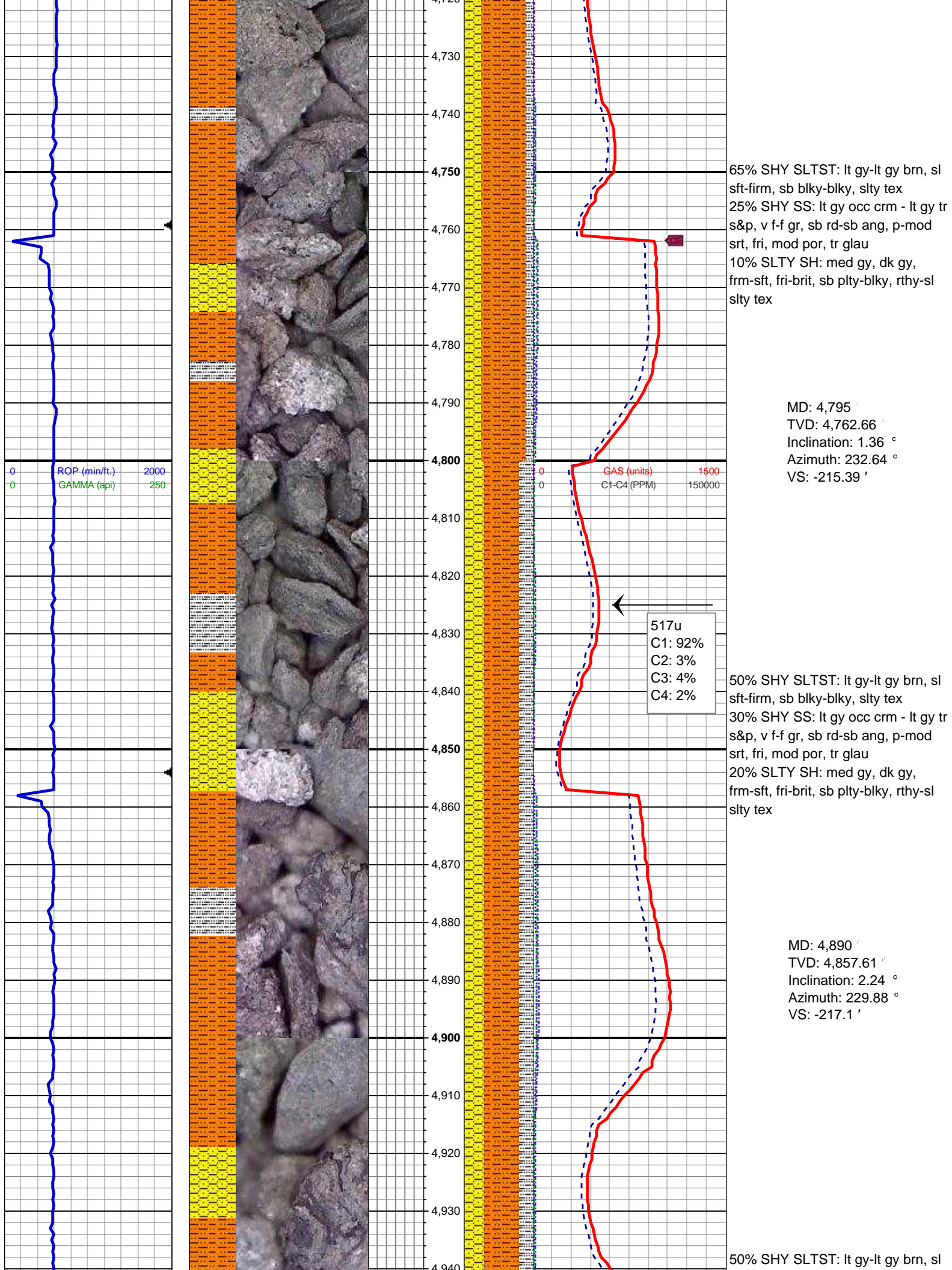
60% SHY SS: lt gy occ crm - lt gy tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, tr glau
30% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blk-y-blky, slty tex
10% SS: lt gy-wh, s&p, fri, f gr, sb
rd-sb ang, p srt, arg cmt

