

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Mecklenburg State LD01-72-1AHN(VERT)

Location SESE SEC1, R9N, T58W, 6 PM

State COLORADO

County WELD

Country USA

Rig Number H&P 326

API Number 05-123-39695

Field WILDCAT

Region DJ BASIN

Drilling Completed 11/1/2014

Spud Date 10/22/2014

Surface Coordinates 400 FSL, 1190 FEL
40.77427/-103.80663

Bottom Hole Coordinates (PROJ)
810 FFNLL, 360 FFELL

Ground Elevation 4652'

K.B. Elevation 4682'

Logged Interval 1246' **To** 4850'

Total Depth 14,824

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

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

MOLDIC

ORGANIC

PINPOINT

VUGGY

Engineering

BIT

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

FORMATION TOP

GAS SHOW

MINDEPTH 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

Zone Color Coding

- Oil
- Condensate
- Gas
- Note
- Core
- Pressure
- Error
- Water
- Seal

Accessories

Fossils

- ALGAE
- AMPHIPORA

F FOSSIL

GASTROPOD

INOCERAMUS

OOLITE

ANHYDRITIC

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

TUFFACEOUS

Stringer

ANHYDRITE STRINGER

BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

OSTRACOD
PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

BITUMENOUS SUBSTANCE
BRECCIA FRAGMENTS
CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET

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

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

Rock Types

UNKNOWN
ANHYDRITE
BENTONITE
BRECCIA
CEMENT
CHALK
CHERT
CLAY CHOKE SAND
CLAYSTONE

COAL
CONGLOMERATE
DOLOMITE
GRANITE
GYPSUM
IGNEOUS
LIMESTONE
SIDERITE or LIMONITE
MARLSTONE

METAMORPHIC
NO SAMPLE
SALT
SALT- PEPPER SAND
SANDSTONE
SHALE
SHALE COLORED
SHALE GRAY
SHALY SANDSTONE

SHALY SILTSTONE
SILTSTONE
SILTY SHALE
TILL
TUFF
WELDED TUFF

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

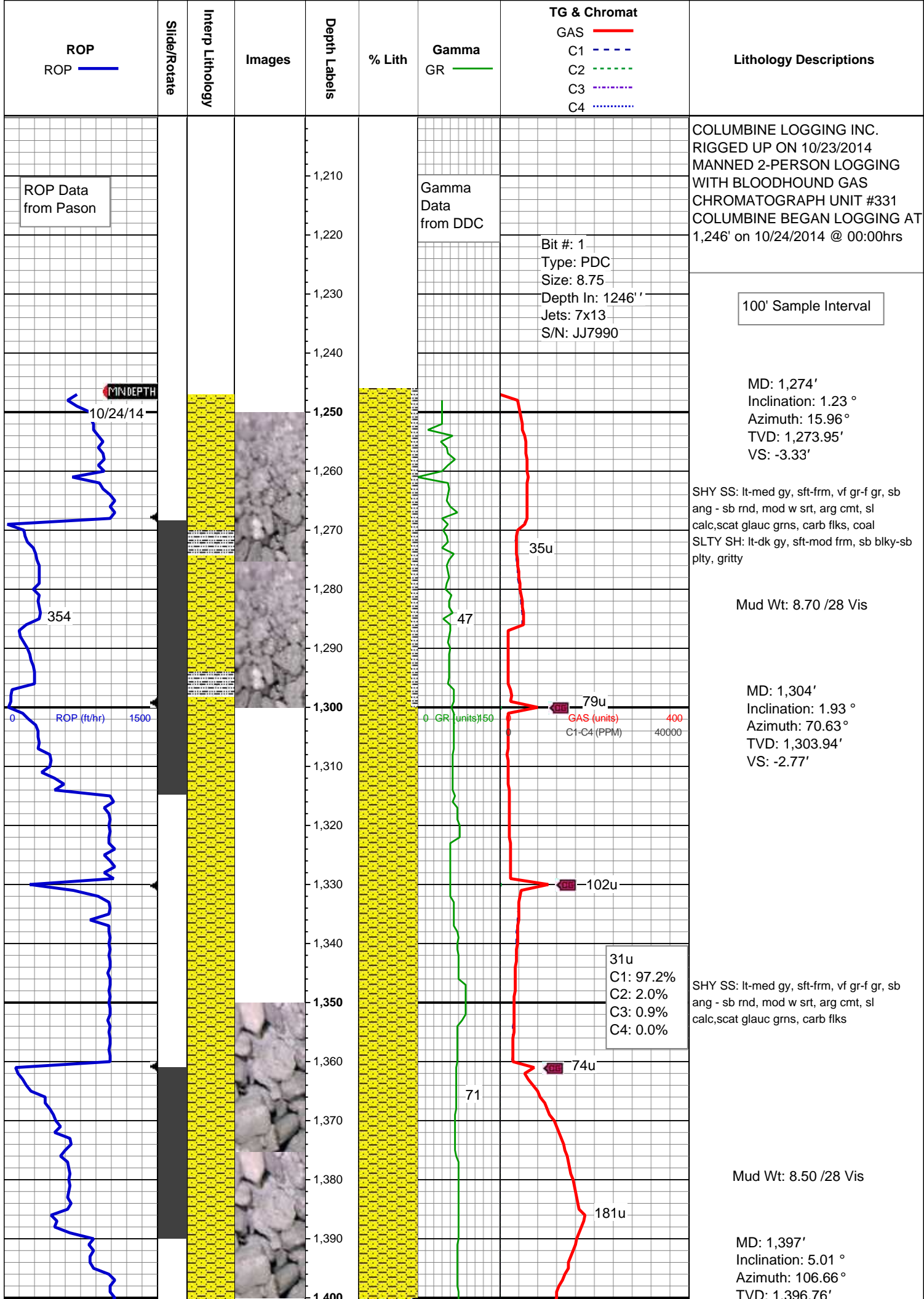
Name JAMES TAYLOR

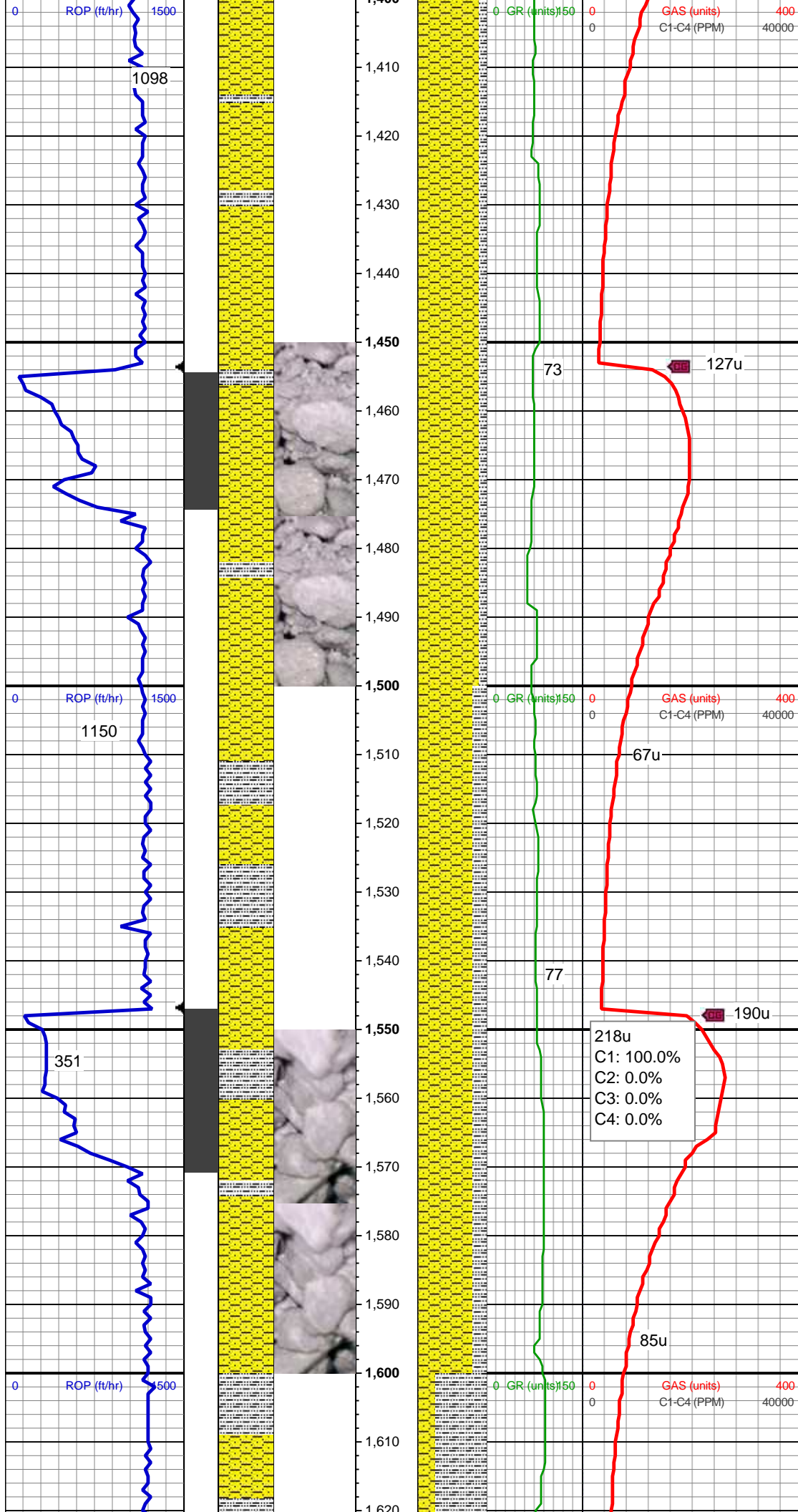
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING MATT HOPKINS
MIKE KERSCHEN



