

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Rohn State LD10-66-1HN

Location SENE SEC9, T9N, R58W, 6 PM

State COLORADO

County WELD

Country USA

Rig Number H&P 326

API Number 05-123-37628

Field WILDCAT

Region DJ BASIN

Drilling Completed 10/17/2014

Spud Date 10/11/2014

Surface Coordinates 1763 FNL, 330 FEL
40.76832/-103.86114

Bottom Hole Coordinates (PROJ)
2310 FFNLL, 660 FFELL

Ground Elevation 4728'

K.B. Elevation 4758'

Logged Interval 1100' To 5115'

Total Depth 9815'

Formation NIOBRARA C-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

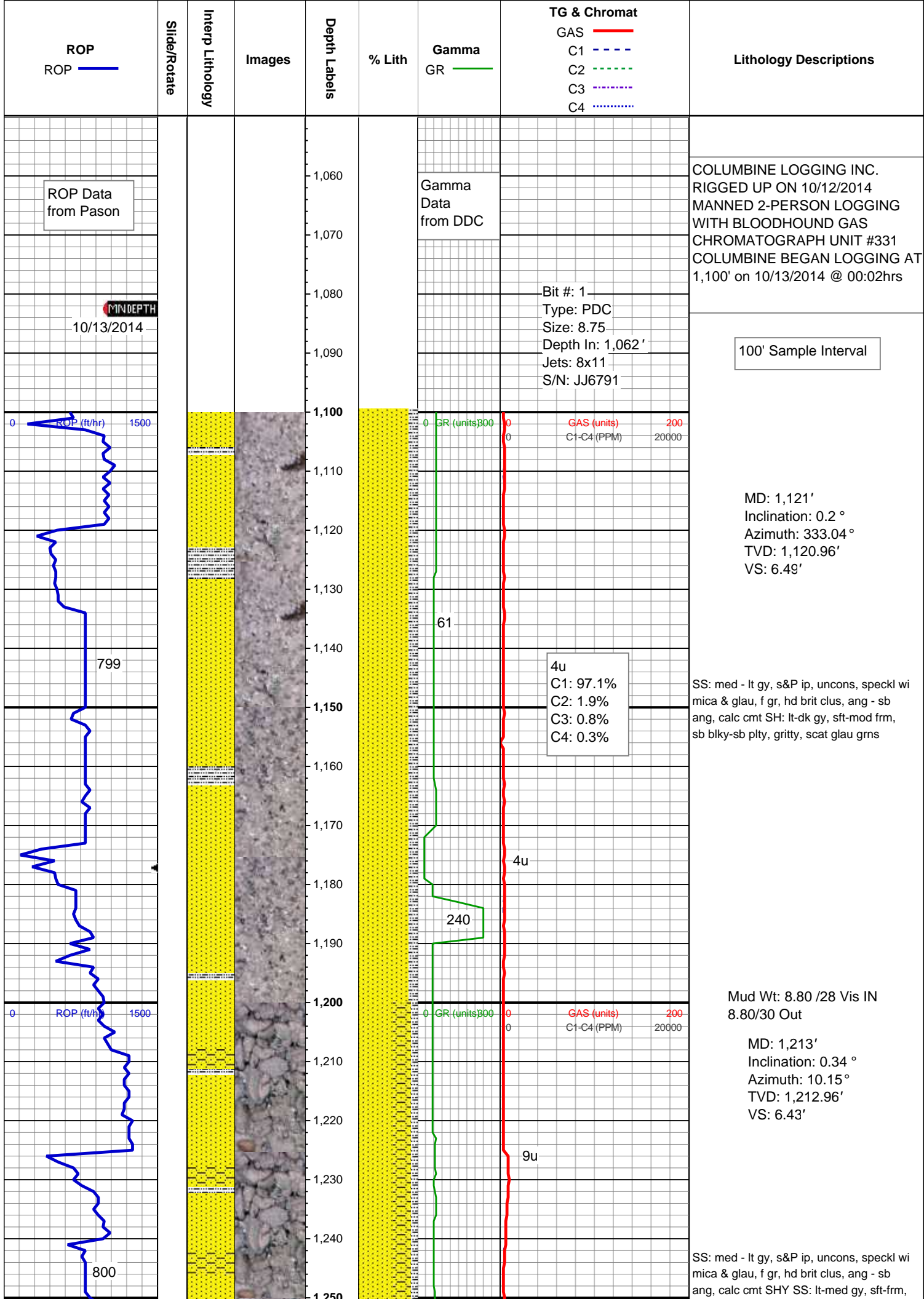
Name JAMES TAYLOR

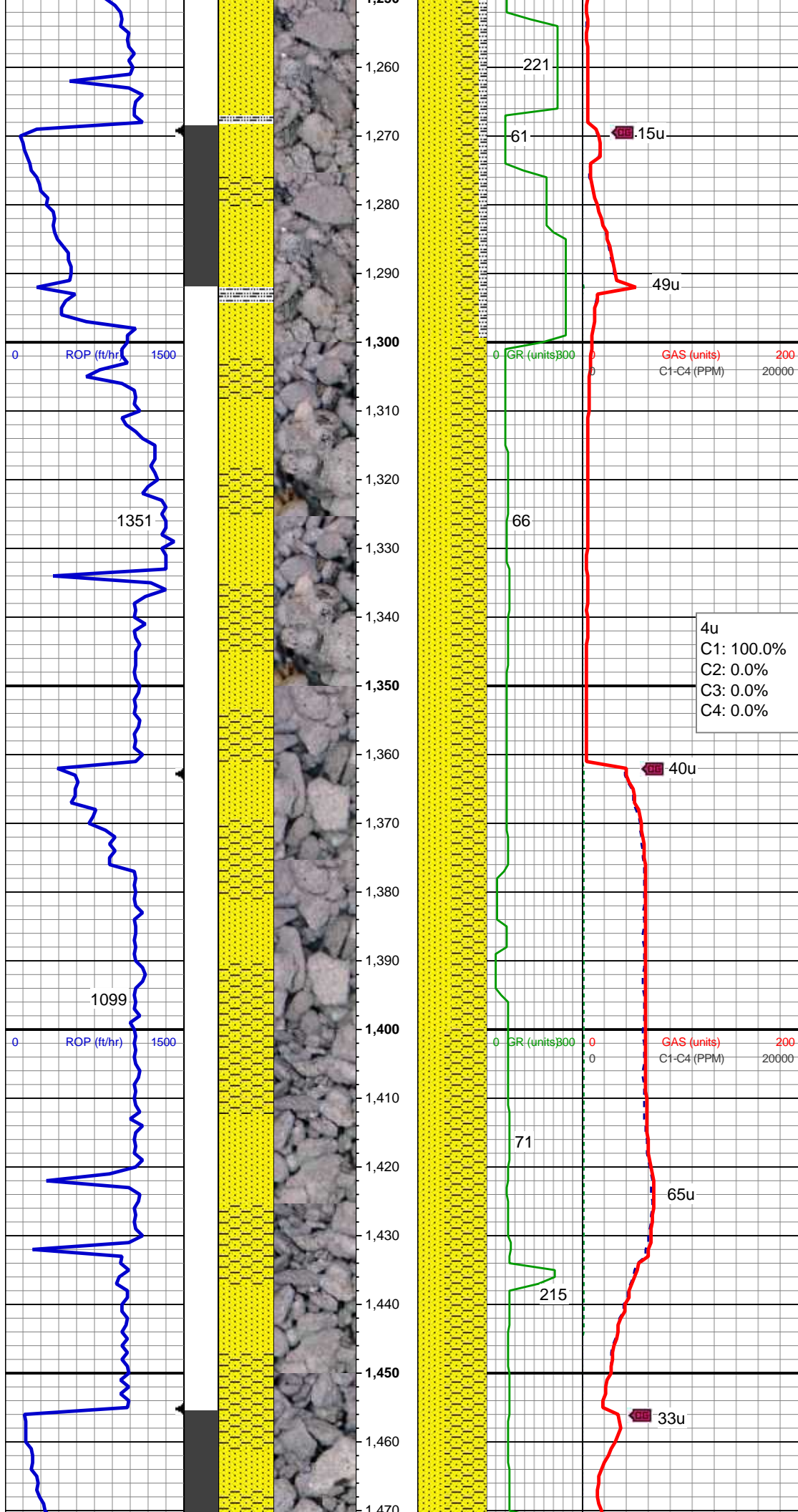
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING MATT HOPKINS
CAMERON NAKOS