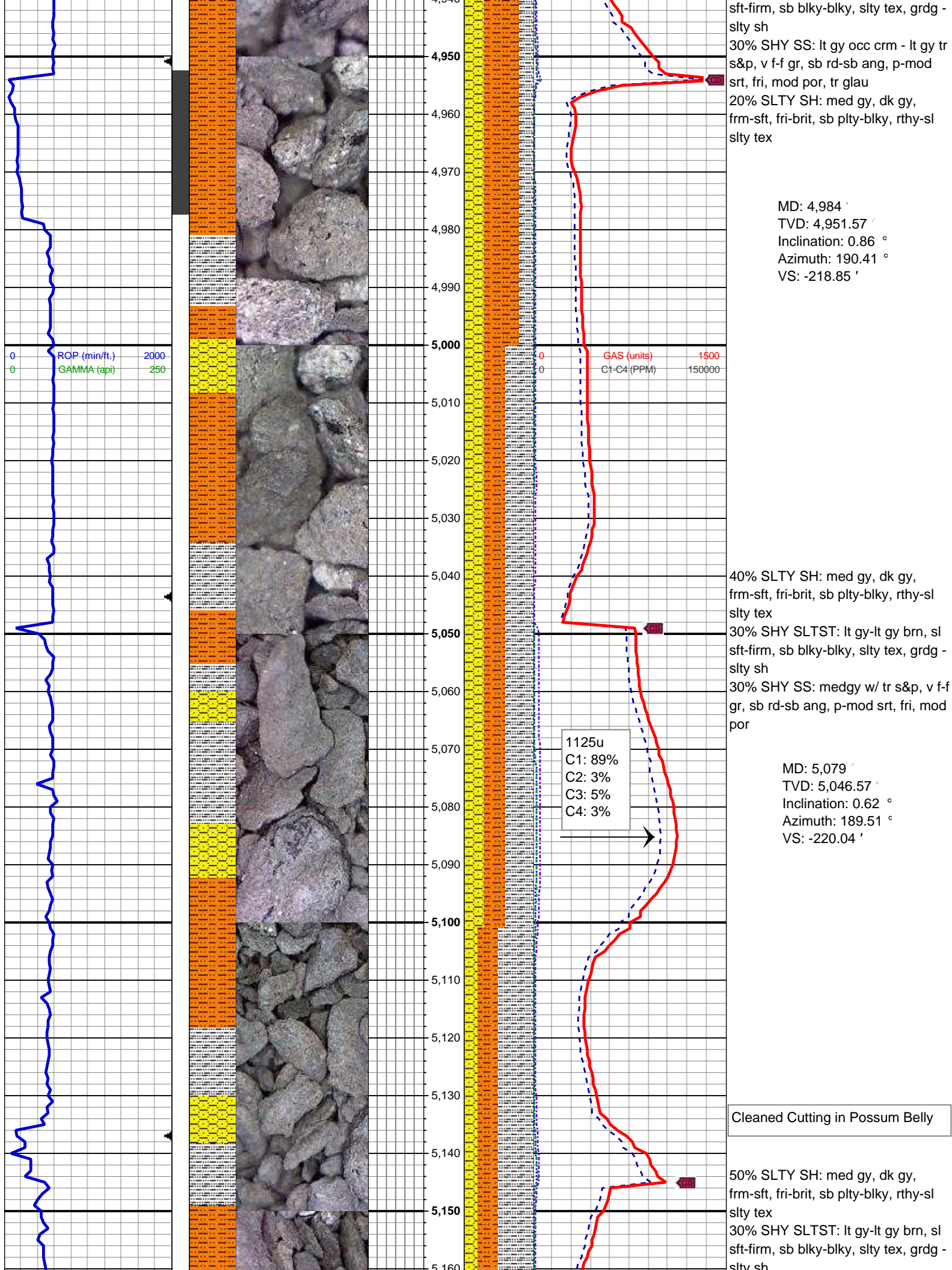
MD: 4,605 '
TVD: 4,572.69 '
Inclination: 0.15 °
Azimuth: 221.98 °
VS: -213.56 '

