



FORMATION EVALUATION LOG



MA32_N1Q.PR1

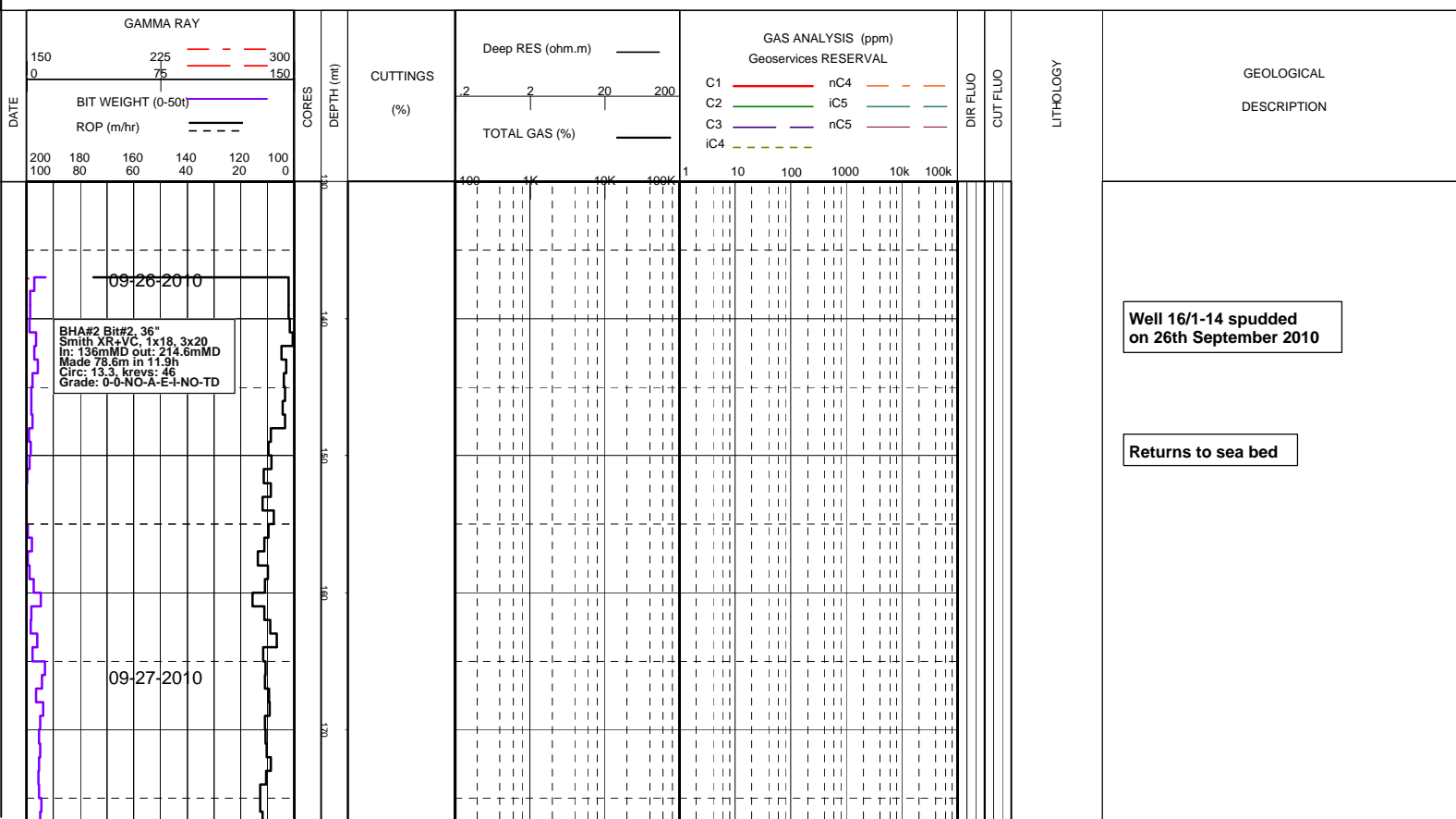
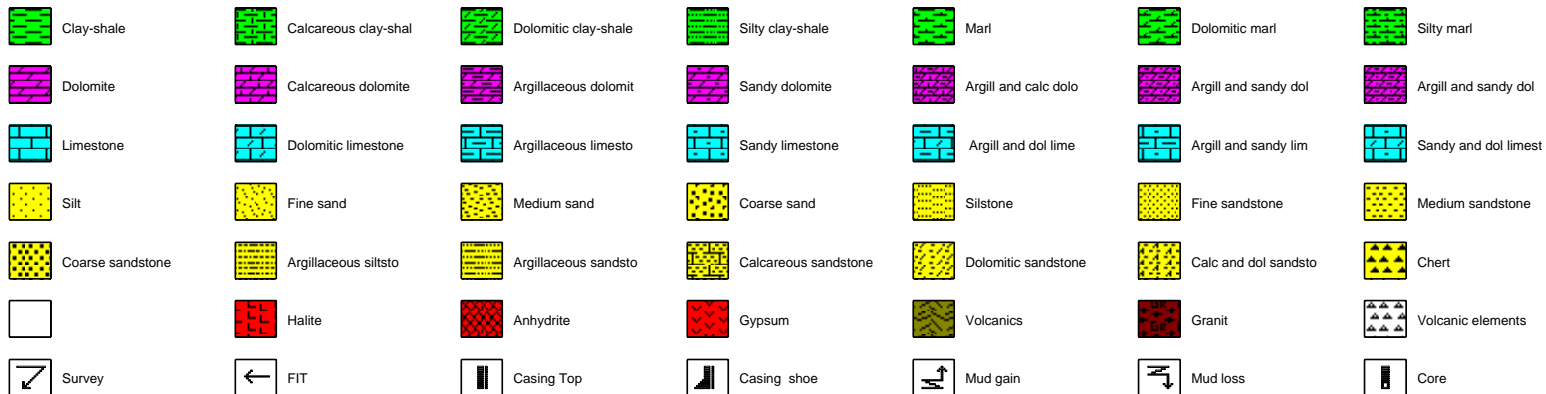
Well name : 16/1-14

