

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Timbro State LD16-65HN(VERT)

**Location** SE NE SEC. 16, T9N, R58W

**State** COLORADO

**County** WELD

**Country** USA

**Rig Number** H&P 326

**API Number** 05-123-37489

**AFE #** 139488

**Region** DJ BASIN

**Field** WILDCAT

**Spud Date** 12/8/2013

**Drilling Completed** 12/14/2103

**Surface Coordinates** 1,882' FNL, 290' FEL  
Lat 40.75342 N, Long 103.86079 W

**Bottom Hole Coordinates** 2,640' FNL, 660' FWL  
Lat 40.75134 N, Long 103.87634 W

**Ground Elevation** 4,759'

**K.B. Elevation** 4,789'

**Logged Interval** 1,300' **To** 9,702'

**Total Depth** 9,702'

**Formation** NIOBRARA B CHALK

**Type of Drilling Fluid** 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

RYAN CHILIVAN

## Rock Types

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

## 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
MICACEOUS
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY

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

### Stringer

## Other Symbols

### Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

### Porosity

E EARTHY
F FENESTRAL
F FRACTURE
X INTERCRYSTALLINE
O INTEROOLITIC
M MOLDIC

ORGANIC
P PINPOINT
V VUGGY

### Engineering

BIT CHANGE
CONNECTION (LEFT)
CONNECTION (RIGHT)
CONNECTION GAS
TRIP GAS
DST DOWN TIME GAS
CORE - LOST
CORE - RECOVERED
DST INTERVAL

FAULT
FORMATION TOP
GAS SHOW
OIL SHOW
MN DEPTH MN DEPTH
MN DEPTH (RIGHT)
NORMAL FAULT
OVERTURNED STRATA
REVERSE FAULT
CASING
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)
SLIDE
SURVEY

