

LOG created using LPLOT VH Version 3.0, August 31, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** NOBLE ENERGY INC  
**WELL:** BOOTH STATE C36-69HN  
**LOCATION:** NENE SEC 36 T4N R64W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 250' FNL, 253' FEL  
**ELEVATION:** 4758' GL, 4771' KB  
**FIELD:** WATTENBERG  
**SPUD DATE:** 08/21/2012  
**TD DATE:** 08/31/2012  
**DATES LOGGED:** 08/23/2012 - 08/31/2012  
**DEPTHS LOGGED:** 660'-10910' MD  
**LOGGERS:** KYLE KNIGHT, RYAN SHILLING  
**DRILLING FLUID:** FW, LSND  
**DRILLING RIG:** ENSIGN 121  
**API:** 05-123-35796  
**LOG TYPE:** VERTICAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** LAT, LONG: 40.27601, -104.50676

### LITHOLOGIES



No Sample



Sandstone



Shaly Sandstone



Shaly Siltstone



Silty Shale

### ENGINEERING SYMBOLS



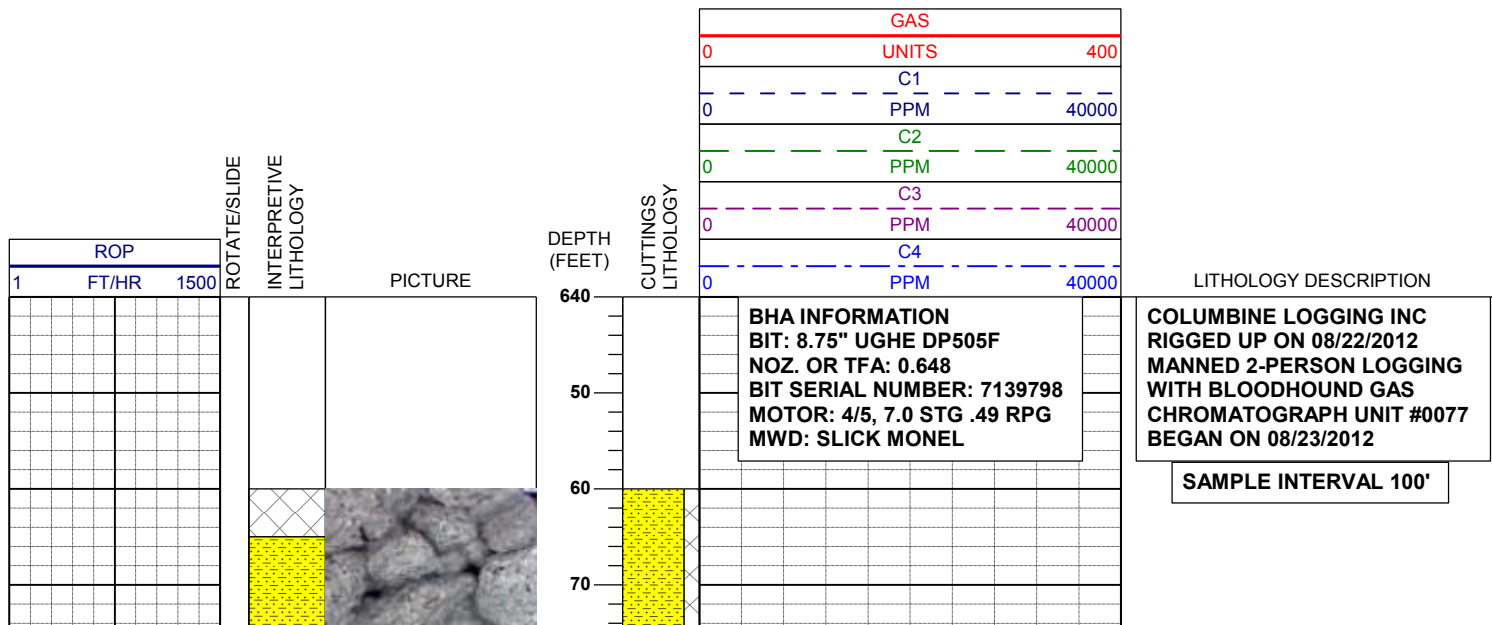
Connection

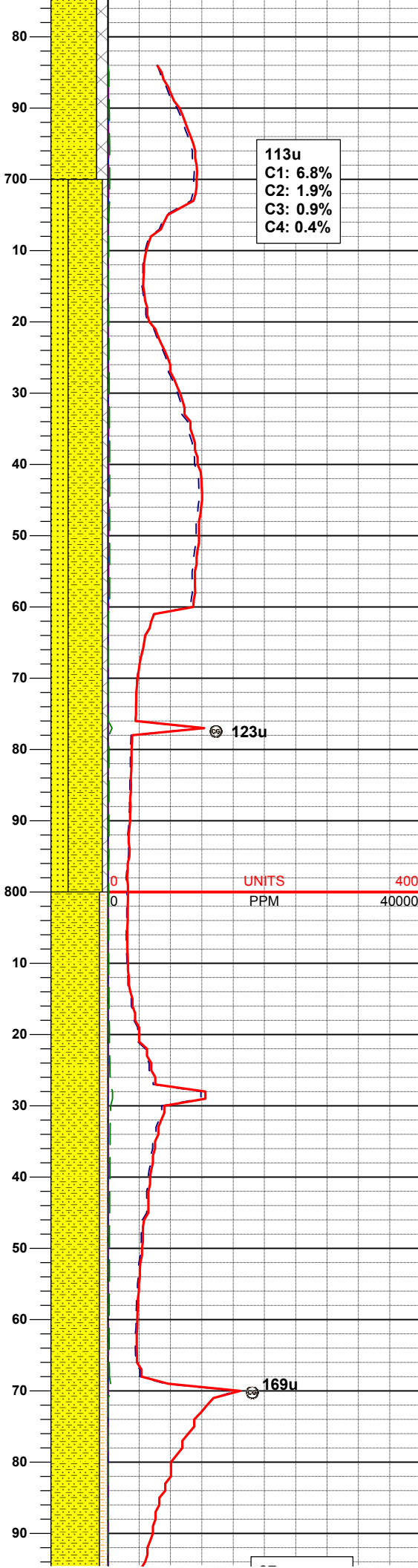
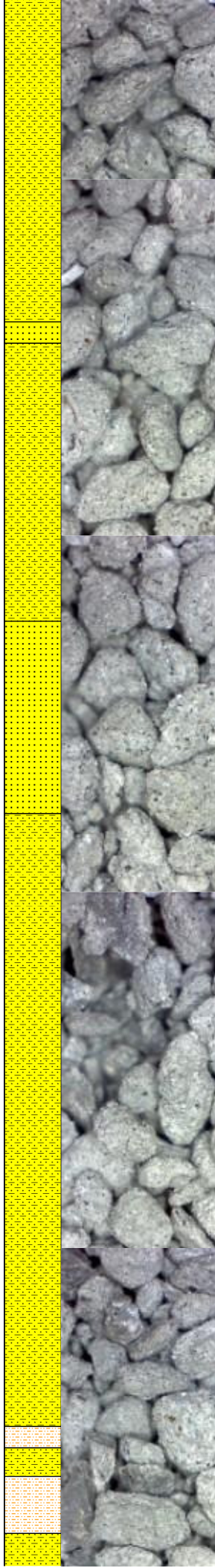
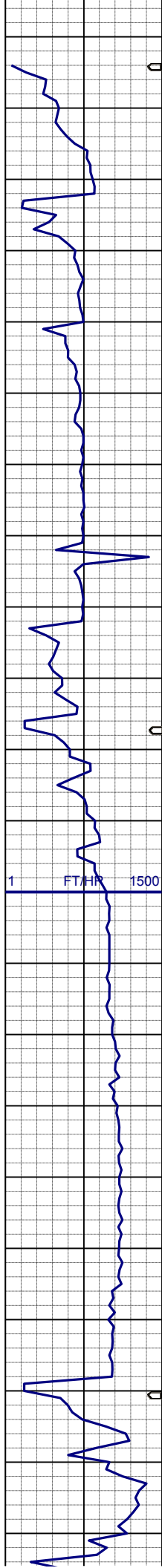


Connection Gas



Midnight Depth





80% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
20% CMT:

113u  
C1: 6.8%  
C2: 1.9%  
C3: 0.9%  
C4: 0.4%

**SURVEY**  
**MD 725'**  
**INC 0.4°**  
**AZI 16.7°**  
**TVD 725.00'**

60% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
30% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, slcalc, phlog, tr glau  
10% CMT:

**MUD WT: 8.4+ VIS: 27 IN**  
**MUD WT: 8.4+ VIS: 27 OUT**

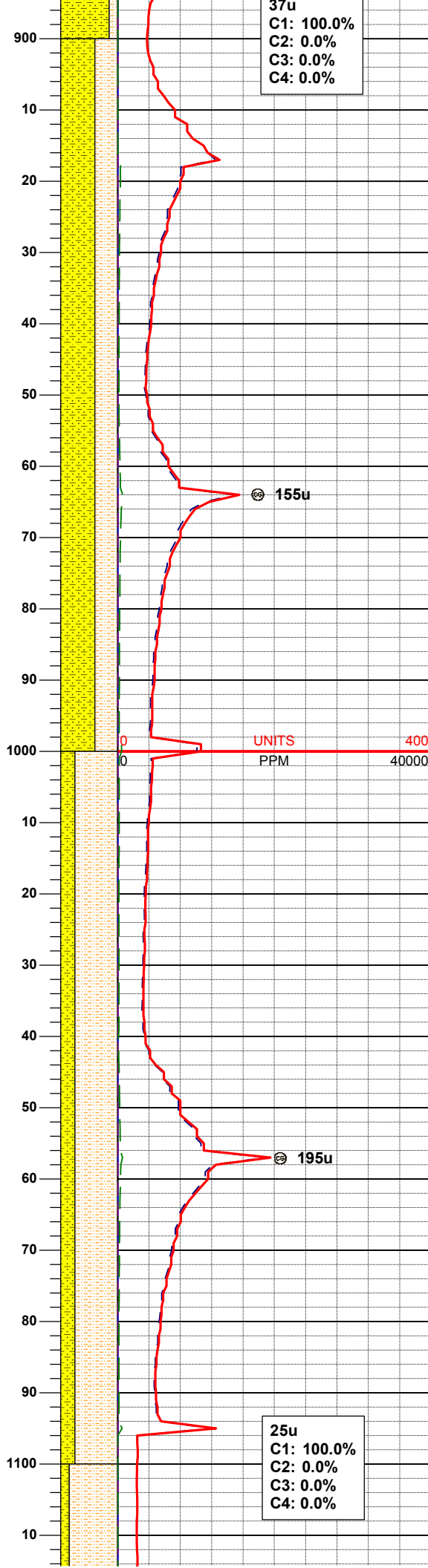
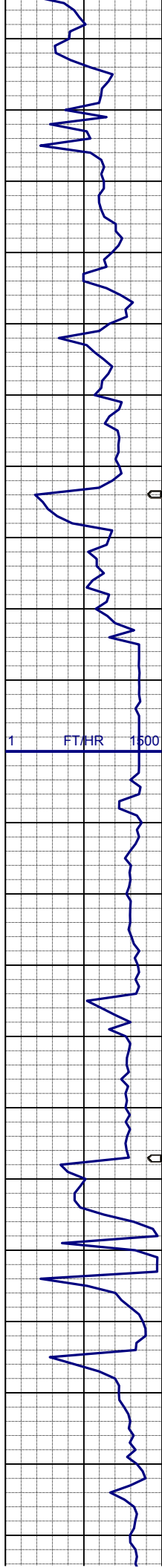
**SURVEY**  
**MD 818'**  
**INC 0.1°**  
**AZI 26.7°**  
**TVD 818.00'**

80% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
15% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, tr cmt