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; scat glauc grns

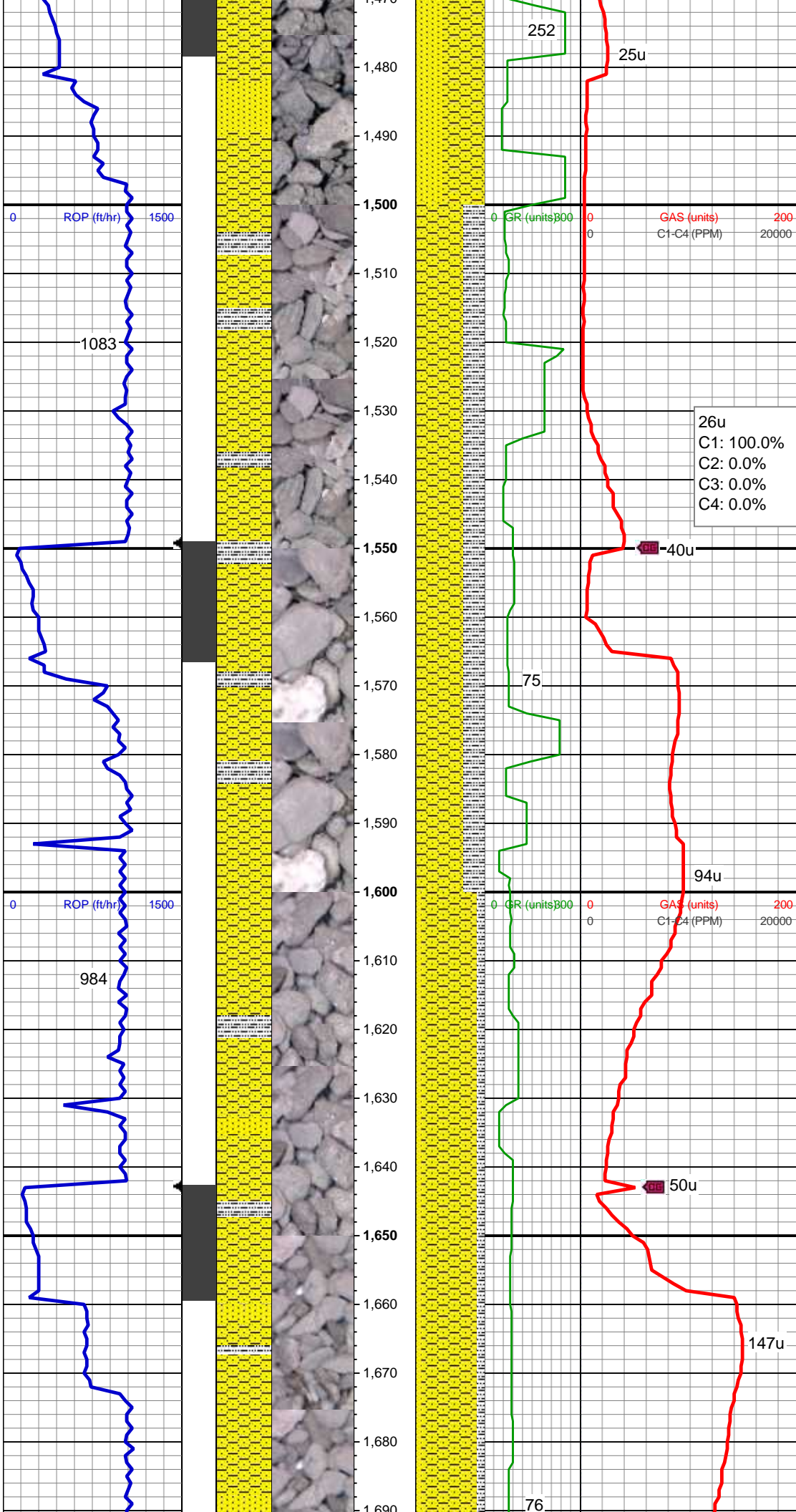
MD: 1,306'
Inclination: 2.95 °
Azimuth: 123.89 °
TVD: 1,305.92'
VS: 8.55'

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; imbd glauc

MD: 1,400'
Inclination: 2.12 °
Azimuth: 130.84 °
TVD: 1,399.83'
VS: 12.08'

Mud Wt: 8.65 /28 Vis IN
8.70/29 Out

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; imbd glauc



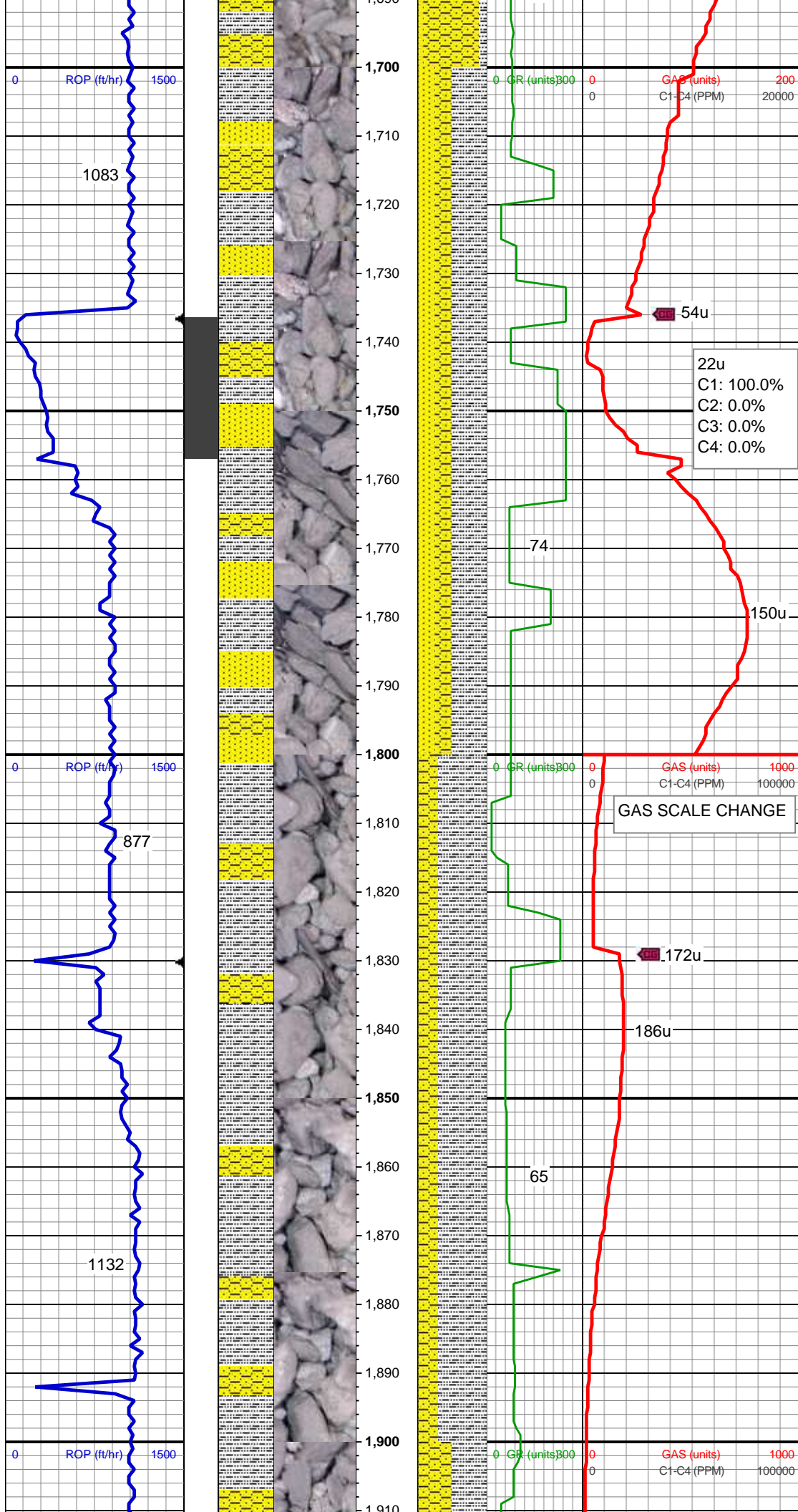
MD: 1,492'
Inclination: 5.68 °
Azimuth: 130.21 °
TVD: 1,491.6'
VS: 17.17'

SHY SS: lt-med gy, s&P ip, 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
blky-sb plty, gritty

MD: 1,584'
Inclination: 7.48 °
Azimuth: 125.11 °
TVD: 1,582.99'
VS: 26.06'

SHY SS: lt-med gy, s&P ip, 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
blky-sb plty, gritty

MD: 1,677'
Inclination: 9.01 °
Azimuth: 113.28 °
TVD: 1,675.04'
VS: 38.21'

