

LOG created using LPLOT VH Version 3.0, August 19, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

OPERATOR: NOBLE ENERGY INC.
WELL: WELLS RANCH AA12-65-1HN
LOCATION: SEC 12 T6N 63W
COUNTY: WELD
STATE: COLORADO
SPOT: 1,152' FSL 215' FEL
ELEVATION: GL 4,858' KB 4,882'
FIELD: WATTENBERG
SPUD DATE: 8/14/2012
TD DATE: 8/16/2012
DATES LOGGED: 8/15/2012 - 8/16/2012 (VERTICAL)
DEPTHS LOGGED: 2,000' - 6,002' (VERTICAL)
LOGGERS: CHRIS COOK; CHRIS SCAHEL
DRILLING FLUID: LSND
DRILLING RIG: H&P 315
API: 05-123-35627
LOG TYPE: VERTICAL
SCALE: 1:240 (5 inches per 100 feet)
REMARKS: SEE CORRESPONDING HORIZONTAL LOG
WELLS_RANCH_AA12_65_1HN_HORZ.

LITHOLOGIES



Sandstone



Shaly Sandstone



Shaly Siltstone



Silty Shale

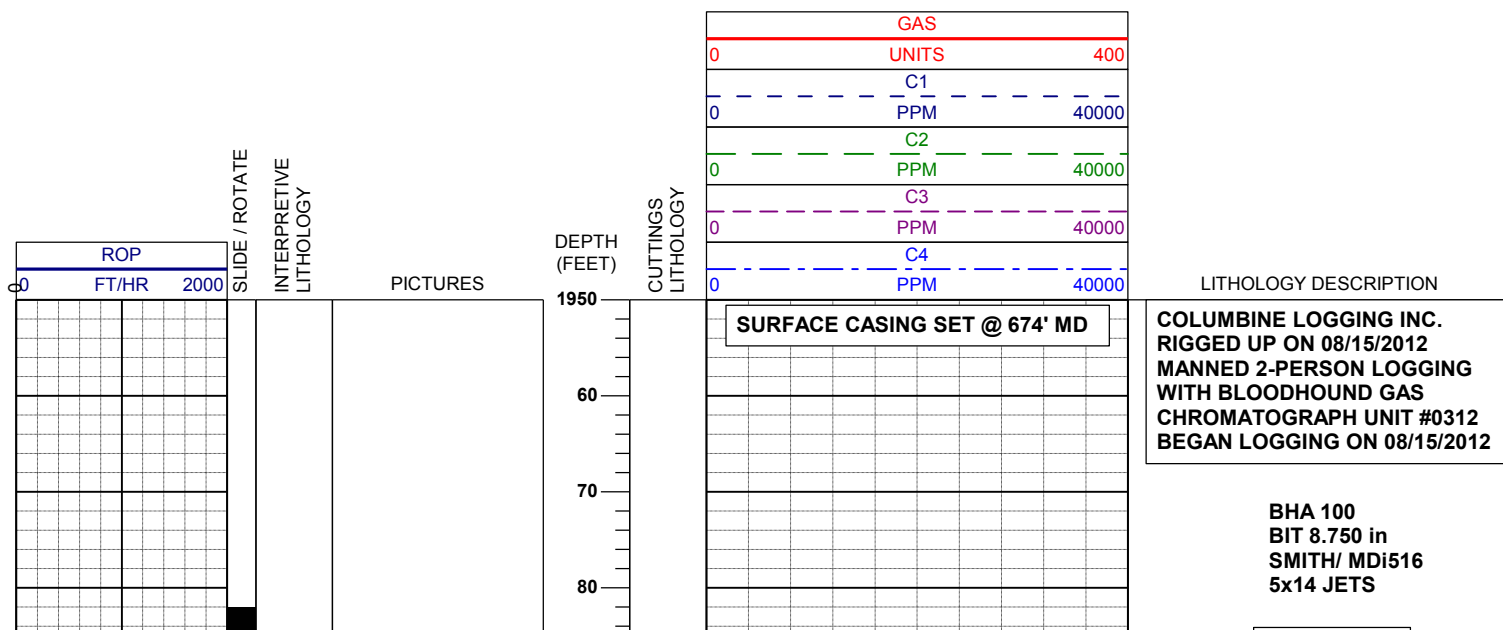
ENGINEERING SYMBOLS

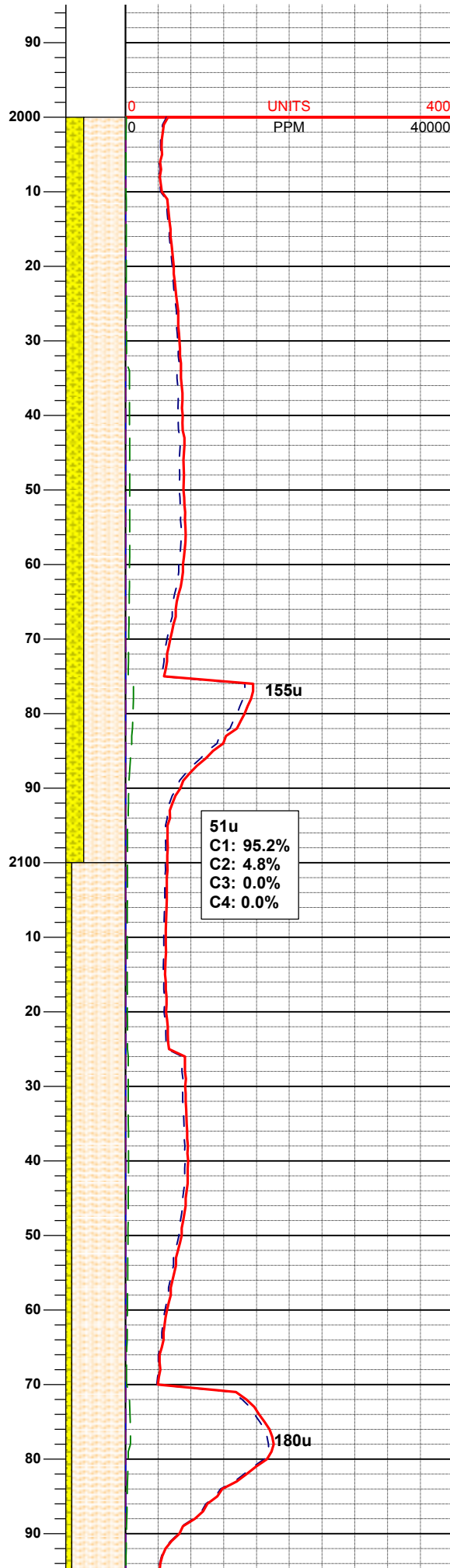
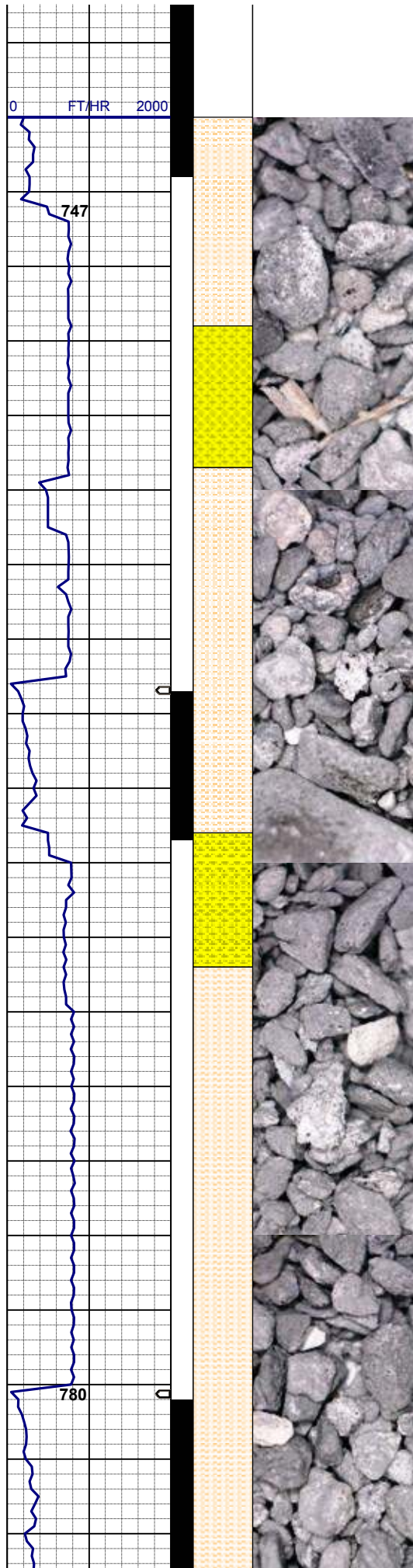


Connection



Midnight Depth





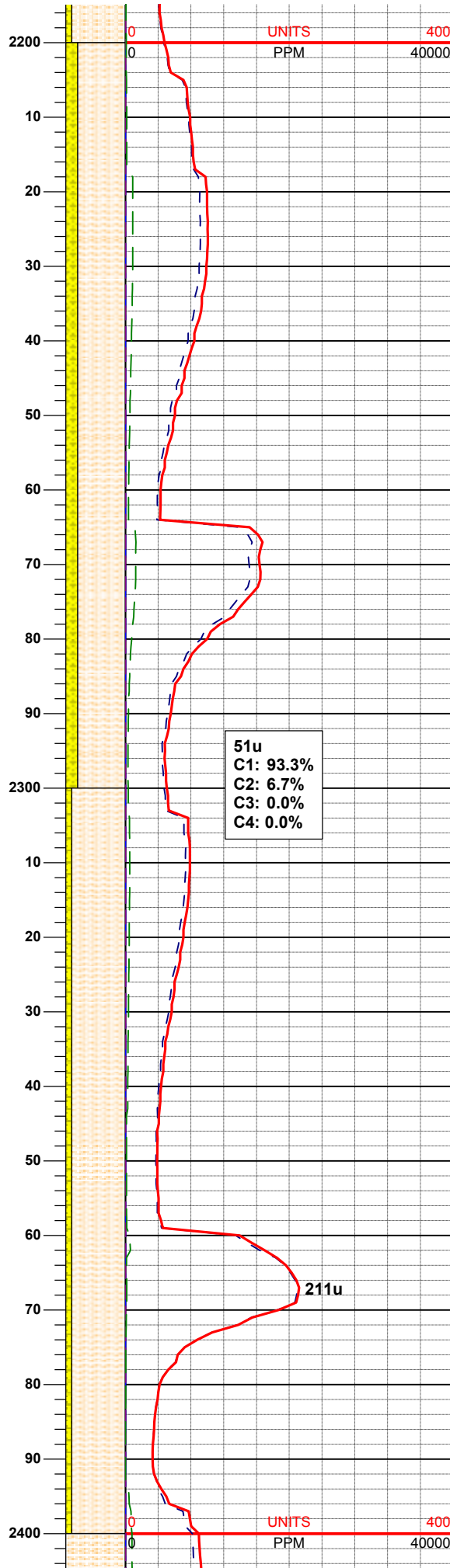
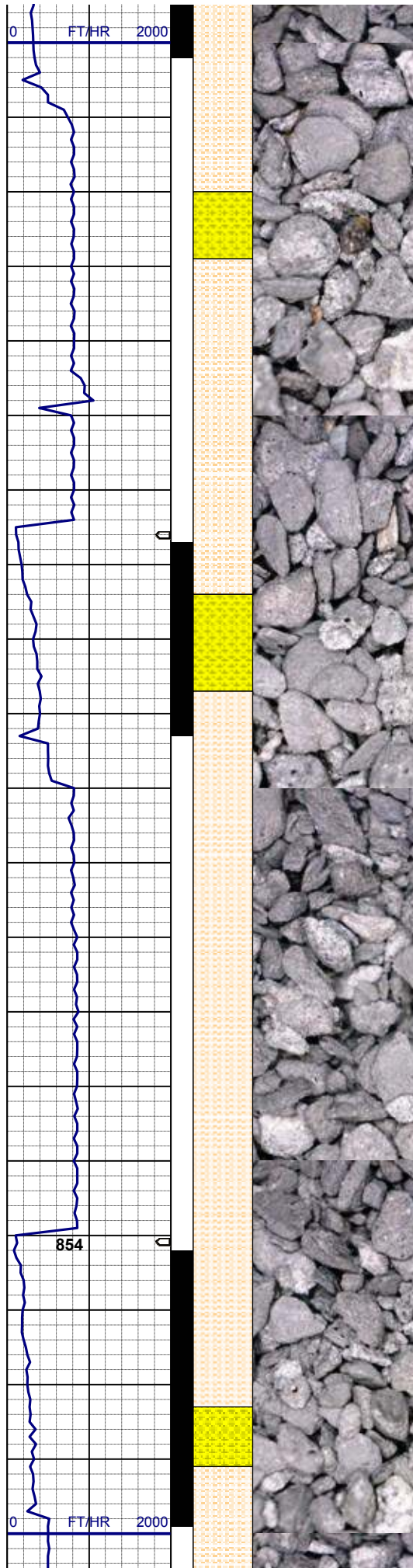
08/15/2012
 Mud Wt: 8.60
 FVis: 29
 PVis: 4
 YP: 4
 GELS: -/-/
 API Filt: N/A
 CAKE: 1/0
 pH: 10.4
 Cl: 1,800
 Ca: 160