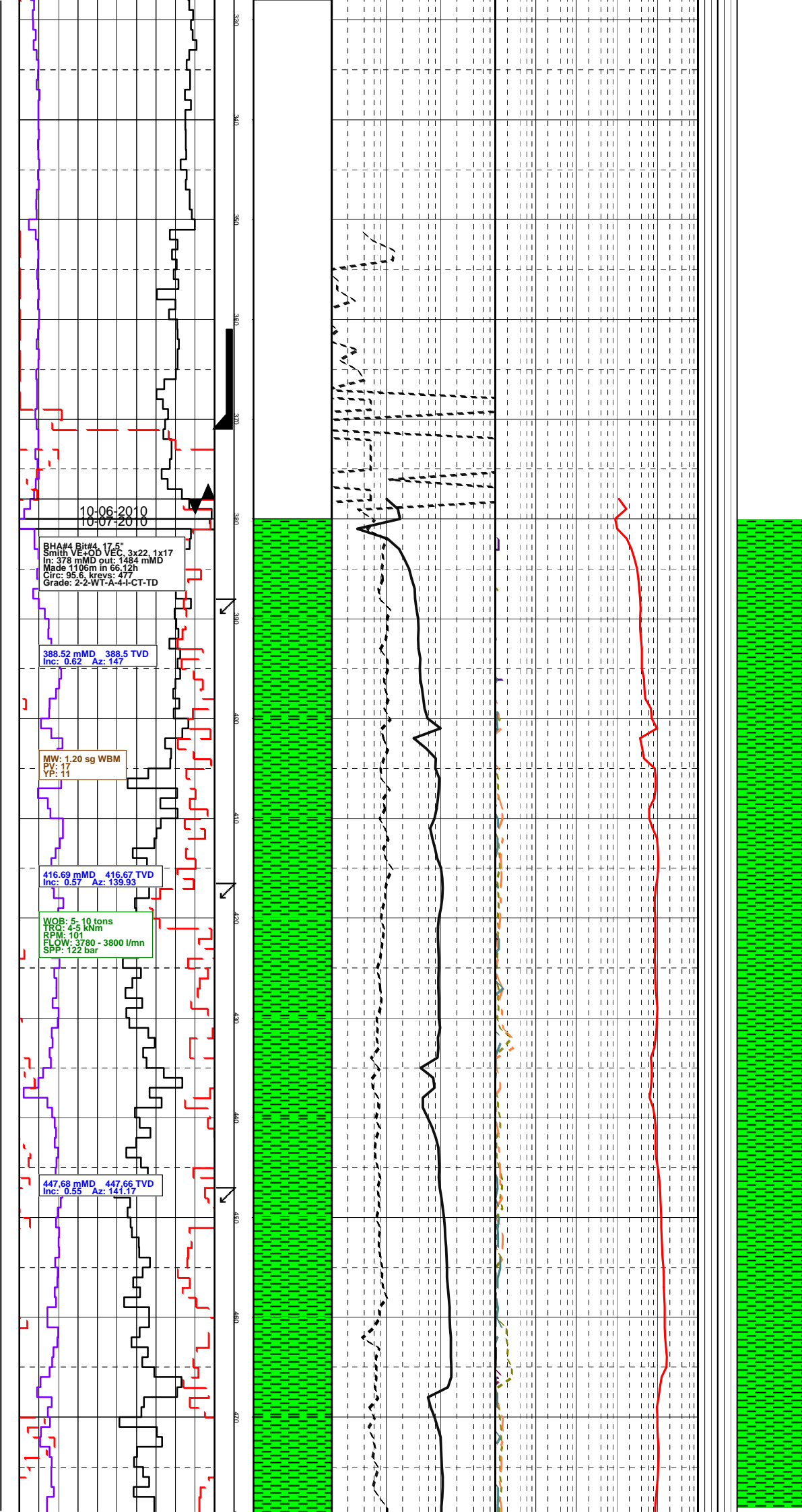
Client name : Lundin

Rig Name : Transocean Winner
Rig Type : Semi-SubmersibleField : Apollo
Country : Norway
Area : North SeaSpud Date : 26th September 2010
TD Reached : 3rd November 2010
Total Drill Days : 39Location long : 2° 12' 10.5526" E
Location lat : 58° 53' 09.3097" NUTM loc [E] (m) : 454053.58
UTM loc [N] (m) : 6527773.05Total Depth (m) : 2550
TVD (m) : 2549.9
RT - MSL (m) : 26
MSL - Seabed (m) : 110
Depth Reference : Rotary Table

