

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Trisha LC29-76HNB

Location SESW SEC 29, T9N, R59W

State COLORADO

County WELD

Country USA

Rig Number H&P 326

API Number 05-123-38779

Region DJ BASIN

Field WILDCAT

Spud Date 4/24/2014

Drilling Completed 5/4/2014

Surface Coordinates SESW SEC 29, T9N, R59W
340' FSL, 1982' FWL

Ground Elevation 4879'

K.B. Elevation 4909'

Logged Interval 700' **To** 5375'

Total Depth 15585'

Formation NIOBRARA, B CHALK

Type of Drilling Fl... LSND

Operator

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

Name EVAN HOWELL

Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING

Mike Kerschen

Rock Types

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

Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOPOD
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
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

Tuffaceous

Stringer

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

Other Symbols

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

EARTHY
FENESTRAL
FRACTURE
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
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)
SLIDE
SURVEY
TRIP GAS

Wireline tested - left

Wireline tested - rt

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

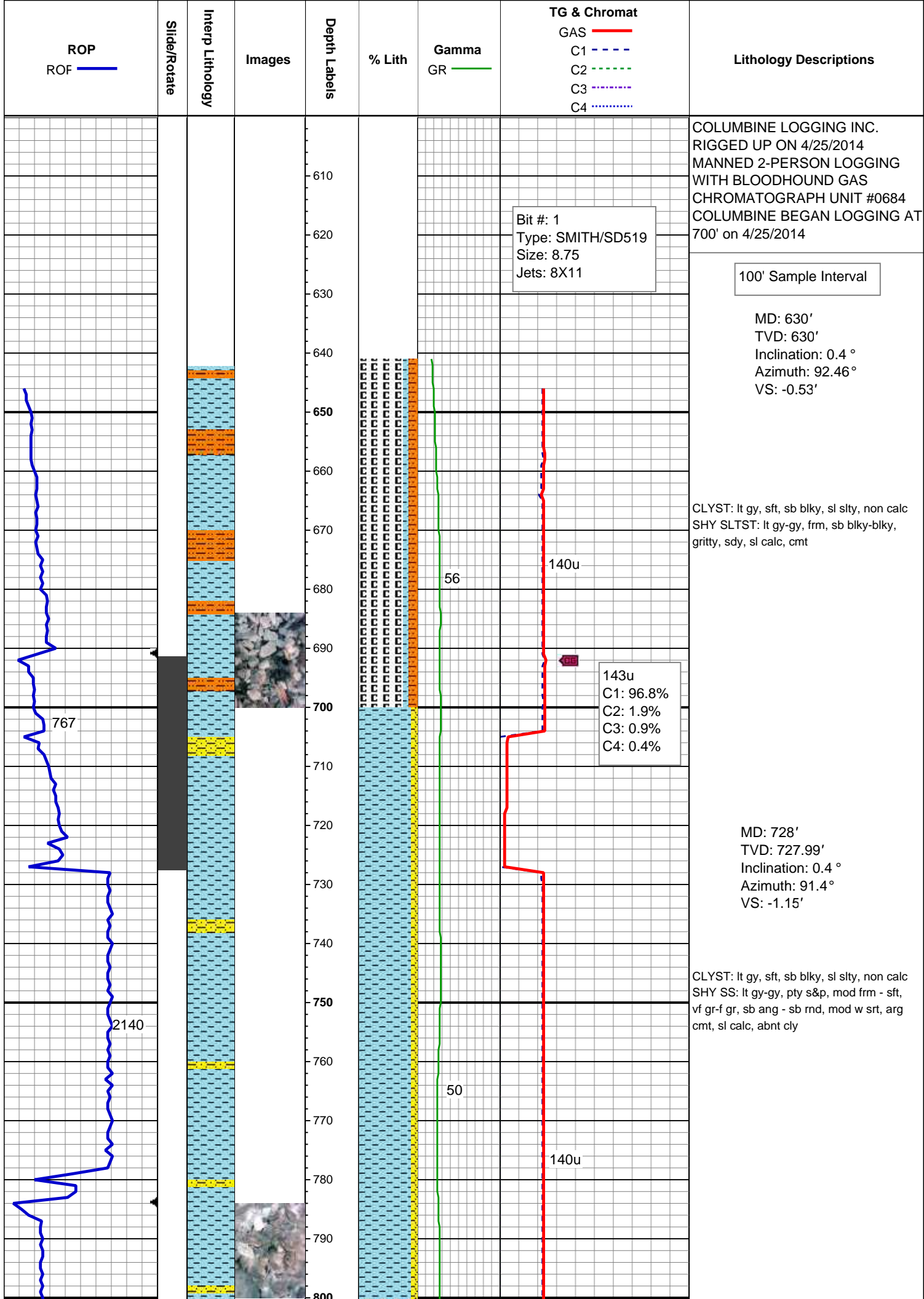
BOUNDSTONE
CHALKY
CRYPTOXLN

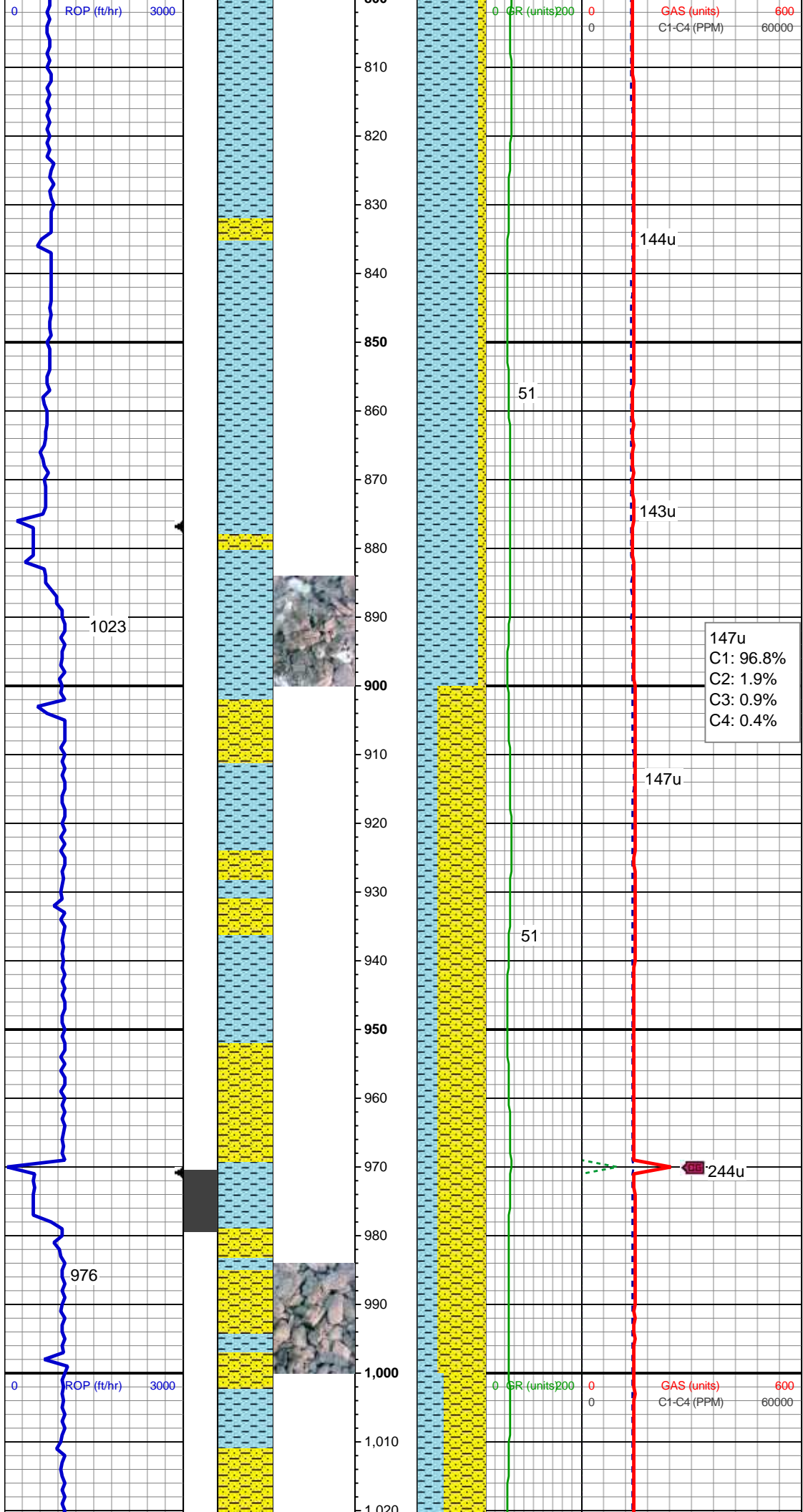
Earthy

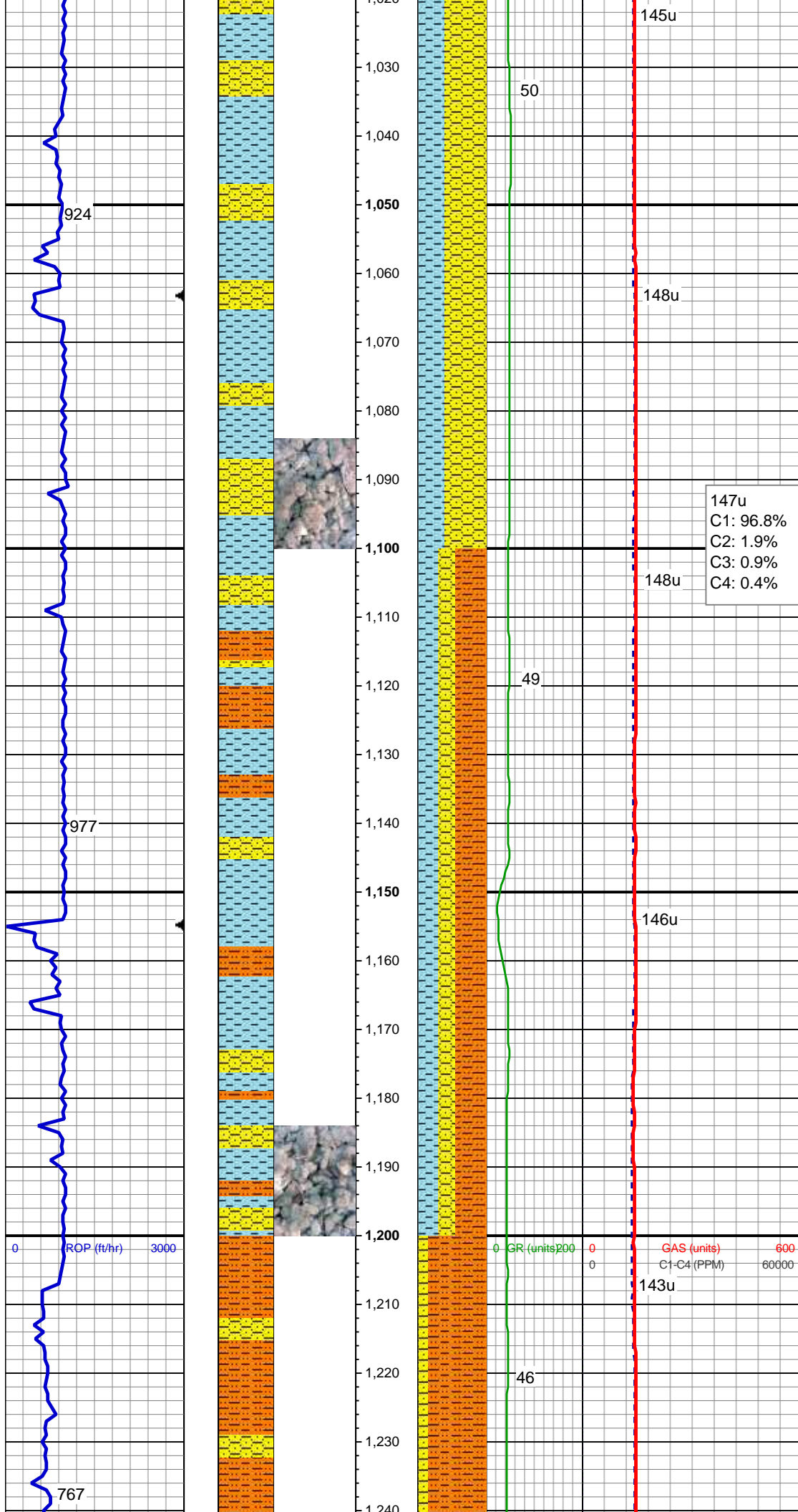
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL







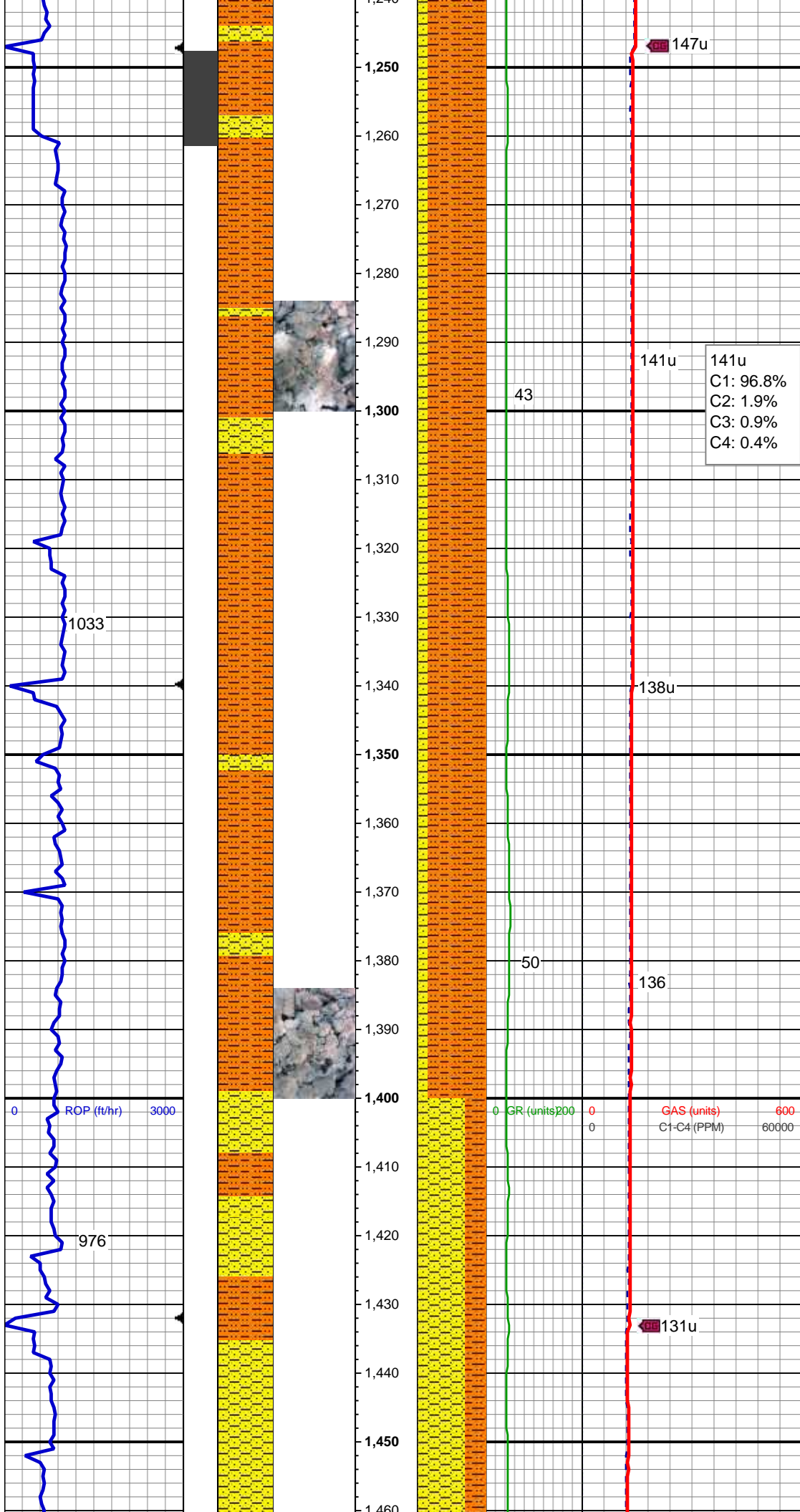
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, CLYST: lt gy, sft, sb blkly, sl slty, non calc, abnt cly

147u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

MD: 1,099'
TVD: 1,098.98'
Inclination: 0.4 °
Azimuth: 109.7°
VS: -1.71'

SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc, CLYST: lt gy, sft, sb blkly, sl slty, non calc, abnt cly

MD: 1,191'
TVD: 1,190.98'
Inclination: 0.5 °
Azimuth: 93.4°
VS: -1.87'



SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, imbd carb flks, abnt cly SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

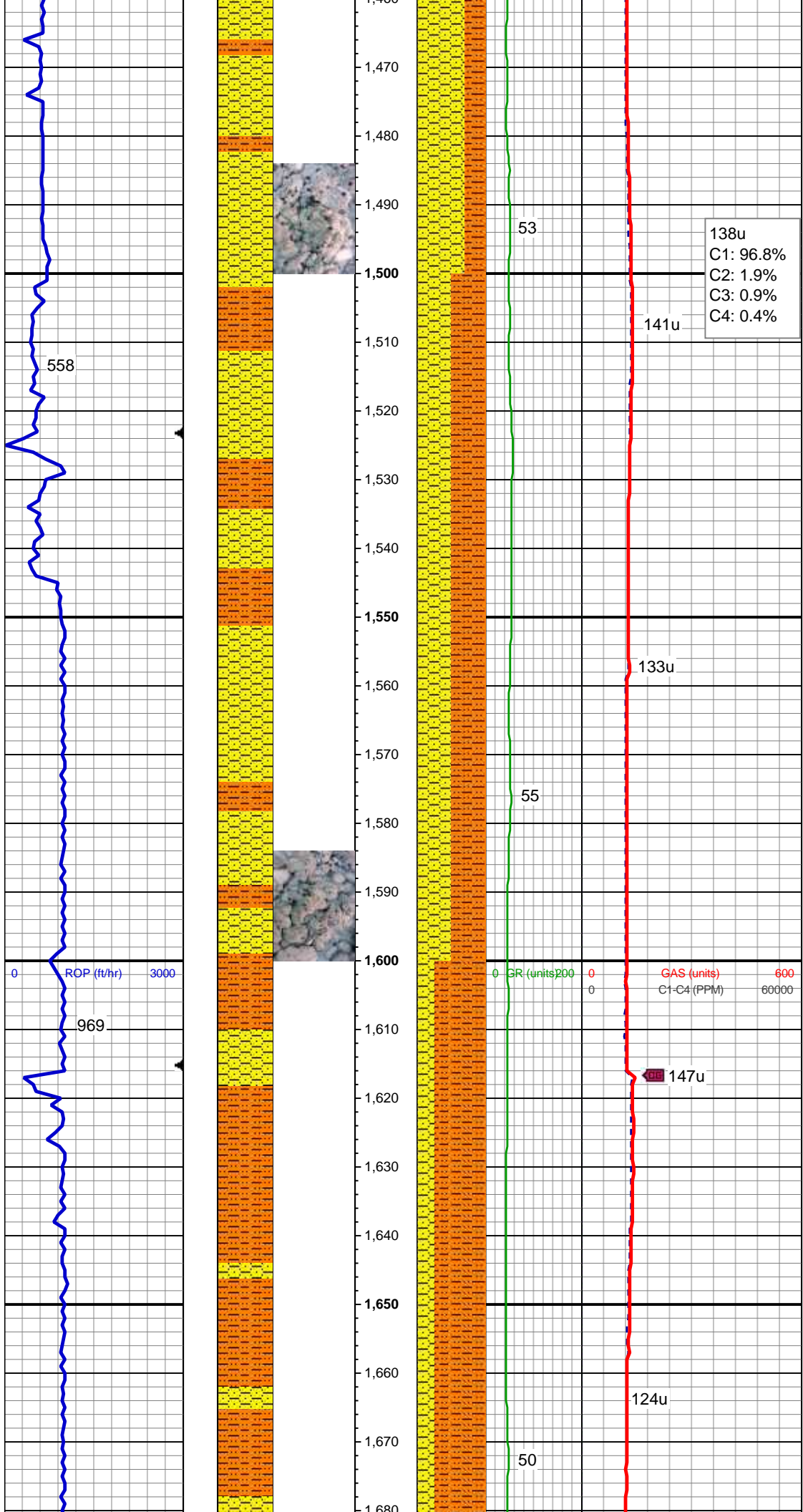
MD: 1,283'
TVD: 1,282.98'
Inclination: 0.5 °
Azimuth: 87.2°
VS: -1.3'

141u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, abnt cly SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 1,375'
TVD: 1,374.97'
Inclination: 0.8 °
Azimuth: 80.8°
VS: -1.19'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, imbd carb flks, abnt cly



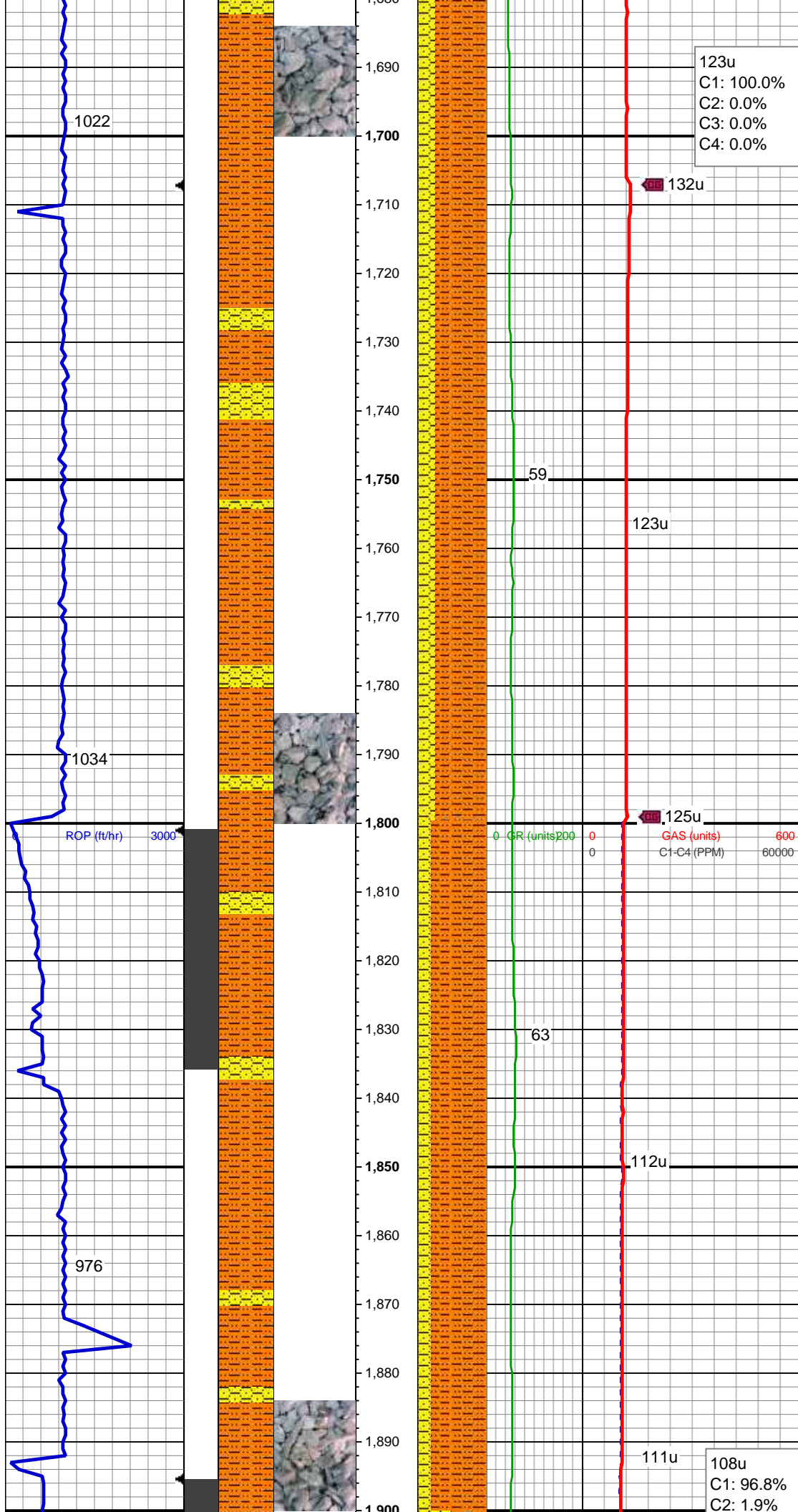
MD: 1,466'
TVD: 1,465.96'
Inclination: 0.8 °
Azimuth: 77.6 °
VS: -0.98'

