

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Final Five Rivers K09-67-1HN(VERT)

Location SWNW, SEC9, T4N, R66W

State COLORADO

County WELD

Country USA

Rig Number H&P 330

API Number 05-123-39480

AFE # 05-123-39480

Region DJ BASIN

Field WATTENBERG

Spud Date 7/18/2014

Drilling Completed 7/20/2014

Surface Coordinates 2060' FNL, 512' FWL

Ground Elevation 4700'

K.B. Elevation 4730'

Logged Interval 700' To 6313'

Total Depth 6313'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LNSD

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 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
- CORAL

F 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

CLUTL

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

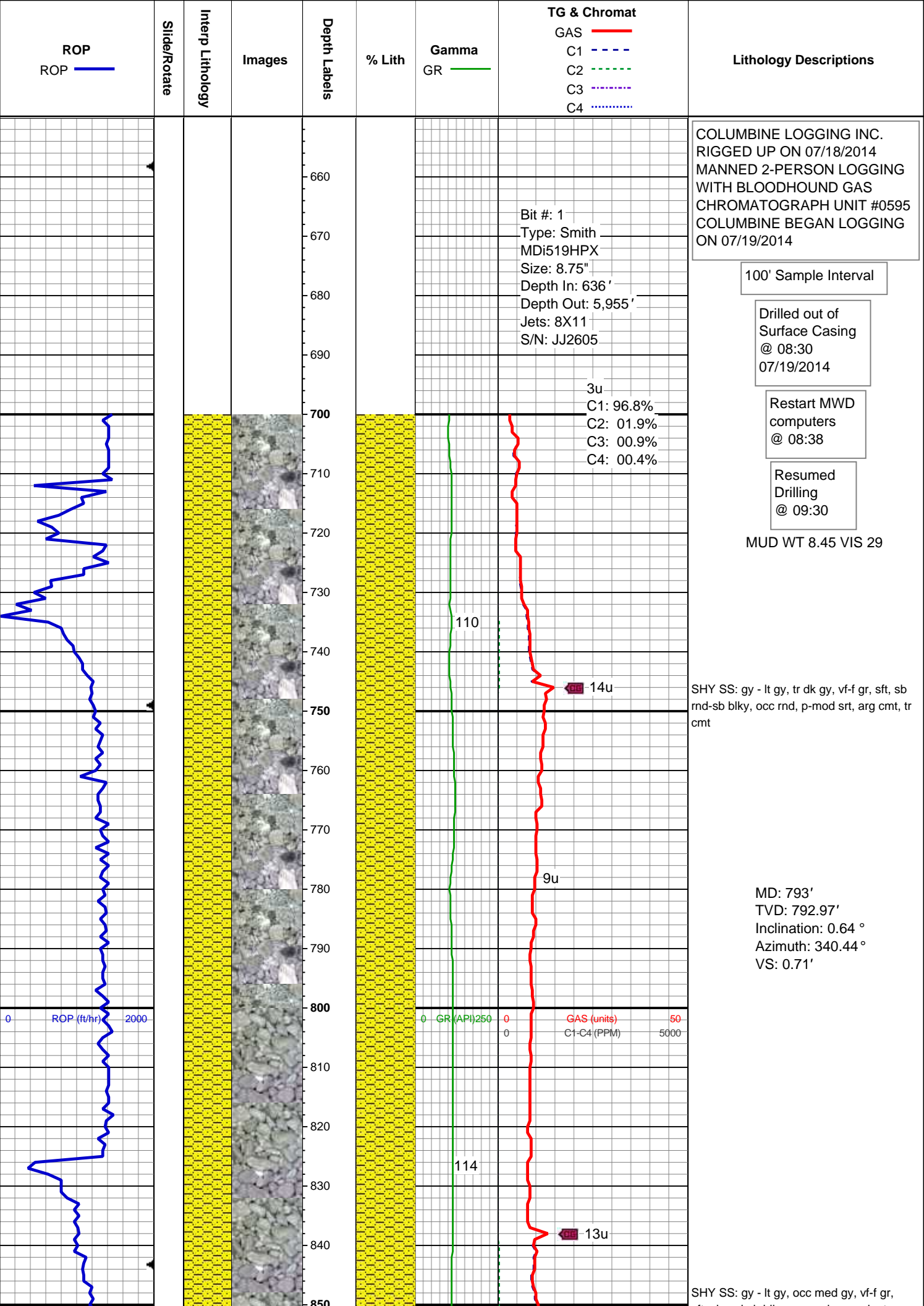
Name RENEE CLACKLER

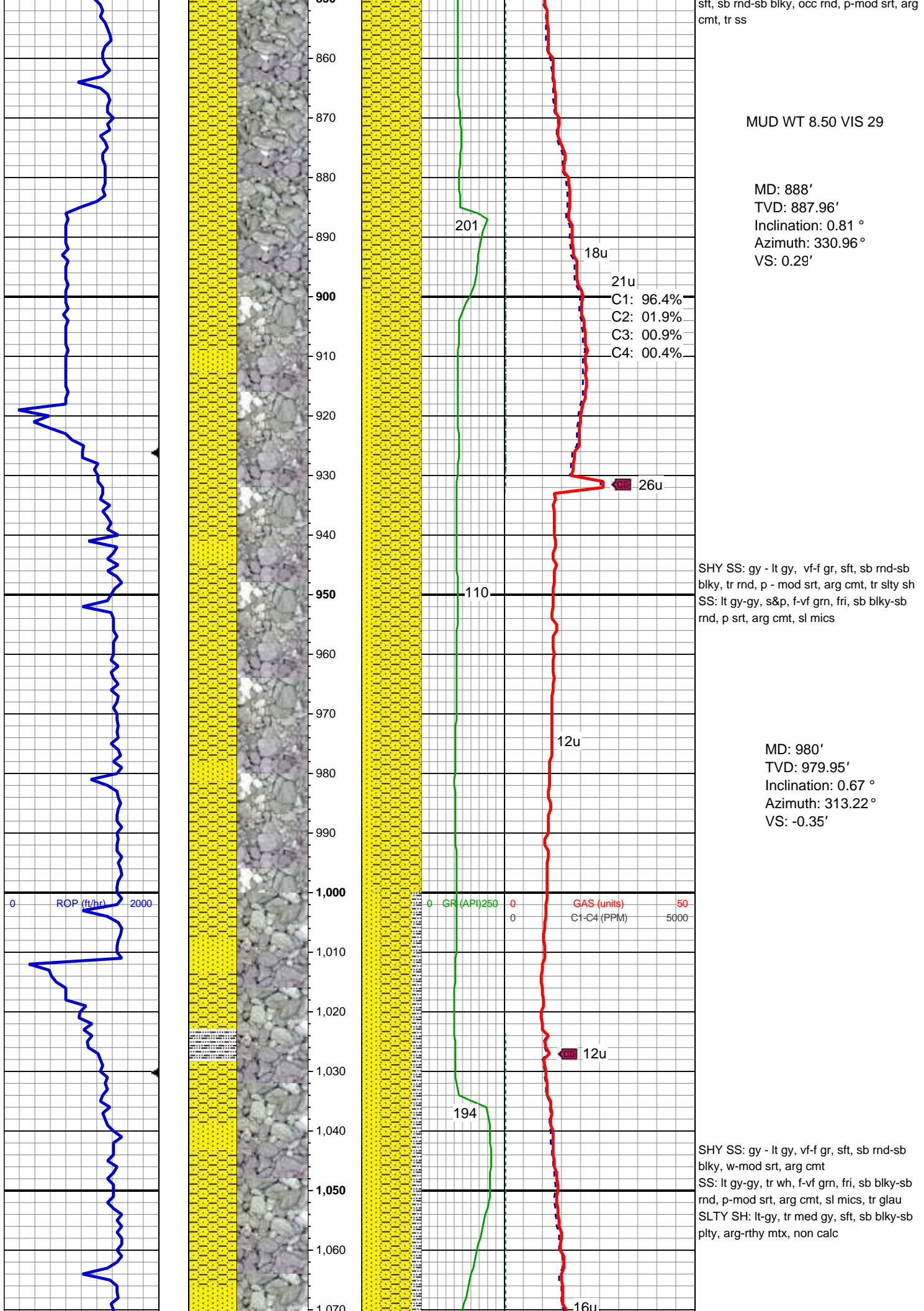
Company NOBLE ENERGY INC.

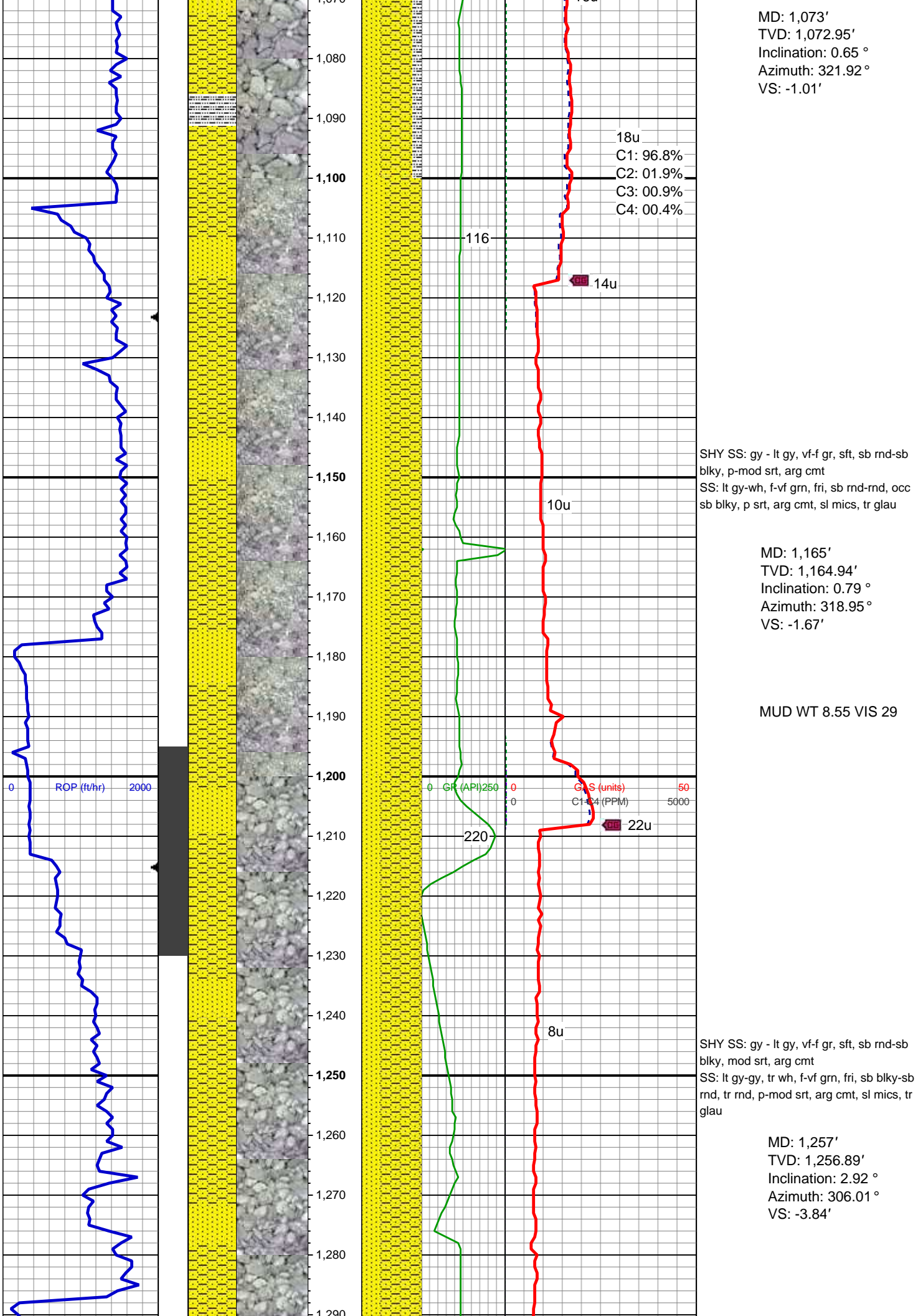
Address 1625 Broadway Suite 2200
Denver, CO 80202