Plot Scale : 1/500

Generated by ALX Package

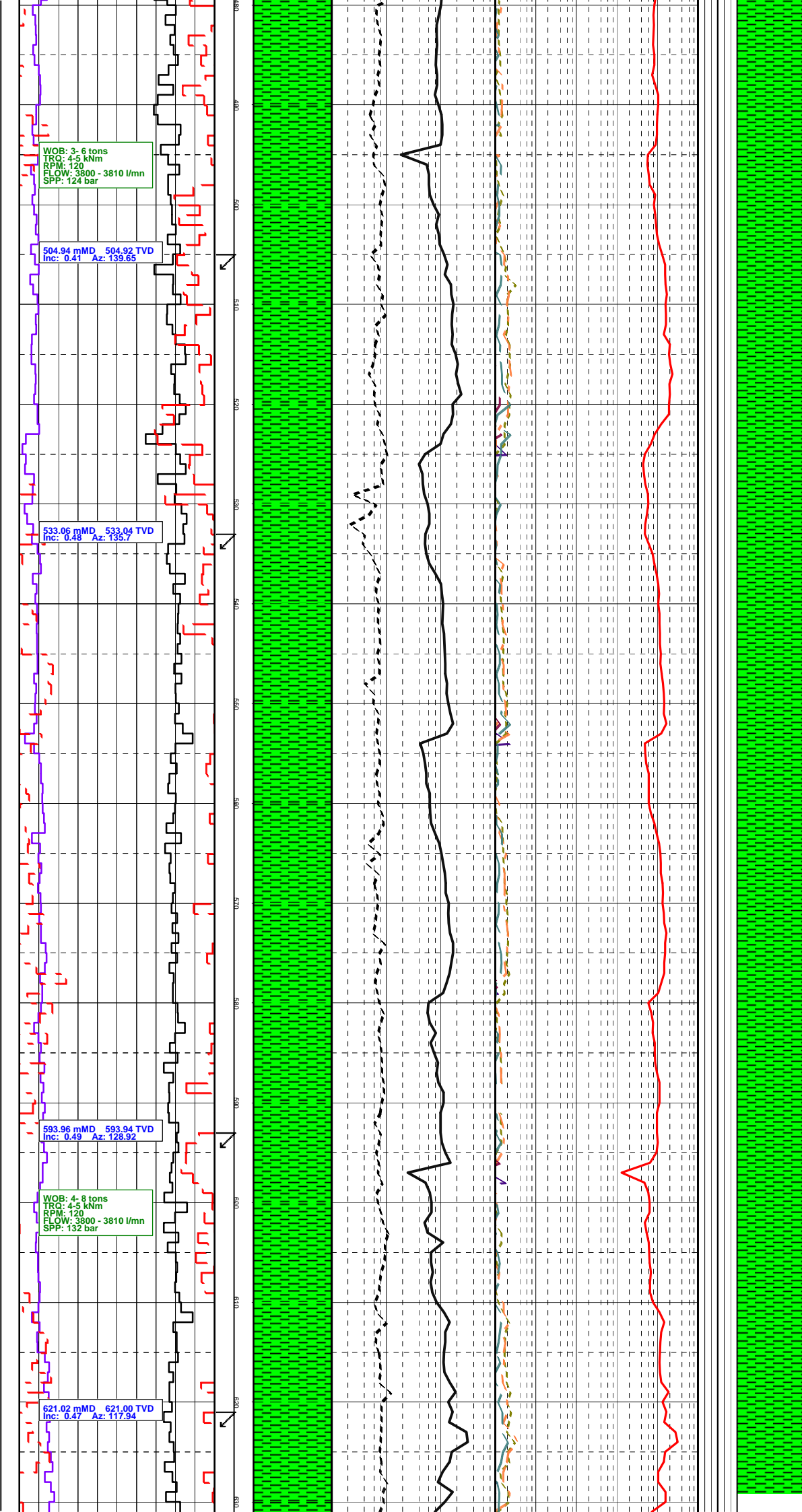




TD 20" casing shoe
at 378mMD

CLST: med dk gry, sft, amor, stky,
calc, carb, slty, loc slily slty & sdy,
predom vf-f, occ m - v crs, clr trnsi,
sbang - sbrnd, wl srt