DST DRILL STEM TEST
WIRELINE TESTED - LEFT
WIRELINE TESTED - RT

### Rounding

A ANGULAR
R ROUNDED
S SUBANG
S SUBRND

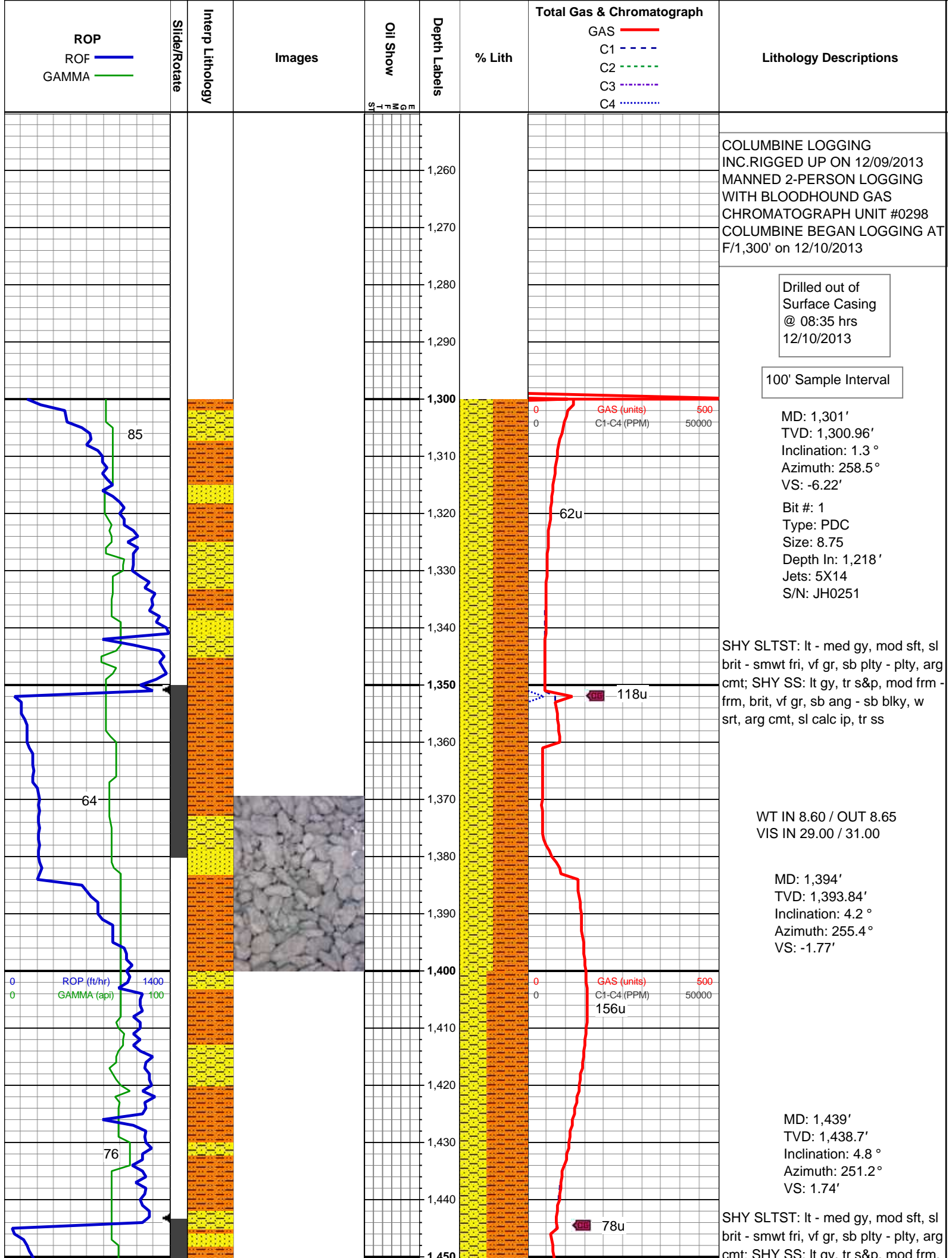
### Textures

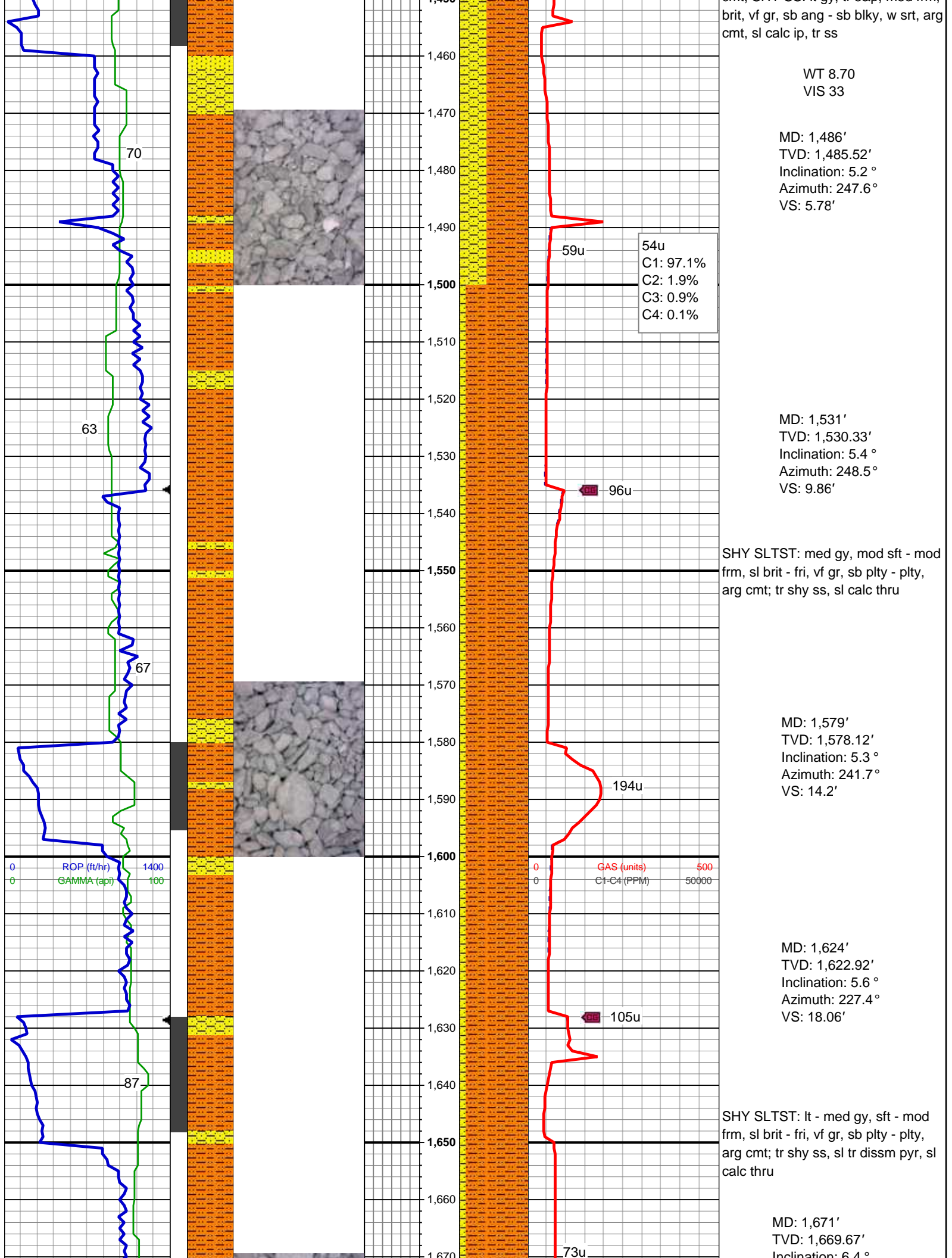
B BOUNDSTONE
C CHALKY
C CRYPTOXLN

E EARTHY
F FINELYXLN
G GRAINSTONE
L LITHOGRAPHIC
M MICROXLN
M MUDSTONE
P PACKSTONE
W WACKESTONE

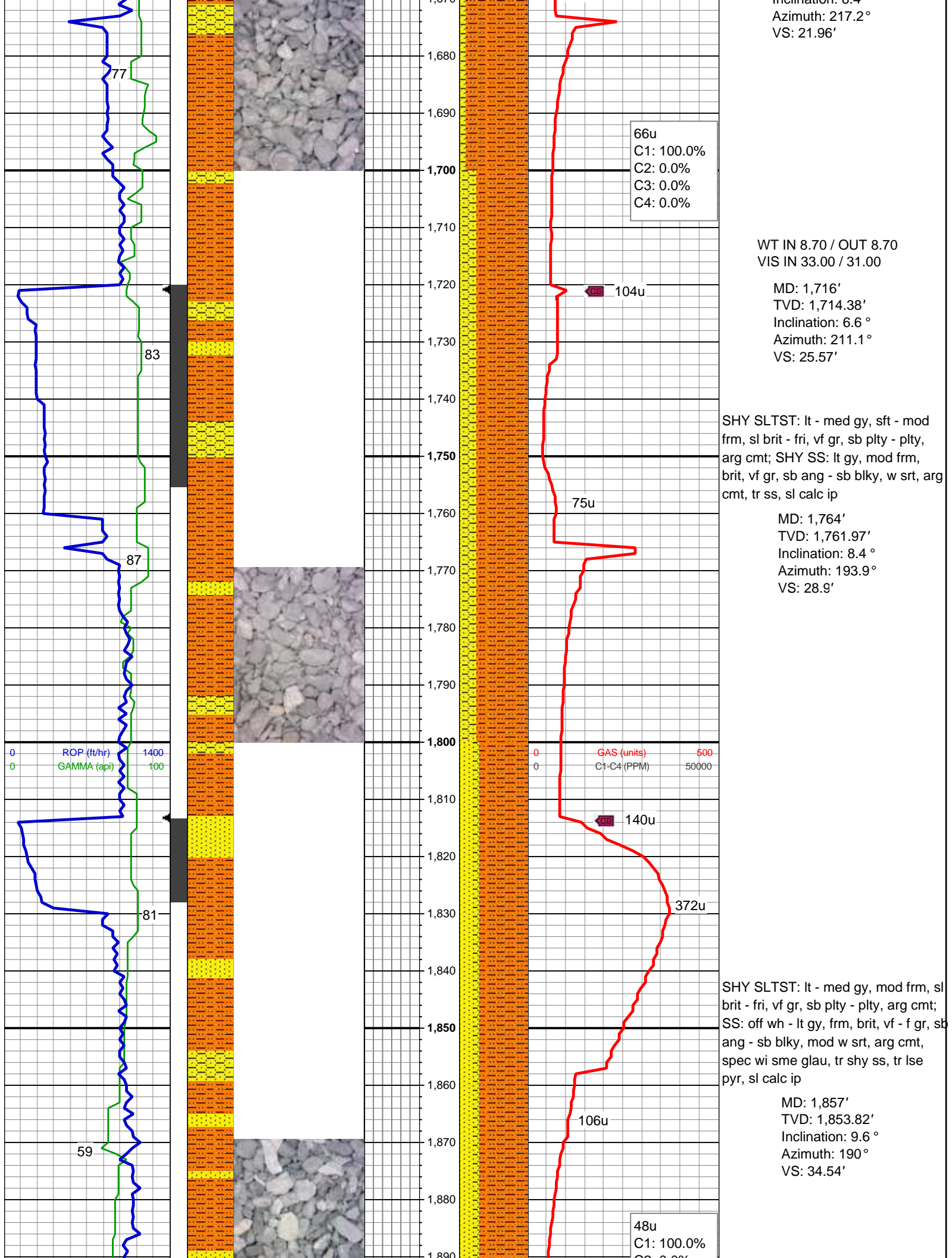
### Sorting

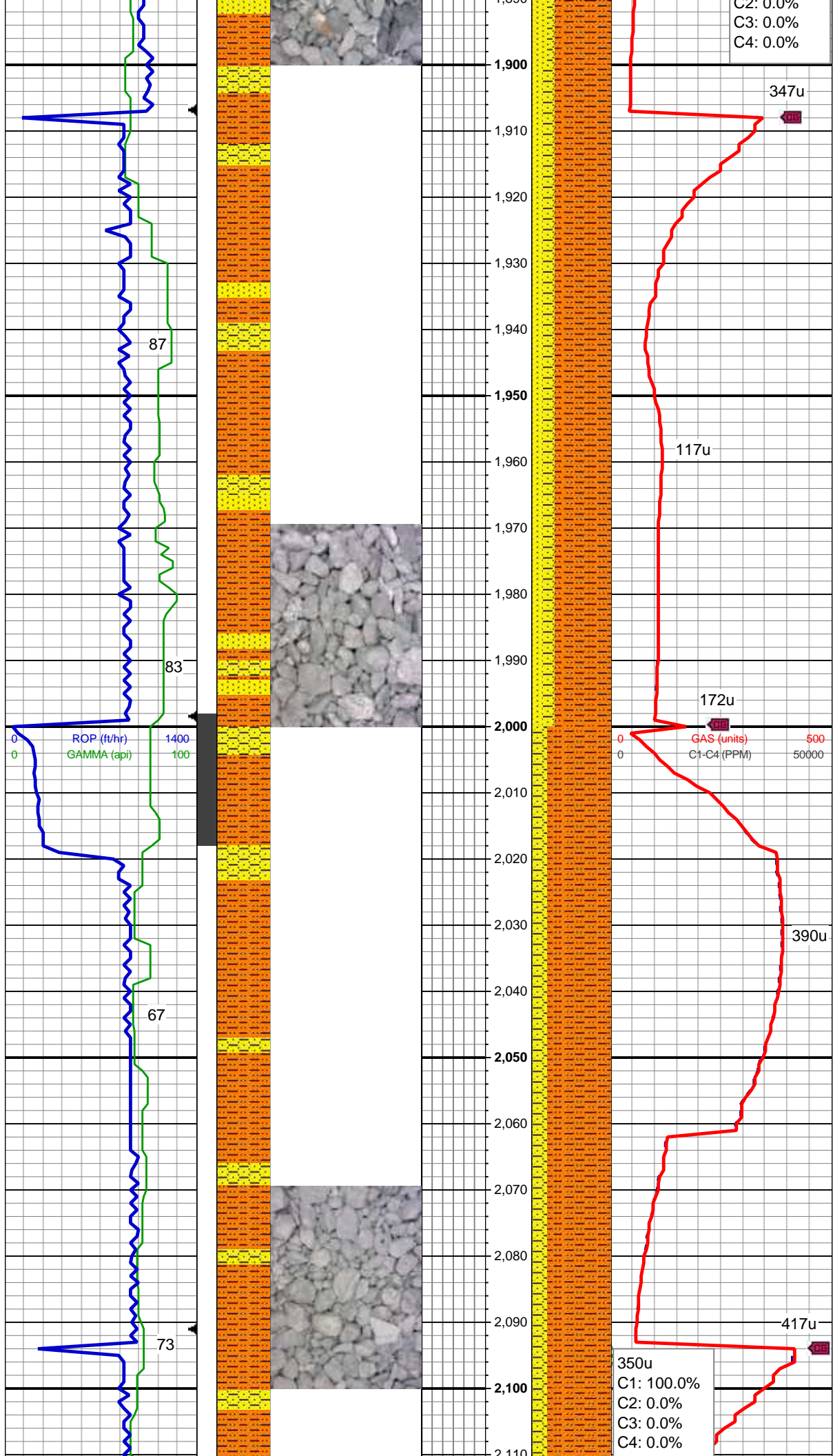
M MODERATE
P POOR
W WELL











C2: 0.0%  
C3: 0.0%  
C4: 0.0%

SHY SLTST: lt - med gy, mod frm - frm, sl brit - fri, vf gr, sb plty - plty, arg cmt; SHY SS: lt gy, mod frm - frm, brit, vf gr, sb ang - sb blk, w srt, arg cmt, spec wi sme glau; SS: off wh - lt gy, frm, brit, vf - f gr, sb ang - sb blk, mod w srt, arg cmt, spec wi sme glau, sl calc ip

MD: 1,949'  
TVD: 1,944.58'  
Inclination: 9.3 °  
Azimuth: 190.5 °  
VS: 40.03'