MD 2,020'
 TVD 2,019.47'
 INC 6.17°
 AZM 9.96°

SHYSLTST: ltgy - mgy, sbply-sbrd,
 slty - gt tex, p por, arg cmt
 SHYSS: lt gy, wh, sme s&p, slty, sbrd
 - sbang, tt clus, brit-fri, v calc cmt

MD 2,115'
 TVD 2,113.90'
 INC 6.42°
 AZM 19.36°

SHYSLTST: ltgy - mgy, sbply-sbrd,
 slty - gt tex, p por, arg cmt
 SHYSS: lt gy, wh, sme s&p, slty, sbrd



51u
C1: 93.3%
C2: 6.7%
C3: 0.0%
C4: 0.0%

SHYSS: lt gy, wh, sme s&p, slty, sbrd
- sbang, tt clus, brit-fri, v calc cmt

MD 2,210'
TVD 2,208.09'
INC 8.52°
AZM 26.27°

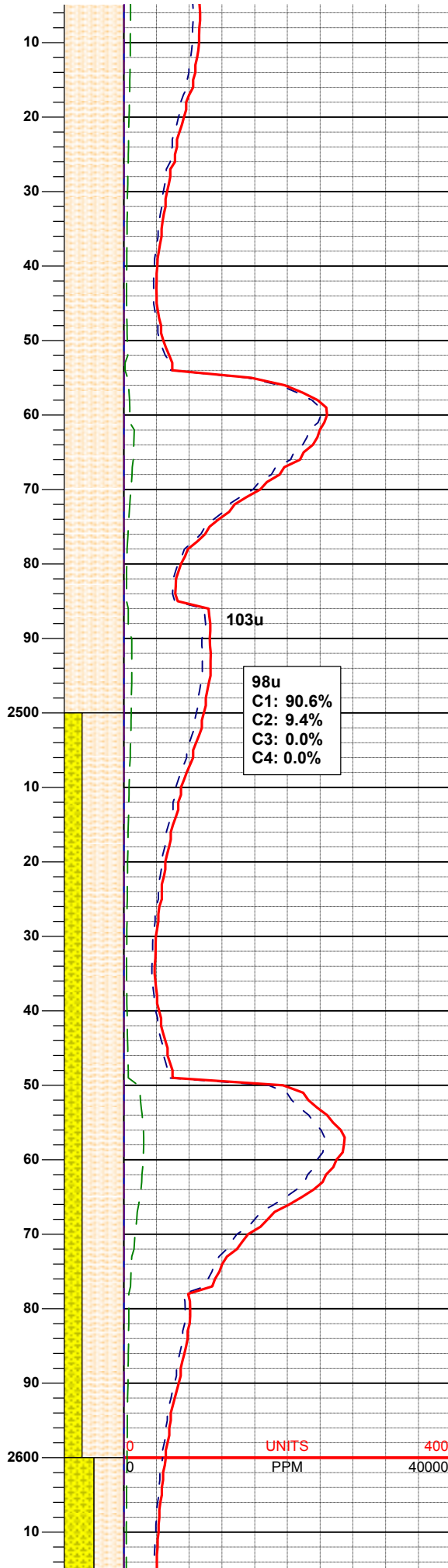
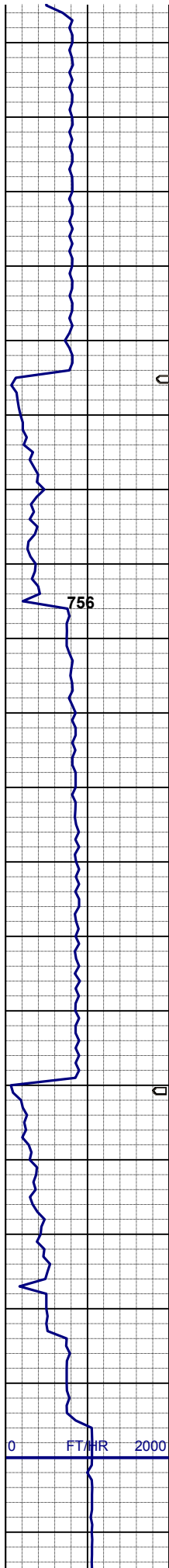
SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt
SHYSS: lt gy, wh, sme s&p, slty, sbrd
- sbang, tt clus, brit-fri, v calc cmt

MD 2,305'
TVD 2,301.85'
INC 9.99°
AZM 19.41°

MUD WT 8.60/8.75
VIS 29/29 IN/OUT

SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt
SHYSS: lt gy, wh, sme s&p, slty, sbrd
- sbang, tt clus, brit-fri, v calc cmt

MD 2,400'
TVD 2,395.14'
INC 11.80°



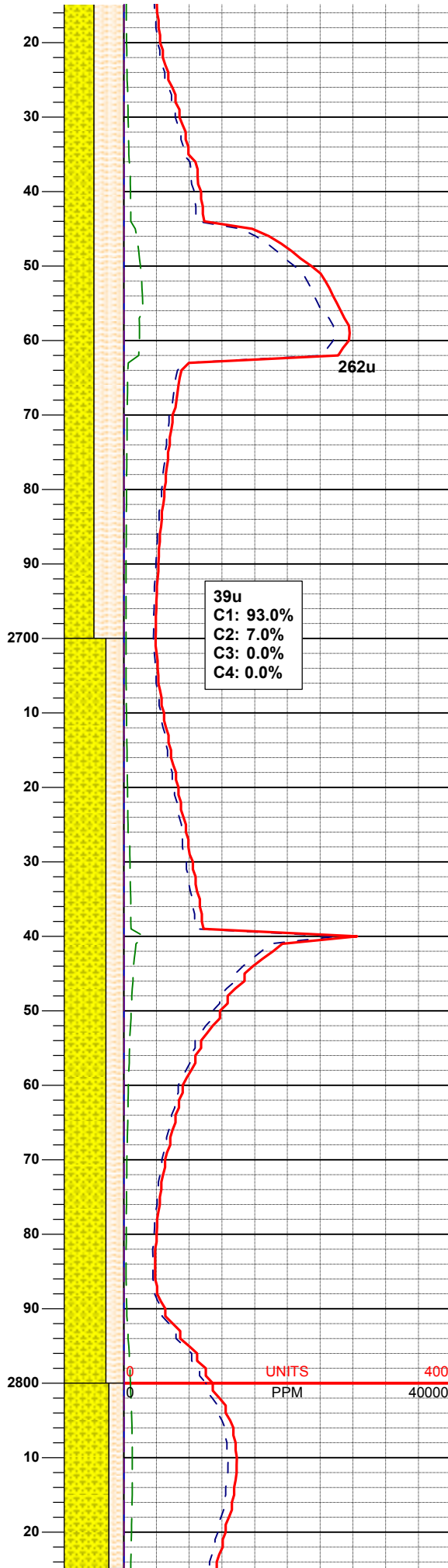
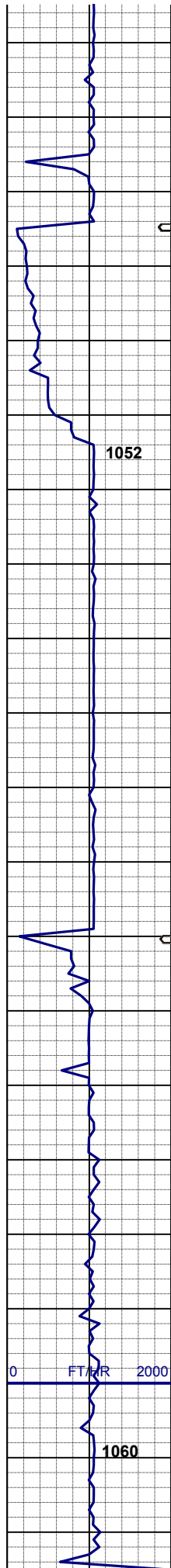
AZM 15.25°

SHYSLTST: ltgy - mgy, gybrn, sbply-sbrd, slty - gt tex, p por, calc cmt

MD 2,495'
TVD 2,487.89'
INC 13.20°
AZM 7.92°

SHYSLTST: ltgy - mgy, gybrn, sbply-sbrd, slty - gt tex, p por, arg cmt
SHYSS: lt gy, wh, sme s&p, slty, sbrd - sbang, tt clus, brit-fri, v calc cmt

