

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K09-66-1HN

Location SWNW SEC 9, T4N, R66W

State COLORADO

County WELD

Country USA

Rig Number H&P 330

API Number 05-123-39482

Field WATTENBERG

Region DJ BASIN

Drilling Completed 8/7/2014

Spud Date 8/6/2014

Surface Coordinates 2105' FNL, 512' FWL

Ground Elevation 4699'

K.B. Elevation 4729

Logged Interval 700' To 6225'

Total Depth 6225'

Formation NIOBRARA A 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
- MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- 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 WACKSTONE

Sorting

- M MODERATE
- P POOR
- W WELL

Zone Color Coding

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

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHIOPOD
- BRYOZOA
- CEPHALOPOD
- CORDAL
- FOSSIL
- GASTROPOD
- INOCERAMUS
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT PROPOG

- ANHYDRITIC
- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- OUTLT

- FERRUGINOUS
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- TYNITE

- TUFFACEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (OIL) STRINGER

CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

PLANT SPORES
SCAPHOPOD
STROMATOPOROID

Minerals

CHERT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET

PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

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

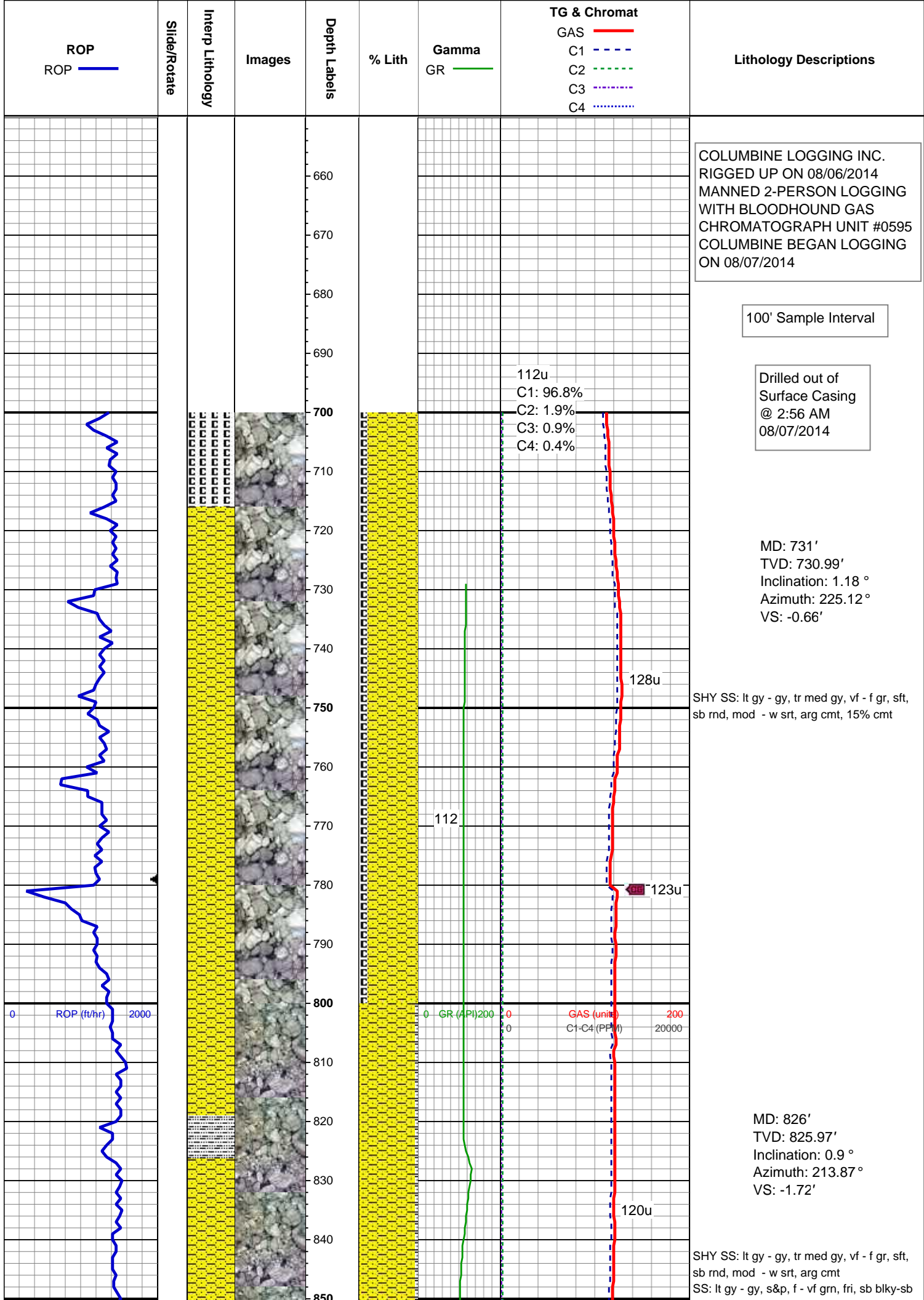
Name RENEE CLACKLER

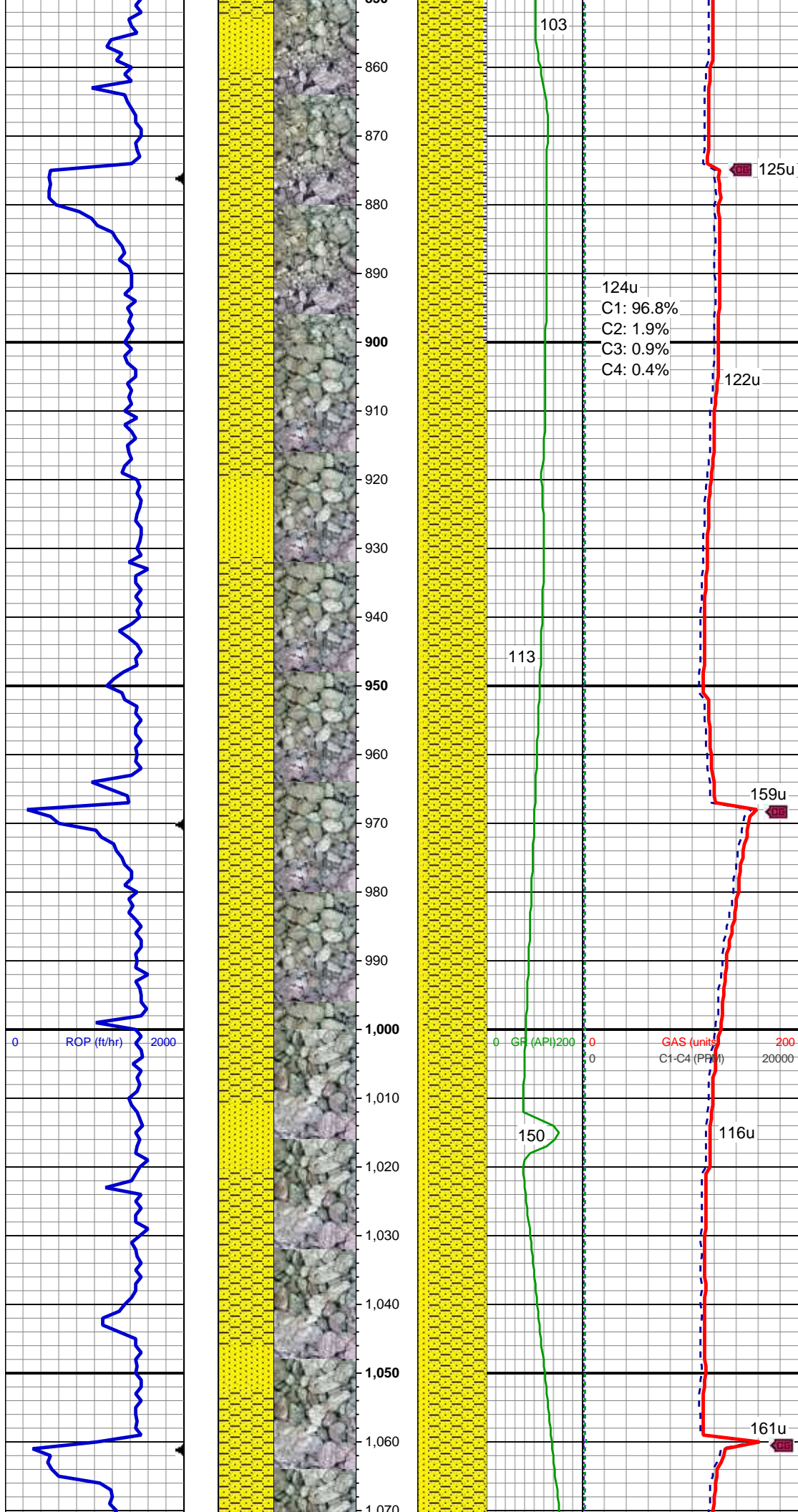
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

WELL SITE GEOLOGIST ANDREA ZUIDEMA
ZACH UBER





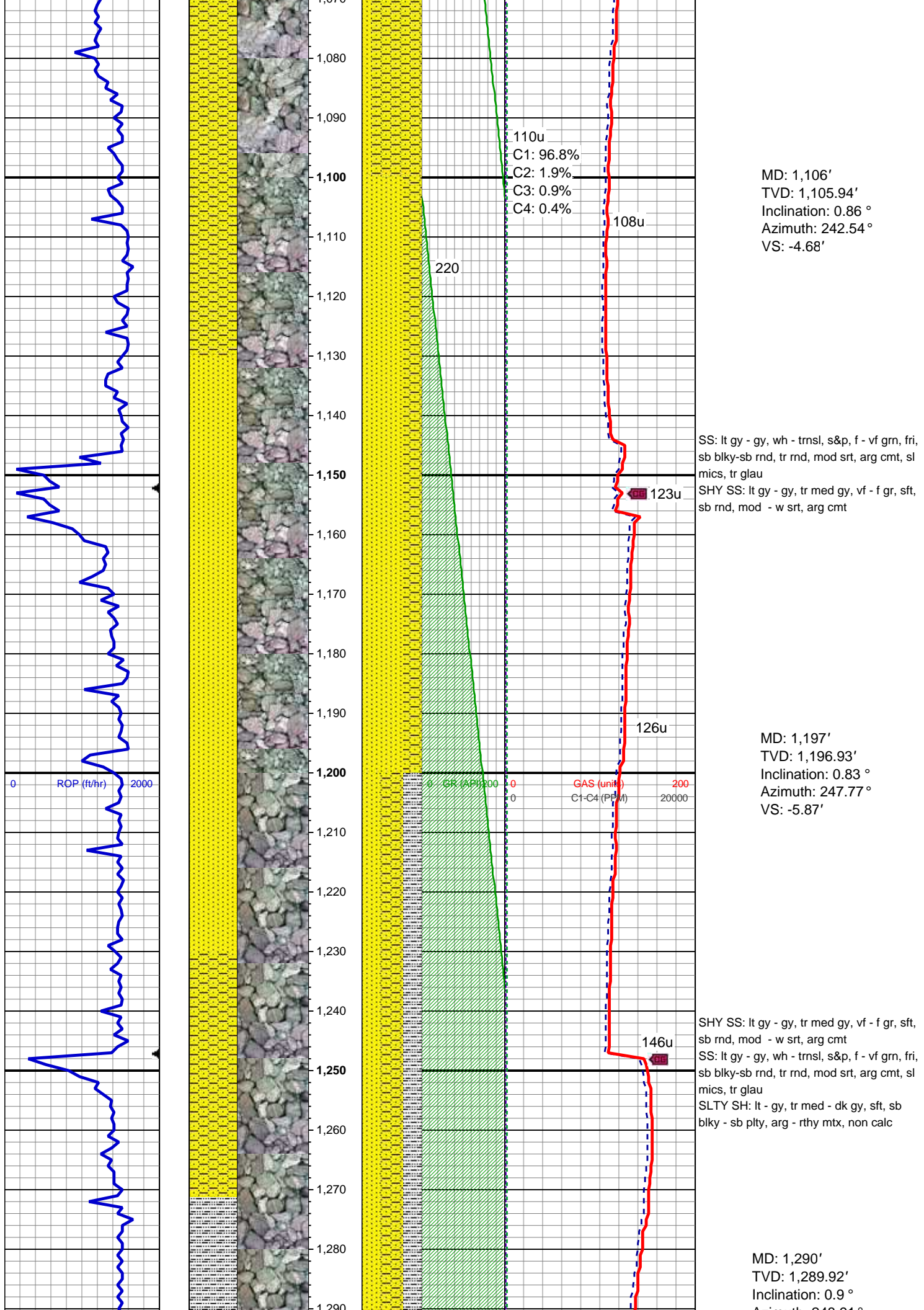
rd, tr rd, p - mod srt, arg cmt, sl mics
SLTY SH: lt - gy, tr med gy, sft, sb blkly -
sb plty, arg - rthy mtz, non calc