UNITS  
PPM  
40000

123u

169u



37u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

25u  
C1: 100.0%  
C2: 0.0%  
C3: 0.0%  
C4: 0.0%

**SURVEY**  
**MD 912'**  
**INC 0.3°**  
**AZI 1.6°**  
**TVD 912.00'**

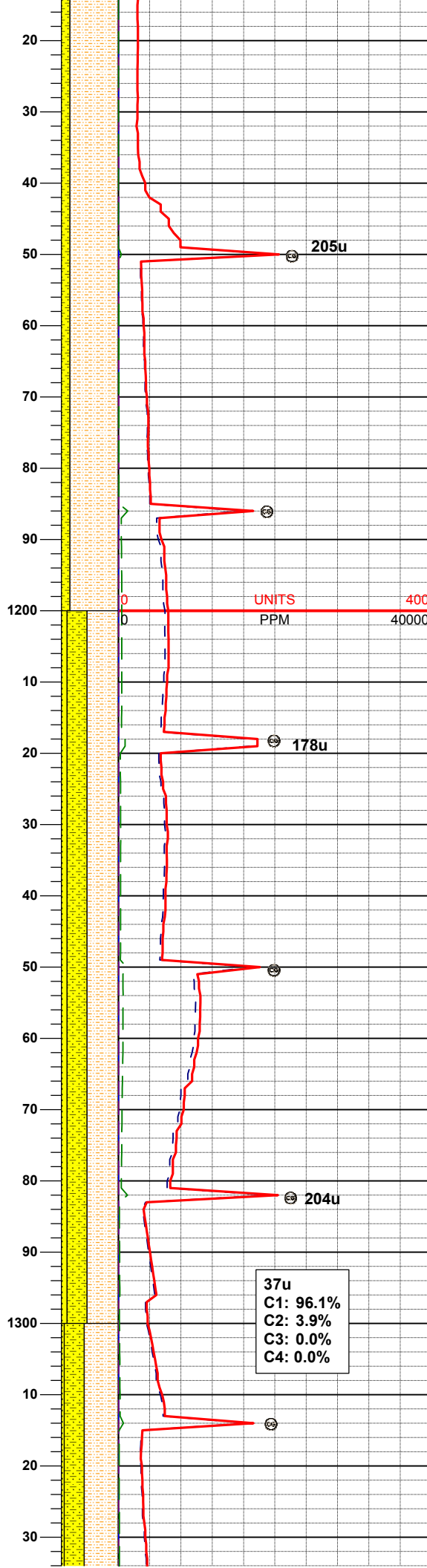
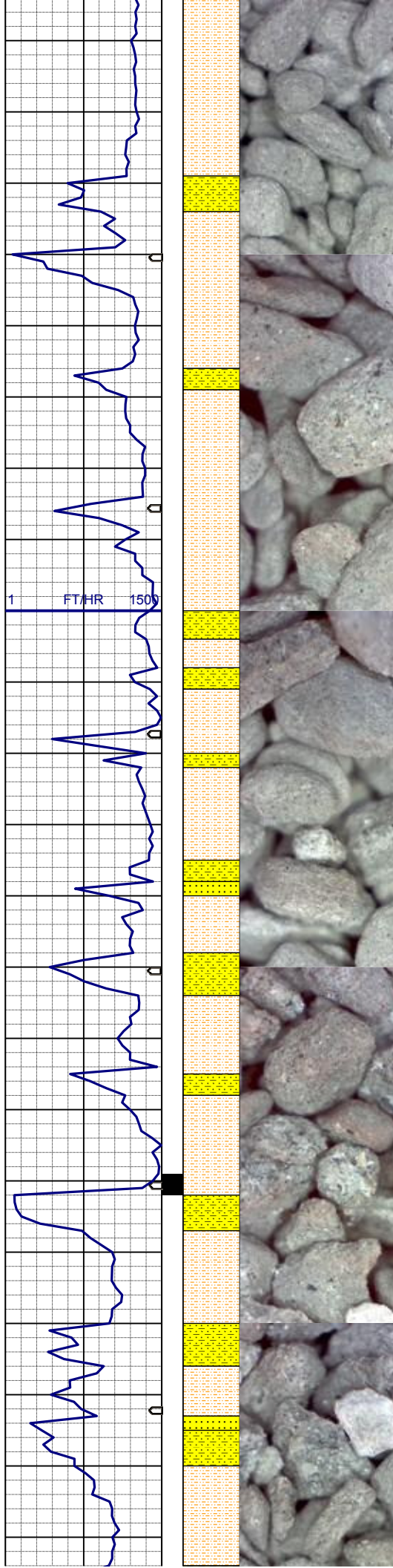
60% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
40% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, tr ss

**SURVEY**  
**MD 1005'**  
**INC 0.3°**  
**AZI 357.2°**  
**TVD 1005.00'**

75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to  
25% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, tr ss

**SURVEY**  
**MD 1098'**  
**INC 0.4°**  
**AZI 3.3°**  
**TVD 1097.99'**





85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 15% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, tr ss

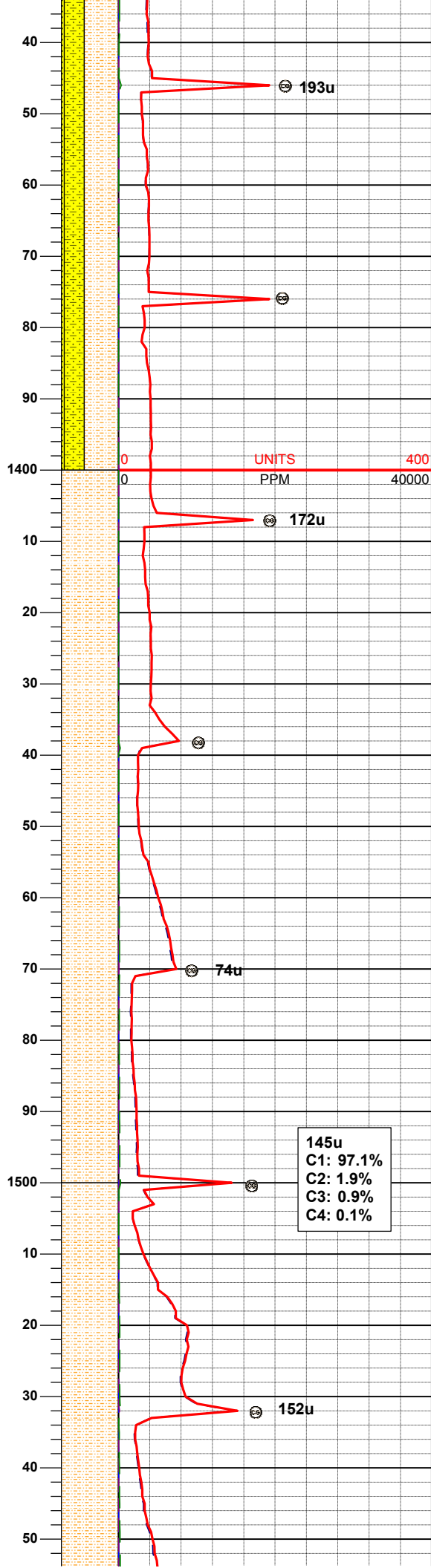
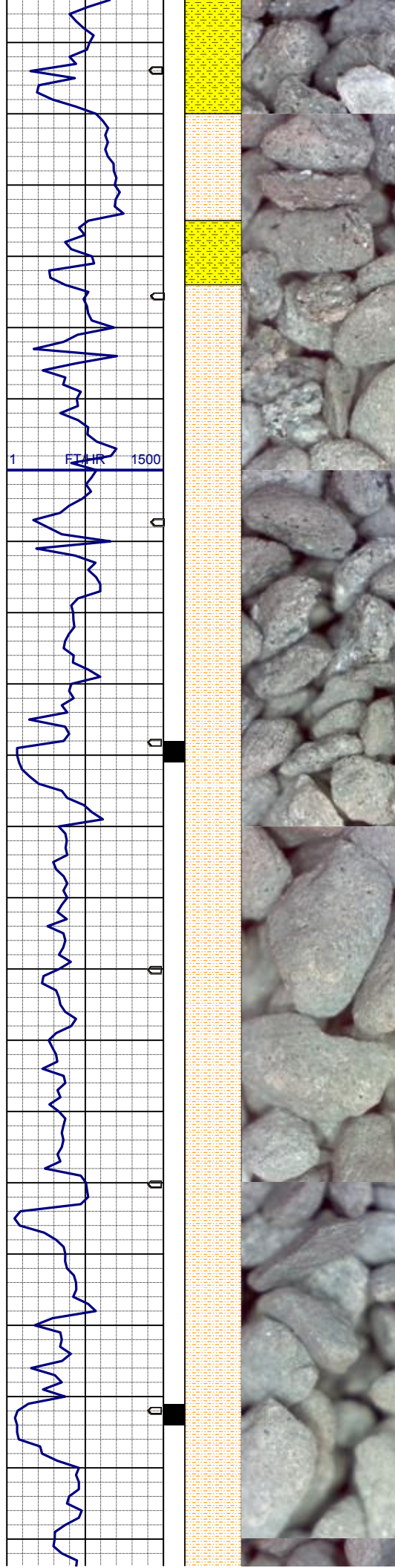
**SURVEY**  
**MD 1197'**  
**INC 0.4°**  
**AZI 4.7°**  
**TVD 1196.99'**

55% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 35% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog 10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau

**SURVEY**  
**MD 1292'**  
**INC 0.4°**  
**AZI 254.0°**  
**TVD 1291.99'**

37u  
C1: 96.1%  
C2: 3.9%  
C3: 0.0%  
C4: 0.0%





MUD WT: 8.5 VIS: 29 IN  
MUD WT: 8.5+ VIS: 29 OUT

60% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 35% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcm, slcalc, phlog 5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcm, calc, phlog, tr glau

SURVEY  
MD 1387'  
INC 0.7°  
AZI 262.6°  
TVD 1386.99'

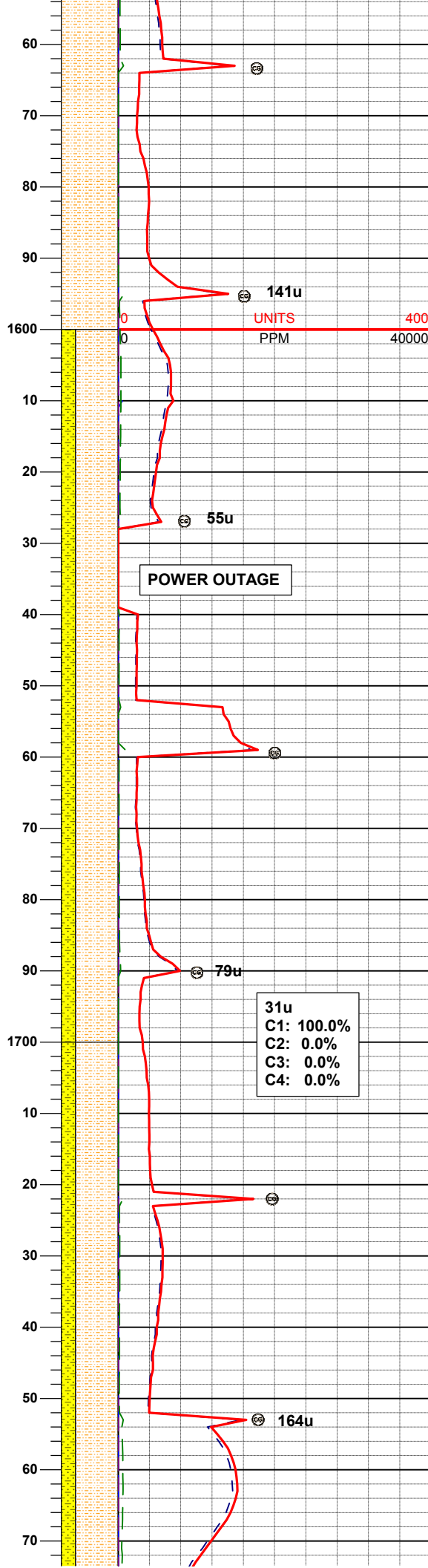
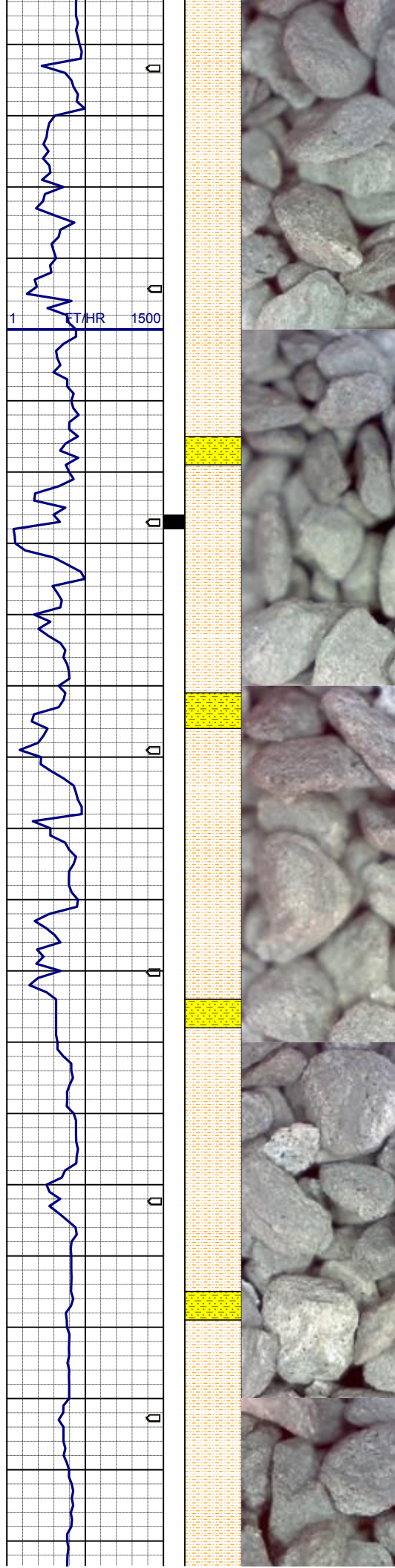
MUD WT: 8.5 VIS: 29 IN  
MUD WT: 8.5+ VIS: 29 OUT

100% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd

SURVEY  
MD 1480'  
INC 0.5°  
AZI 27.6°  
TVD 1479.98'

MUD WT: 8.4 VIS: 28 IN  
MUD WT: 8.5+ VIS: 29 OUT

100% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme ovr ctd



**SURVEY**  
**MD 1575'**  
**INC 1.0°**  
**AZI 157.0°**  
**TVD 1574.98'**

75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 25% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog

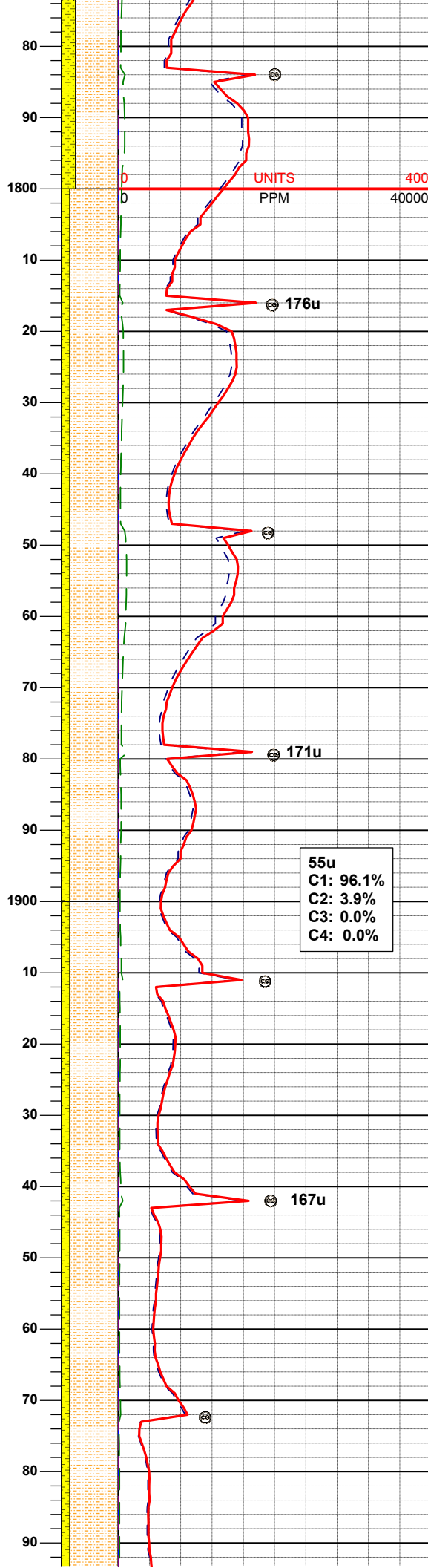
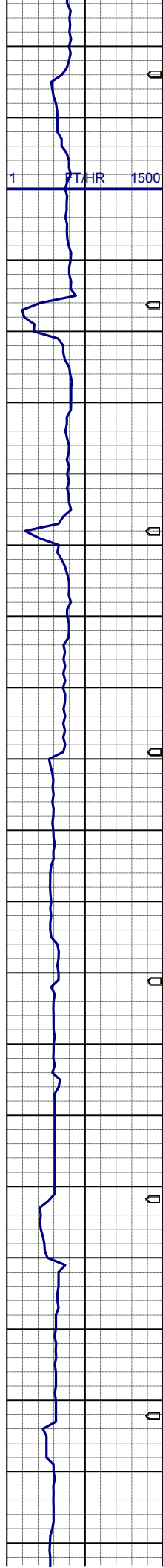
**SURVEY**  
**MD 1670'**  
**INC 0.5°**  
**AZI 126.6°**  
**TVD 1669.97'**