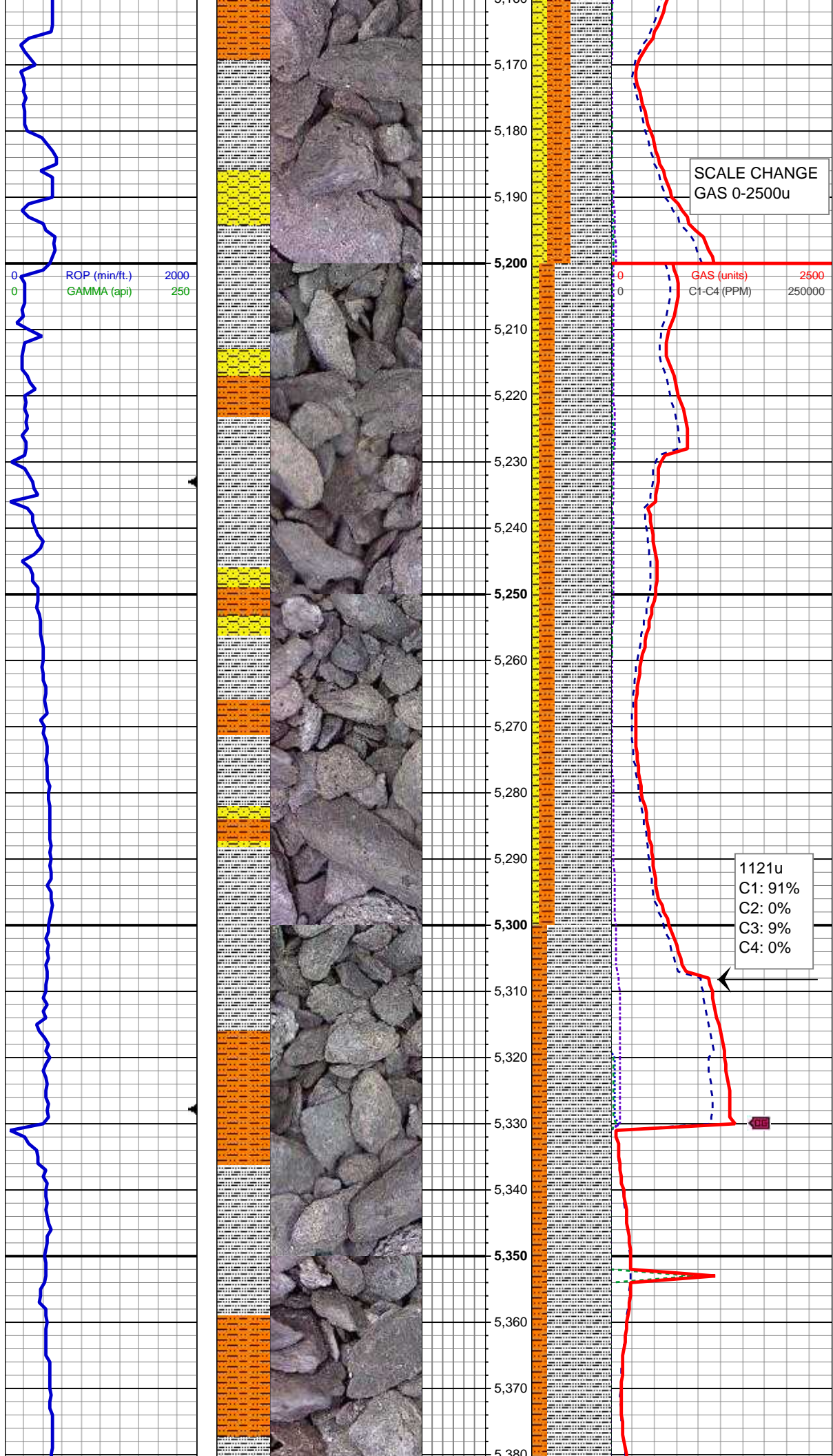
50% SHY SS: lt gy occ crm - lt gy tr
s&p, v f-f gr, sb rd-sb ang, p-mod
srt, fri, mod por, tr glau
50% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blk-y-blky, slty tex