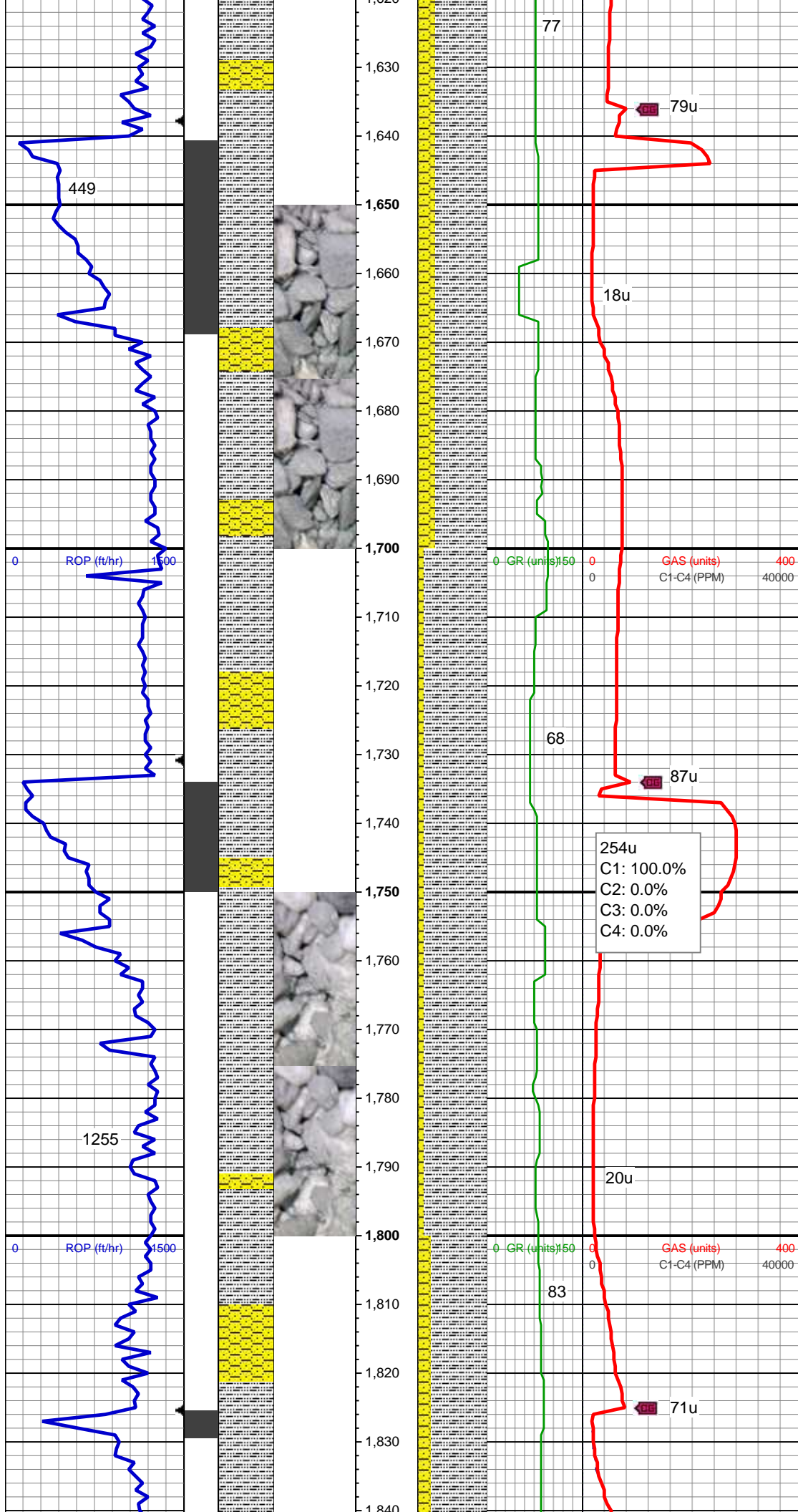


SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl
calc,scat glauc grns SLTY SH: lt-dk gy,
sft-mod frm, sb blk-y-sb plty, gritty

MD: 1,490'
Inclination: 7.3 °
Azimuth: 108.07 °
TVD: 1,489.22'
VS: 12.11'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl
calc,scat glauc grns SLTY SH: lt-dk gy,
sft-mod frm, sb blk-y-sb plty, gritty

MD: 1,582'
Inclination: 9.23 °
Azimuth: 119.85 °
TVD: 1,580.27'
VS: 24.07'

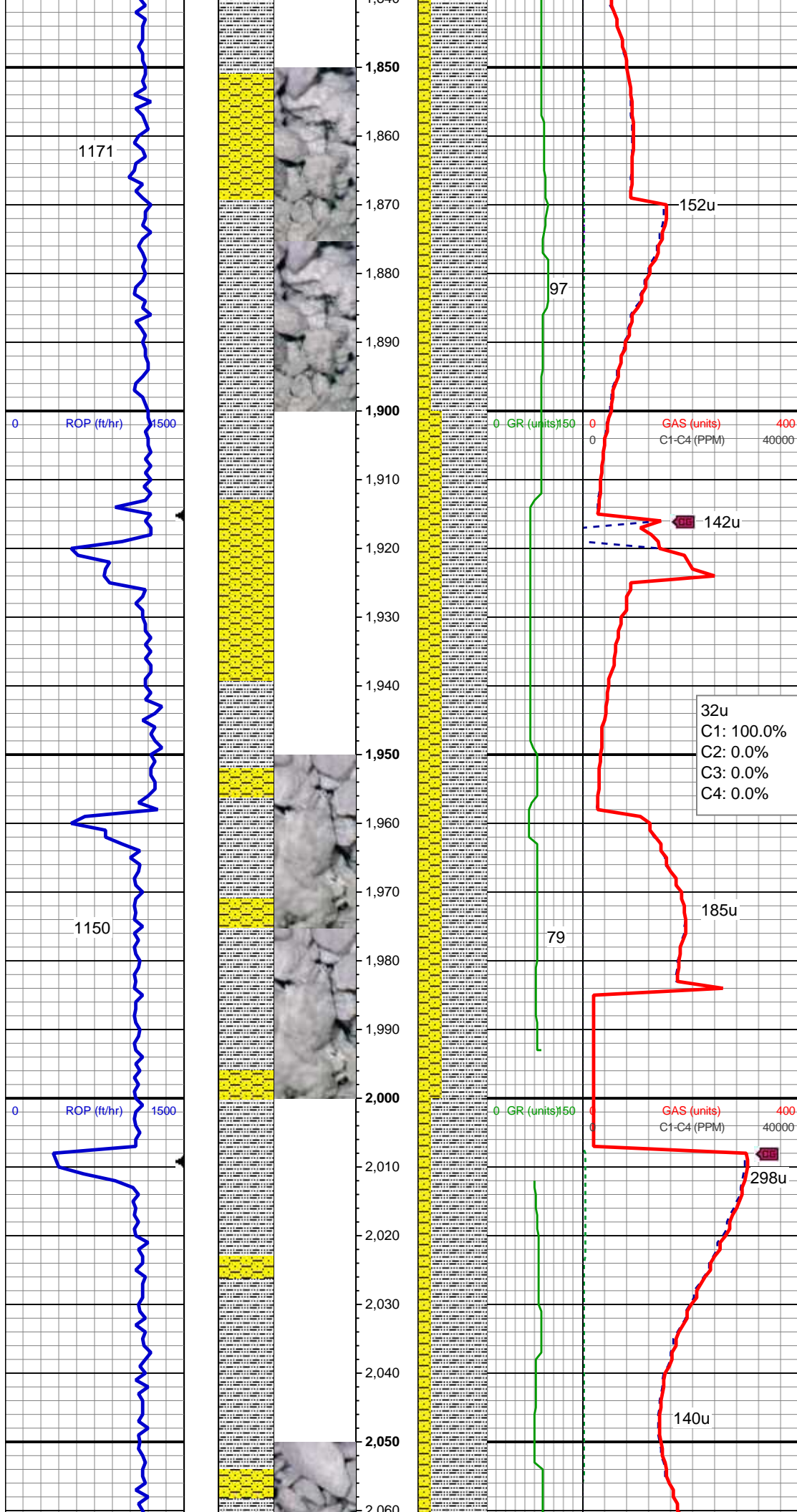


SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb plty, gritty SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 1,675'
Inclination: 11.34 °
Azimuth: 103.5 °
TVD: 1,671.79'
VS: 39.43'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb plty, gritty SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 1,767'
Inclination: 13.28 °
Azimuth: 90.67 °
TVD: 1,761.69'
VS: 58.8'



SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

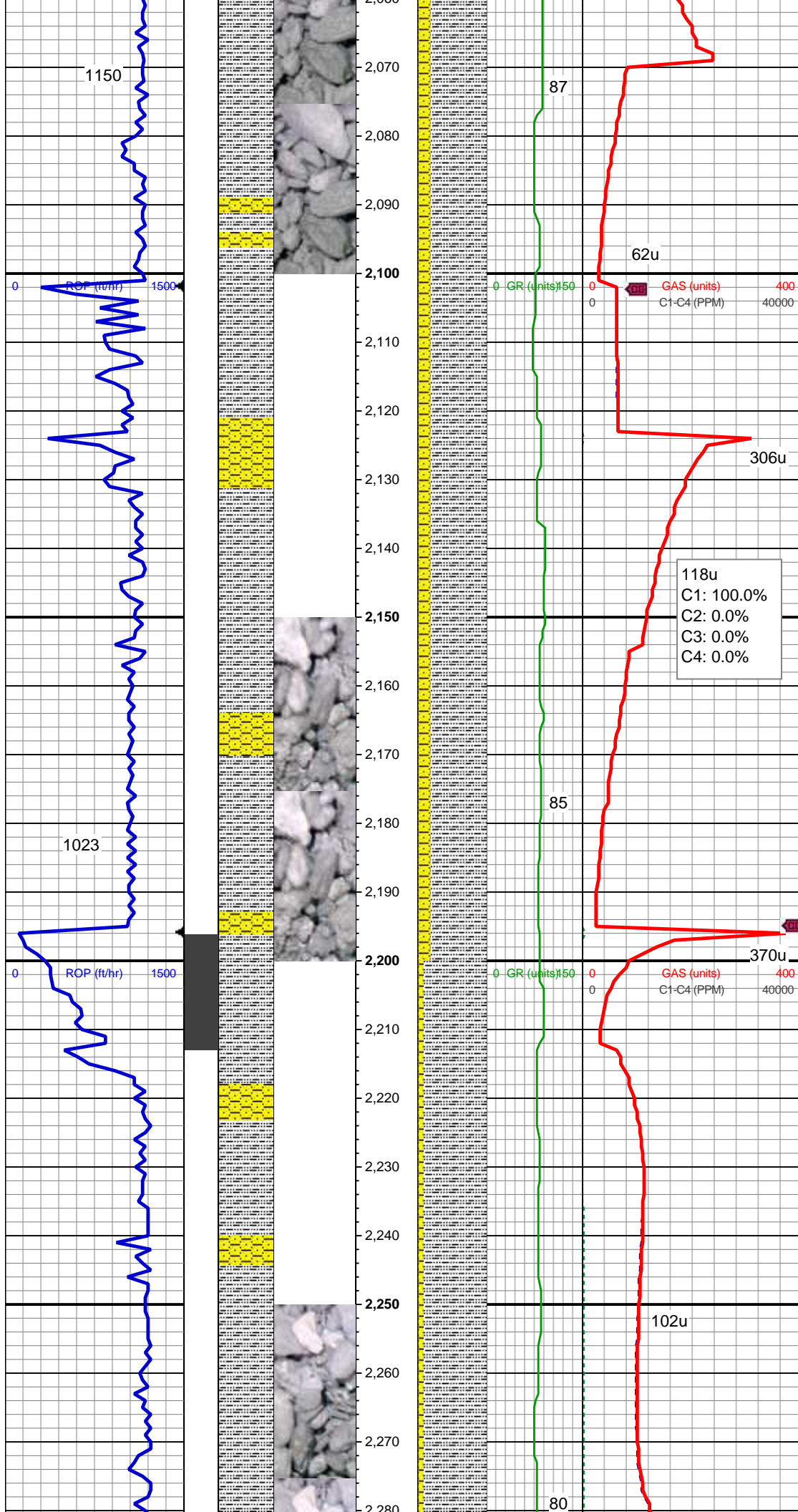
MD: 1,859'
Inclination: 13.37 °
Azimuth: 88.21 °
TVD: 1,851.21'
VS: 80'

MD: 1,952'
Inclination: 13.37 °
Azimuth: 88.03 °
TVD: 1,941.69'
VS: 101.49'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

MD: 2,045'
Inclination: 13.37 °
Azimuth: 88.03 °
TVD: 2,032.17'
VS: 122.99'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly



1150

ROP (ft/hr)

1023

ROP (ft/hr)

87

62u

GR (units)

GAS (units)

C1-C4 (PPM)

306u

118u

C1: 100.0%

C2: 0.0%

C3: 0.0%

C4: 0.0%

85

370u

GR (units)

GAS (units)

C1-C4 (PPM)

102u

80

MD: 2,138'

Inclination: 12.93 °

Azimuth: 86.8 °

TVD: 2,122.73'

VS: 144.12'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

MD: 2,231'

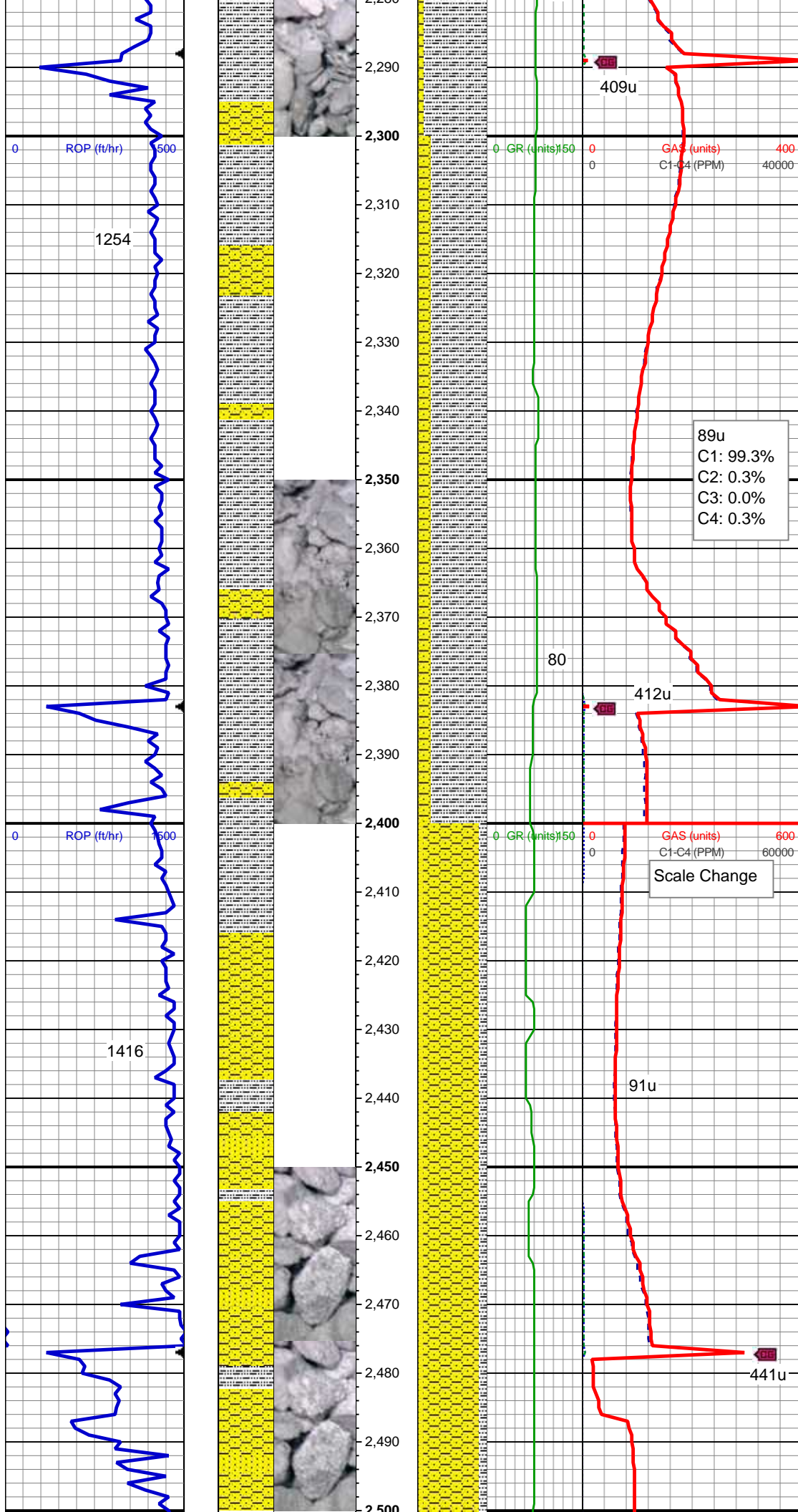
Inclination: 14.51 °

Azimuth: 86.8 °

TVD: 2,213.07'