WT 8.65  
VIS 32

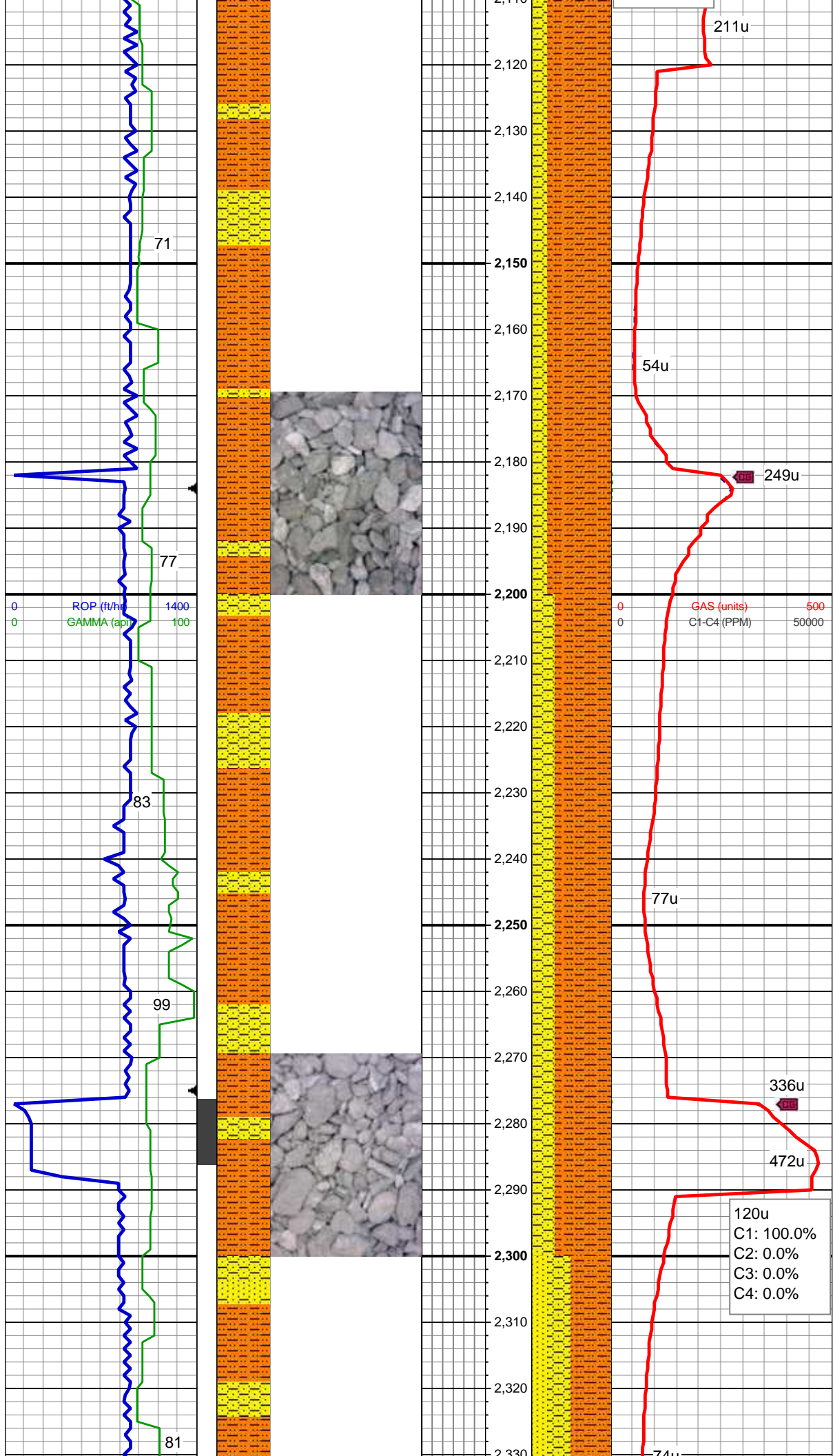
SHY SLTST: lt - med gy, mod frm - frm, sl brit - fri, vf gr, sb plty - plty, arg cmt; SHY SS: lt gy, mod frm - frm, brit, vf -f gr, sb ang - sb blk, w srt, arg cmt, spec wi sme glau & carb flk; sl calc ip

MD: 2,042'  
TVD: 2,036.19'  
Inclination: 10.5 °  
Azimuth: 189.5 °  
VS: 45.75'

WT. 8.60  
VIS 30

350u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%





MD: 2,135'  
TVD: 2,127.62'  
Inclination: 10.6 °  
Azimuth: 191.2 °  
VS: 51.96'

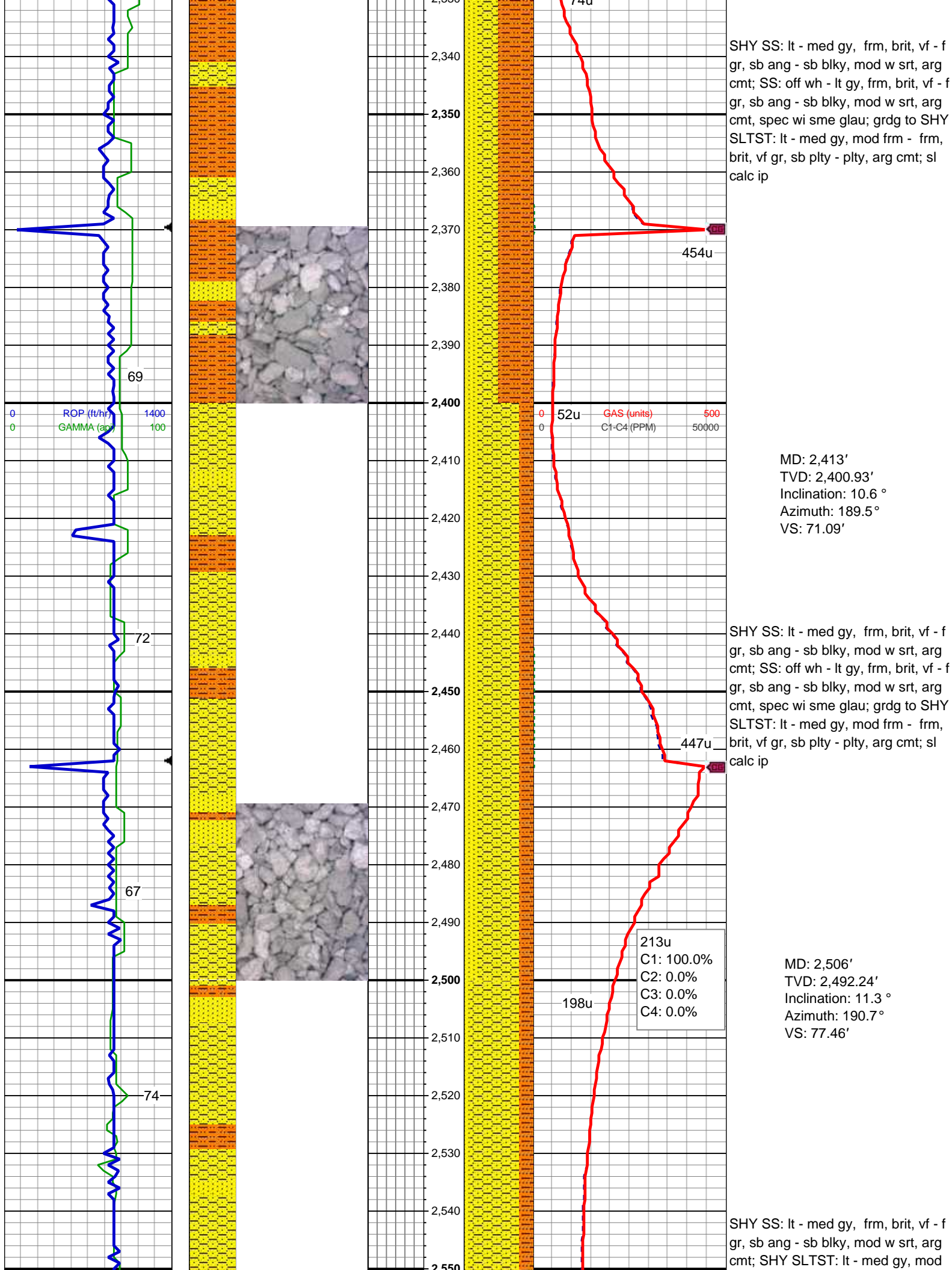
SHY SLTST: med - dk gy, mod frm - frm, sl brit - fri, vf gr, sb plty - plty, arg cmt; SHY SS: lt - med gy, frm, brit, vf -f gr, sb ang - sb blk, w srt, arg cmt; sl calc ip

MD: 2,227'  
TVD: 2,218.09'  
Inclination: 10.3 °  
Azimuth: 193.5 °  
VS: 58.58'

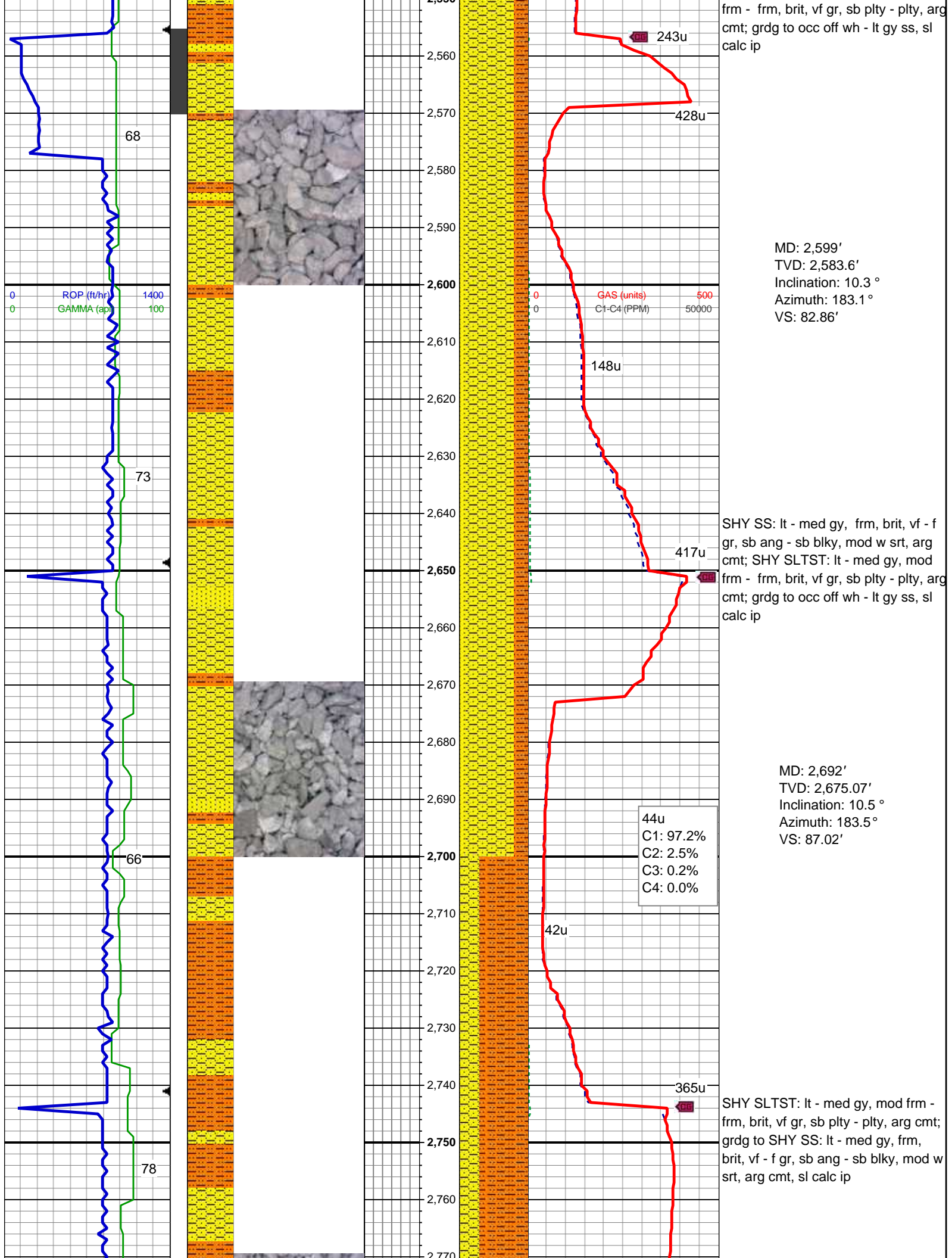
SHY SLTST: med - dk gy, mod frm - frm, sl brit, vf gr, sb plty - plty, arg cmt; SHY SS: lt - med gy, mod frm - frm, brit, vf -f gr, sb ang - sb blk, w srt, arg cmt; sl calc ip