SHY SLTST: lt gy-gy, frm, sb blkly-blky,
gritty, sdy, sl calc, imbd carb flks, abnt
cly SHY SS: lt gy-gy, pty s&p, mod frm -
sft, vf gr-f gr, sb ang - sb rnd, mod w srt,
glau, arg cmt, sl calc

MD: 1,558'
TVD: 1,557.95'
Inclination: 1 °
Azimuth: 97.2 °
VS: -0.97'

SHY SLTST: lt gy-gy, frm, sb blkly-blky,
gritty, sdy, sl calc, imbd carb flks, abnt
cly SHY SS: lt gy-gy, pty s&p, mod frm -
sft, vf gr-f gr, sb ang - sb rnd, mod w srt,
glau, arg cmt, sl calc

MD: 1,650'
TVD: 1,649.94'
Inclination: 0.9 °
Azimuth: 75.4 °
VS: -0.92'

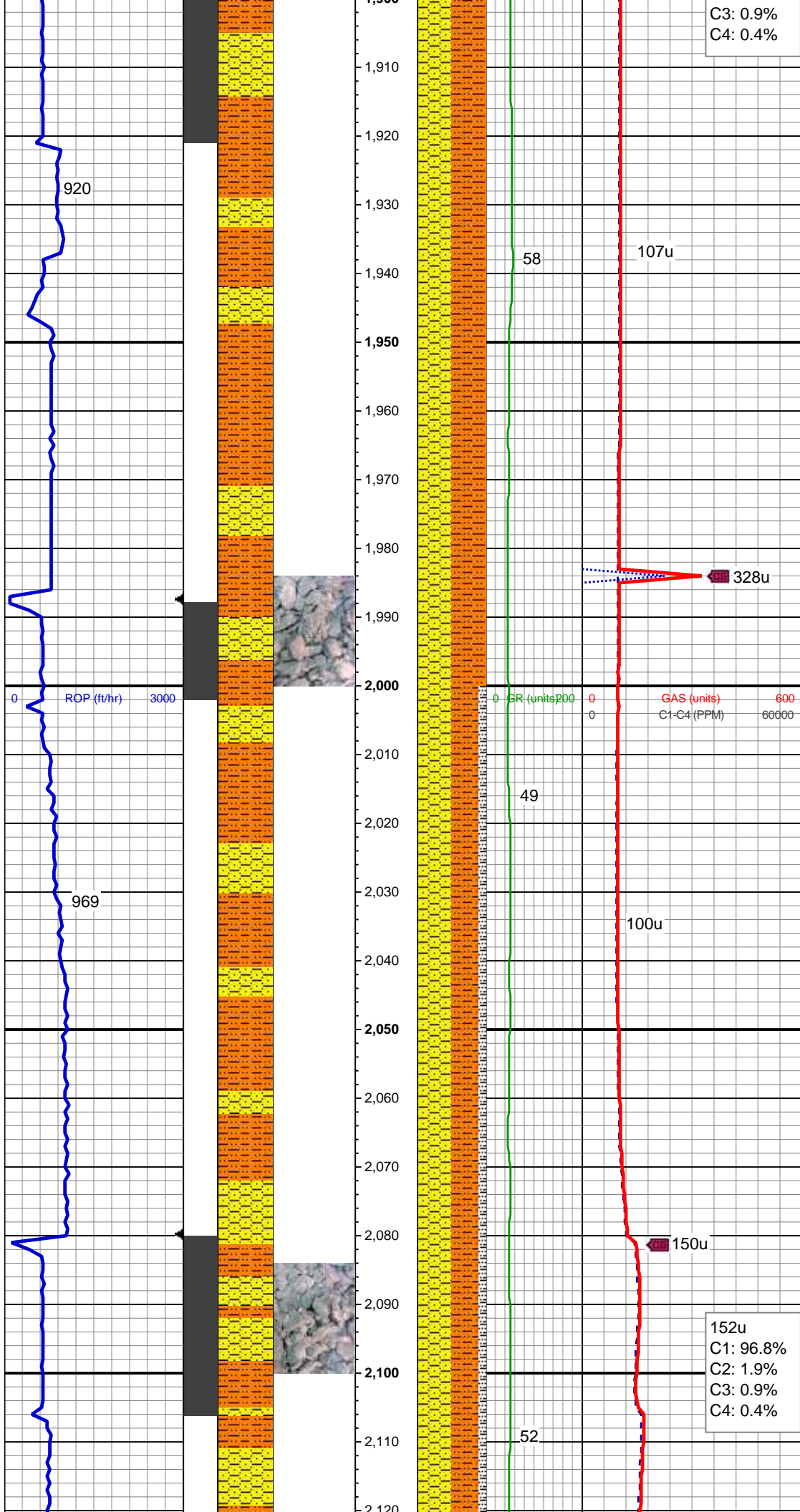


MD: 1,744'
TVD: 1,743.93'
Inclination: 0.8 °
Azimuth: 87.3°
VS: -0.73'

SHY SLTST: lt gy-gy, frm, sb blkly-blky,
gritty, sdy, sl calc, imbd carb flks, abnt
cly SHY SS: lt gy-gy, pty s&p, mod frm -
sft, vf gr-f gr, sb ang - sb rnd, mod w srt,
glau, arg cmt, sl calc

MD: 1,838'
TVD: 1,837.9'
Inclination: 2.3 °
Azimuth: 180.4°
VS: -2.6'

SHY SLTST: lt gy-gy, frm, sb blkly-blky,
gritty, sdy, sl calc, imbd carb flks, abnt
cly SHY SS: lt gy-gy, pty s&p, mod frm -
sft, vf gr-f gr, sb ang - sb rnd, mod w srt,
glau, arg cmt, sl calc



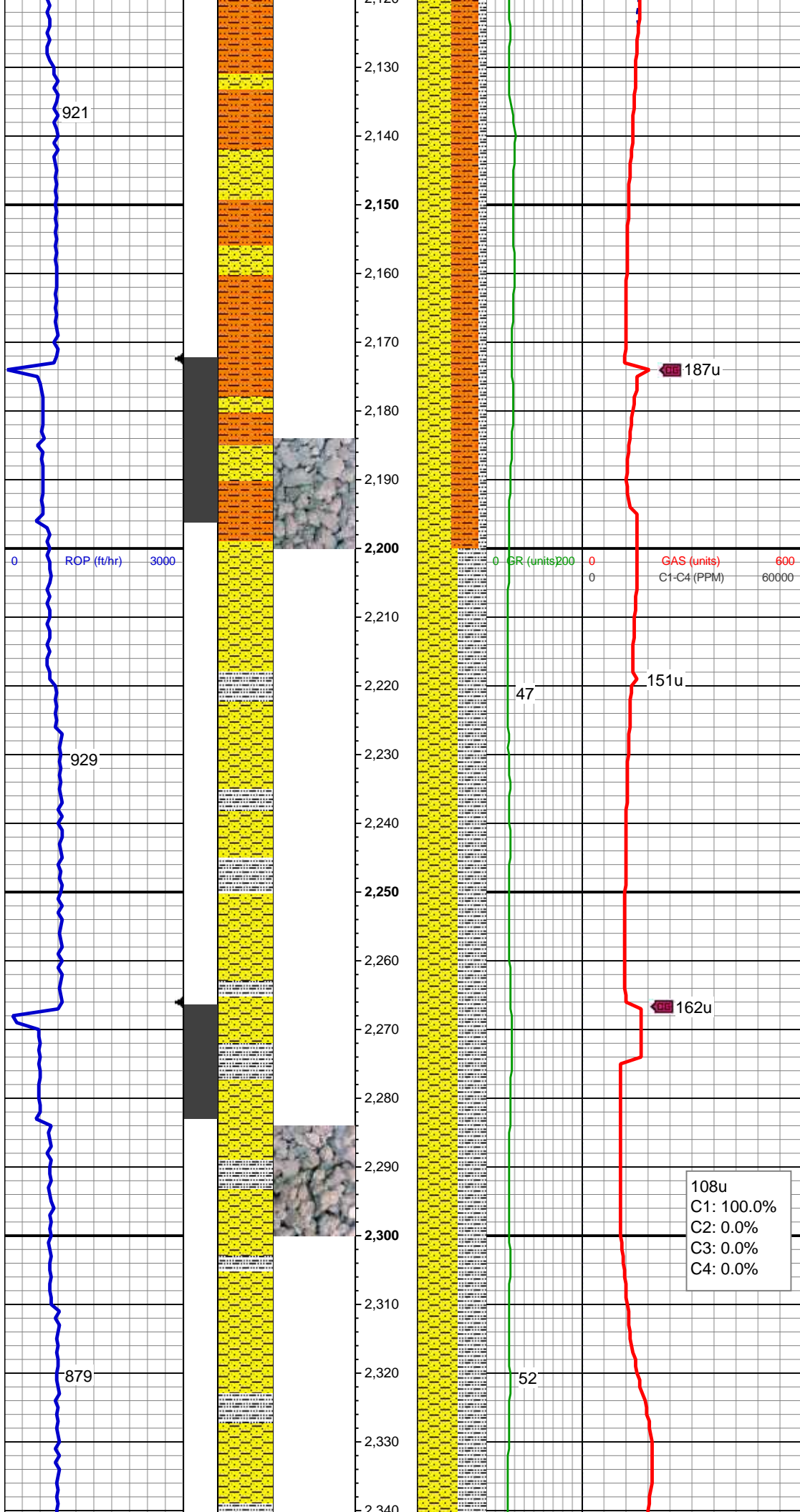
MD: 1,931'
TVD: 1,930.69'
Inclination: 5.3 °
Azimuth: 180.9 °
VS: -8.76'

SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, imbd carb flks, abnt cly SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc

MD: 2,023'
TVD: 2,022.22'
Inclination: 6.3 °
Azimuth: 179.9 °
VS: -18.06'

SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, imbd carb flks, abnt cly SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SILTY SHALE: light gray-gray, moderately soft-firm, sub blocky-sub platy, sandy earthy texture, pyr, slightly calcareous

MD: 2,115'
TVD: 2,113.5'
Inclination: 8 °



Azimuth: 179.5°
VS: -29.5'