VS: 166.14'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

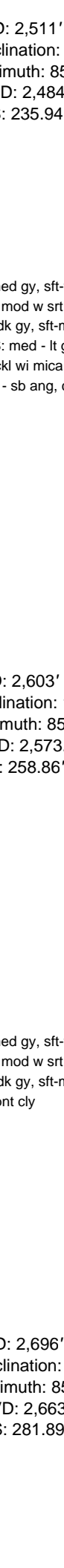
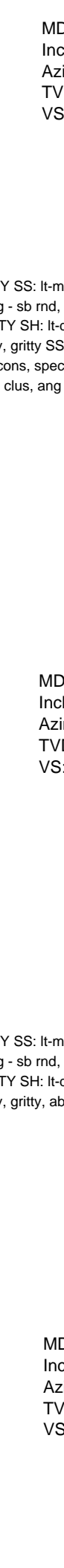
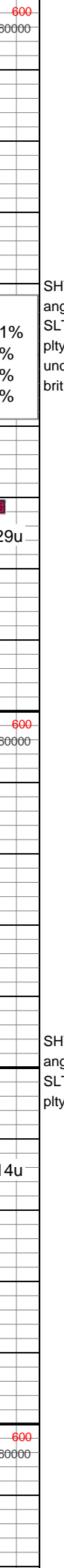
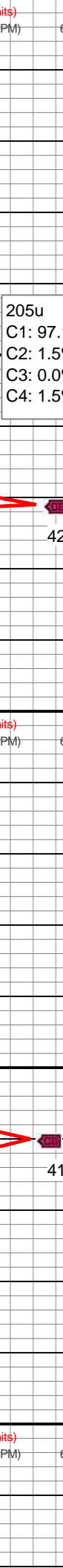
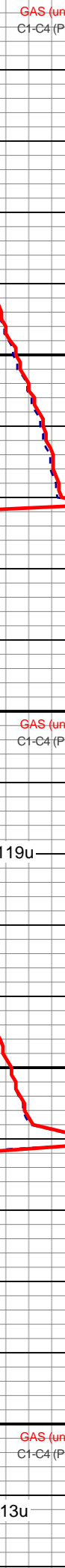
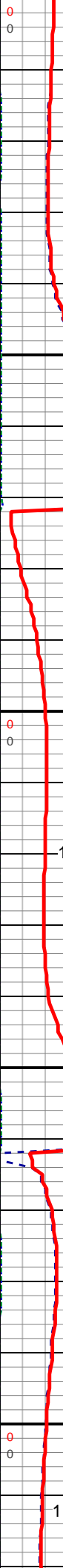
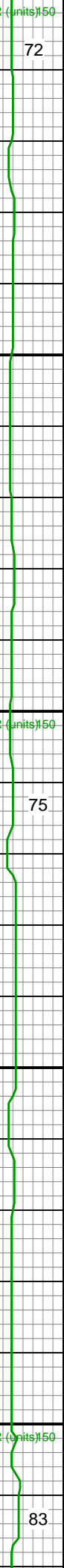
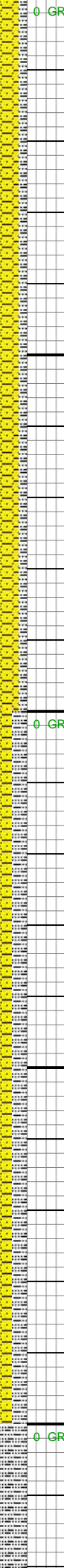
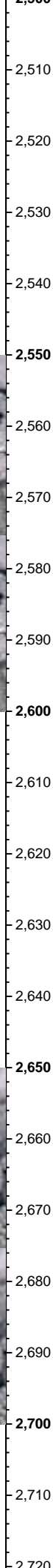
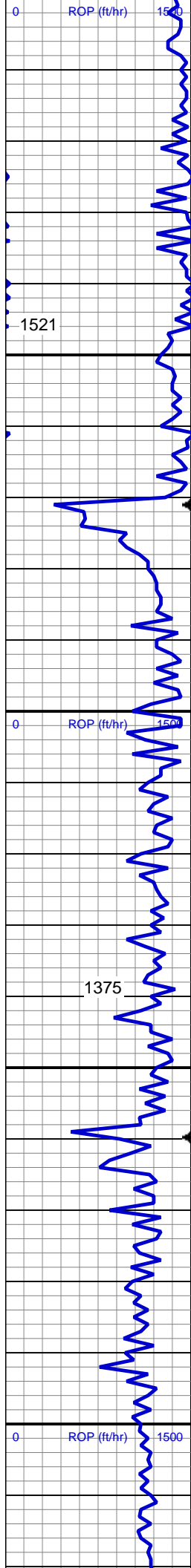


MD: 2,325'
Inclination: 14.42 °
Azimuth: 86.62 °
TVD: 2,304.09'
VS: 189.58'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb pty, gritty SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, abnt cly

MD: 2,418'
Inclination: 14.51 °
Azimuth: 86.1 °
TVD: 2,394.15'
VS: 212.77'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb pty, gritty SHY SS: med - lt gy, s&P ip, uncon, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt



MD: 2,511'
Inclination: 14.42 °
Azimuth: 85.92 °
TVD: 2,484.2'
VS: 235.94'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
pity, gritty SS: med - lt gy, s&P ip,
uncons, speckl wi mica & glau, f gr, hd
brit clus, ang - sb ang, calc cmt

MD: 2,603'
Inclination: 14.51 °
Azimuth: 85.75 °
TVD: 2,573.28'
VS: 258.86'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
pity, gritty, abnt cly

MD: 2,696'
Inclination: 14.25 °
Azimuth: 85.22 °
TVD: 2,663.37'
VS: 281.89'

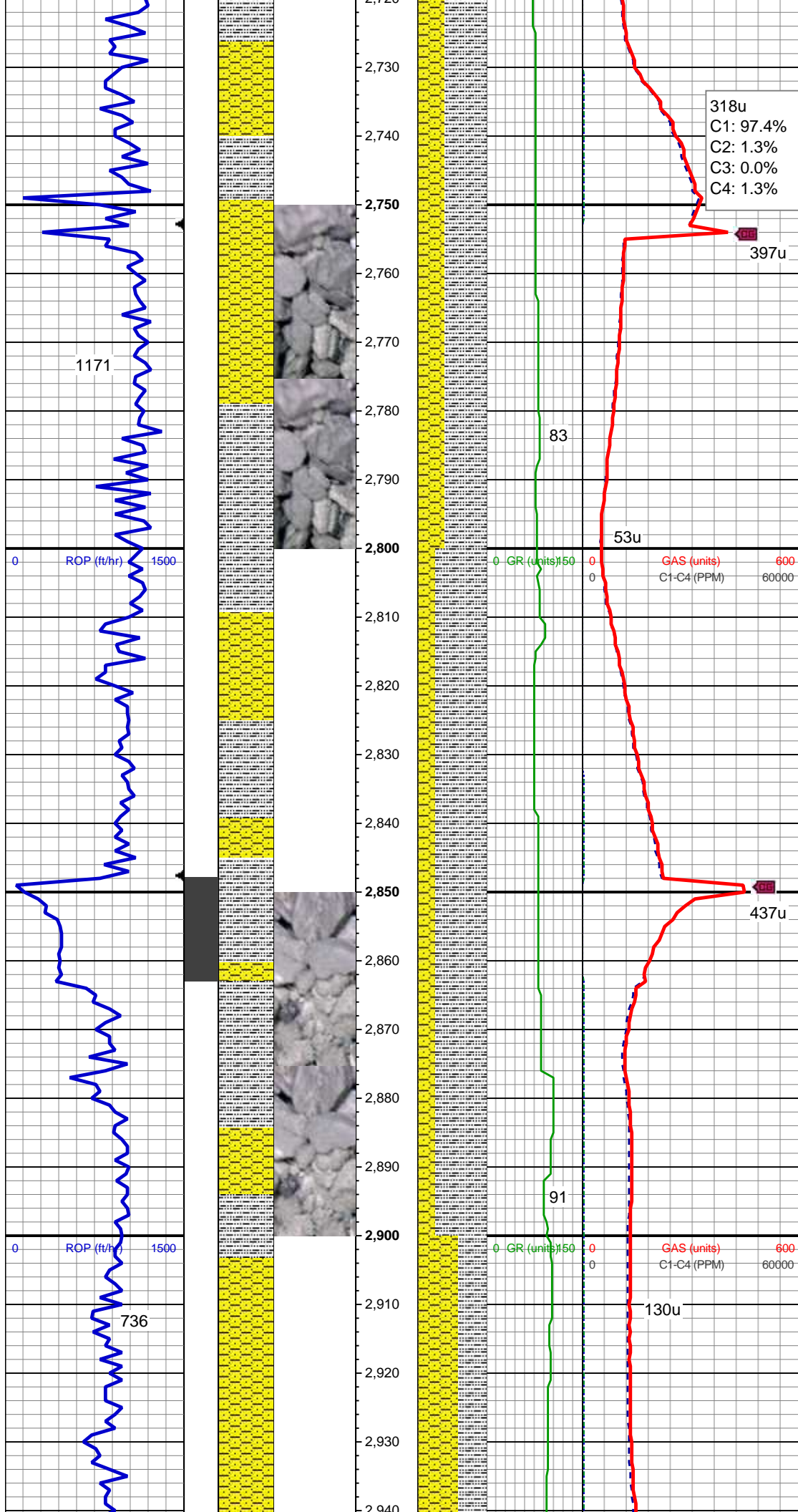
205u
C1: 97.1%
C2: 1.5%
C3: 0.0%
C4: 1.5%