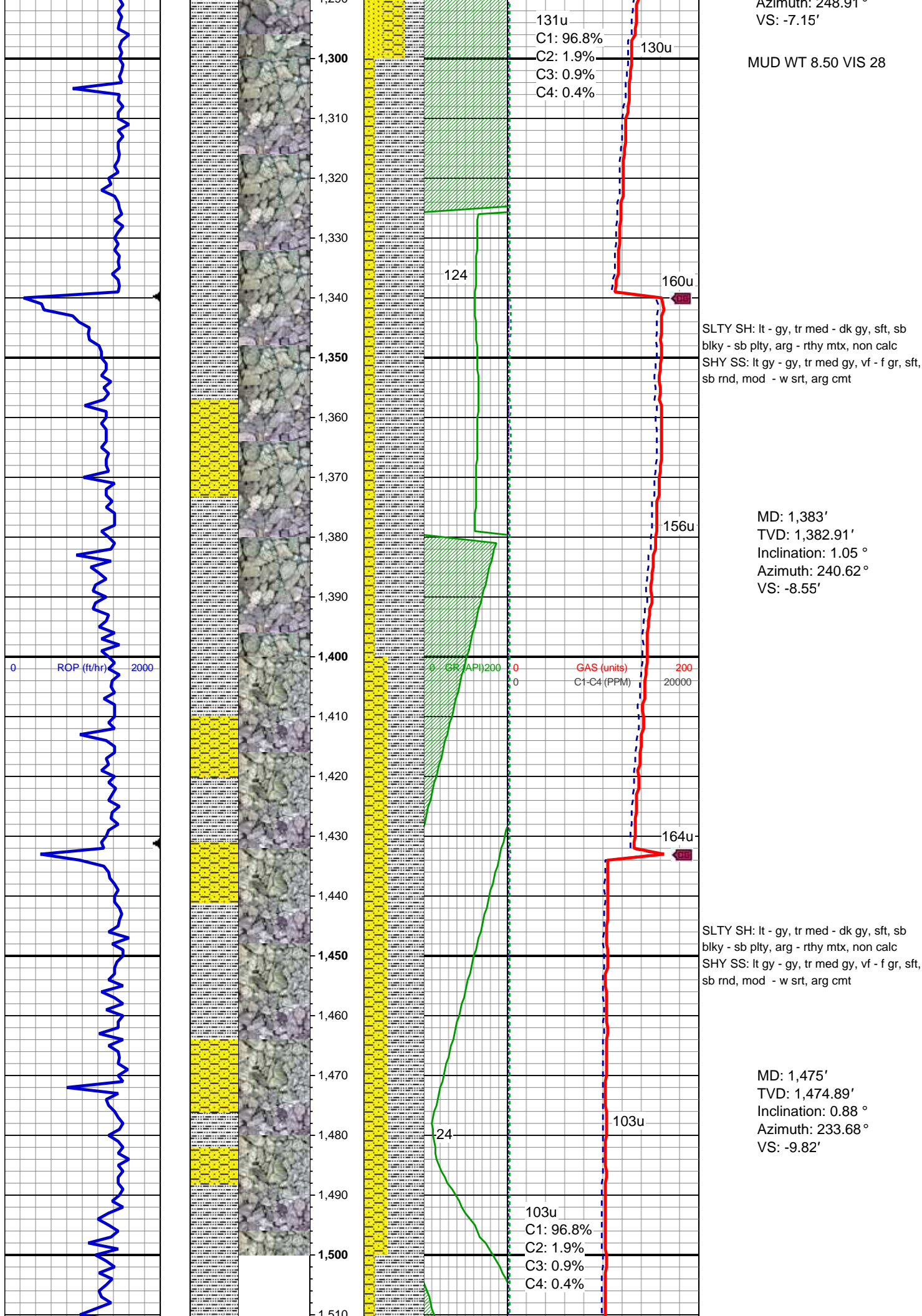
MD: 920'
TVD: 919.96'
Inclination: 1.08 °
Azimuth: 211.02 °
VS: -2.53'

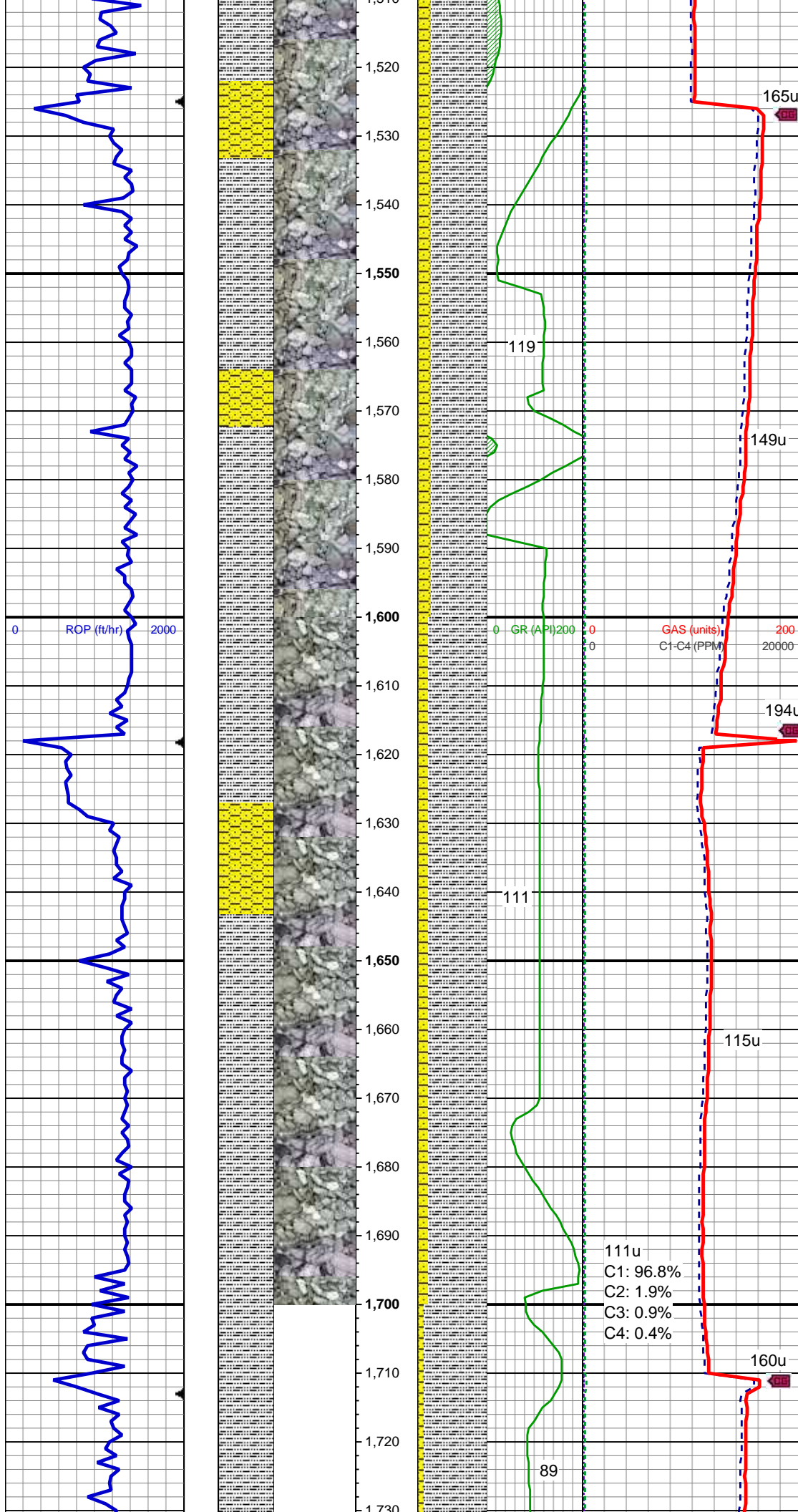
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod - w srt, arg cmt
SS: lt gy - gy, s&p, f - vf grn, fri, sb blkly-sb
rnd, tr rd, p - mod srt, arg cmt, sl mics, tr
intbdd pyr, tr slty sh

MD: 1,013'
TVD: 1,012.95'
Inclination: 0.8 °
Azimuth: 242.42 °
VS: -3.51'

SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod - w srt, arg cmt
SS: lt gy - gy, s&p, f - vf grn, fri, sb blkly-sb
rnd, tr rd, p - mod srt, arg cmt, sl mics, tr
glau







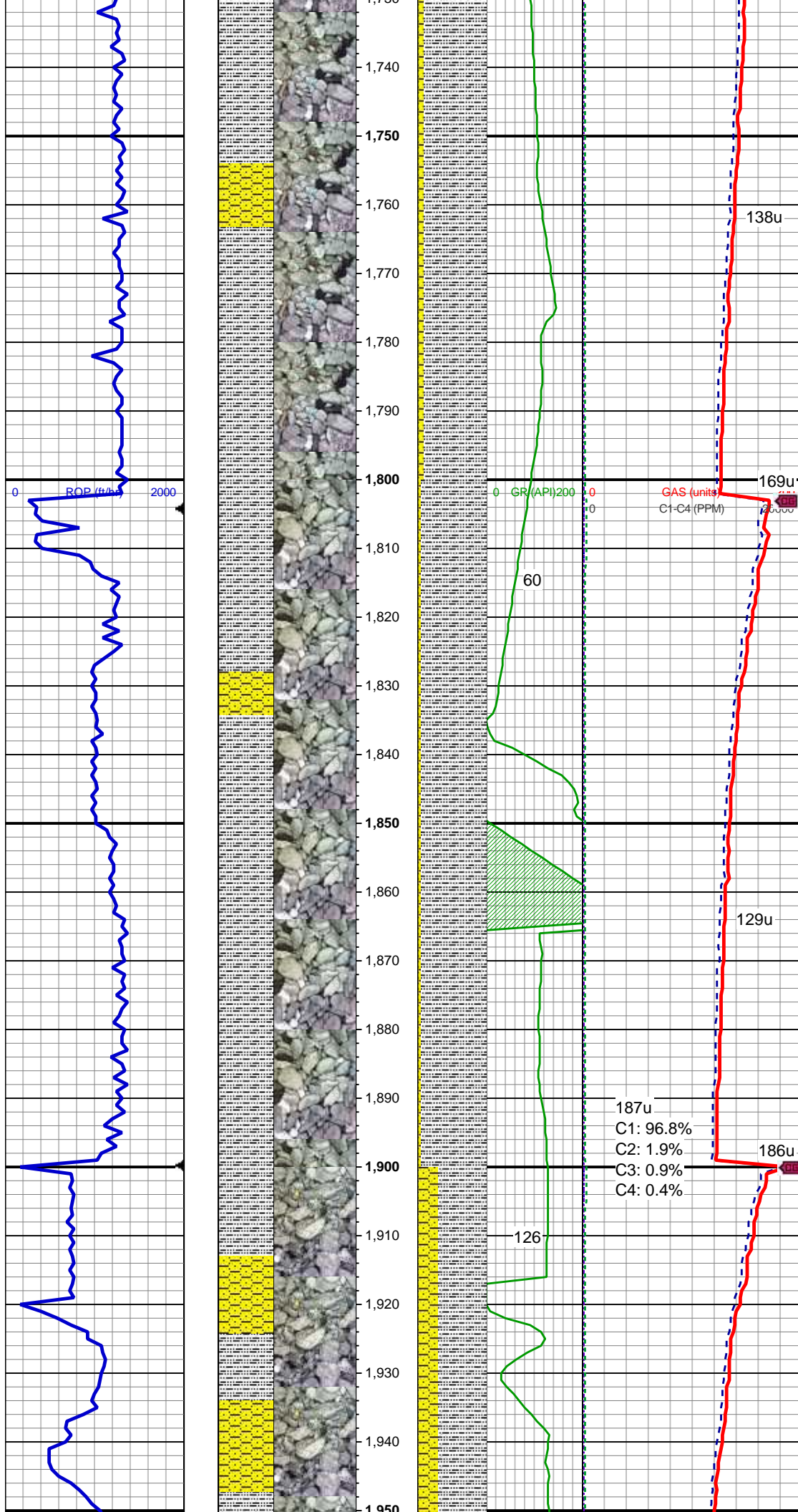
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtz, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod - w srt, arg cmt, tr ss, tr sltst

MD: 1,568'
TVD: 1,567.88'
Inclination: 0.86 °
Azimuth: 243.81 °
VS: -10.99'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtz, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod - w srt, arg cmt, tr ss

MD: 1,662'
TVD: 1,661.87'
Inclination: 0.74 °
Azimuth: 217.71 °
VS: -11.96'

111u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%



SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod - w srt, arg cmt, tr ss

MD: 1,757'
TVD: 1,756.87'
Inclination: 0.47 °
Azimuth: 200.2 °
VS: -12.43'

MUD WT 8.70 VIS 28

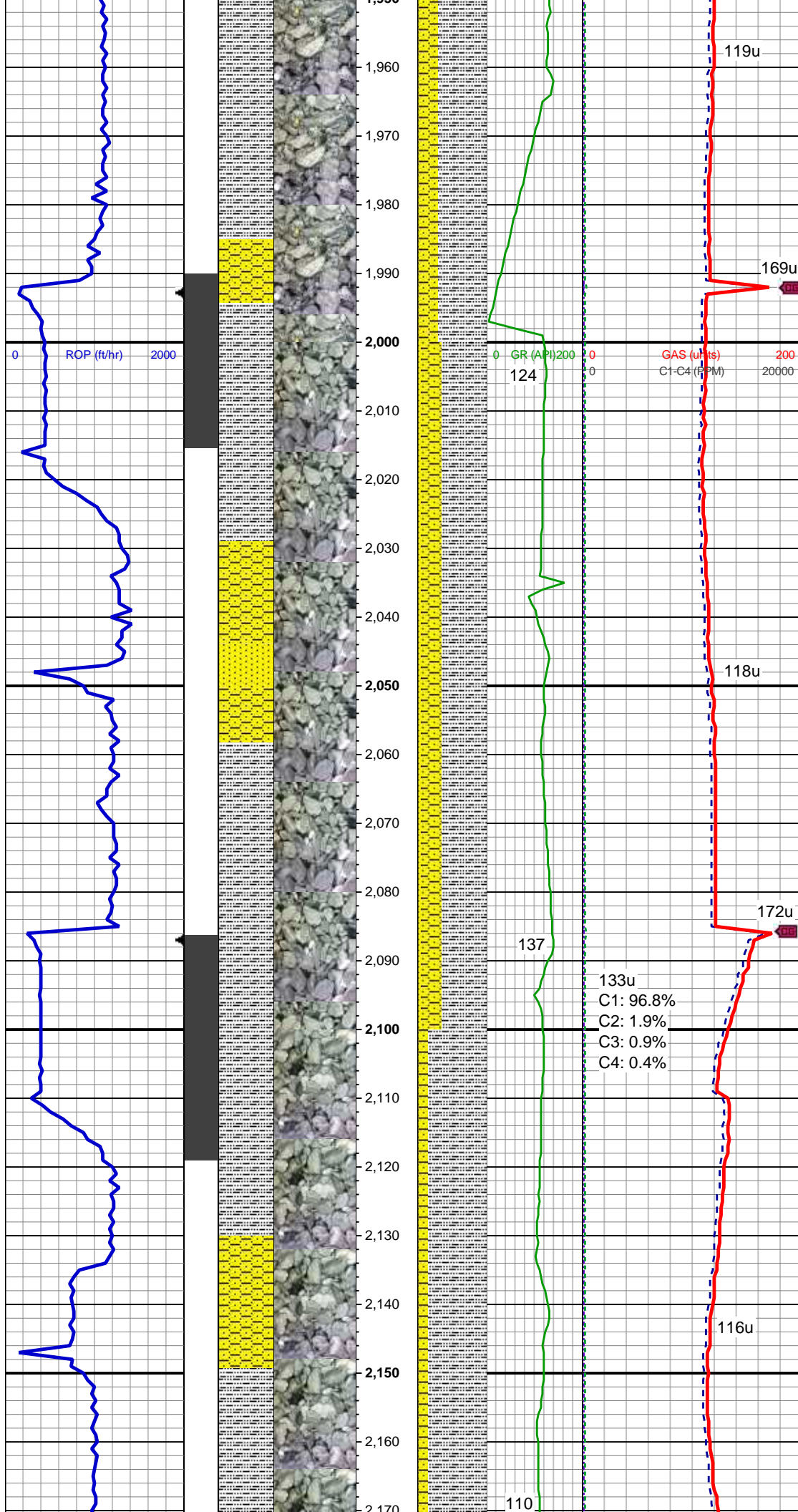
MD: 1,849'
TVD: 1,848.87'
Inclination: 0.14 °
Azimuth: 224.81 °
VS: -12.62'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt, tr ss