MD 2,590'
TVD 2,580.26'
INC 13.82°
AZM 7.17°

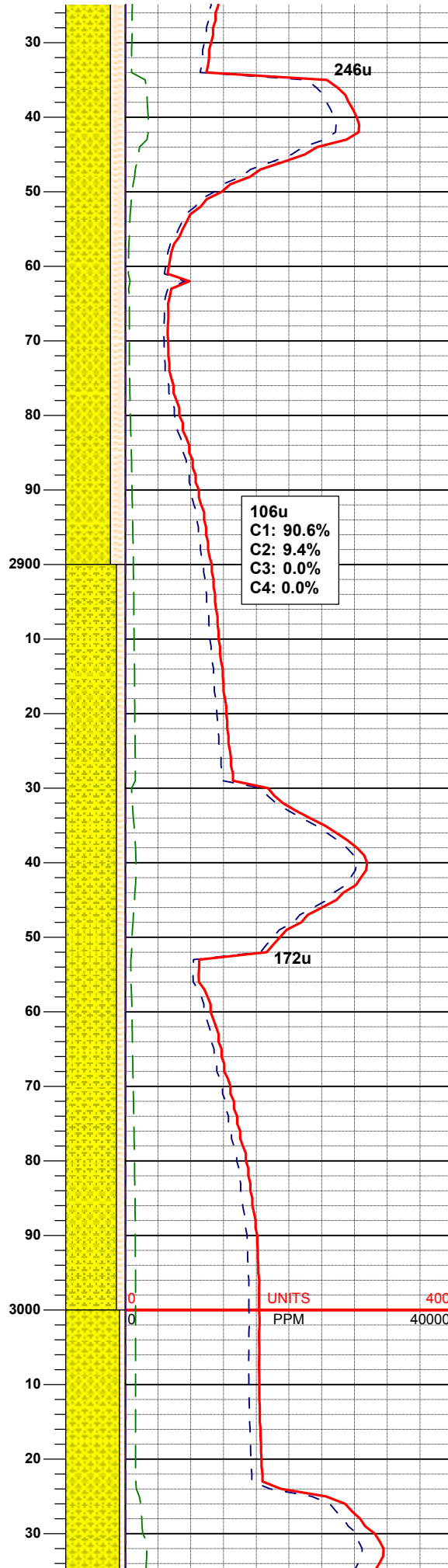
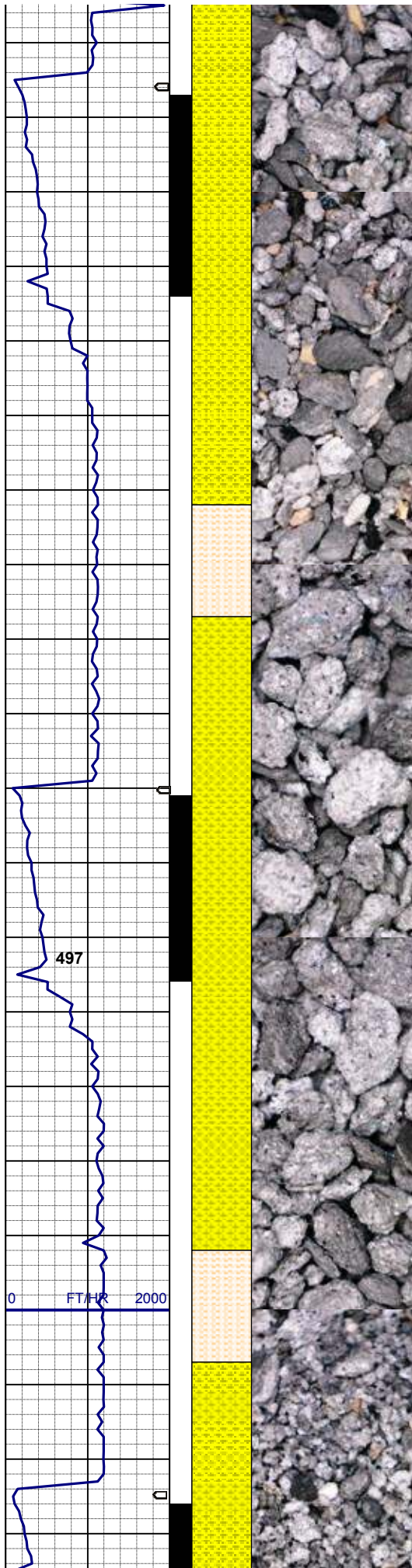


MD 2,685'
TVD 2,672.37'
INC 14.50°
AZM 5.38°

SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt
SHYSS: wh, lt gy, fros, spec w/ mica,
slty, sbrd - sbang, tt clus, brit-fri, v
calc cmt

MD 2,780'
TVD 2,764.65'
INC 12.96°
AZM 5.26°

SHYSS: wh, lt gy, fros, spec w/ mica,
slty, sbrd - sbang, tt clus, brit-fri, v
calc cmt
SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt

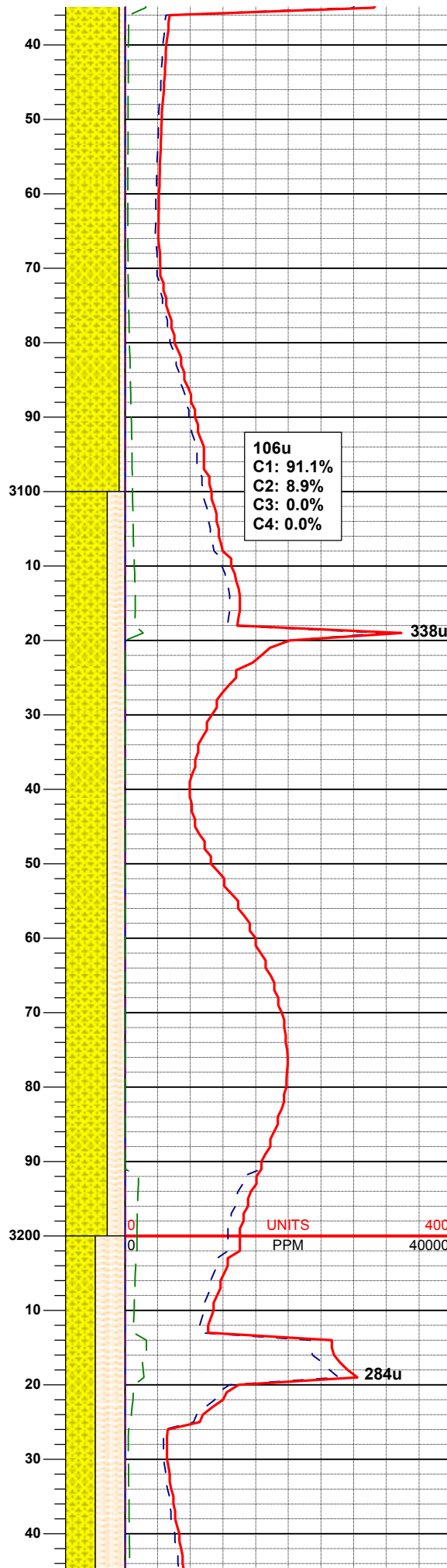
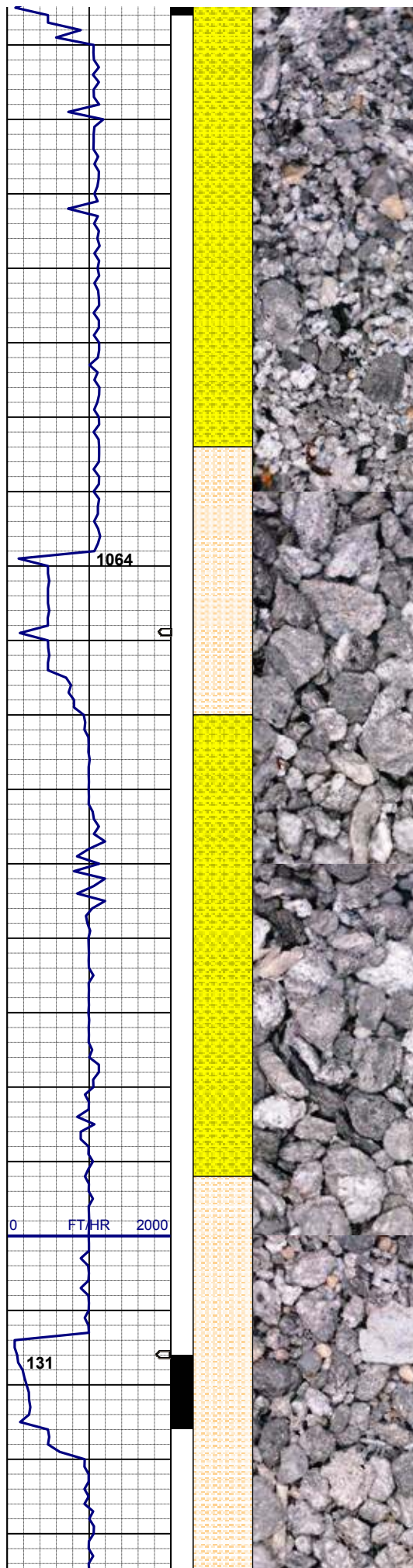


MD 2,874'
TVD 2,856.17'
INC 13.45°
AZM 7.60°

SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbrd - sbang, tt clus, brit-fri, v calc cmt
SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt

MD 2,969'
TVD 2,948.41'
INC 14.21°
AZM 11.40°

SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbrd - sbang, tt clus, brit-fri, v calc cmt
dk gn glau, spec w/ mica
SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt



MD 3,064'
TVD 3,040.43'
INC 14.61°
AZM 10.25°

MUD WT 8.90/8.85
VIS 31/31 IN/OUT

SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbrd - sbang, tt clus, brit-fri, v calc cmt
dk gn glau, spec w/ mica
SHYSLTST: ltgy - mgy, gybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt

106u
C1: 91.1%
C2: 8.9%
C3: 0.0%
C4: 0.0%

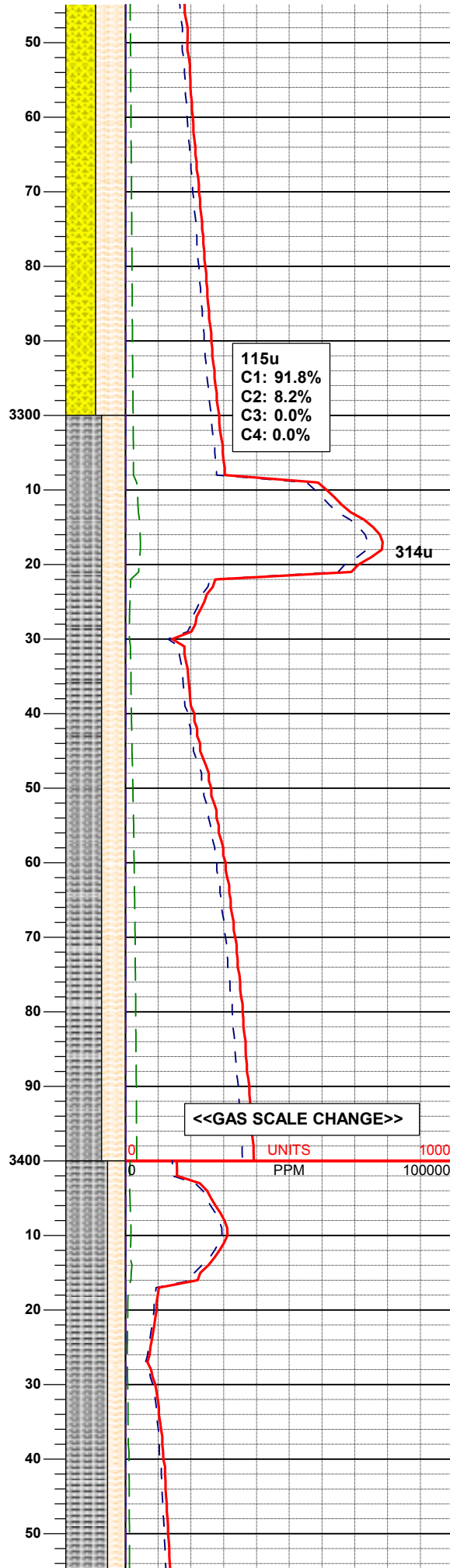
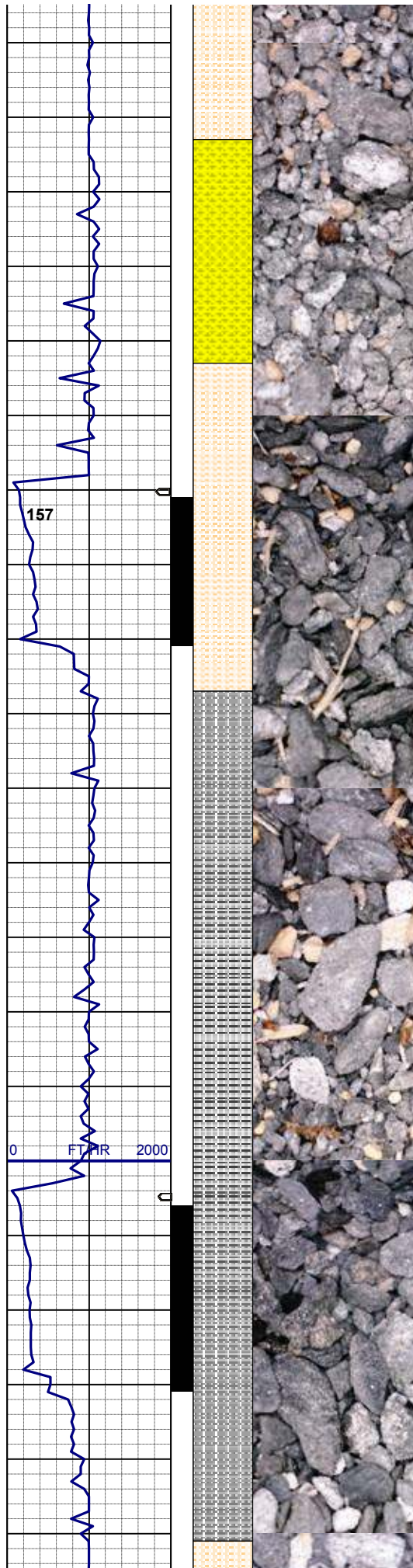
338u