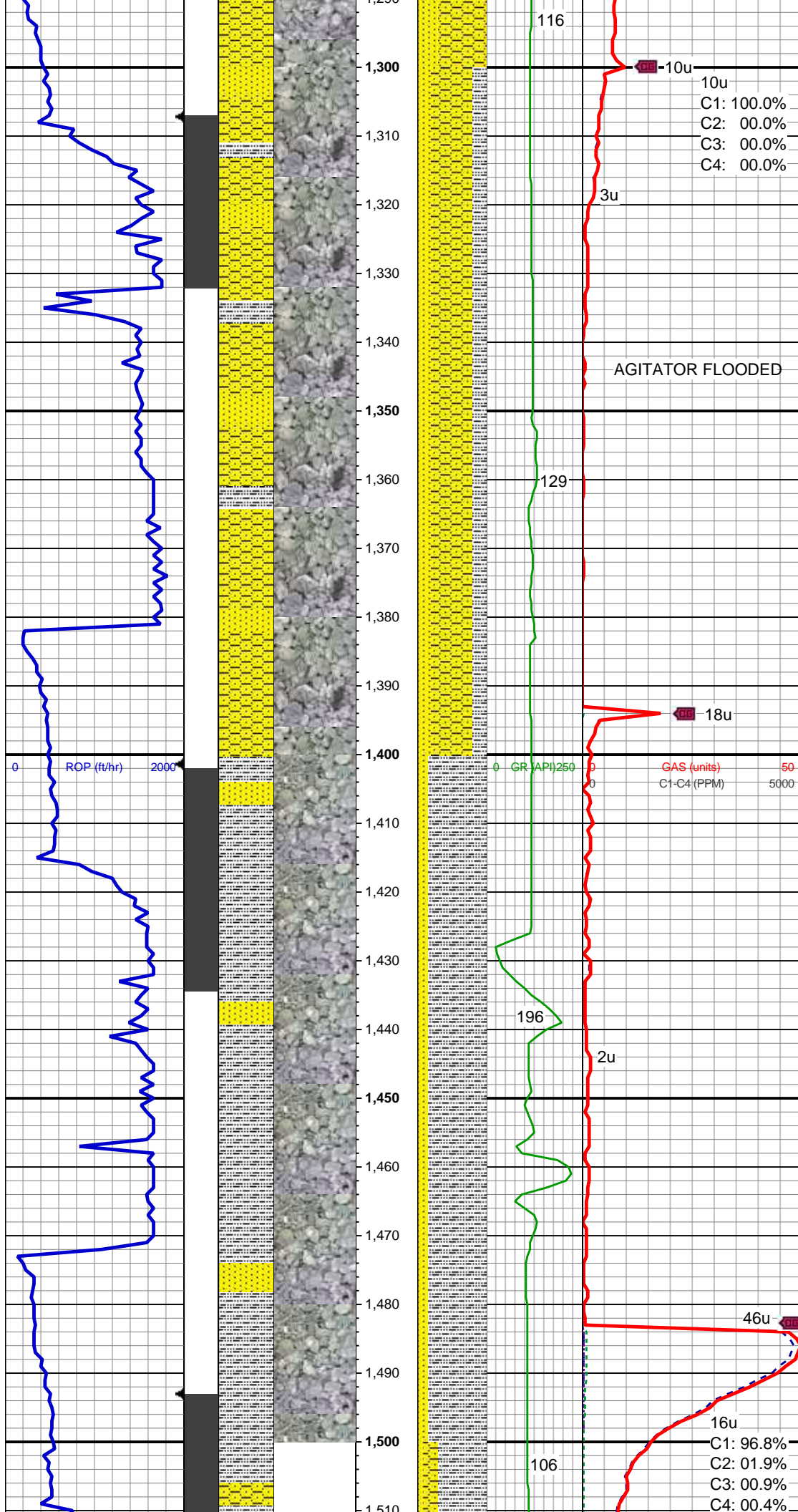
Other

WELL SITE GEOLOGIST JESSICA SIEBERG
JOHN SABROSKE









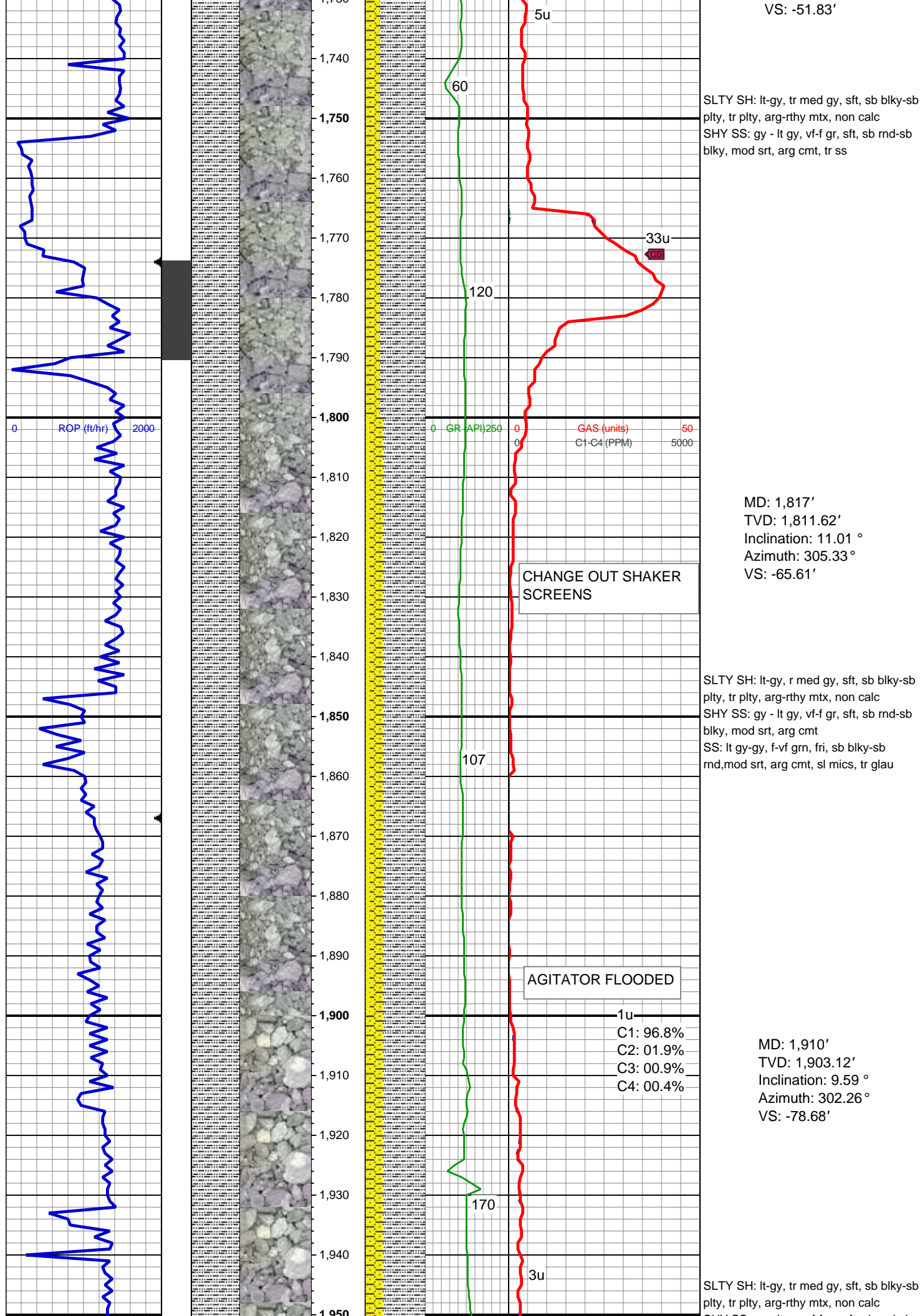
MD: 1,351'
TVD: 1,350.72'
Inclination: 3.83 °
Azimuth: 304.13 °
VS: -8.12'

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

MD: 1,443'
TVD: 1,442.41'
Inclination: 5.53 °
Azimuth: 291.66 °
VS: -14.52'

SLTY SH: lt-gy, occ med gy, tr wh, sft, sb blkly-sb plty, tr plty, arg-rthy mtz, non calc
SS: lt gy-gy, f-vf grn, fri, sb blkly-sb rnd, mod srt, arg cmt, sl mics, tr glau

MUD WT 8.60 VIS 28



VS: -51.83'

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

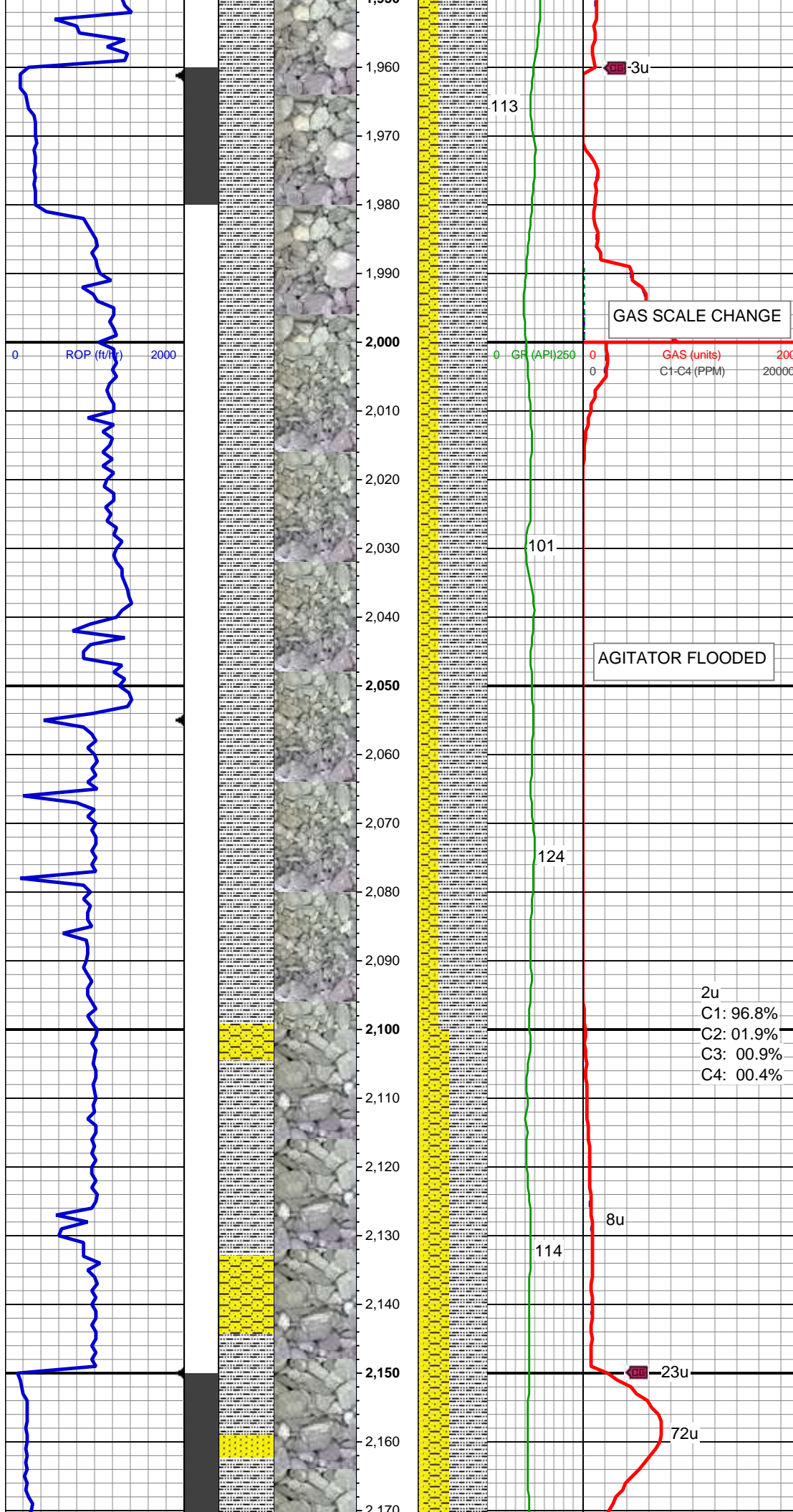
MD: 1,817'
TVD: 1,811.62'
Inclination: 11.01 °
Azimuth: 305.33 °
VS: -65.61'

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

1u
C1: 96.8%
C2: 01.9%
C3: 00.9%
C4: 00.4%

MD: 1,910'
TVD: 1,903.12'
Inclination: 9.59 °
Azimuth: 302.26 °
VS: -78.68'

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



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

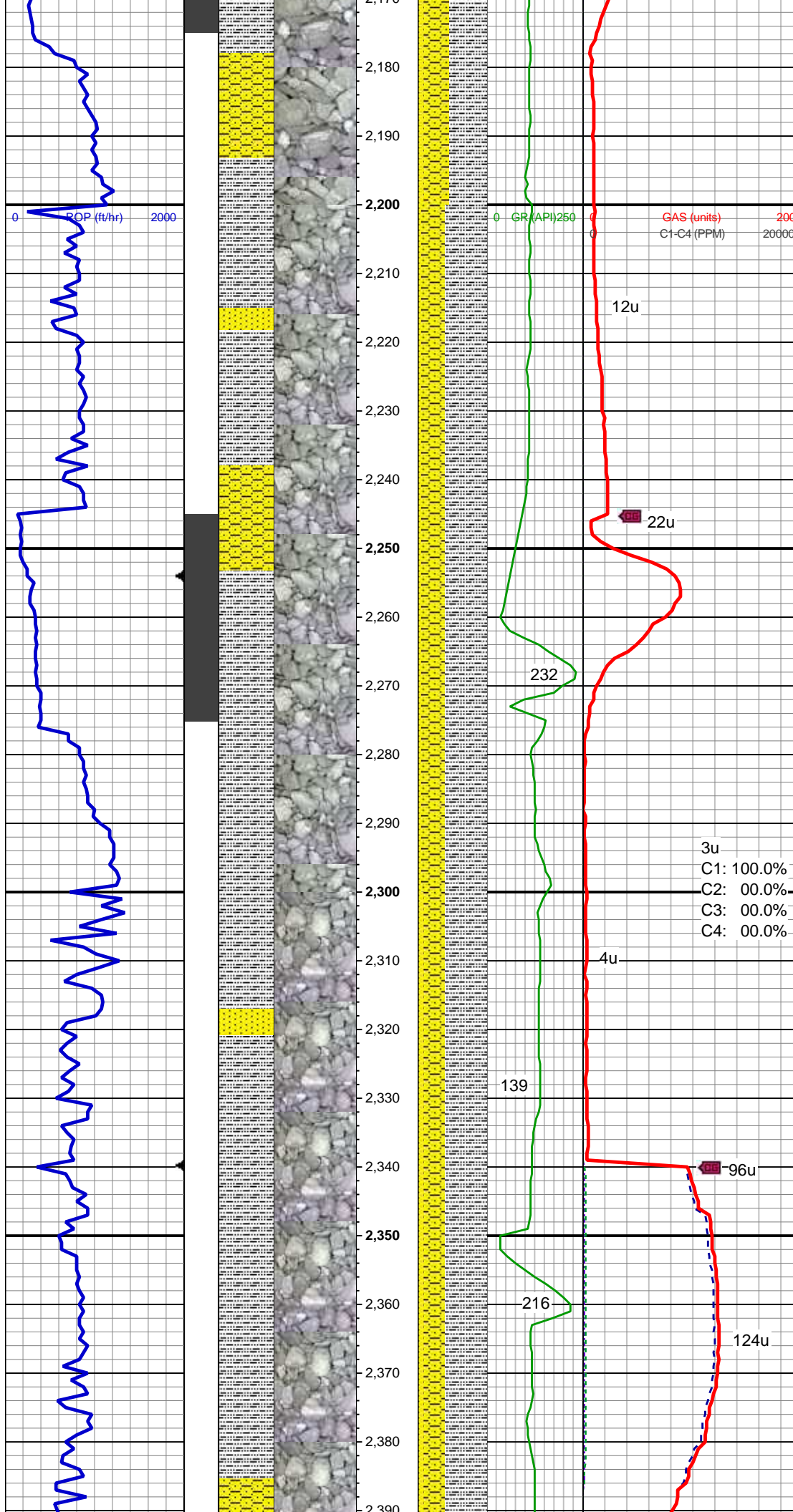
MD: 2,005'
TVD: 1,996.75'
Inclination: 9.91 °
Azimuth: 309.67 °
VS: -90.93'