187u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 1,943'
TVD: 1,942.86'
Inclination: 0.56 °
Azimuth: 6.77 °
VS: -12.67'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc



SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt, occ ss

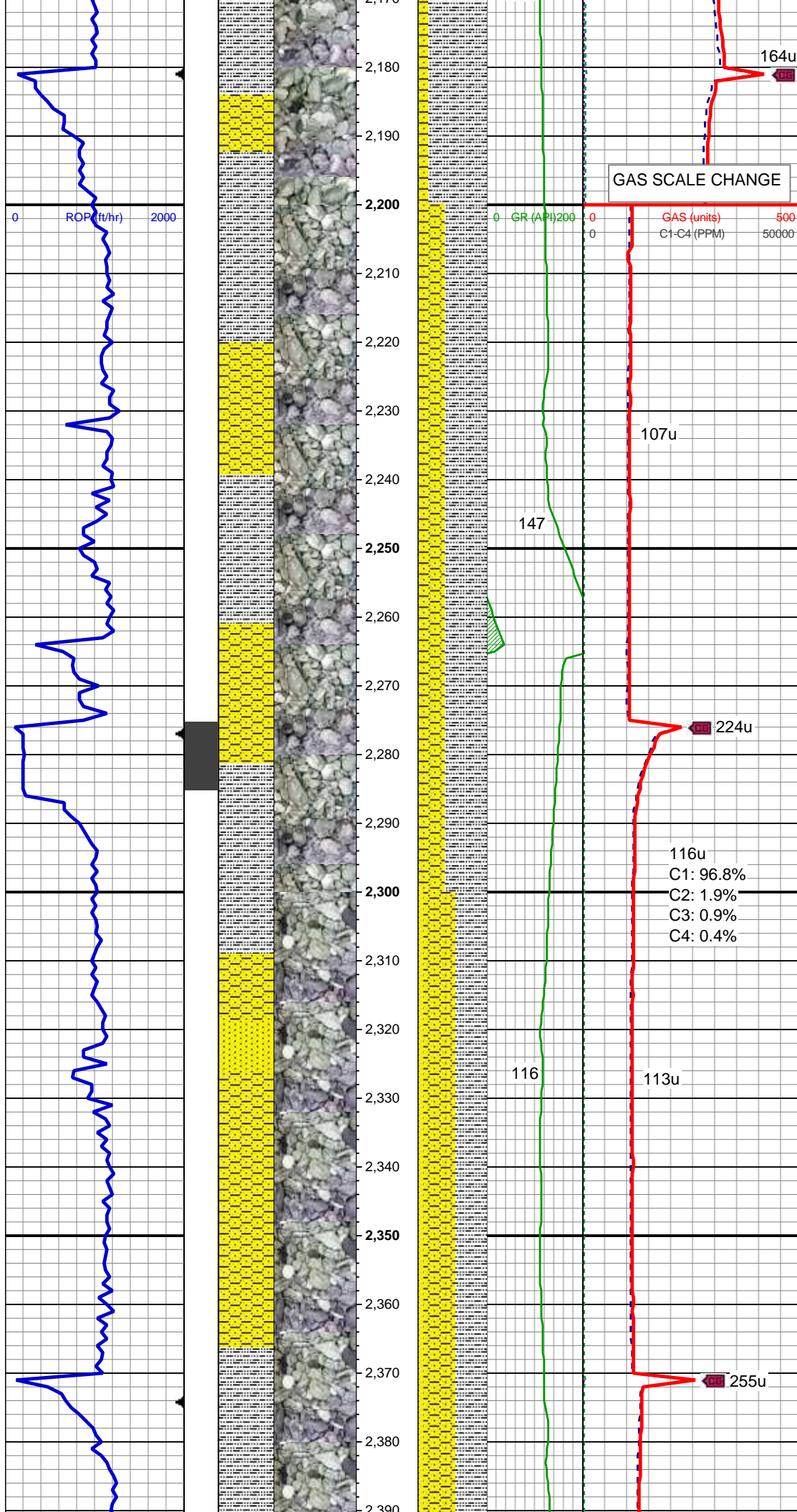
MD: 2,037'
TVD: 2,036.82'
Inclination: 3.04 °
Azimuth: 300.25 °
VS: -14.83'

SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtz, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt
SS: lt gy - gy, wh - trnsf, s&p, f - vf grn, fri, sb blkly-sb rnd, mod srt, arg cmt, sl mics, tr glau

133u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 2,132'
TVD: 2,131.56'
Inclination: 5.3 °
Azimuth: 284.4 °
VS: -21.35'

SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtz, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt



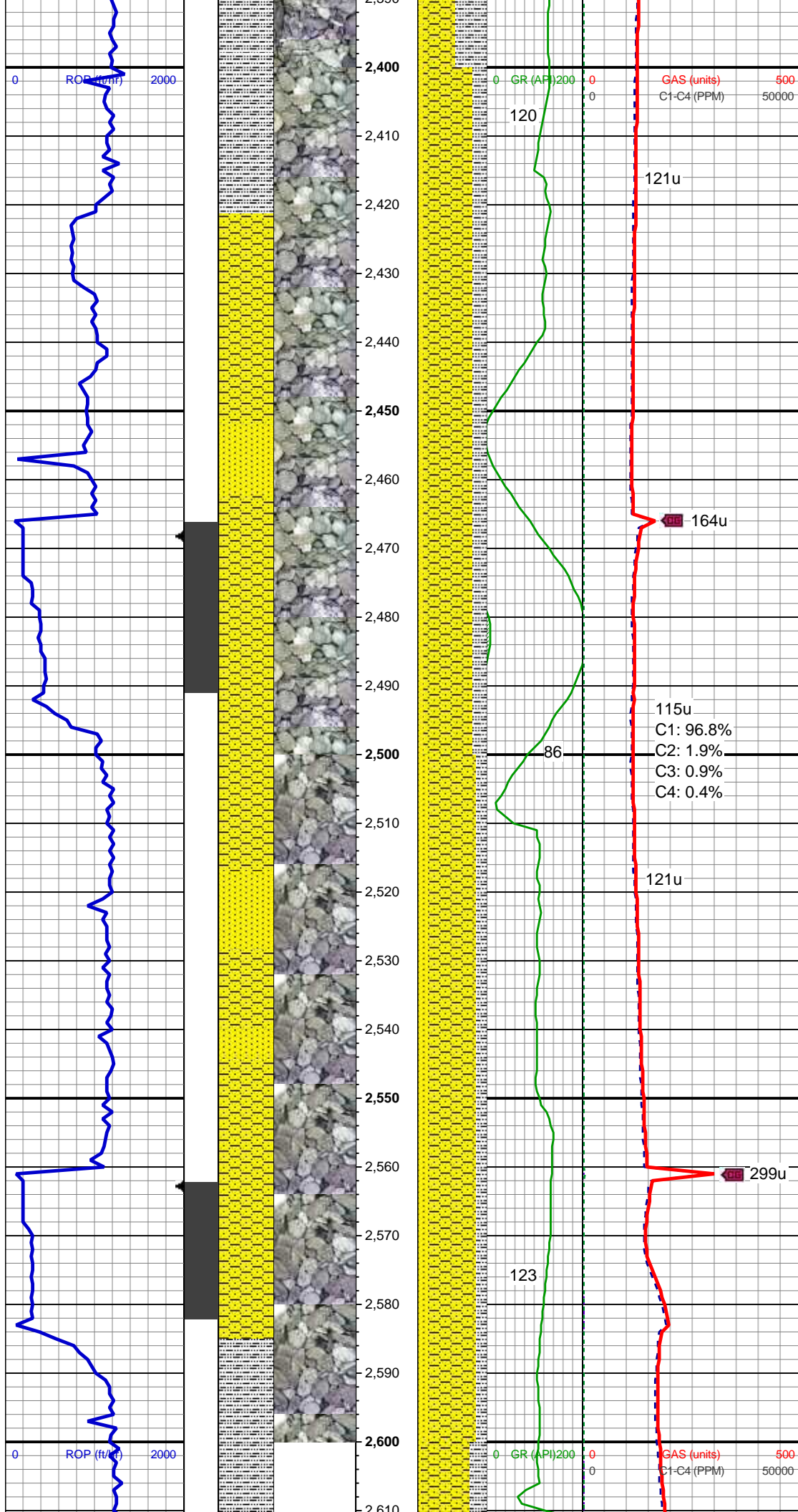
MD: 2,227'
TVD: 2,226.16'
Inclination: 5.19 °
Azimuth: 282.81 °
VS: -29.86'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt

MD: 2,322'
TVD: 2,320.72'
Inclination: 5.9 °
Azimuth: 277.97 °
VS: -38.95'

SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SS: lt gy - gy, wh - trns, s&p, f - vf grn, fri,
sb blky-sb rnd, mod srt, arg cmt, sl mics, tr
glau

MUD WT 8.70 VIS 29



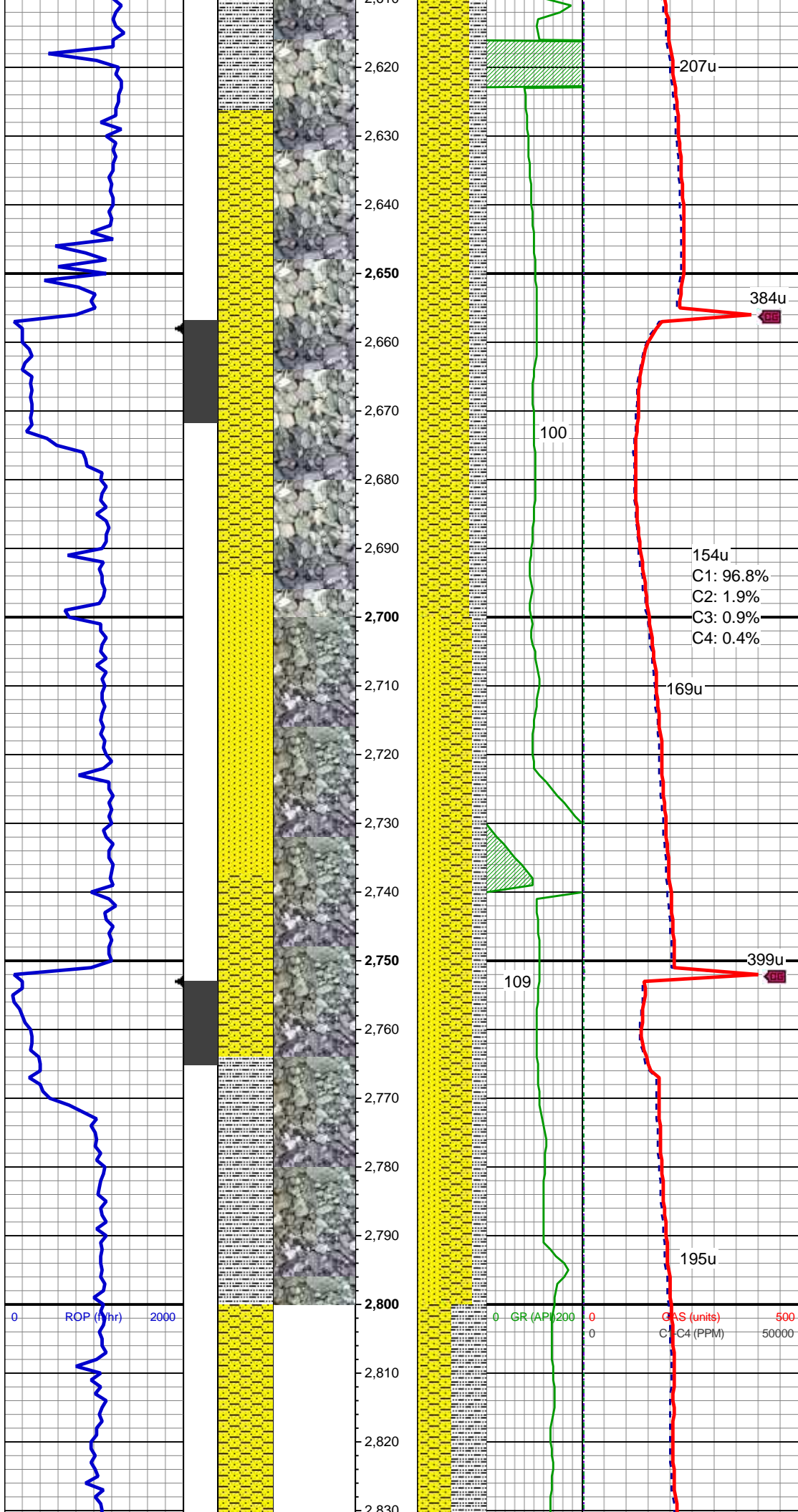
MD: 2,418'
TVD: 2,416.25'
Inclination: 5.4 °
Azimuth: 276.98 °
VS: -48.37'

SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtx, non calc
SS: lt gy - gy, wh - trnsl, s&p, f - vf grn, fri, sb blkly-sb rnd, mod srt, arg cmt, sl mics, tr - occ glau

MD: 2,513'
TVD: 2,510.72'
Inclination: 6.95 °
Azimuth: 248.73 °
VS: -58.09'

SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtx, non calc
SS: lt gy, wh - trnsl, s&p, f - vf grn, fri, sb blkly-sb rnd, mod srt, arg cmt, sl mics, tr glau

MD: 2,608'
TVD: 2,604.84'
Inclination: 8.62 °
Azimuth: 276.98 °
VS: -48.37'



Azimuth: 239.76°
VS: -69.36'

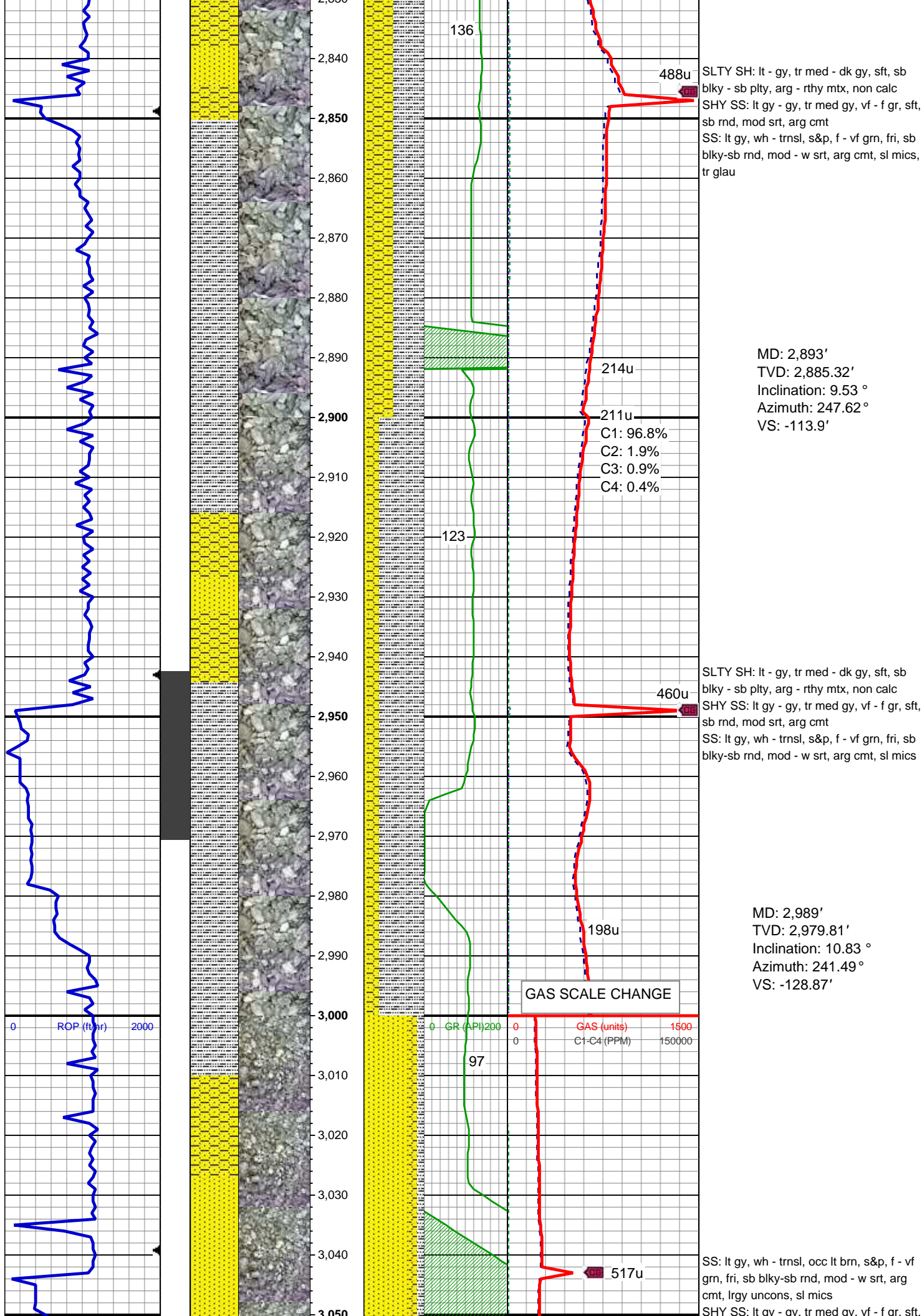
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtx, non calc
SS: lt gy, wh - trnsl, s&p, f - vf grn, fri, sb blkly-sb rnd, mod srt, arg cmt, sl mics

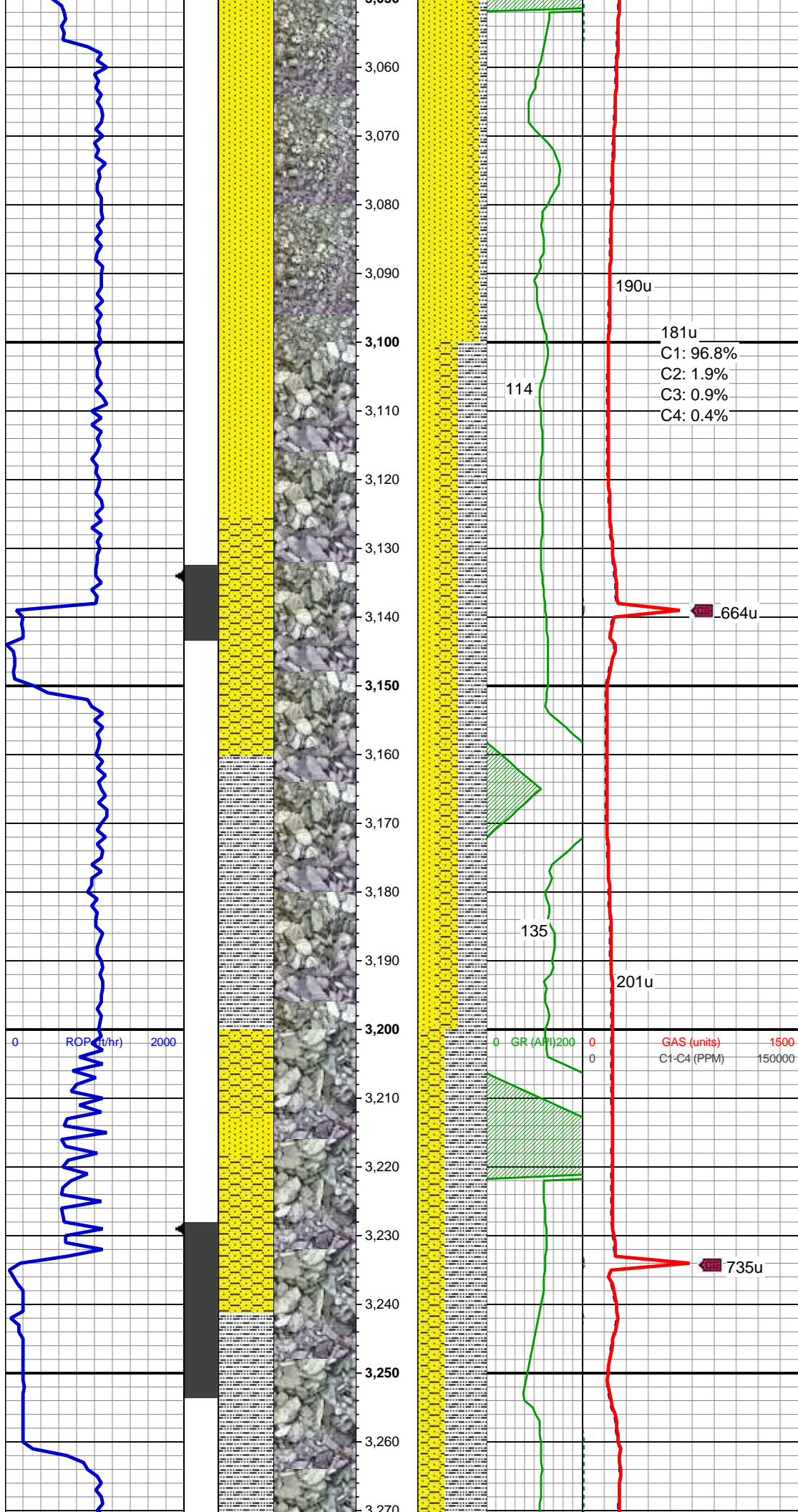
MD: 2,703'
TVD: 2,698.51'
Inclination: 10.55°
Azimuth: 242.22°
VS: -82.89'

SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, mod srt, arg cmt
SS: lt gy, wh - trnsl, s&p, f - vf grn, fri, sb blkly-sb rnd, mod - w srt, arg cmt, sl mics, tr glau
SLTY SH: lt - gy, tr med - dk gy, sft, sb blkly - sb plty, arg - rthy mtx, non calc

MUD WT 8.75 VIS 28

MD: 2,798'
TVD: 2,791.84'
Inclination: 11°
Azimuth: 246.52°
VS: -98.59'





sb rnd, mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc

MD: 3,084'
TVD: 3,073.22'
Inclination: 10.13 °
Azimuth: 240.02 °
VS: -143.6'

181u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt
SS: lt gy, wh - trns, occ lt brn, s&p, f - vf
grn, fri, sb blky-sb rnd, mod - w srt, arg
cmt, uncon, sl mics

MD: 3,179'
TVD: 3,166.92'
Inclination: 8.88 °
Azimuth: 235.1 °
VS: -156.51'

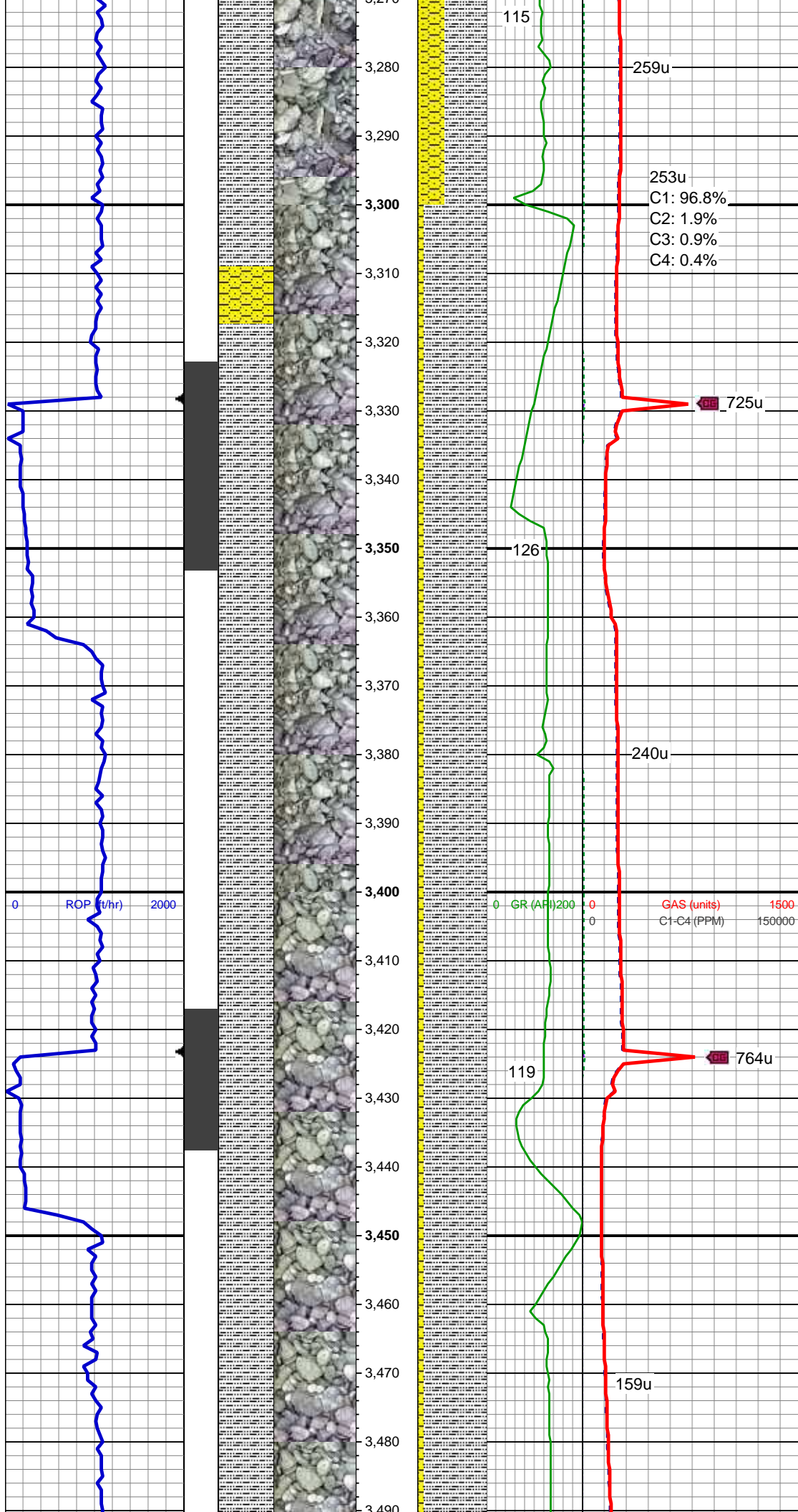
0 ROP (ft/hr) 2000

GR (API) 200 0 GAS (units) 1500
C1-C4 (PPM) 150000

MUD WT 8.80 VIS 28

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt
SS: lt gy, wh - trns, occ lt brn, s&p, f - vf
grn, fri, sb blky-sb rnd, mod - w srt, arg
cmt, uncon, sl mics

MD: 3,273'
TVD: 3,259.92'