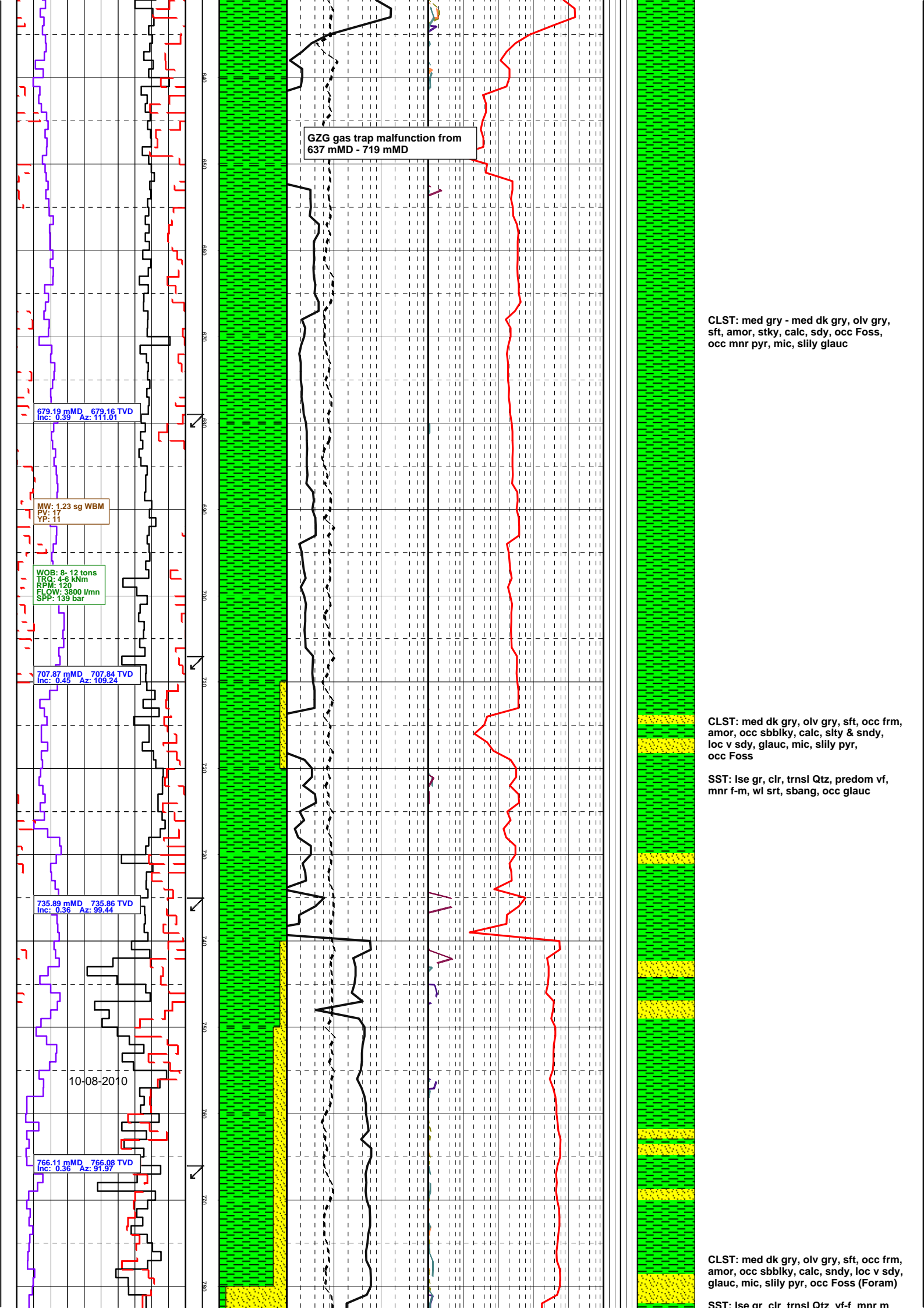
CLST: med gry - med dk gry, sft,
amor - sbbiky, stky, calc, carb, glauc,
foss (Foram), mnr pyr, v slty & sdy:
clr trnsi Qtz, predom vf-f, occ m-crs,
mod srt, sbang - rndd