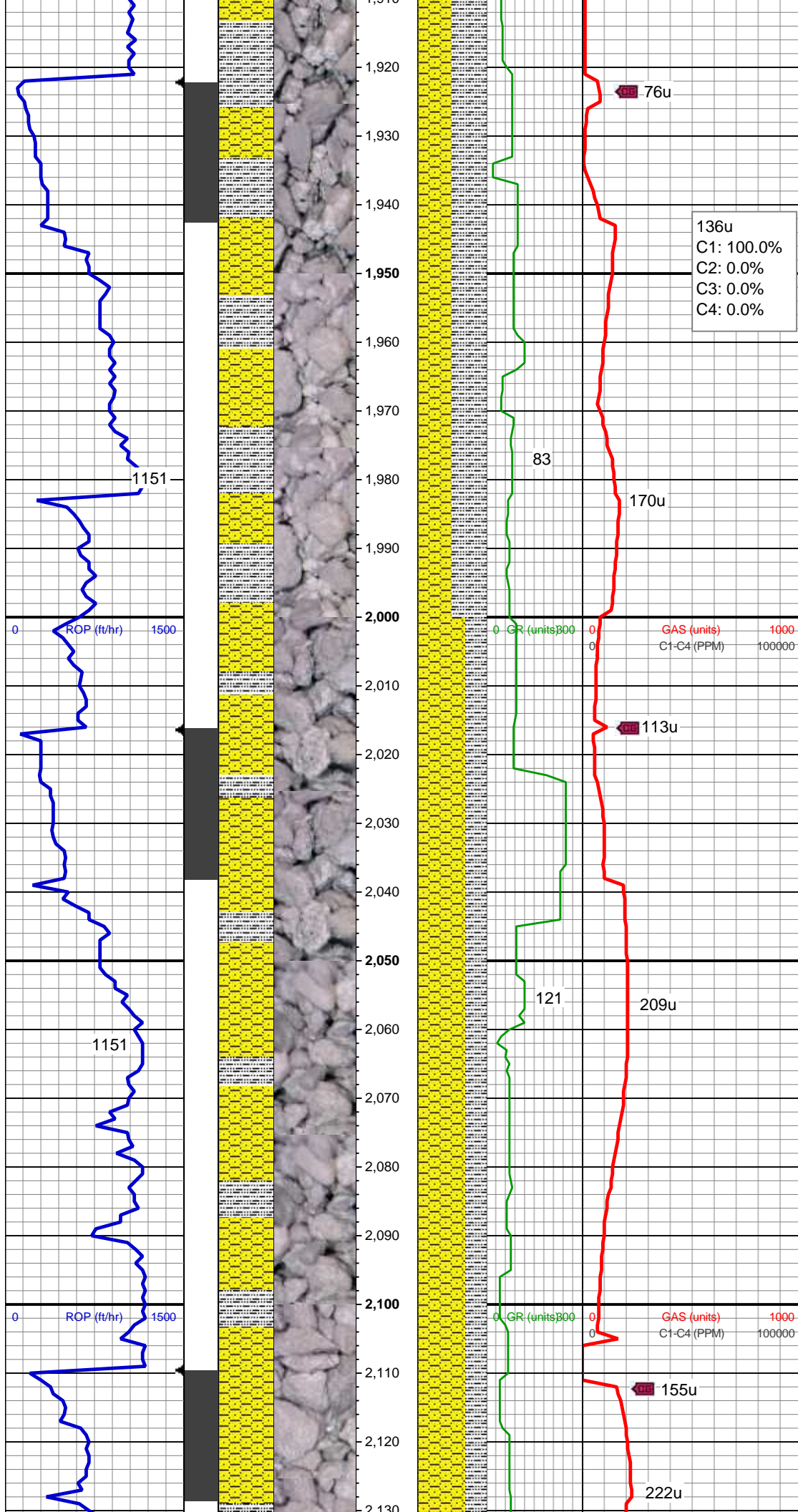


SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc SS: med - lt gy, s&P ip,
speckl wi mica & glau, f gr, hd brit clus,
ang - sb ang, calc cmt

MD: 1,770'
Inclination: 10.09 °
Azimuth: 111.75 °
TVD: 1,766.75'
VS: 52.92'

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: 1,863'
Inclination: 9.69 °
Azimuth: 104.95 °
TVD: 1,858.37'
VS: 68.42'



Mud Wt: 8.80 /27 Vis IN
9.00/27 Out

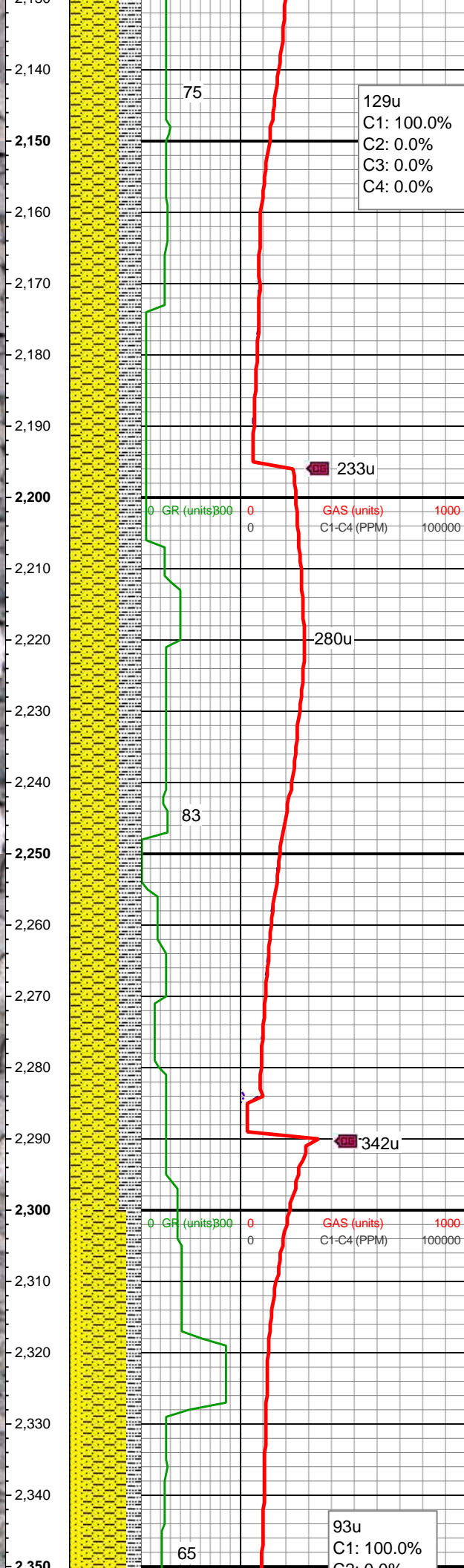
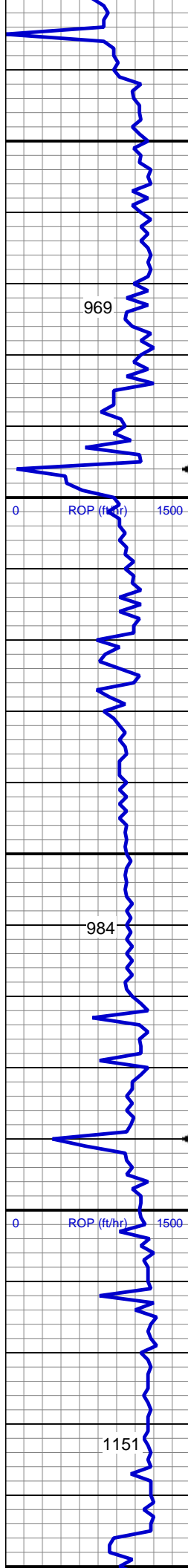
SLTY SH: lt-dk gy, sft-mod frm, sb blkly-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

MD: 1,956'
Inclination: 10.79 °
Azimuth: 106.41 °
TVD: 1,949.88'
VS: 84.66'

MD: 2,048'
Inclination: 10.36 °
Azimuth: 117.65 °
TVD: 2,040.33'
VS: 100.73'

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 blkly-sb
plty, gritty, abnt cly

Mud Wt: 8.75 /30 Vis IN
8.85/28 Out



MD: 2,141'
Inclination: 13.61 °
Azimuth: 128.09 °
TVD: 2,131.3'
VS: 117.6'

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 blkly-sb
ply, gritty, abnt cly

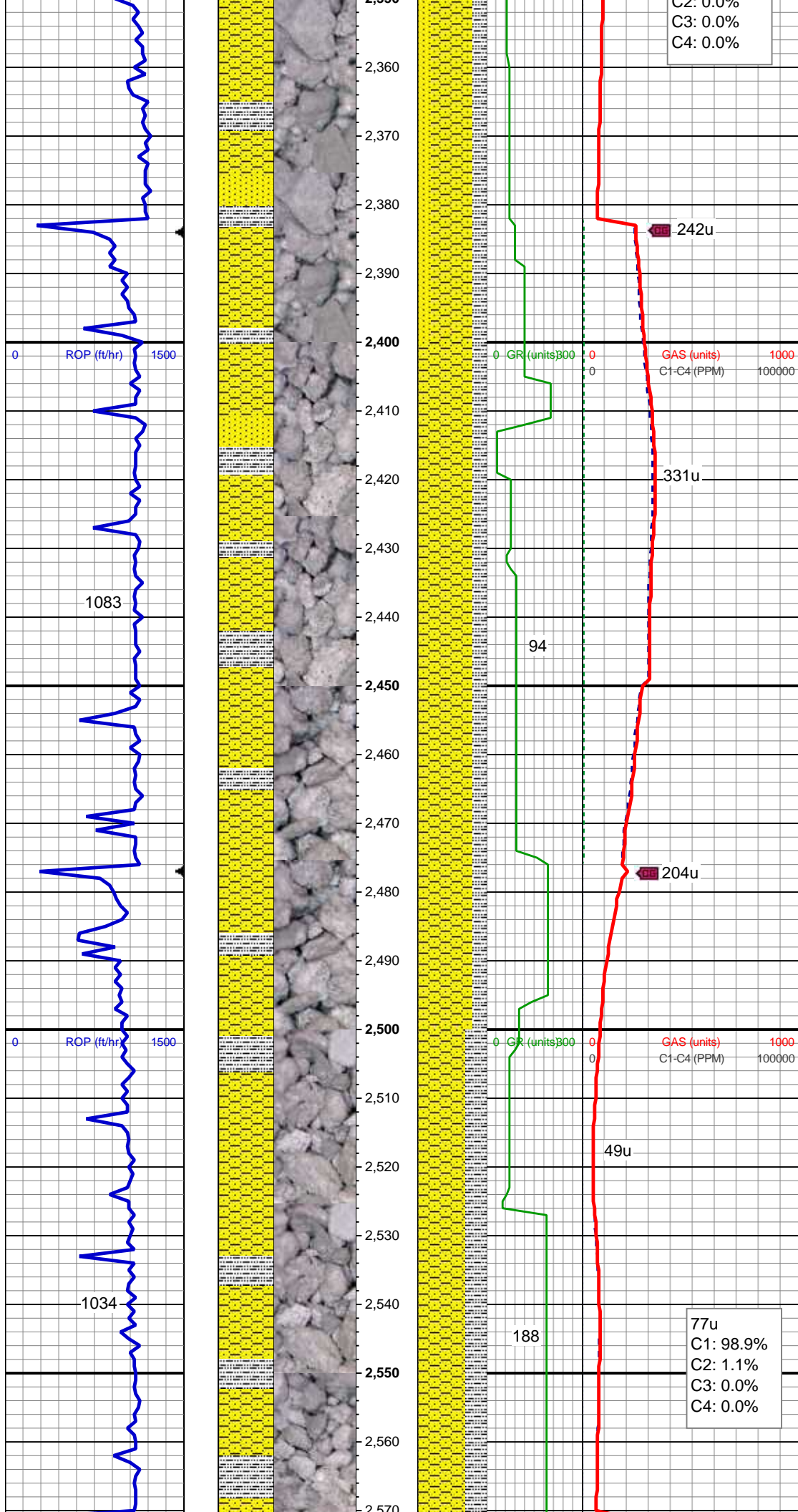
MD: 2,234'
Inclination: 13.19 °
Azimuth: 123.43 °
TVD: 2,221.77'
VS: 136.09'

