

Scale: 5" / 100'
Measured Depth Log

Type of Drilling Fluid LSND

COAL STRINGER

↑ BRYOZOA
🐙 CEPHALOPOD
🪸 CORAL
🪼 CRINOID
🐚 ECHINOID
🐟 FISH
🔍 FORAMINIFERA

🔍 PISOLITE
🌿 PLANT REMAINS
🍄 PLANT SPORES
🐚 SCAPHOPOD
🪸 STROMATOPOROID

Minerals

■ CARBONACEOUS FLAKES
▲ CHTDK
▲ CHTLT
— COAL - THIN BEDS
🔍 DOLOMITIC
+ FELDSPAR
● FERRUGINOUS PELLET

🔍 NODULES
● PHOSPHATE PELLETS
🔍 PYRITE
🔍 SALT CAST
· SANDY
🔍 SILICEOUS
· SILTY

🔍 GYPSUM STRINGER
🔍 LIMESTONE STRINGER
🔍 MARLSTONE (CALC) STRG
🔍 MARLSTONE (DOL) STRG
🔍 SANDSTONE STRINGER
— SHALE STRINGER
🔍 SILTSTONE STRINGER

Rock Types

🔍 UNKNOWN
🔍 CHALK
🔍 MARLSTONE
🔍 SANDSTONE
🔍 SHALY SANDSTONE
🔍 SILTY SHALE
🔍 ANHYDRITE
🔍 BENTONITE
🔍 BRECCIA

🔍 CEMENT
🔍 CHERT
🔍 CLAY CHOKE SAND
🔍 CLAYSTONE
🔍 COAL
🔍 CONGLOMERATE
🔍 DOLOMITE
🔍 GRANITE
🔍 GYPSUM

🔍 IGNEOUS
🔍 LIMESTONE
🔍 SIDERITE or LIMONITE
🔍 METAMORPHIC
X X X X X X NO SAMPLE
🔍 SALT
🔍 SALT- PEPPER SAND
🔍 SHALE
🔍 SHALE COLORED

🔍 SHALE GRAY
🔍 SHALY SILTSTONE
🔍 SILTSTONE
🔍 TILL
🔍 TUFF
🔍 WELDED TUFF

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

Wellsite Geologist #1 Laura Kellogg

Wellsite Geologist #2 Tim Bright

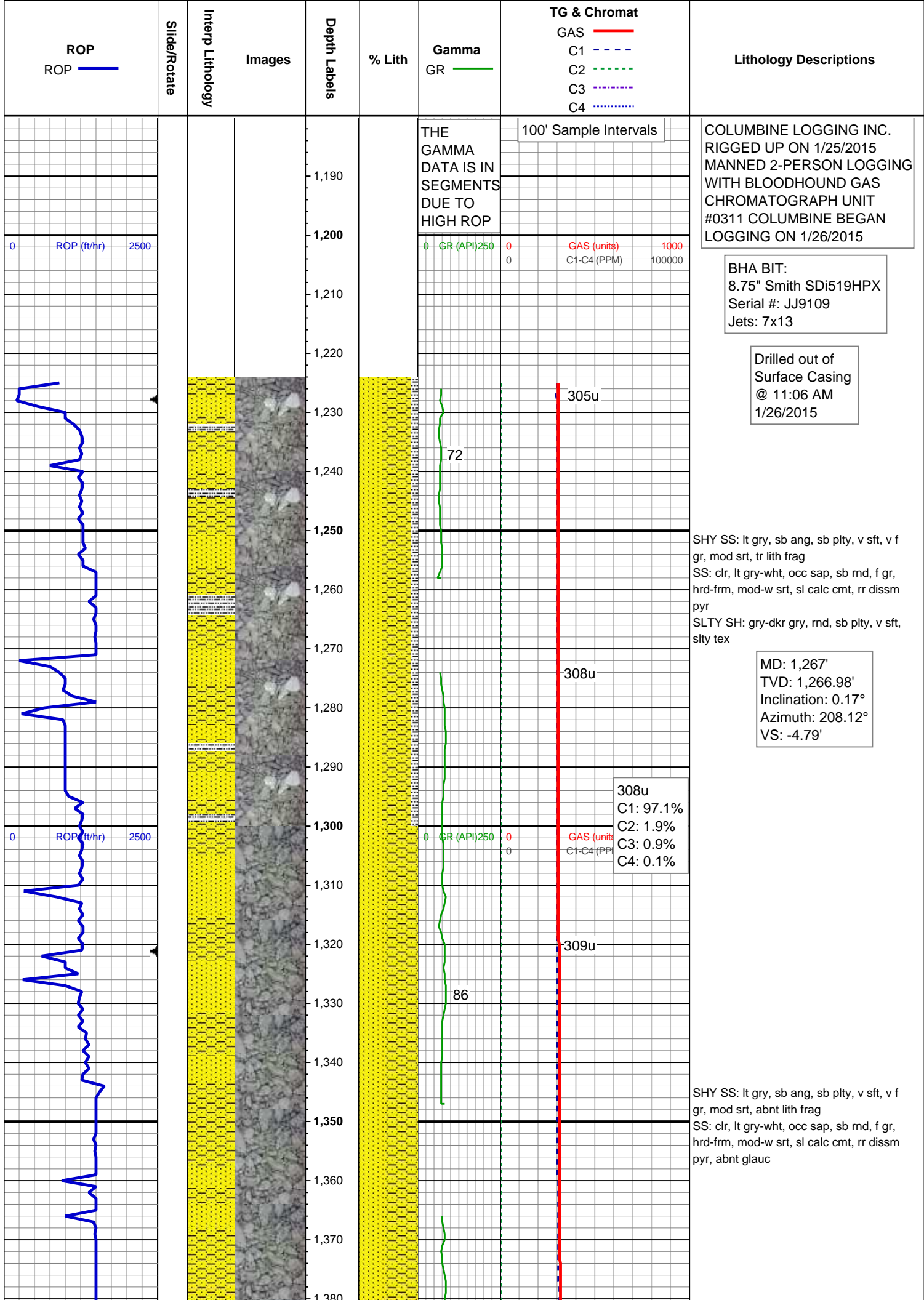
Wellsite Geological Services Provided By Columbine Logging Inc.