MD 3,159'
TVD 3,132.47'
INC 14.05°
AZM 9.73°

SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbrd - sbang, tt clus, brit-fri, v calc cmt
dk gn glau, spec w/ mica
SHYSLTST: ltgybrn - mgybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt

UNITS
PPM

284u



MD 3,254'
TVD 3,224.78'
INC 13.26°
AZM 10.17°

SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbrd - sbang, tt clus, brit-fri, v calc cmt
dk gn glau, spec w/ mica
SHYSLTST: ltgybrn - mgybrn, sbply-
sbrd, slty - gt tex, p por, arg cmt

115u
C1: 91.8%
C2: 8.2%
C3: 0.0%
C4: 0.0%

314u

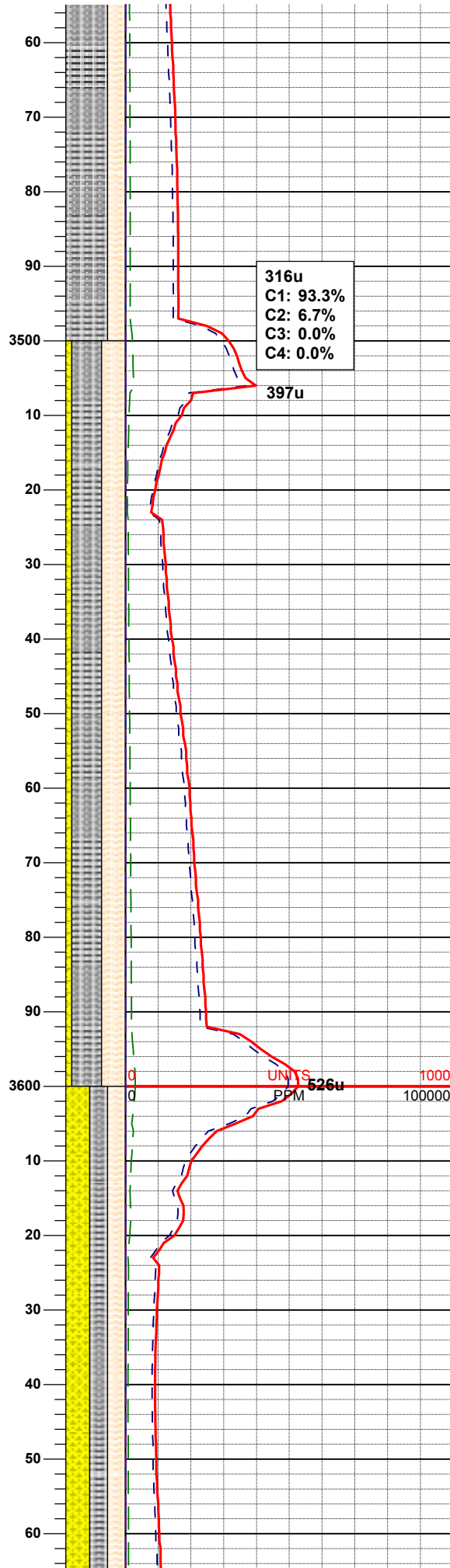
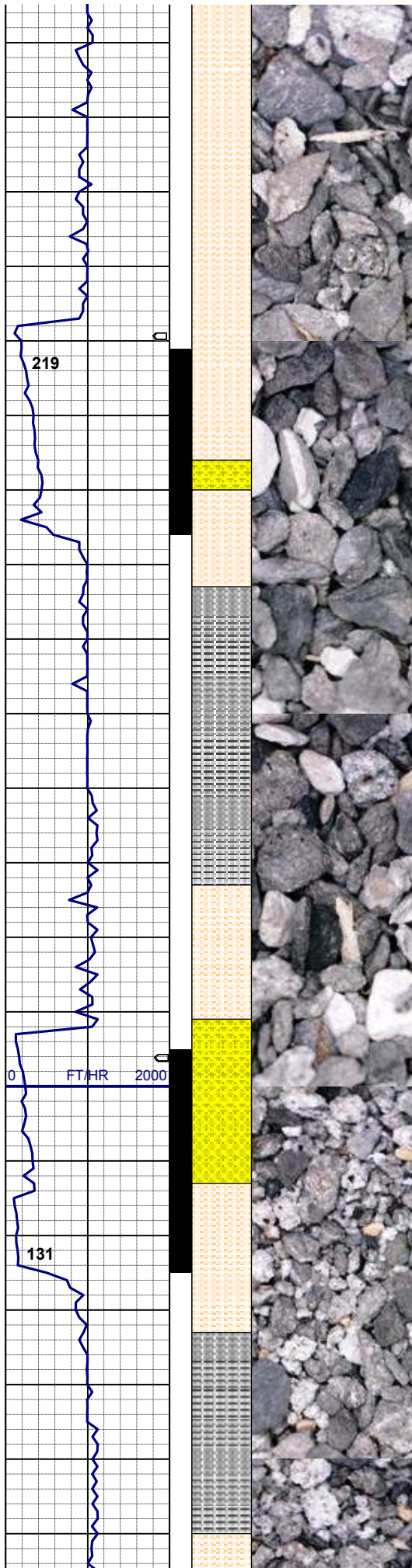
MD 3,349'
TVD 3,317.23'
INC 13.39°
AZM 12.36°

SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam, v sl calc ip
SHYSLTST: wh, ltgy - mgy, mod hd,
sbrd -w rd, gt tex, brit, calc cmt

<<GAS SCALE CHANGE>>

UNITS
PPM
1000
100000

MD 3,444'
TVD 3,409.69'
INC 13.15°
AZM 12.78°

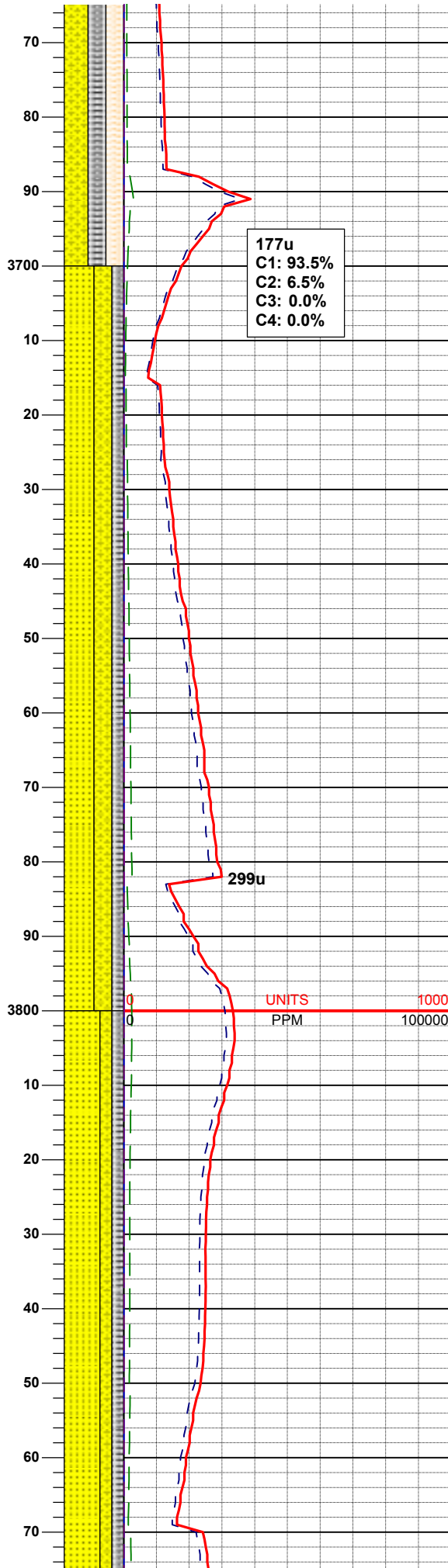
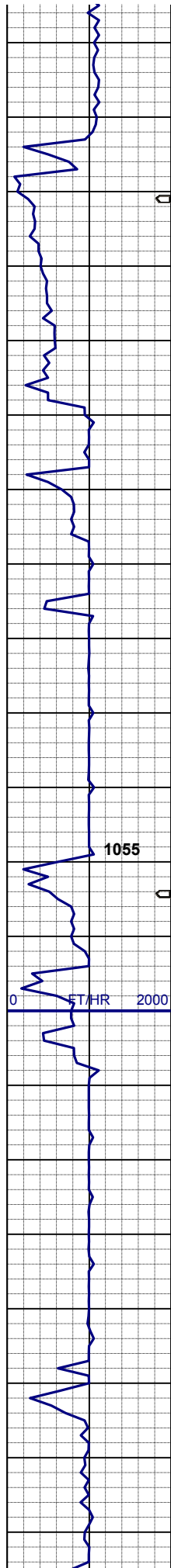


SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam, v sl calc ip
SHYSLTST: wh, ltgy - mgy, mod hd,
sbrd -w rd, gt tex, brit, calc cmt

MD 3,538'
TVD 3,501.33'
INC 12.57°
AZM 10.93°

SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam, v sl calc ip
SHYSLTST: wh, ltgy, mod hd, sbang -
sbrd, gt tex, brit, calc cmt
SHYSS: wh, lt gy, clr - fros, s&p, slty,
sbang - ang, tt clus, brit-fri, v calc cmt

MD 3,633'
TVD 3,594.02'
INC 12.76°
AZM 8.97°



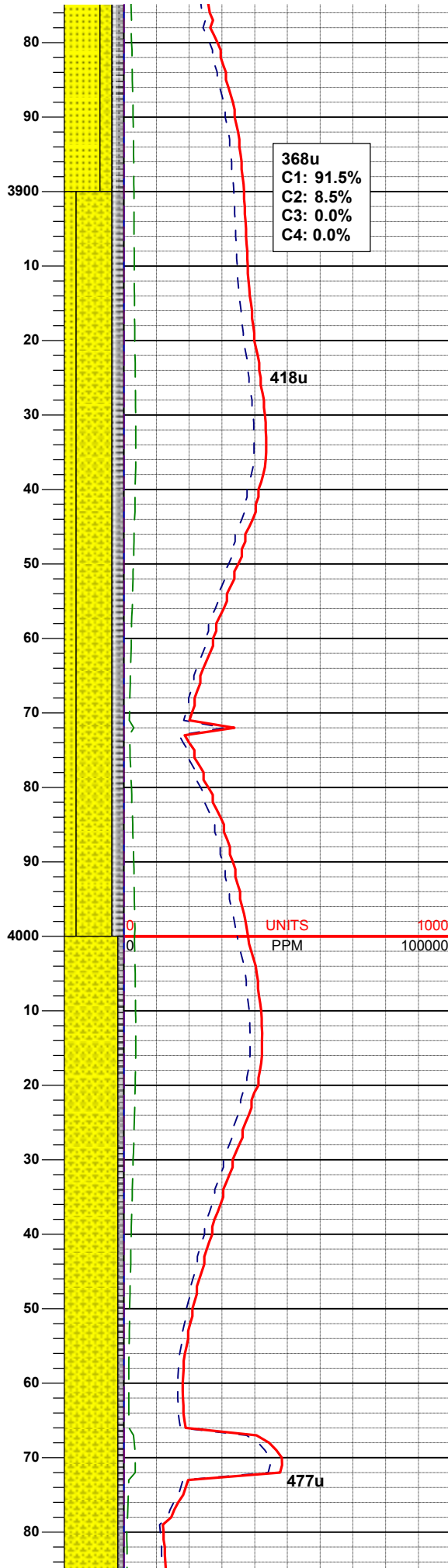
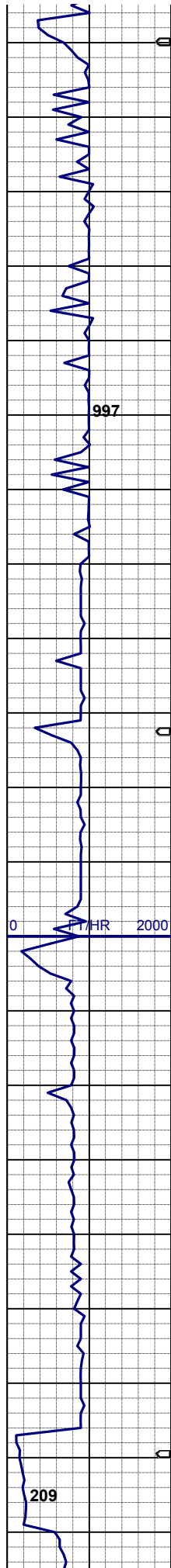
SHYSS: wh, lt gy, clr - fros, s&p, slty, sbang - ang, brit-fri clus, v calc cmt
SLTYSH: mgy - dkgy, firm - hd, sbply - pty, sme thn lam, v sl calc ip
SHYSLTST: wh, ltgy, mod hd, sbang - sbrd, gt tex, brit, calc cmt