1108u
C1: 94%
C2: 2%
C3: 3%
C4: 1%

MD: 4,700 '
TVD: 4,667.68 '
Inclination: 1.12 °
Azimuth: 228.32 °
VS: -214.21 '







city sh
20% SHY SS: medgy w/ tr s&p, v f-f
gr, sb rd-sb ang, p-mod srt, fri, mod
por

MD: 5,174 '
TVD: 5,141.56 '
Inclination: 0.5 °
Azimuth: 220.85 °
VS: -220.83 '

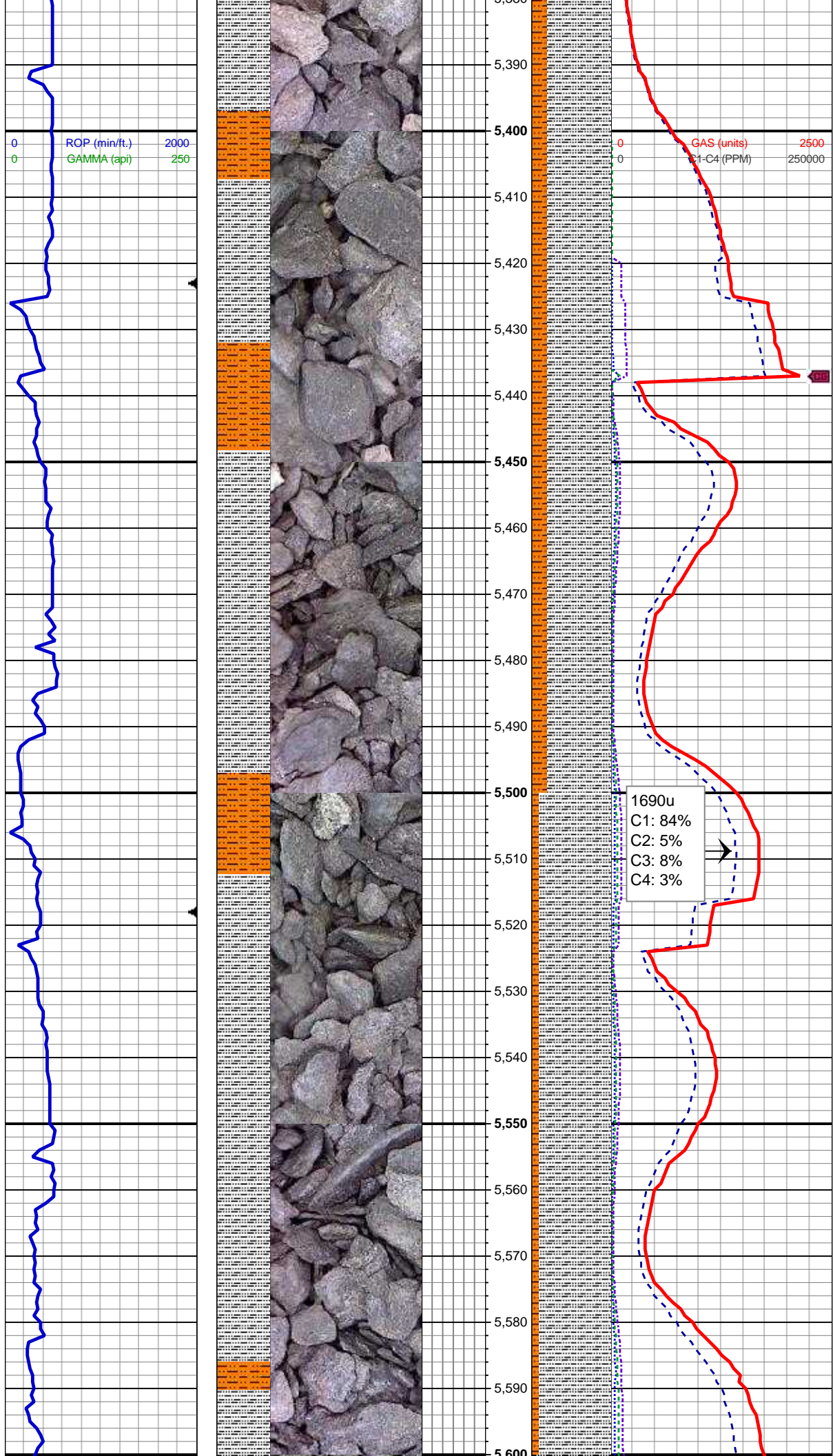
MUD WT 9.3 VIS 35

70% SLTY SH: med gy, dk gy,
frm-sft, fri-brit, sb plty-blky, rthy-sl
silty tex
20% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blkly-blky, silty tex, grdg -
silty sh
10% SHY SS: medgy w/ tr s&p, v f-f
gr, sb rd-sb ang, p-mod srt, fri, mod
por

MD: 5,269 '
TVD: 5,236.56 '
Inclination: 0.7 °
Azimuth: 79.42 °
VS: -221.05 '

80% SLTY SH: med gy, dk gy,
frm-sft, fri-brit, sb plty-blky, rthy-sl
silty tex
20% SHY SLTST: lt gy-lt gy brn, sl
sft-firm, sb blkly-blky, silty tex, grdg -
silty sh

MD: 5,364 '
TVD: 5,331.55 '
Inclination: 0.79 °
Azimuth: 86.81 °
VS: -221 '