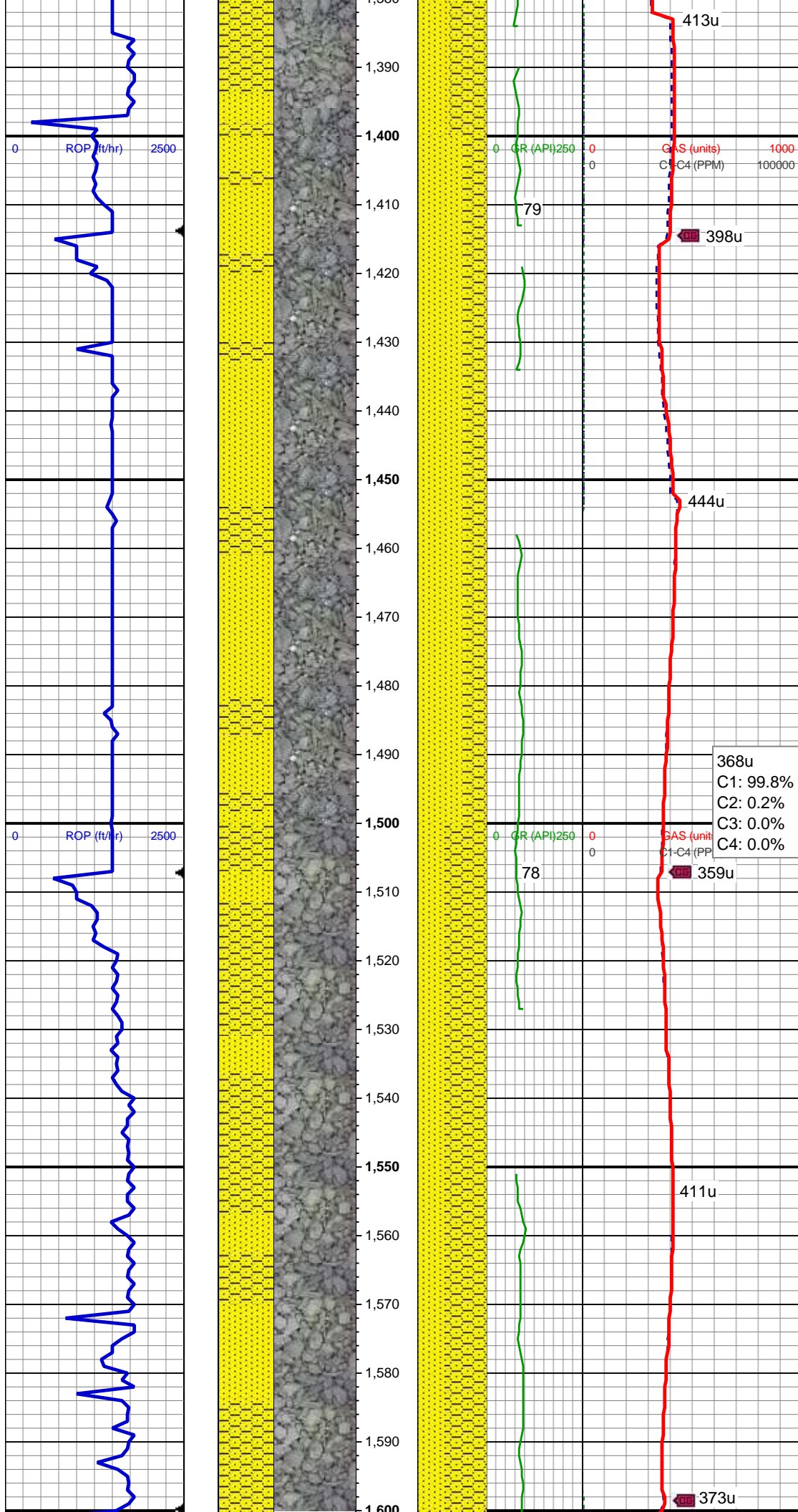
Geologist

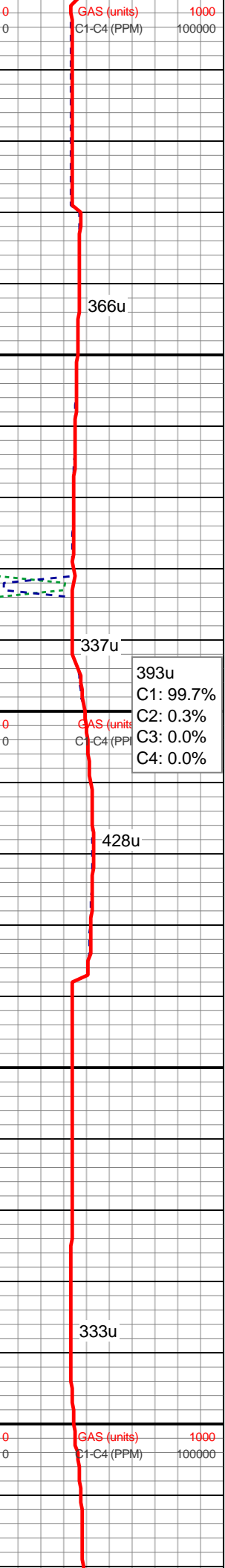
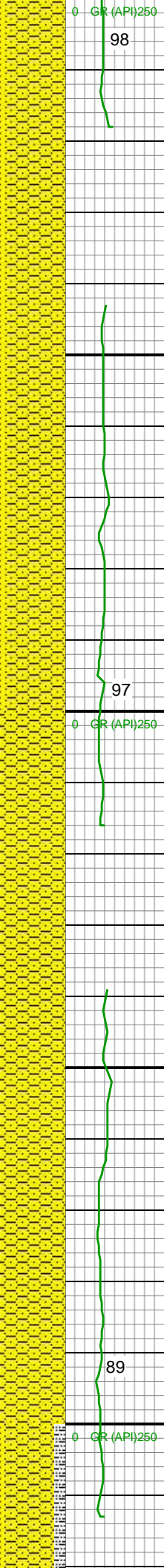
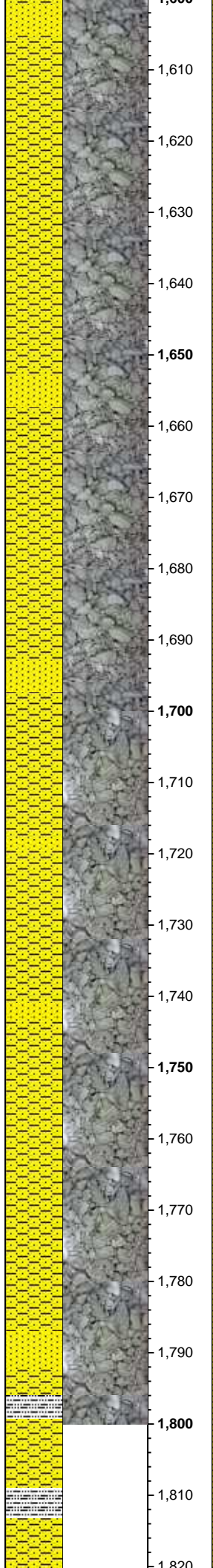
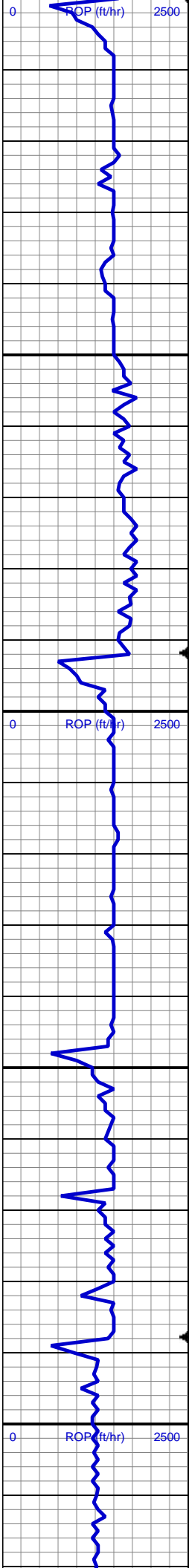
Name RENEE CLACKLER

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202







MD: 1,636'
TVD: 1,635.97'
Inclination: 0.52°
Azimuth: 253.76°
VS: -3.82'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, rr diss mpyr, abnt glauc

393u
C1: 99.7%
C2: 0.3%
C3: 0.0%
C4: 0.0%

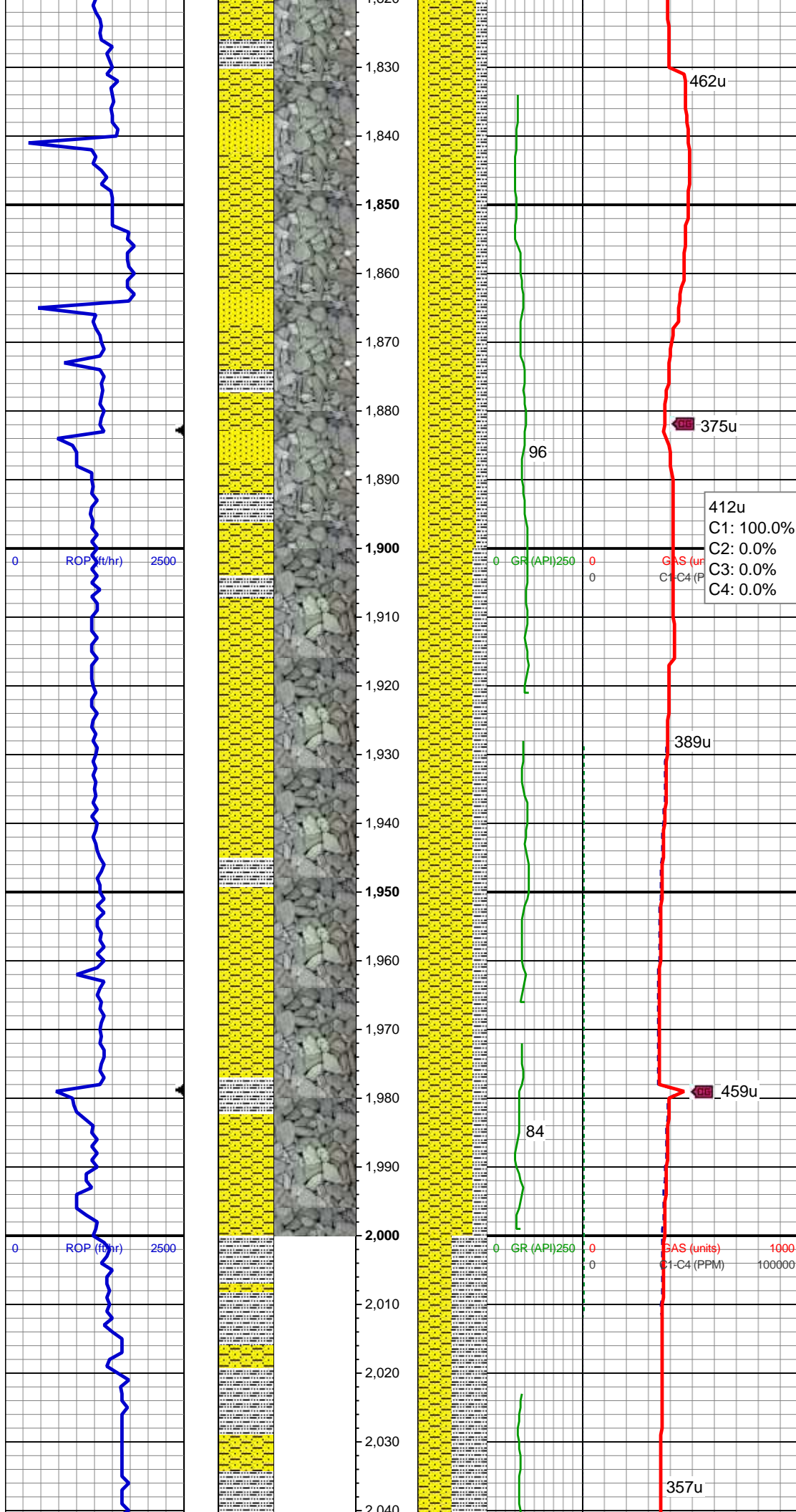
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SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd frm, mod-w srt, sl calc cmt, abnt glauc