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 blkly-sb
ply, gritty, abnt cly

Mud Wt: 8.75 /27 Vis IN
8.80/28 Out

MD: 2,327'
Inclination: 12.78 °
Azimuth: 121.7 °
TVD: 2,312.4'
VS: 154.59'

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 blkly-sb
ply, gritty, abnt cly



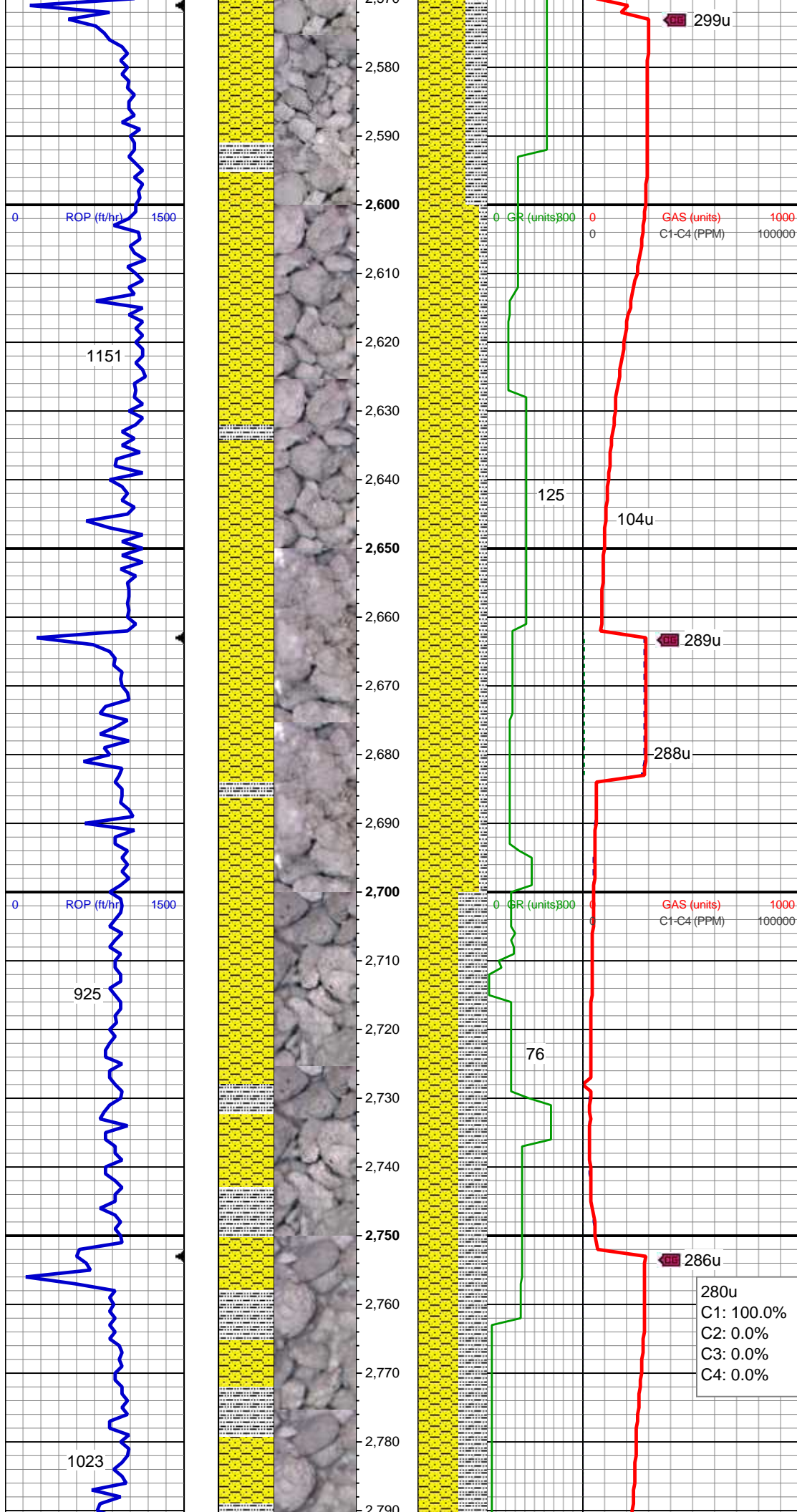
pity, gritty SS: med - lt gy, s&p ip, speckl
wi mica & glau, f gr, hd brit clus, ang - sb
ang, calc cmt

SHY SS: lt-med gy, s&p ip, 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
blky-sb plty, gritty, abnt cly

MD: 2,512'
Inclination: 12.43 °
Azimuth: 115.82 °
TVD: 2,492.94'
VS: 191.46'

SHY SS: lt-med gy, s&p ip, 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
blky-sb plty, gritty, abnt cly

Mud Wt: 8.80 /28 Vis IN
0.10/20 Cut

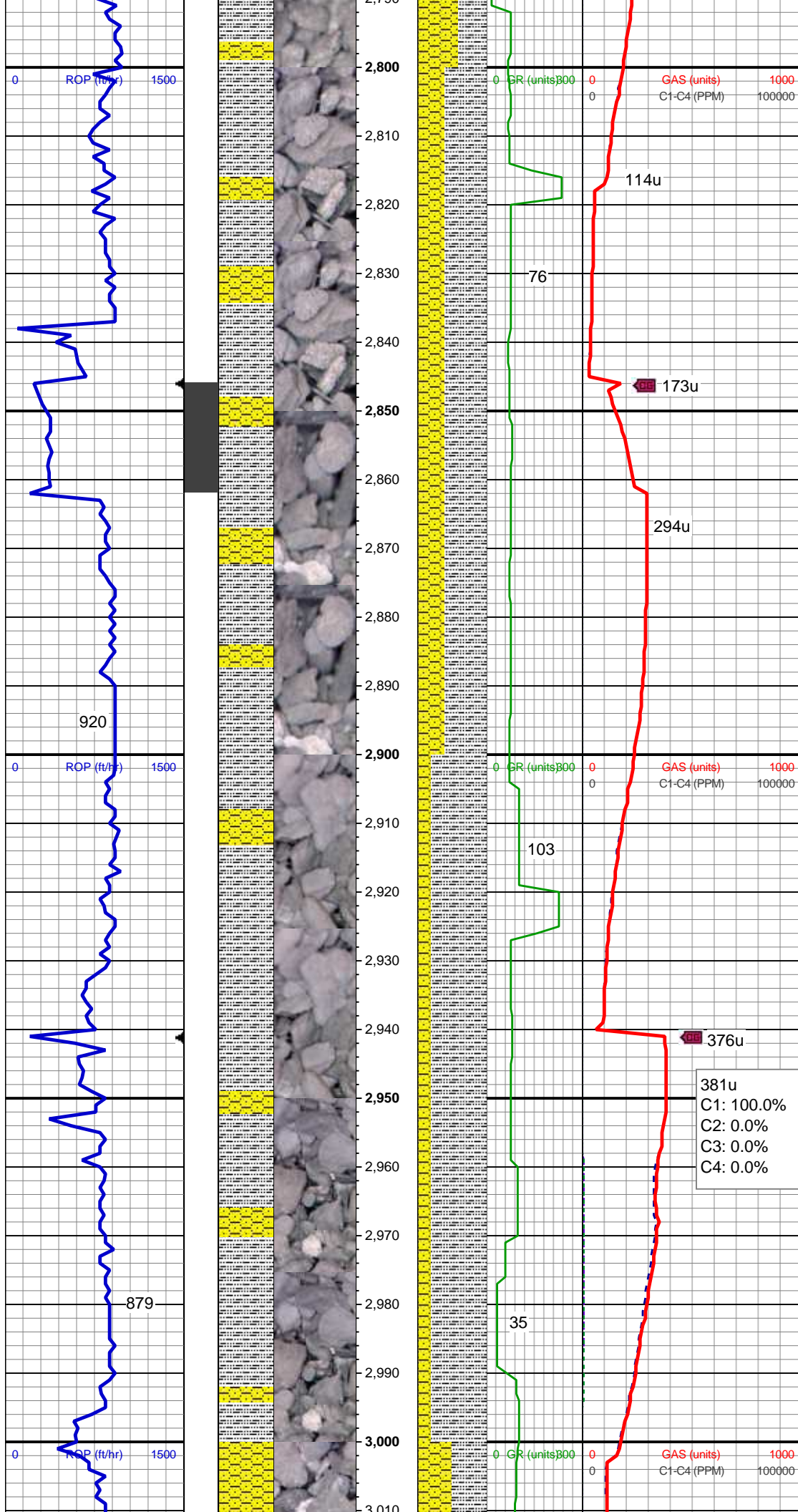


SHY SS: lt-med gy, s&p ip, sft frm, vf gr-f
gr, sb ang - sb rnd, mod w srt, arg cmt, sl
calc SLTY SH: lt-dk gy, sft-mod frm, sb
blky-sb plty, gritty, abnt cly