**TOP OF PARKMAN
@ 3,700' MD 3,655' TVD**

**MD 3,728'
TVD 3,686.42'
INC 14.09°
AZM 9.36°**

SS: wh, clr - trnsl, spec w/ mica, ang - sbang, p srt, p consol, f-vf gr, v calc cmt
SHYSS: wh, ltgy - mgy, sbang - ang, mod srt, mod consol, smwt calc cmt
SLTYSH: mgy - dkgy, firm - hd, sbply - pty, sme thn lam,

**MD 3,823'
TVD 3,778.43'
INC 14.73°
AZM 9.71°**



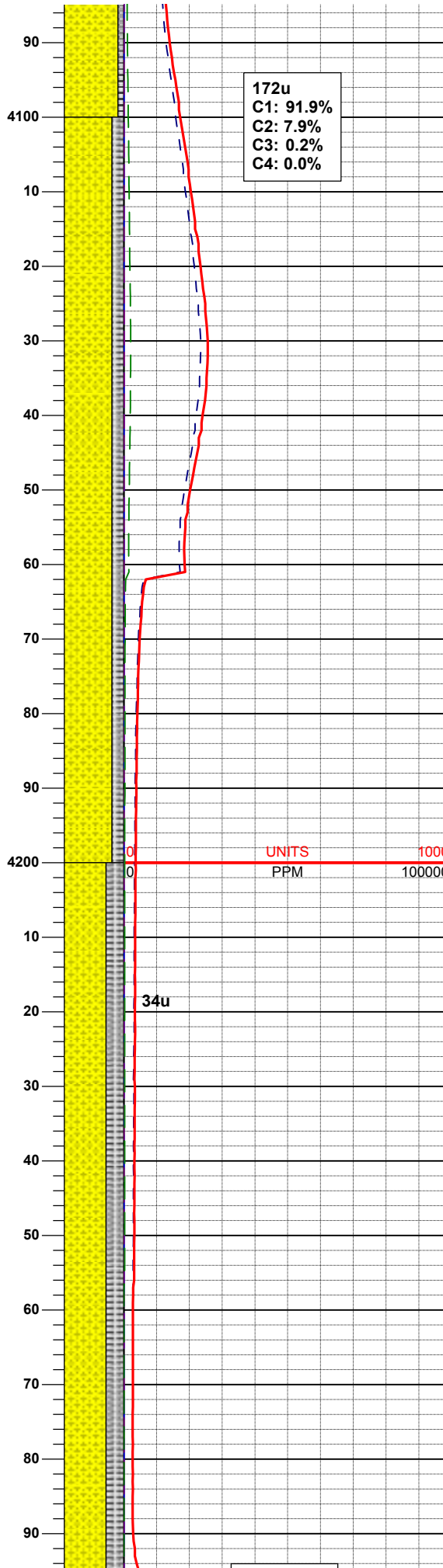
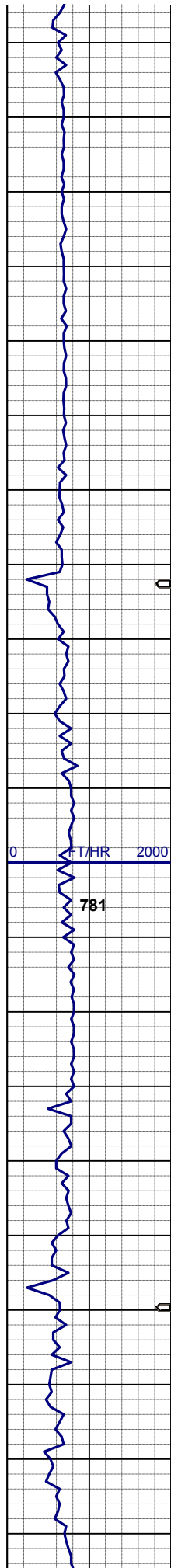
SS: wh, clr - trnsl, spec w/ mica, ang - sbang, p srt, p consol, f-vf gr, v calc cmt
SHYSS: wh, ltgy - mgy, sbang - ang, mod srt, mod consol, smwt calc cmt
SLTYSH: mgy - dkgy, firm - hd, sbply - plty, sme thn lam,

MD 3,918'
TVD 3,870.13'
INC 15.57°
AZM 9.95°

SHYSS: wh, ltgy - mgy, gybrn, sbang - sbrd, mod srt, mod consol, v f gr, smwt calc cmt
SS: wh, clr - trnsl, spec w/ mica, ang - sbang, p srt, p consol, f-vf gr, v calc cmt
SLTYSH: mgy - dkgy, firm - hd, sbply - plty, sme thn lam,

MD 4,013'
TVD 3,961.48'
INC 16.30°
AZM 9.78°

SHYSS: wh ltav - mav avbrn sme



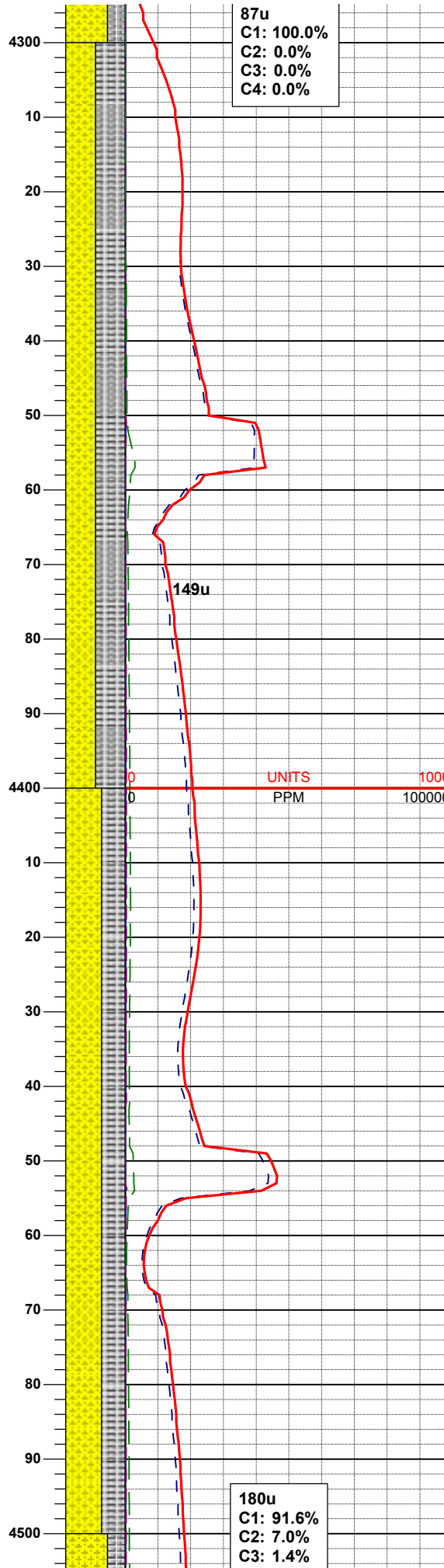
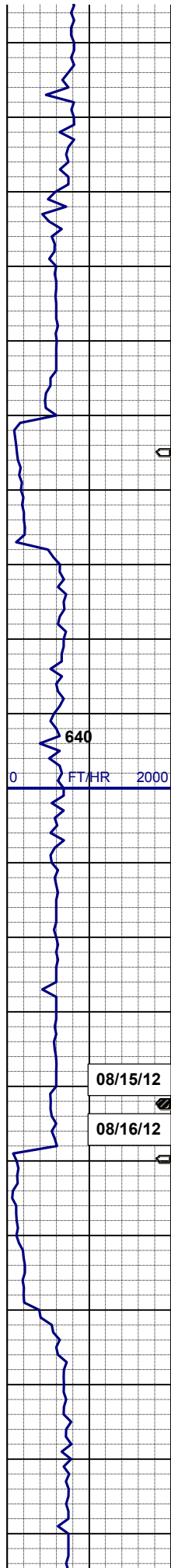
SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam,

MD 4,108'
TVD 4,052.91'
INC 15.23°
AZM 8.52°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, v freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam,

MD 4,203'
TVD 4,144.72'
INC 14.52°
AZM 7.56°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, v freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam,



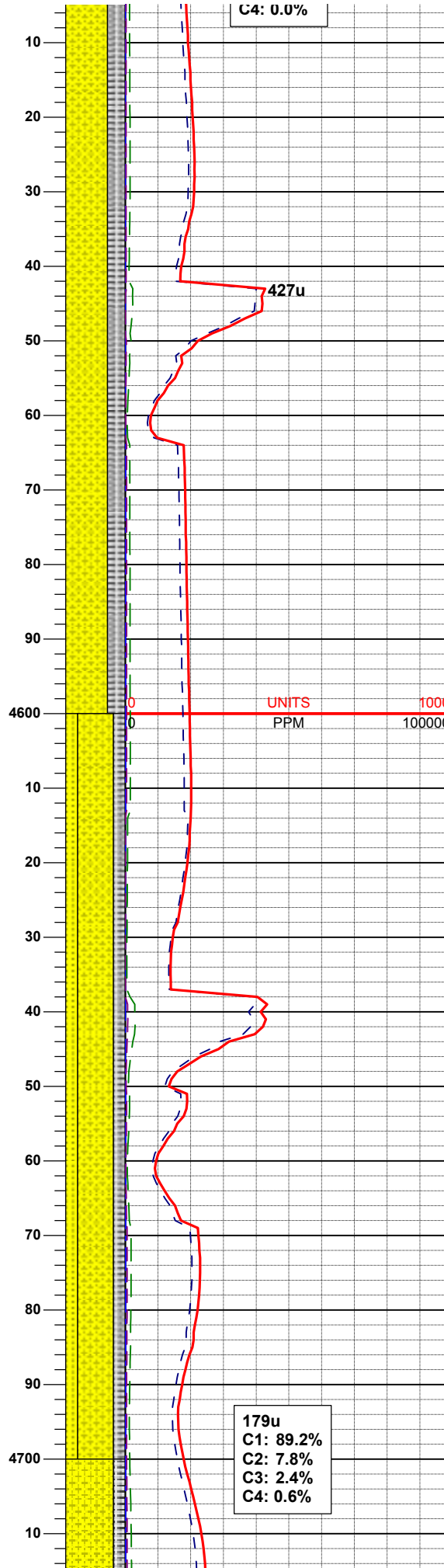
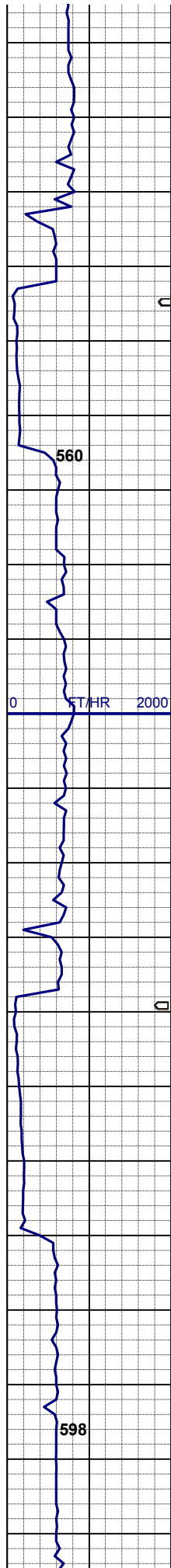
MD 4,298'
TVD 4,236.92'
INC 13.36°
AZM 6.72°