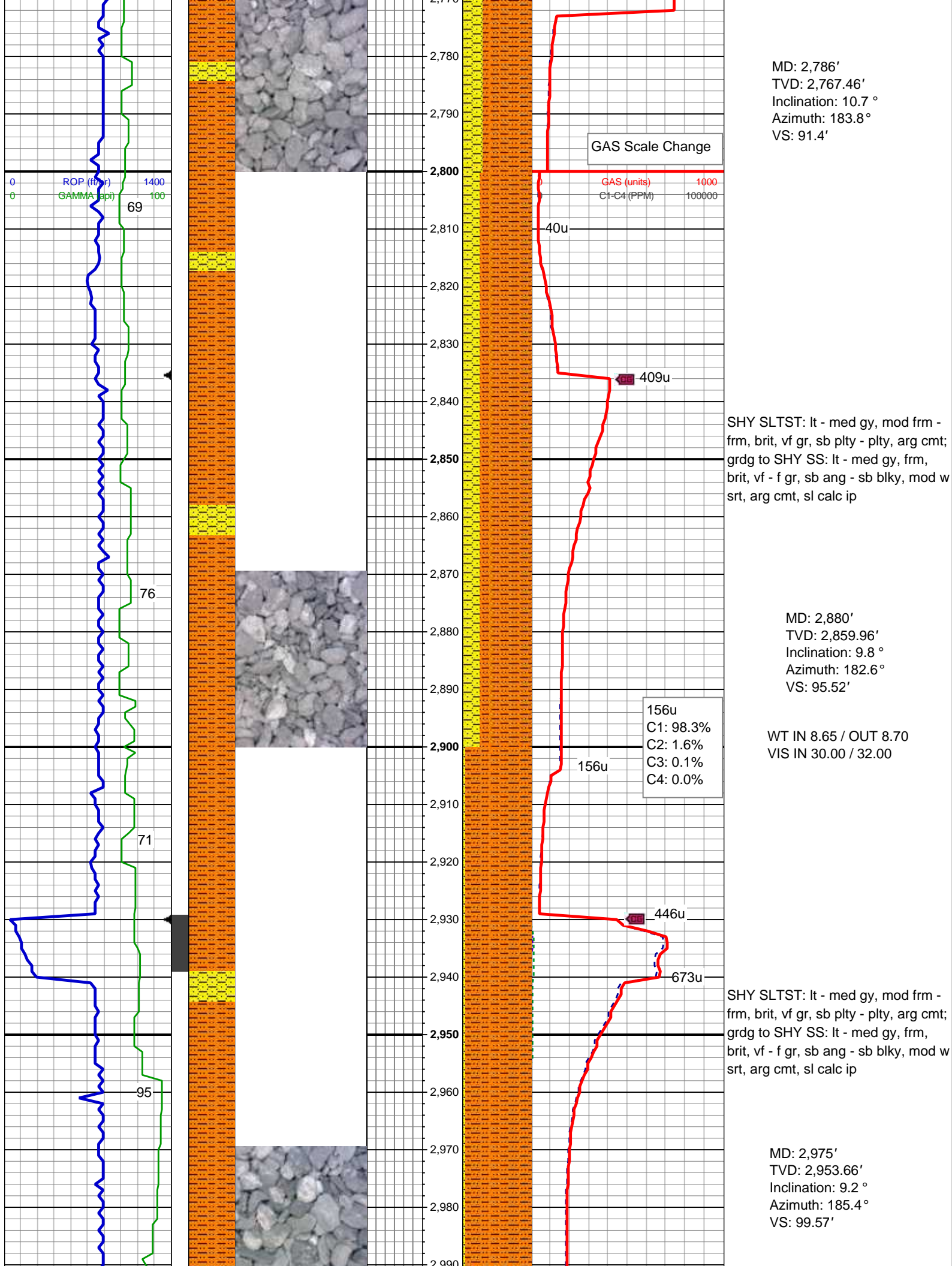
WT IN 8.75 / OUT 8.75  
VIS IN 30.00 / 28.00

MD: 2,320'  
TVD: 2,309.54'  
Inclination: 10.7 °  
Azimuth: 189.5 °  
VS: 65.06'

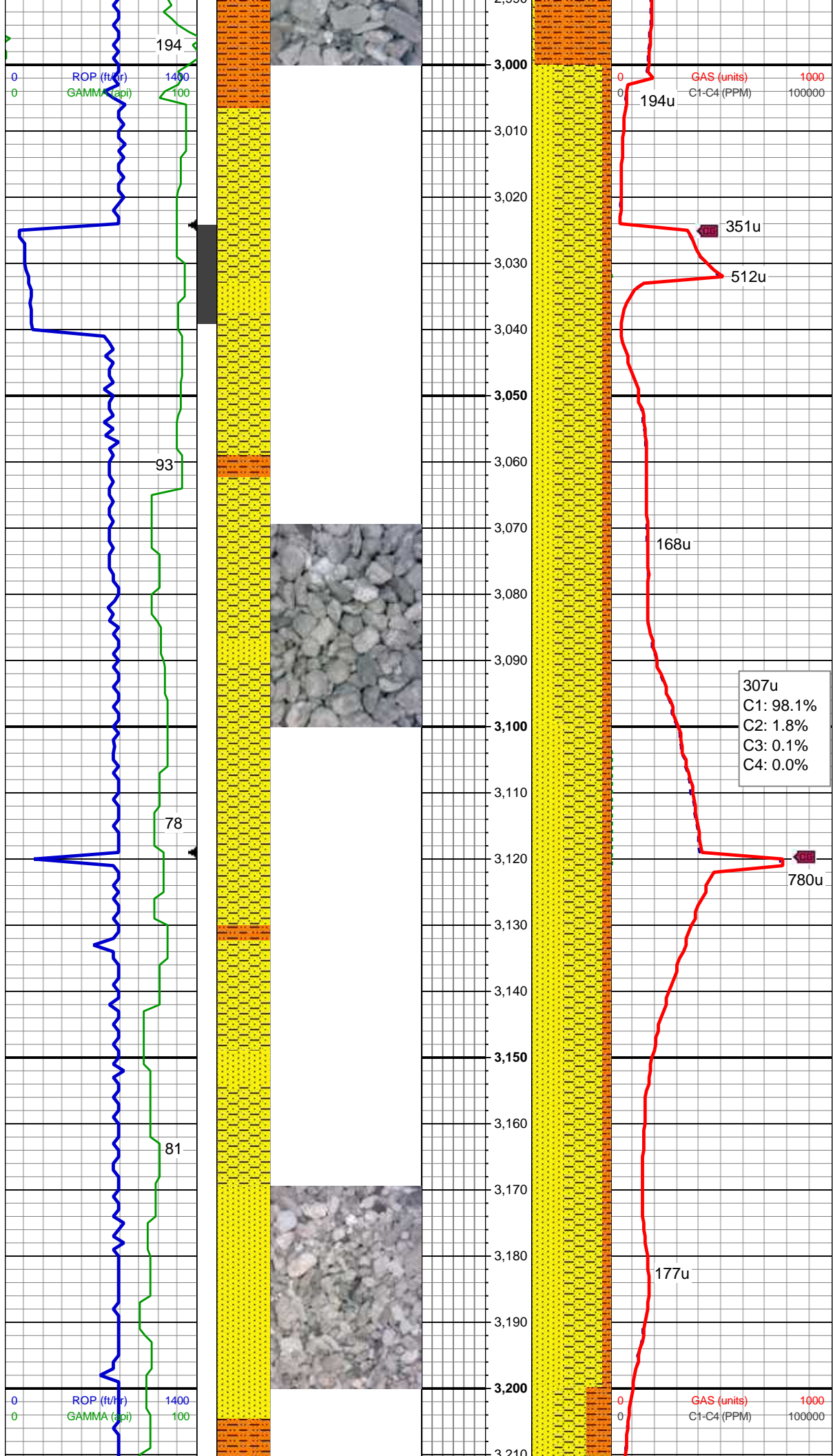












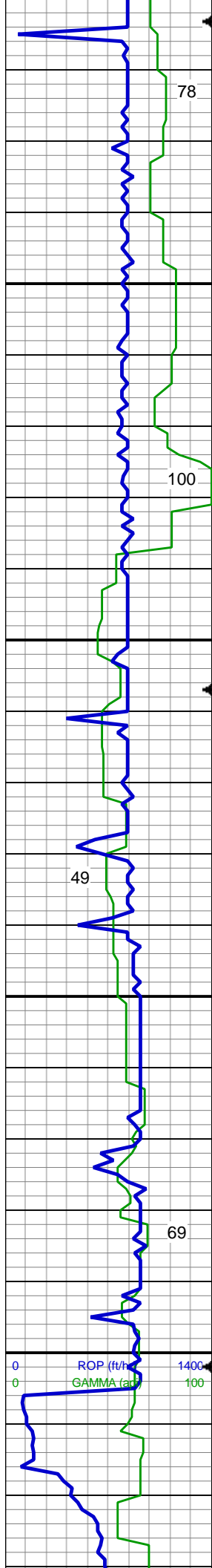
SHY SS: lt - med gy, frm, brit, vf - f  
gr, sb ang - sb blk, mod w srt, arg  
cmt, sl calc ip ; grdg to SHY SLTST:  
lt - med gy, mod frm - frm, brit, vf gr,  
sb plty - plty, arg cmt; SS: off wh -gy,  
frm, brit, vf -med gr, sb ang - sb  
blk, mod srt