MD: 2,696'
Inclination: 11.64 °
Azimuth: 108.66 °
TVD: 2,672.91'
VS: 227.99'

SHY SS: lt-med gy, s&p ip, 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
blky-sb plty, gritty, abnt cly

280u
C1: 100.0%
C2: 0.0%
C3: 0.0%
C4: 0.0%



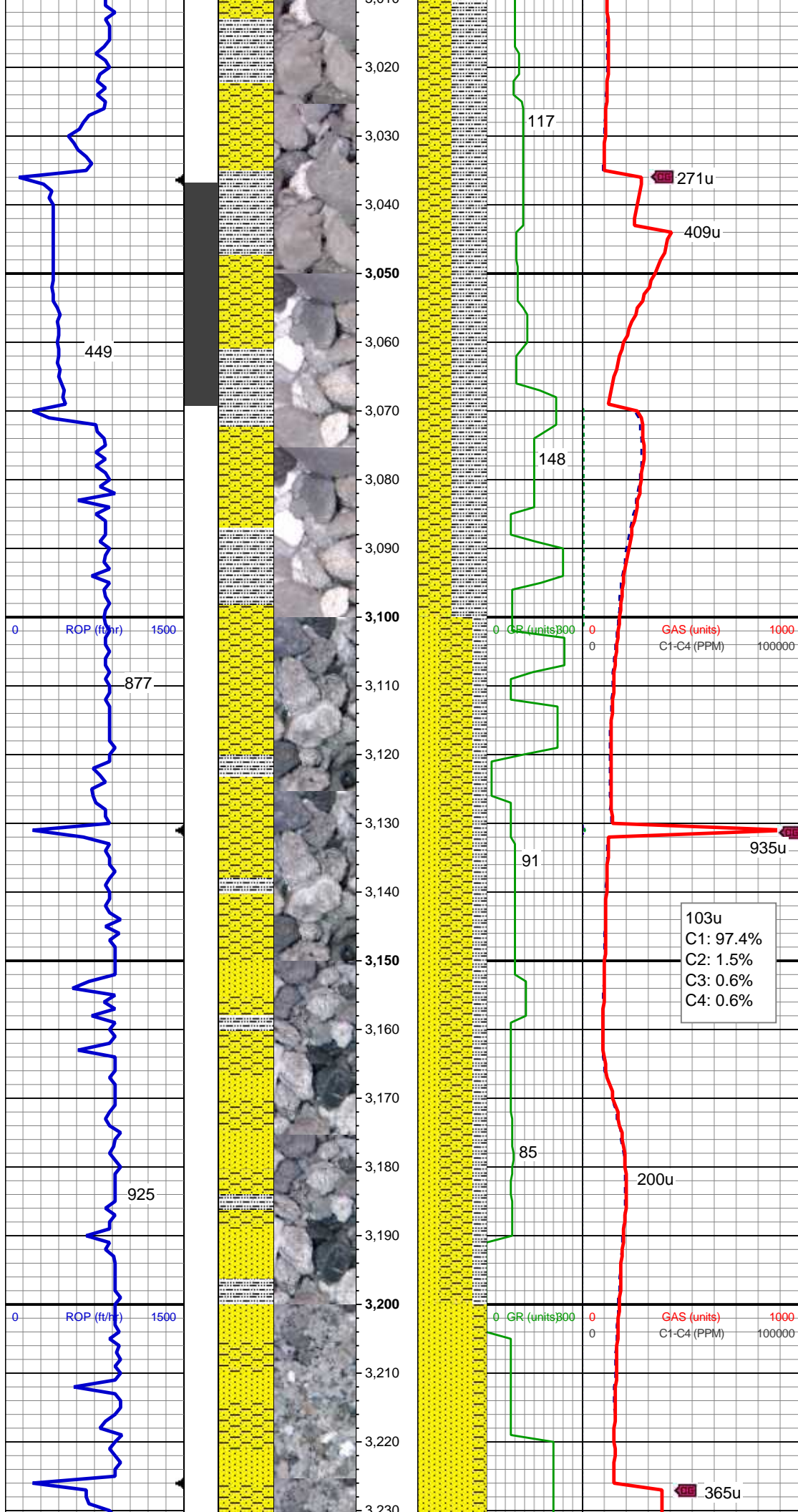
SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
ply, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

MD: 2,885'
Inclination: 10.93 °
Azimuth: 118.27 °
TVD: 2,858.27'
VS: 262.96'

Mud Wt: 8.95 /28 Vis IN
9.10/28 Out

SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-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

MD: 2,980'
Inclination: 10.42 °
Azimuth: 119.18 °
TVD: 2,951.63'
VS: 279.06'

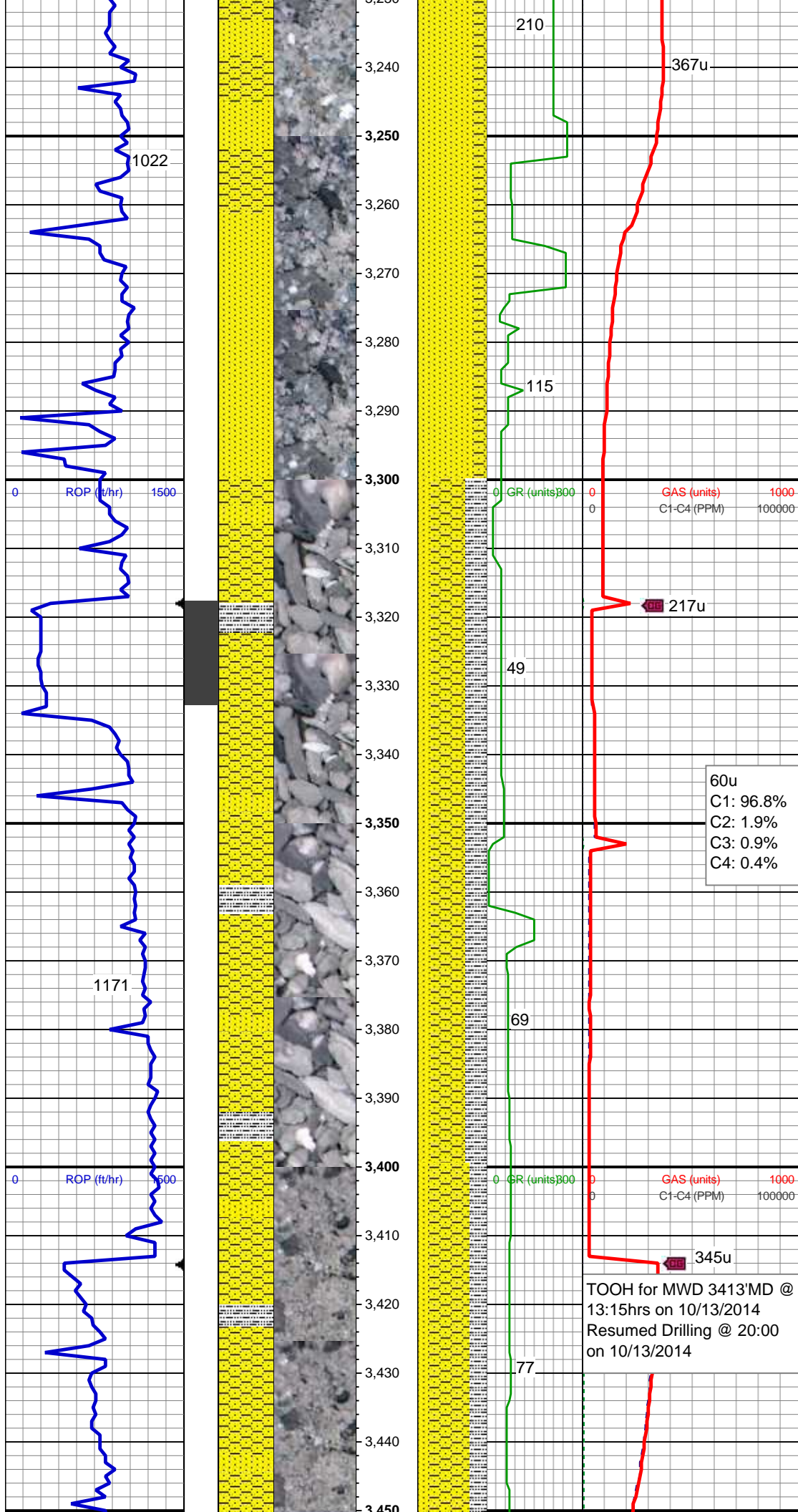


SLTY SH: lt-dk gy, sft-mod frm, sb blk-y-sb
plty, gritty SHY SS: lt-med gy, sft-frm, vf
gr-f gr, sb ang - sb rnd, mod w srt, arg
cmt, sl calc, abnt cly