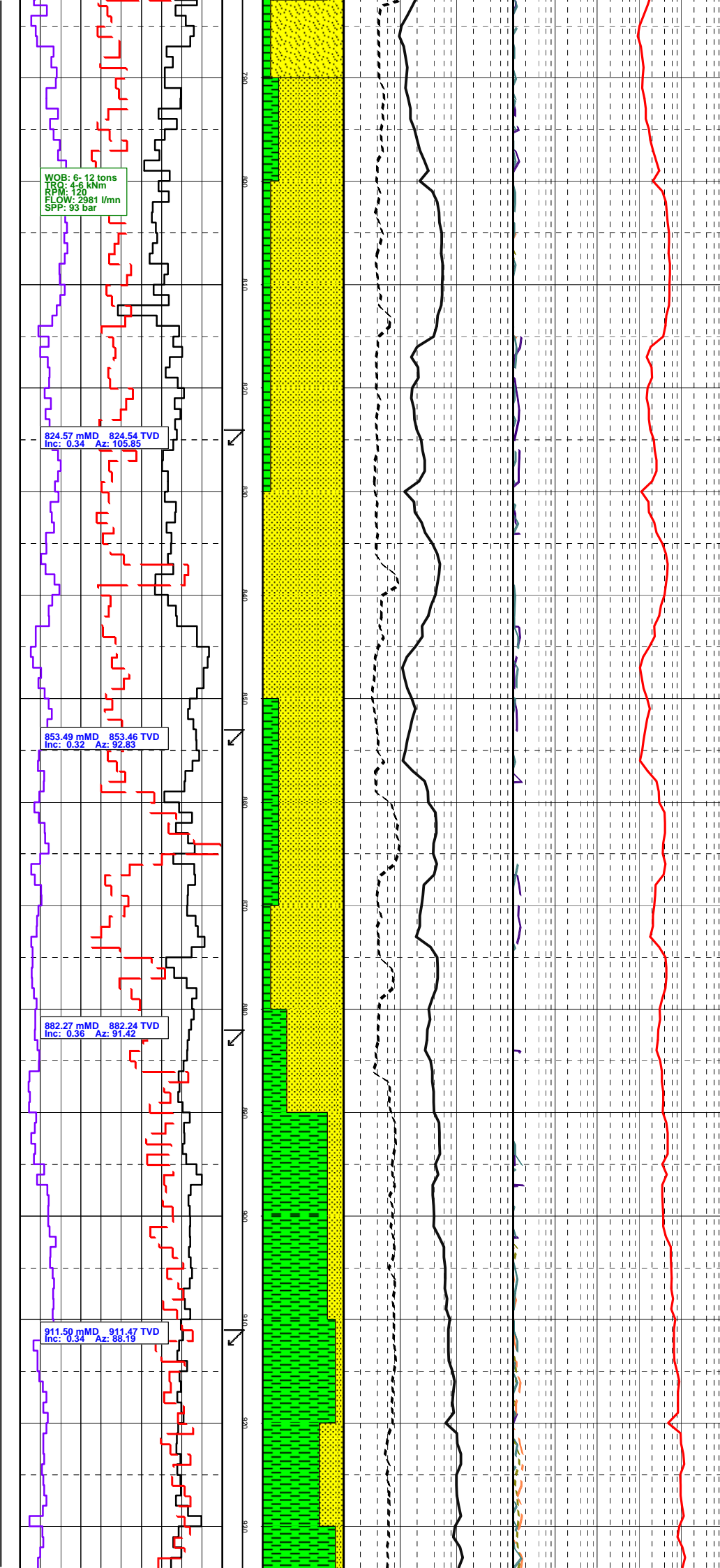


CLST: med gry - med dk gry, sft, amor, stky, calc, occ carb, glauc, foss, mnv pyr, slty & sdy: clr trnsi Qtz, predom vf-f, occ m - crs, mod - wl srt sbang - rndd

CLST: med gry - med dk gry, sft, amor stky, calc, occ carb, glauc, r shl frgm, mnv pyr, slty & loc v sdy: clr trnsi Qtz, predom vf-f, occ m - crs, mod - wl srt sbang - rndd,

CLST: med gry - med dk gry, sft, stky, calc, occ carb, glauc, r shl frgm, mnv pyr, slty & loc v sdy: clr trnsi Qtz, predom vf-f, occ m - crs, mod - wl srt sbang - rndd,





WOB: 6-12 tons
TRO: 4-6 kNm
RPM: 120
FLOW: 2981 l/min
SPP: 93 bar

824.57 mMD 824.54 TVD
Inc: 0.34 Az: 105.85

853.49 mMD 853.46 TVD
Inc: 0.32 Az: 92.83

882.27 mMD 882.24 TVD
Inc: 0.36 Az: 91.42

911.50 mMD 911.47 TVD
Inc: 0.34 Az: 88.19

sbang, wl srt, dom ls, glauc

CLST: med dk gry, olv gry, sft, occ frm, amor, occ sbbiky, calc, sndy, loc v sdy, glauc, mic, slily pyr, occ Foss (Foram)

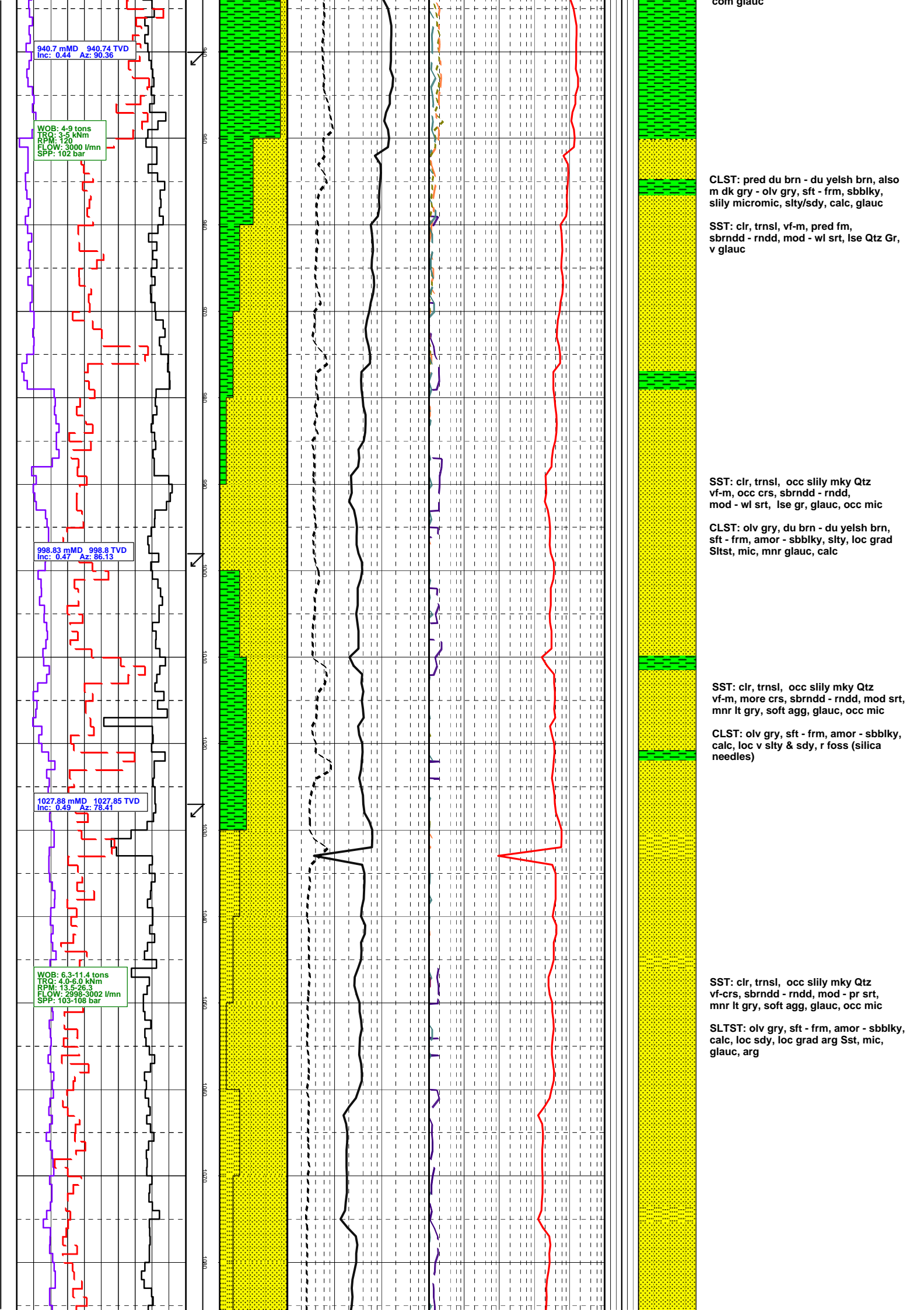
SST: clr, trnsi, vf-f, r crs, sbrndd - rndd, mod srt, lse Qtz Gr, com glauc