SLTY SH: lt-gy, tr med gy, sft, sb blky-sb
ppty, occ ppty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt
SS: lt gy-gy, tr wh, f-vf grn, fri, sb blky-sb
rnd, mod srt, arg cmt, sl mics, tr glau

MD: 2,100'
TVD: 2,090.43'
Inclination: 9.22 °
Azimuth: 308.96 °
VS: -102.36'

SLTY SH: lt-gy, tr med gy, sft, sb blky-sb
ppty, occ ppty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt
SS: lt gy-gy, tr wh, f-vf grn, fri, sb blky-sb
rnd, mod srt, arg cmt, sl mics

MUD WT 8.70 VIS 28



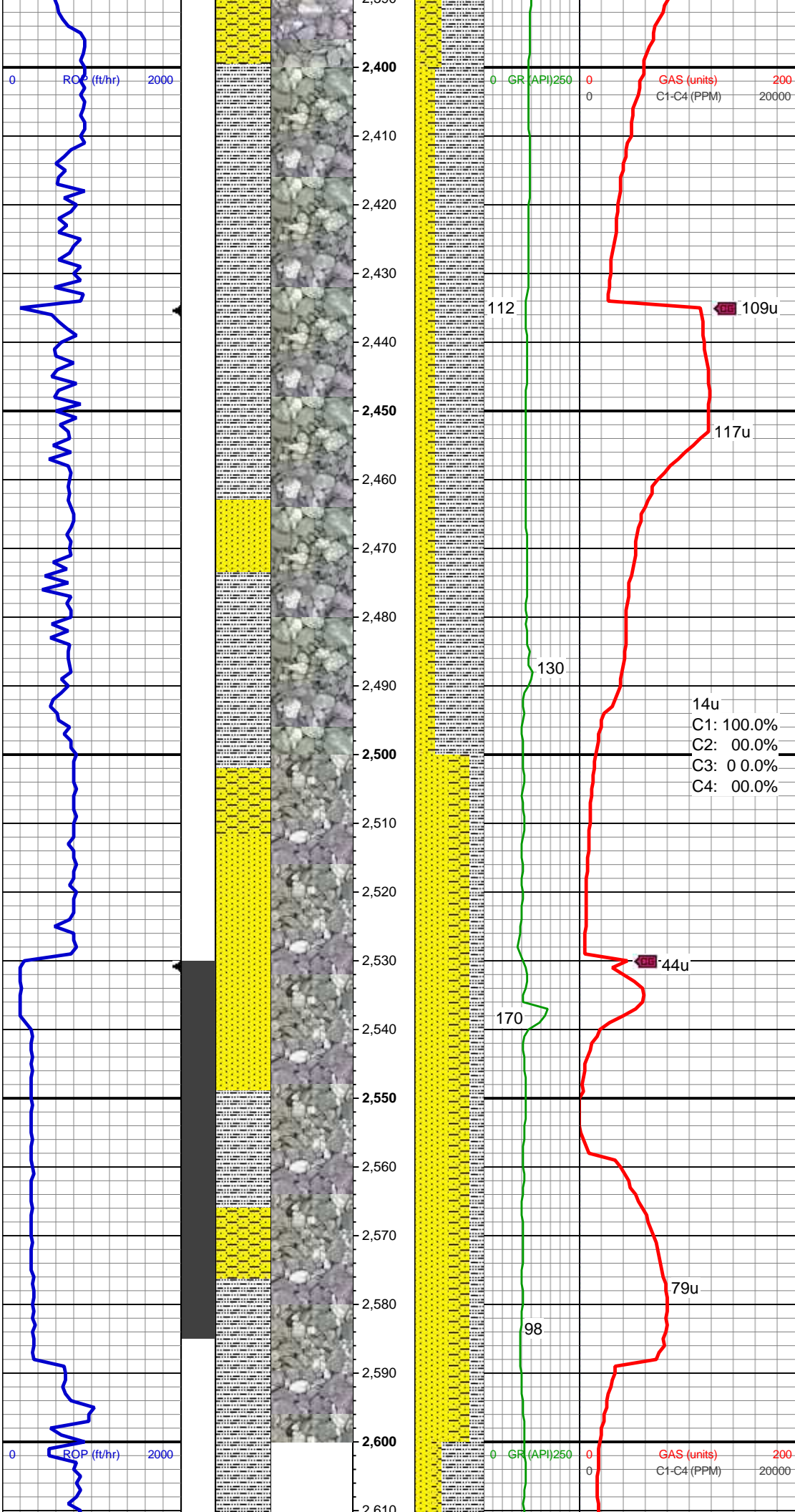
MD: 2,195'
TVD: 2,184.13'
Inclination: 9.78 °
Azimuth: 306.55 °
VS: -114.02'

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

MD: 2,290'
TVD: 2,277.61'
Inclination: 10.72 °
Azimuth: 311.06 °
VS: -126.33'

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

MD: 2,385'
TVD: 2,371.07'
Inclination: 9.91 °
Azimuth: 311.24 °
VS: -122.28'



VS: -138.28'

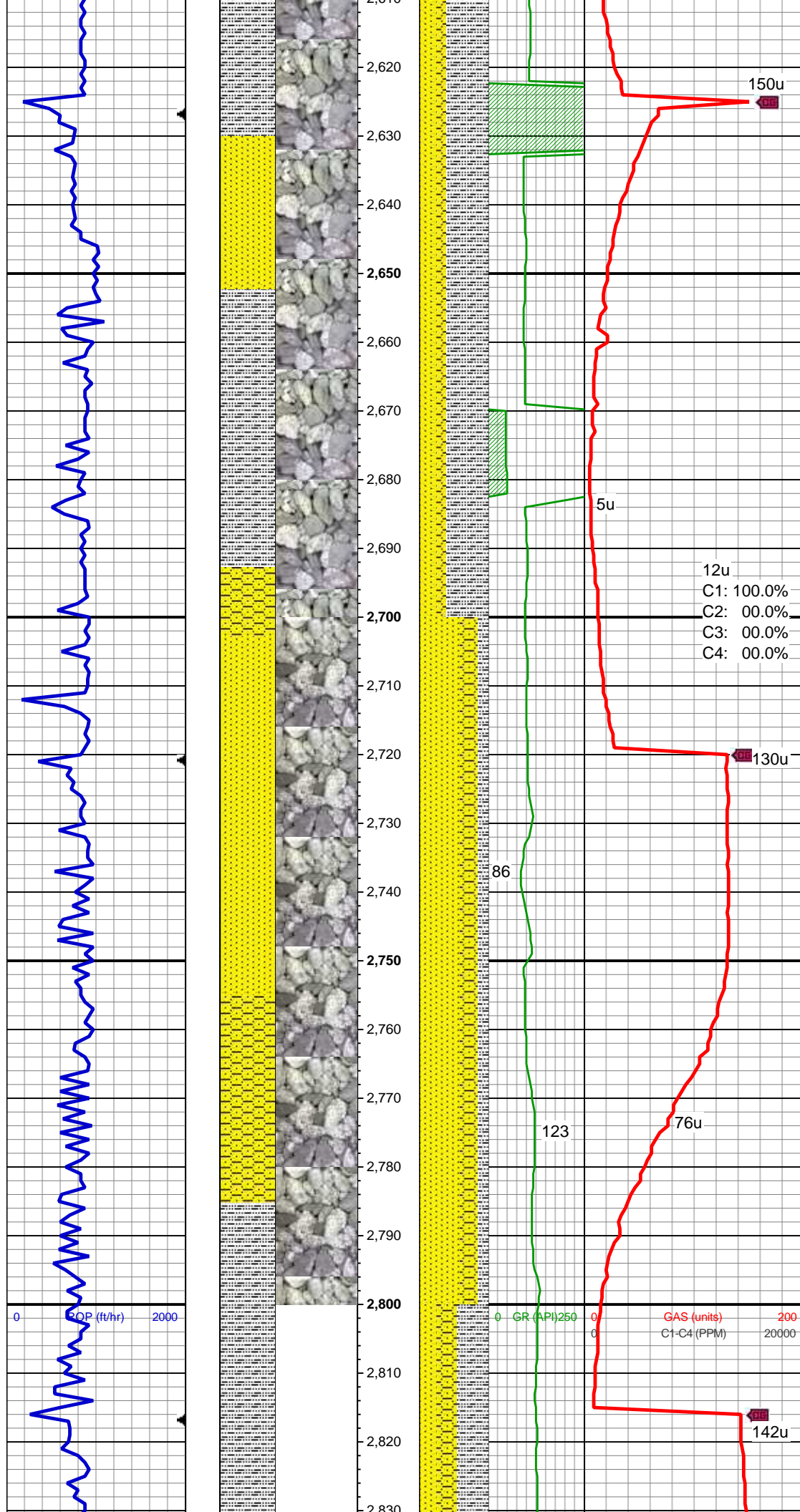
SLTY SH: lt-gy, tr med gy, sft, sb blk-y-sb
ppty, occ ppty, arg-rthy mtx, non calc
SS: lt gy-gy, tr wh, f-med grn, fri, sb
blk-y-sb rnd,mod srt, arg cmt, sl mics, tr
glau
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blk-y, w-mod srt, arg cmt

MD: 2,480'
TVD: 2,464.82'
Inclination: 8.75 °
Azimuth: 308.66 °
VS: -149.3 '

MUD WT 8.75 VIS 27

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

MD: 2,576'
TVD: 2,559.34'
Inclination: 11.33 °
Azimuth: 311.22 °
VS: -161.25'



MUD WT 8.75 VIS 27

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

MD: 2,671'
TVD: 2,652.37'
Inclination: 12.02 °
Azimuth: 309.85 °
VS: -174.9 '

12u
C1: 100.0%
C2: 00.0%
C3: 00.0%
C4: 00.0%

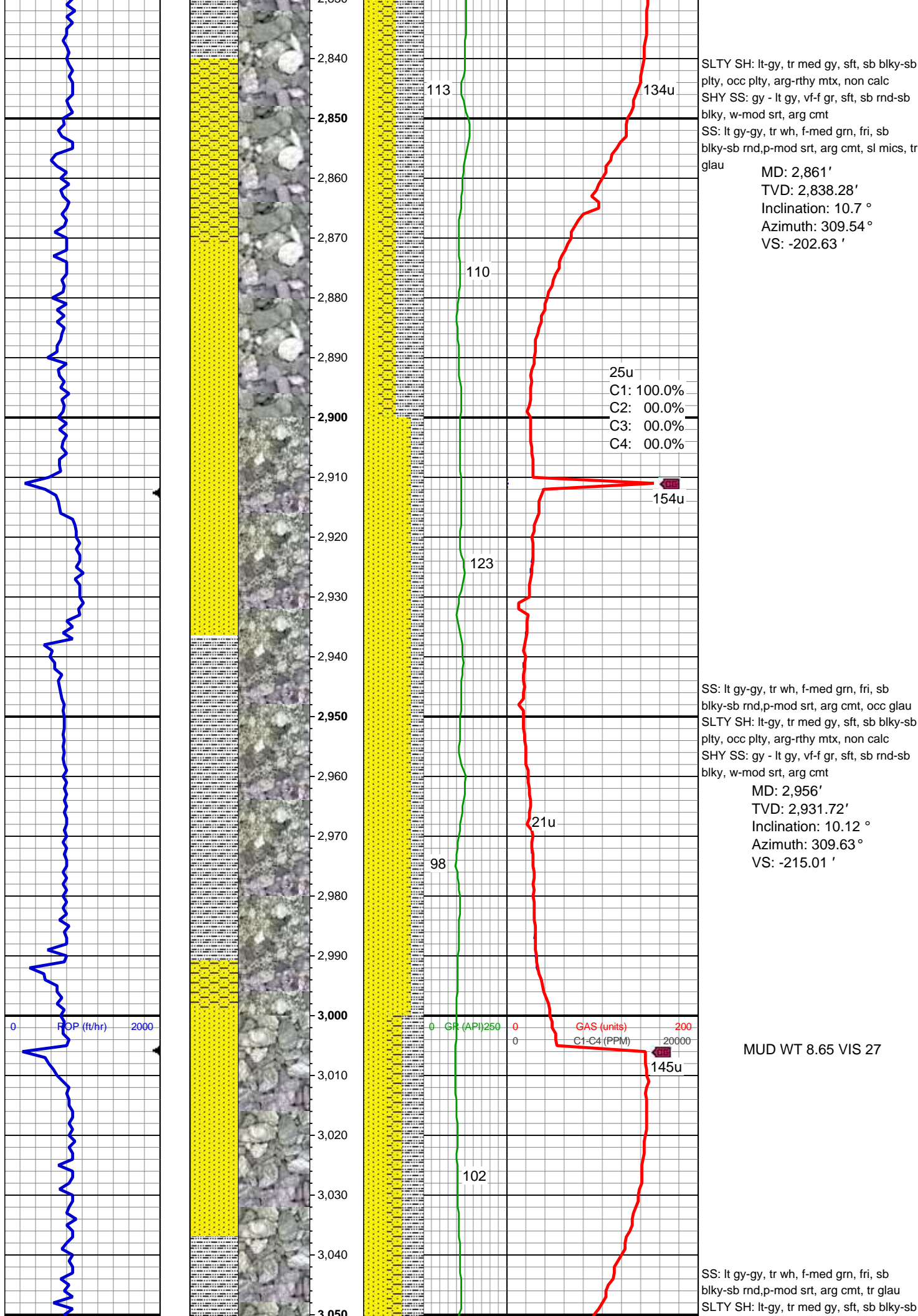
SS: lt gy-gy, tr wh, f-med grn, fri, sb
blk-y-sb rnd,p-mod srt, arg cmt, sl mics, tr
glau, sl uncon
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blk-y, w-mod srt, arg cmt
SLTY SH: lt-gy, tr med gy, S&p, sft, sb
blk-y-sb plty, occ plty, arg-rthy mtx, non
calc