SHYSS: wh, ltgy - mgy, gybrn, sme trnsl, sbang - sbrd, p srt, mod consol, f - v f gr, calc cmt, v freq dk gn xl glau, SLTYSH: mgy - dkgy, firm - hd, sbplty - plty, sme thn lam,

MD 4,392'
TVD 4,328.38'
INC 13.35°
AZM 4.63°

SHYSS: wh, ltgy - mgy, gybrn, sme trnsl, sbang - sbrd, p srt, mod consol, f - v f gr, calc cmt, v freq dk gn xl glau, SLTYSH: mgy - dkgy, firm - hd, sbplty - plty, sme thn lam,

MD 4,487'
TVD 4,420.83'
INC 13.26°
AZM 2.58°



MUD WT 8.75/8.85
VIS 33/31 IN/OUT

TOP OF SUSSEX
@ 4,543' MD 4,475' TVD

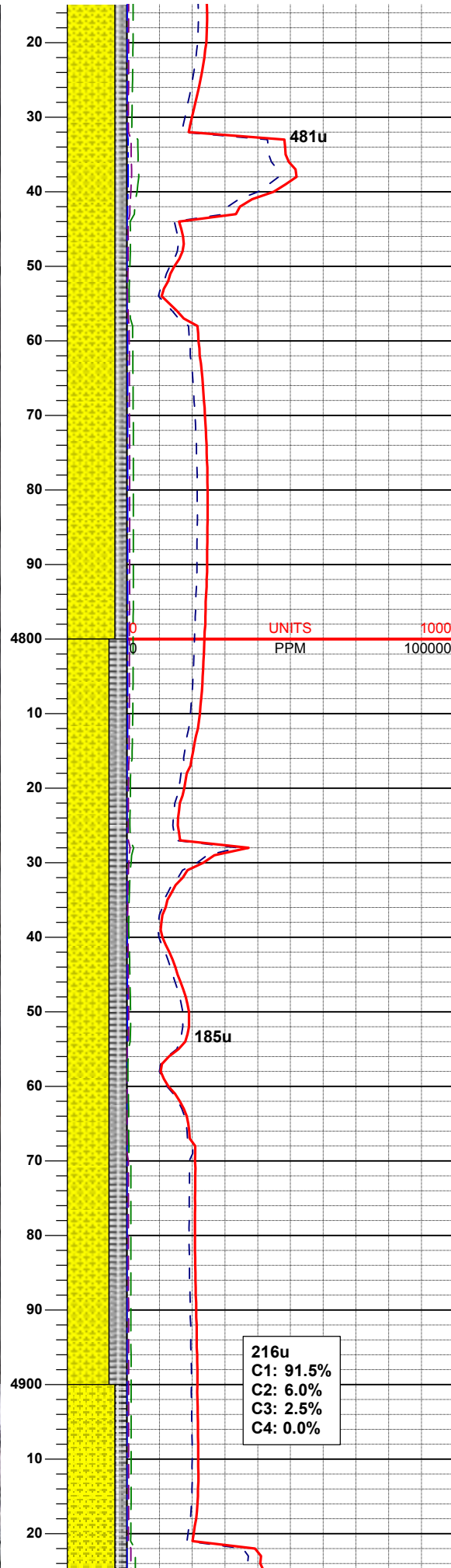
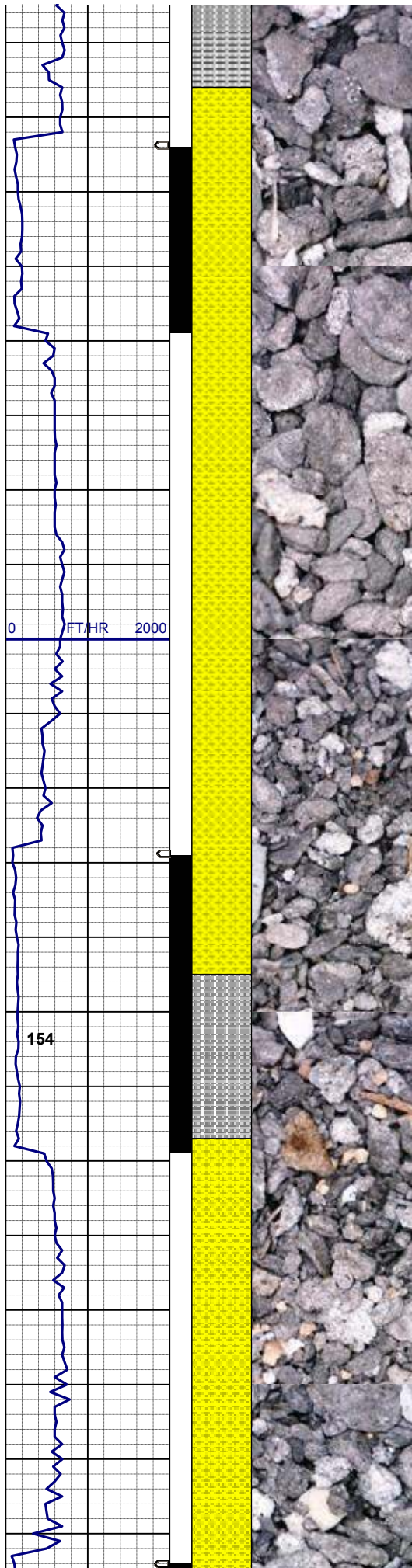
MD 4,582'
TVD 4,513.33'
INC 13.11°
AZM 1.70°

SHYSS: wh, ltgy - mgy, gybrn, sme trnsl, sbang - sbrd, p srt, mod consol, f - v f gr, calc cmt, v freq dk gn xl glau, SLTYSH: mgy - dkgy, firm - hd, sbplty - plty, sme thn lam,

MD 4,677'
TVD 4,605.93'
INC 12.68°
AZM 4.39°

SHYSS: ltgy - mgy, gybrn, sme trnsl, sbang - sbrd, p srt, mod consol, f - v f gr, calc cmt, v freq dk gn xl glau, SLTYSH: mgy - dkgy, firm - hd, sbplty - plty, sme thn lam, SS: wh, ltgy, clr - trnsl, spec w/ mica, ang - sbang, p srt, p consol, f-vf gr, v calc cmt

179u
C1: 89.2%
C2: 7.8%
C3: 2.4%
C4: 0.6%



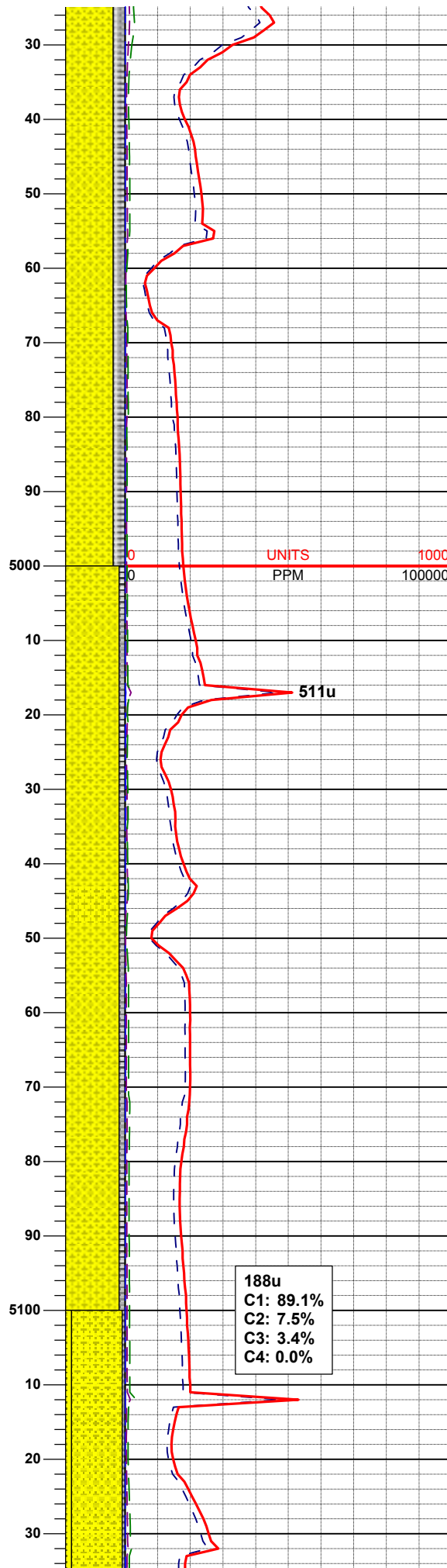
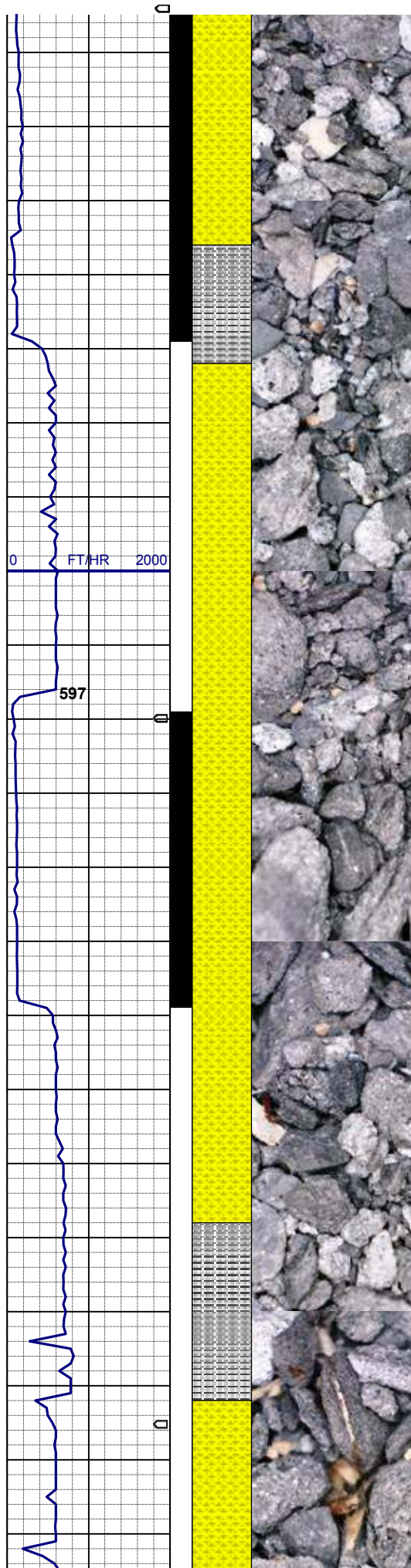
MD 4,772'
TVD 4,698.70'
INC 12.23°
AZM 6.58°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, v freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- ply, gt tex, sme thn lam,

MD 4,867'
TVD 4,791.43'
INC 12.84°
AZM 5.66°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- ply, gt tex, sme thn lam,