429u

119u

414u

113u



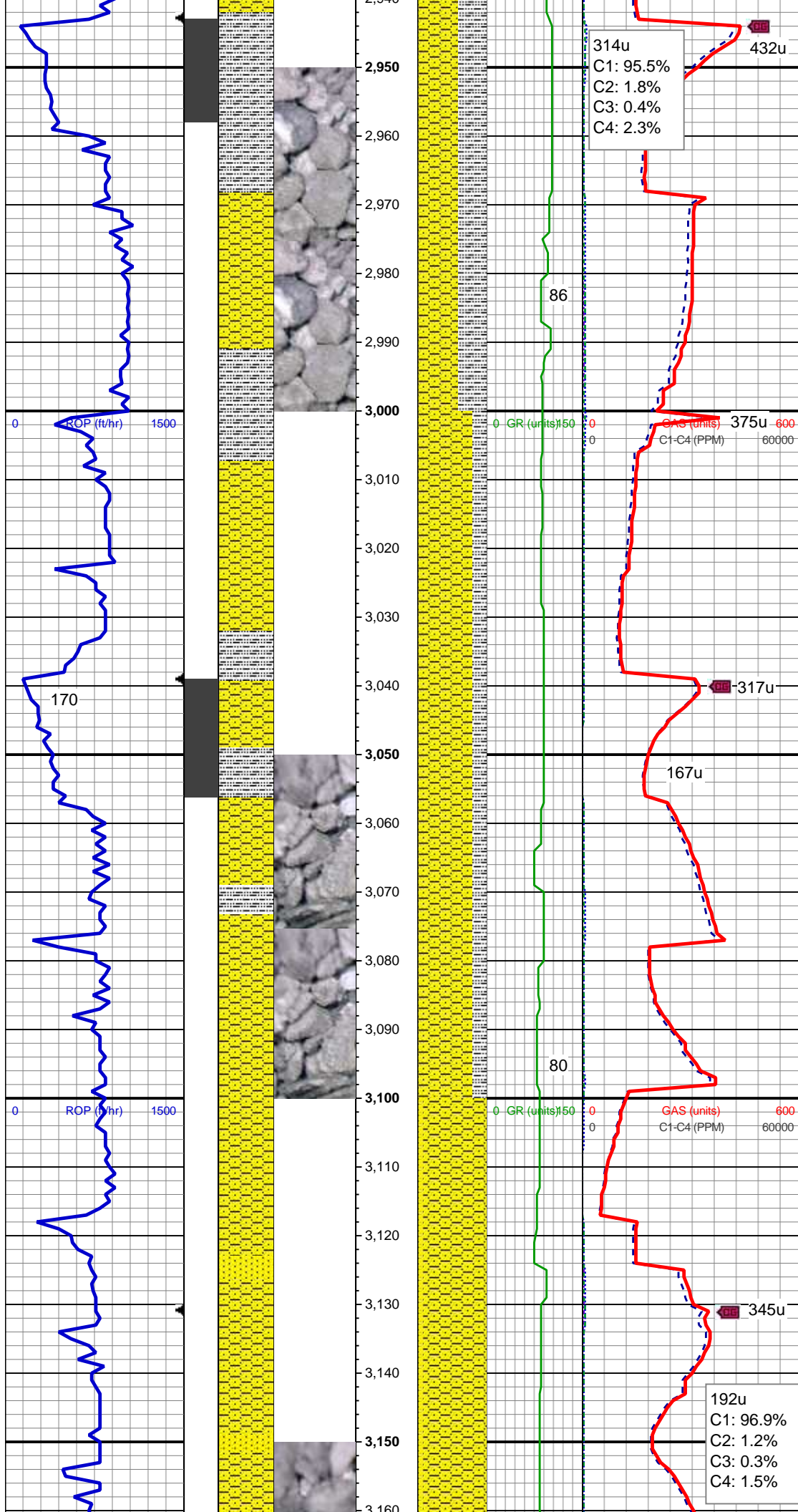
SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

Mud Wt: 8.80 /31 Vis

MD: 2,790'
Inclination: 13.98 °
Azimuth: 83.81 °
TVD: 2,754.53'
VS: 304.7'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc

MD: 2,885'
Inclination: 12.66 °
Azimuth: 89.61 °
TVD: 2,846.98'
VS: 326.52'



314u
C1: 95.5%
C2: 1.8%
C3: 0.4%
C4: 2.3%

432u

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb pty, gritty

MD: 2,980'
Inclination: 12.84 °
Azimuth: 93.13 °
TVD: 2,939.64'
VS: 347.47'

Mud Wt: 8.80 /31 Vis

317u

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb pty, gritty

167u

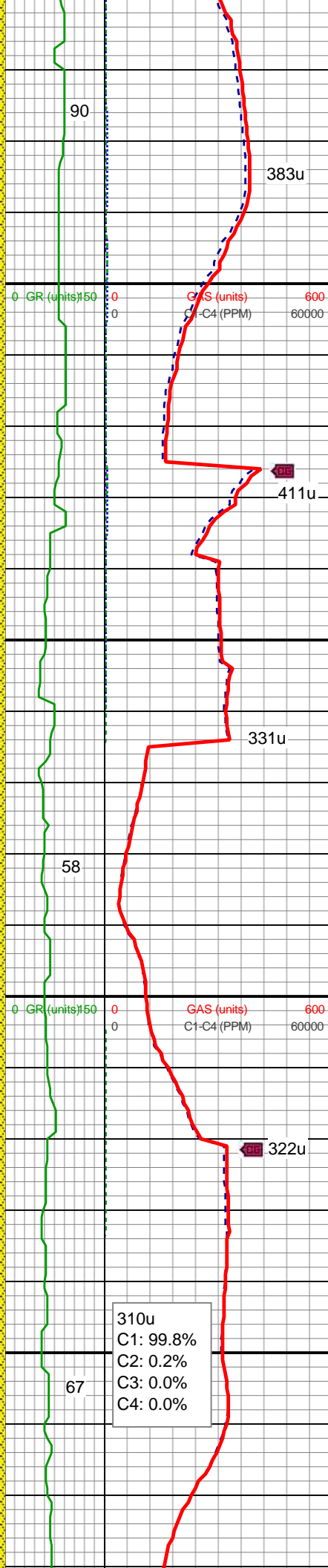
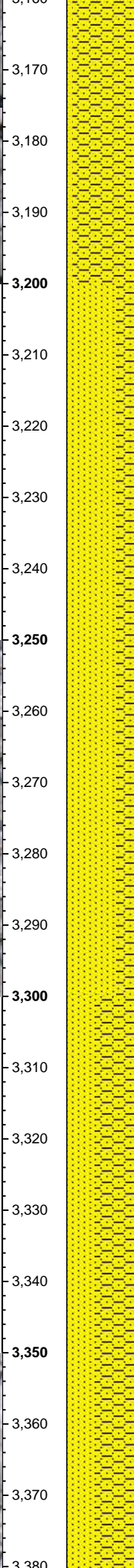
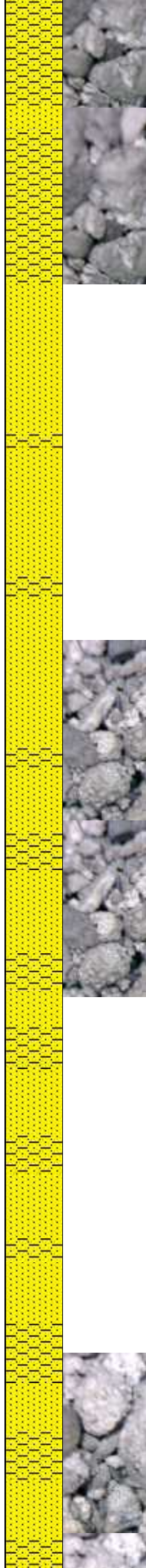
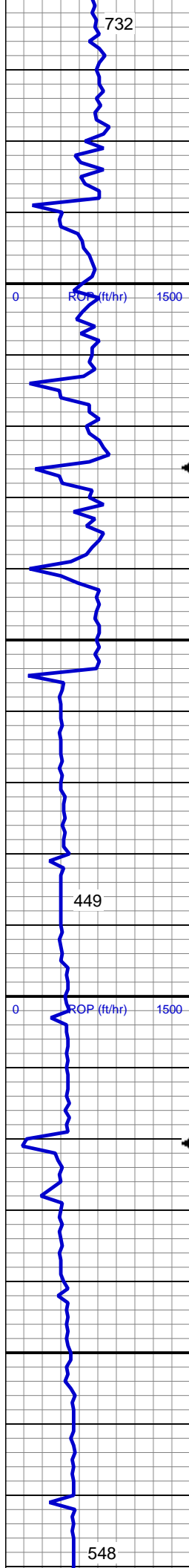
MD: 3,074'
Inclination: 14.33 °
Azimuth: 94.53 °
TVD: 3,031'
VS: 16.08'