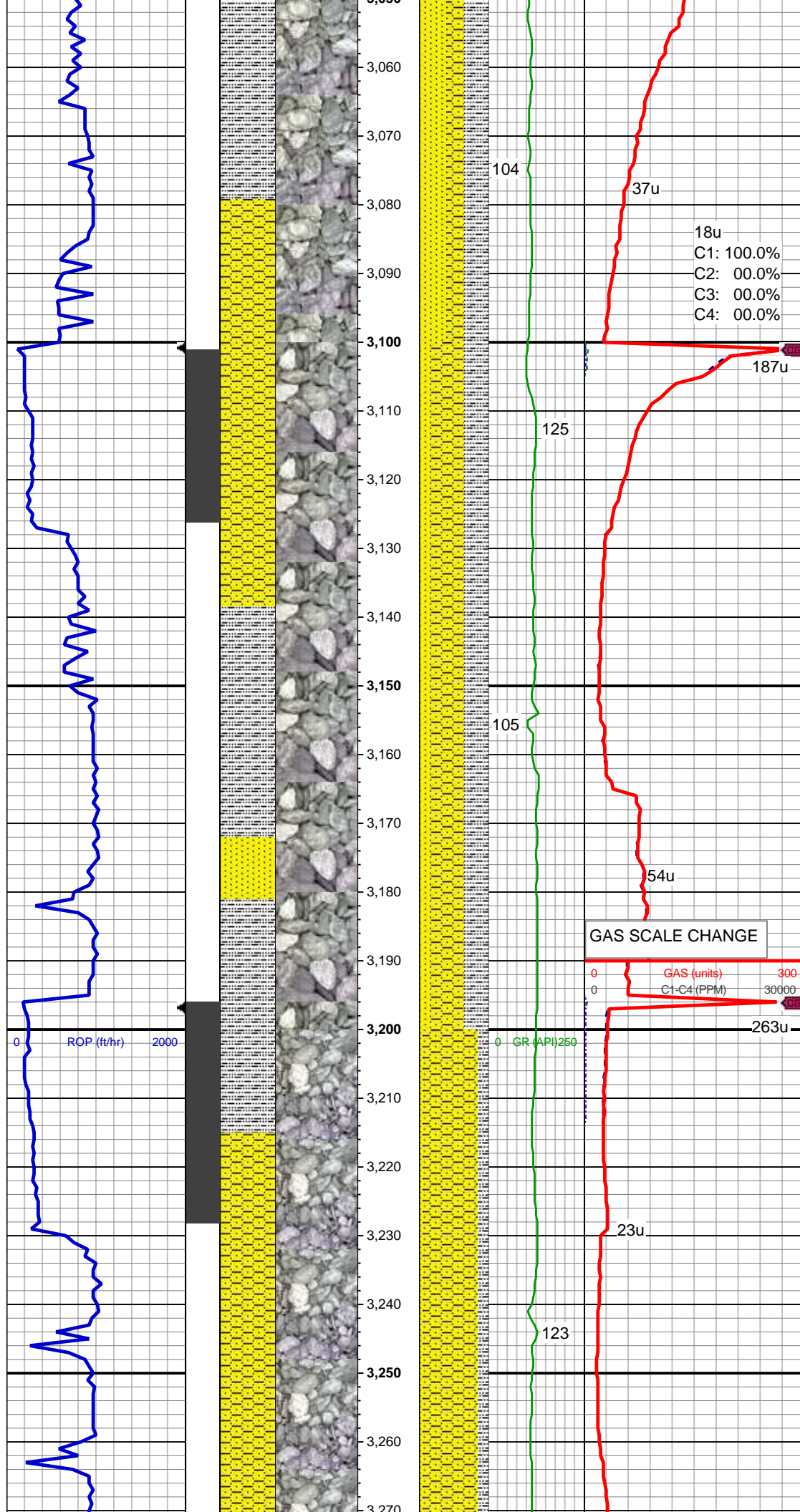
MD: 2,766'
TVD: 2,745.22'
Inclination: 12.44 °
Azimuth: 311.54 °
VS: -189.13 '

0 OP (ft/hr) 2000

0 GR (API) 250

GAS (units) 200
C1-C4 (PPM) 20000





plty, occ plty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

MD: 3,051'
TVD: 3,025.36'
Inclination: 9.28 °
Azimuth: 309.19 °
VS: -226.58 '

18u
C1: 100.0%
C2: 00.0%
C3: 00.0%
C4: 00.0%

MD: 3,146'
TVD: 3,119.11'
Inclination: 9.33 °
Azimuth: 305.45 °
VS: -238.06 '

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

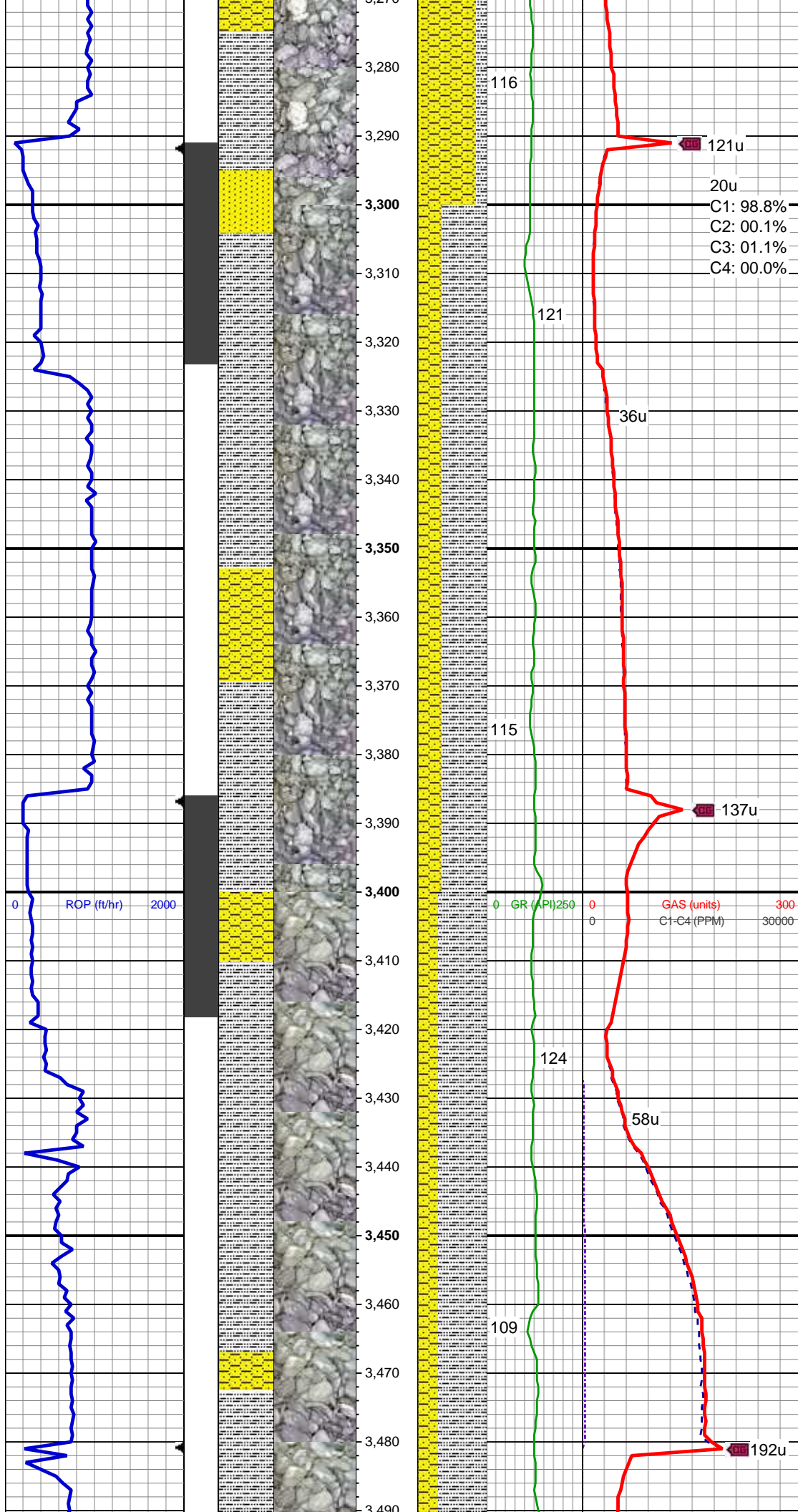
GAS SCALE CHANGE

0 GAS (units) 300
0 C1-C4 (PPM) 30000

MUD WT 8.7 VIS 27

MD: 3,241'
TVD: 3,212.74'
Inclination: 10.16 °
Azimuth: 303.55 °
VS: -250.6 '

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

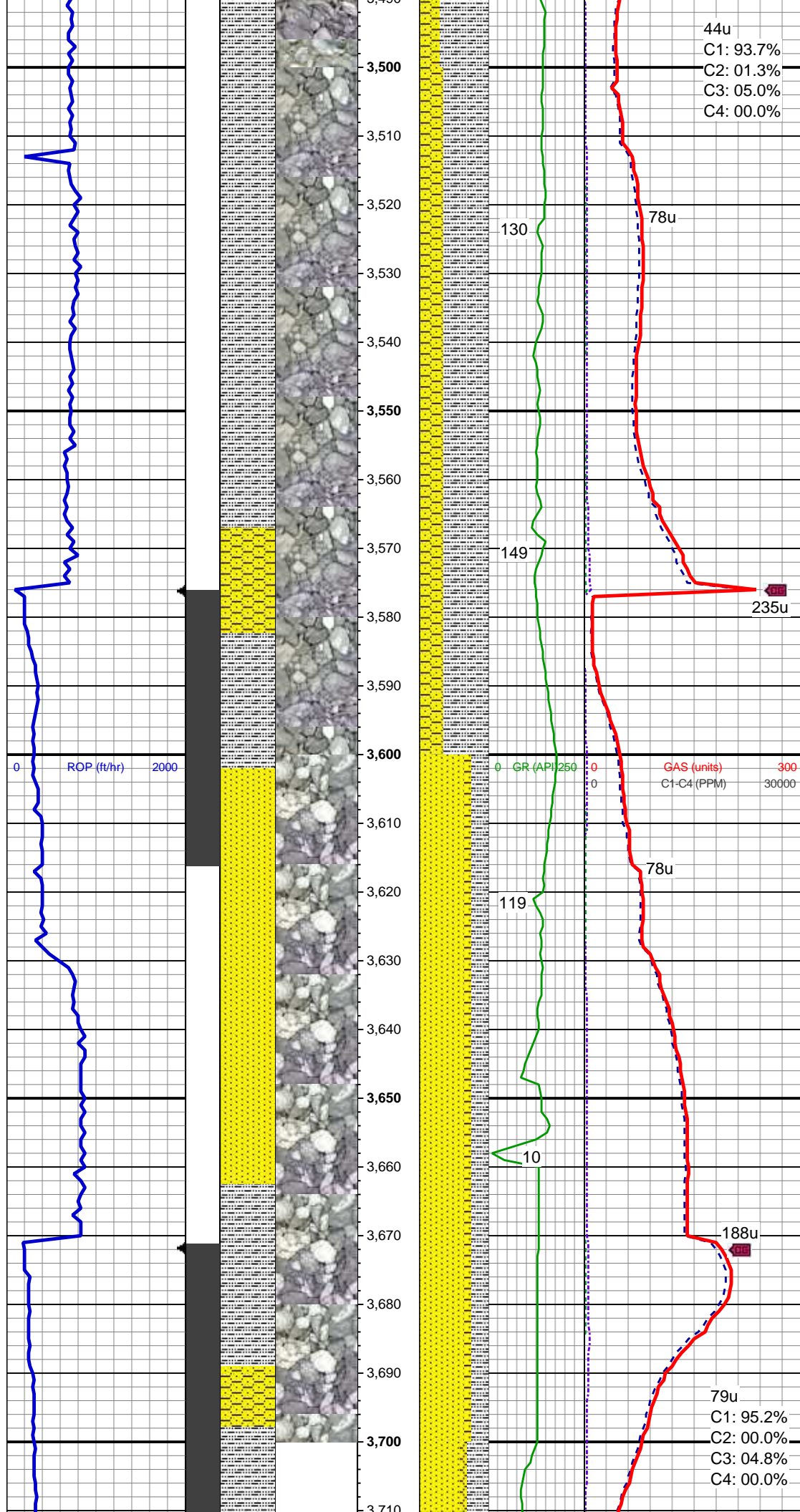


MD: 3,336'
TVD: 3,306.19'
Inclination: 10.55 °
Azimuth: 306.15 °
VS: -263.84 '