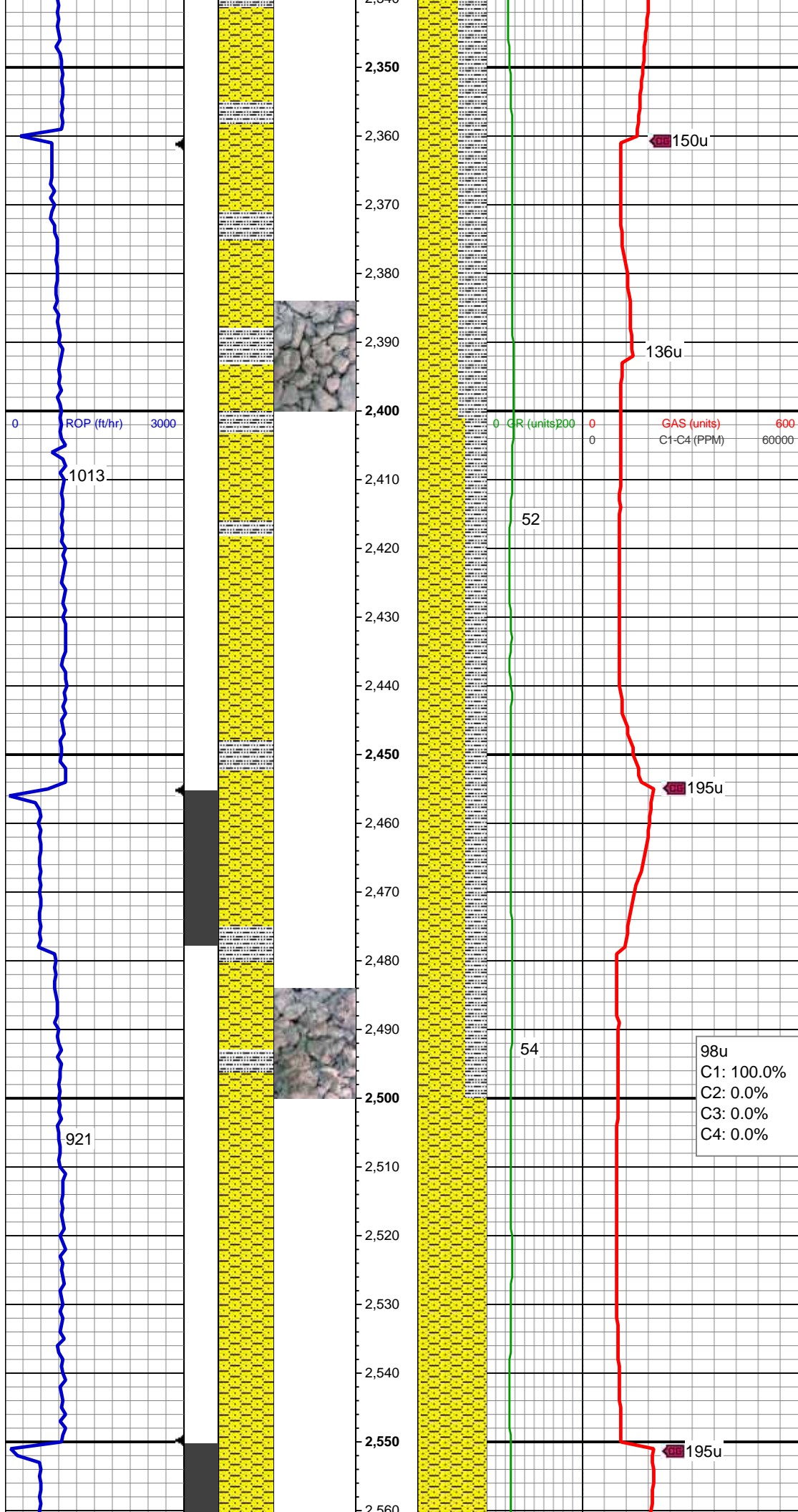
SHY SLTST: lt gy-gy, frm, sb blkly-blky, gritty, sdy, sl calc, imbd carb flks, abnt cly
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc
SILTY SHALE: light gray-gray, moderately soft-firm, sub blocky-sub platy, sandy earthy texture, pyr, slightly calcareous

Mud Wt: 8.75 / 40 Vis

MD: 2,210'
TVD: 2,207.56'
Inclination: 8.1 °
Azimuth: 187.5°
VS: -42.73'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc
SILTY SHALE: light gray-gray, moderately soft-firm, sub blocky-sub platy, sandy earthy texture, slightly calcareous

MD: 2,304'
TVD: 2,300.49'
Inclination: 9.2 °
Azimuth: 188.4°
VS: -56.69'



SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SILTY SHALE: light gray-gray, moderately soft-firm, sub blocky-sub platy, sandy earthy texture, slightly calcareous

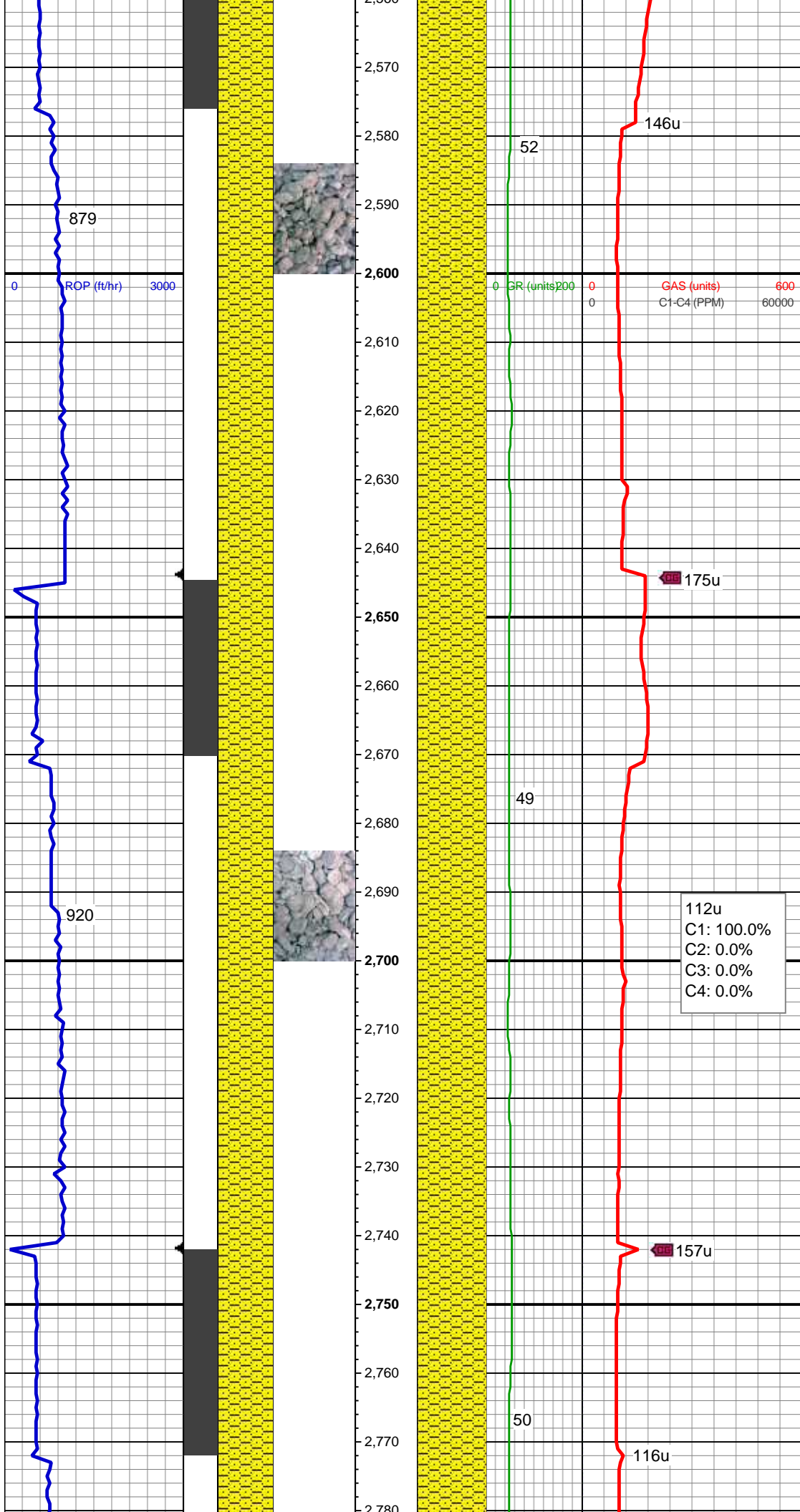
MD: 2,399'
TVD: 2,394.29'
Inclination: 9.1 °
Azimuth: 185.2 °
VS: -71.64'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SILTY SHALE: light gray-gray, moderately soft-firm, sub blocky-sub platy, sandy earthy texture, slightly calcareous

Mud Wt: 8.8 / 40 Vis

MD: 2,493'
TVD: 2,487.3'
Inclination: 7.5 °
Azimuth: 183.6 °
VS: -85.14'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SS: lt gy, off wh, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc, tr slty sh



MD: 2,588'
TVD: 2,581.68'
Inclination: 5.5 °
Azimuth: 186.2 °
VS: -95.84'

SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr-f gr, sb ang - sb rnd, mod w srt, glau,
arg cmt, sl calc, tr ss

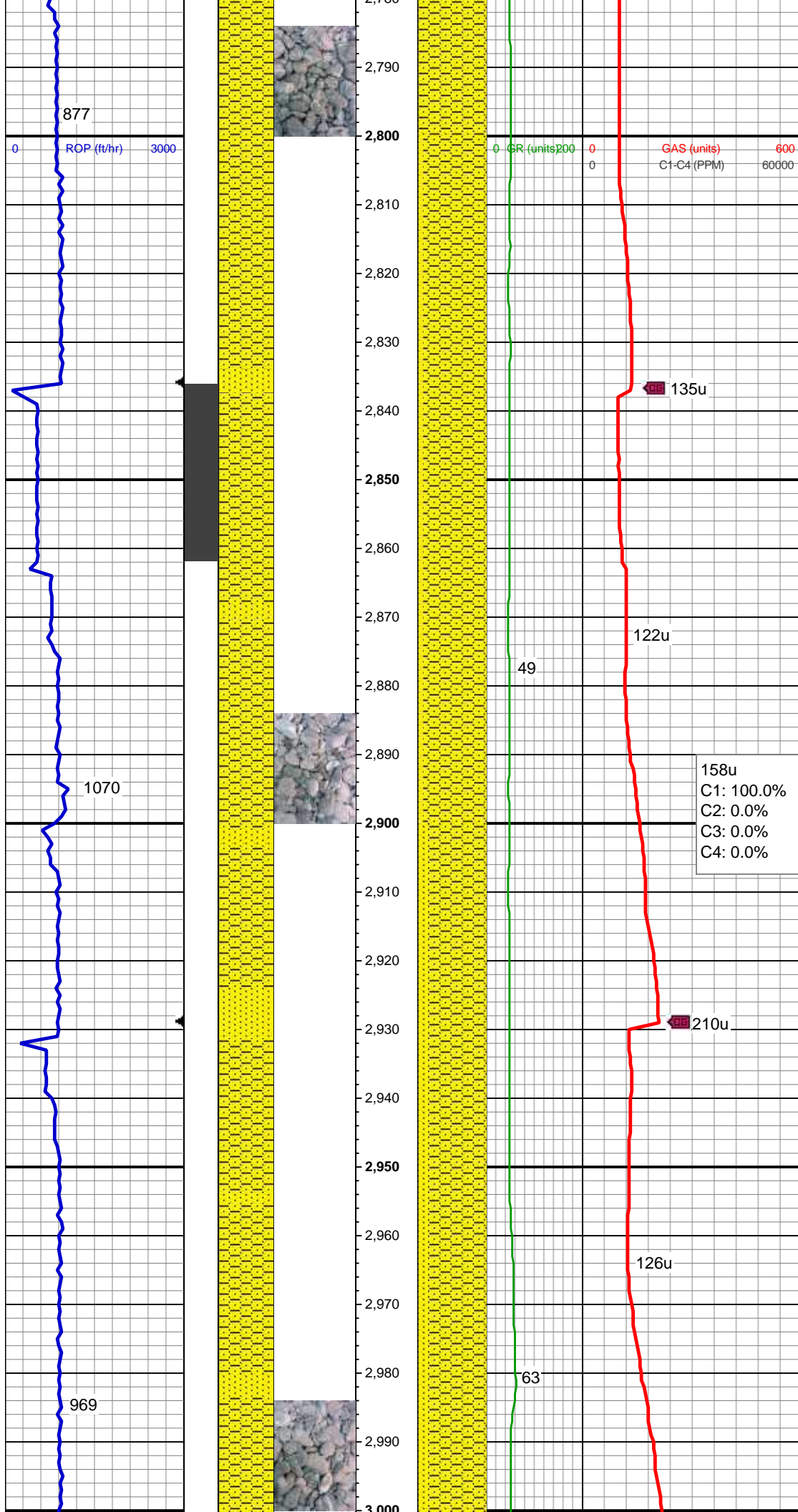
Mud Wt: 8.85 / 38 Vis

MD: 2,682'
TVD: 2,675.37'
Inclination: 3.8 °
Azimuth: 204.5 °
VS: -103.11'

SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr-f gr, sb ang - sb rnd, mod w srt, glau,
arg cmt, sl calc, tr ss

MD: 2,777'
TVD: 2,770.26'
Inclination: 1.7 °
Azimuth: 215.5 °

VS: -107.08'



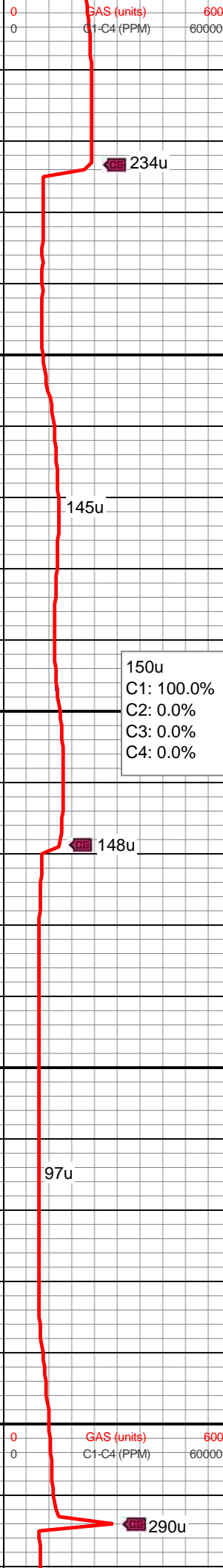
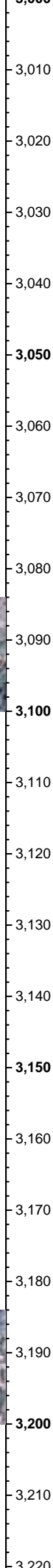
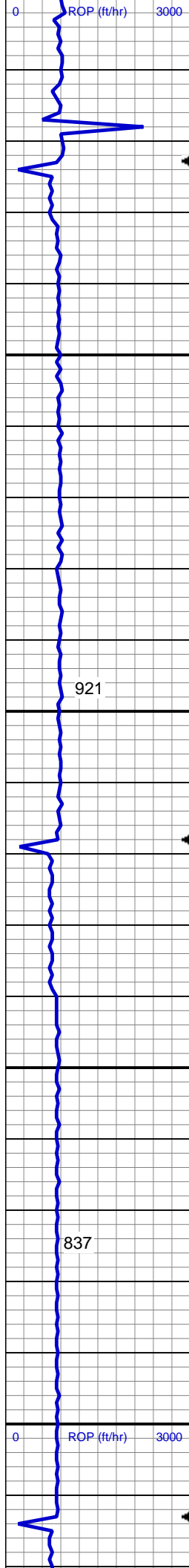
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SS: lt gy, off wh, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc, tr slty sh

MD: 2,872'
TVD: 2,865.25'
Inclination: 0.4 °
Azimuth: 344 °
VS: -107.89'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SS: lt gy, off wh, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc, tr slty sh

Mud Wt: 8.85 / 35 Vis

MD: 2,967'
TVD: 2,960.24'
Inclination: 0.5 °
Azimuth: 304.8 °
VS: -107.33'

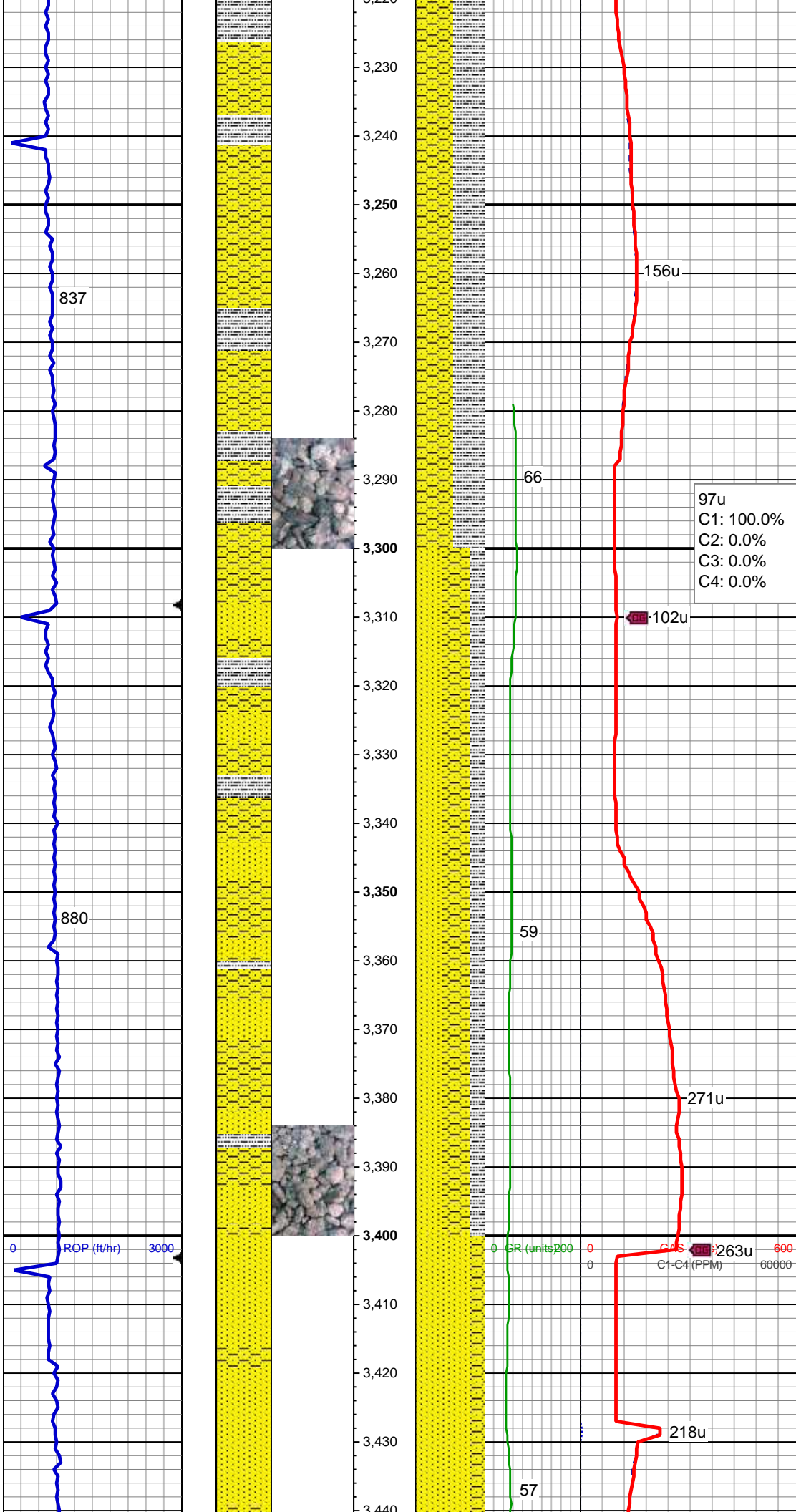


SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr-f gr, sb ang - sb rnd, mod w srt, glau,
arg cmt, sl calc, tr ss

MD: 3,062'
TVD: 3,055.24'
Inclination: 0.6 °
Azimuth: 308.5°
VS: -106.77'

SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr-f gr, sb ang - sb rnd, mod w srt, glau,
arg cmt, calc SLTY SH: lt gy-gy, mod
sft-frm, sub blkly-sub pty, sdy rthy tex, sl
calc

MD: 3,156'
TVD: 3,149.24'
Inclination: 0.6 °
Azimuth: 317.9°
VS: -106.08'



MD: 3,251'
TVD: 3,244.23'
Inclination: 0.6 °
Azimuth: 320.5 °
VS: -105.31'

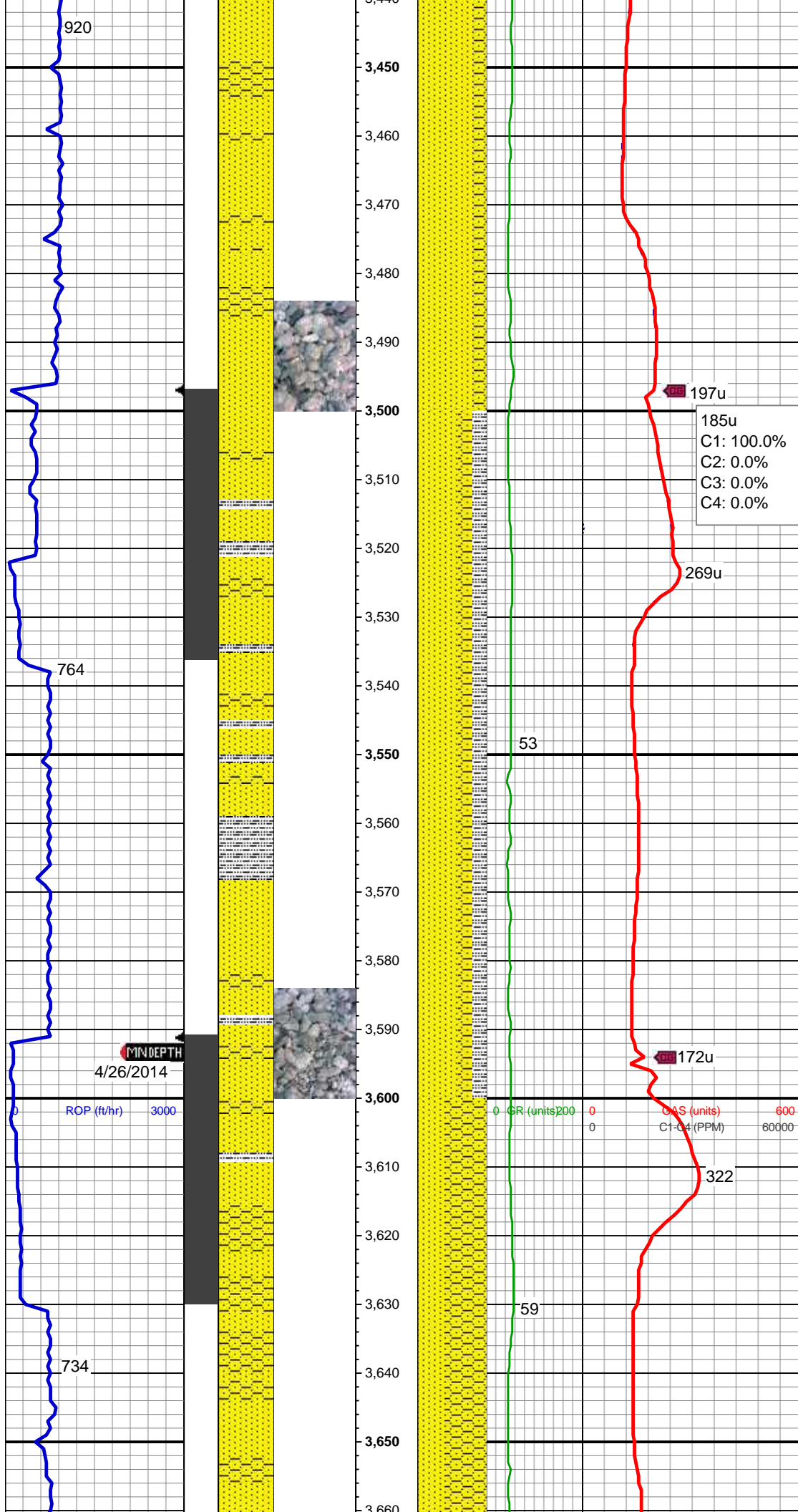
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, calc SLTY SH: lt gy-gy, mod sft-frm, sub blkly-sub plty, sdy rthy tex, sl calc