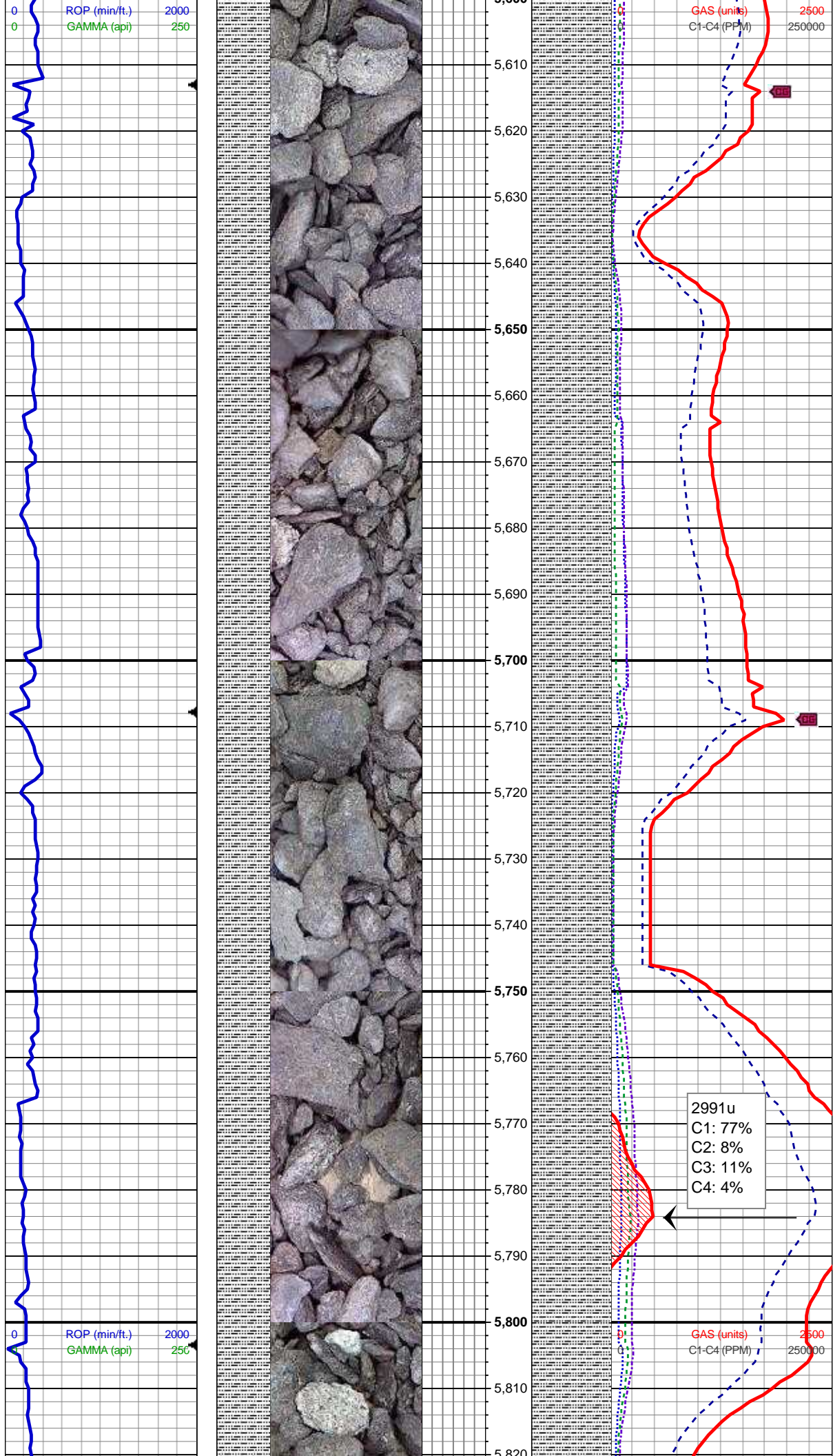
80% SLTY SH: med gy, dk gy, frm-sft, fri-brit, sb plty-blky, rthy-sl slty tex
20% SHY SLTST: lt gy-lt gy brn, sl sft-firm, sb blky-blky, slty tex, grdg - slty sh

MD: 5,459 '
TVD: 5,426.54 '
Inclination: 0.94 °
Azimuth: 37.49 °
VS: -220.43 '

1690u
C1: 84%
C2: 5%
C3: 8%
C4: 3%

90% SLTY SH: med gy, dk gy, frm-sft, fri-brit, sb plty-blky, rthy-sl slty tex
10% SHY SLTST: lt gy-lt gy brn, sl sft-firm, sb blky-blky, slty tex, grdg - slty sh