216u
C1: 91.5%
C2: 6.0%
C3: 2.5%
C4: 0.0%



MD 4,962'
TVD 4,883.86'
INC 13.91°
AZM 3.82°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- plty, gt tex, sme thn lam,

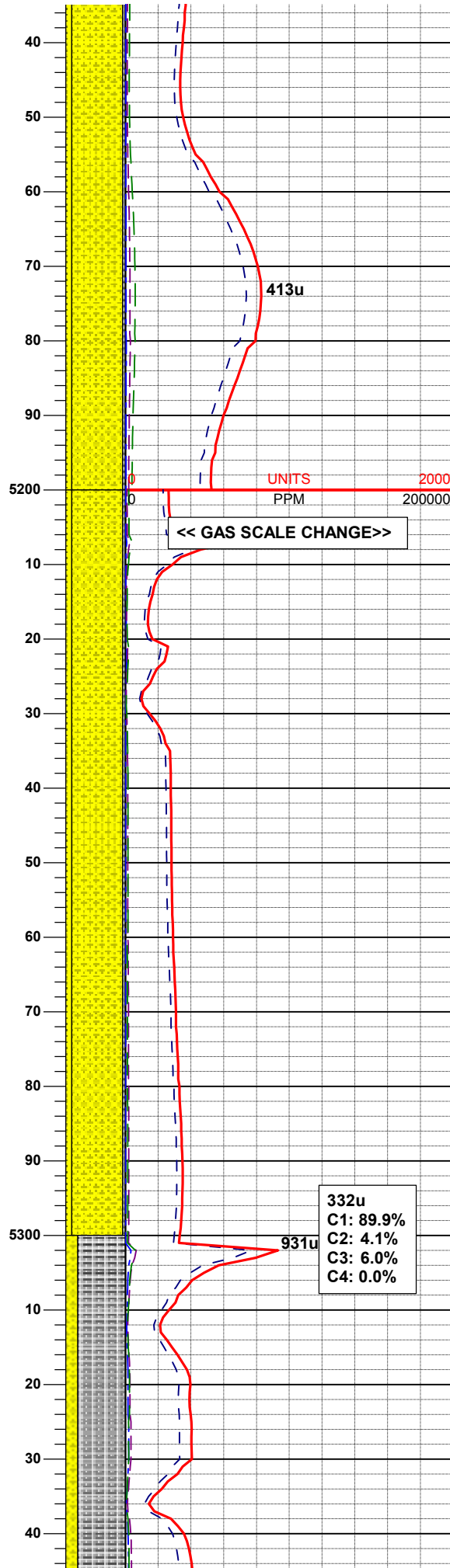
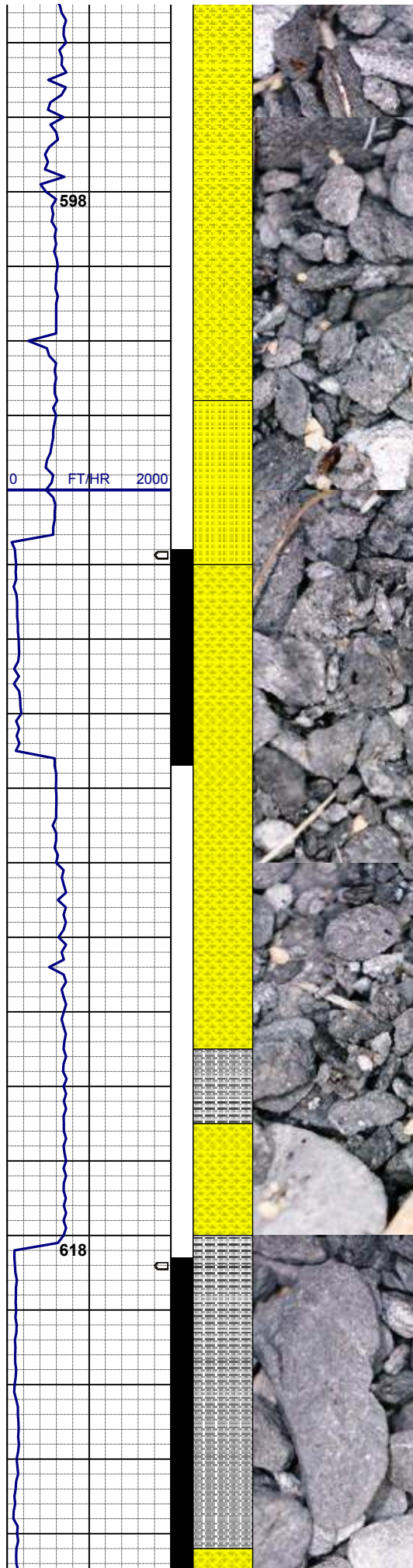
MUD WT 8.70/8.75
VIS 30/30 IN/OUT

MD 5,057'
TVD 4,975.62'
INC 14.65°
AZM 9.33°

SHYSS: wh, ltgy - mgy, gybrn, sme
trnsI, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- plty, gt tex, sme thn lam,

TOP OF SHANNON
@ 5,112' MD 5,030' TVD

08/16/2012
Mud Wt: 8.70
FVis: 29
PVis: 2
YP: 3
GFI S: -J-L-



API Filt: N/A
CAKE: 1/0
pH: 9.1
Cl: 1,500
Ca: 120

MD 5,151'
TVD 5,064.07'
INC 13.66°
AZM 8.94°

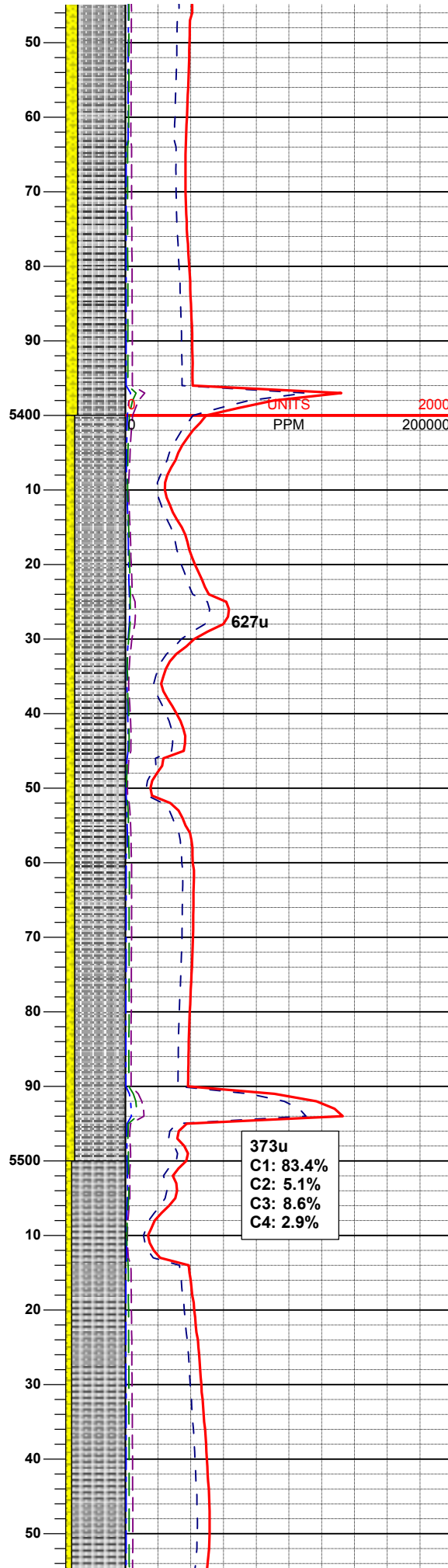
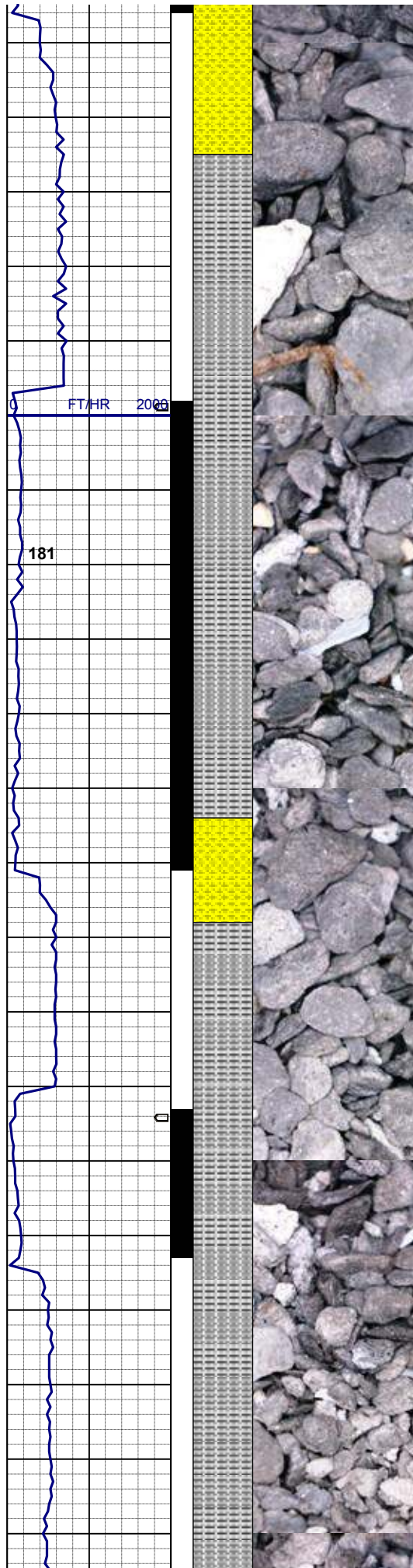
SHYSS: ltgy - mgy, gybrn, sme trnsl,
sbang - sbrd, p srt, mod consol, f - v f
gr, calc cmt, v freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam,
SS: wh, ltgy, clr - trnsl, spec w/ mica,
ang - sbang, p srt, p consol, f-vf gr, v
calc cmt

MD 5,246'
TVD 5,159.48'
INC 13.17°
AZM 12.97°

SHYSS: ltgy - mgy, gybrn, sme trnsl,
sbang - sbrd, p srt, mod consol, f - v f
gr, calc cmt, v freq dk gn xl glau,
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, sme thn lam,
SS: wh, ltgy, clr - trnsl, spec w/ mica,
ang - sbang, p srt, p consol, f-vf gr, v
calc cmt

332u
C1: 89.9%
C2: 4.1%
C3: 6.0%
C4: 0.0%

MD 5,341'
TVD 5,252.08'



TVD 5,252.00
INC 12.61°
AZM 12.70°

SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, gt tex, sme thn lam,
SHYSS: wh, ltgy - mgy, gybrn, sme
trns, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,