MD: 3,069'  
TVD: 3,046.41'  
Inclination: 9.5 °  
Azimuth: 193.1 °  
VS: 104.87'

SHY SS: lt - med gy, frm, brit, vf - f  
gr, sb ang - sb blk, mod w srt, arg  
cmt, sl calc ip ; grdg to SHY SLTST:  
lt - med gy, mod frm - frm, brit, vf gr,  
sb plty - plty, arg cmt; SS: off wh -gy,  
frm, brit, vf -med gr, sb ang - sb  
blk, mod srt

MD: 3,164'  
TVD: 3,140.1'  
Inclination: 9.6 °  
Azimuth: 193.5 °  
VS: 111.36'



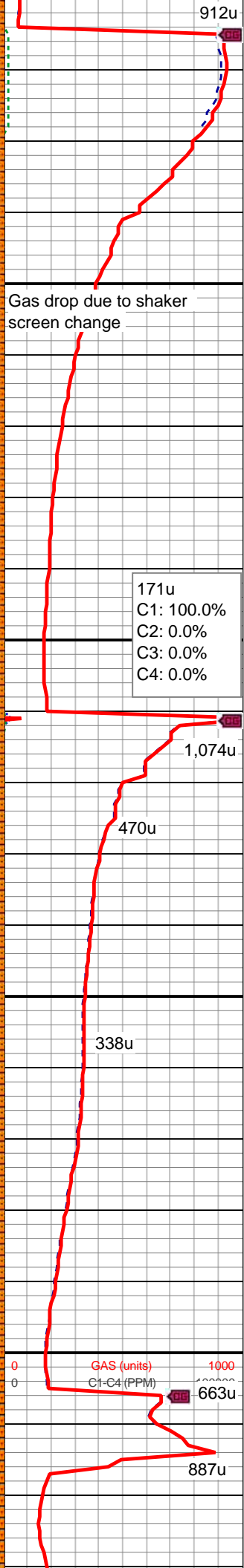
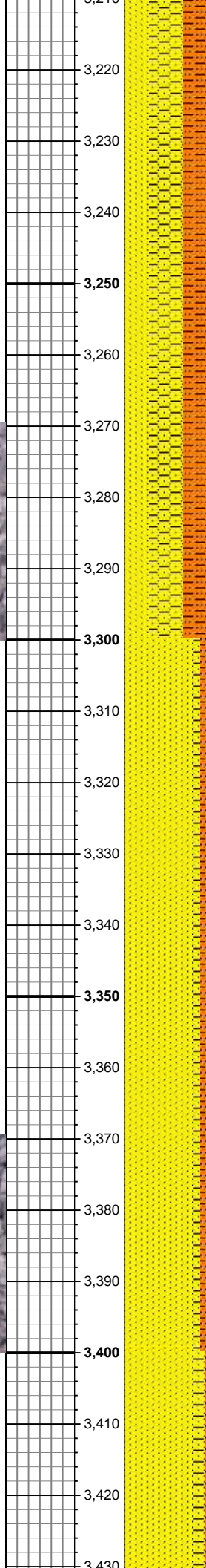
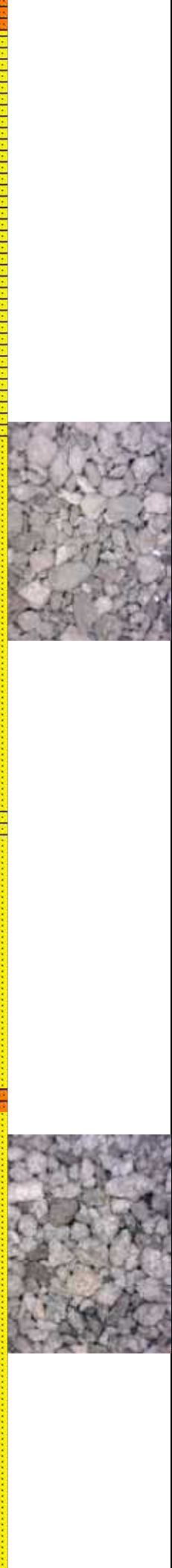
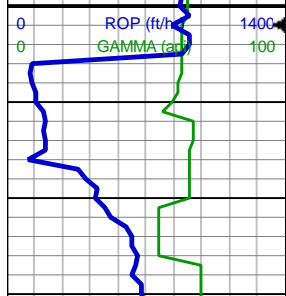