**MUD WT: 8.4 VIS: 27 IN**  
**MUD WT: 8.4+ VIS: 28 OUT**

75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 25% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog

**SURVEY**  
**MD 1764'**  
**INC 0.8°**  
**AZI 162.2°**  
**TVD 1763.97'**





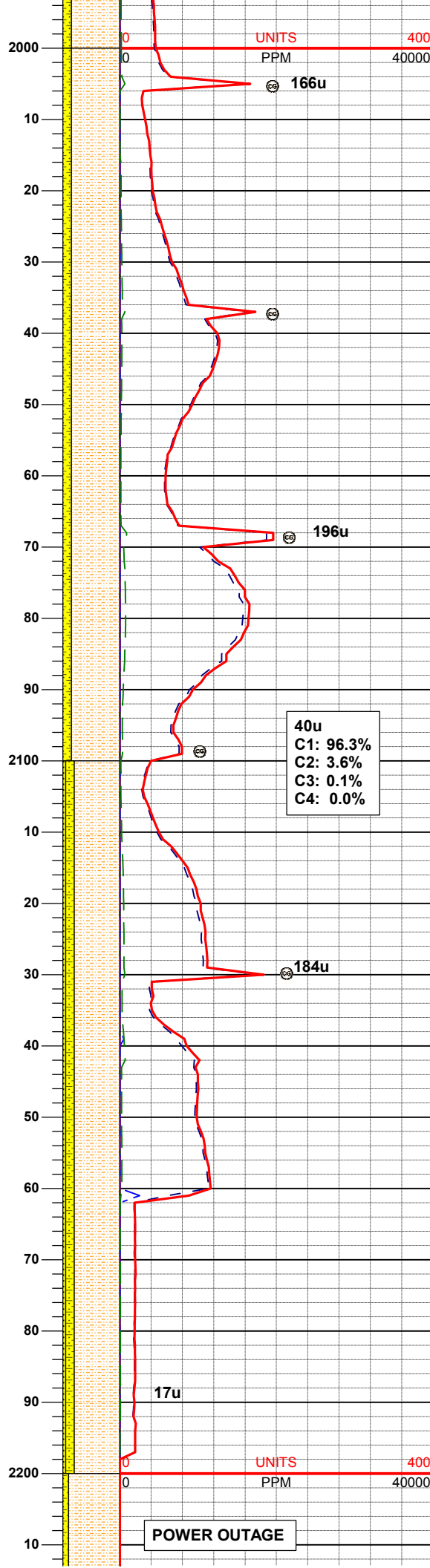
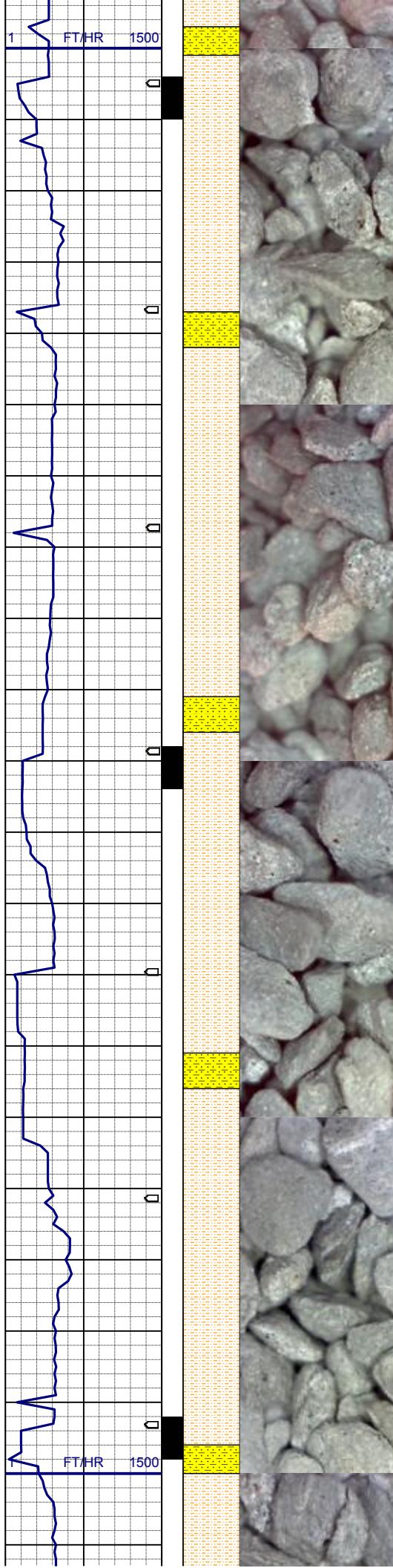
85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbdr-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 15% SHYSS: lt-mgy, f-mfgr, sbdr-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog

**SURVEY**  
**MD 1859'**  
**INC 0.9°**  
**AZI 160.3°**  
**TVD 1858.96'**

85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbdr-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 15% SHYSS: lt-mgy, f-mfgr, sbdr-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog

**SURVEY**  
**MD 1953'**  
**INC 1.3°**  
**AZI 160.8°**  
**TVD 1952.94'**





**SURVEY**  
**MD 2047'**  
**INC 2.0°**  
**AZI 100.2°**  
**TVD 2046.90'**

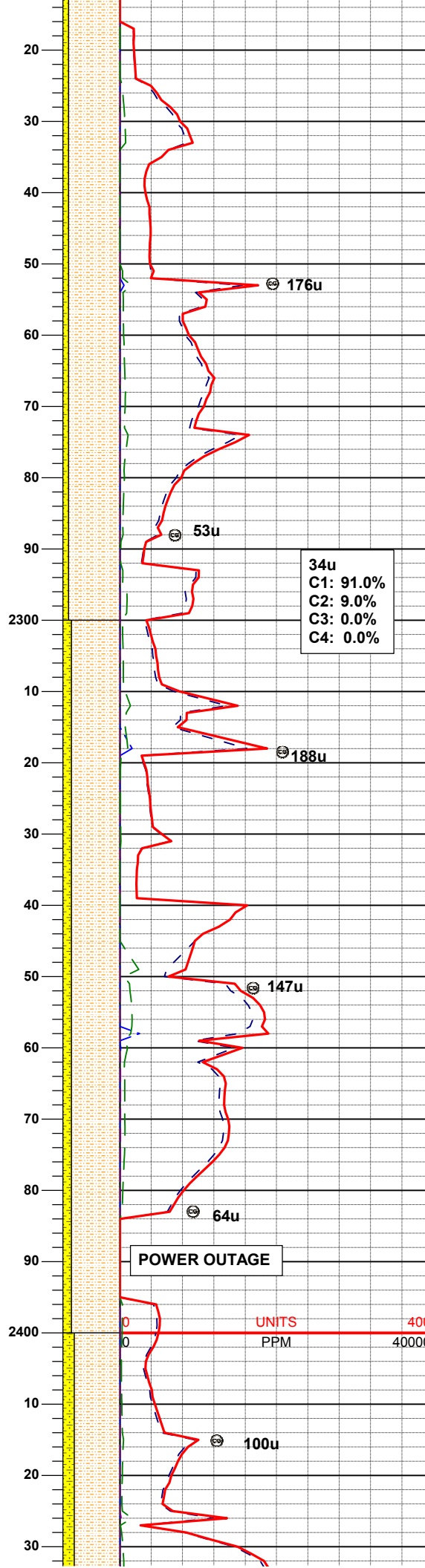
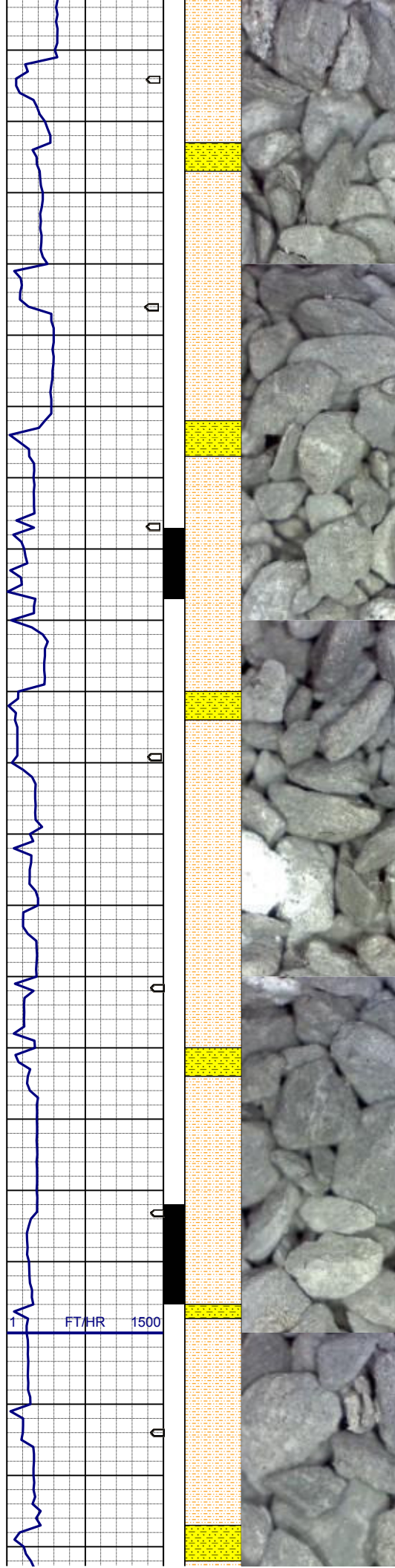
85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to  
15% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog

**40u**  
**C1: 96.3%**  
**C2: 3.6%**  
**C3: 0.1%**  
**C4: 0.0%**

**SURVEY**  
**MD 2141'**  
**INC 2.6°**  
**AZI 45.2°**  
**TVD 2140.84'**

80% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to  
15% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog  
5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau

**POWER OUTAGE**



**SURVEY**  
**MD 2236'**  
**INC 3.5°**  
**AZI 38.7°**  
**TVD 2235.00'**

90% SHYSLTST: lt-mgy, tr tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 10% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog, tr ss

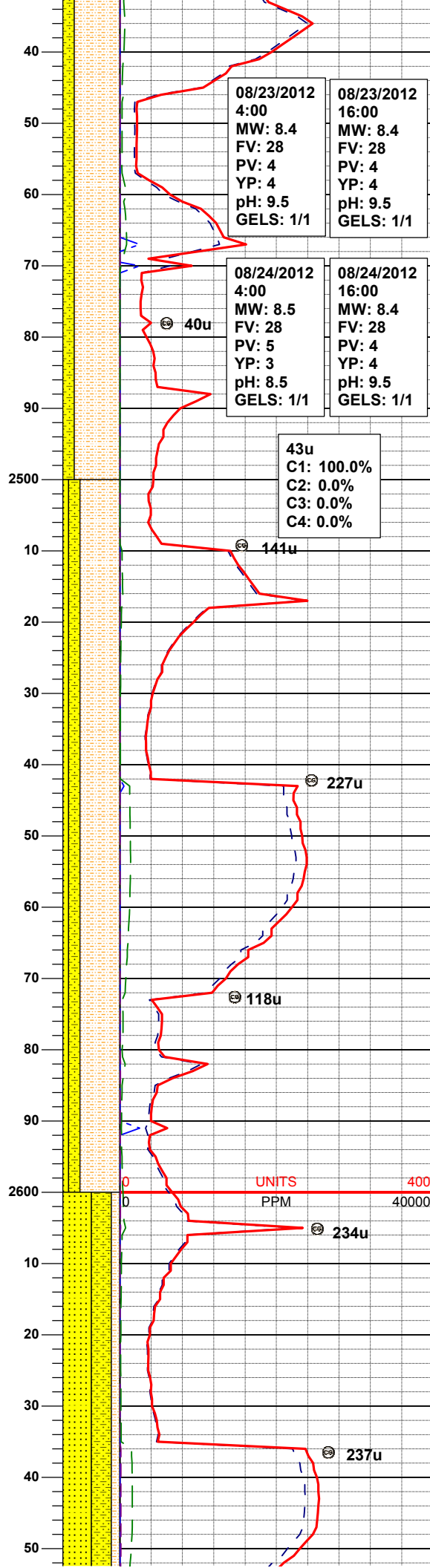
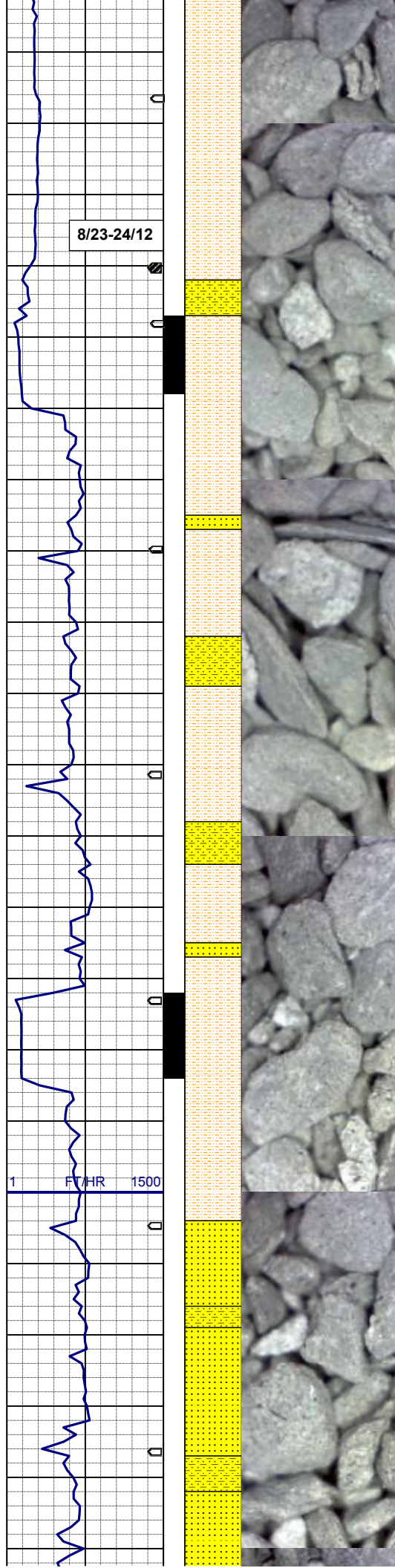
**SURVEY**  
**MD 2331'**  
**INC 3.7°**  
**AZI 42.2°**  
**TVD 2330.52'**