MD: 3,074'
Inclination: 12.43 °
Azimuth: 116.6 °
TVD: 3,043.76'
VS: 296.21'

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: 3,168'
Inclination: 12.8 °
Azimuth: 114.93 °
TVD: 3,135.49'
VS: 315.4'



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

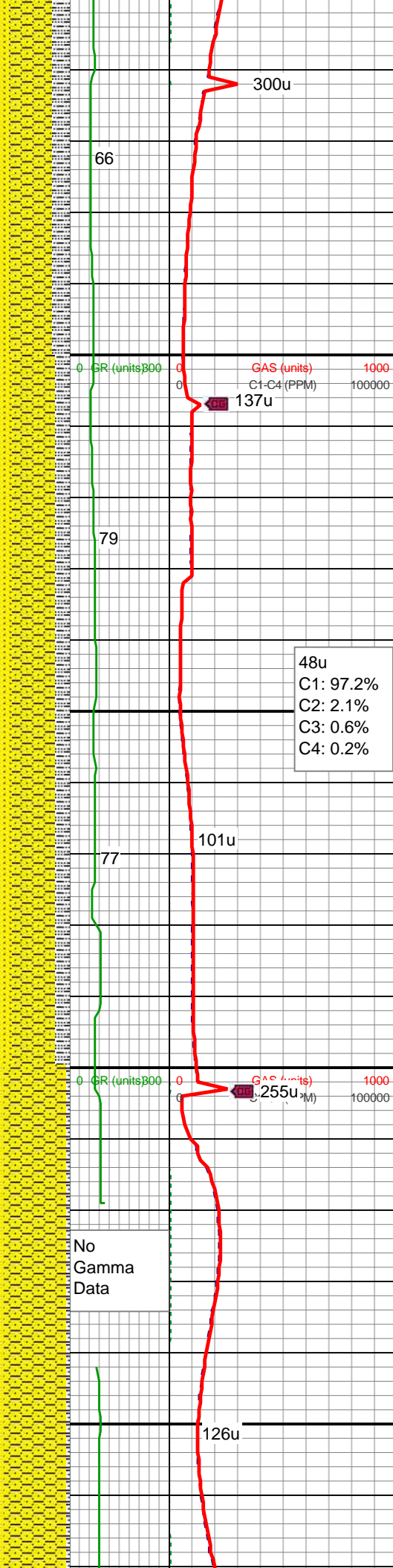
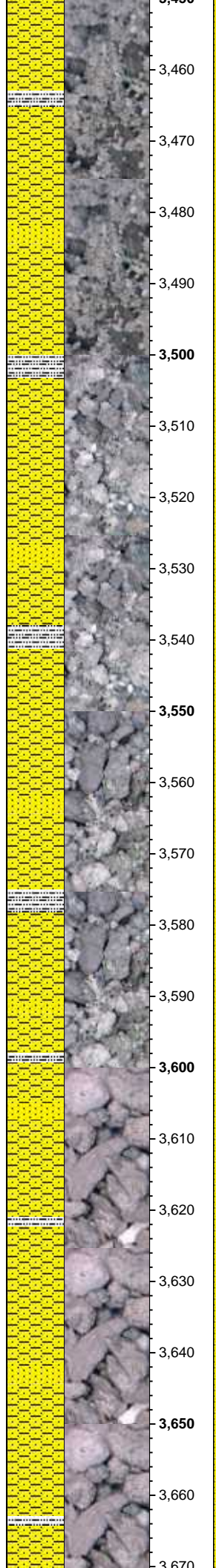
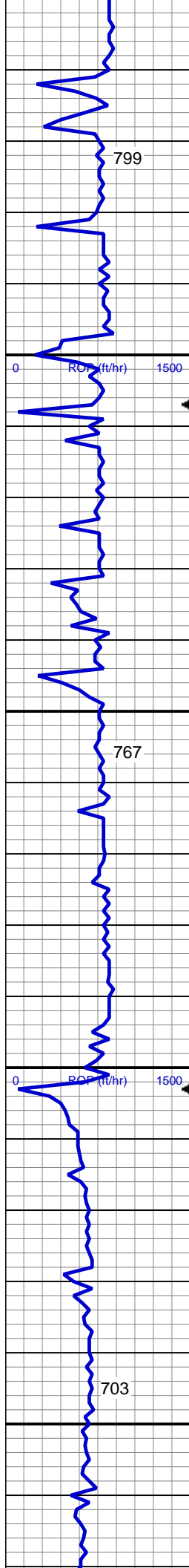
MD: 3,263'
Inclination: 12.6 °
Azimuth: 112.13 °
TVD: 3,228.17'
VS: 335.18'

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 blkly-sb plty, gritty

MD: 3,357'
Inclination: 11.62 °
Azimuth: 119.67 °
TVD: 3,320.08'
VS: 353.57'

Mud Wt: 8.70 /27 Vis IN
8.80/27 Out

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
blky-sb plty, gritty

MD: 3,452'
Inclination: 12.04 °
Azimuth: 118.7 °
TVD: 3,413.06'
VS: 371.33'

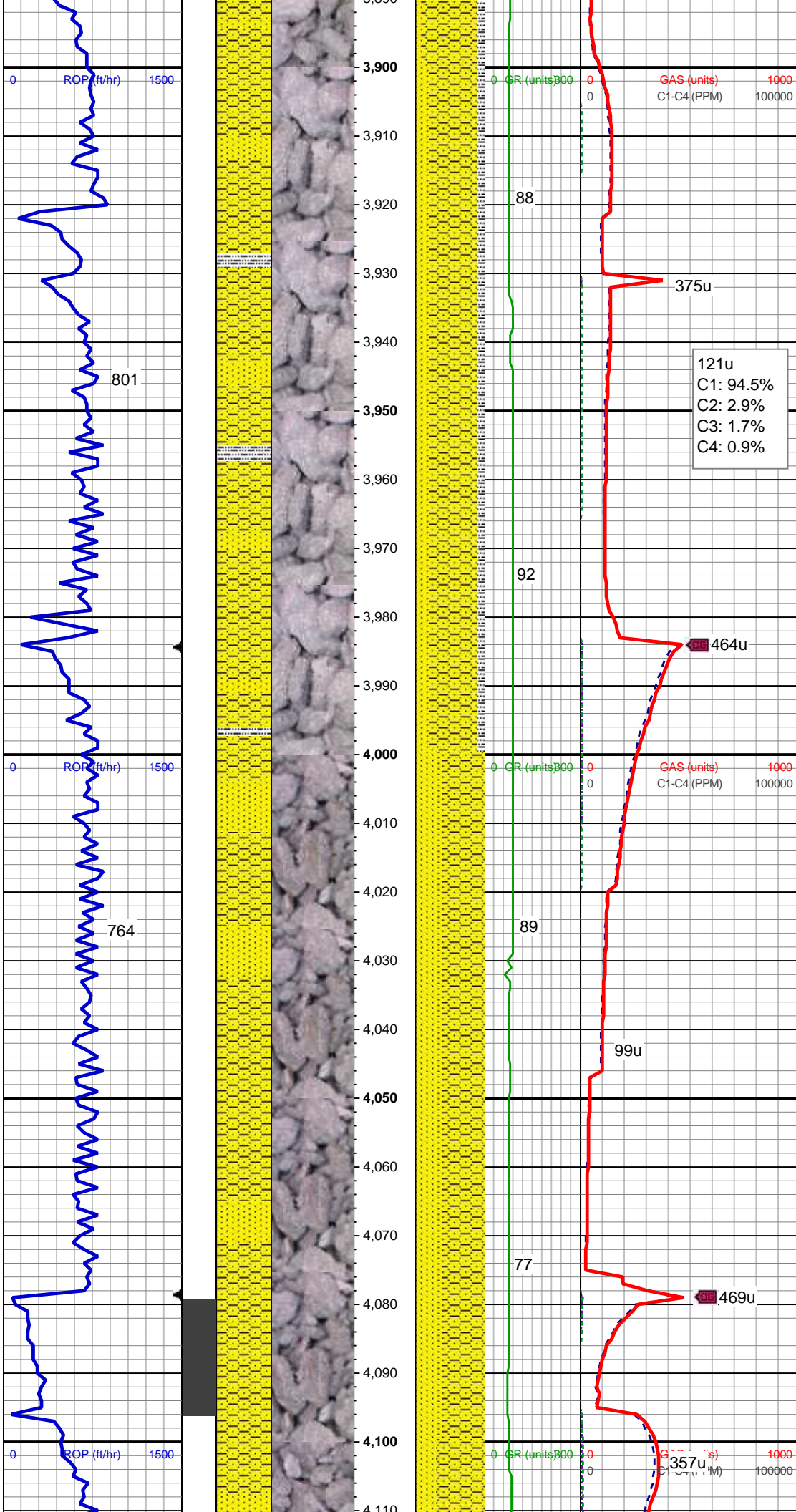
MD: 3,546'
Inclination: 12.16 °
Azimuth: 117.14 °
TVD: 3,504.97'
VS: 389.46'