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

MD: 3,431'
TVD: 3,399.58'
Inclination: 10.61 °
Azimuth: 307.77 °
VS: -276.96 '

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



MD: 3,526'
TVD: 3,493.2'
Inclination: 8.89 °
Azimuth: 308.11 °
VS: -288.88 '

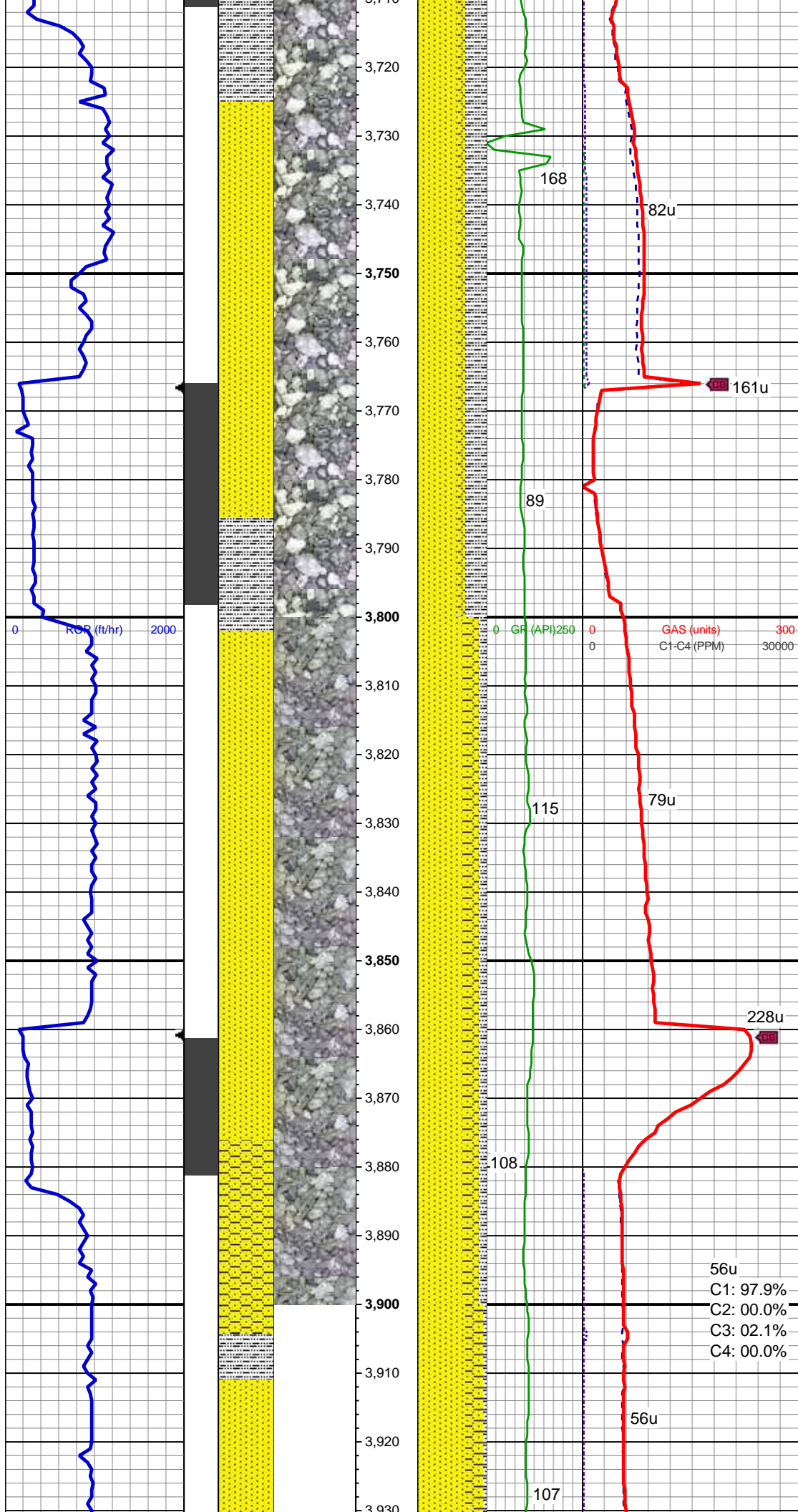
SLTY SH: lt-gy, tr med gy, sft frm, sb
plty-plty, occ plty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt; tr ss

MUD WT 8.7 VIS 27

MD: 3,621'
TVD: 3,587.03'
Inclination: 9.14 °
Azimuth: 308.87 °
VS: -299.8 '

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

MD: 3,716'



MD: 3,710'
TVD: 3,680.66'
Inclination: 10.31 °
Azimuth: 313.57 °
VS: -311.02 '

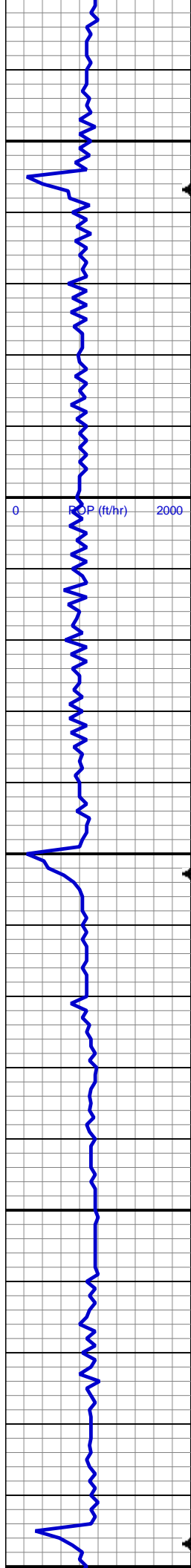
SS: lt gy-gy, tr wh, s&p, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt
SLTY SH: lt-gy, tr med gy, sft, sb blky-sb
plty, occ plty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

MD: 3,811'
TVD: 3,773.87'
Inclination: 11.98 °
Azimuth: 310.67 °
VS: -323.71 '

SS: lt gy-gy, tr wh, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt
SLTY SH: lt-gy, tr med gy, sft, sb
plty-plty, arg-rthy mtx, non calc, slty tex

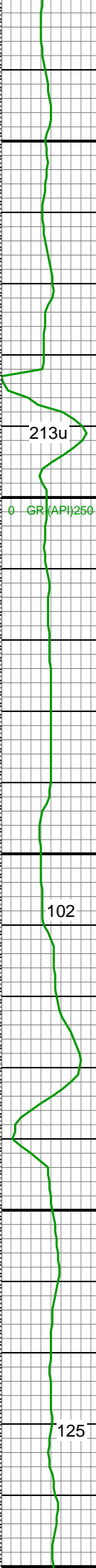
MD: 3,906'
TVD: 3,866.69'
Inclination: 12.64 °
Azimuth: 305.59 °
VS: -338.67 '

56u
C1: 97.9%
C2: 00.0%
C3: 02.1%
C4: 00.0%

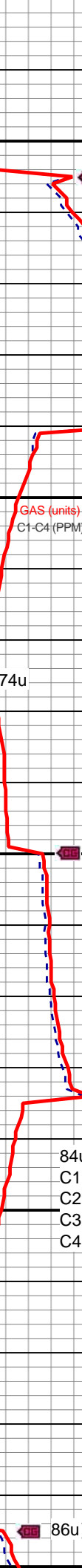


3,930
3,940
3,950
3,960
3,970
3,980
3,990
4,000
4,010
4,020
4,030
4,040
4,050
4,060
4,070
4,080
4,090
4,100
4,110
4,120
4,130
4,140
4,150

GR (API) 250



213u
102
125



178u
74u
138u
201u
84u
86u

SS: lt gy-gy, tr wh,s&p, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt
SLTY SH: lt-gy, tr med gy, sft, sb
pty-pty, arg-rthy mtx, non calc, slty tex

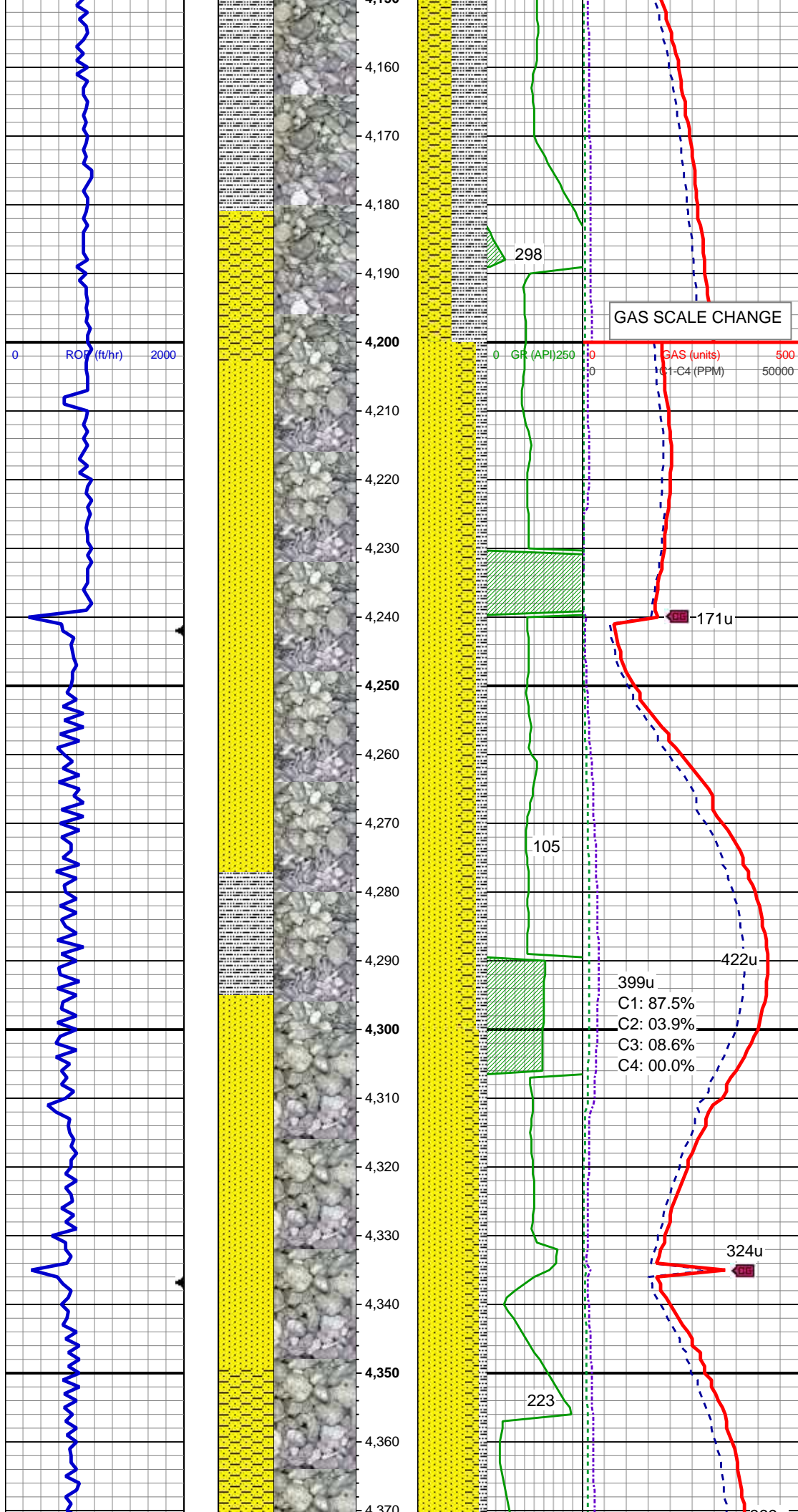
MD: 4,001'
TVD: 3,959.46'
Inclination: 12.18 °
Azimuth: 305 °
VS: -354.41'

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

MUD WT 8.7 VIS 27

MD: 4,096'
TVD: 4,052.61'
Inclination: 10.46 °
Azimuth: 304.43 °
VS: -368.9'

SLTY SH: lt-gy, tr med gy, sft, sb blky-sb
pty, occ pty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb