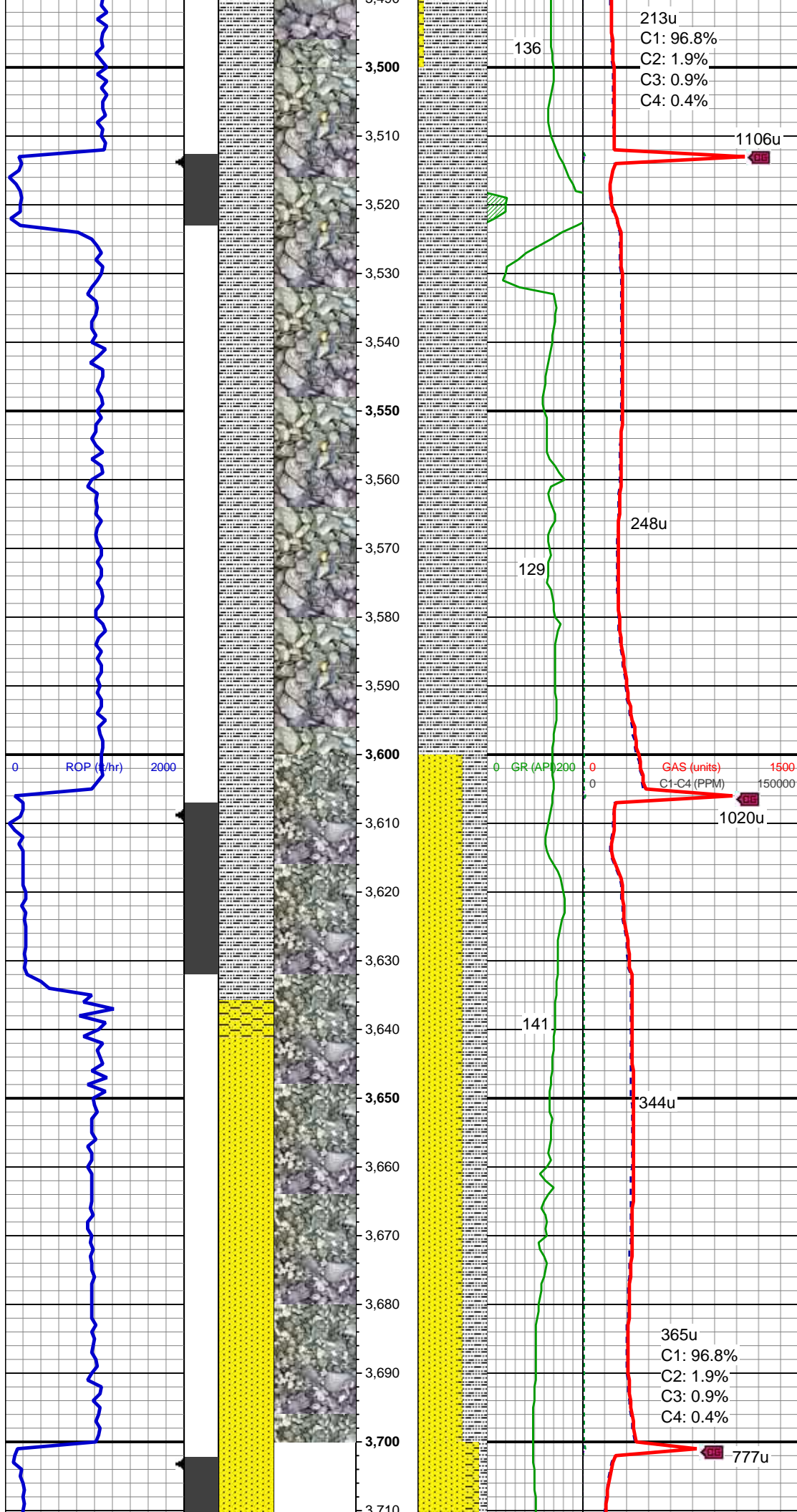
TVD: 3,259.66'
Inclination: 9.84 °
Azimuth: 228.77 °
VS: -168.12'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
biky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt, tr ss

MD: 3,368'
TVD: 3,353.17'
Inclination: 10.51 °
Azimuth: 237.34 °
VS: -181.12'

SLTY SH: lt - gy, tr med - dk gy, sft, sb
biky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, mod srt, arg cmt, tr ss

MD: 3,463'
TVD: 3,446.52'
Inclination: 10.9 °
Azimuth: 241.01 °
VS: -195.9'



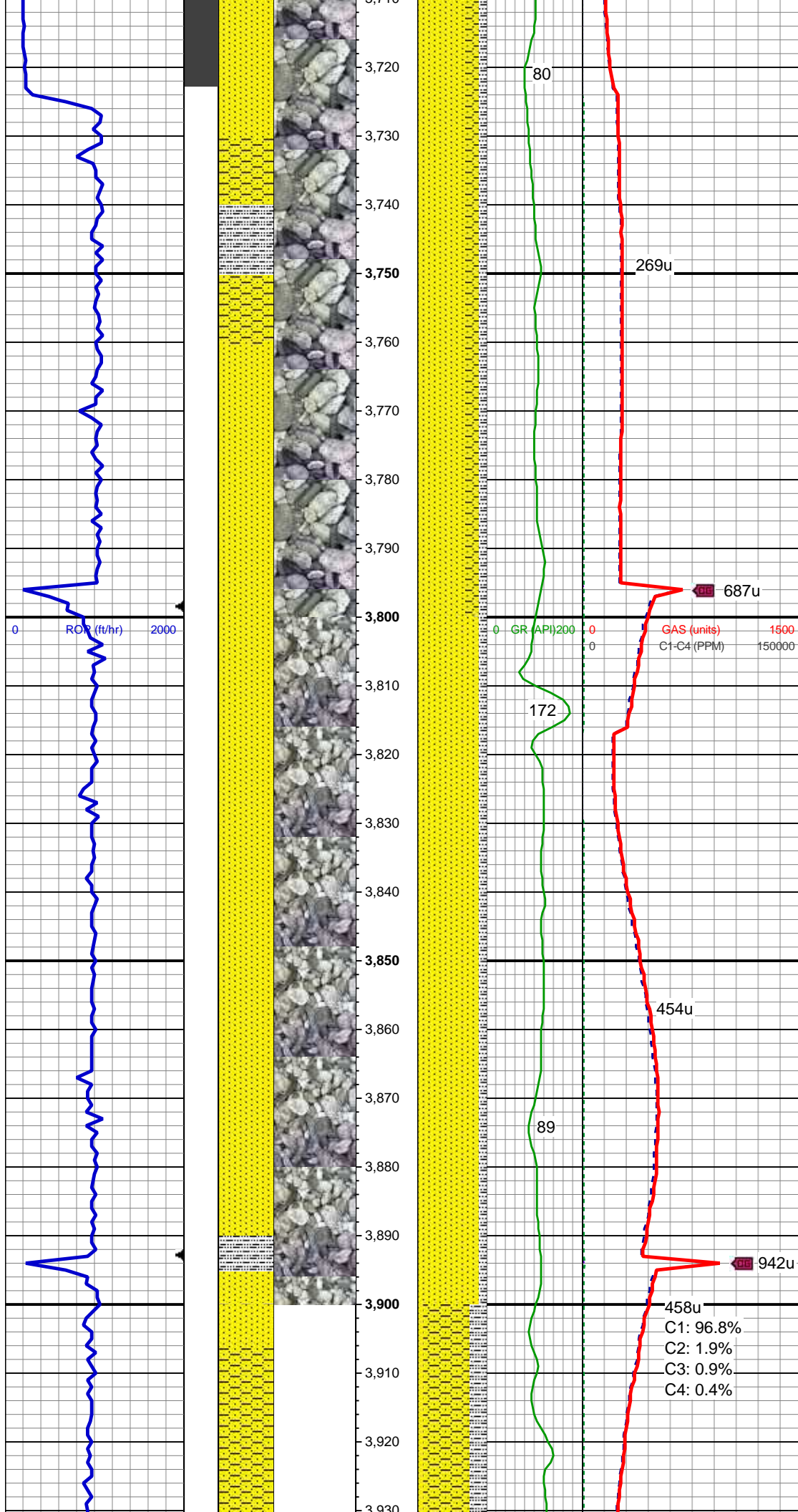
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc, tr
shy ss, tr ss

MD: 3,558'
TVD: 3,539.93'
Inclination: 10.13 °
Azimuth: 237.44 °
VS: -210.44'

SS: lt gy, wh - trnsf, occ lt brn, s&p, f - vf
grn, fri, sb blky-sb rnd, mod srt, occ w srt,
arg cmt, unconfs, sl mics

SLTY SH: lt - gy, tr med - dk gy, sft, sb
blky - sb plty, arg - rthy mtx, non calc
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, p - mod srt, arg cmt

MUD WT 8.95 VIS 28



MD: 3,748'
TVD: 3,726.26'
Inclination: 12.67 °
Azimuth: 244.07 °
VS: -242.27'

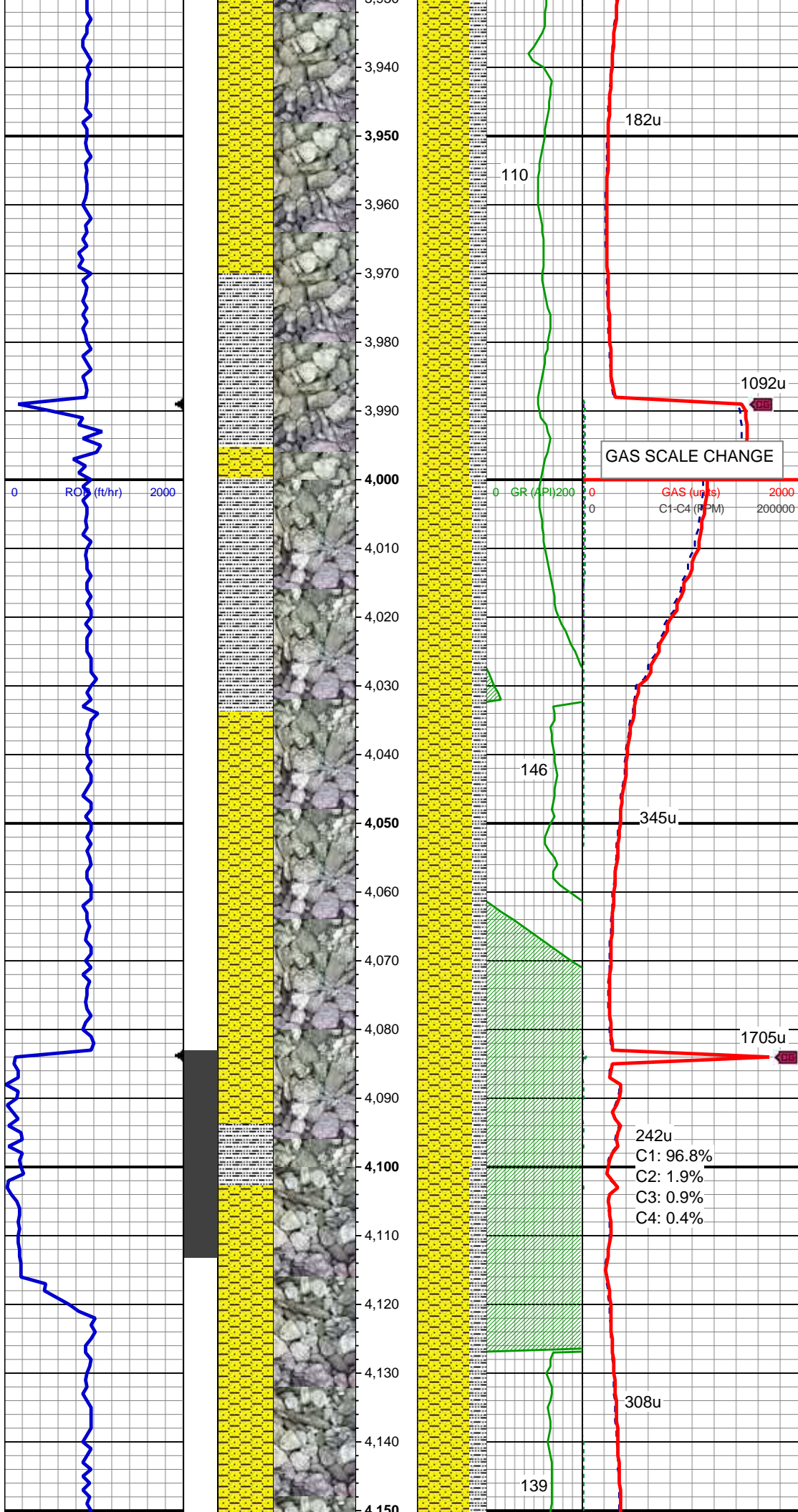
SS: lt gy, wh - trnsl, occ lt brn, s&p, f - vf
grn, fri, sb blk-y-sb rnd, mod srt, occ w srt,
arg cmt, sl uncon, sl mics
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft,
sb rnd, p - mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blk-y - sb plty, arg - rthy mtx, non calc

MD: 3,843'
TVD: 3,818.94'
Inclination: 12.72 °
Azimuth: 243.26 °
VS: -260.6'

SS: lt gy, wh - trnsl, occ lt brn, s&p, f - vf
grn, fri, sb blk-y-sb rnd, mod srt, occ w srt,
arg cmt, sl uncon, sl mics
SLTY SH: lt - gy, tr med - dk gy, sft, sb
blk-y - sb plty, arg - rthy mtx, non calc, tr
shy ss

MUD WT 8.95 VIS 28

MD: 3,939'
TVD: 3,912.58'
Inclination: 12.70 °



Inclination: 12.76 °
Azimuth: 242.56 °
VS: -279.05'