97u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%

MD: 3,346'
TVD: 3,339.22'
Inclination: 0.8 °
Azimuth: 331.8 °
VS: -104.33'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SS: lt gy, off wh, sme stnd lt brn, s&p, vf-f grn, sb rd ang, mod w srt, frm-friable, glau, mod calc SLTY SH: lt gy-gy, mod sft-frm, sub blkly-sub plty, sdy rthy tex, sl calc

MD: 3,441'
TVD: 3,434.21'



Inclination: 1.1 °
Azimuth: 327.6 °
VS: -102.96'

SS: lt gy, off wh, sme stnd lt brn, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb md, mod w srt, glau, arg cmt, sl calc

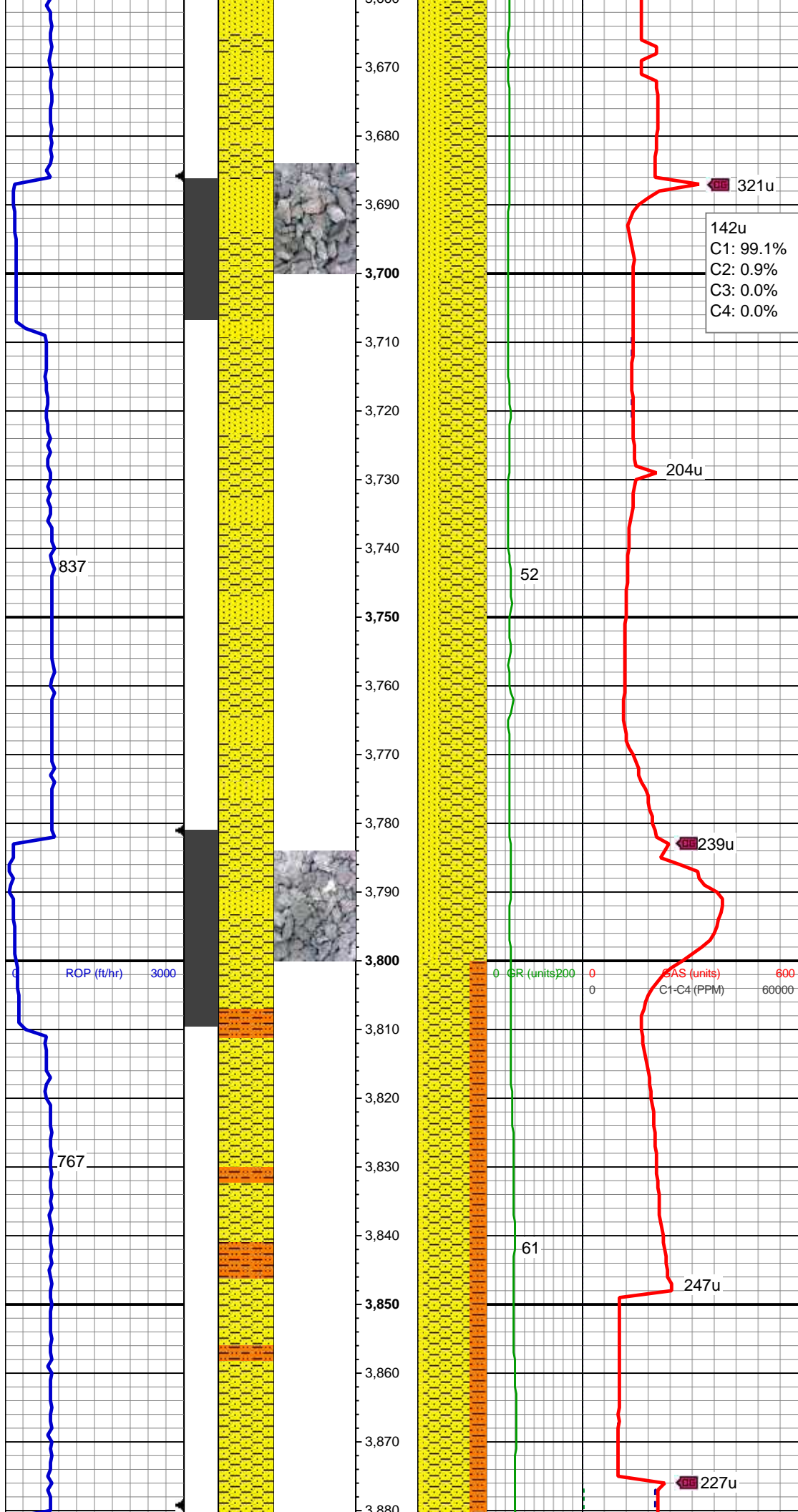
Mud Wt: 8.8 / 41 Vis

MD: 3,535'
TVD: 3,528.2'
Inclination: 0.9 °
Azimuth: 356.1 °
VS: -101.45'

SS: lt gy, off wh, sme stnd lt brn, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc
SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb md, mod w srt, glau, arg cmt, sl calc
SLTY SH: lt gy-gy, mod sft-frm, sub blk-sub plty, sdy rthy tex, sl calc

MD: 3,629'
TVD: 3,622.19'
Inclination: 1.4 °
Azimuth: 152.3 °
VS: -101.74'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb md, mod w srt, glau, arg cmt, sl calc
SS: lt gy, off wh, sme stnd lt brn, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc

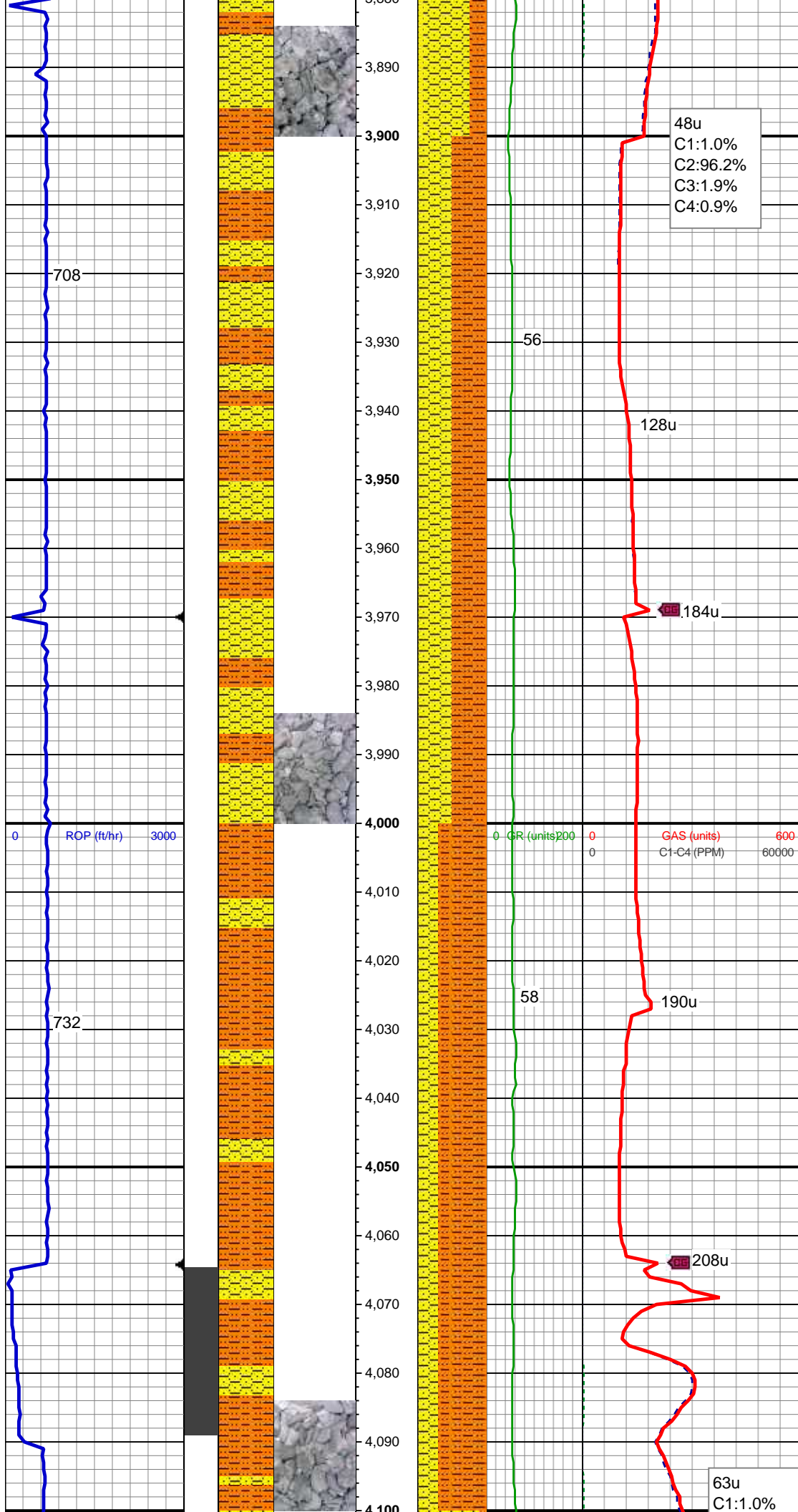


MD: 3,724'
TVD: 3,717.16'
Inclination: 1.4 °
Azimuth: 111 °
VS: -103.22'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr-f gr, sb ang - sb rnd, mod w srt, glau, arg cmt, sl calc SS: lt gy, off wh, sme stnd lt brn, s&p, vf-f grn, sb rd-db ang, mod w srt, frm-friable, glau, mod calc

MD: 3,819'
TVD: 3,812.15'
Inclination: 0.6 °
Azimuth: 9.2 °
VS: -103.17'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SHY SLTST: lt gy-gy, mod sft-frm, sb blk-ly-sb pty, sdy rthy tex, sl calc SS: lt gy, off wh, some stnd lt brn, s&p, vf-f grn, sb rd-ang, mod w srt, frm-friable, glau, mod calc



48u
C1:1.0%
C2:96.2%
C3:1.9%
C4:0.9%

MD: 3,913'
TVD: 3,906.15'
Inclination: 0.6 °
Azimuth: 310.2 °
VS: -102.36'

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SHY SLTST: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc

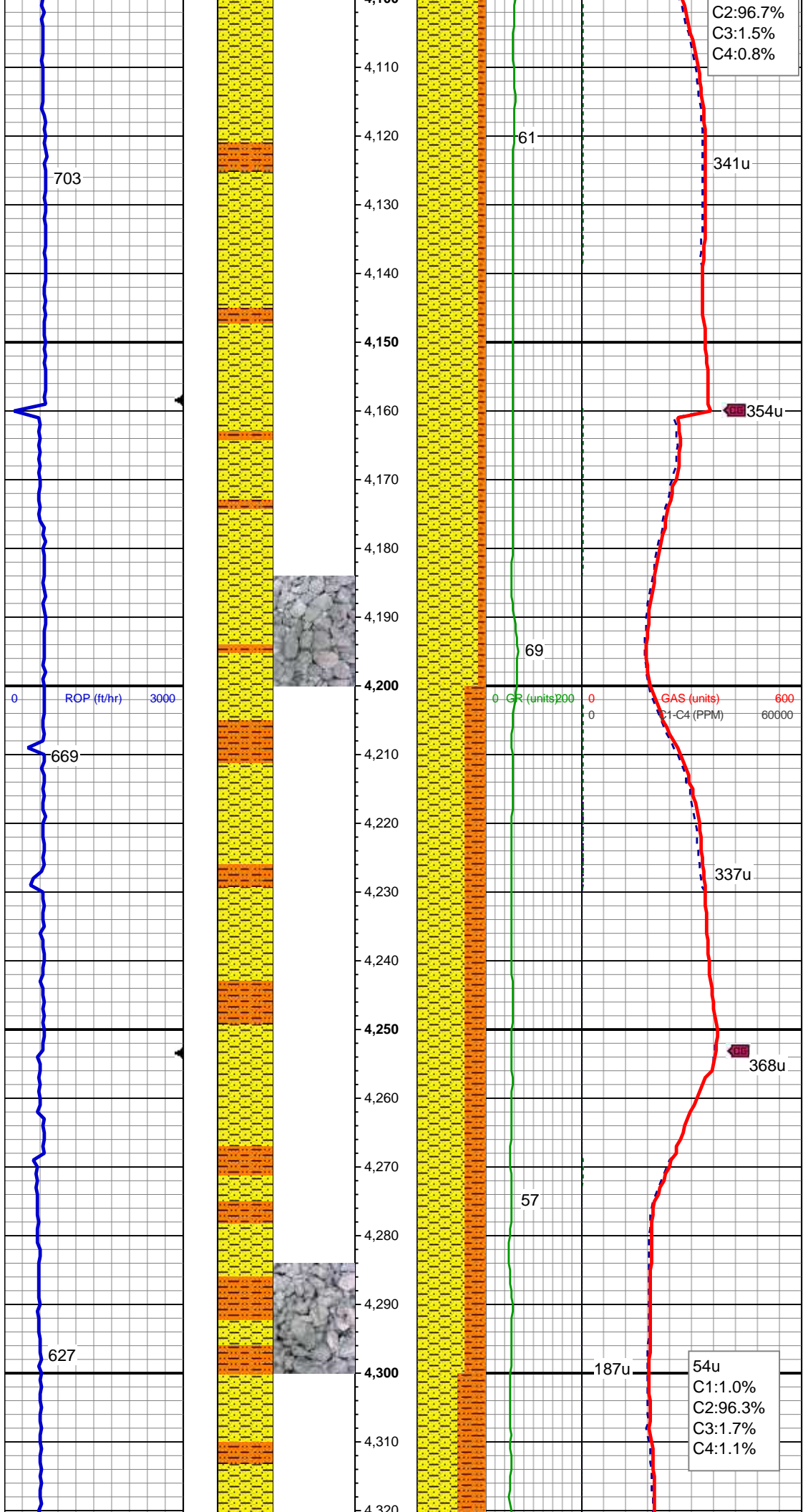
MD: 4,007'
TVD: 4,000.14'
Inclination: 1.1 °
Azimuth: 313.6 °
VS: -101.4'

SHY SLTST: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

Mud Wt: 9.45 / 38 Vis

MD: 4,101'
TVD: 4,094.13'
Inclination: 0.4 °
Azimuth: 202.2 °

63u
C1:1.0%



Azimuth: 203.3
VS: -101.06'

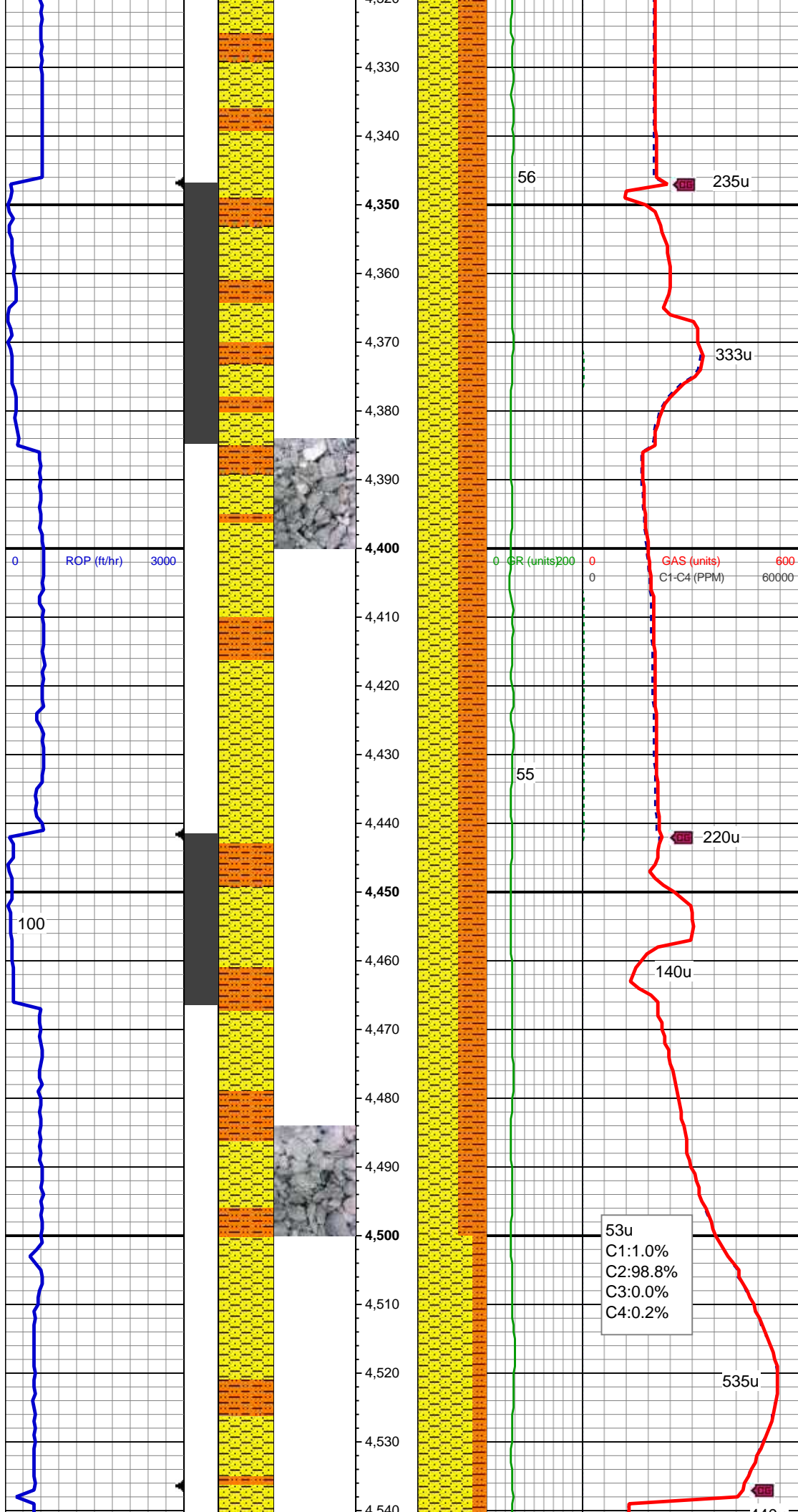
SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr, sb ang - sb rnd, mod w srt, arg cmt,
sl calc SHY SLTST: lt gy-gy, mod sft-frm,
sb blk-y-sb plty, sdy rthy tex, sl calc

MD: 4,196'
TVD: 4,189.13'
Inclination: 0.9 °
Azimuth: 247.1 °
VS: -101.64'

SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr, sb ang - sb rnd, mod w srt, arg cmt,
sl calc SHY SLTST: lt gy-gy, mod sft-frm,
sb blk-y-sb plty, sdy rthy tex, sl calc

MD: 4,291'
TVD: 4,284.11'
Inclination: 1.3 °
Azimuth: 273.7 °
VS: -101.82'

54u
C1:1.0%
C2:96.3%
C3:1.7%
C4:1.1%



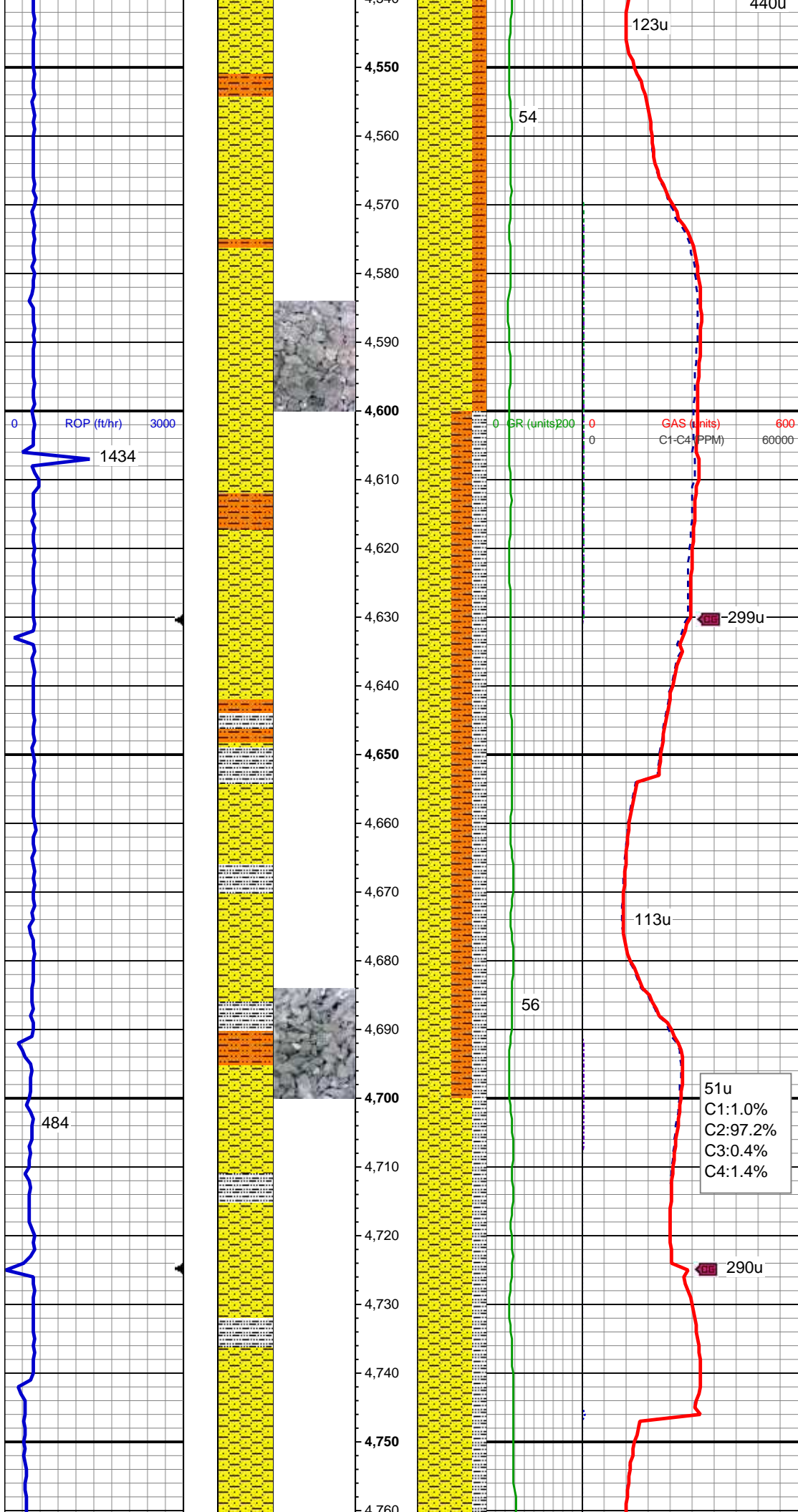
SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr, sb ang - sb rnd, mod w srt, arg cmt,
sl calc SHY SLTST: lt gy-gy, mod sft-frm,
sb blk-y-sb plty, sdy rthy tex, sl calc