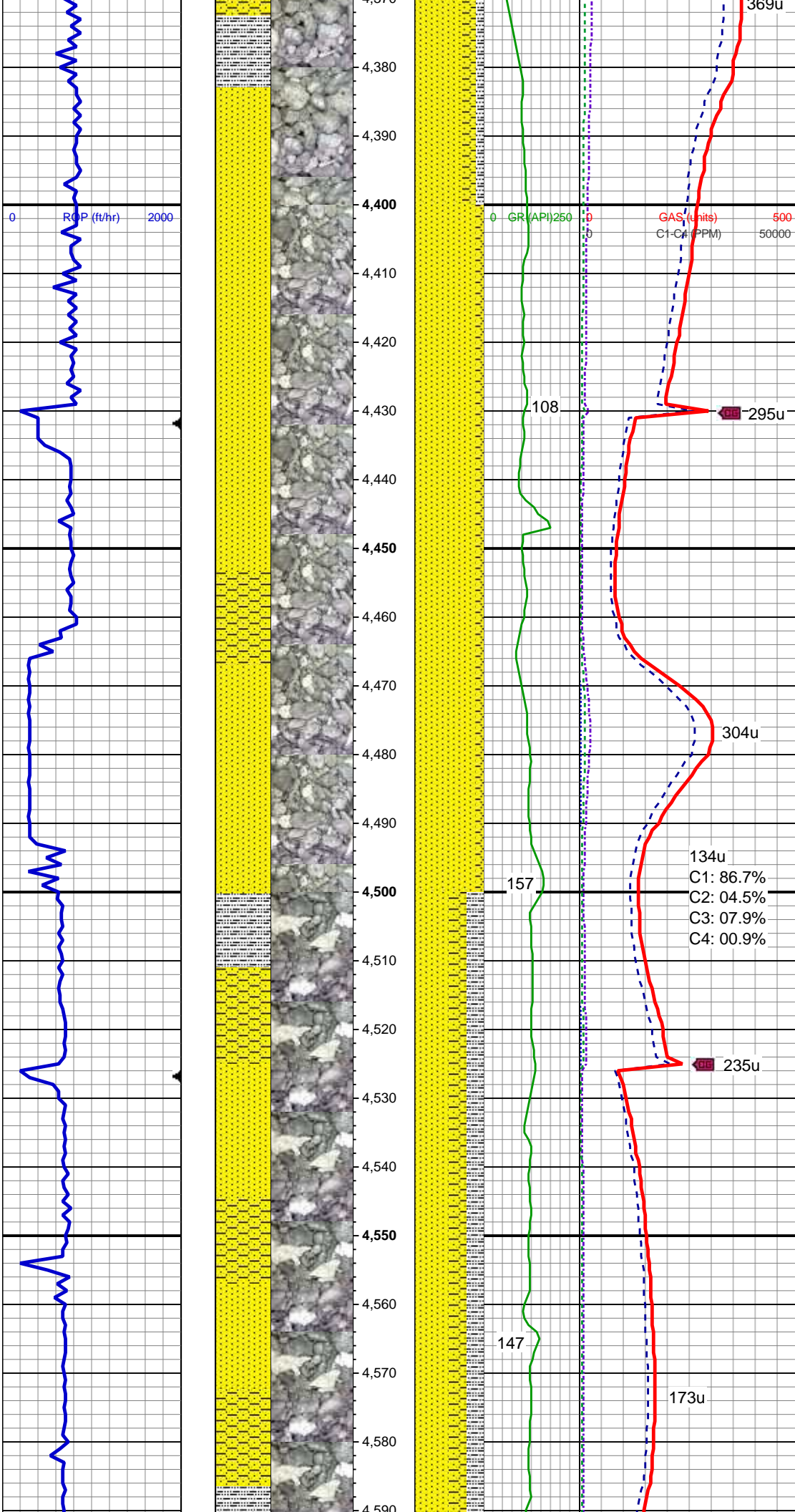
blky, w-mod srt, arg cmt
SS: lt gy-gy, tr wh, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau

MD: 4,192'
TVD: 4,147.31'
Inclination: 8.42 °
Azimuth: 300.05 °
VS: -381.51 '

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

MD: 4,287'
TVD: 4,241.38'
Inclination: 7.64 °
Azimuth: 299.86 °
VS: -392.48 '

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



MD: 4,382'
TVD: 4,335.63'
Inclination: 6.77 °
Azimuth: 299.36 °
VS: -402.37 '

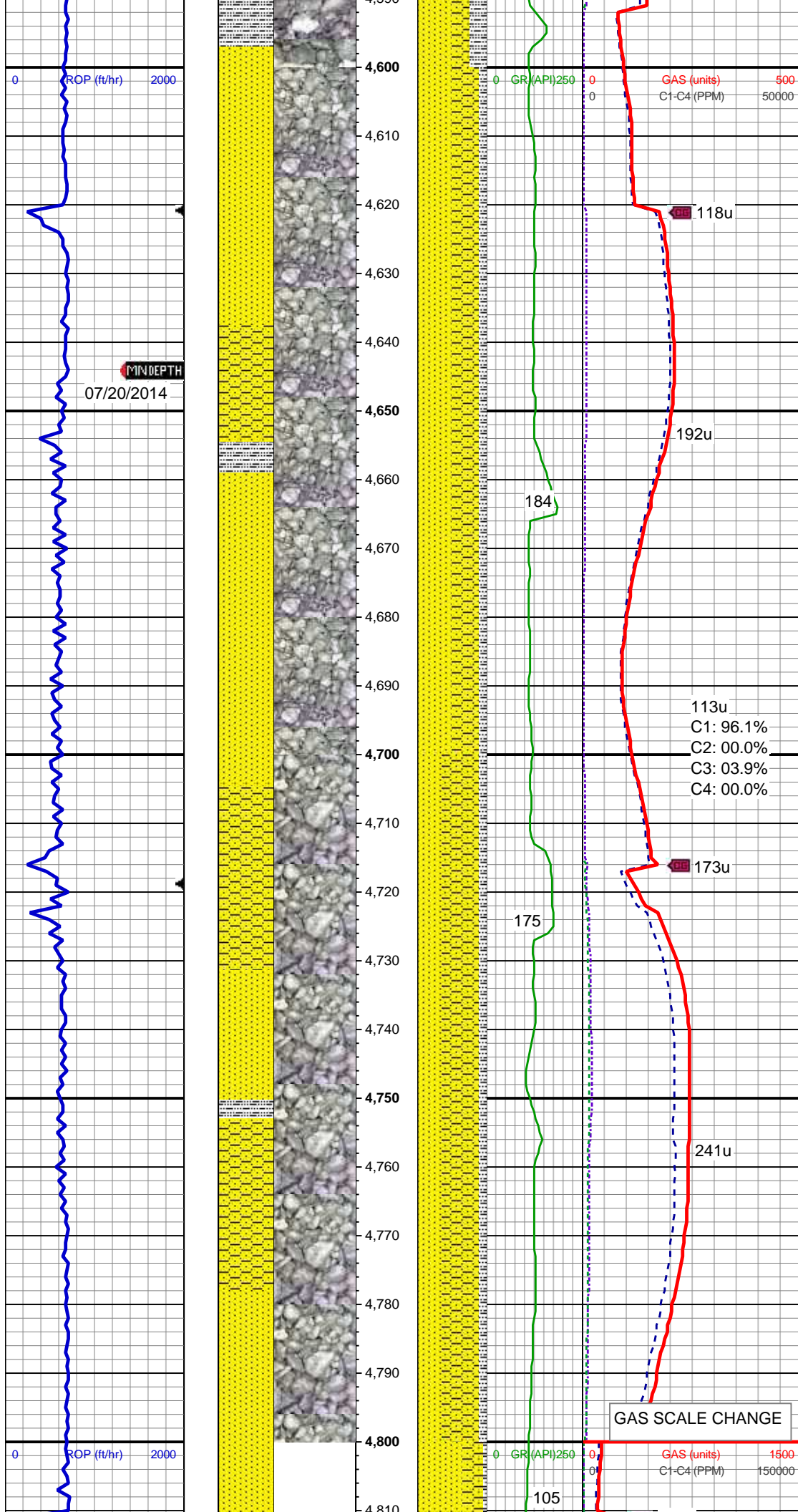
SS: lt gy-gy, tr wh, s&p, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau, tr
foss
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt, tr glau

MD: 4,477'
TVD: 4,430'
Inclination: 6.34 °
Azimuth: 298.44 °
VS: -411.45 '

134u
C1: 86.7%
C2: 04.5%
C3: 07.9%
C4: 00.9%

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

MD: 4,572'
TVD: 4,524.45'
Inclination: 6.06 °
Azimuth: 300.72 °
VS: -419.98 '



MUD WT 8.85 VIS 28

SS: lt gy-gy, tr wh, s&p, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau, sl
mics

SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

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

MD: 4,668'

TVD: 4,619.99'

Inclination: 5.13 °

Azimuth: 314.31 °

VS: -426.97 '

SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

SS: lt gy-gy, tr wh, s&p, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau, sl
mics

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

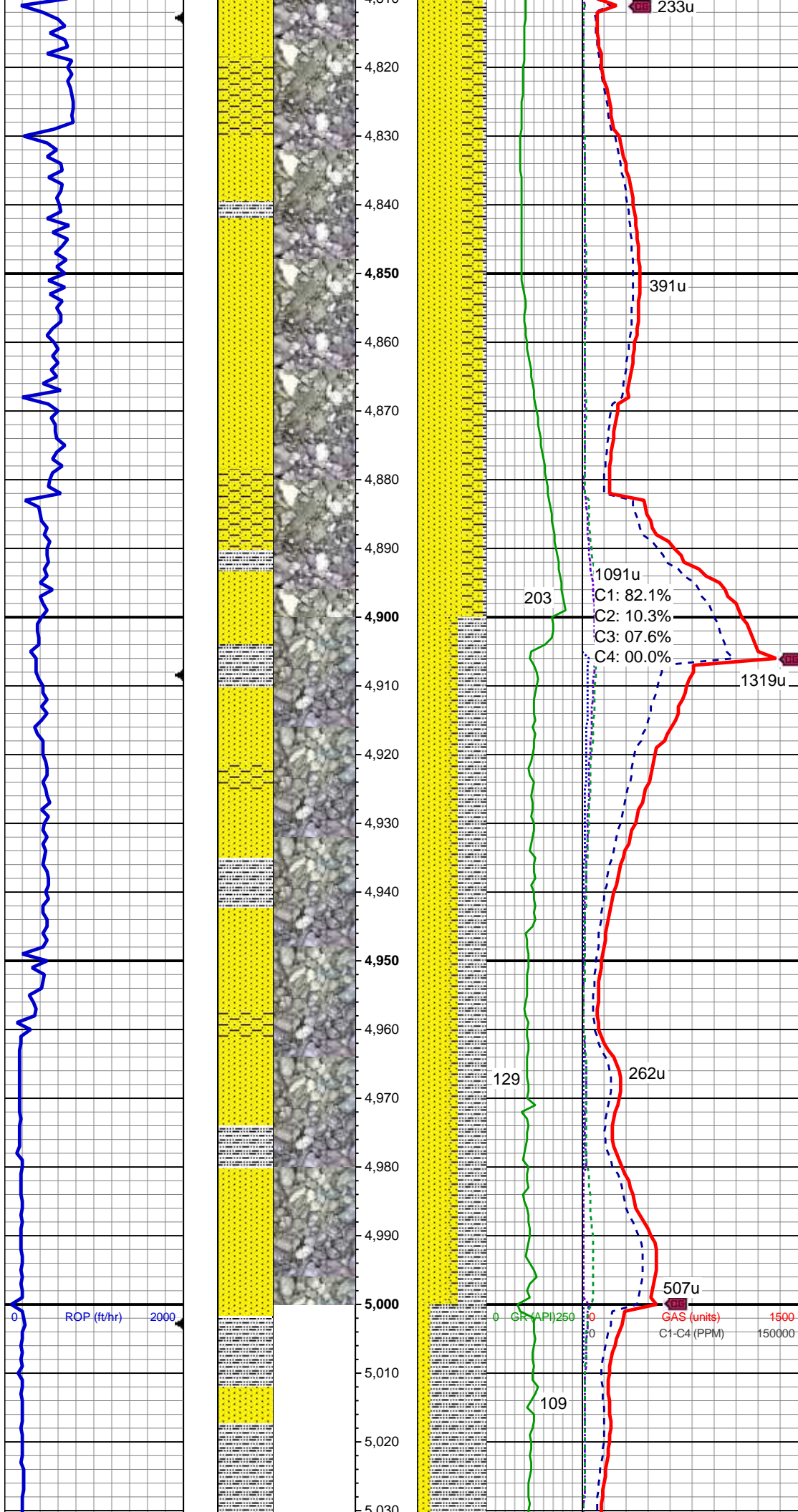
MD: 4,763'

TVD: 4,714.65'

Inclination: 4.59 °

Azimuth: 314.01 °

VS: -432.31'



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

MD: 4,858'
TVD: 4,809.35'
Inclination: 4.58 °
Azimuth: 315.49 °
VS: -437.29'

203
1091u
C1: 82.1%
C2: 10.3%
C3: 07.6%
C4: 00.0%

1319u

SS: lt gy-gy, tr wh, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau
SLTY SH: lt-gy, tr med gy/blk, sft, sb
plty-plty, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

MD: 4,953'
TVD: 4,904.08'
Inclination: 4.04 °
Azimuth: 314.78 °
VS: -441.93'