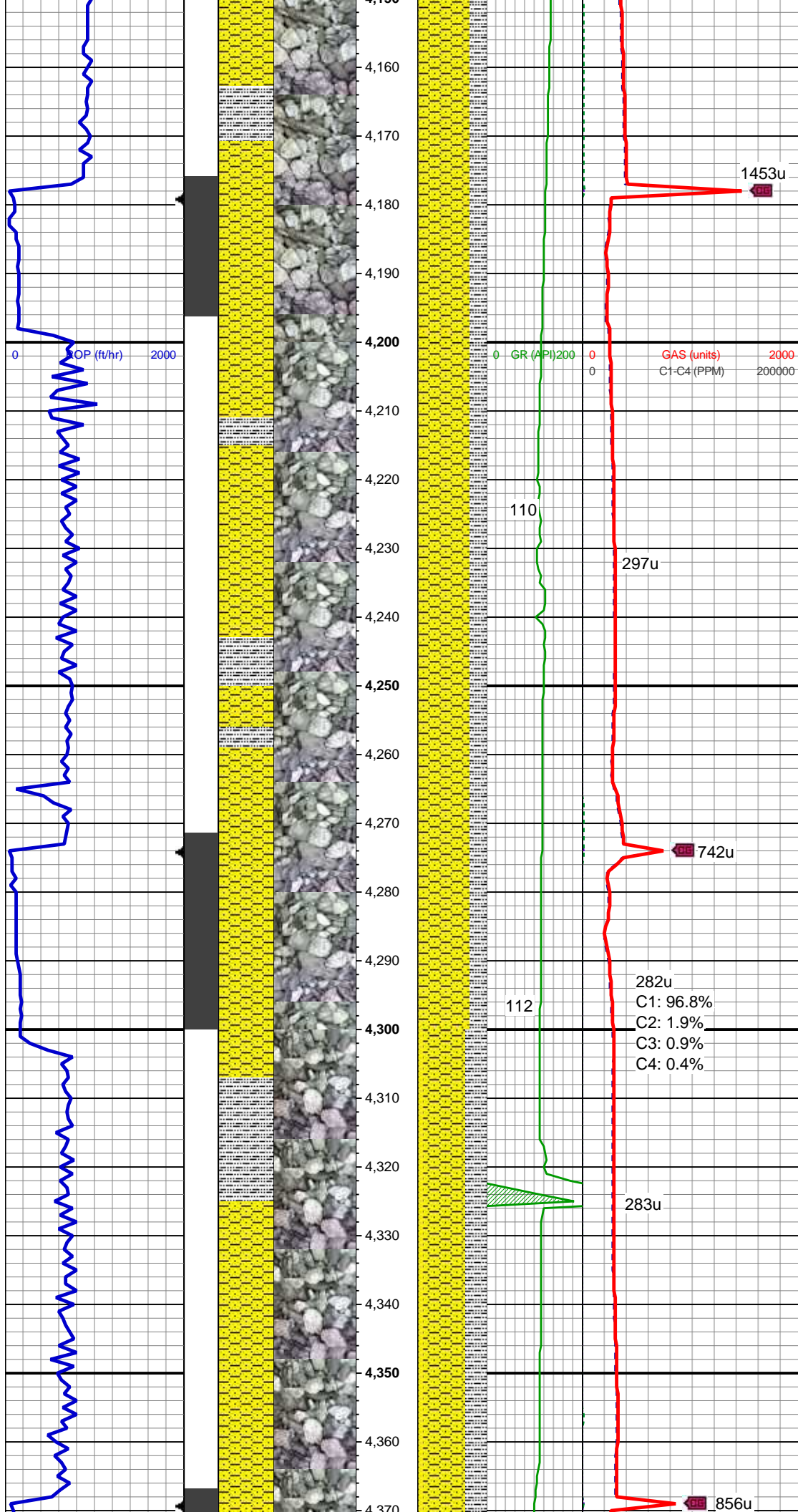
SHY SS: lt gy - gy, tr med gy, vf - f gr, sft, sb rnd, p - mod srt, arg cmt
SLTY SH: lt - gy, tr med - dk gy, sft, sb blk - sb plty, arg - rthy mtx, non calc
SS: lt gy, wh - trns, occ lt brn, s&p, f - vf grn, fri, sb blk - sb rnd, mod srt, occ w srt, arg cmt, sl uncons, sl mics

MD: 4,034'
TVD: 4,005.53'
Inclination: 11.03 °
Azimuth: 241.08 °
VS: -301.64'

SHY SS: gy - med gy, tr dk gy, vf - f gr, sft, sb rnd - sb blk, mod srt, arg cmt, occ ss
SLTY SH: gy - med gy, sft, sb blk - sb plty, occ plty, arg - rthy mtx, non calc

MD: 4,129'
TVD: 4,099'
Inclination: 9.58 °
Azimuth: 243.13 °
VS: -316.65'

SHY SS: gy - med gy, tr dk gy, vf - f gr, sft, sb rnd - sb blk, mod srt, arg cmt, occ ss



SLTY SH: gy - med gy, sft, sb blkly - sb
plty, occ plty, arg - rthy mtx, non calc

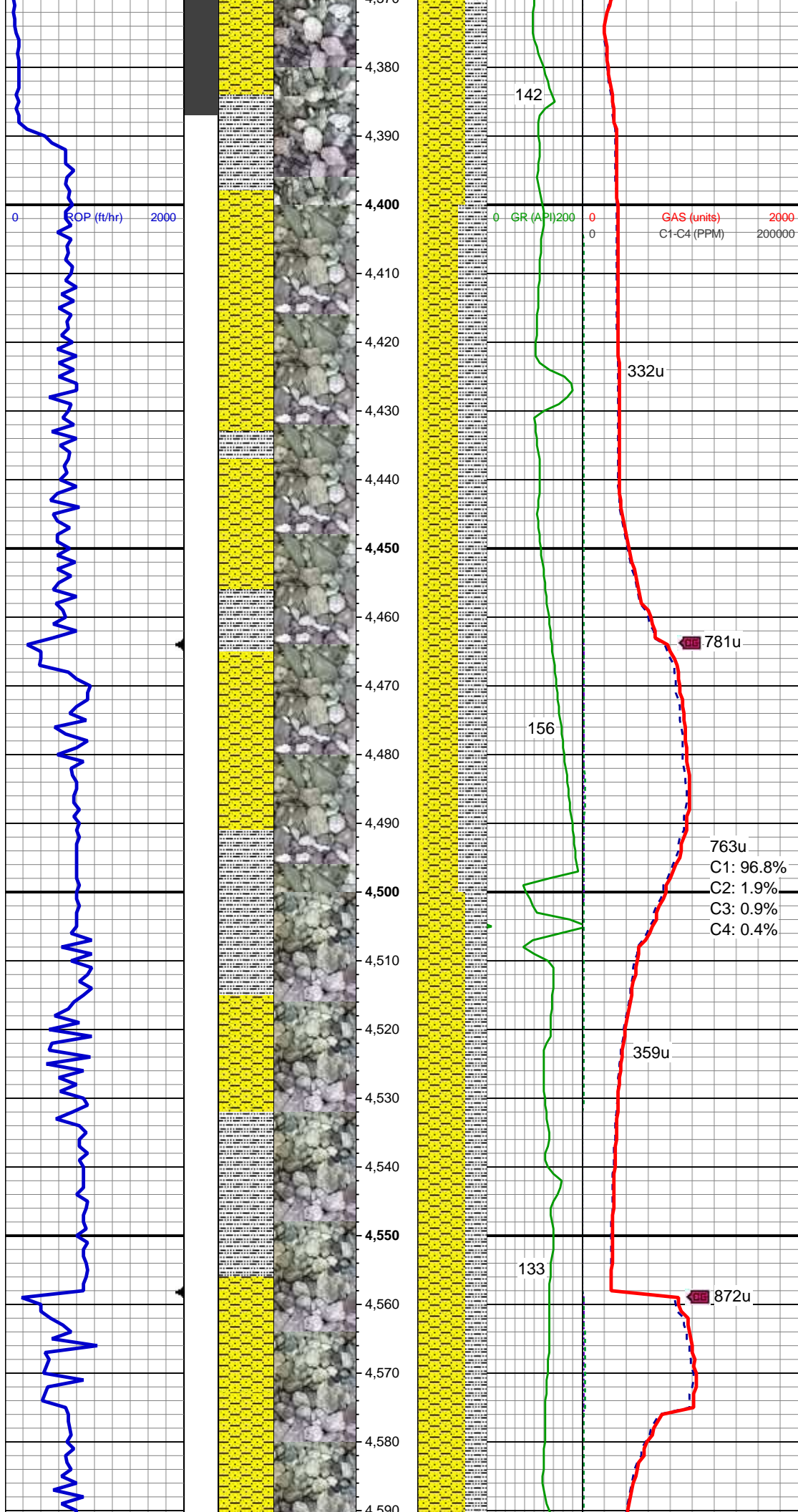
MUD WT 8.95 VIS 28

MD: 4,224'
TVD: 4,192.63'
Inclination: 9.85 °
Azimuth: 246.32 °
VS: -331.15'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blkly, mod srt, arg cmt, tr ss
SLTY SH: gy - med gy, sft, sb blkly - sb
plty, tr plty, arg - rthy mtx, non calc

MD: 4,319'
TVD: 4,286.15'
Inclination: 10.45 °
Azimuth: 245.12 °
VS: -346.4'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blkly, mod srt, arg cmt, tr ss
SLTY SH: gy - med gy, sft, sb blkly - sb
plty, tr plty, arg - rthy mtx, non calc
SS: lt gy, wh - trnsf, occ lt brn, s&p, f - vf
grn, fri, sb blkly-sb rnd, mod srt, occ w srt,
arg cmt, sl unconc, non calc



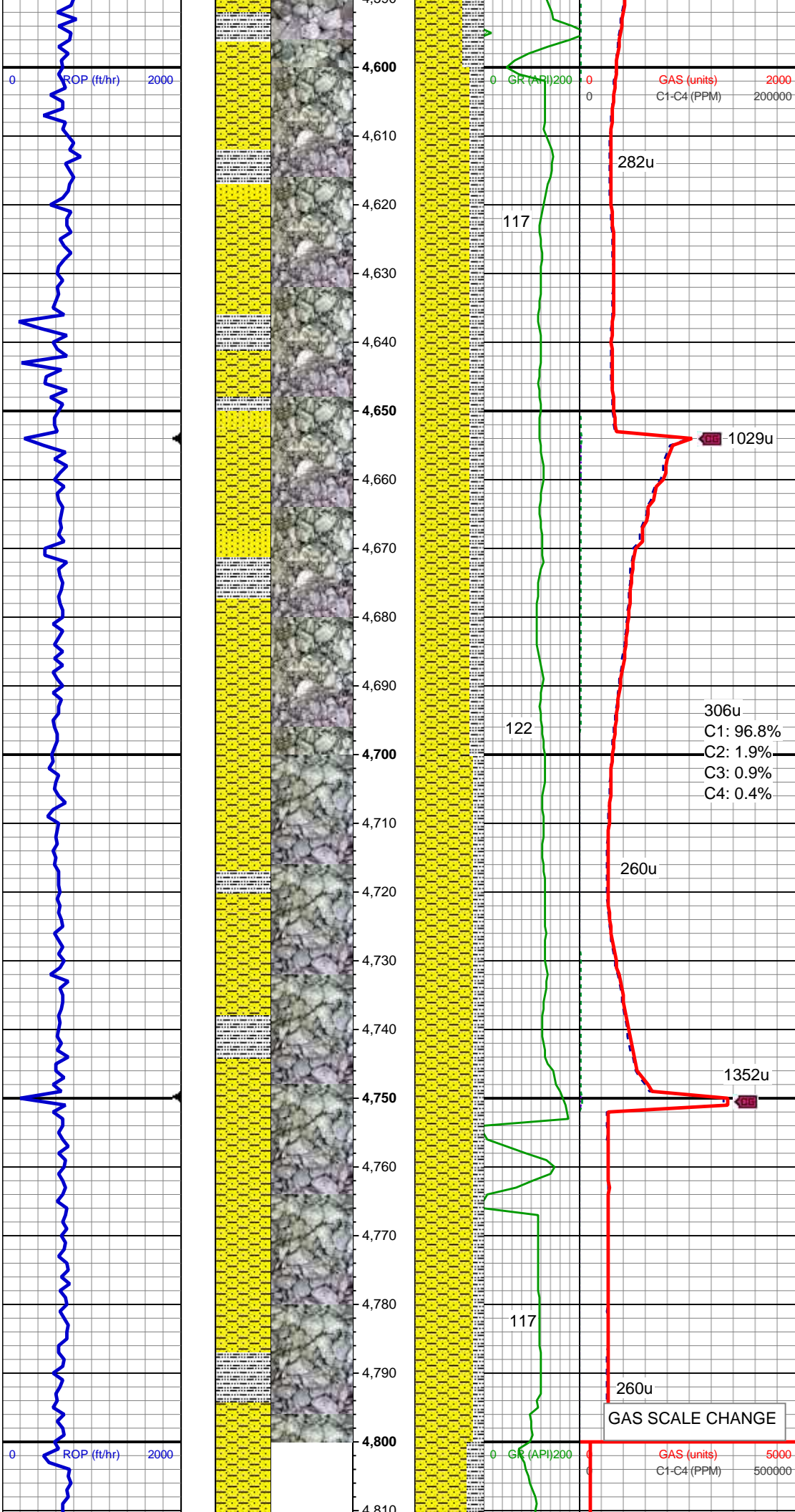
MD: 4,414'
TVD: 4,379.64'
Inclination: 10.02 °
Azimuth: 246.25 °
VS: -361.78'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd - sb blk, mod srt, arg cmt, tr ss
SLTY SH: gy - med gy, sft, sb blk - sb plty, tr plty, arg - rthy mtx, non calc
SS: lt gy, wh - trns, occ lt brn, s&p, f - vf grn, fri, sb blk-sb rnd, mod srt, occ w srt, arg cmt, sl uncons, non calc

MD: 4,509'
TVD: 4,473.37'
Inclination: 8.68 °
Azimuth: 245.87 °
VS: -375.88'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd - sb blk, mod srt, arg cmt, tr ss
SLTY SH: gy - med gy, sft, sb blk - sb plty, tr plty, arg - rthy mtx, non calc