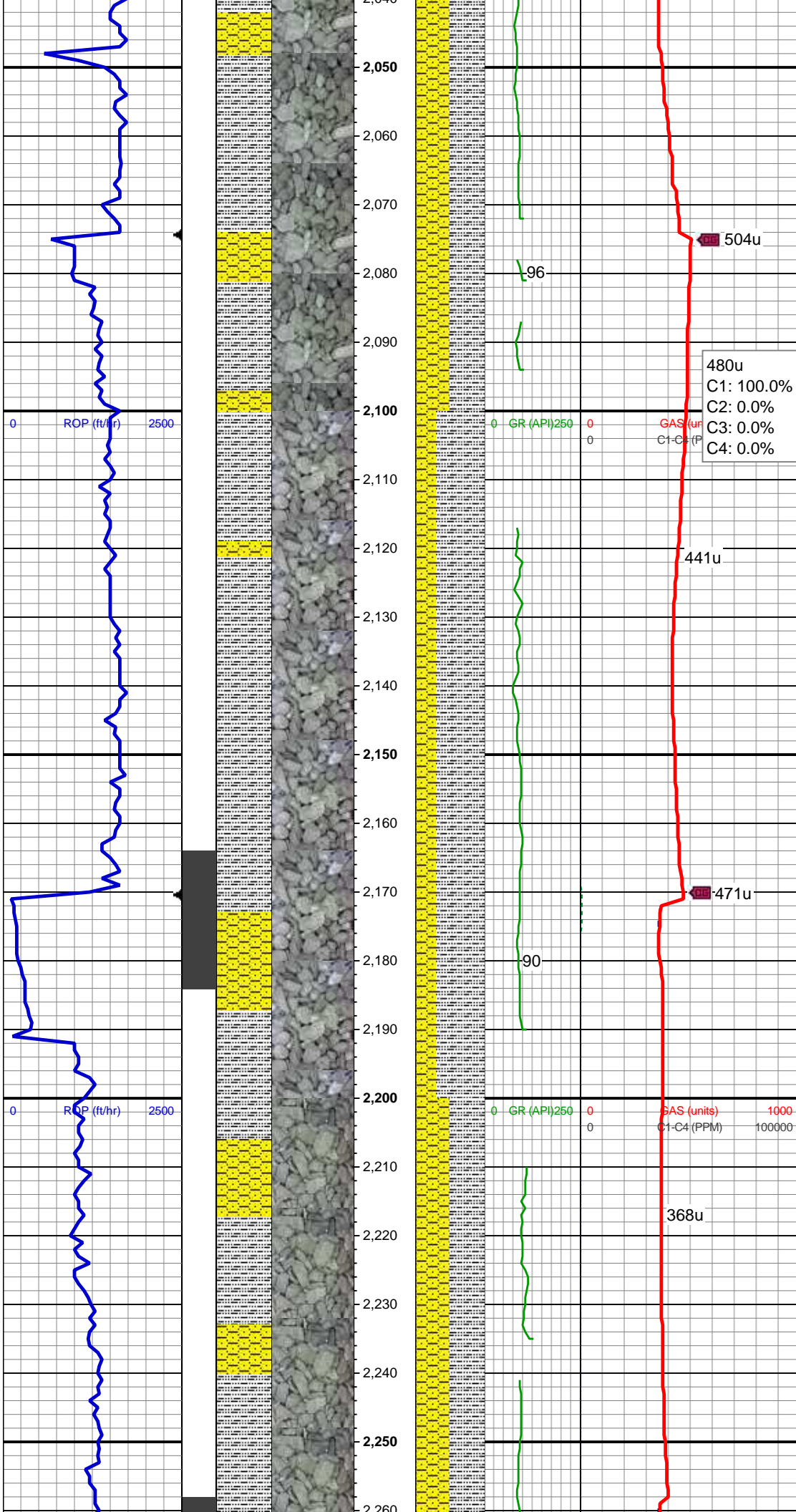
MD: 1,825'

TVD: 1,824.96'
Inclination: 0.66°
Azimuth: 239.65°
VS: -3.05'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd frm, mod-w srt, sl calc cmt, abnt
glauc
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex





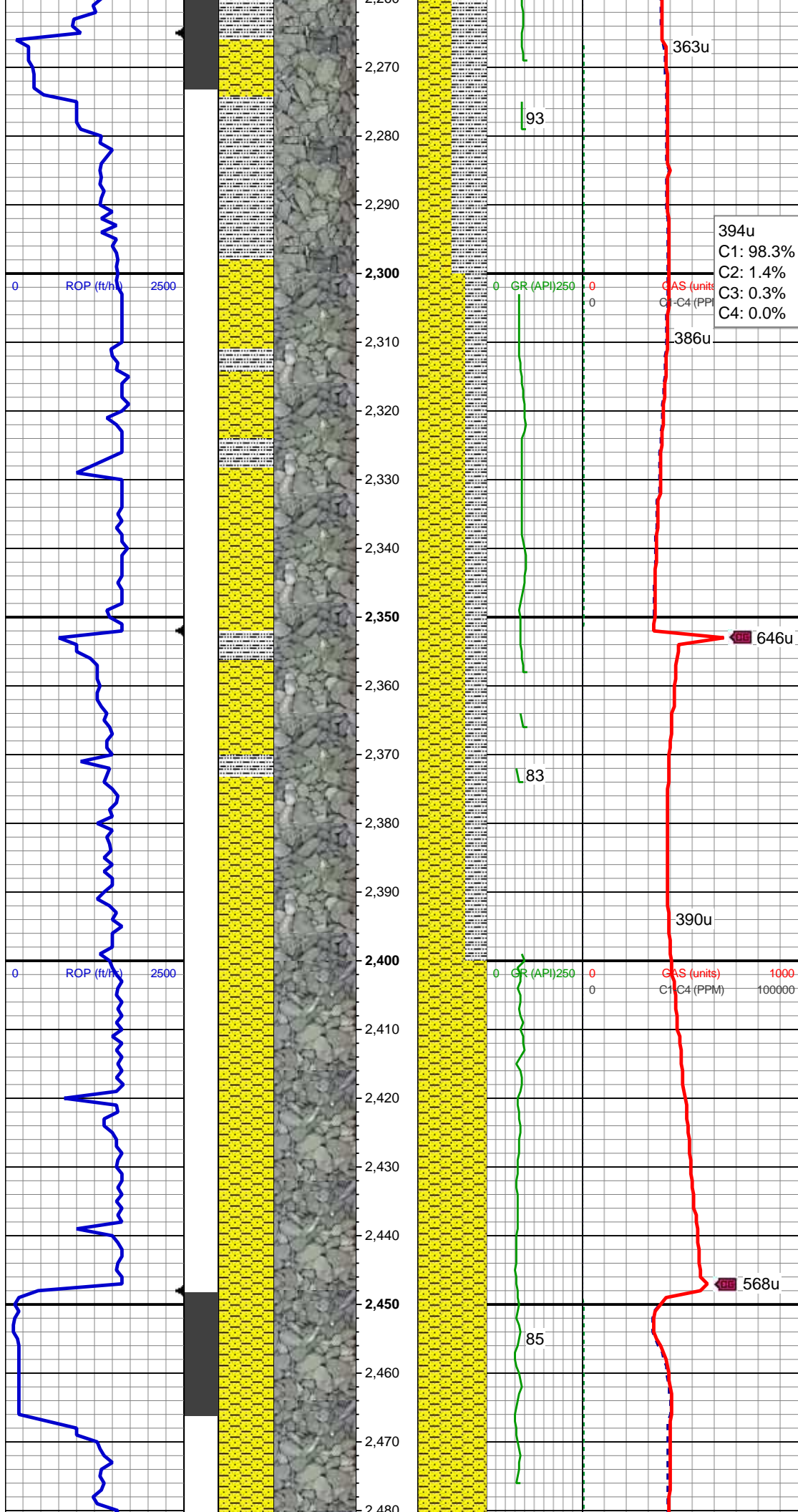
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex

MD: 2,110'
TVD: 2,109.95'
Inclination: 0.57°
Azimuth: 237.59°
VS: -1.5'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

MD: 2,204'
TVD: 2,203.9'
Inclination: 2.96°
Azimuth: 242.34°
VS: -0.15'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