80

192u
C1: 96.9%
C2: 1.2%
C3: 0.3%
C4: 1.5%

345u

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SS: med - lt gy, s&P ip, unconcs, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt



MD: 3,169'
Inclination: 14.51 °
Azimuth: 93.13 °
TVD: 3,123.01'
VS: 15.6'

Mud Wt: 8.70 /30 Vis

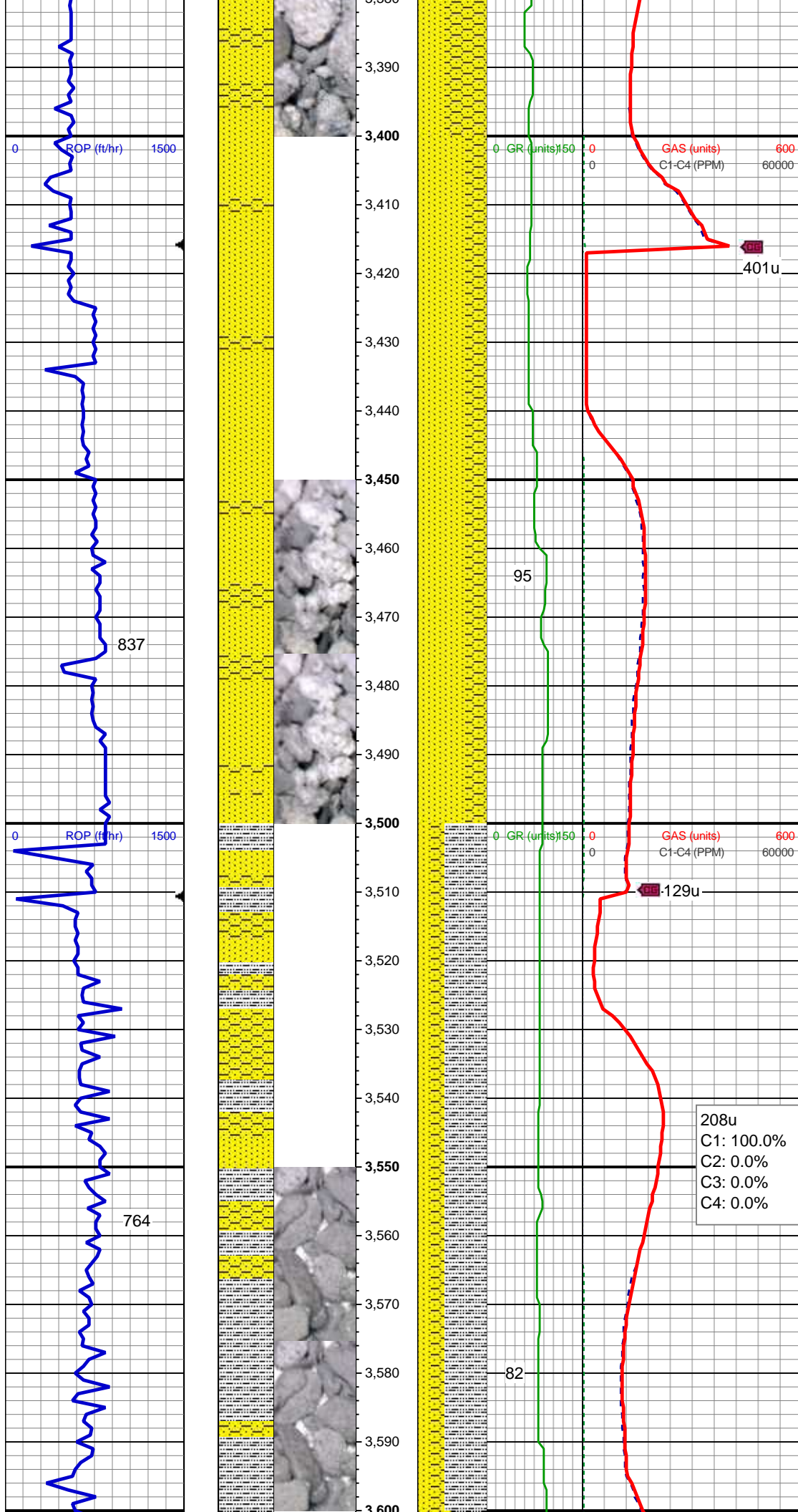
SS: med - lt gy, s&P ip, uncon, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 3,263'
Inclination: 14.6 °
Azimuth: 93.66 °
TVD: 3,213.99'
VS: 15.3'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SS: med - lt gy, s&P ip, uncon, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt, occ slty sh, tr coal

MD: 3,358'
Inclination: 14.95 °
Azimuth: 93.83 °
TVD: 3,305.85'
VS: 14.84'

310u
C1: 99.8%
C2: 0.2%
C3: 0.0%
C4: 0.0%

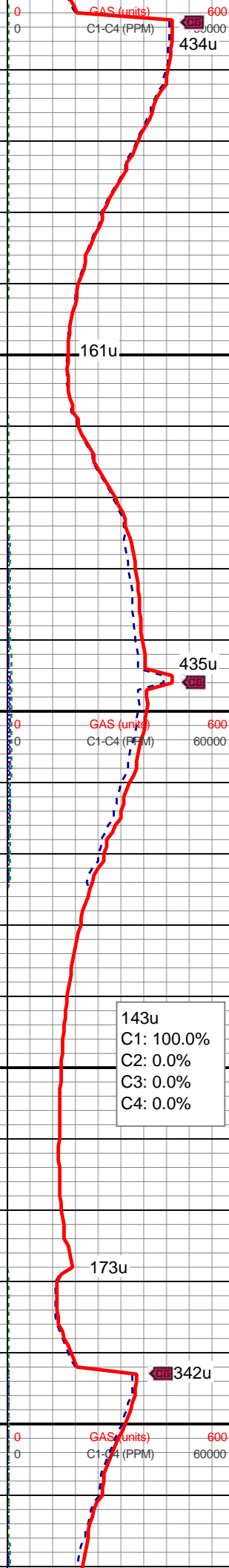
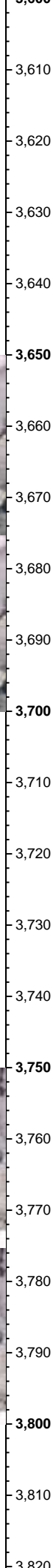
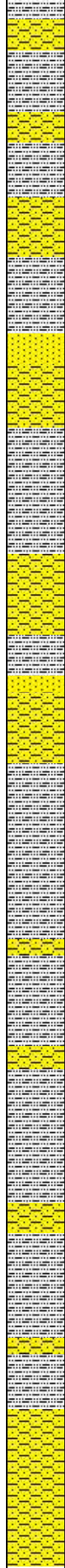
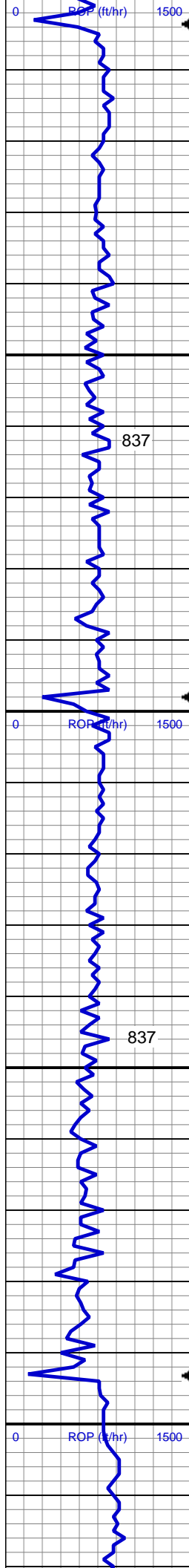


MD: 3,452'
Inclination: 15.48 °
Azimuth: 93.48 °
TVD: 3,396.56'
VS: 14.41'