MD: 4,385'
TVD: 4,378.09'
Inclination: 0.7 °
Azimuth: 242.4°
VS: -102.01'

SHY SS: lt gy-gy, pty s&p, mod frm - sft,
vf gr, sb ang - sb rnd, mod w srt, arg cmt,
sl calc SHY SLTST: lt gy-gy, mod sft-frm,
sb blk-y-sb plty, sdy rthy tex, sl calc

MD: 4,480'
TVD: 4,473.09'
Inclination: 0.4 °
Azimuth: 54°
VS: -102.08'

53u
C1:1.0%
C2:98.8%
C3:0.0%
C4:0.2%



SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SHY SLTST: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc

MD: 4,574'
TVD: 4,567.09'
Inclination: 0.4 °
Azimuth: 326.9°
VS: -101.61'

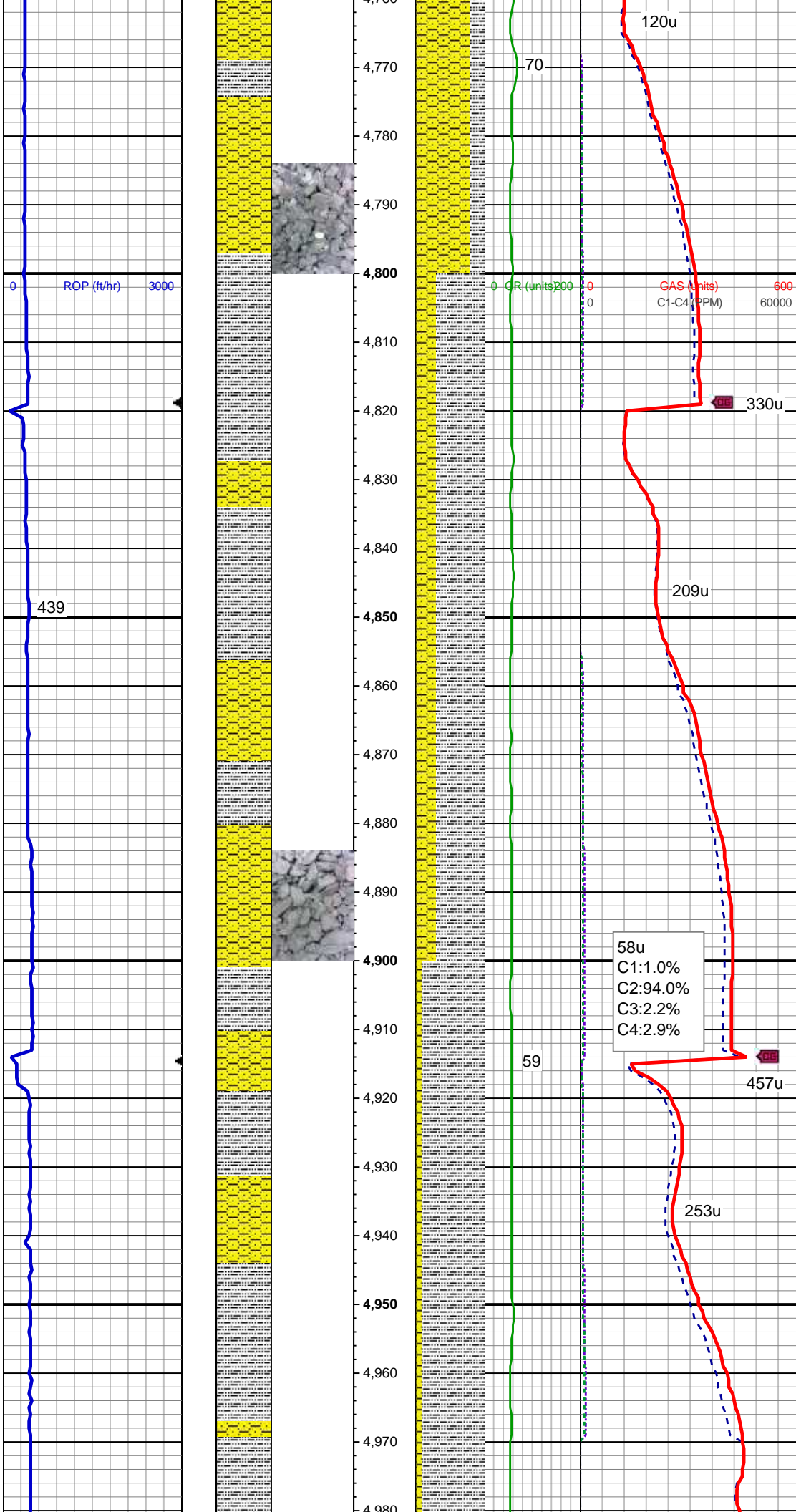
SLTY SH: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc SHY SLTST: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc

MD: 4,668'
TVD: 4,661.09'
Inclination: 0.5 °
Azimuth: 312.5°
VS: -101.05'

51u
C1:1.0%
C2:97.2%
C3:0.4%
C4:1.4%

Mud Wt: 9.85 / 45 Vis

SHY SS: lt gy-gy, pty s&p, mod frm - sft, vf gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc SLTY SH: lt gy-gy, mod sft-frm, sb blk-y-sb plty, sdy rthy tex, sl calc



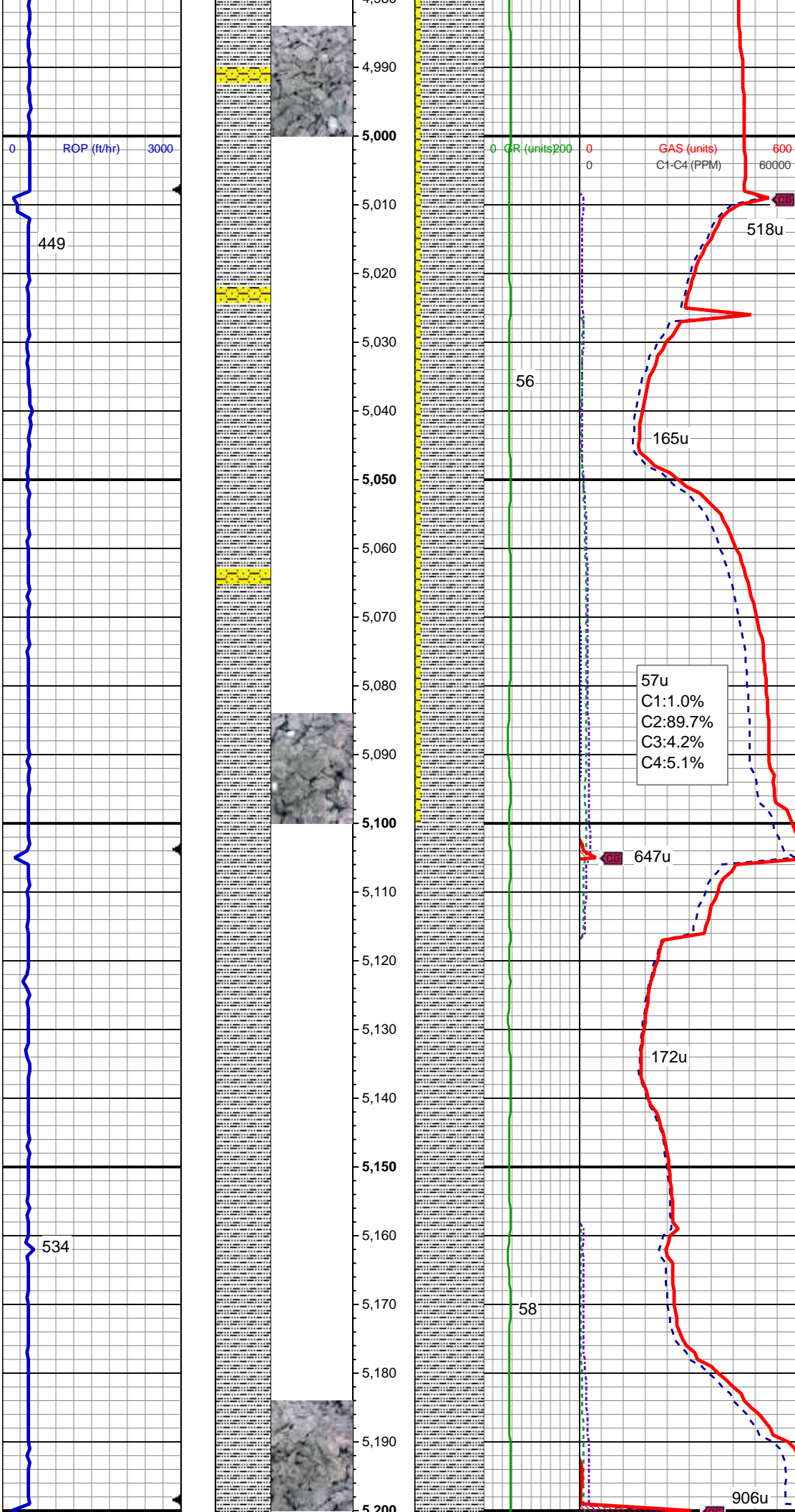
MD: 4,763'
TVD: 4,756.08'
Inclination: 1 °
Azimuth: 282.4 °
VS: -100.57'

SLTY SH: lt gy-gy, mod sft frm, sb blkly-sb
pty, sdy rthy tex, sl calc SHY SS: lt
gy-gy, pty s&p, mod frm - sft, vf gr, sb ang
- sb rnd, mod w srt, arg cmt, sl calc

MD: 4,858'
TVD: 4,851.07'
Inclination: 1 °
Azimuth: 288.4 °
VS: -100.1'

SLTY SH: lt gy-gy, mod sft frm, sb blkly-sb
pty, sdy rthy tex, sl calc SHY SS: lt
gy-gy, pty s&p, mod frm - sft, vf gr, sb ang
- sb rnd, mod w srt, arg cmt, sl calc

MD: 4,952'
TVD: 4,945.05'
Inclination: 1.2 °
Azimuth: 285.8 °
VS: -99.54'



SLTY SH: lt gy-gy, mod sft frm, sb blk-y-sb
pity, sdy rthy tex, sl calc SHY SS: lt
gy-gy, pty s&p, mod frm - sft, vf gr, sb ang
- sb rnd, mod w srt, arg cmt, sl calc

MD: 5,047'
TVD: 5,040.03'
Inclination: 1.3 °
Azimuth: 292.1 °
VS: -98.82'

MD: 5,142'
TVD: 5,135.01'
Inclination: 0.8 °
Azimuth: 280.9 °
VS: -98.26'

SLTY SH: lt gy-gy, mod sft frm, sb blk-y-sb
pity, sdy rthy tex, sl calc