MUD WT 9.28 VIS 28



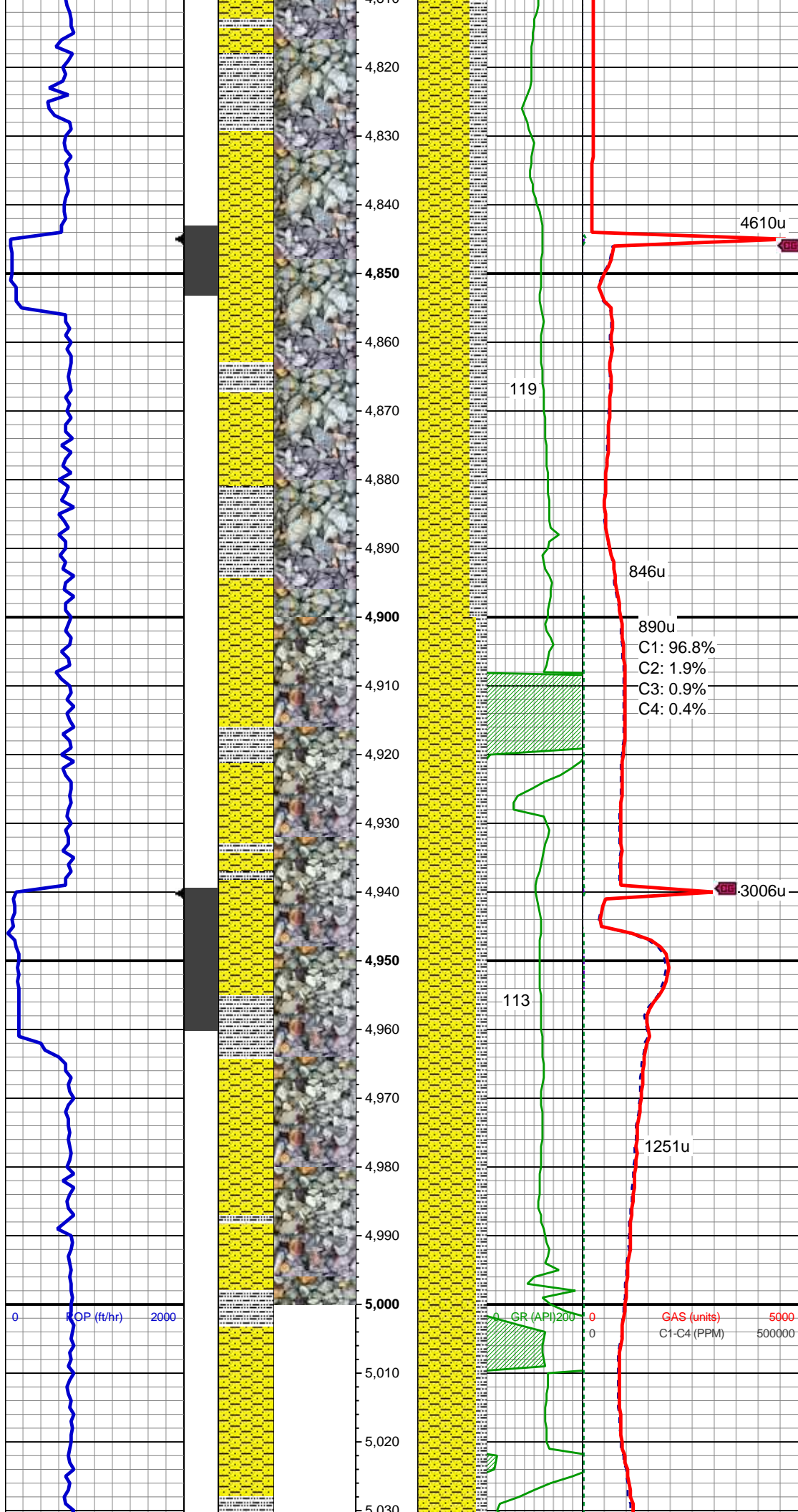
MD: 4,604'
TVD: 4,567.33'
Inclination: 8.3 °
Azimuth: 244.87 °
VS: -388.64'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, tr ss
SLTY SH: gy - med gy, sft, sb blk - sb
plty, tr plty, arg - rthy mtx, non calc
SS: lt gy, wh - trns, occ lt brn, s&p, f - vf
grn, fri, sb blk-sb rnd, mod srt, occ w srt,
arg cmt, sl uncon, non calc

MD: 4,700'
TVD: 4,662.46'
Inclination: 7.1 °
Azimuth: 249.26 °
VS: -400.47'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, v sl tr ss grns
SLTY SH: gy - med gy, sft, sb blk - sb
plty, tr plty, arg - rthy mtx, non calc

MD: 4,795'
TVD: 4,756.78'
Inclination: 6.7 °
Azimuth: 248.9 °
VS: -411.12'



MUD WT 9.28 VIS 28

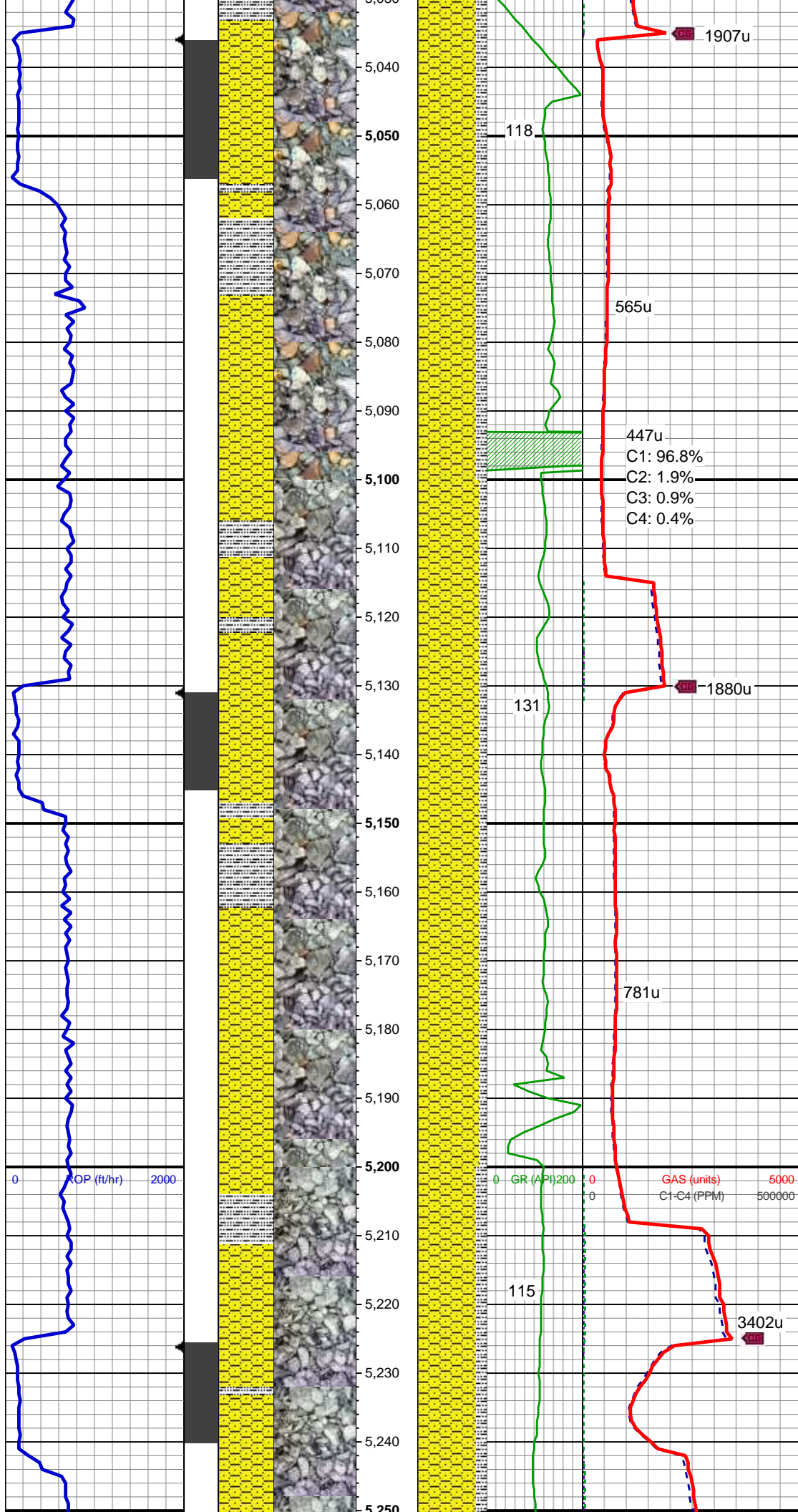
SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, v sl tr ss grns
SLTY SH: gy - med gy, sft, sb blk - sb
pity, tr pity, arg - rthy mtx, non calc

MD: 4,890'
TVD: 4,851.19'
Inclination: 5.99 °
Azimuth: 250.79 °
VS: -420.98'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, v sl tr ss grns
SLTY SH: gy - med gy, sft, sb blk - sb
pity, tr pity, arg - rthy mtx, non calc

MD: 4,986'
TVD: 4,946.79'
Inclination: 4.4 °
Azimuth: 254.63 °
VS: -429.26'

MUD WT 9.40 VIS 38



SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, v sl tr ss grns
SLTY SH: gy - med gy, sft, sb blk - sb
pity, tr pity, arg - rthy mt, non calc

MD: 5,081'
TVD: 5,041.58'
Inclination: 3.38 °
Azimuth: 224.58 °
VS: -434.75'

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, v sl tr ss grns
SLTY SH: gy - med gy, sft, sb blk - sb
pity, tr pity, arg - rthy mt, non calc

MD: 5,176'
TVD: 5,136.49'
Inclination: 1.7 °
Azimuth: 220.18 °
VS: -437.63'

MUD WT 9.70 VIS 36

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt, tr SS
SLTY SH: gy - med gy, sft, sb blk - sb

SLTY SH: gy - med gy, sft, sb blk - sb
plty, tr ang-tr plty, arg - rthy mtx, non calc

MD: 5,271'
TVD: 5,231.47'
Inclination: 0.59 °
Azimuth: 243.69 °
VS: -438.97'

1612u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

3417u

SHY SS: gy - med gy, vf - f gr, sft, sb rnd -
sb blk, mod srt, arg cmt
SLTY SH: gy - med gy, sft-mod frm, sb
blk - sb plty, tr plty, arg - rthy mtx, non
calc

MD: 5,366'
TVD: 5,326.46'
Inclination: 0.46 °
Azimuth: 233.18 °
VS: -439.72'

1770u

ROP (ft/hr) 2000

GR (API) 200

GAS (units) 5000
C1-C4 (PPM) 500000

2652u

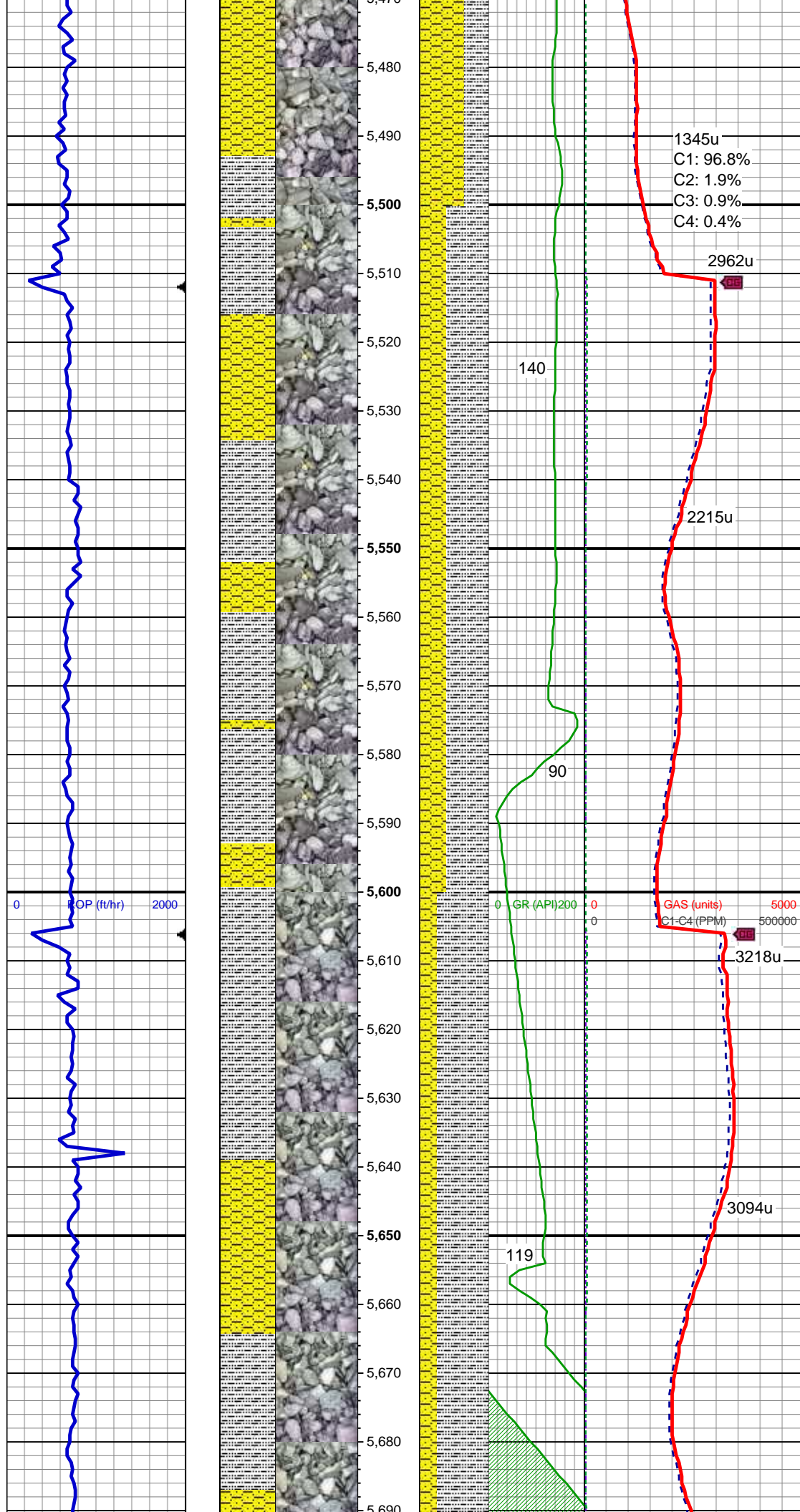
MUD WT 9.70 VIS 36

SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft, sb rnd - sb blk, mod srt, arg cmt
SLTY SH: gy - dk gy, sft, sb blk - sb plty,
tr plty, arg - rthy mtx, non calc

MD: 5,462'
TVD: 5,422.46'
Inclination: 0.85 °
Azimuth: 186.81 °
VS: -442.41'

890u

135



VS: -440.11'

MUD WT 9.70 VIS 36

SLTY SH: gy - med gy, tr dk gy, sft, sb
blky - sb plty, occ plty, arg - rthy mtx, non
calc