85% SHYSLTST: lt-mgy, tr tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 15% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog, tr ss

**MUD WT: 8.4 VIS: 27 IN**  
**MUD WT: 8.4 VIS: 27 OUT**

**SURVEY**  
**MD 2426'**  
**INC 5.5°**  
**AZI 34.3°**  
**TVD 2425.34'**





80% SHYSLTST: lt-mgy, tr tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 20% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog, tr ss, tr cmt, tr sh

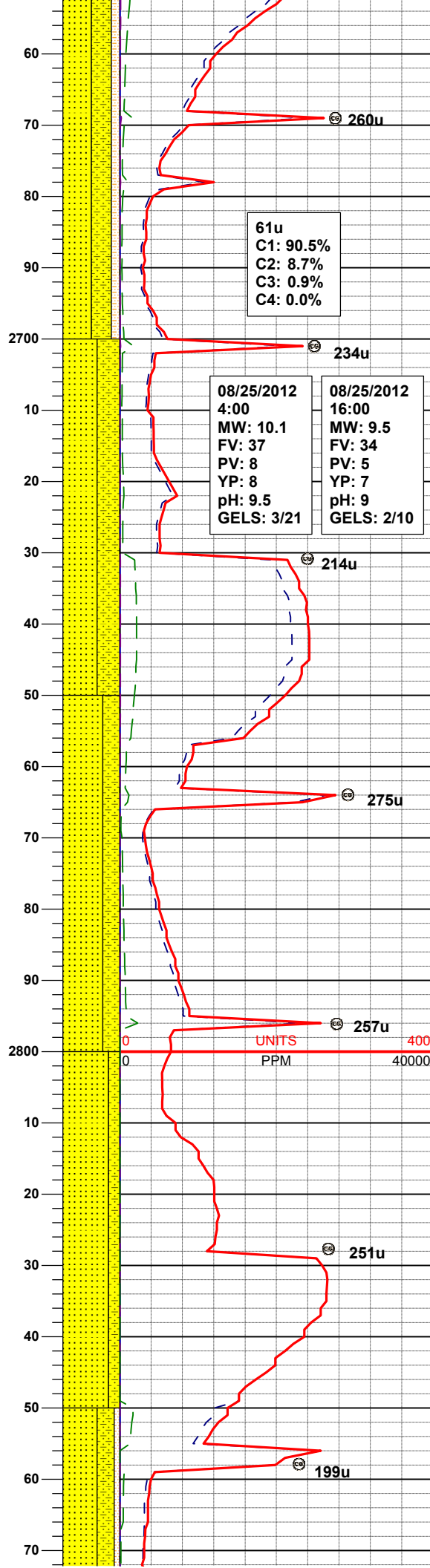
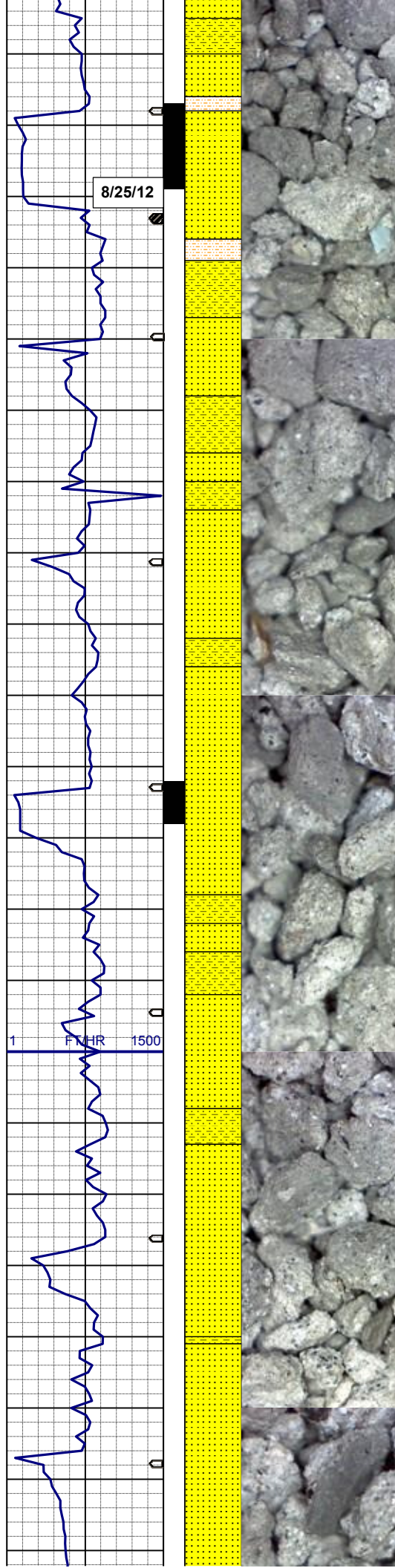
**SURVEY**  
**MD 2521'**  
**INC 6.8°**  
**AZI 24.3°**  
**TVD 2519.66'**

70% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 20% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog 10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau

**SURVEY**  
**MD 2616'**  
**INC 8.4°**  
**AZI 17.2°**  
**TVD 2613.83'**

50% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau, grd to 35% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, sicalc, phlog





sicalc, phlog  
15% SHYSLTST: lt-mgy, sme tan, f-  
vfgr, sbrd-sbang, mod-psrt, arg mtx,  
occ phlog, sme pyr ctd

MUD WT: 8.4+ VIS: 28 IN  
MUD WT: 8.5 VIS: 27 OUT

**SURVEY**  
**MD 2711'**  
**INC 10.8°**  
**AZI 12.8°**  
**TVD 2707.49'**

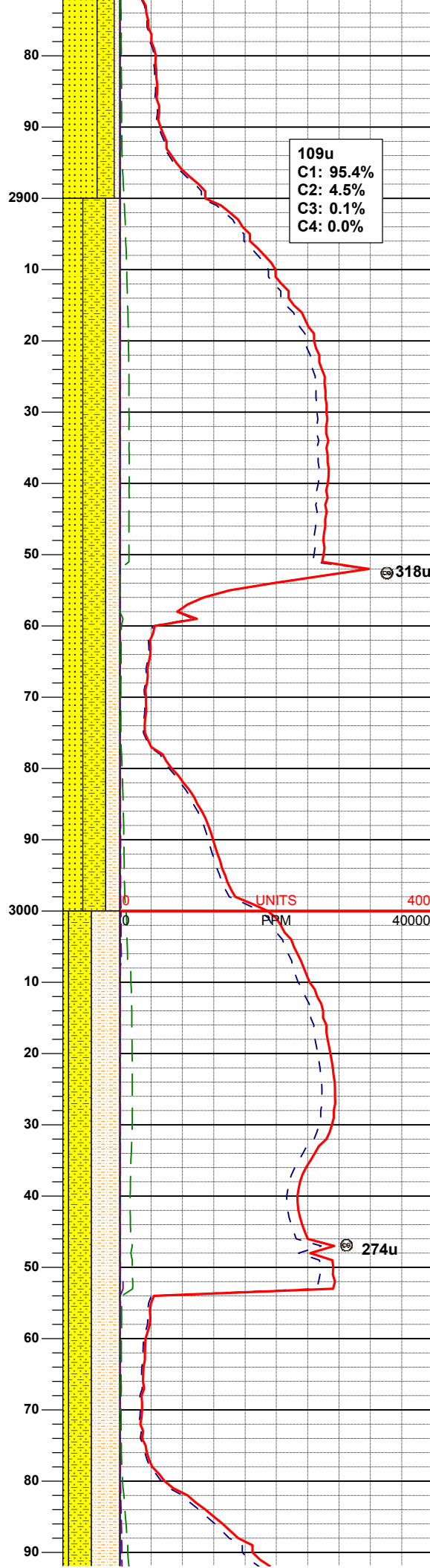
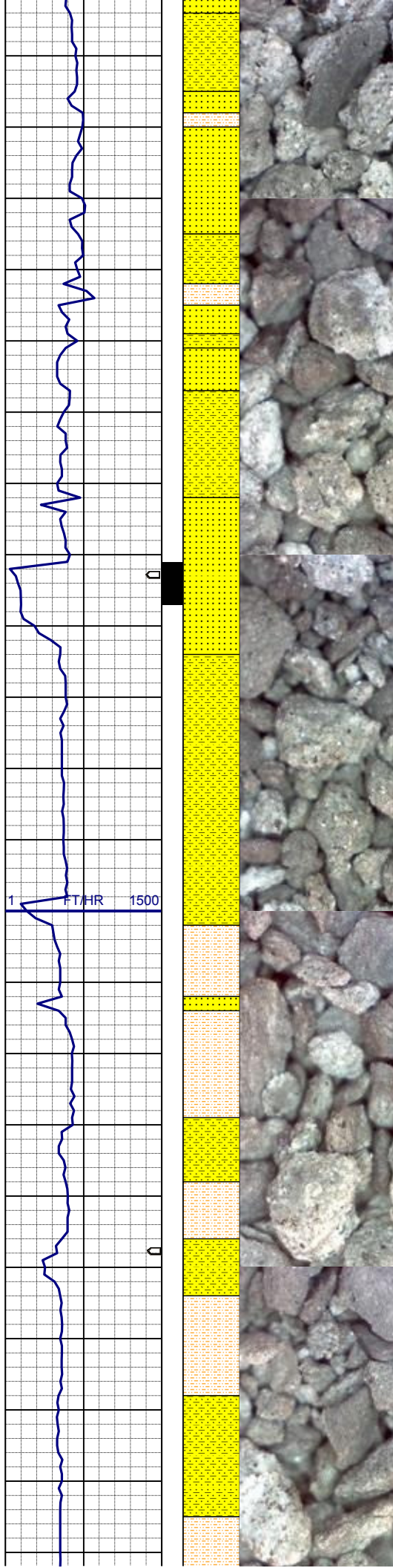
60% SS: w-ltgy, s&p, mf-c gr, sbrd,  
mod-wsrt, ppor, argcmt, calc, phlog, tr  
glau, grd to  
40% SHYSS: lt-mgy, f-mfgr, sbrd-  
sbang, mod-psrt, sft, ppor, argcmt,  
sicalc, phlog, tr shysltst

70% SS: w-ltgy, s&p, mf-c gr, sbrd,  
mod-wsrt, ppor, argcmt, calc, phlog, tr  
glau, grd to  
30% SHYSS: lt-mgy, f-mfgr, sbrd-  
sbang, mod-psrt, sft, ppor, argcmt,  
sicalc, phlog, tr shysltst

**SURVEY**  
**MD 2805'**  
**INC 12.3°**  
**AZI 13.7°**  
**TVD 2799.58'**

80% SS: w-ltgy, s&p, mf-c gr, sbrd,  
mod-wsrt, ppor, argcmt, calc, phlog, tr  
glau, grd to  
20% SHYSS: lt-mgy, f-mfgr, sbrd-  
sbang, mod-psrt, sft, ppor, argcmt,  
sicalc, phlog, tr shysltst

60% SS: w-ltgy, s&p, mf-c gr, sbrd,  
mod-wsrt, ppor, argcmt, calc, phlog, tr  
glau, grd to



109u  
C1: 95.4%  
C2: 4.5%  
C3: 0.1%  
C4: 0.0%

318u

274u

30% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
10% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd

**SURVEY**  
**MD 2900'**  
**INC 11.7°**  
**AZI 11.1°**  
**TVD 2892.51'**

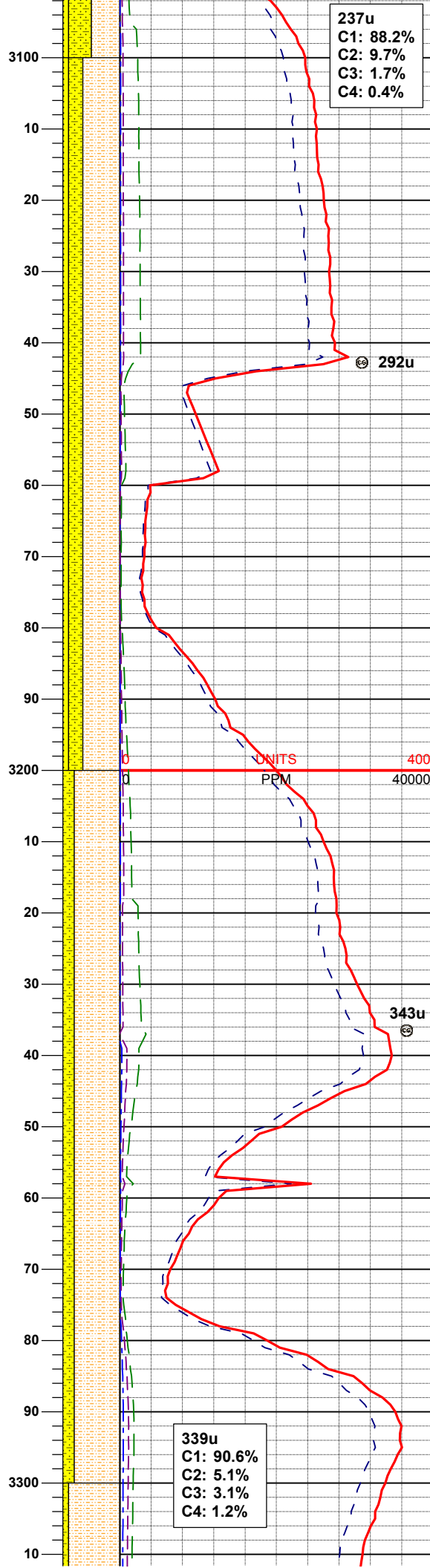
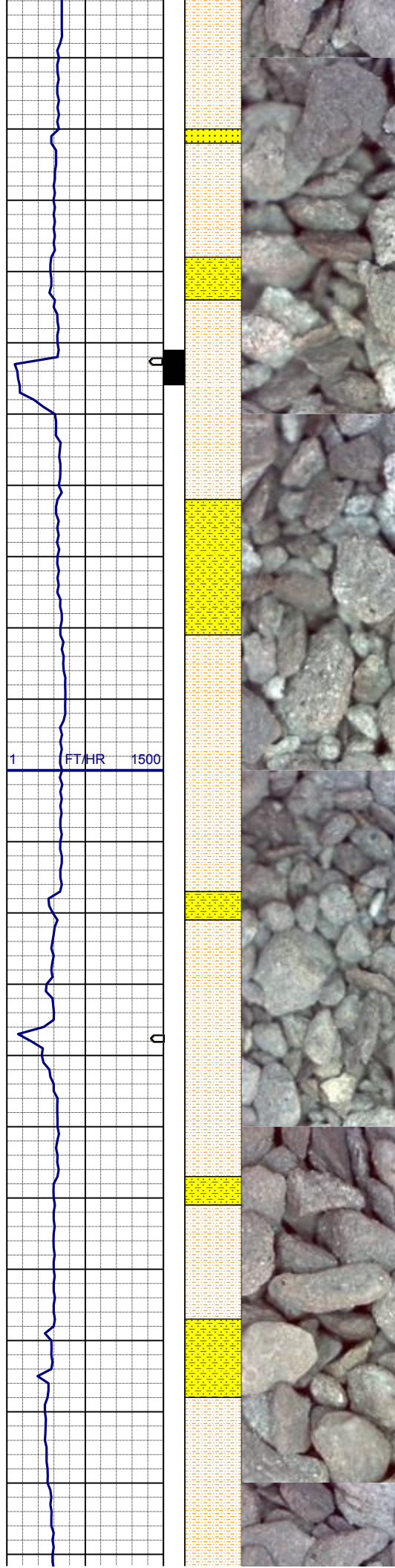
40% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, grd to  
35% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau  
25% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd

**SURVEY**  
**MD 2995'**  
**INC 9.8°**  
**AZI 9.7°**  
**TVD 2985.84'**

50% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to  
40% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau

**SURVEY**  
**MD 2995'**





237u  
C1: 88.2%  
C2: 9.7%  
C3: 1.7%  
C4: 0.4%

MD 3090  
INC 9.6°  
AZI 9.7°  
TVD 3079.48'

65% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 25% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog  
10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, calc, phlog, tr glau

SURVEY  
MD 3185'  
INC 6.6°  
AZI 11.1°  
TVD 3173.52'

UNITS  
PPM

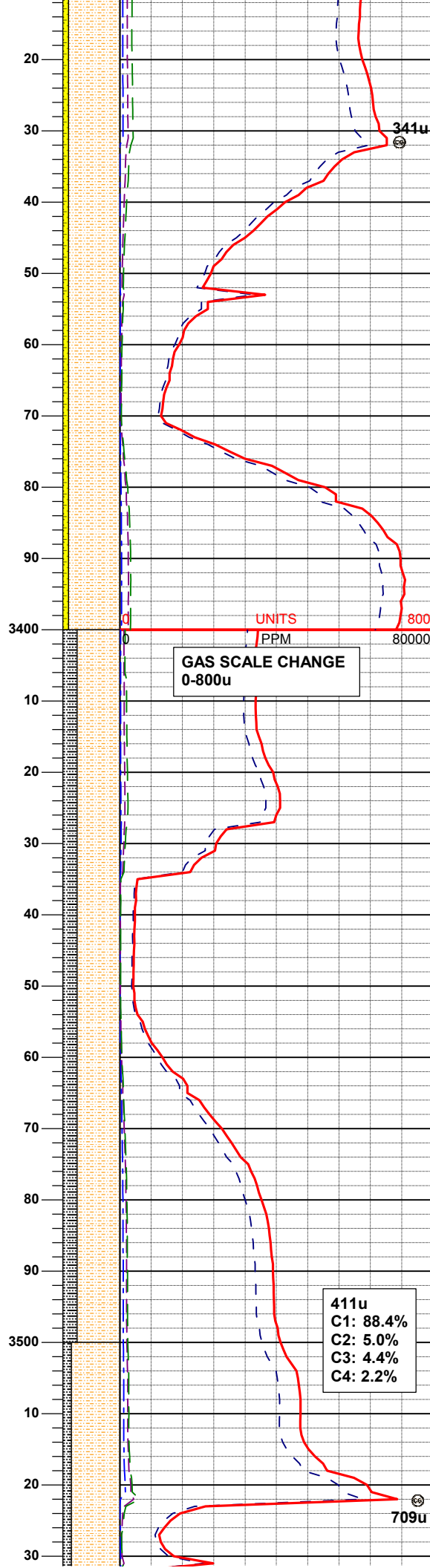
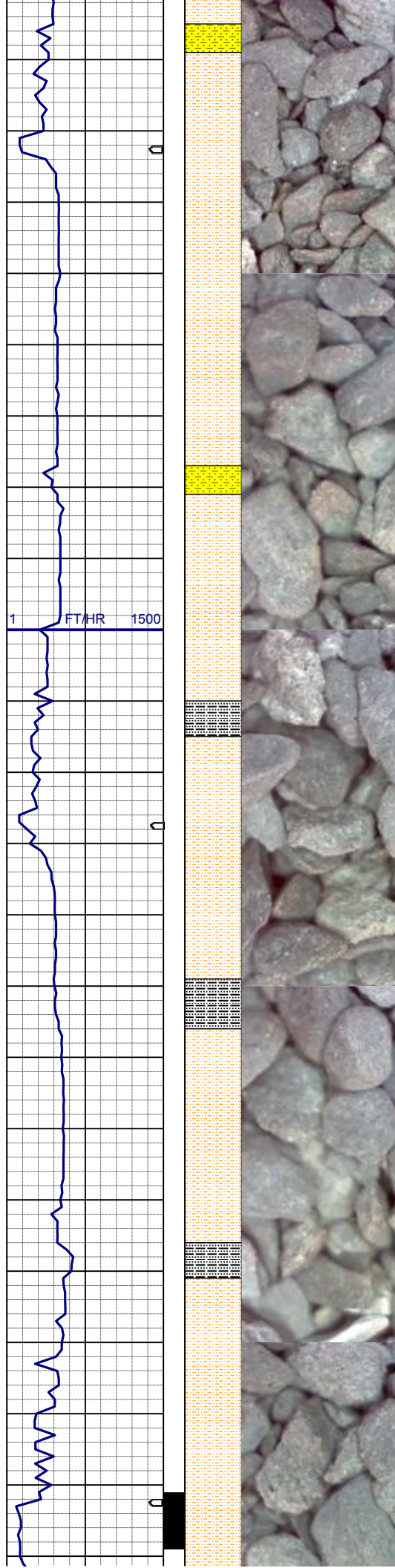
343u

80% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 20% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcmt, slcalc, phlog, sme ss, tr sltysh

SURVEY  
MD 3280'  
INC 5.5°  
AZI 6.3°  
TVD 3267.99'

339u  
C1: 90.6%  
C2: 5.1%  
C3: 3.1%  
C4: 1.2%





90% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 10% SHYSS: lt-mgy, f-mfgr, sbrd-sbang, mod-psrt, sft, ppor, argcm, slcalc, phlog, tr ss, tr sltysh

**SURVEY**  
**MD 3375'**  
**INC 4.3°**  
**AZI 4.6°**  
**TVD 3362.64'**

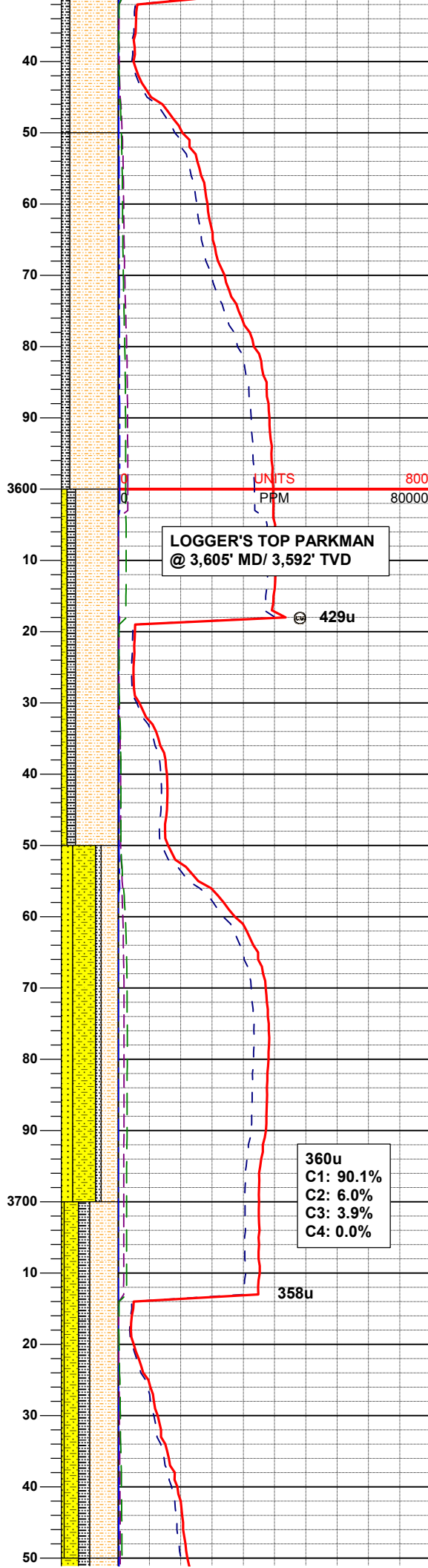
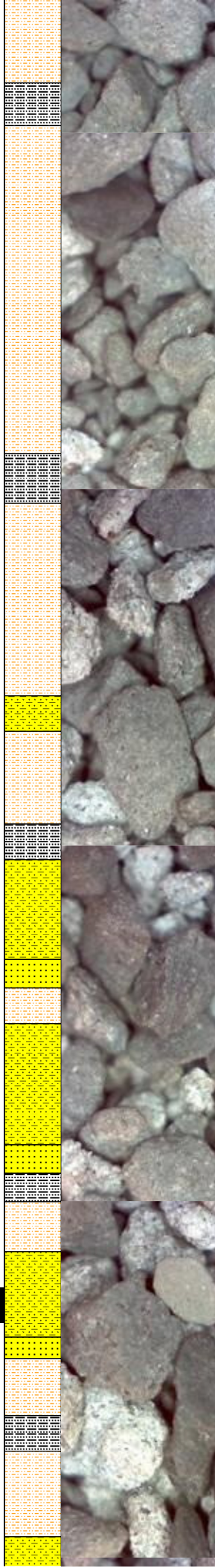
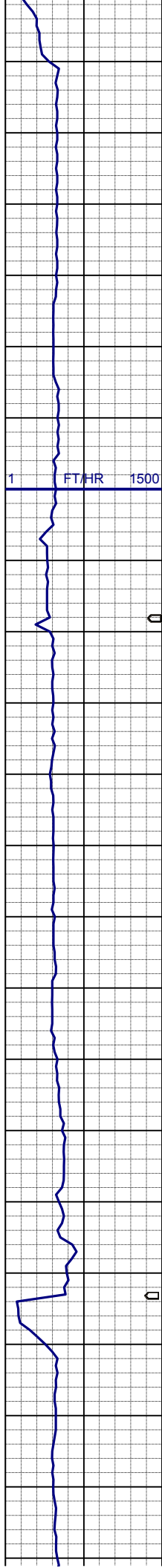
**MUD WT: 8.6 VIS: 28 IN**  
**MUD WT: 8.6 VIS: 28 OUT**

75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 25% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss, tr ss

**SURVEY**  
**MD 3470'**  
**INC 4.3°**  
**AZI 2.5°**  
**TVD 3457.37'**

**411u**  
**C1: 88.4%**  
**C2: 5.0%**  
**C3: 4.4%**  
**C4: 2.2%**

85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 15% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss, tr ss



33

**SURVEY**  
**MD 3566'**  
**INC 2.6°**  
**AZI 11.8°**  
**TVD 3553.20'**

85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd; grd to 15% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss, tr ss

75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd; grd to 15% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss 10% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt, tr s&p ss