MUD WT 8.60/8.70
VIS 29/29 IN/OUT

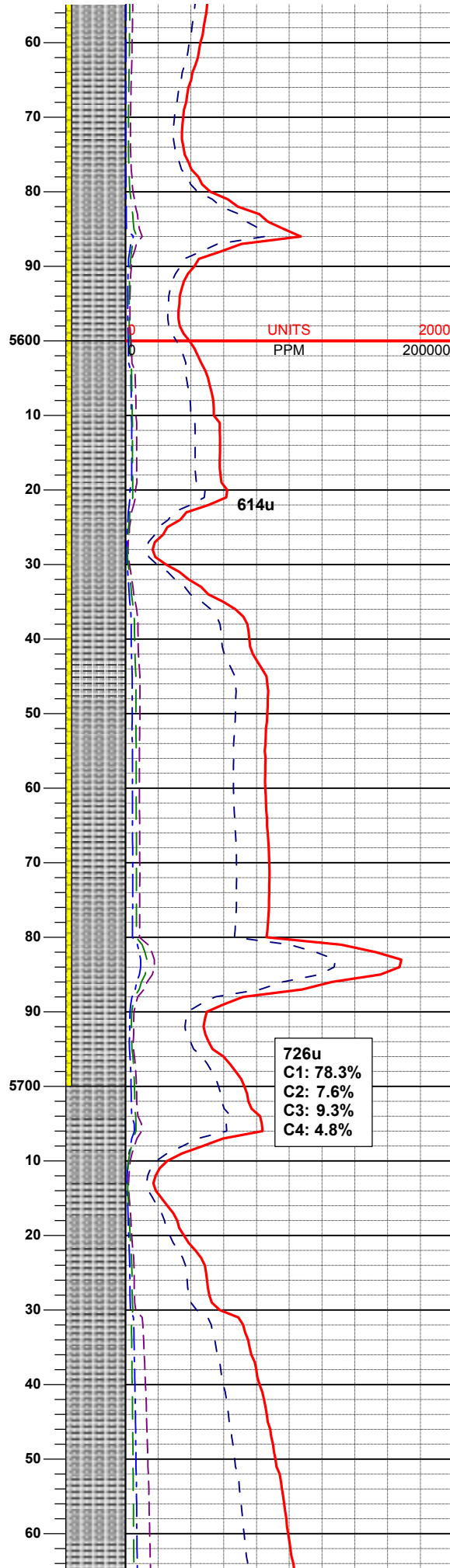
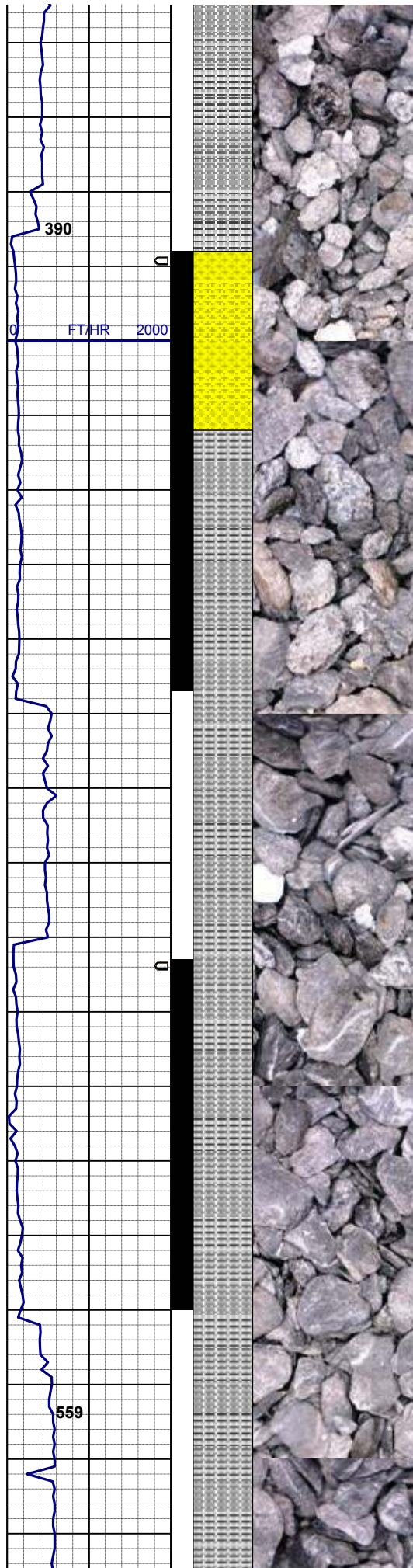
MD 5,436'
TVD 5,344.66'
INC 13.33°
AZM 10.95°

SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, gt tex, sme thn lam,
SHYSS: wh, ltgy - mgy, gybrn, sme
trns, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,

MUD WT 8.75/8.80
VIS 31/31 IN/OUT

MD 5,531'
TVD 5,437.18'
INC 12.94°
AZM 6.58°

373u
C1: 83.4%
C2: 5.1%
C3: 8.6%
C4: 2.9%



SLTYSH: mgy - dkgy, firm - hd, sbply
- plty, gt tex, sme thn lam,
SHYSS: wh, ltgy - mgy, gybrn, sme
trns, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,

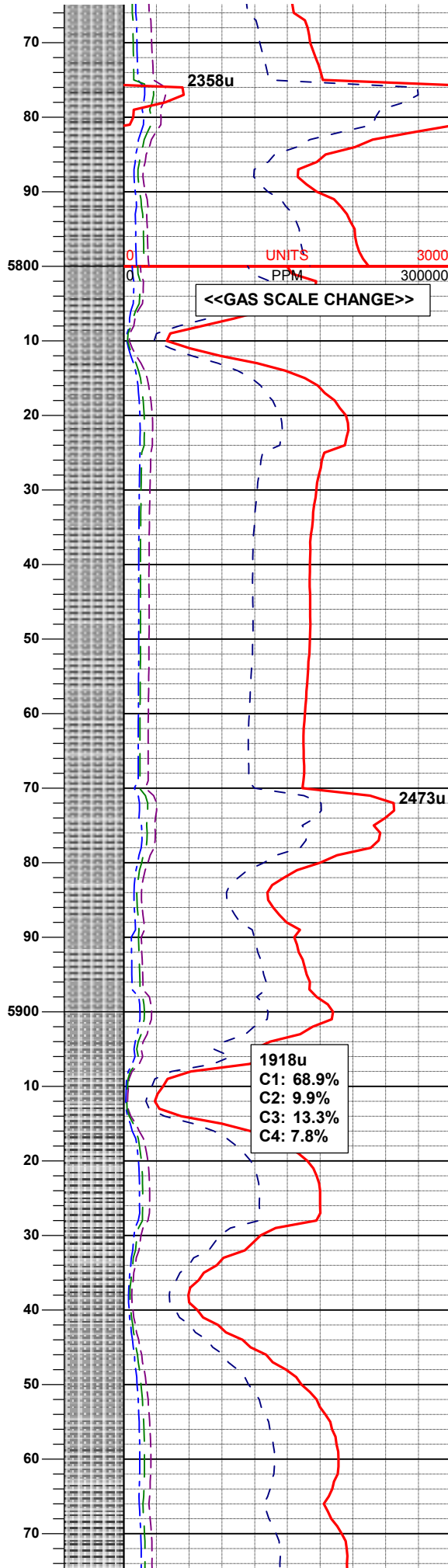
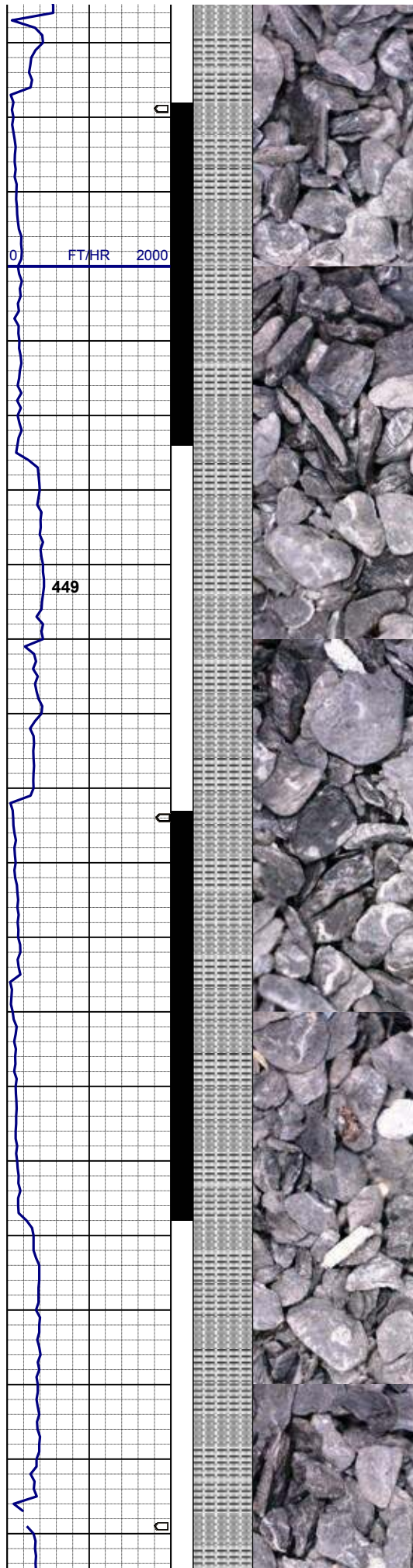
MD 5,626'
TVD 5,529.58'
INC 13.89°
AZM 5.94°

SLTYSH: mgy - dkgy, firm - hd, sbply
- plty, gt tex, sme thn lam,
SHYSS: wh, ltgy - mgy, gybrn, sme
trns, sbang - sbrd, p srt, mod consol,
f - v f gr, calc cmt, freq dk gn xl glau,

726u
C1: 78.3%
C2: 7.6%
C3: 9.3%
C4: 4.8%

MUD WT 8.70/8.85
VIS 31/31 IN/OUT

MD 5,721'
TVD 5,621.59'
INC 14.94°
AZM 7.60°



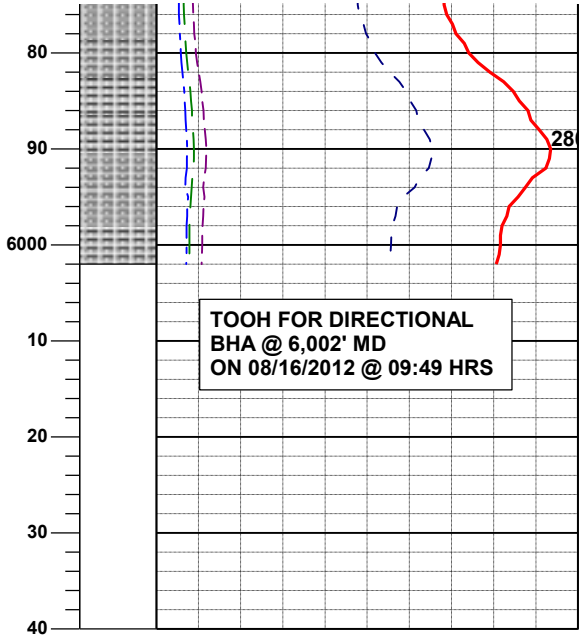
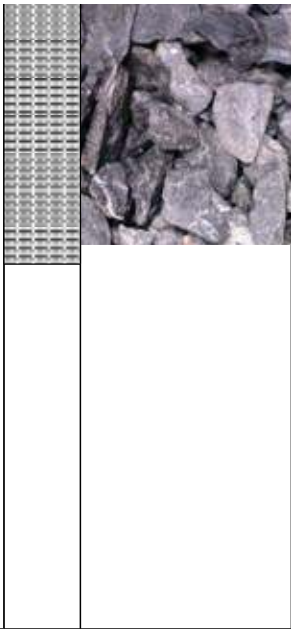
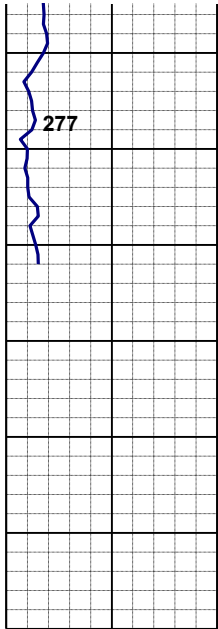
SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, gt tex, sme thn lam,

MD 5,816'
TVD 5,713.28'
INC 15.44°
AZM 5.77°

MUD WT 9.25/9.05
VIS 33/33 IN/OUT

SLTYSH: mgy - dkgy, firm - hd, sbply
- pty, gt tex, sme thn lam,

MD 5,945'
TVD 5,837.84'
INC 14.71°
AZM 359.77°



SLTYSH: mgy - dkgy, firm - hd, sbply
- plty, gt tex, sme thn lam,

LOG CONTINUES ON
HORIZONTAL L PLOT LOG
WELLS RANCH
AA12-65-1HN
HORIZONTAL

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