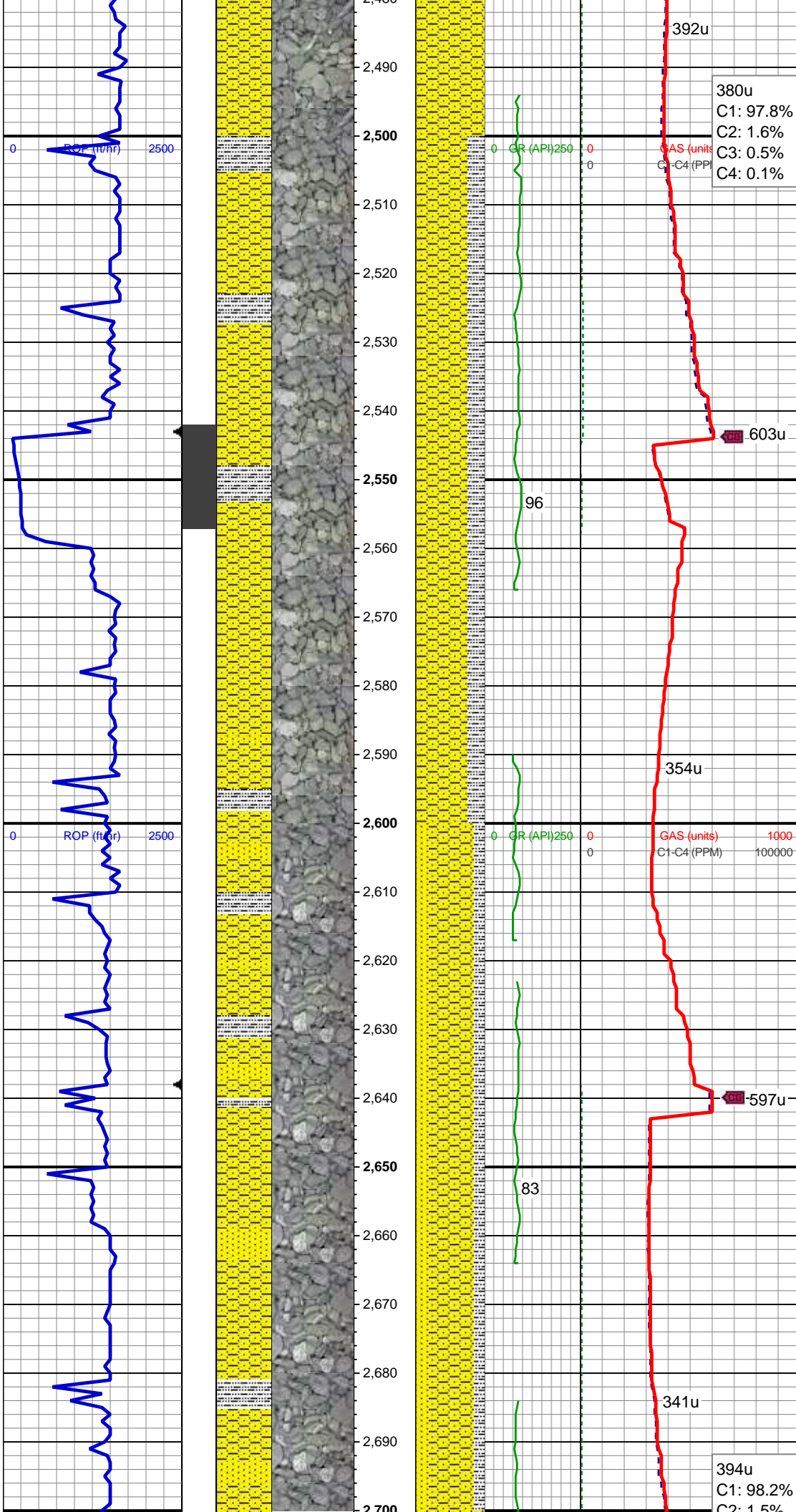


MD: 2,299'
TVD: 2,298.69'
Inclination: 4.48°
Azimuth: 238.27°
VS: 2.88'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex

MD: 2,394'
TVD: 2,393.4'
Inclination: 4.52°
Azimuth: 235.93°
VS: 6.87'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag



MD: 2,488'
TVD: 2,487.02'
Inclination: 5.78°
Azimuth: 235.6°
VS: 11.54'

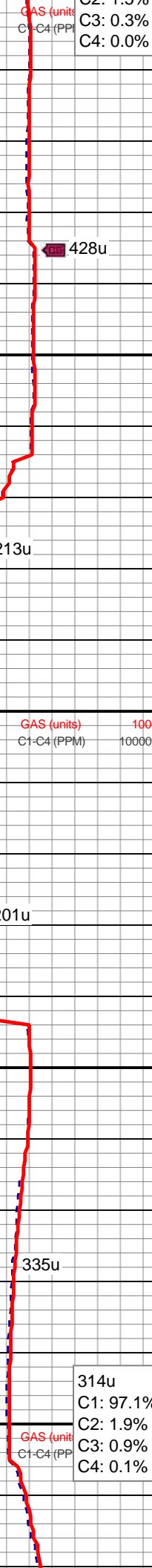
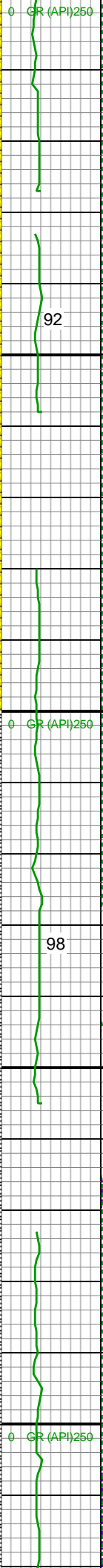
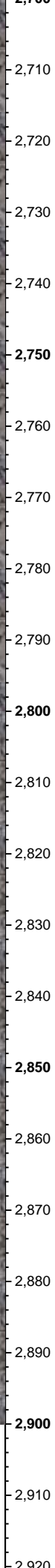
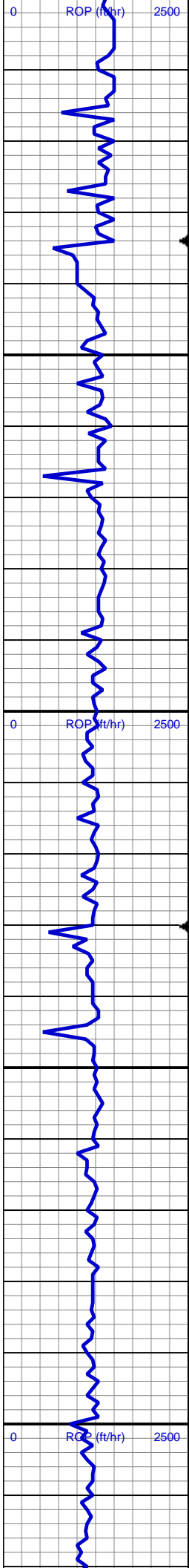
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex

MD: 2,583'
TVD: 2,581.4'
Inclination: 7.26°
Azimuth: 238.82°
VS: 17.26'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd-frn, mod-w srt, sl calc cmt, rr diss
pyr, tr glauc
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex

380u
C1: 97.8%
C2: 1.6%
C3: 0.5%
C4: 0.1%

394u
C1: 98.2%
C2: 1.5%



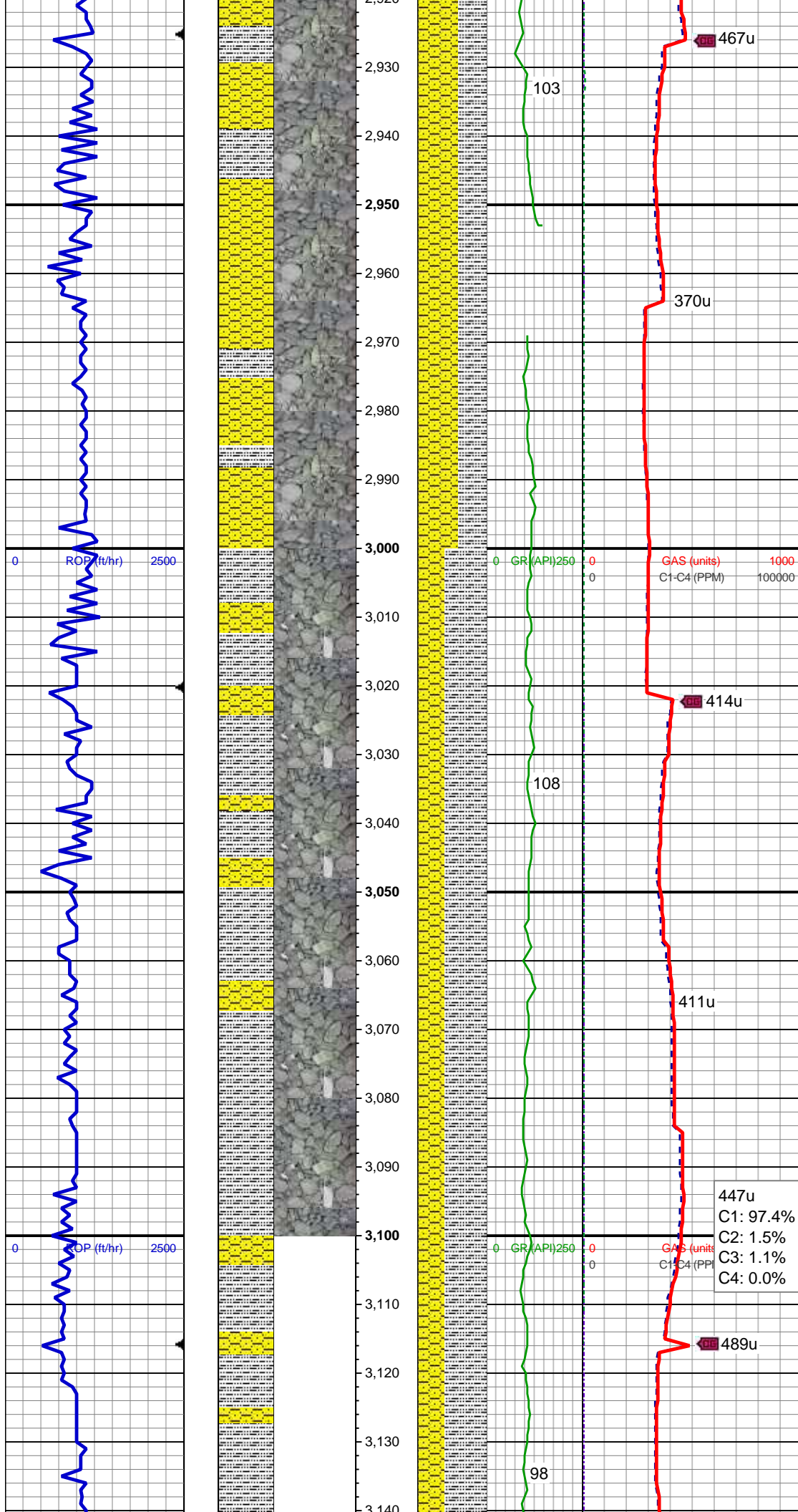
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd frm, mod-w srt, sl calc cmt, rr diss
pyr, tr glauc