**SURVEY**  
**MD 3661'**  
**INC 2.1°**  
**AZI 27.4°**  
**TVD 3648.12'**

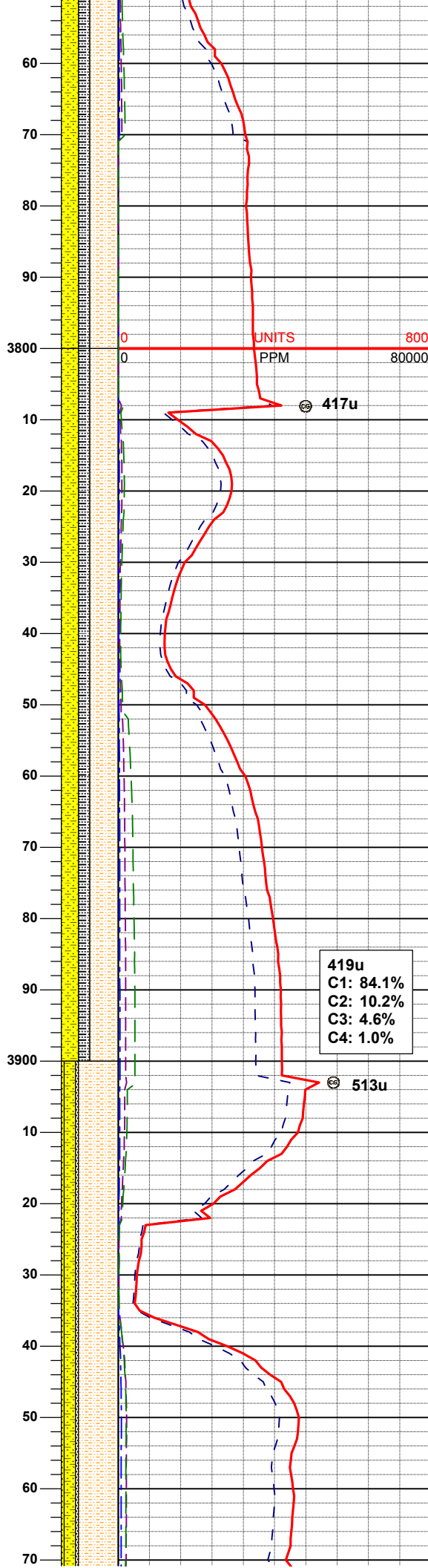
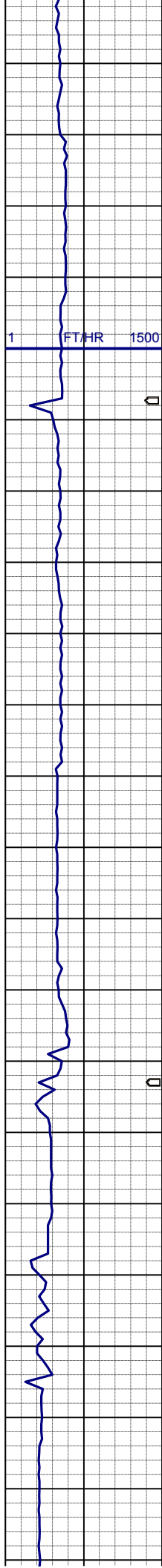
40% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt 30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd 20% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau 10% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss

50% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 25% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt 20% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss 5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau

**MUD WT: 8.6 VIS: 28 IN**  
**MUD WT: 8.7 VIS: 28 OUT**

**SURVEY**





**SURVEY**  
**MD 3756'**  
**INC 0.4°**  
**AZI 25.3°**  
**TVD 3743.09'**

50% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 30% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt 20% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss, abnt calcite

50% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 30% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt 20% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, sme shyss, abnt calcite

**SURVEY**  
**MD 3851'**  
**INC 0.5°**  
**AZI 81.0°**  
**TVD 3838.09'**

419u  
C1: 84.1%  
C2: 10.2%  
C3: 4.6%  
C4: 1.0%

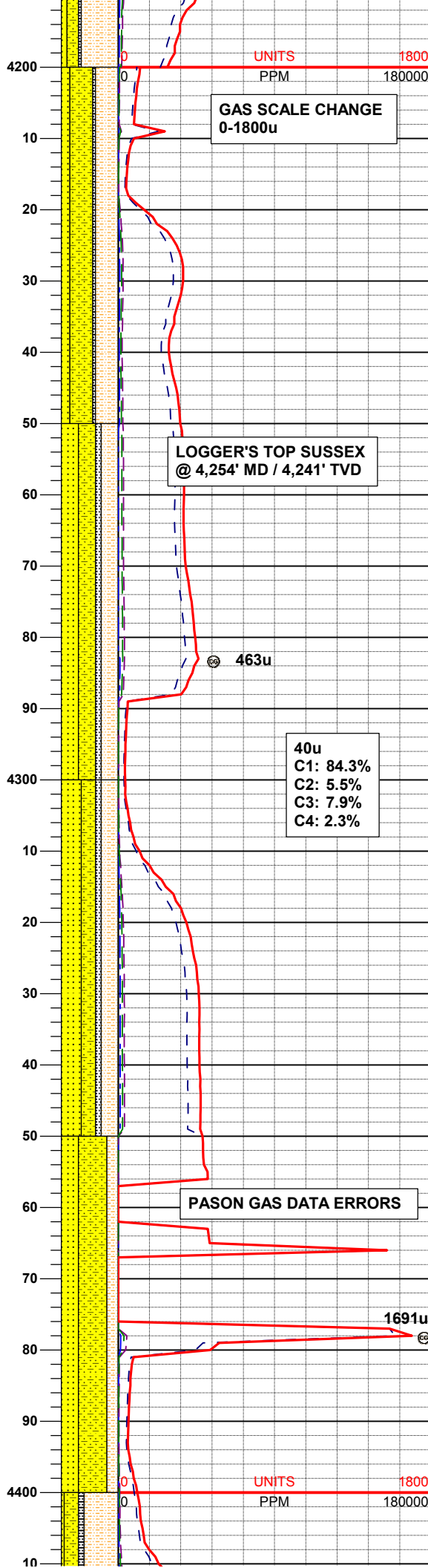
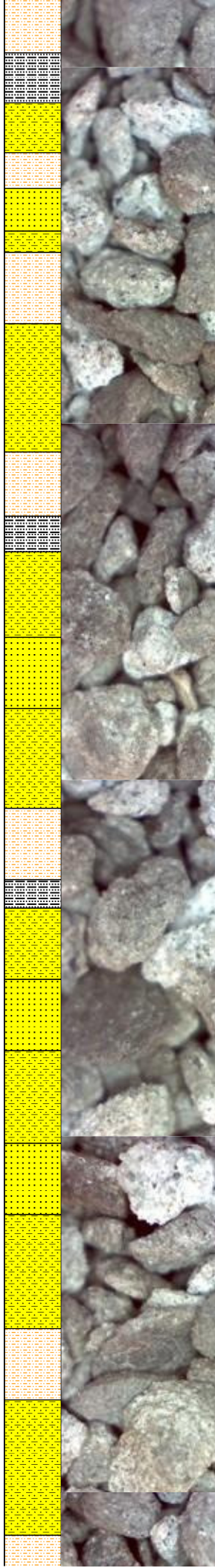
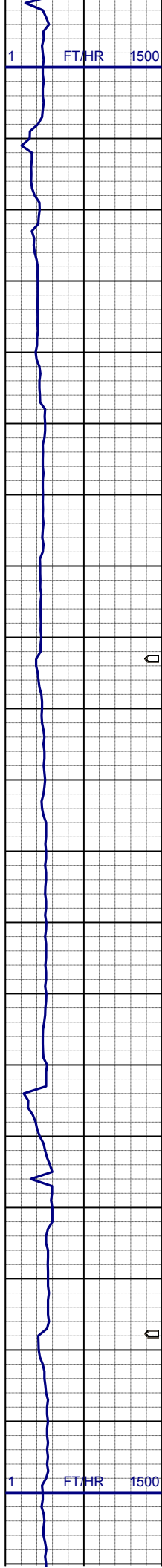
513u

**SURVEY**  
**MD 3946'**  
**INC 0.7°**  
**AZI 121.1°**  
**TVD 3933.08'**

70% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd, grd to 20% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt 5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau 5% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite







**SURVEY**  
**MD 4230'**  
**INC 0.9°**  
**AZI 40.4°**  
**TVD 4217.16'**

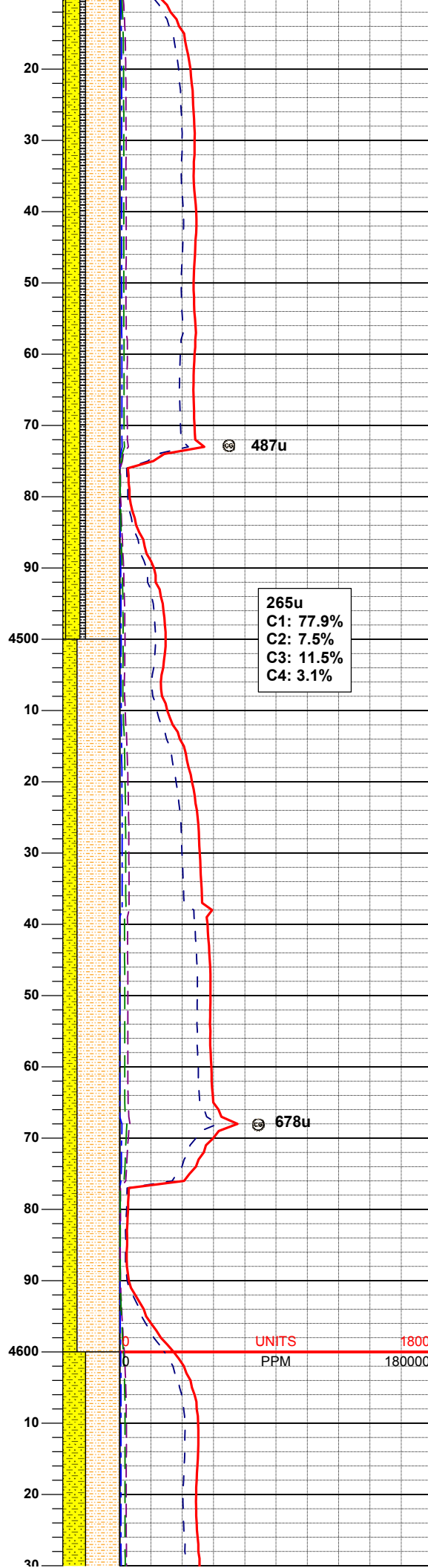
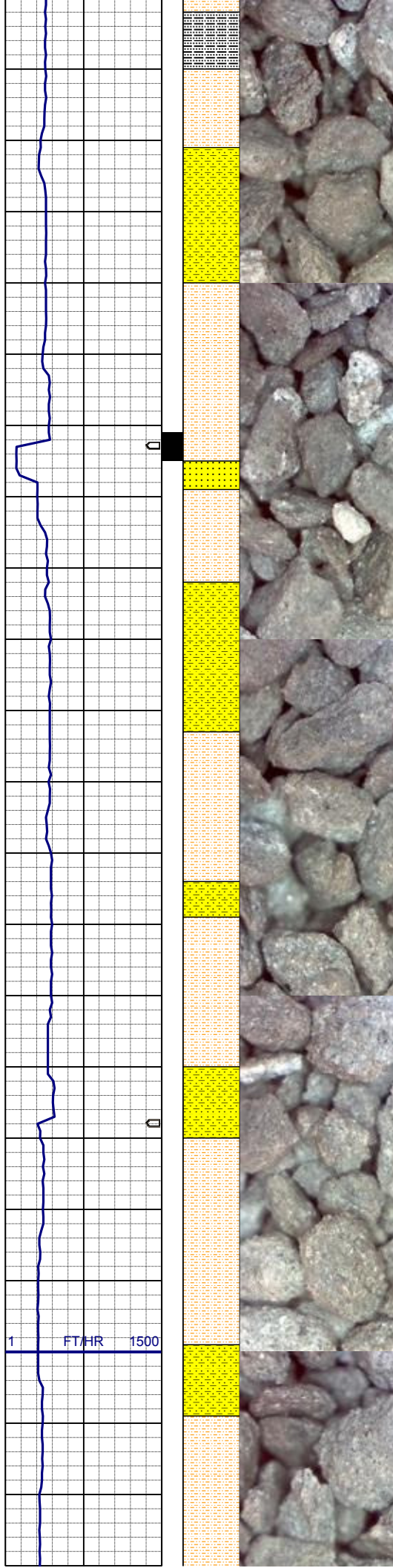
40% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
40% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mt, occ phlog, sme pyr ctd, grd to  
15% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
5% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite

30% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mt, occ phlog, sme pyr ctd, grd to  
30% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
10% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite

**SURVEY**  
**MD 4325'**  
**INC 1.1°**  
**AZI 25.3°**  
**TVD 4312.05'**

35% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
25% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mt, occ phlog, sme pyr ctd, grd to  
10% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite

50% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
20% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mt, occ phlog, sme pyr ctd



**SURVEY**  
**MD 4420'**  
**INC 1.1°**  
**AZI 26.2°**  
**TVD 4407.03'**

60% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
25% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
10% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite  
5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau

487u

265u  
C1: 77.9%  
C2: 7.5%  
C3: 11.5%  
C4: 3.1%

**SURVEY**  
**MD 4515'**  
**INC 0.7°**  
**AZI 59.1°**  
**TVD 4502.02'**

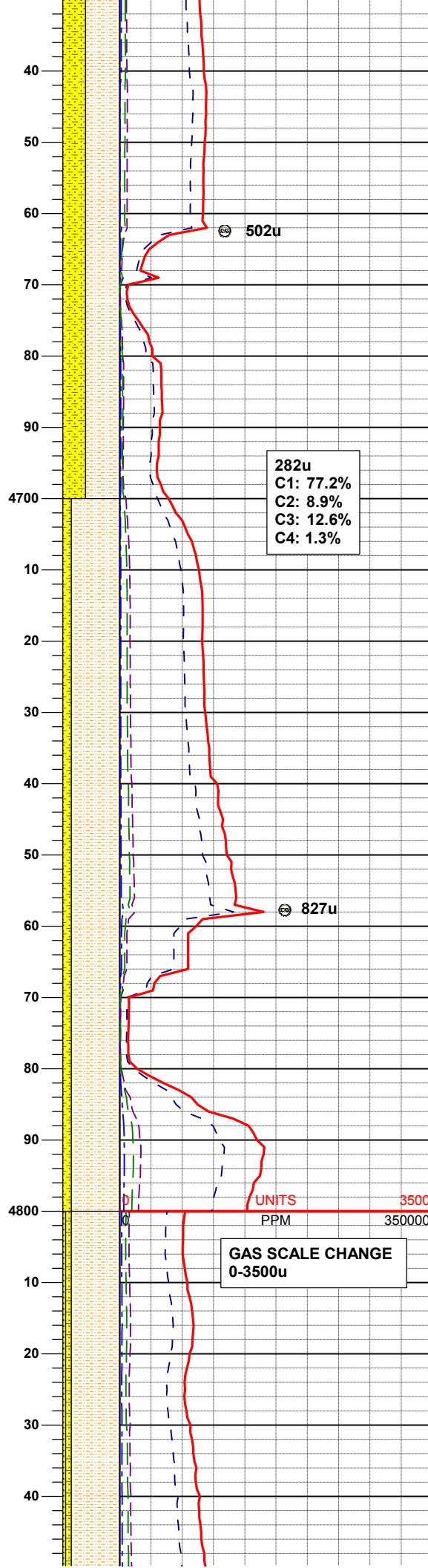
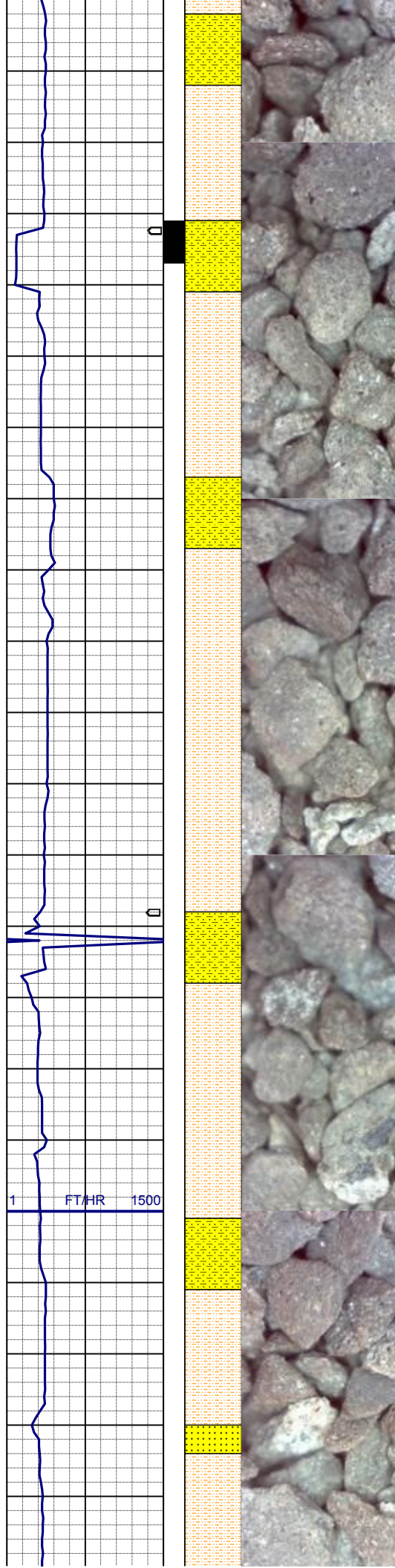
75% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
25% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt

678u

UNITS  
PPM

**SURVEY**  
**MD 4610'**  
**INC 1.5°**  
**AZI 72.1°**  
**TVD 4597.00'**





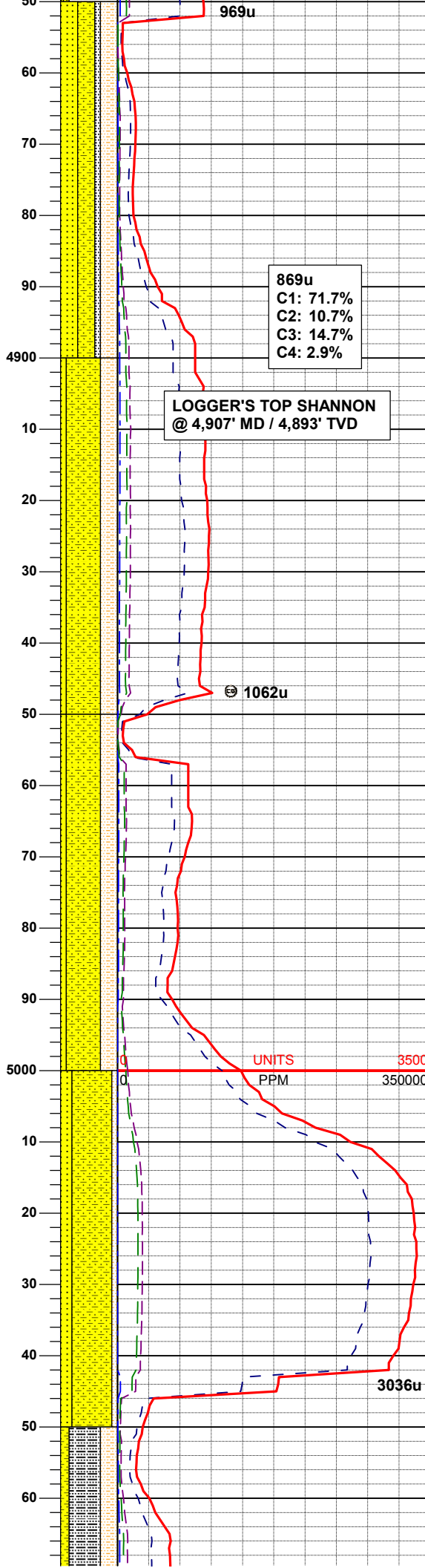
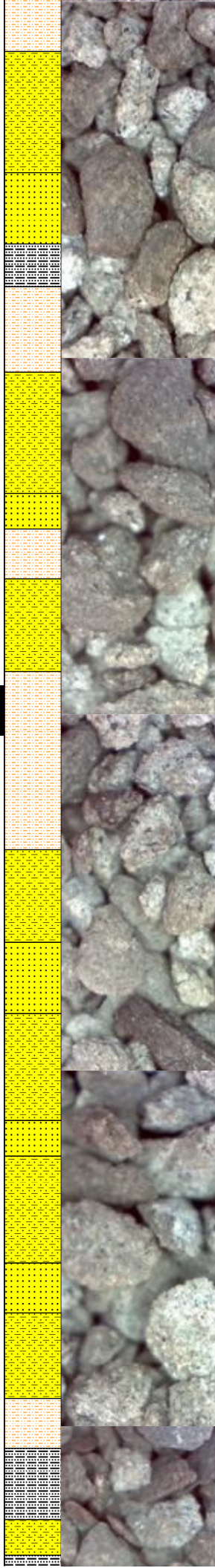
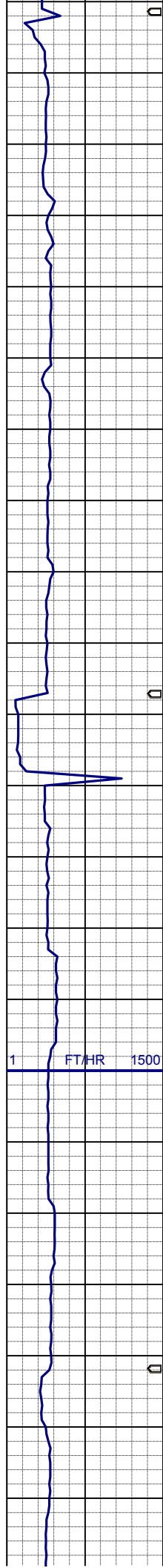
60% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
40% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt

**SURVEY**  
**MD 4705'**  
**INC 0.6°**  
**AZI 53.3°**  
**TVD 4691.99'**

85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
15% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt

**SURVEY**  
**MD 4800'**  
**INC 0.6°**  
**AZI 43.8°**  
**TVD 4786.98'**

85% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
10% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
5% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau



30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
30% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
10% SLTYSH: m- dkgy, slty, plty-sbplty, sft-brit, sl calc, tr calcite

**SURVEY**  
**MD 4895'**  
**INC 0.9°**  
**AZI 43.9°**  
**TVD 4881.97'**

60% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau

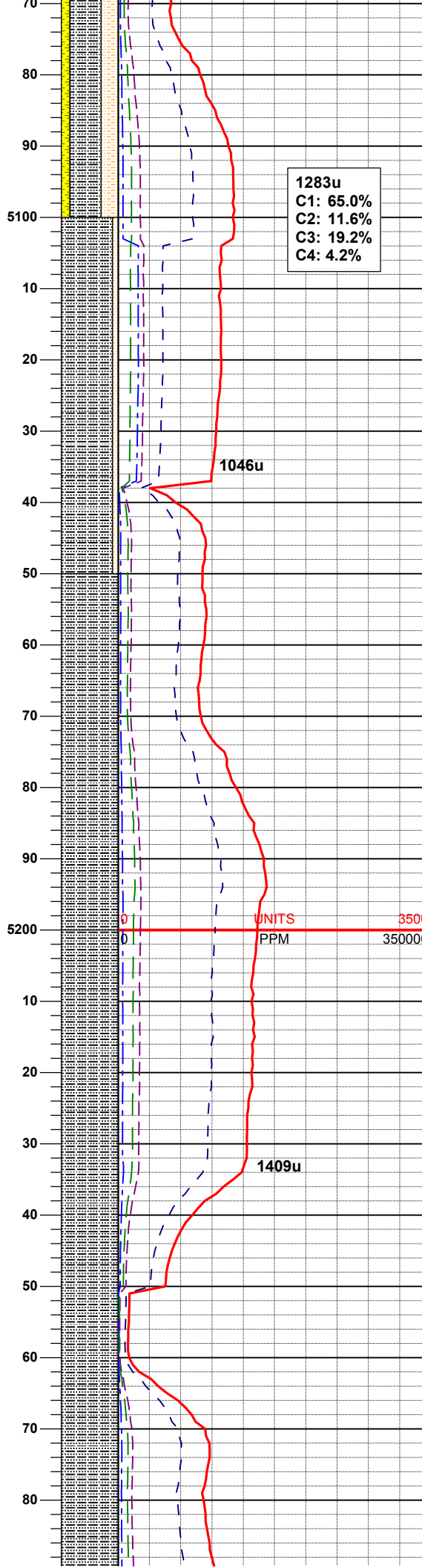
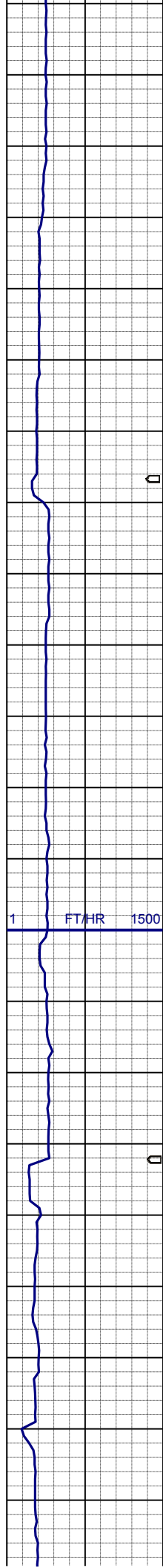
60% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
30% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd  
10% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau

**SURVEY**  
**MD 4990'**  
**INC 1.1°**  
**AZI 253.5°**  
**TVD 4976.97'**

70% SHYSS: lt-mgy, f-mggr, sbrd-sbang, mod-psrt, ppor, argcmt  
20% SS: w-ltgy, s&p, mf-c gr, sbrd, mod-wsrt, ppor, argcmt, sl calc, tr glau  
10% SHYSLTST: lt-mgy, sme tan, f-vfgr, sbrd-sbang, mod-psrt, arg mtx, occ phlog, sme pyr ctd

55% SLTYSH: m- dkgy, slty, plty-shnlty, sft-brit, sl calc, tr calcite





sbply, sft-brit, sl calc, tr calcite  
15% SHYSS: lt-mgy, f-mggr, sbdr-  
sbang, mod-psrt, ppor, argcmt

**SURVEY**  
**MD 5085'**  
**INC 0.5°**  
**AZI 248.4°**  
**TVD 5071.96'**

90% SLTYSH: m- dkgy, slty, plty-  
sbply, sft-brit, sl calc, tr calcite  
10% SHYSLTST: lt-mgy, sme tan, f-  
vfgr, sbdr-sbang, mod-psrt, arg mtz,  
occ phlog, sme pyr ctd