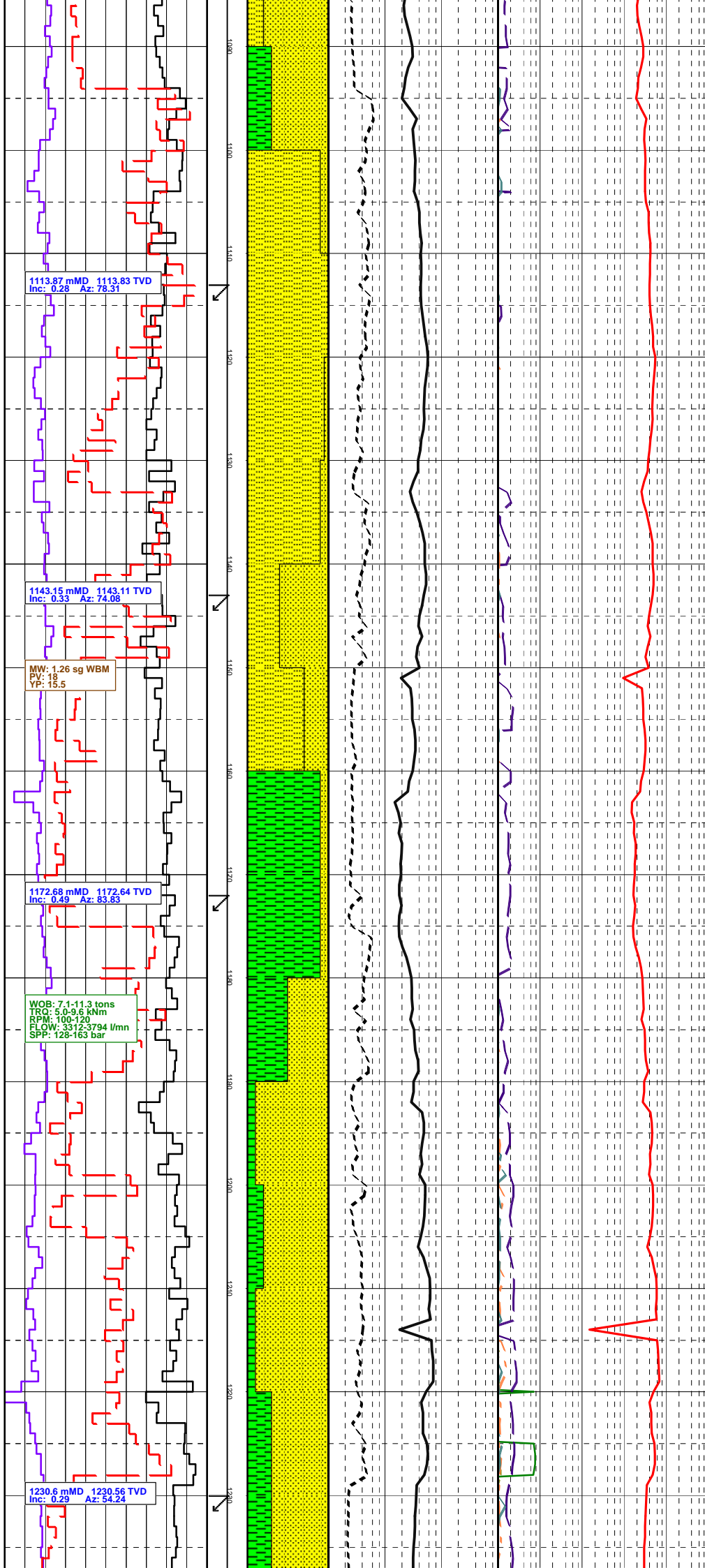
CLST: med dk gry, olv gry, sft - frm, amor, occ sbbiky, calc, sndy, loc v sdy, glauc, mic, slily pyr, occ Foss (Foram)

SST: clr, trnsi, vf-f, occ m, sbrndd - rndd, mod - wl srt, lse Qtz Gr, com glauc

CLST: med dk gry - olv gry, brnsh gry (calc) and gnsh gry (non - slily calc), sft - frm, sbbiky - amor, v slty/sdy, loc grad Stst, calc, v glauc