MD: 2,772'
TVD: 2,768.98'
Inclination: 6.79°
Azimuth: 237.67°
VS: 29.21'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr,
hrd frm, mod-w srt, sl calc cmt, rr diss
pyr, tr glauc

MD: 2,867'
TVD: 2,863.34'
Inclination: 6.49°
Azimuth: 236.26°
VS: 35.1'

314u
C1: 97.1%
C2: 1.9%
C3: 0.9%
C4: 0.1%



SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex

MD: 2,962'
TVD: 2,957.77'
Inclination: 6.12°
Azimuth: 234.13°
VS: 40.95'

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

MD: 3,057'
TVD: 3,052.29'
Inclination: 5.35°
Azimuth: 230.41°
VS: 46.66'

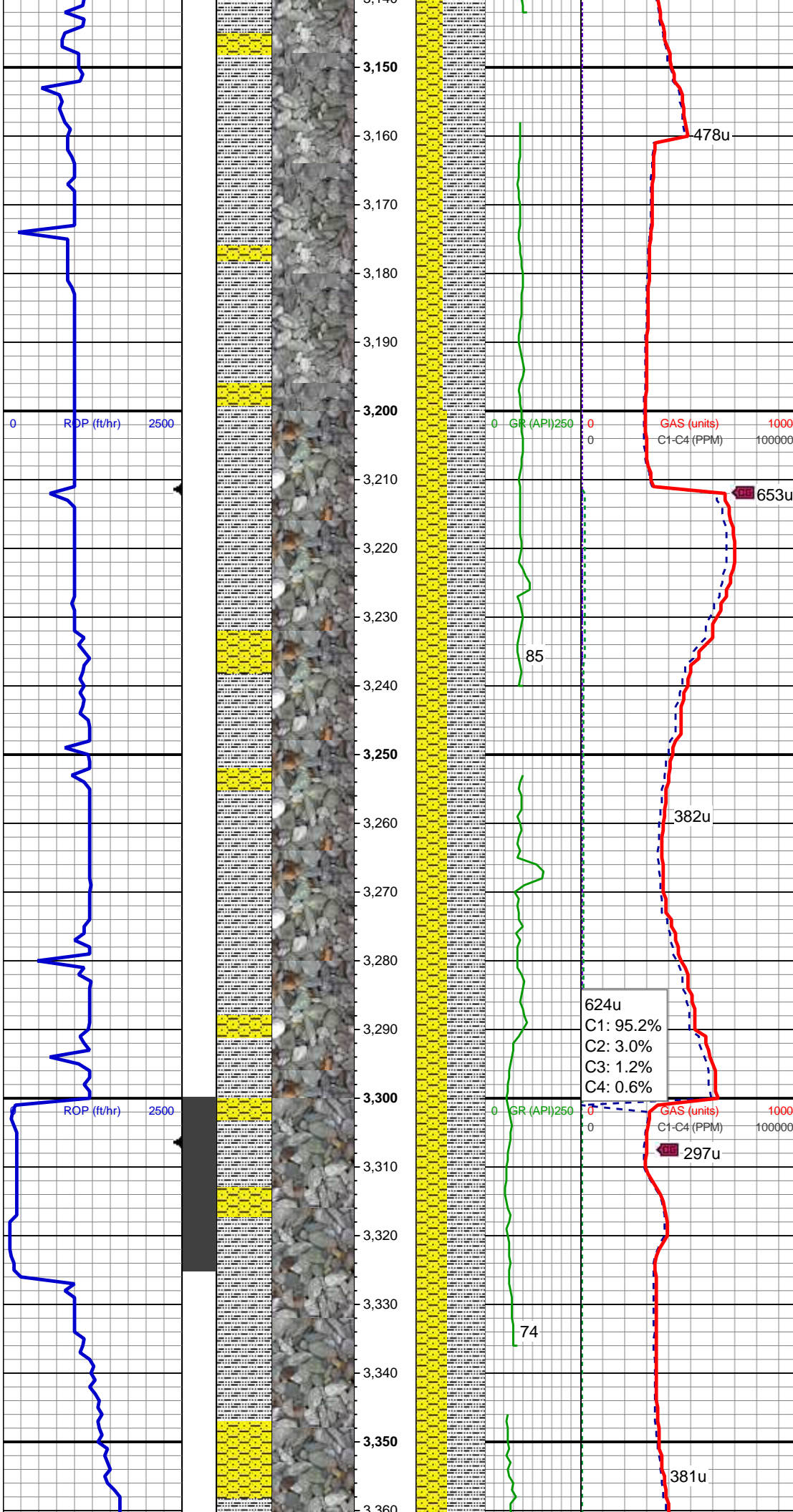
447u
C1: 97.4%
C2: 1.5%
C3: 1.1%
C4: 0.0%

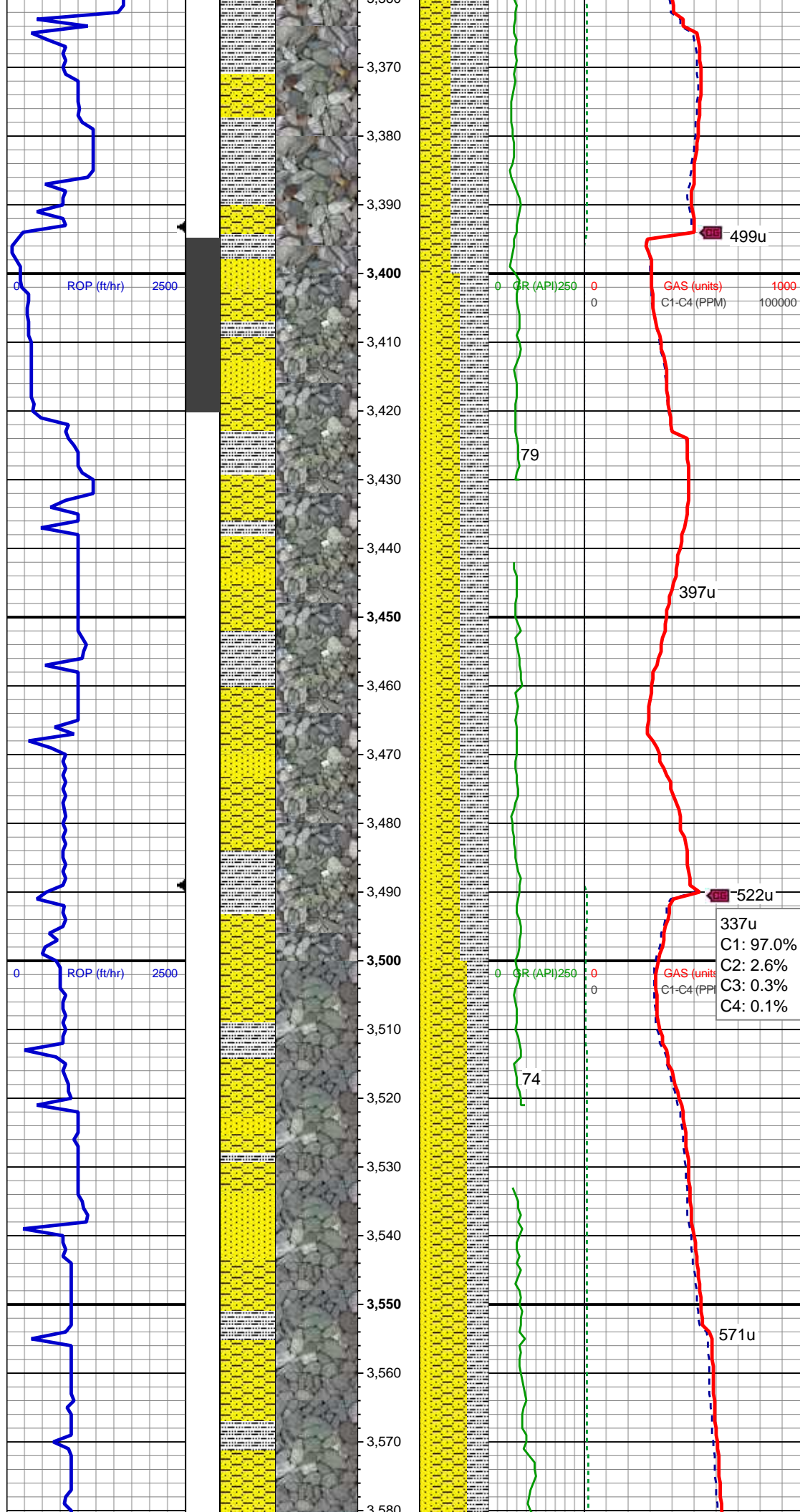
MD: 3,151'
TVD: 3,145.92'
Inclination: 4.86°
Azimuth: 227.41°
VS: 52.88'

MD: 3,246'
TVD: 3,240.56'
Inclination: 5.13°
Azimuth: 225.18°
VS: 57.73'

SLTY SH: lt gry-dkr gry, rnd, sb plty, v sft,
slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, abnt lith frag





TVD: 3,335.27'
Inclination: 3.76°
Azimuth: 219.65°
VS: 63.07'