SS: med - lt gy, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, ply cmt
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 3,547'
Inclination: 14.77 °
Azimuth: 93.48 °
TVD: 3,488.27'
VS: 14.06'

SLTY SH: lt-dk gy, sft-mod frm, sb blkgy-sb ply, gritty
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SS: med - lt gy, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt

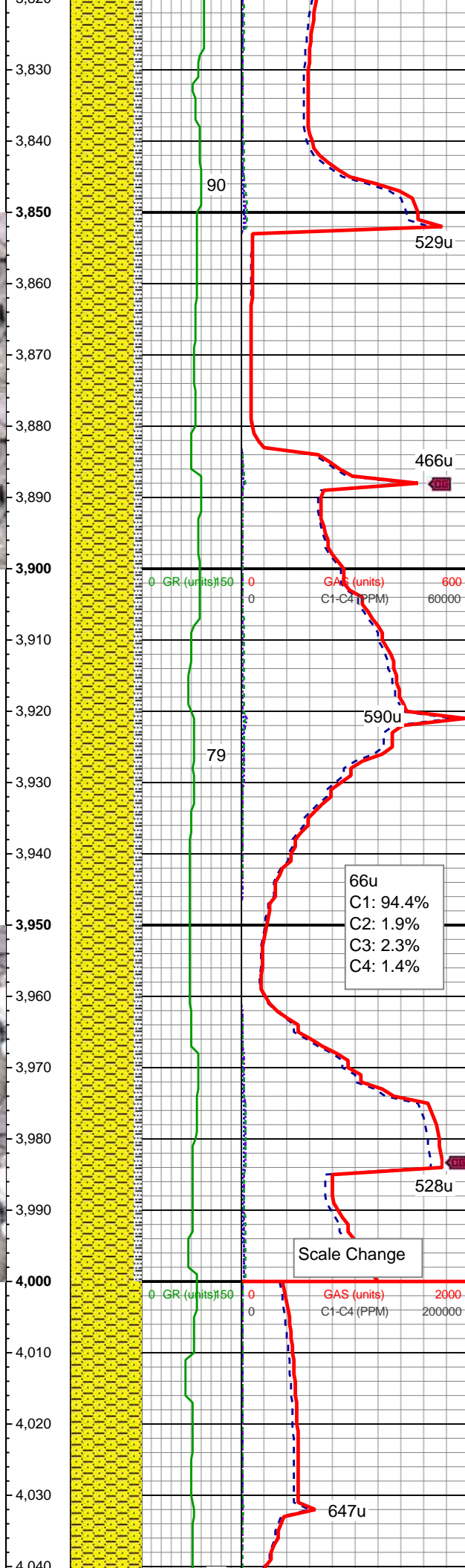
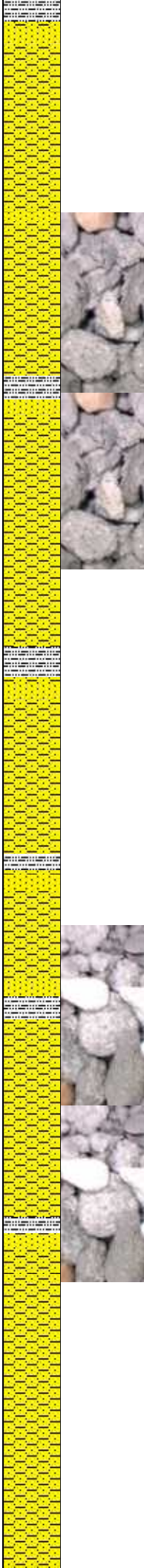
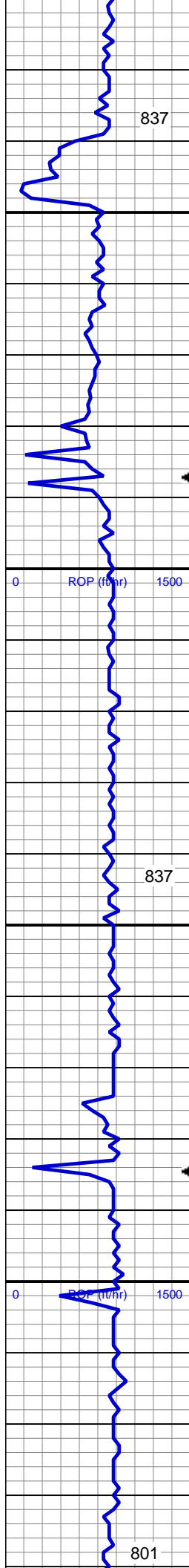


MD: 3,642'
Inclination: 13.72 °
Azimuth: 95.06 °
TVD: 3,580.34'
VS: 13.41'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc SS: med - lt gy, s&p ip,
speckl wi mica & glau, f gr, hd brit clus,
ang - sb ang, calc cmt

MD: 3,736'
Inclination: 11.61 °
Azimuth: 97.7 °
TVD: 3,672.05'
VS: 12.11'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, tr ss



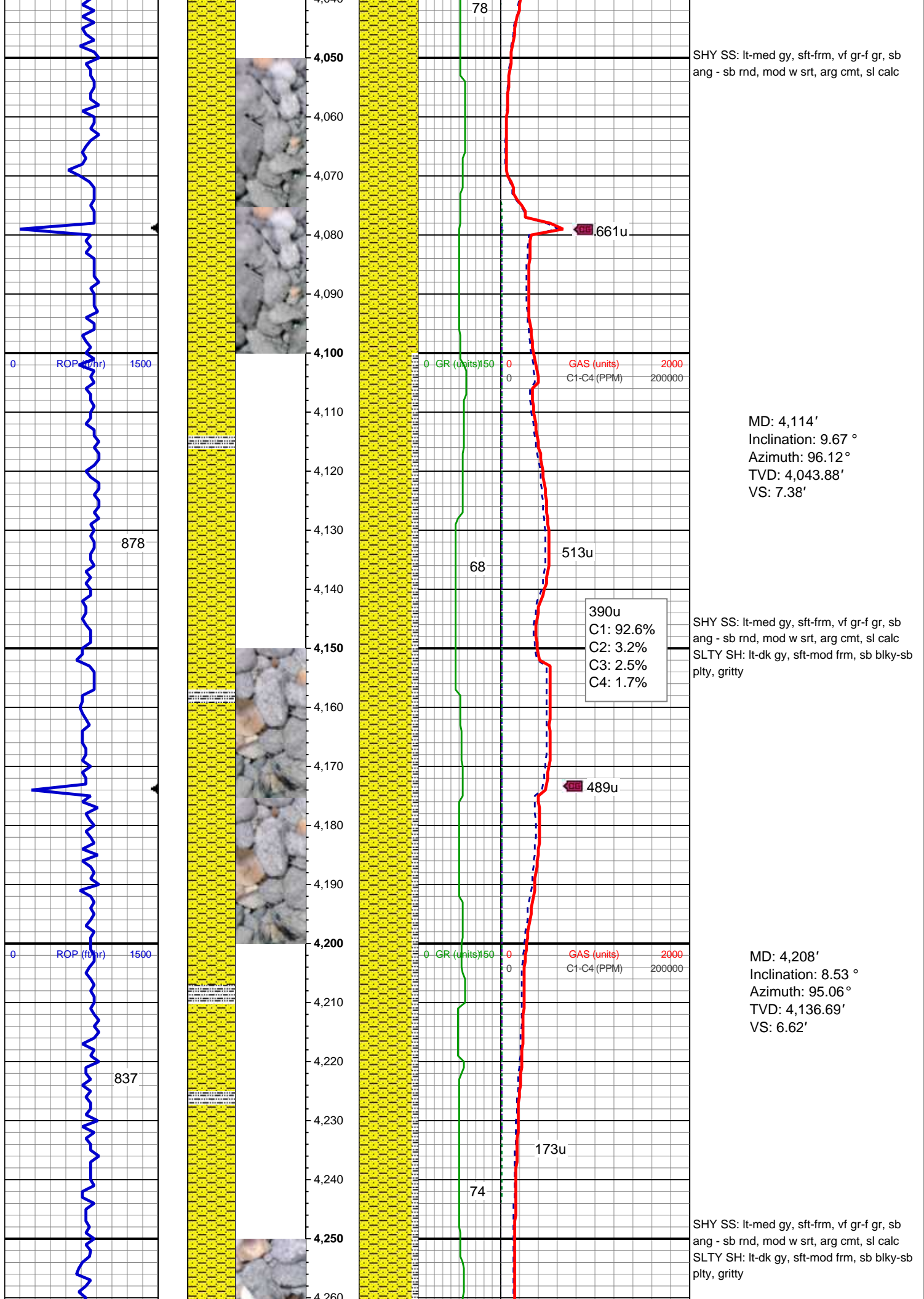
MD: 3,830'
Inclination: 10.73 °
Azimuth: 97 °
TVD: 3,764.27'
VS: 10.62'