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
blky-sb plty, gritty

Mud Wt: 8.90 /29 Vis IN
9.00/28 Out

MD: 3,641'
Inclination: 12.08 °
Azimuth: 114.76 °
TVD: 3,597.86'
VS: 408.08'

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
blky-sb plty, gritty



MD: 3,925'
Inclination: 9.07 °
Azimuth: 123.71 °
TVD: 3,877.15'
VS: 454.6'

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 blkly-sb plty, gritty

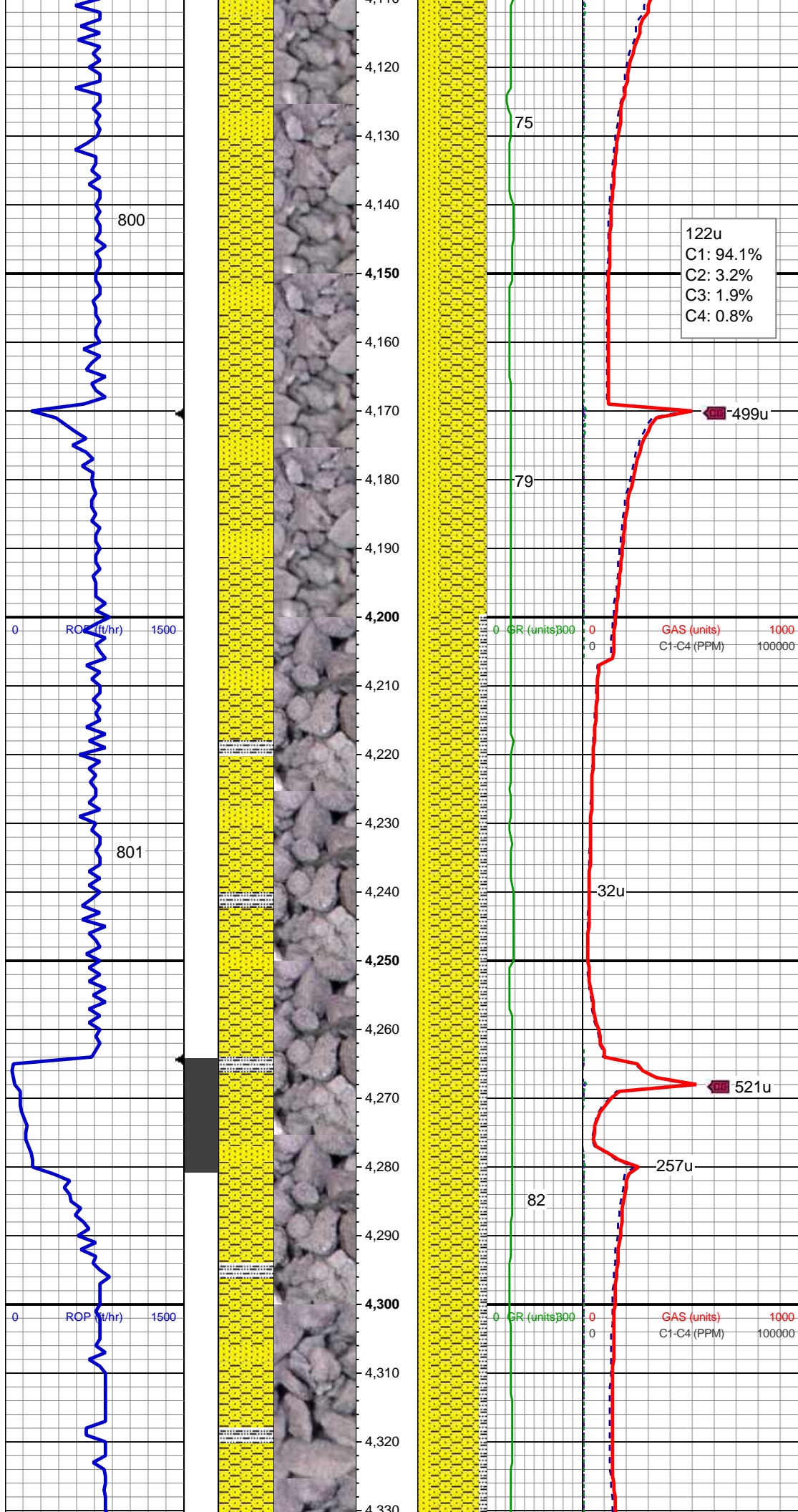
Mud Wt: 8.90 /30 Vis IN
9.00/30 Out

MD: 4,019'
Inclination: 8.56 °
Azimuth: 120.36 °
TVD: 3,970.04'
VS: 467.41'

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

Mud Wt: 9.80 /29 Vis IN
9.00/27 Out

MD: 4,114'



Inclination: 11.51 °
Azimuth: 123.57 °
TVD: 4,063.58'
VS: 482.11'

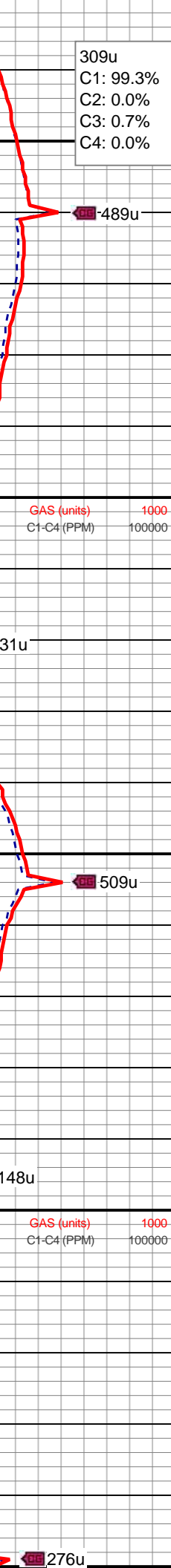
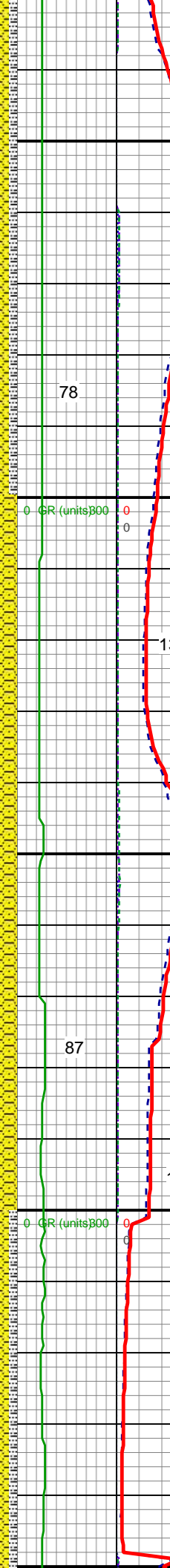
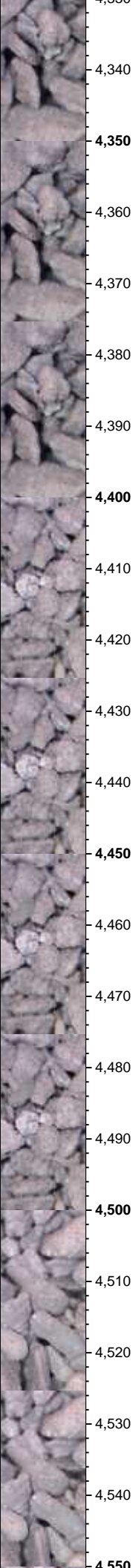
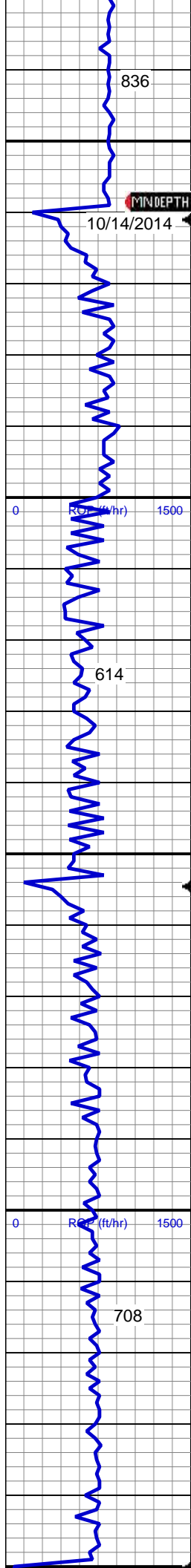
SHY SS: lt-med gy, sft-frm, vf gr-f gr, sb ang - sb rnd, mod w srt, arg cmt, sl calc
SS: med - lt gy, s&p ip, speckl wi mica & glau, f gr, hd brit clus, ang - sb ang, calc cmt

MD: 4,208'
Inclination: 11.22 °
Azimuth: 118.31 °
TVD: 4,155.74'
VS: 498.73'

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 blkly-sb plty, gritty

Mud Wt: 8.90 /28 Vis IN
9.00/27 Out

MD: 4,302'
Inclination: 12.58 °
Azimuth: 117.19 °
TVD: 4,247.71'
VS: 516.6'