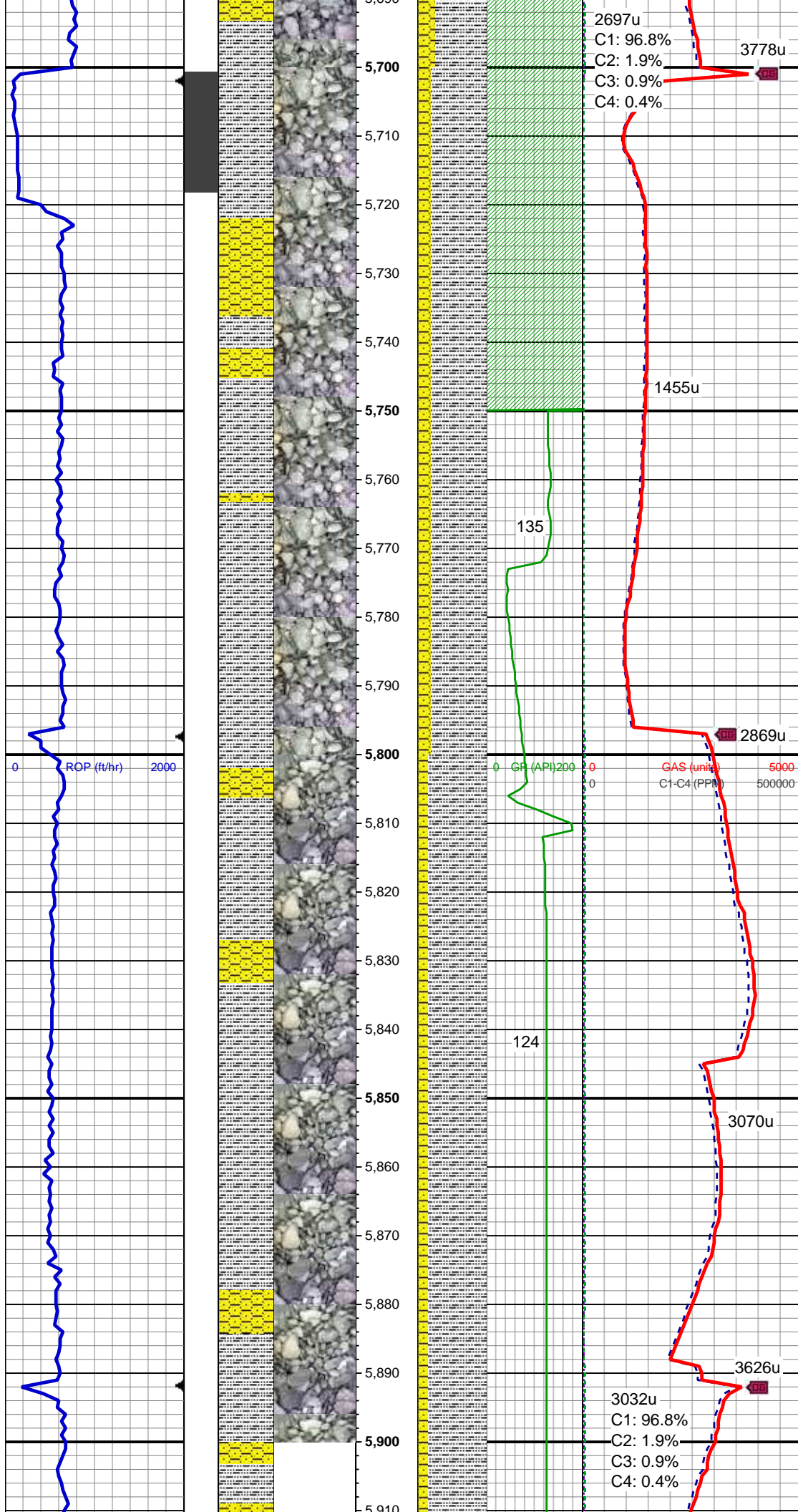
SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft, sb rnd - sb blky, mod srt, arg cmt

MD: 5,556'
TVD: 5,516.44'
Inclination: 1.23 °
Azimuth: 207.54 °
VS: -440.66'

MD: 5,651'
TVD: 5,611.41'
Inclination: 1.59 °
Azimuth: 180.68 °
VS: -441.14'

SLTY SH: gy - med gy, tr dk gy, sft, sb
blky - sb plty, occ plty, arg - rthy mtx, non
calc

SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft, sb rnd - sb blky, mod srt, arg cmt



MUD WT 9.8 VIS 36

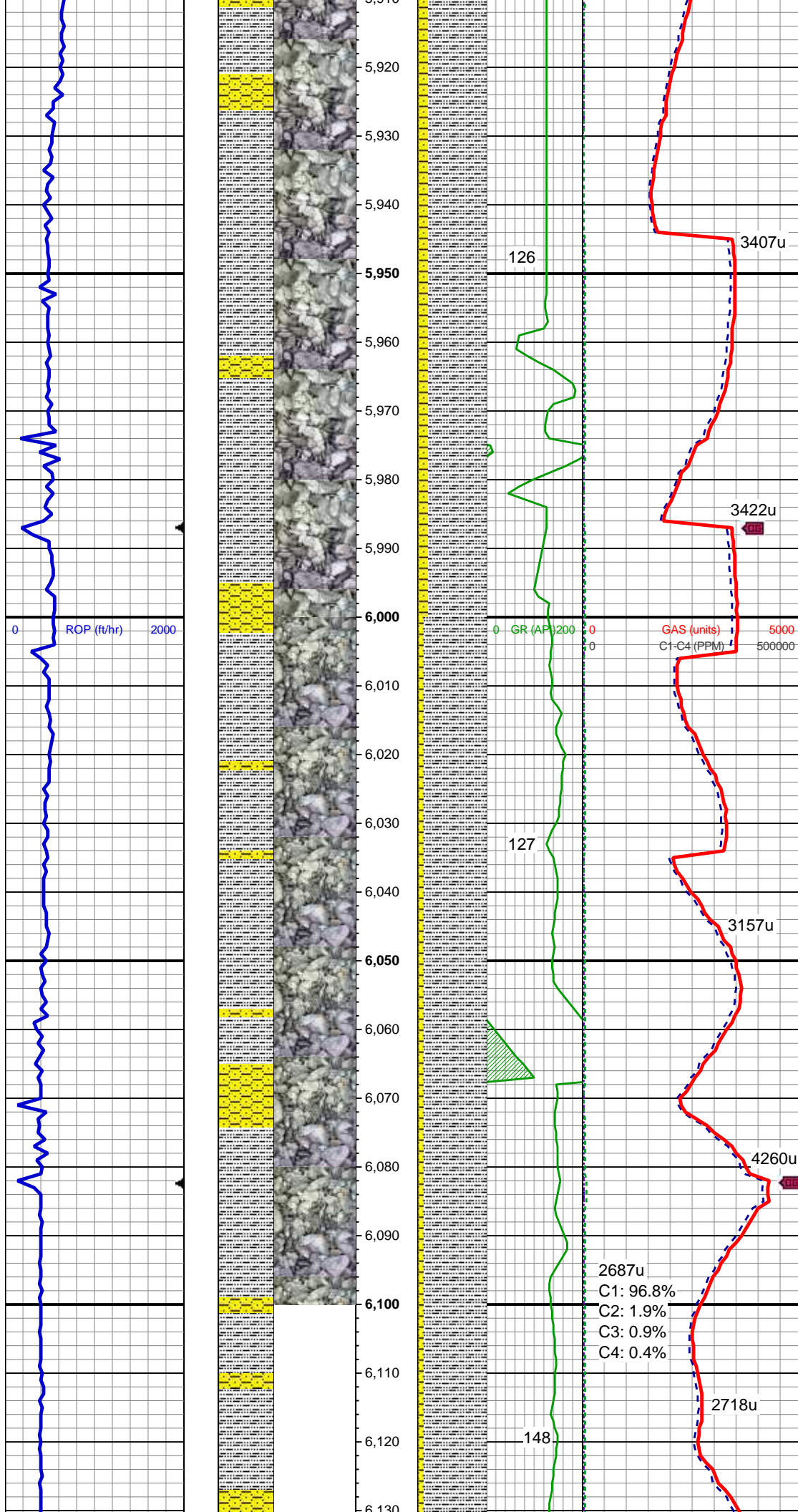
MD: 5,747'
TVD: 5,707.4'
Inclination: 0.65 °
Azimuth: 121.08 °
VS: -440.69'

SLTY SH: gy - med gy, sft, sb blkly - sb
ppty, tr ppty, arg - rthy mtx, non calc
SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft, sb rnd - sb blkly, mod srt, arg cmt

MUD WT 9.85 VIS 37

MD: 5,842'
TVD: 5,802.39'
Inclination: 0.77 °
Azimuth: 176.38 °
VS: -440.2'

SLTY SH: gy - med gy, some dk gy, sft,
sb blkly - sb ppty, tr ppty, arg - rthy mtx, non
calc
SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft-mod frm, sb rnd - sb blkly, mod srt, arg
cmt



MD: 5,937'
TVD: 5,897.39'
Inclination: 0.39 °
Azimuth: 219.45 °
VS: -440.36'

SLTY SH: gy - med gy, some dk gy, sft, sb blkly - sb plty, tr plty, arg - rthy mtz, non calc
SHY SS: gy - med gy, tr dk gy, vf - f gr, sft, sb rnd - sb blkly, mod srt, arg cmt

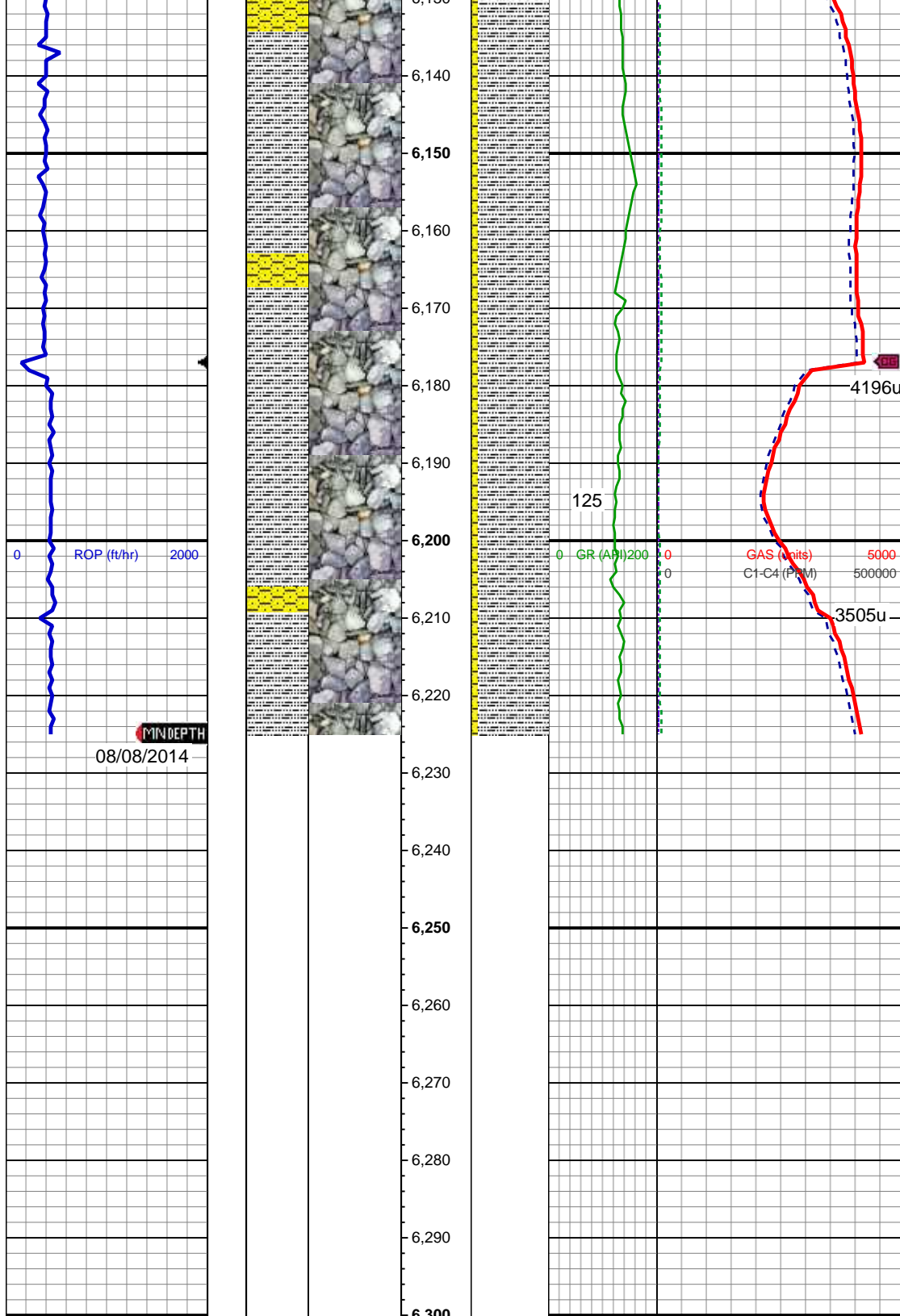
MUD WT 9.85 VIS 38

MD: 6,032'
TVD: 5,992.39'
Inclination: 0.14 °
Azimuth: 75.63 °
VS: -440.45'

SLTY SH: gy - med gy, sft, sb blkly - sb plty, occ plty, arg - rthy mtz, non calc
SHY SS: gy - med gy, vf - f gr, ply srt, sft-mod frm, sb rnd - sb blkly, mod srt-popkst, arg cmt

2687u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 6,127'
TVD: 6,087.39'
Inclination: 0.24 °
Azimuth: 251.85 °



VS: -440.53'

SLTY SH: gy - med gy, some dk gy, sft,
sb blkly - sb plty, tr plty, arg - rthy mtx, non
calc
SHY SS: gy - med gy, tr dk gy, vf - f gr,
sft, sb rnd - sb blkly, mod srt, arg cmt

MUD WT 10.00 VIS 38

MD: 6,175'
TVD: 6,135.39'
Inclination: 0.33 °
Azimuth: 256.38 °
VS: -440.76'

4196u

125

0 ROP (ft/hr) 2000

0 GR (API) 200

GAS (units) 5000
C1-C4 (PMM) 500000

3505u

TD @ 6225' MD
08/08/2014 @ 11:33 PM

TOOH FOR CURVE BHA
LOG CONTINUES ON MPlot
FIVE RIVERS K09-66-1HN(HORZ)

Thank you for choosing
Columbine Logging Inc.