78

100

49

69



912u

Gas drop due to shaker screen change

171u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

1,074u

470u

338u

663u

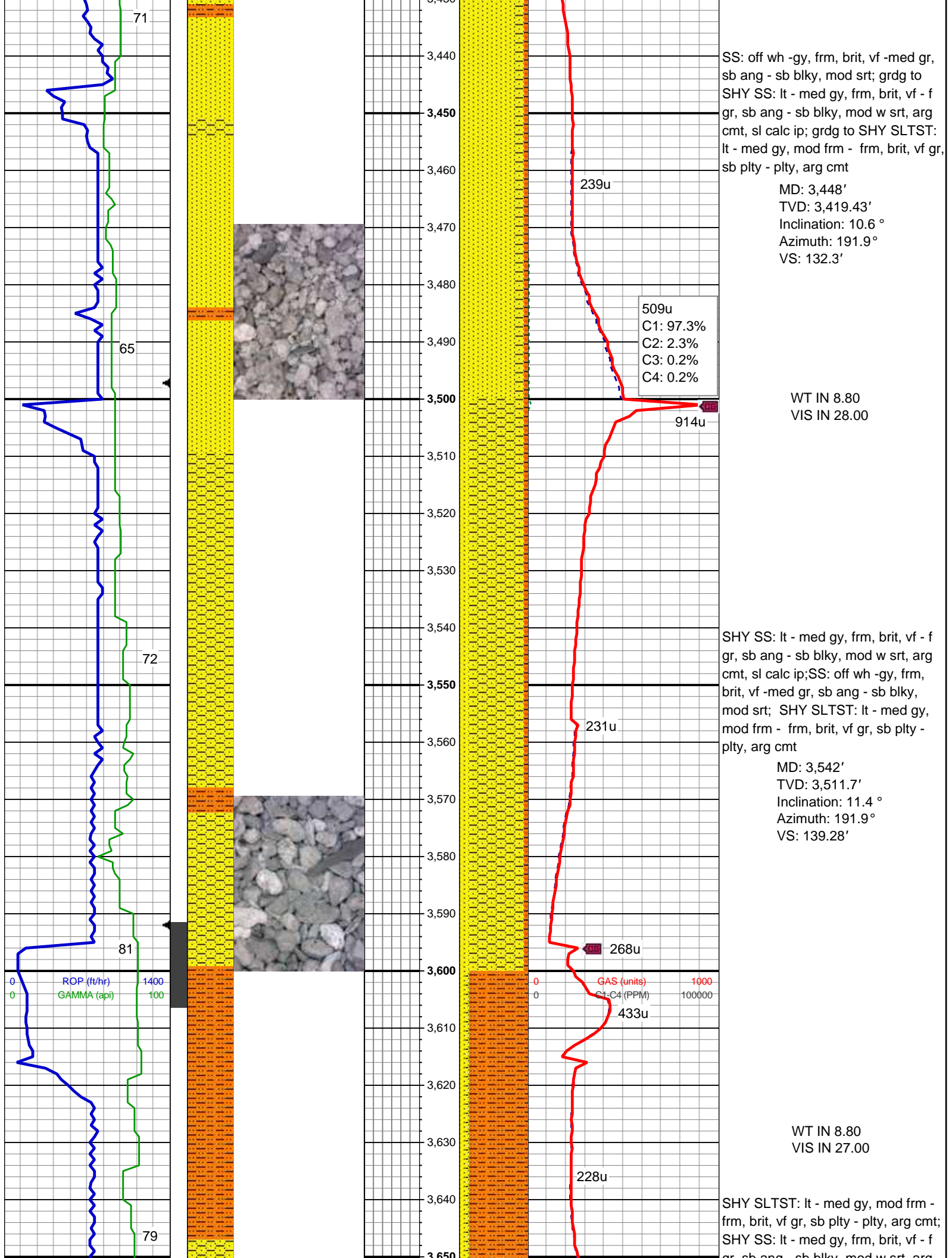
887u

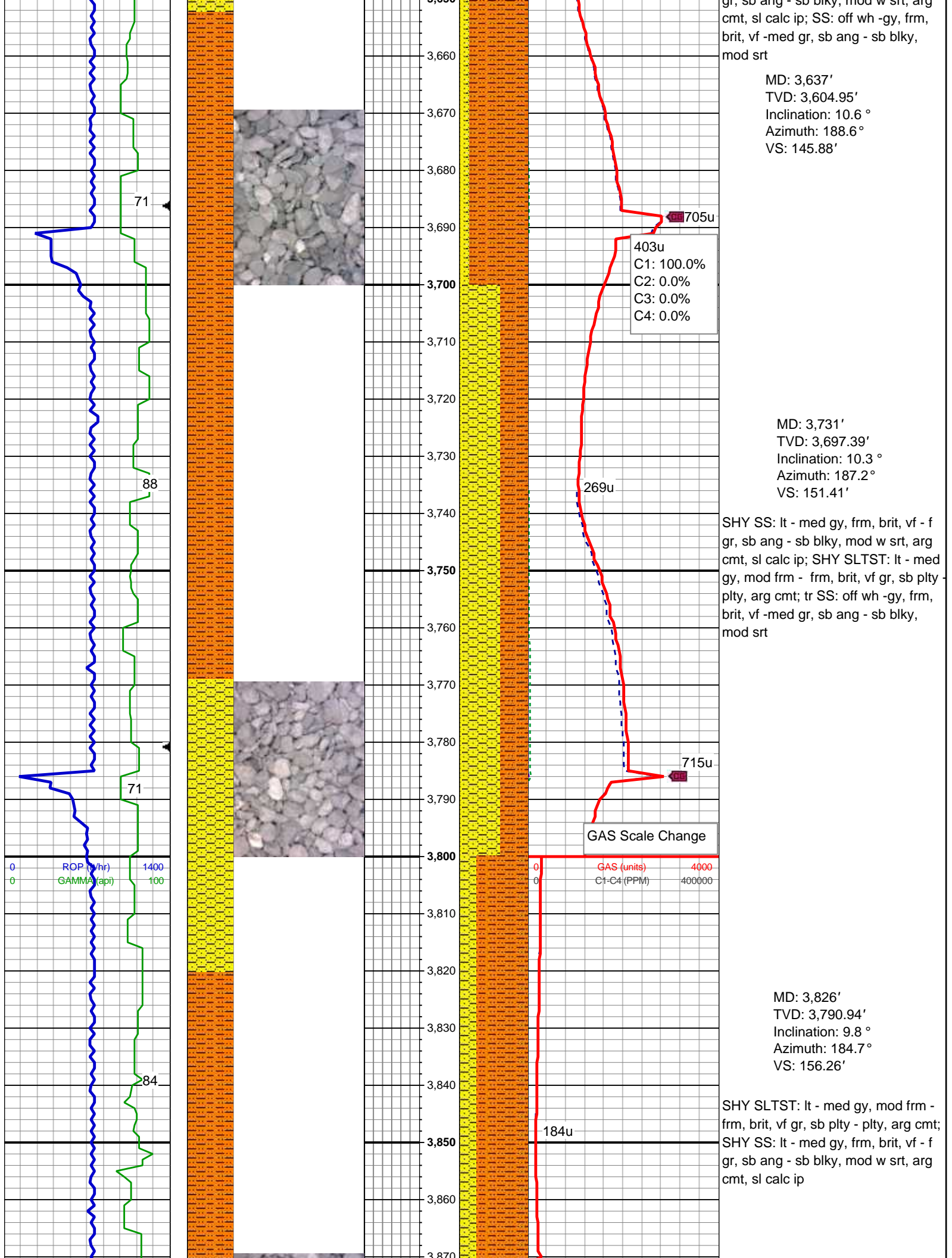
SHY SS: lt - med gy, frm, brit, vf - f gr, sb ang - sb blk, mod w srt, arg cmt, sl calc ip ; grdg to SHY SLTST: lt - med gy, mod frm - frm, brit, vf gr, sb plty - plty, arg cmt; SS: off wh -gy, frm, brit, vf -med gr, sb ang - sb blk, mod srt

MD: 3,258'  
TVD: 3,232.68'  
Inclination: 10.3 °  
Azimuth: 192.8 °  
VS: 118.01'

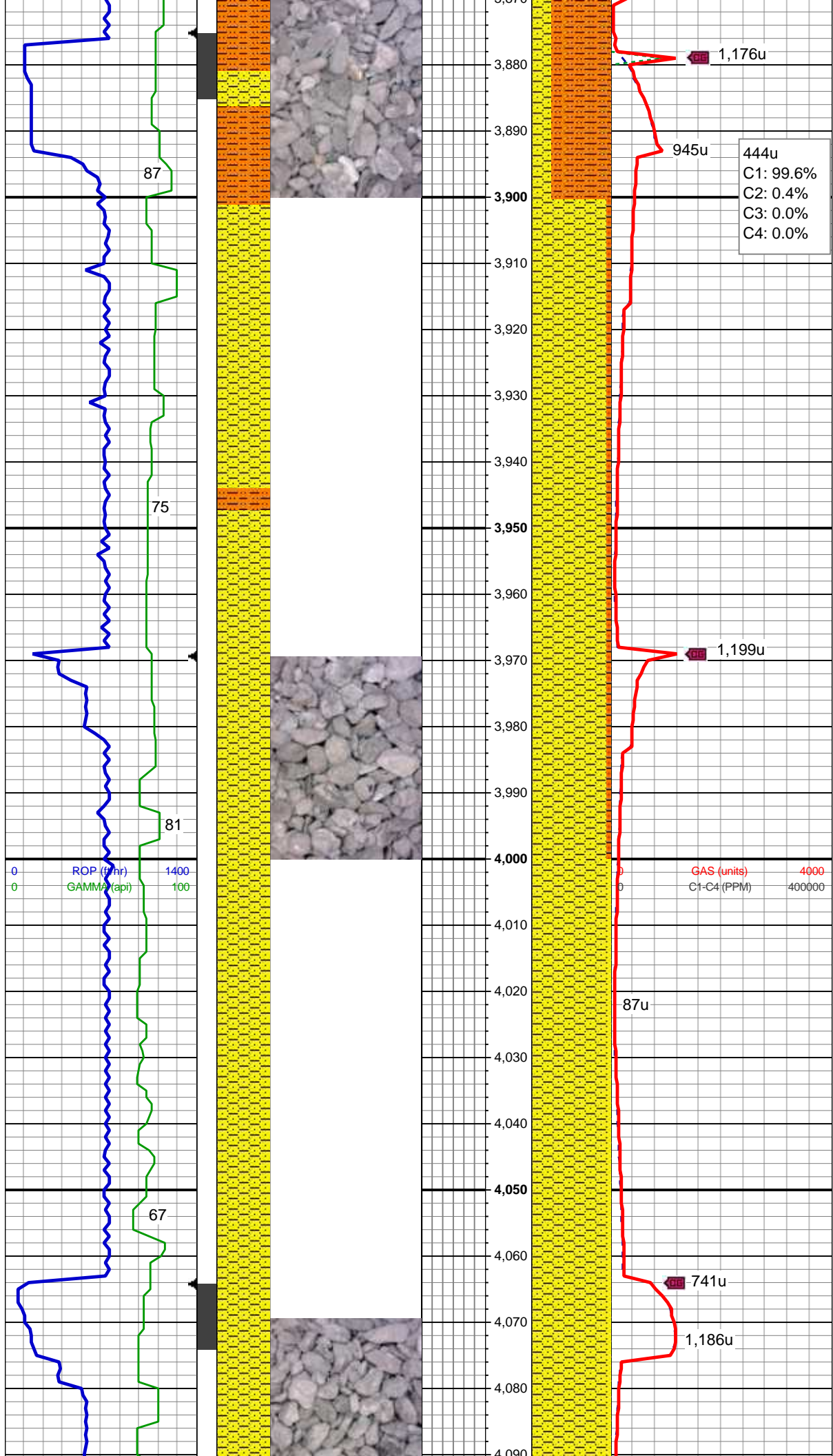
SS: off wh -gy, frm, brit, vf -med gr, sb ang - sb blk, mod srt; SHY SS: lt - med gy, frm, brit, vf - f gr, sb ang - sb blk, mod w srt, arg cmt, sl calc ip ; grdg to SHY SLTST: lt - med gy, mod frm - frm, brit, vf gr, sb plty - plty, arg cmt

MD: 3,353'  
TVD: 3,326.08'  
Inclination: 10.8 °  
Azimuth: 193.7 °  
VS: 125.17'







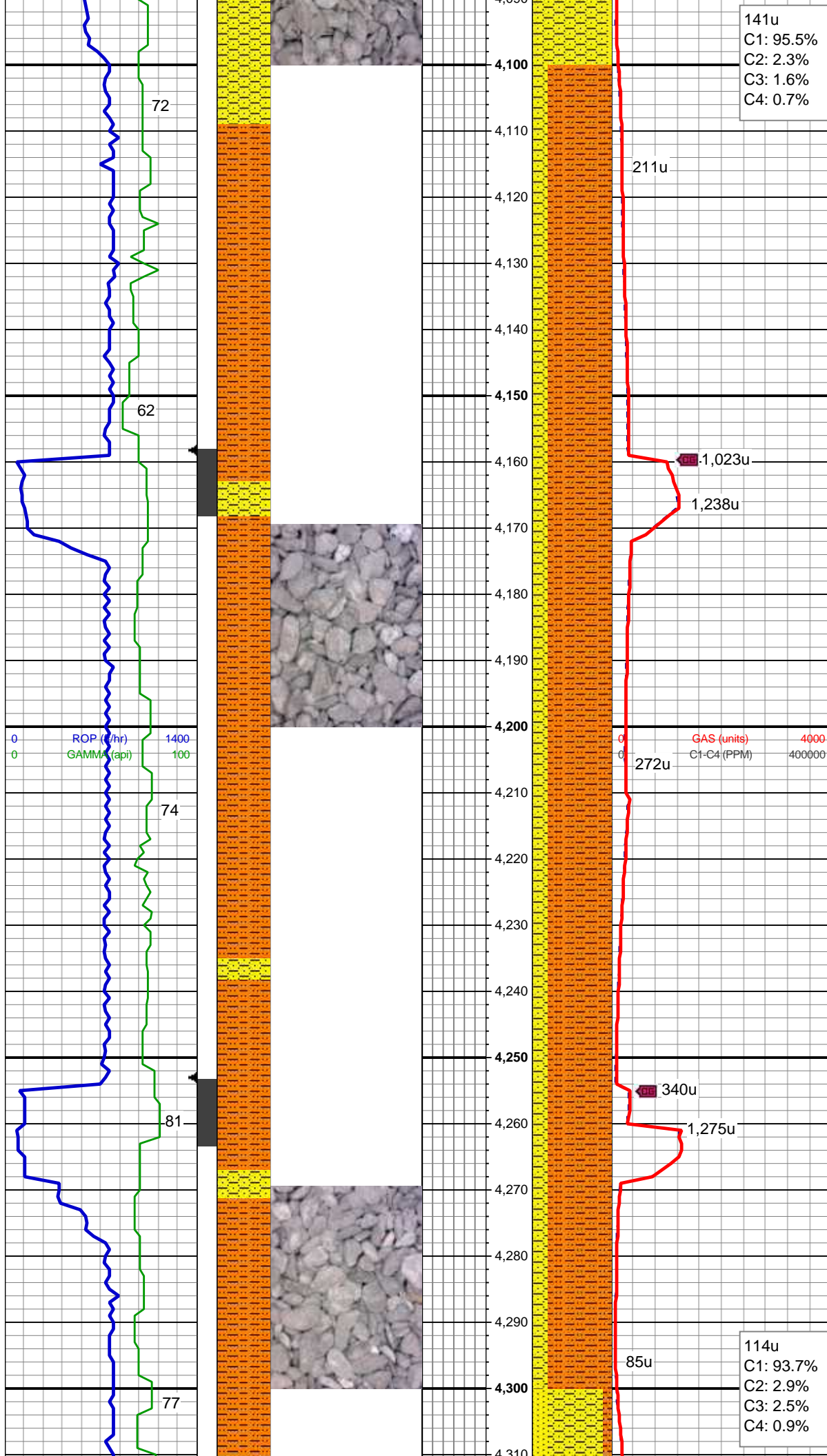


MD: 3,920'  
TVD: 3,883.54'  
Inclination: 10 °  
Azimuth: 186.1 °  
VS: 160.83'