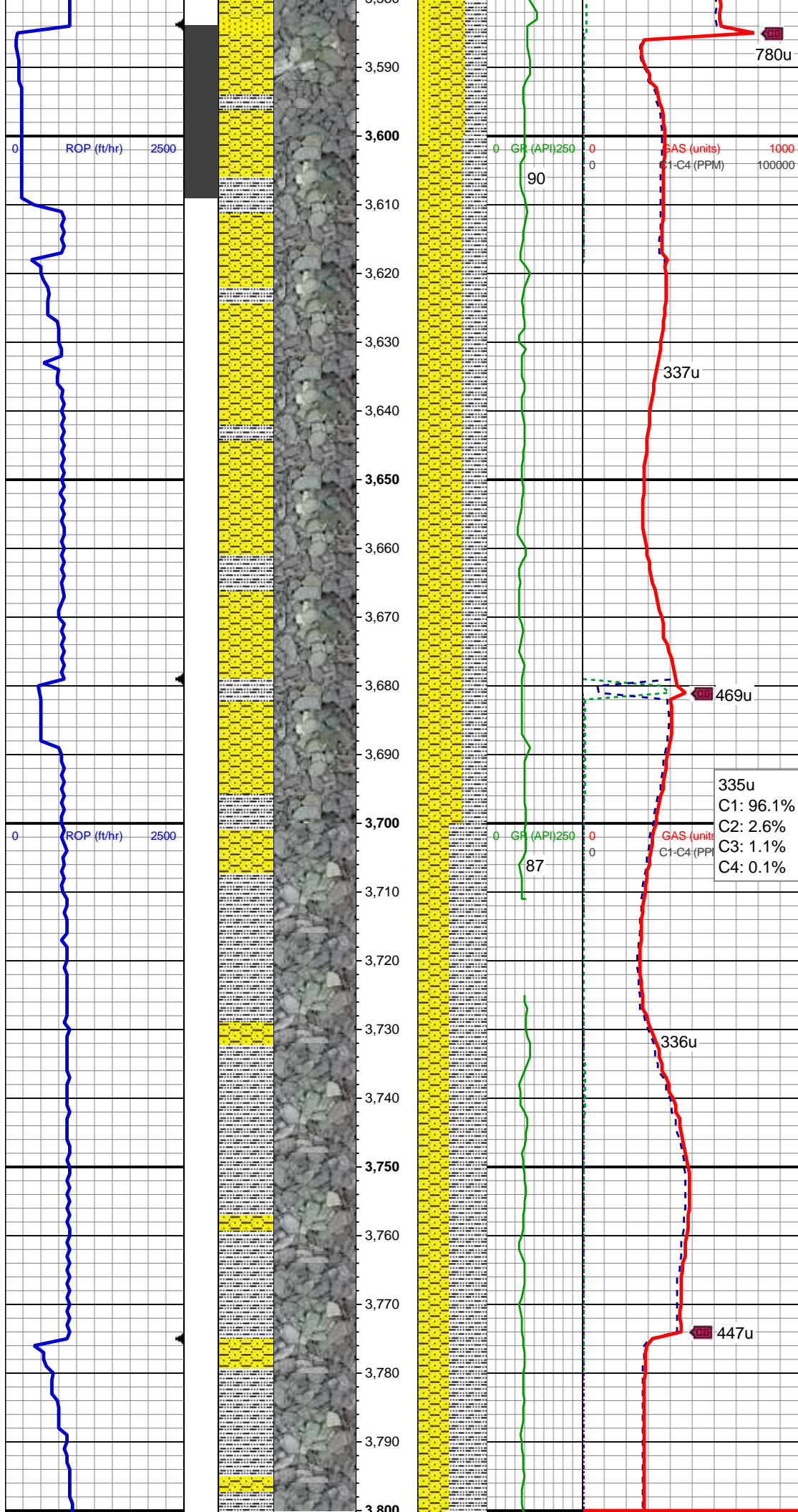
MD: 3,435'
TVD: 3,429.15'
Inclination: 1.91°
Azimuth: 225.66°
VS: 66.5'

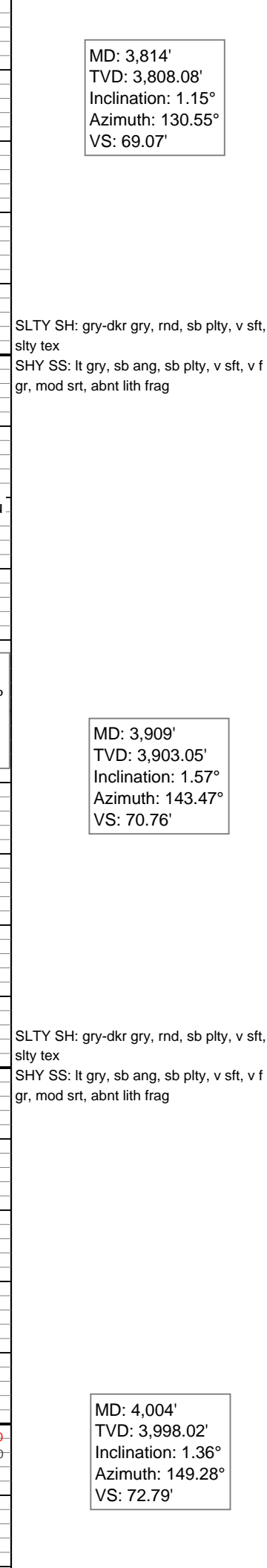
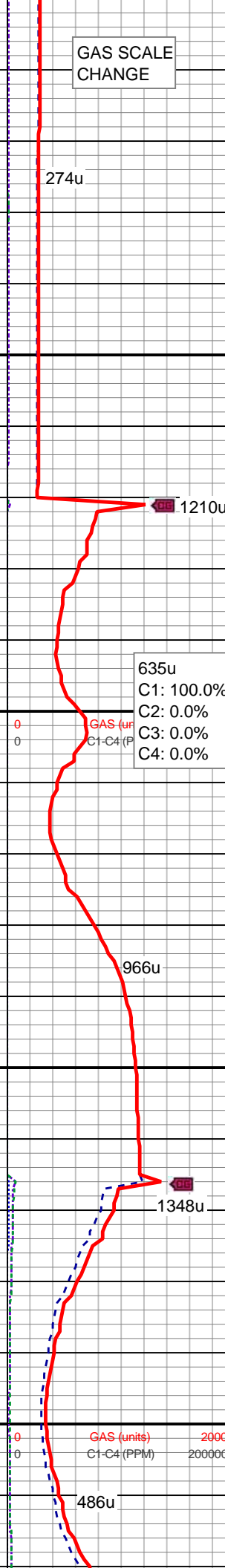
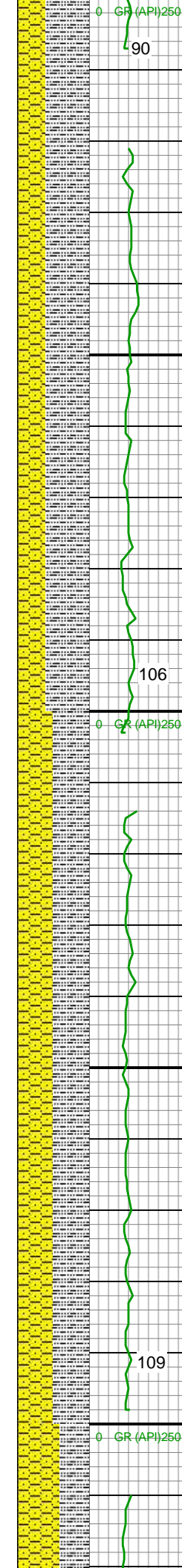
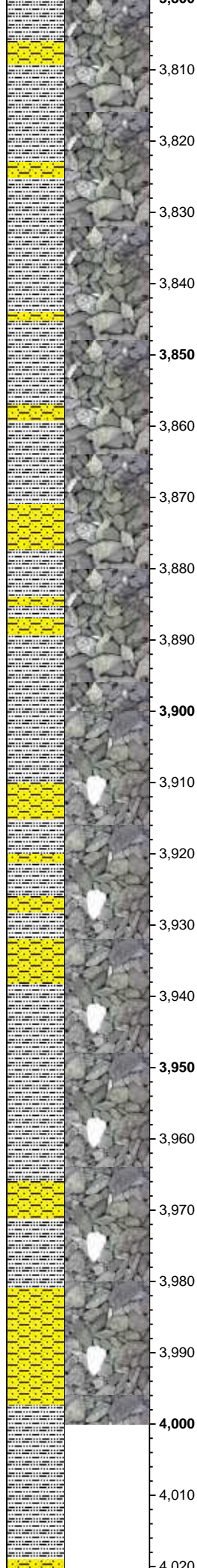
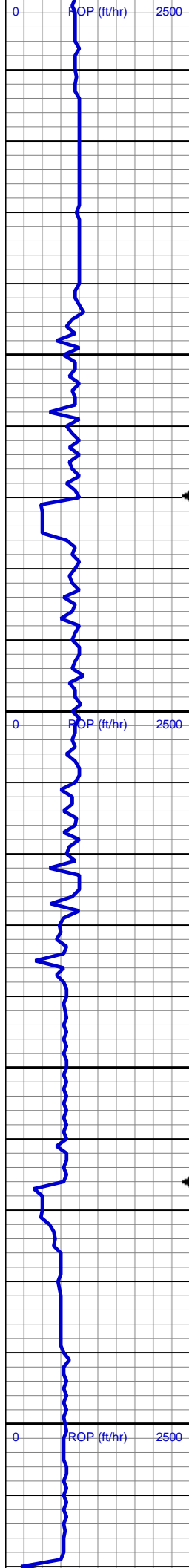
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, occ lith frag
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd-frn, mod-w srt, sl calc cmt, rr dissim pyr, tr glauc