SST: clr, trnsi, vf-m, pred fm, sbrndd - rndd, mod - wl srt, lse Qtz Gr, com glauc





SST: clr, trnsI, occ slily mky Qtz
vf-crs, sbrndd - rndd, mod - pr srt,
mnr lt gry, soft agg, glauc, occ mic,
occ foss frag (shell)

CLST: dsk brn - dsky yelsh, frm, loc
mod hd, sbblky, non calc, loc slily sdy,
mic, loc glauc, r sil needles (foss)

SST: clr, trnsI, occ mky Qtz, vf-crs,
pred f-m, sbrndd - rndd, mod - pr srt,
pred lse gr, mnr lt gry, sft agg,
mic, glauc

SLTST: dsk brn - dsky yelsh, frm, loc
mod hd, sbblky, non calc, loc slily sdy,
mic, loc glauc, r sil needles (foss)

SST: clr, trnsI, occ mky Qtz, vf-crs,
pred f-m, sbrndd - rndd, mod - pr srt,
pred lse gr, mnr lt gry, sft agg,
mic, glauc

CLST: dsk brn - dsky yelsh brn, frm,
sft - frm, amor - sbblky, non calc,
sity, loc glauc, loc sdy, loc mic

SST: clr, trnsI, occ mky, vf-crs,
sbrndd - rndd, mod - wl srt, lse Qtz gr

CLST: dsky yelsh brn - dsk brn,
sft - frm, amor - sbblky, sity, occ sdy,
occ glauc, loc mic, non - slily calc

SST: clr, trnsI, occ mky, vf-crs,
sbrndd - rndd, mod - wl srt, lse Qtz gr

CLST: dsky yelsh brn - dsk brn,
also dk gnsh gry, sft - frm,
amor - sbblky, sity, occ sdy, occ glauc,
loc mic, non calc, occ carb

WOB: 5.8-12.7 tons
TRQ: 4.3-9.3 kNm
RPM: 120
FLOW: 3206-3810 l/min
SPP: 121-168 bar

1288.65 mMD 1288.61 TVD
Inc: 0.37 Az: 80.86

1347.34 mMD 1347.30 TVD
Inc: 0.20 Az: 69.25

WOB: 6.4-22.8 tons
TRQ: 4.3-8.4 kNm
RPM: 98-120
FLOW: 3803-3810 l/min
SPP: 168-173 bar

MW: 1.26 sg WBM
PV: 18.5

1376.28 mMD 1376.24 TVD
Inc: 0.33 Az: 42.40

SST: clr, trnsi, occ mky, vf-crs,
pred f - m, sbrndd - rndd, mod - wl srt,
lse Qtz gr

CLST: m dk gry - olv gry, dsky brn -
dsky yelsh brn, predom frm, sbbiky,
slily slty, slily micromic, loc slily
micropyr, slily glauc, loc abd glauc
non - slily calc, loc slily carb

SST: clr, trnsi, occ mky, vf-crs,
pred f - m, sbrndd - rndd, mod - wl srt,
lse Qtz gr

CLST: med dk gry - olv gry, frm, sbbiky,
sbbiky, slily slty - loc abd slty,
micromic, loc slily, micropyr, slily
glauc, non - slily calc, loc slily carb

LS: dk yelsh brn, frm-hd, sbbiky - biky

SST: clr trnsi Qtz, vf - crs, pr srt,
sbrndd - rndd, lse gr

CLST: olv gry - occ gnsh gry,
frm - mod hd, sbbiky - biky, non - slily
calc, loc v slty, grad arg Slst, mic,
loc dissem pyr, loc glauc

SLTST: olv gry, frm, sbbiky, calc, arg,
mic, occ dissem pyr, loc slily sdv

CLST: olv gry - occ gnsh gry,
frm - mod hd, sbbiky - biky, non - slily
calc, loc v slty, grad arg Slst, mica,
loc dissem pyr, loc glauc

LS: lt brnsh gry, lt olv gry, frm, biky,
slily arg, microxl

1405.13 mMD 1405.09 TVD
Inc: 0.40 Az: 19.13

WOB: 10-22 tons
TRO: 8-12 kNm
RPM: 120
FLOW: 3500 - 3800 l/mn
SPP: 145 - 180 bar

1462.83 mMD 1462.79 TVD
Inc: 0.29 Az: 0.47

MW: 1.35 sg WBM
PV: 19
VP: 17

10-14-2010

BHA#5 Bit#5, 12.25"
Halliburton FX65R 3x13, 1x15
In: 1484mMD out: 2, 3x13, 1x15
Made 731m in 29.8h
Circ: 61.8, krevs: 253
Grade: 1-2-51-A-X-1-NO-TD

WOB: 4.5-22.1 tons
TRO: 5.5-11.3 kNm
RPM: 70-120
FLOW: 3077 - 3810 l/mn
SPP: 172 - 180 bar

1526.64 mMD 1526.6 TVD
Inc: 0.49 Az: 314.1

CLST: olv gry - brnsh gnsh gry,
frm - mod hd, sbblky, loc subfis,
mica, slty, calc

LS: lt brnsh gry, lt olv gry, frm, blkly,
slily arg, microxl

CLST: olv gry, frm, sbblky-blky,
slily micromic, slily slty, r glauc,
slily calc

CLST: olv gry-brnsh gry, frm,
sbblky-blky, slily micromic, slily slty,
r glauc, slily calc