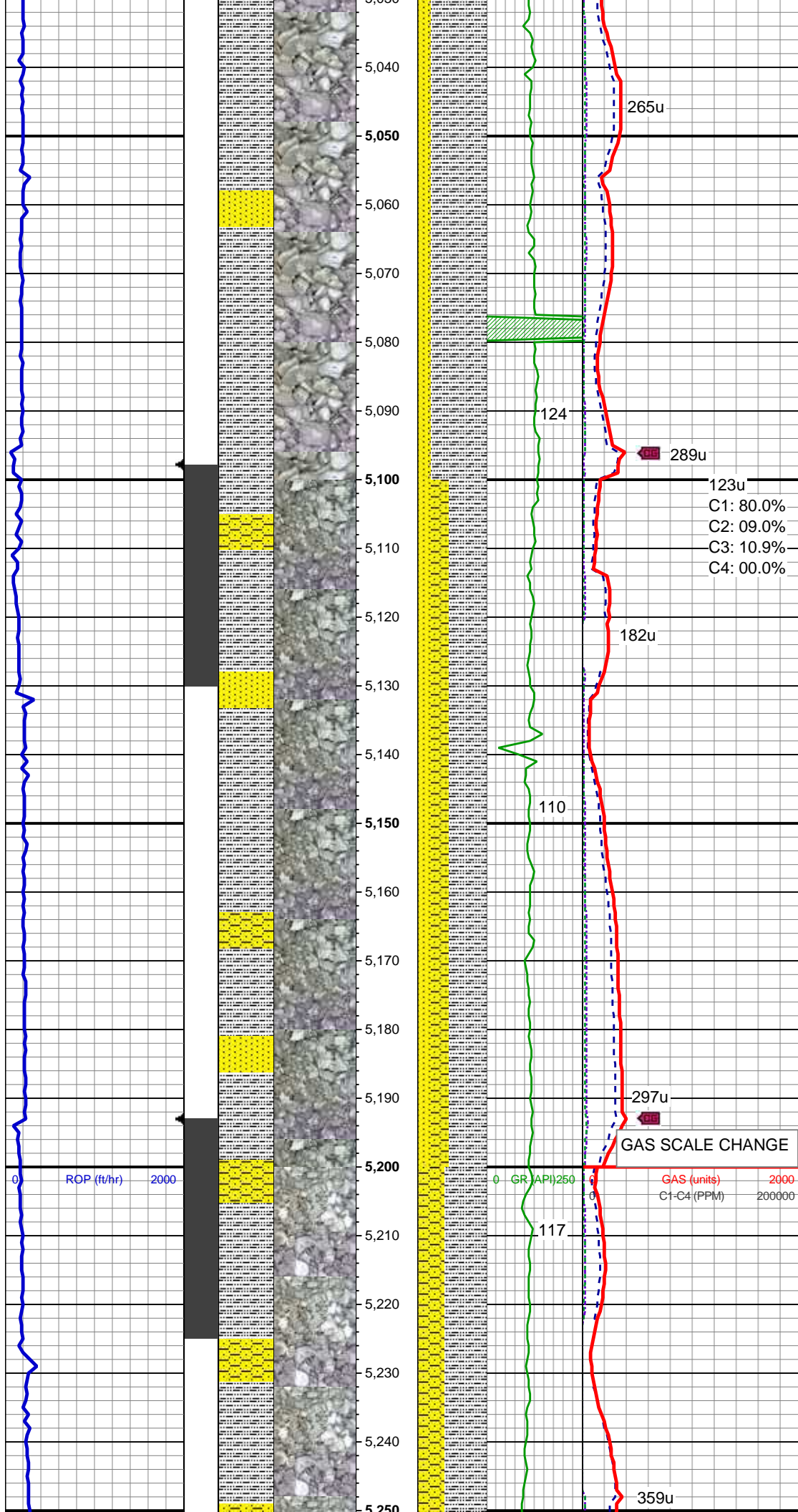
129 262u

507u

GR (API) 250 GAS (units) 1500 C1-C4 (PPM) 150000

109

MD: 5,048'
TVD: 4,998.85'
Inclination: 3.95 °



Inclination: 3.95
Azimuth: 316.25 °
VS: -446.2'

SLTY SH: lt-gy, tr med gy/blk, sft, sb
plty-plty, arg-rthy mtx, non calc
SS: lt gy-gy, tr wh, f-med grn, fri, sb
blky-sb rnd,p-mod srt, arg cmt, tr glau
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, w-mod srt, arg cmt

MUD WT 8.75 VIS 28

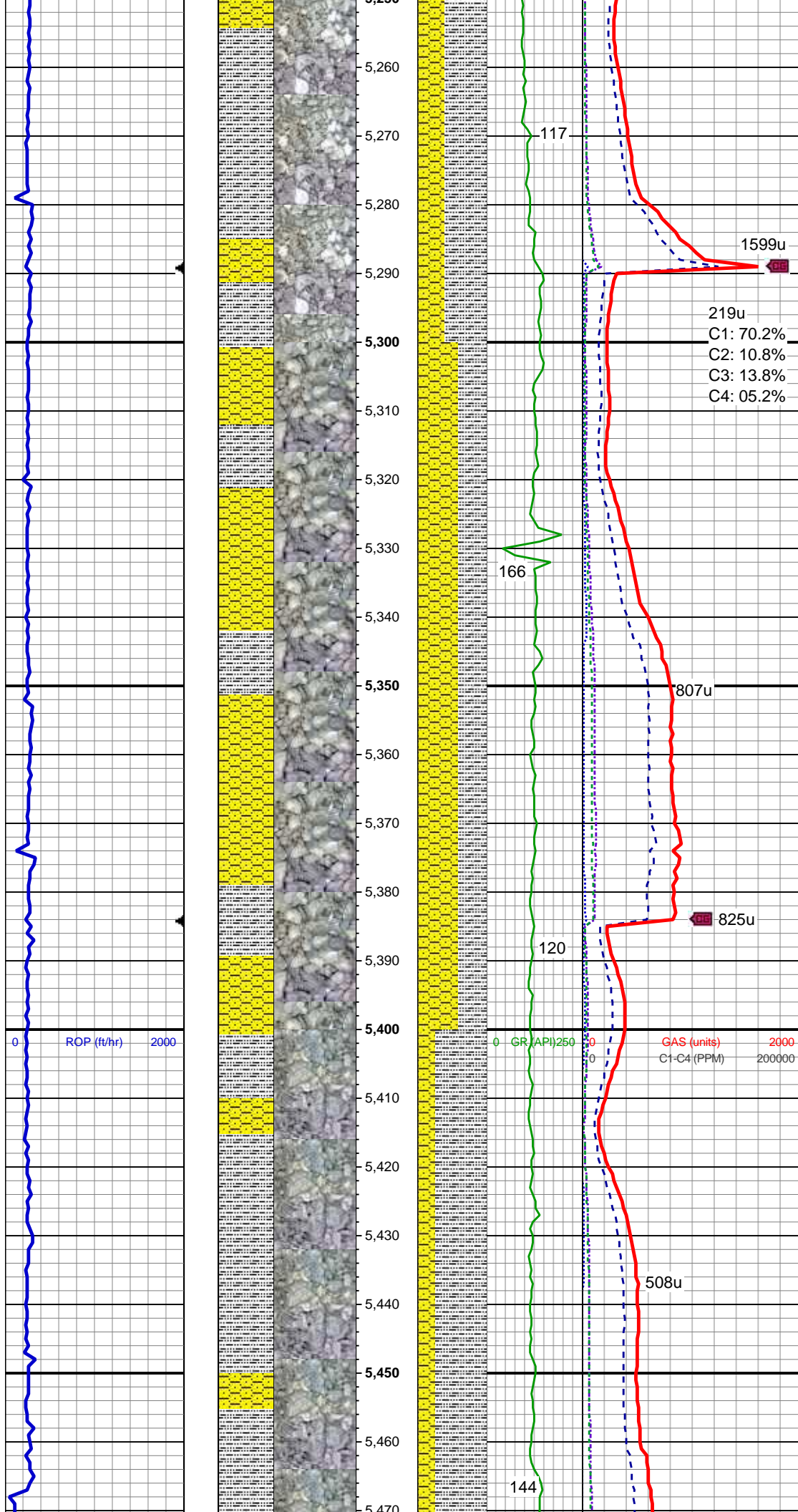
MD: 5,143'
TVD: 5,093.68'
Inclination: 2.79 °
Azimuth: 324.72 °
VS: -449.47'

SLTY SH: lt-med gy, sft, sb plty-plty, occ
sb blky, arg-rthy mtx, non calc
SHY SS: gy - lt gy, vf-f gr, sft, sb rnd-sb
blky, p-mod srt, arg cmt
SS: lt gy-gy, f-med grn, fri, sb blky-sb
rnd,p-mod srt, arg cmt, sl uncons

MUD WT 8.70 VIS 31

MD: 5,239'
TVD: 5,189.63'
Inclination: 0.94 °
Azimuth: 311.31 °
VS: -451.23'

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



SHY SS: gy - lt gy, tr med gy, vf-f gr, sft, sb blk-y-sb plty, p-mod srt, arg cmt, sl uncons

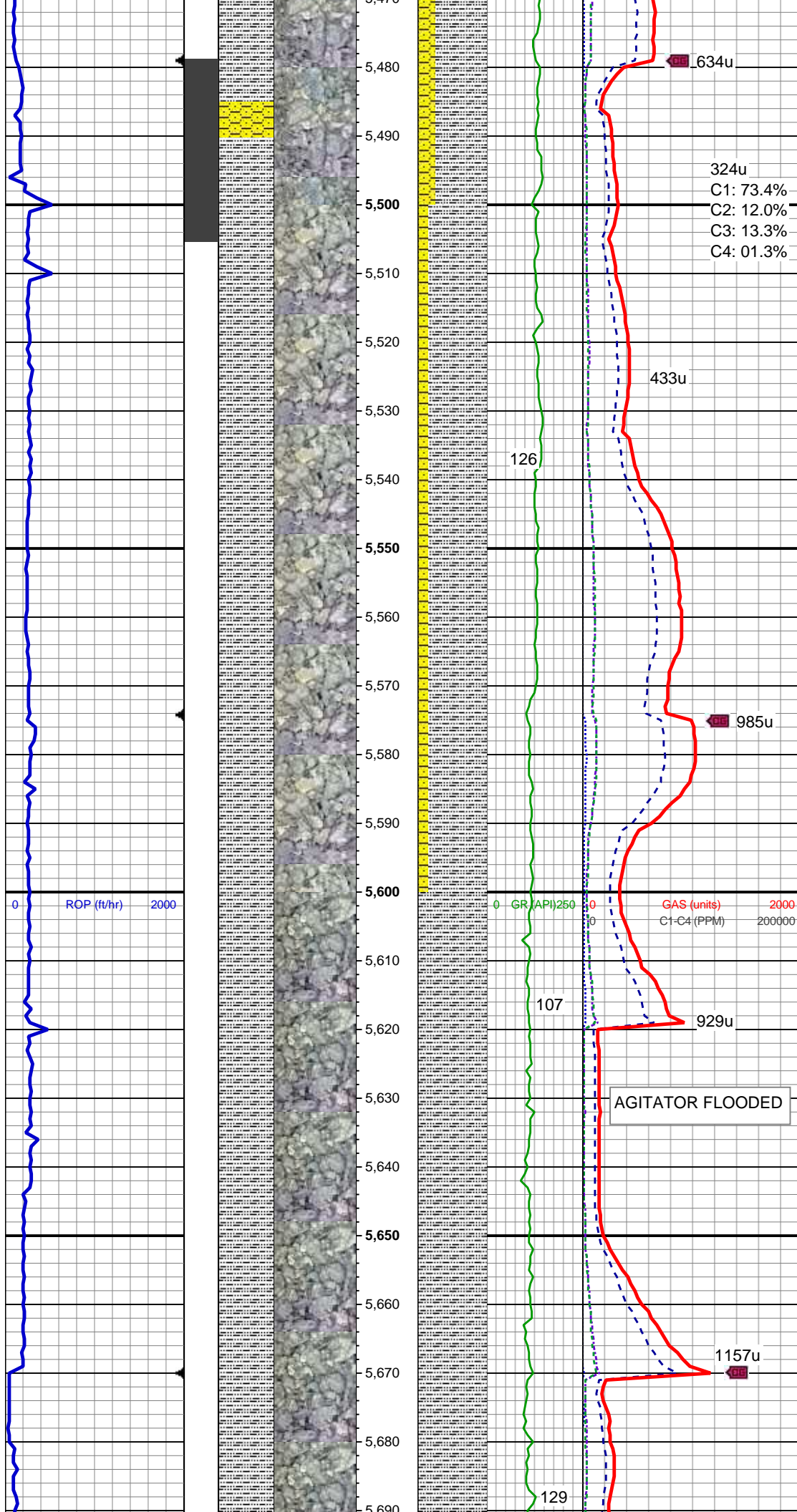
MD: 5,334'
TVD: 5,284.62'
Inclination: 0.69 °
Azimuth: 306.53 °
VS: -452.21'

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

MUD WT 8.60 VIS 37

MD: 5,429'
TVD: 5,379.61'
Inclination: 0.84 °
Azimuth: 309.64 °
VS: -453.14'