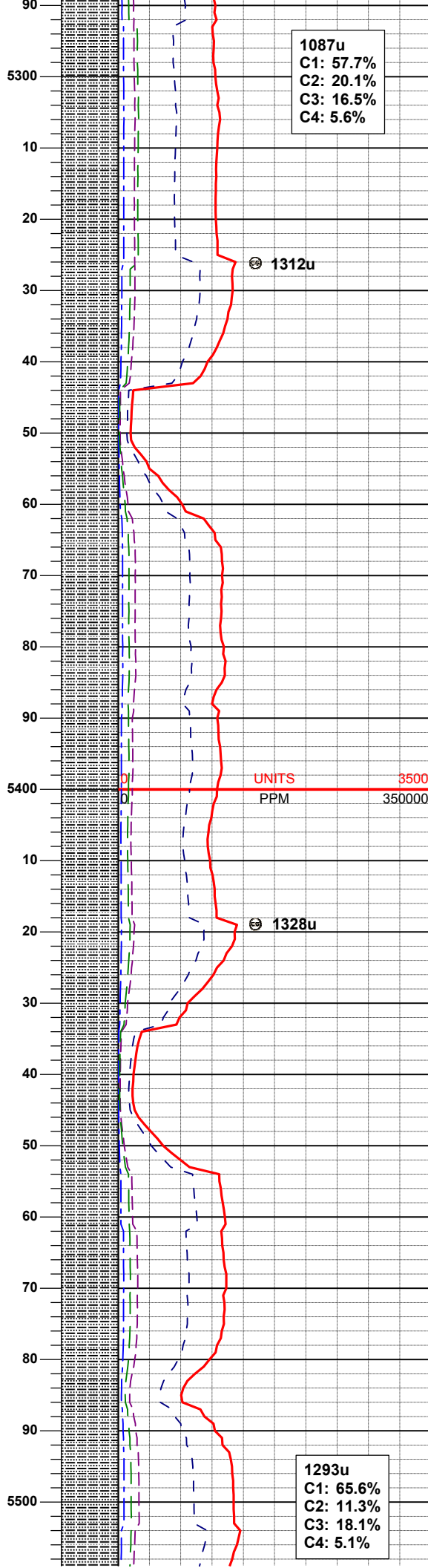
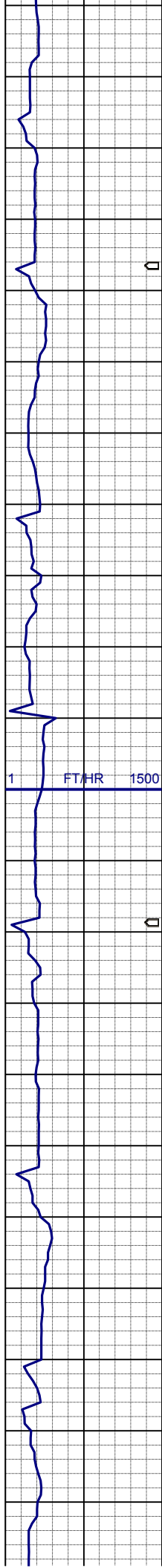
**MUD WT: 8.7 VIS: 30 IN**  
**MUD WT: 8.7 VIS: 30 OUT**

100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd

**SURVEY**  
**MD 5180'**  
**INC 0.6°**  
**AZI 234.1°**  
**TVD 5166.95'**

100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd, sme shylistst

**SURVEY**  
**MD 5275'**  
**INC 0.9°**  
**AZI 354.5°**  
**TVD 5261.95'**



1087u  
C1: 57.7%  
C2: 20.1%  
C3: 16.5%  
C4: 5.6%

MUD WT: 9.1 VIS: 31 IN  
MUD WT: 9.0 VIS: 30 OUT

100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd, sme shysltst

SURVEY  
MD 5370'  
INC 0.9°  
AZI 7.2°  
TVD 5356.94'

1312u

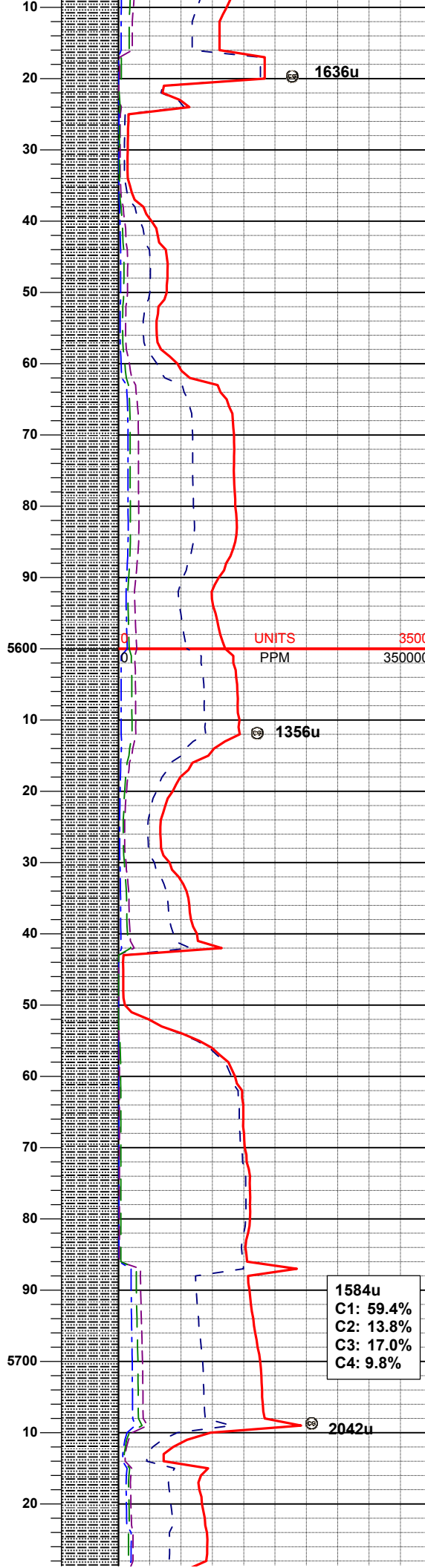
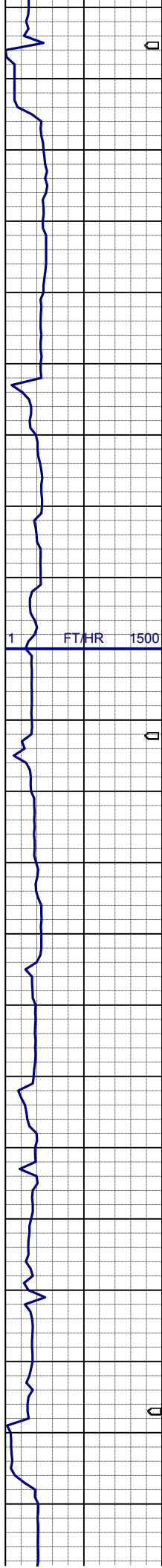
1328u

100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd

SURVEY  
MD 5465'  
INC 1.1°  
AZI 15.6°  
TVD 5451.92'

1293u  
C1: 65.6%  
C2: 11.3%  
C3: 18.1%  
C4: 5.1%





MUD WT: 9.3 VIS: 33 IN  
MUD WT: 9.4 VIS: 33 OUT

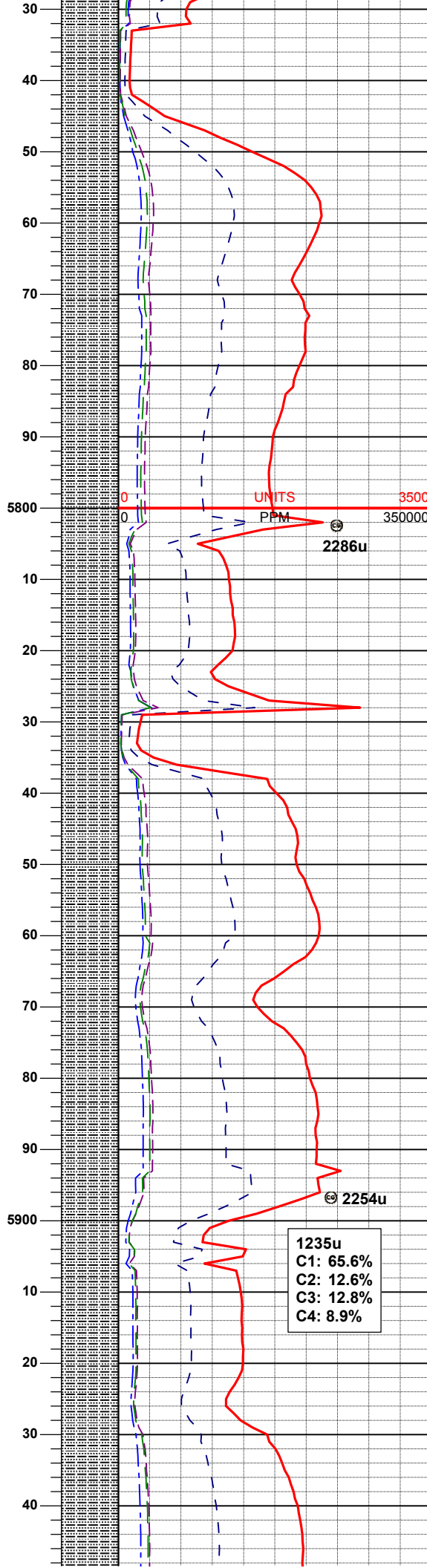
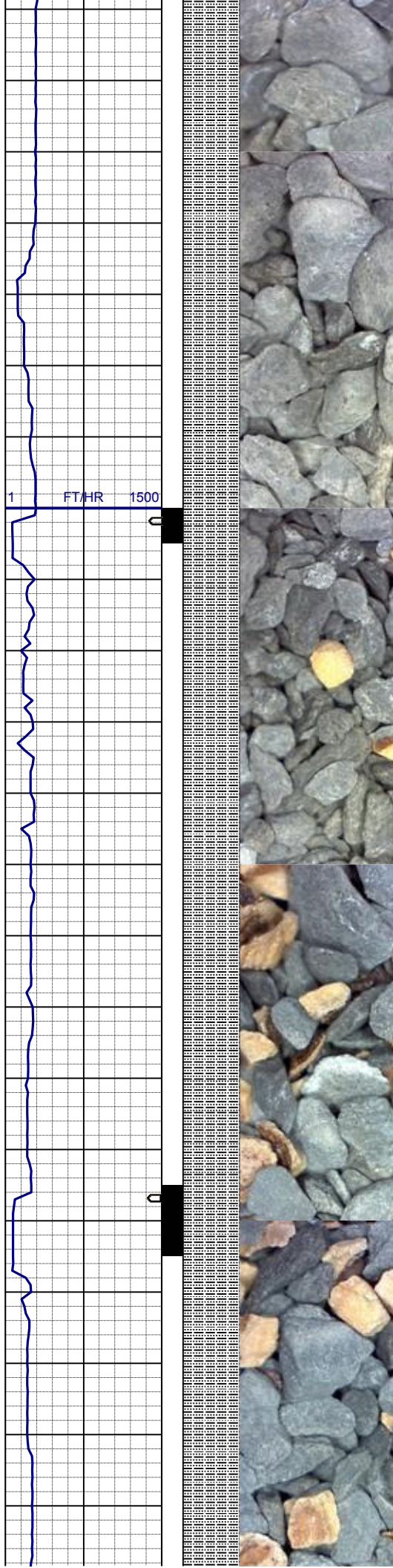
100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbbiky, sl calc, sme  
pyr ctd

**SURVEY**  
**MD 5560'**  
**INC 0.4°**  
**AZI 34.1°**  
**TVD 5546.91'**

100% SLTYSH: lt - mgy, sme tan, v f  
gr, fri-brit, sbply-sbbiky, sl calc, sme  
pyr ctd

**SURVEY**  
**MD 5655'**  
**INC 1.1°**  
**AZI 25.1°**  
**TVD 5641.90'**

**1584u**  
**C1: 59.4%**  
**C2: 13.8%**  
**C3: 17.0%**  
**C4: 9.8%**



**SURVEY**  
**MD 5749'**  
**INC 0.9°**  
**AZI 351.6°**  
**TVD 5735.89'**

100% SLTYSH: lt - mgy, sme dkgy, v  
f gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd, tr shysltst

**MUD WT: 9.4 VIS: 34 IN**  
**MUD WT: 9.5 VIS: 34 OUT**

100% SLTYSH: lt - mgy, sme dkgy, v  
f gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd, tr shysltst, tr ss

**SURVEY**  
**MD 5844'**  
**INC 1.5°**  
**AZI 5.6°**  
**TVD 5830.87'**

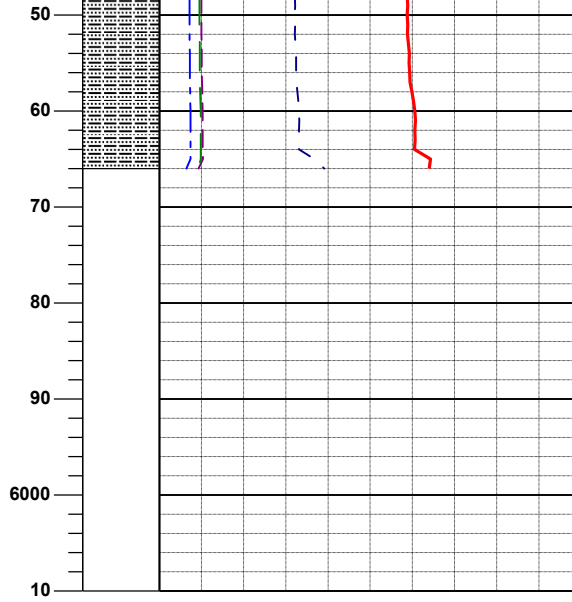
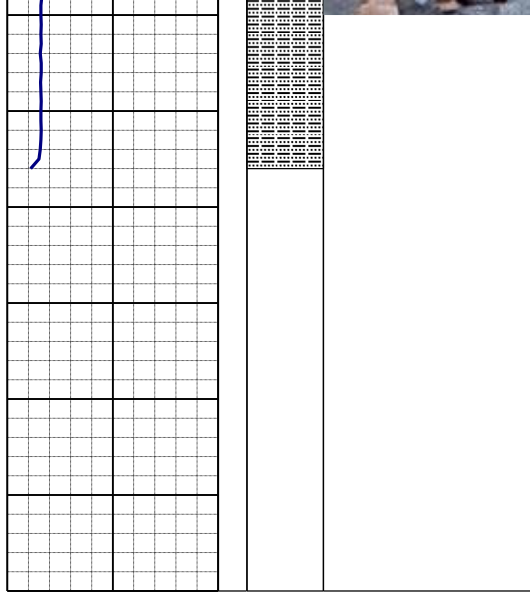
100% SLTYSH: lt - mgy, sme dkgy, v  
f gr, fri-brit, sbply-sbblky, sl calc, sme  
pyr ctd, tr shysltst

**MUD WT: 9.5+ VIS: 35 IN**  
**MUD WT: 9.6+ VIS: 36 OUT**

**SURVEY**  
**MD 5934'**  
**INC 0.2°**  
**AZI 81.4°**  
**TVD 5925.86'**

**1235u**  
**C1: 65.6%**  
**C2: 12.6%**  
**C3: 12.8%**  
**C4: 8.9%**





TD VERTICAL @ 5,966' MD  
7/25/2012 16:38 MST

LOG CONTINUES ON  
LPLOT BOOTH STATE  
C36-69HN HORIZONTAL

THANK YOU FOR USING  
COLUMBINE LOGGING INC.