337u
C1: 97.0%
C2: 2.6%
C3: 0.3%
C4: 0.1%

MD: 3,530'
TVD: 3,524.1'
Inclination: 1.85°
Azimuth: 225.34°
VS: 68.66'

SHY SS: lt gry, sb ang, sb plty, v sft, v f gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex
SS: clr, lt gry-wht, occ sap, sb rnd, f gr, hrd-frn, mod-w srt, sl calc cmt, rr dissim pyr, tr glauc





GAS SCALE
CHANGE

274u

1210u

106

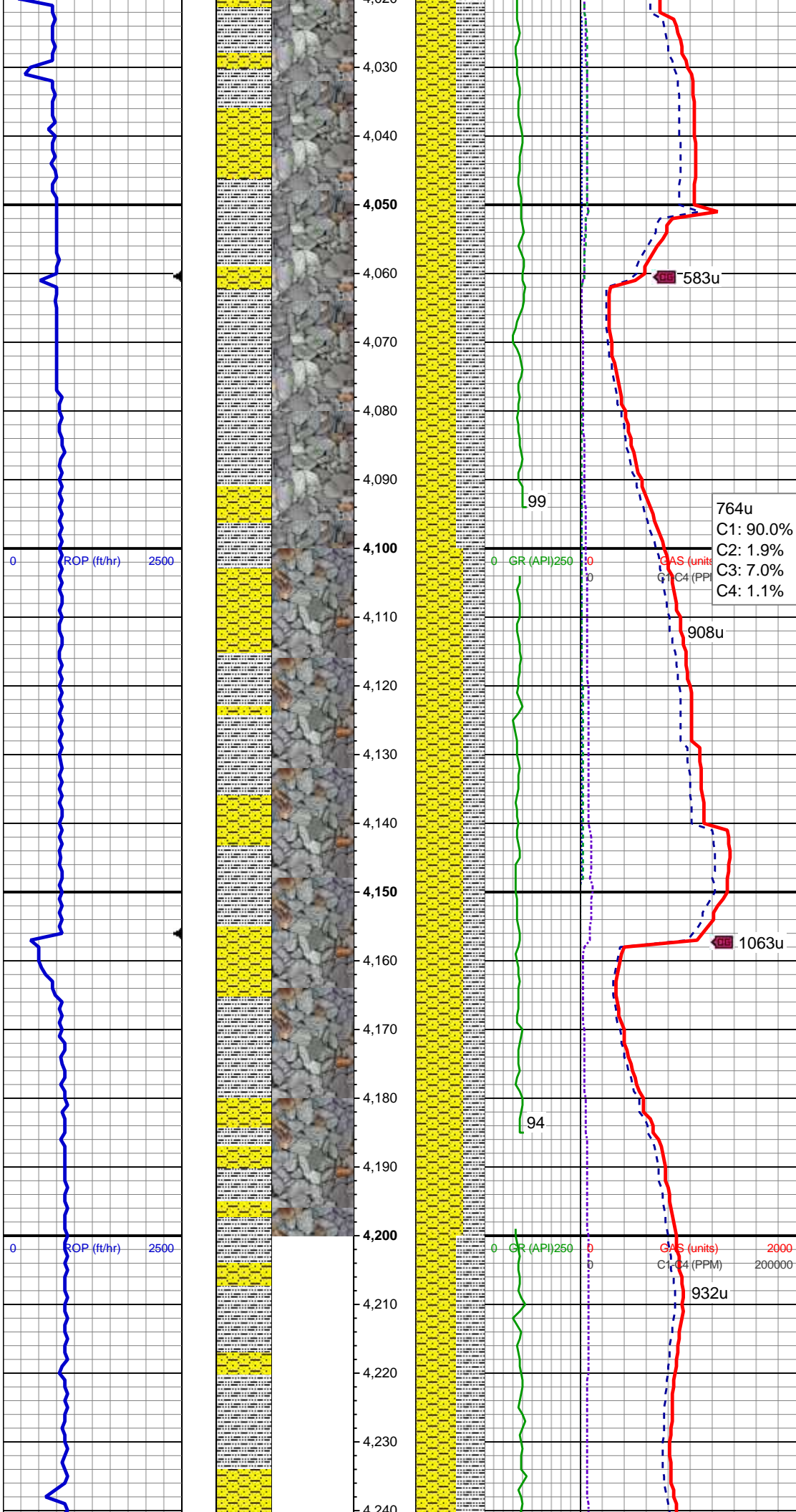
635u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

966u

1348u

109

486u

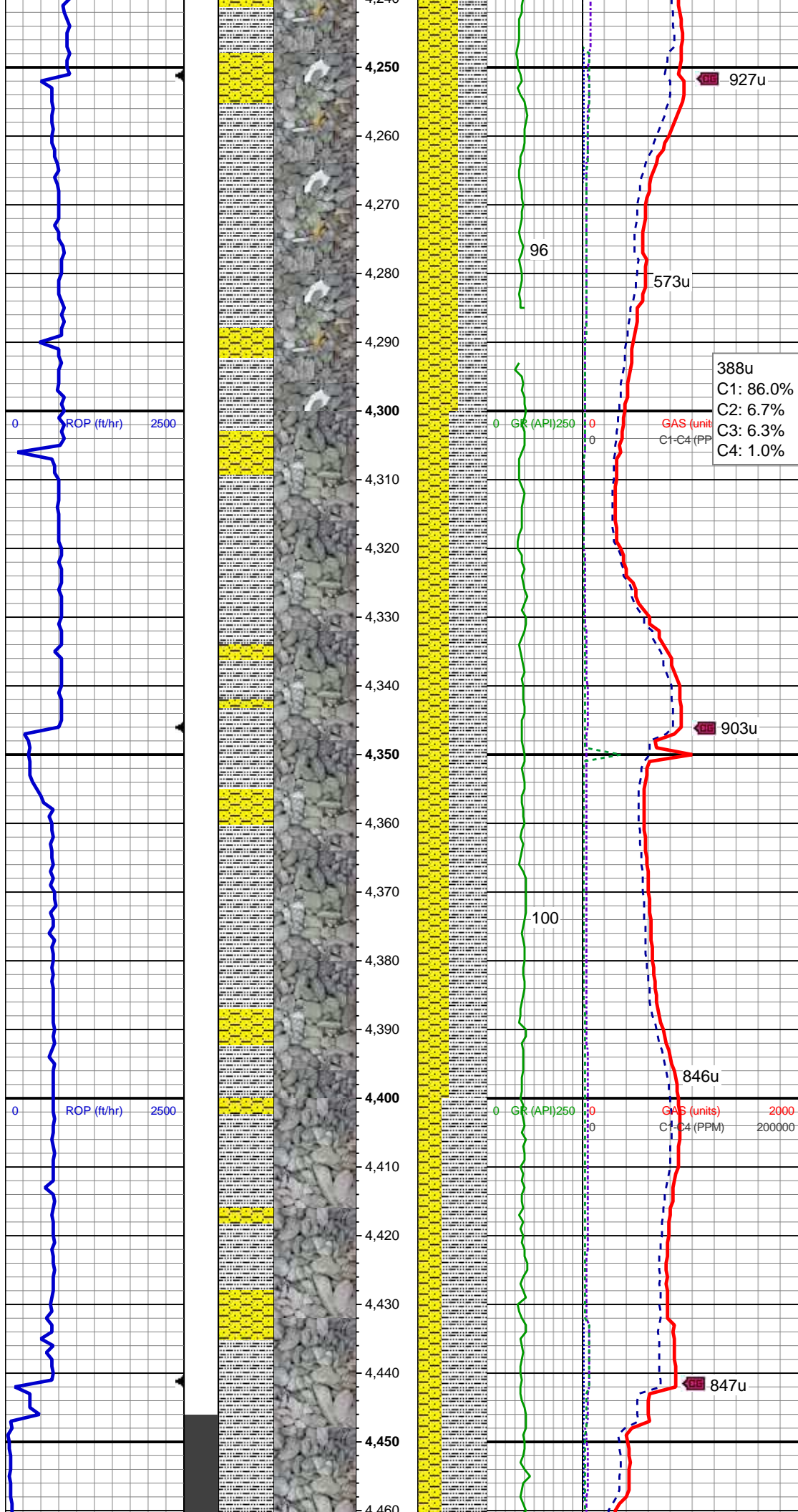


SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex

MD: 4,098'
TVD: 4,092'
Inclination: 1.27°
Azimuth: 182.36°
VS: 74.79'

SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
silty tex

MD: 4,193'
TVD: 4,186.97'
Inclination: 1.23°
Azimuth: 207.09°
VS: 76.74'



SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag
SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex

MD: 4,287'
TVD: 4,280.95'
Inclination: 1.6°
Azimuth: 226.97°
VS: 78.53'