SHY SS: lt - med gy, frm, brit, vf - f  
gr, sb ang - sb blk, mod w srt, arg  
cmt, sl calc ip; SHY SLTST: lt - med  
gy, mod frm - frm, brit, vf gr, sb plty -  
plty, arg cmt

MD: 4,015'  
TVD: 3,977.14'  
Inclination: 9.7 °  
Azimuth: 185.2 °  
VS: 165.5'

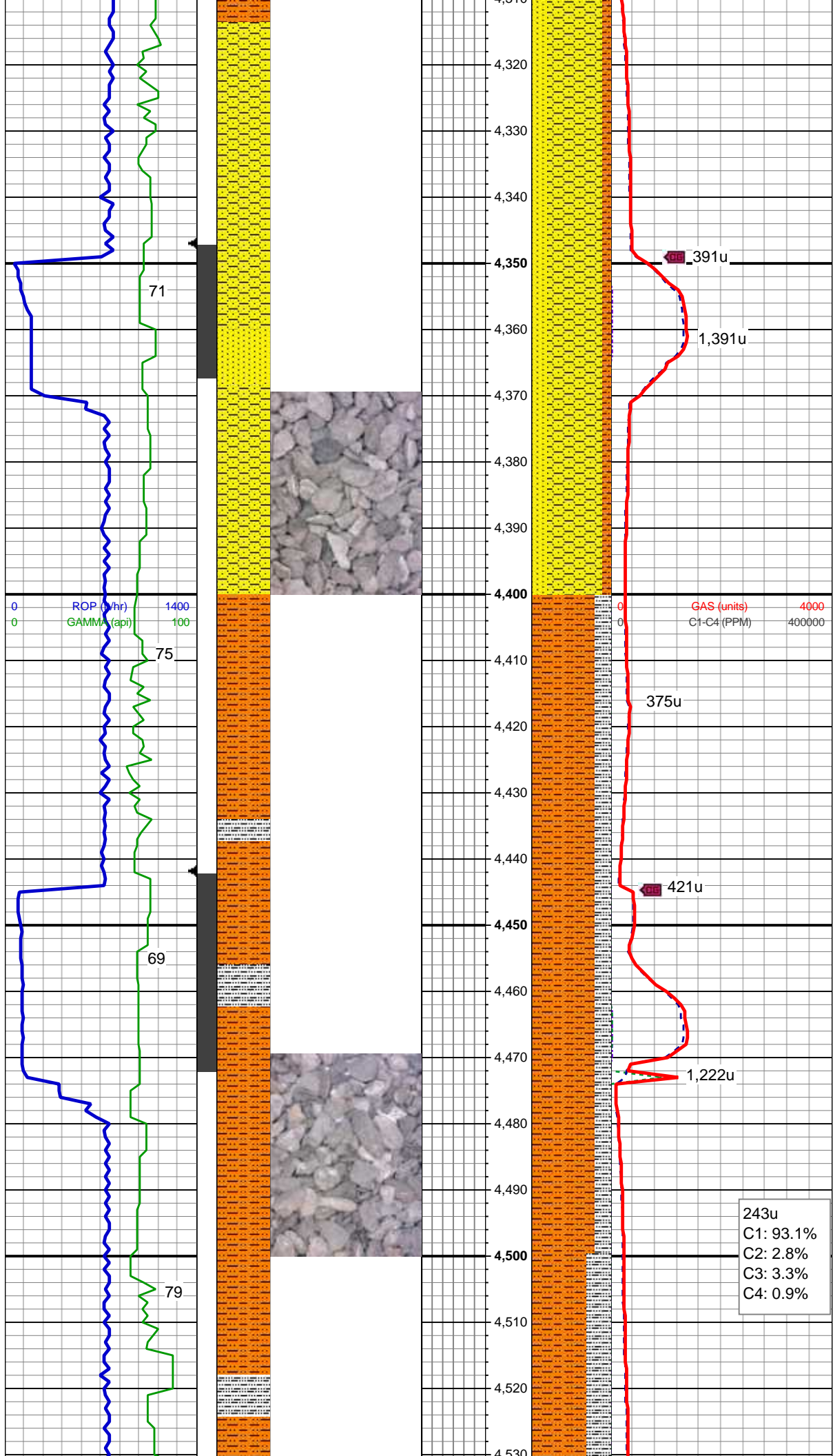
SHY SS: lt - med gy, frm, brit, vf - f  
gr, sb ang - sb blk, mod w srt, arg  
cmt, sl calc ip



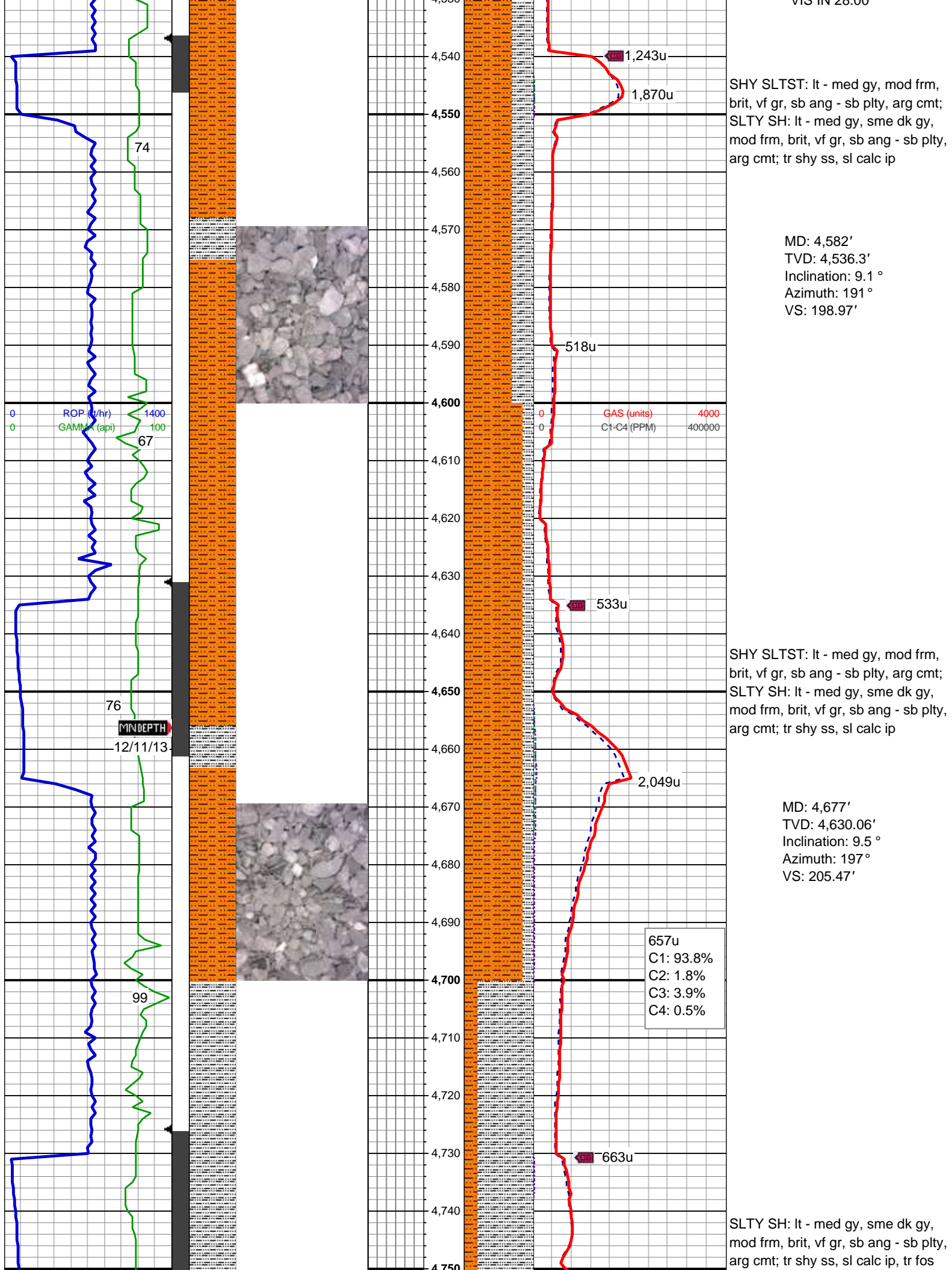
SHY SLTST: lt - med gy, mod frm - frm, brit, vf gr, sb plty - plty, arg cmt;  
SHY SS: lt - med gy, frm, brit, vf - f gr, sb ang - sb blk, mod w srt, arg cmt, sl calc ip