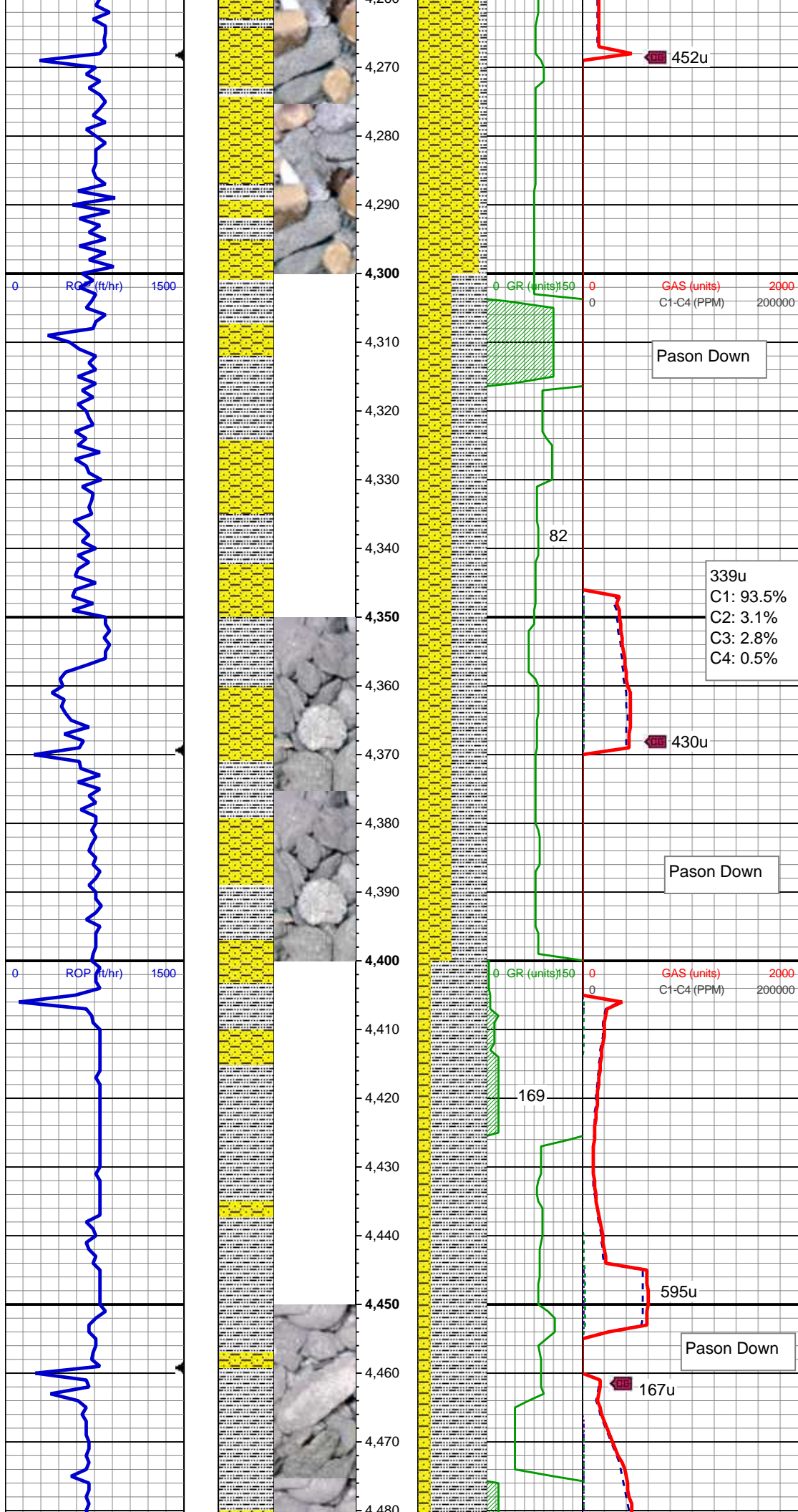
SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SS: med - lt gy, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 3,925'
Inclination: 10.29 °
Azimuth: 96.12 °
TVD: 3,857.68'
VS: 9.44'

SHY SS: lt-med gy, sft frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SS: med - lt gy, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb plty, gritty

MD: 4,020'
Inclination: 9.76 °
Azimuth: 96.47 °
TVD: 3,951.23'
VS: 8.39'



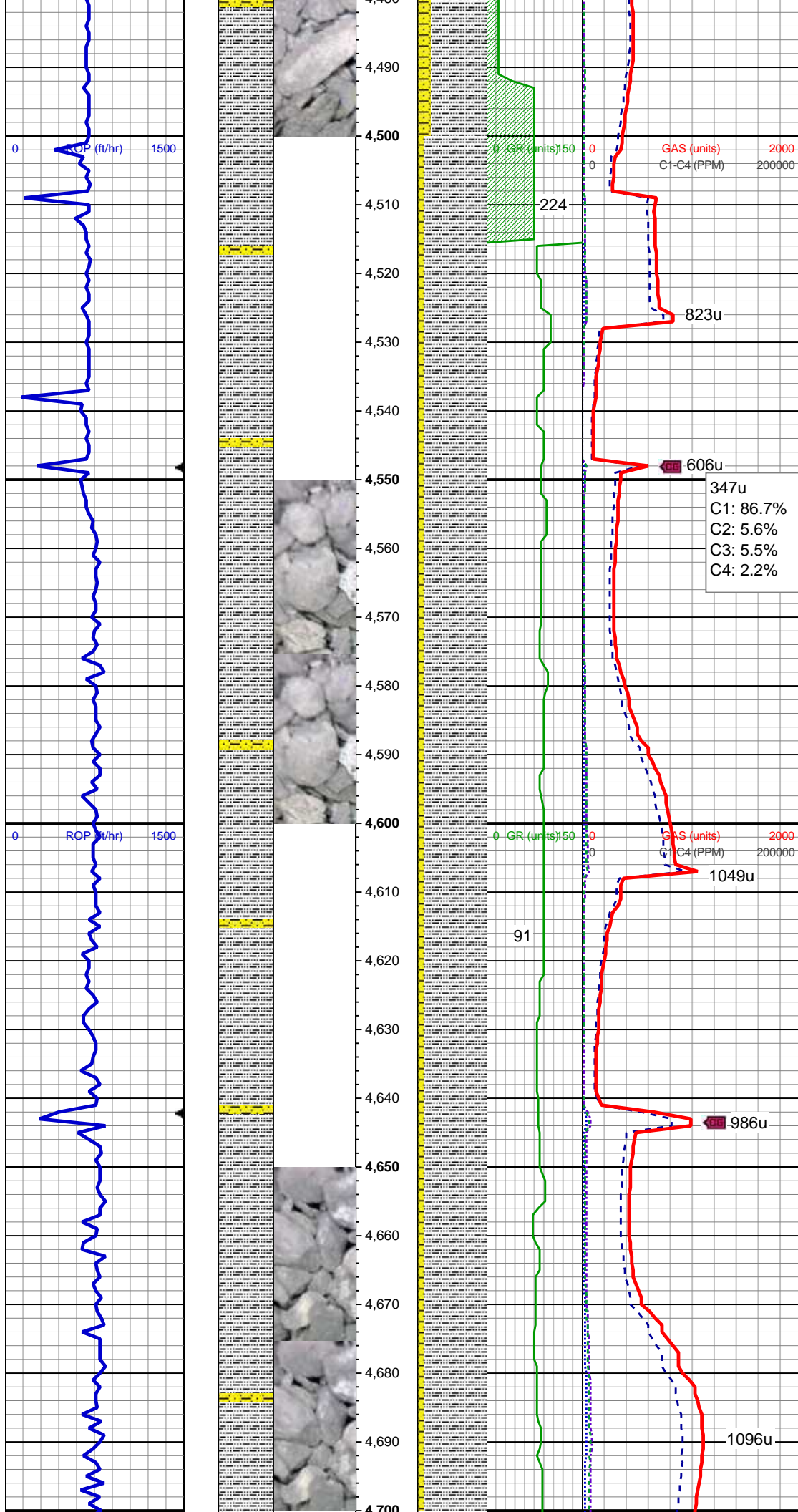


MD: 4,302'
Inclination: 7.65 °
Azimuth: 90.67 °
TVD: 4,229.76'
VS: 6.54'

SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb
ang - sb rnd, mod w srt, arg cmt, sl calc
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty

MD: 4,397'
Inclination: 7.03 °
Azimuth: 92.78 °
TVD: 4,323.98'
VS: 6.75'

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc



MD: 4,491'
Inclination: 6.24 °
Azimuth: 95.59 °
TVD: 4,417.35'
VS: 6.48'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc

MD: 4,585'
Inclination: 5.1 °
Azimuth: 93.48 °
TVD: 4,510.89'
VS: 6.16'

SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc

MD: 4,680'
Inclination: 4.13 °
Azimuth: 91.72 °
TVD: 4,605.58'
VS: 6.15'