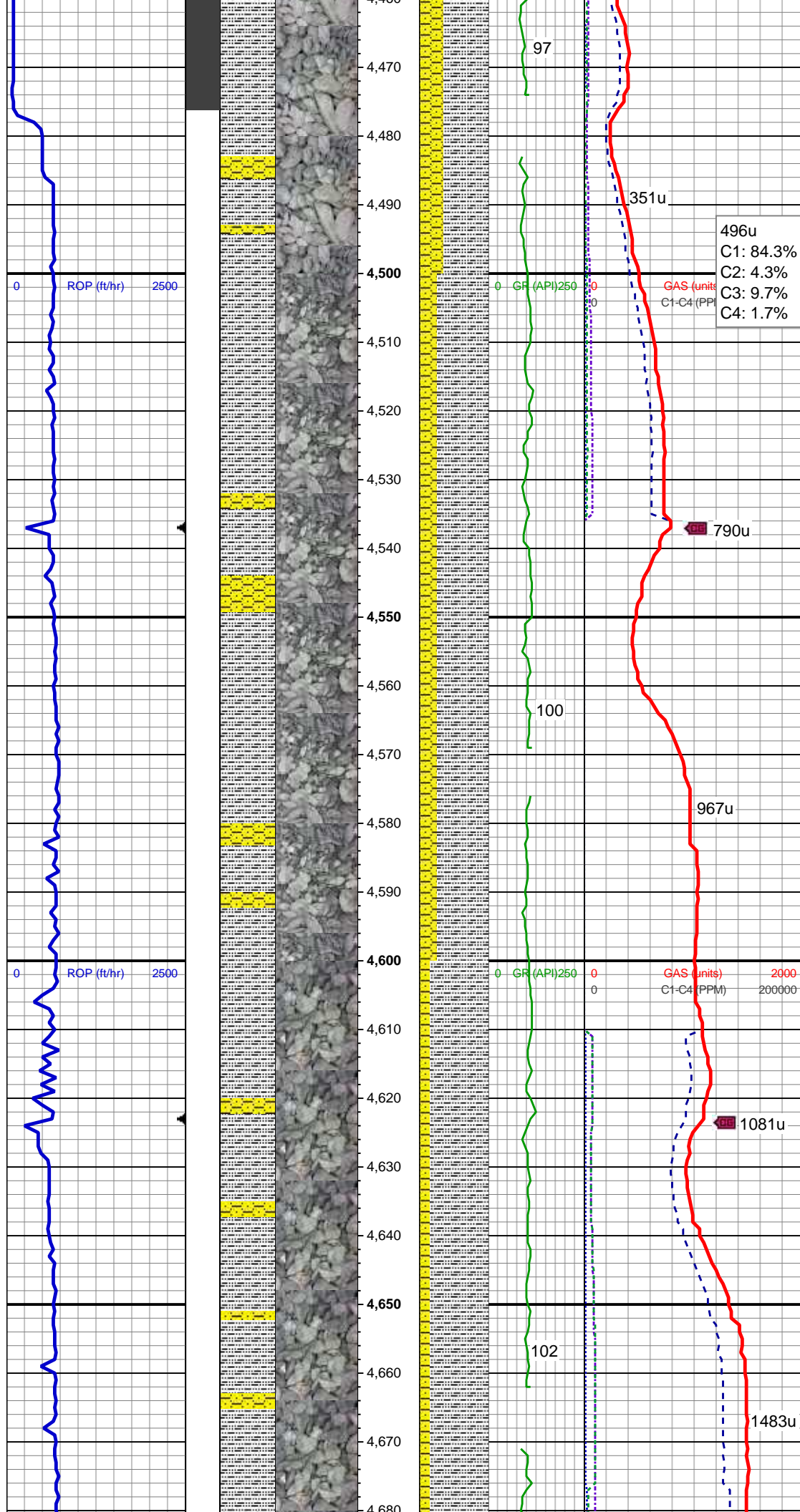
388u
C1: 86.0%
C2: 6.7%
C3: 6.3%
C4: 1.0%

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

MD: 4,382'
TVD: 4,375.88'
Inclination: 2.71°
Azimuth: 237.43°
VS: 80.61'

WT IN 9.40/ OUT 9.40
VIS IN 34/ OUT 34

SLTY SH: lt gry-dkr gry, rnd, sb plty, v sft,
sfty tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag



WT IN 9.50+ OUT 9.50+
VIS IN 35/ OUT 35

MD: 4,476'
TVD: 4,469.81'
Inclination: 1.64°
Azimuth: 258.45°
VS: 82.04'

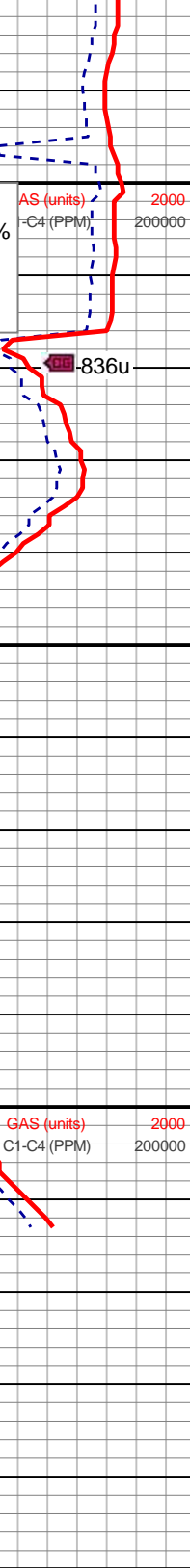
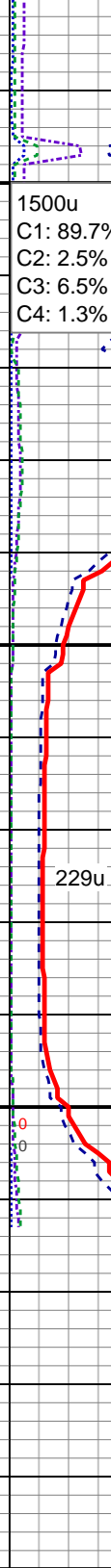
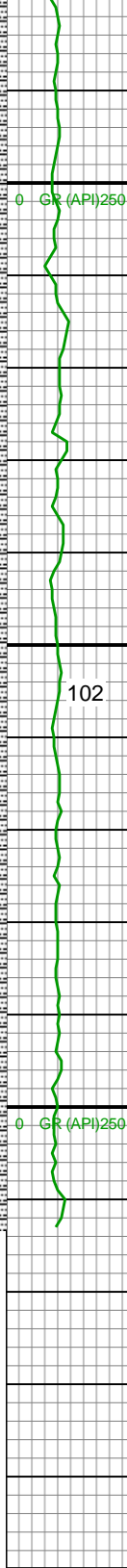
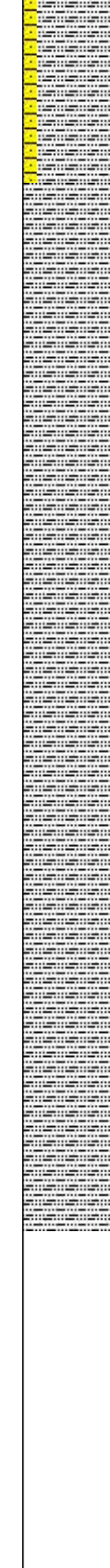
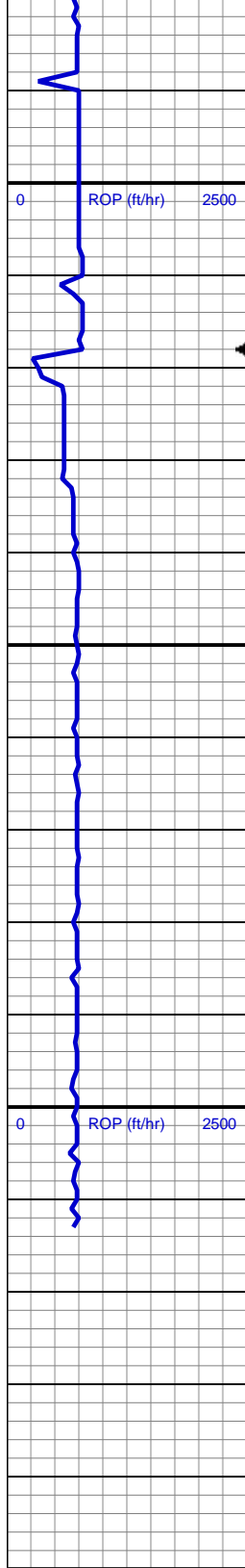
496u
C1: 84.3%
C2: 4.3%
C3: 9.7%
C4: 1.7%

SLTY SH: gry-dkr gry, rnd, sb plty, v sft,
sly tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, abnt lith frag

WT IN 9.50+ OUT 9.50+
VIS IN 37/ OUT 37

SLTY SH: lt gry-dkr gry, rnd, sb plty, v sft,
sly tex
SHY SS: lt gry, sb ang, sb plty, v sft, v f
gr, mod srt, occ lith frag

MD: 4,665'
TVD: 4,658.76'
Inclination: 1.01°
Azimuth: 256.33°
VS: 82.93'



SLTY SH: gry-dkr gry, rnd, sb plty, v sft, slty tex

MD: 4,759'
TVD: 4,752.75'
Inclination: 0.34°
Azimuth: 268.86°
VS: 83.12'

102

229u

836u

ENDED VERT @ 4813' MD
1/26/2015 @ 7:45 PM

LOG CONTINUES ON MPLOT
"MOSES STATE LD11-78-1BHN
HORZ"