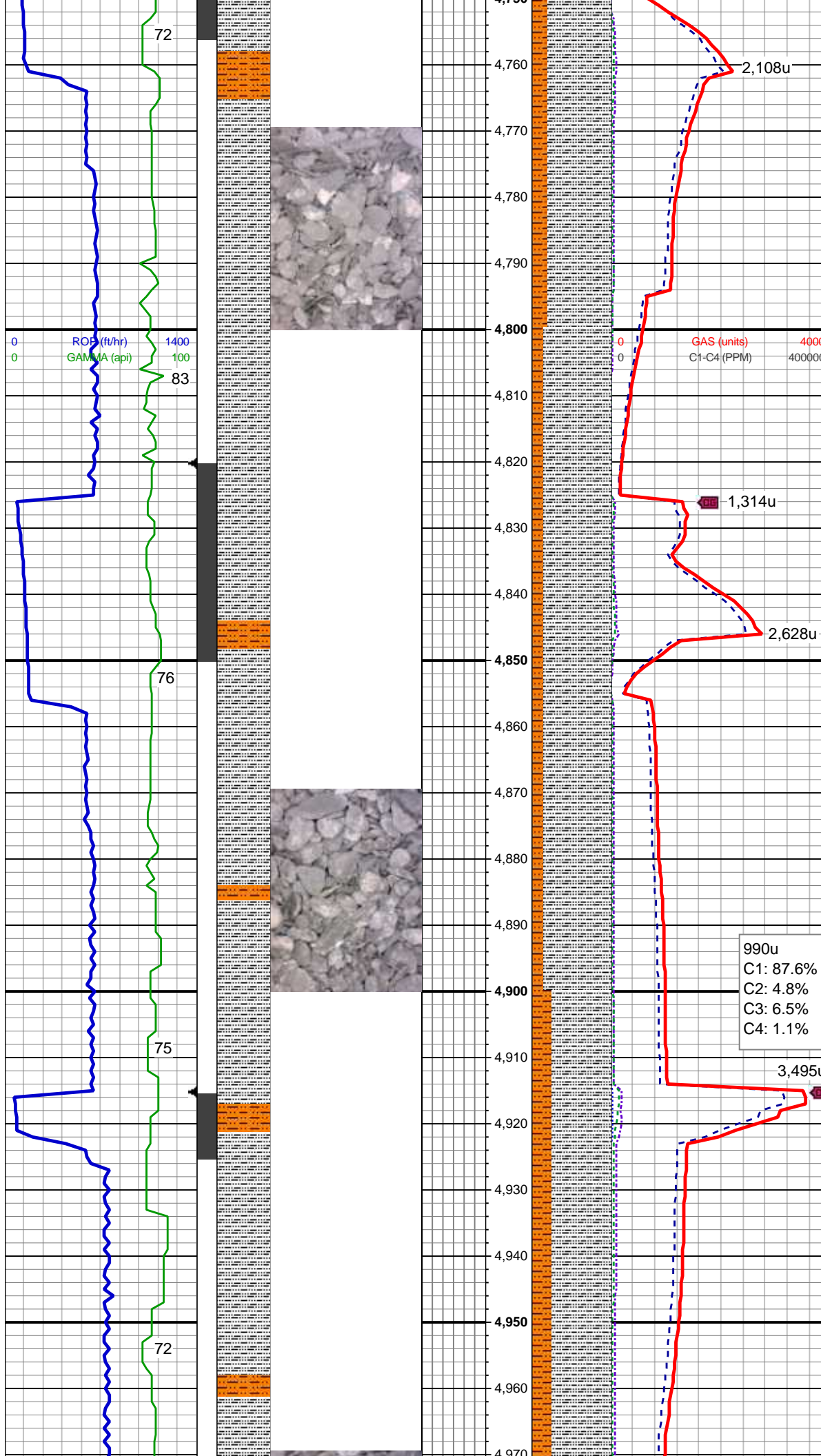
SHY SLTST: lt - med gy, mod frm - frm, brit, vf gr, sb plty - plty, arg cmt;  
SHY SS: lt - med gy, frm, brit, vf - f gr, sb ang - sb blk, mod w srt, arg cmt, sl calc ip











frags; SHY SLTST: lt - med gy, mod frm, brit, vf gr, sb ang - sb plty, arg cmt

MD: 4,771'  
TVD: 4,722.73'  
Inclination: 9.8 °  
Azimuth: 192.1 °  
VS: 212.26'

WT IN 8.90  
VIS IN 38.00

SLTY SH: lt - med gy, sme dk gy, mod frm, brit, vf gr, sb ang - sb plty, arg cmt; tr shy ss, sl calc ip; SHY SLTST: lt - med gy, mod frm, brit, vf gr, sb ang - sb plty, arg cmt

MD: 4,866'  
TVD: 4,816.2'  
Inclination: 10.8 °  
Azimuth: 189.1 °  
VS: 218.5'

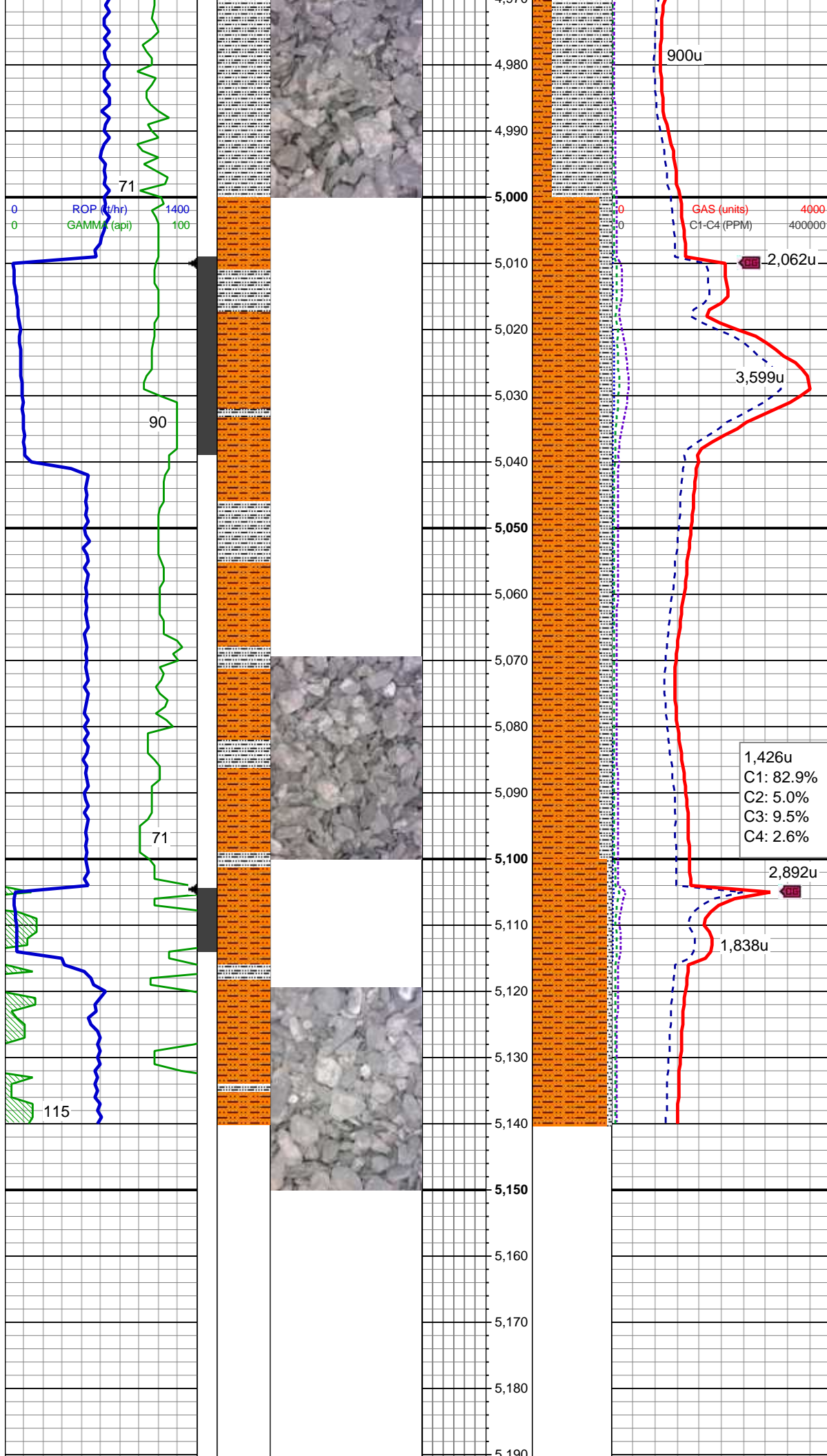
990u  
C1: 87.6%  
C2: 4.8%  
C3: 6.5%  
C4: 1.1%

SLTY SH: lt - med gy, sme dk gy, mod frm, brit, vf gr, sb ang - sb plty, arg cmt; tr shy ss, sl calc ip; SHY SLTST: lt - med gy, mod frm, brit, vf gr, sb ang - sb plty, arg cmt

MD: 4,960'  
TVD: 4,908.77'  
Inclination: 9.2 °  
Azimuth: 192.3 °



VS: 224.51'



WT IN 9.10  
VIS IN 39.00

SHY SLTST: lt - med gy, mod frm,  
brit, vf gr, sb ang - sb plty, arg cmt;  
SLTY SH: lt - med gy, sme dk gy,  
mod frm, brit, vf gr, sb ang - sb plty,  
arg cmt; tr shy ss, sl calc ip

MD: 5,055'  
TVD: 5,002.44'  
Inclination: 10 °  
Azimuth: 194.4 °  
VS: 231.06'

SHY SLTST: lt - med gy, mod frm,  
brit, vf gr, sb ang - sb plty, arg cmt;  
SLTY SH: lt - med gy, sme dk gy,  
mod frm, brit, vf gr, sb ang - sb plty,  
arg cmt; tr shy ss, sl calc ip

TD @ 5,140' MD  
12/11/2013 @ 02:58 hrs

TOOH FOR BHA #2  
LOG CONTINUES ON MPlot  
"TIMBRO STATE  
LD16-65HN(HORZ)"

Thank you for choosing