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

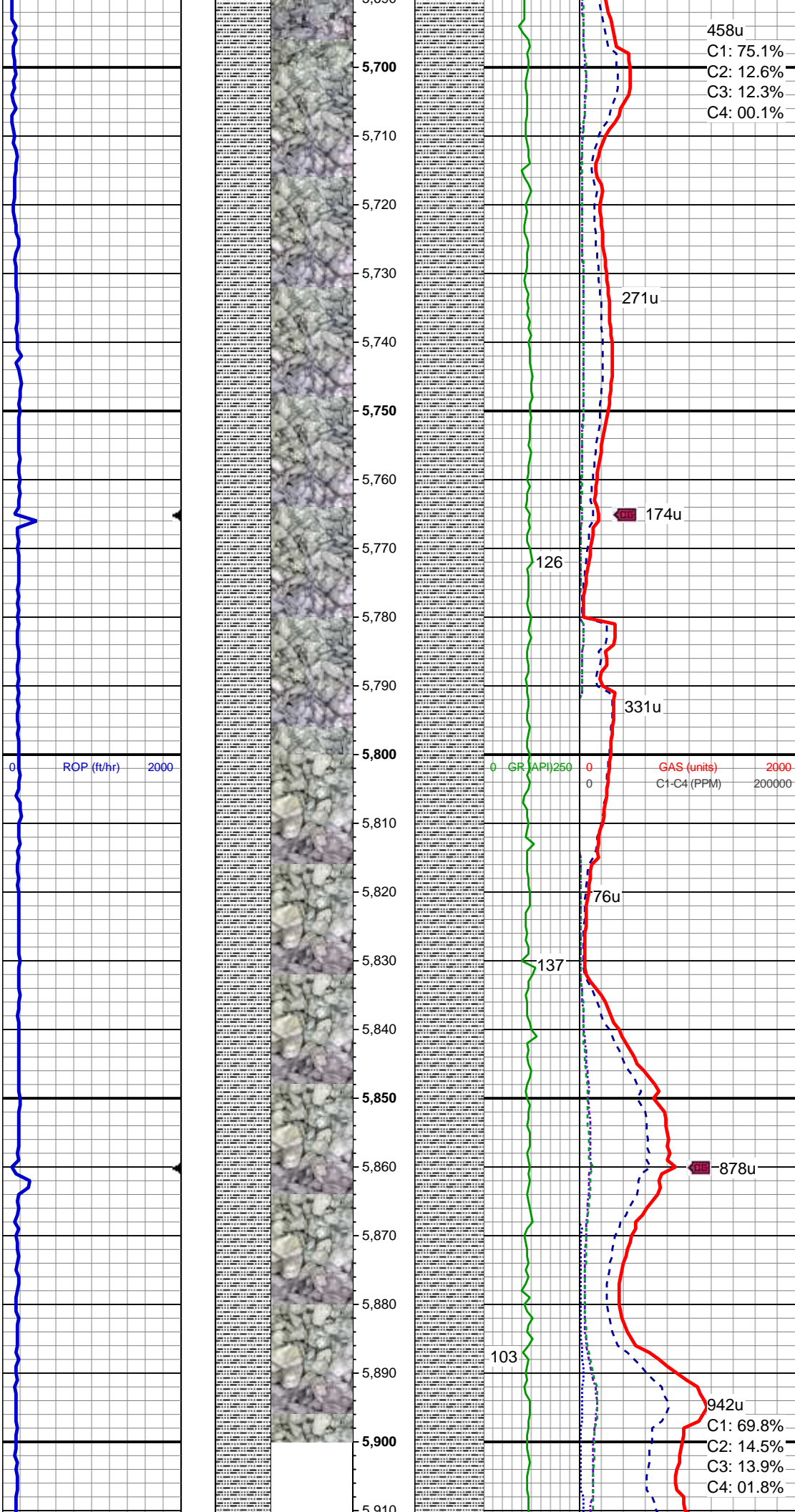


MD: 5,524'
TVD: 5,474.61'
Inclination: 0.28 °
Azimuth: 78.52 °
VS: -453.41'

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

MD: 5,619'
TVD: 5,569.61'
Inclination: 0.52 °
Azimuth: 144.91 °
VS: -452.96'

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



MUD WT 8.85 VIS 37

MD: 5,715'
TVD: 5,665.6'
Inclination: 1.06 °
Azimuth: 177.8 °
VS: -452.77'

SLTY SH: lt gy-gy, tr med gy, sft, sb
pty-pty, occ sb blkly, arg-rthy mtx, non
calc, occ shy ss

MD: 5,810'
TVD: 5,760.58'
Inclination: 1.09 °
Azimuth: 183.05 °
VS: -452.91'

MUD WT 9.00 VIS 36

SLTY SH: lt gy-gy, occ med gy, sft, sb
pty-sb blkly, occ pty arg-rthy mtx, non
calc, occ shy ss

MD: 5,905'
TVD: 5,855.57'
Inclination: 0.88 °
Azimuth: 192.79 °
VS: -452.24'

VS: -453.24

MUD WT 9.30 VIS 37

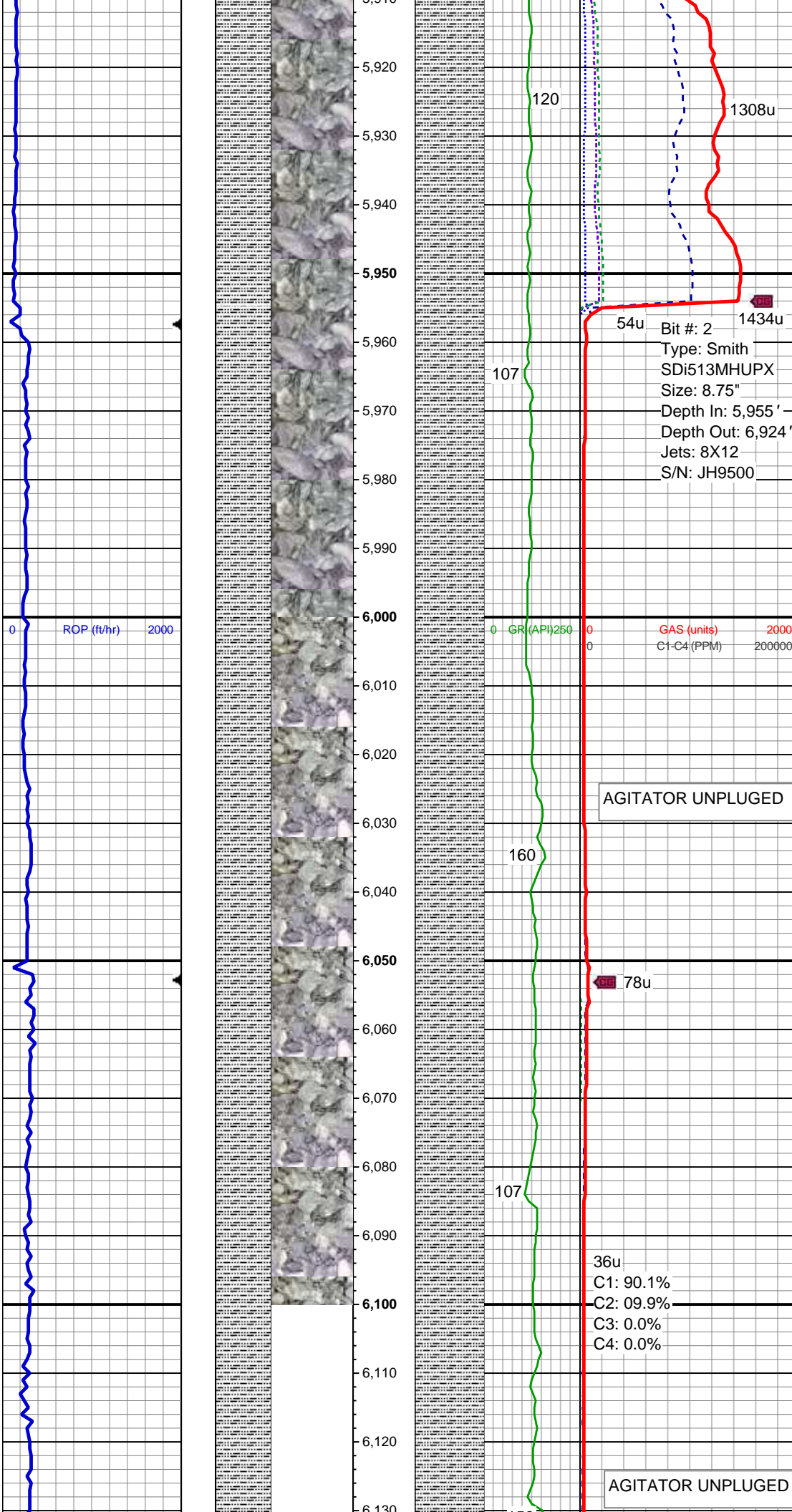
SLTY SH: lt gy-gy, occ med gy, sft, sb
ply-sb blkly, tr ply arg-rthy mtx, non calc,
occ shy ss

TOOH TO CHANGE
OUT BHA @ 5955' MD
08:52 AM 07/20/2014

Resumed Drilling @
21:20 on 07/20/2014

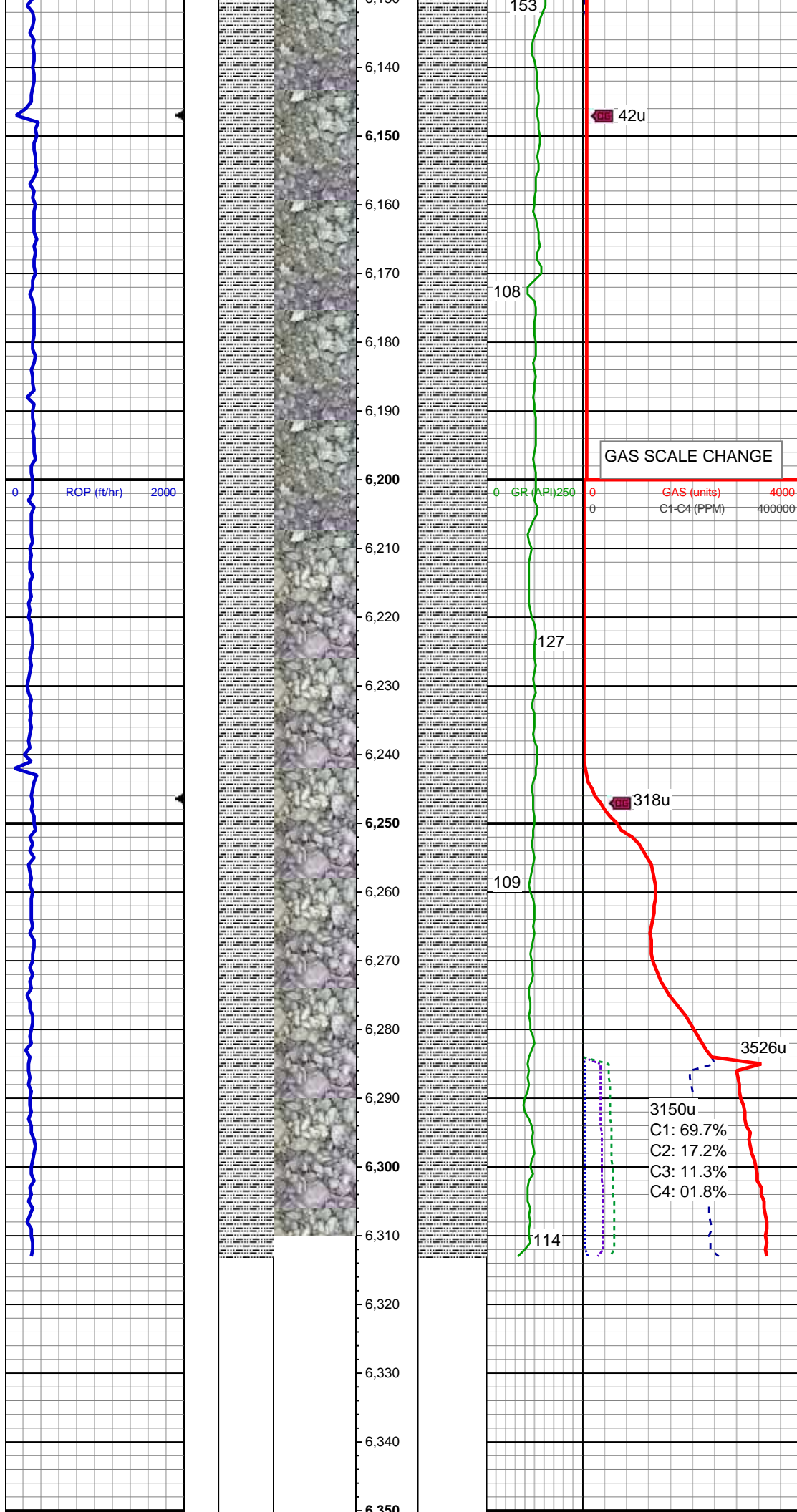
MUD WT 9.50 VIS 34

MD: 5,994'
TVD: 5,944.56'
Inclination: 0.72 °
Azimuth: 213.27 °
VS: -453.79 '



SLTY SH: lt gy-gy, occ med gy, tr blk, sft,
sb ply-sb blkly, tr ply, arg-rthy mtx, non
calc, occ shy ss

MD: 6,089'
TVD: 6,039.55'
Inclination: 0.76 °
Azimuth: 208.03 °
VS: -454.49 '



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

MUD WT 9.55 VIS 35

MD: 6,184'
TVD: 6,134.54'
Inclination: 0.41 °
Azimuth: 257.48 °
VS: -455.16 '

GAS SCALE CHANGE

0 GR (API) 250 0 GAS (units) 4000
0 C1-C4 (PPM) 400000

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

MD: 6,279'
TVD: 6,229.54'
Inclination: 0.85 °
Azimuth: 250.73 °
VS: -456.19 '

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

TD @ 6313' MD
07/20/2014 @ 23:12

TOOH FOR CURVE BHA
LOG CONTINUES ON MPlot
"FIVE RIVERS K09-67-1HN(HORZ)"

Thank you for choosing
Columbine Logging Inc.