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

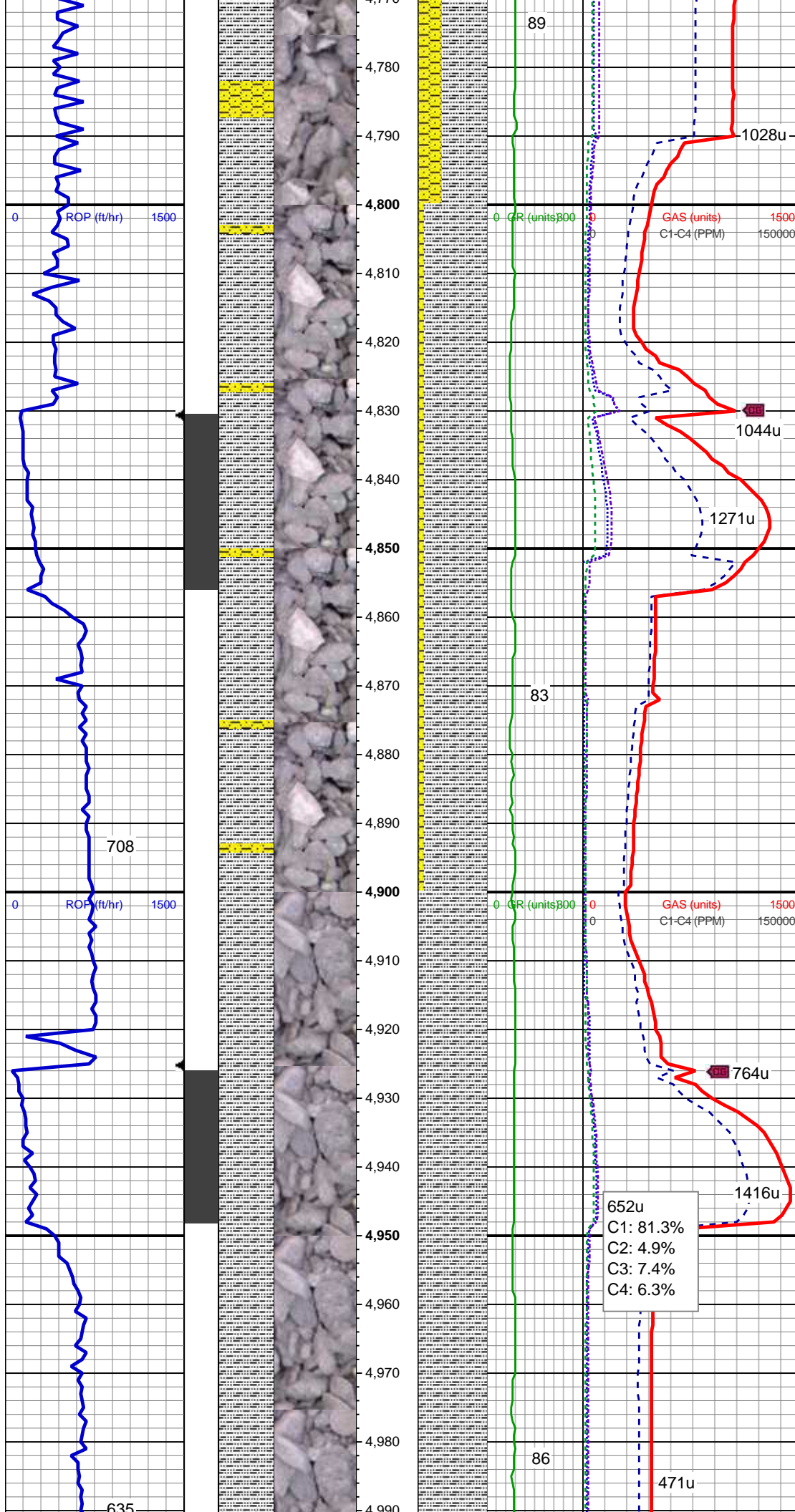
MD: 4,396'
Inclination: 11.56 °
Azimuth: 114.37 °
TVD: 4,339.64'
VS: 534.95'

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: 4,491'
Inclination: 11.23 °
Azimuth: 111.83 °
TVD: 4,432.76'
VS: 552.78'

Mud Wt: 9.00 /28 Vis IN
9.50/27 Out

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



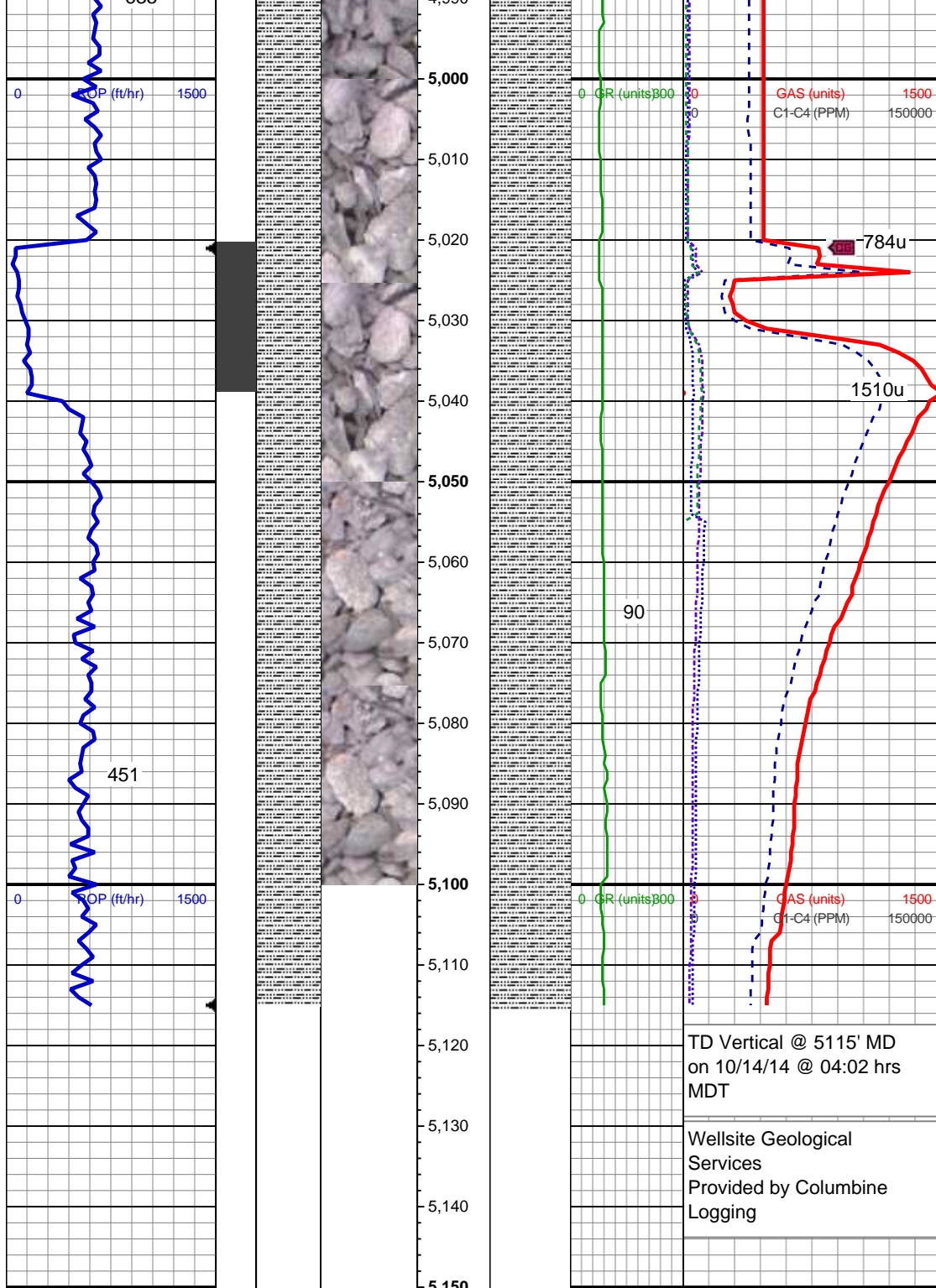
MD: 4,775'
Inclination: 9.61 °
Azimuth: 115.68 °
TVD: 4,711.23'
VS: 604.34'

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: 4,869'
Inclination: 10.44 °
Azimuth: 131.59 °
TVD: 4,803.82'
VS: 618.51'

SLTY SH: lt-dk gy, mod frm, sb blk-y-sb
plty, gritty, rthy, silky, occ string of ss

MD: 4,964'
Inclination: 13.01 °
Azimuth: 136.53 °
TVD: 4,896.83'
VS: 633.41'



SLTY SH: lt-dk gy, mod frm, sb blkly-sb
ply, gritty, rthy, slky, occ string of ss

Mud Wt: 10.20 /36 Vis IN
10.40/34 Out

MD: 5,058'
Inclination: 12.05 °
Azimuth: 122.29 °
TVD: 4,988.61'
VS: 650.04'

See Corresponding Horizontal Log
Rohn State LD10-66-1HN(HORZ)

TD Vertical @ 5115' MD
on 10/14/14 @ 04:02 hrs
MDT

Wellsite Geological
Services
Provided by Columbine
Logging