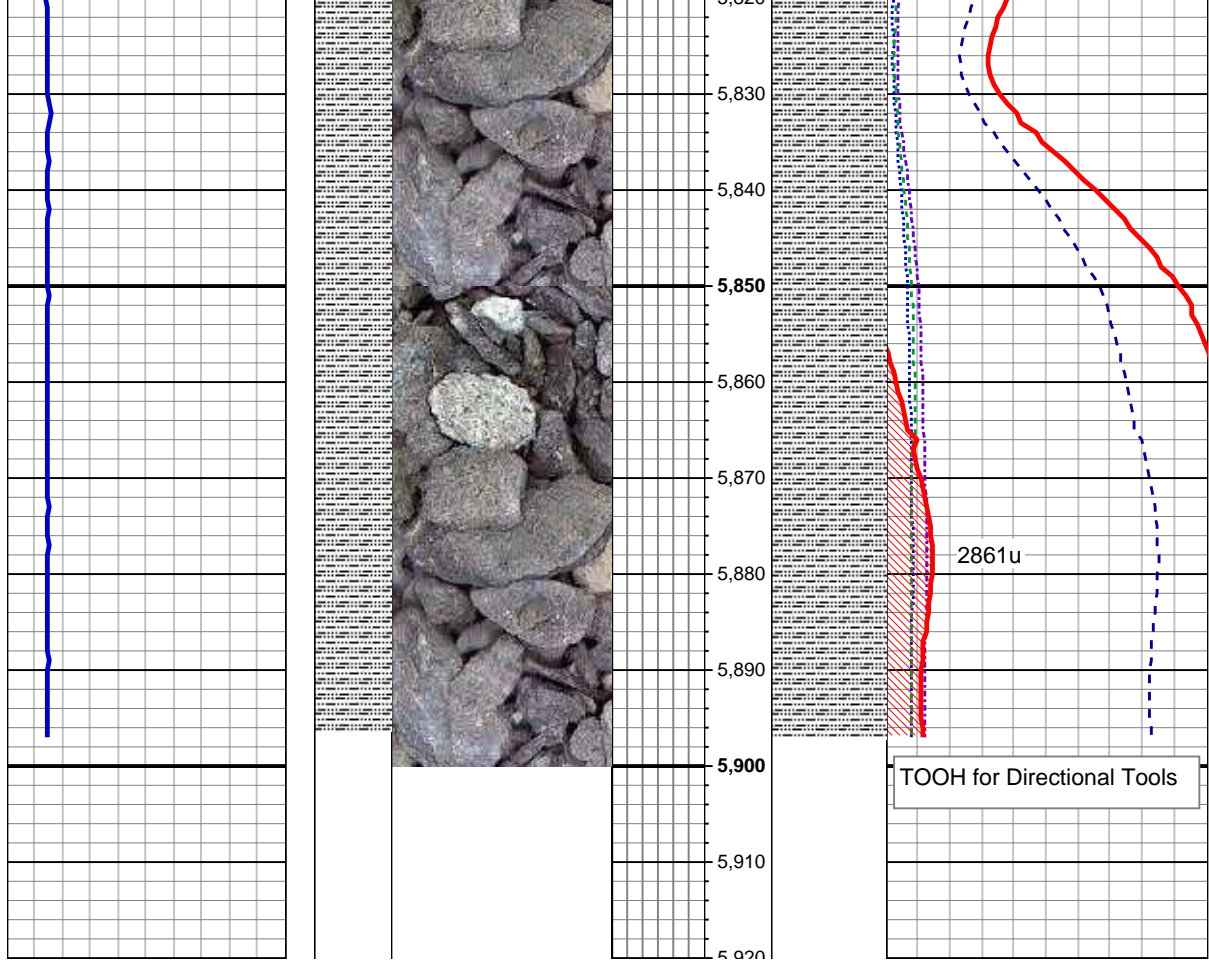
MD: 5,554 '
TVD: 5,521.53 '
Inclination: 0.81 °
Azimuth: 69.65 °
VS: -219.66 '



MD: 5,649 '
TVD: 5,616.52 '
Inclination: 0.93 °
Azimuth: 63.29 °
VS: -219.18 '

MD: 5,744 '
TVD: 5,711.51 '
Inclination: 0.71 °
Azimuth: 42.77 °
VS: -218.48 '

100% SLTY SH: med gy, dk gy, frm-sft, fri-brit, sb plty-blky, rthy-sl sly tex



MD: 5,838 '
TVD: 5,805.5 '
Inclination: 0.63 °
Azimuth: 73.14 °
VS: -217.97 '

100% SLTY SH: med gy, dk gy,
frm-sft, fri-brit, sb plty-blky, rthy-sl
silty tex

TD Vertical Section
5897' @ 06:24hrs 12/19/13

Log Continues On
Guttersen State
DD17-79HN(HORZ).MPlot