LS: yelsh gry-lt olv gry, hd, blkly, slily slty

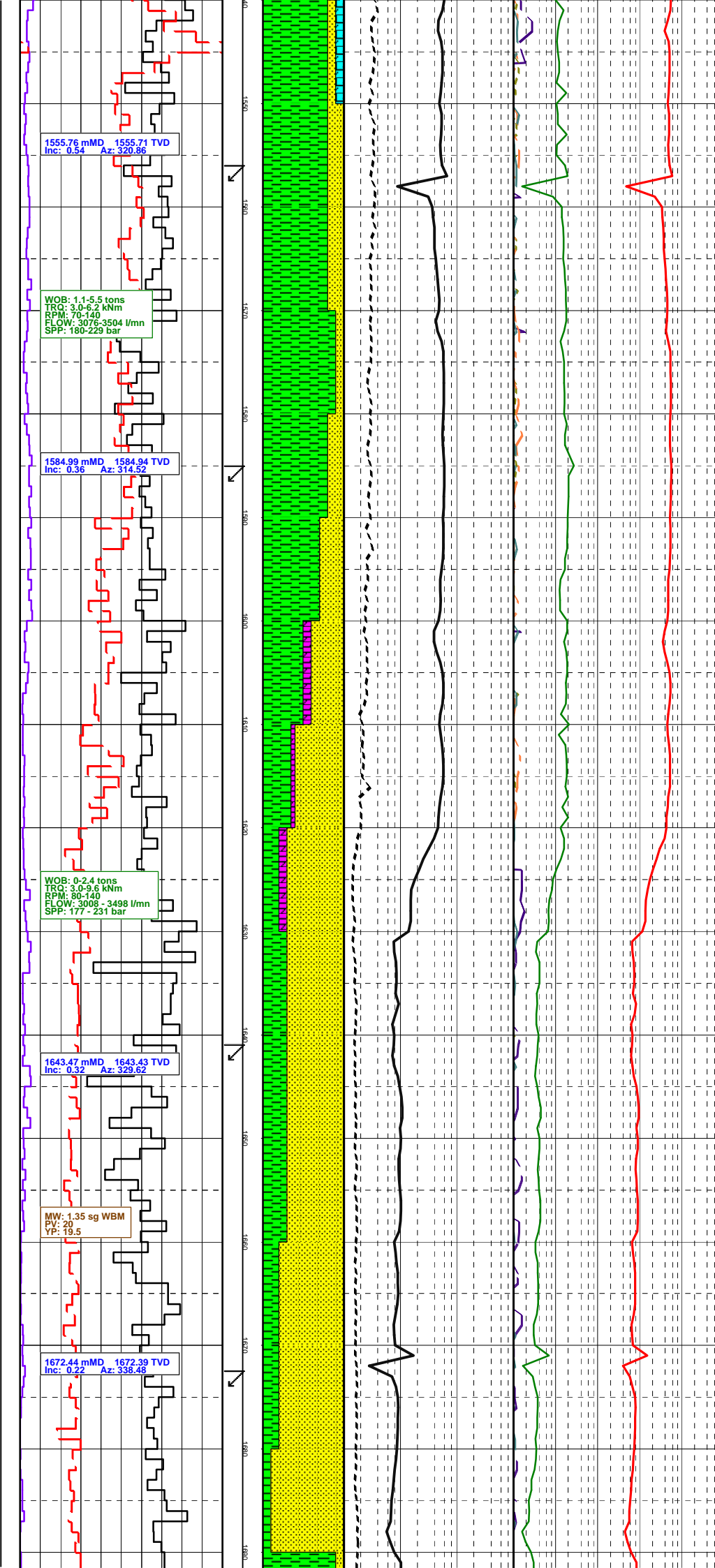
DOL LS: pl yelsh brn, hd,
sbblky-subsplin, pt dol, microxl

13 3/8" csg shoe
at 1481mMD

SST:clr trnsl, mnr lt brn - or Qtz,
predom vf-f, occ m-crs, wl srt, sbang-
sbrndd, lse gr

CLST: olv gry - dk gry, frm, sbblky-blky,
micromic, slily slty, loc pyr

LS: lt brnsh gry-lt olv gry, frm, loc hd,
sbblky-crmblly, loc subsplin, microxl,
slily arg, occ foss frag



1555.76 mMD 1555.71 TVD
Inc: 0.54 Az: 320.86

WOB: 1.1-5.5 tons
TRQ: 3.0-6.2 kNm
RPM: 70-140
FLOW: 3076-3504 l/mn
SPP: 180-229 bar

1584.99 mMD 1584.94 TVD
Inc: 0.36 Az: 314.52

WOB: 0-2.4 tons
TRQ: 3.0-9.6 kNm
RPM: 80-140
FLOW: 3008 - 3498 l/mn
SPP: 177 - 231 bar

1643.47 mMD 1643.43 TVD
Inc: 0.32 Az: 329.62

MW: 1.35 sg WBM
PV: 20
YF: 19.5

1672.44 mMD 1672.39 TVD
Inc: 0.22 Az: 338.48

SST:clr trnsi Qtz, predom vf-f, m-crs, wl srt, sbang-sbrndd, predom lse gr,occ fri agg, lt gry, sil cmt, loc slily arg, tr glauc

CLST:dk gnsh gry, frm, sbblky, non calc, slily mica, loc micropyr, wxy

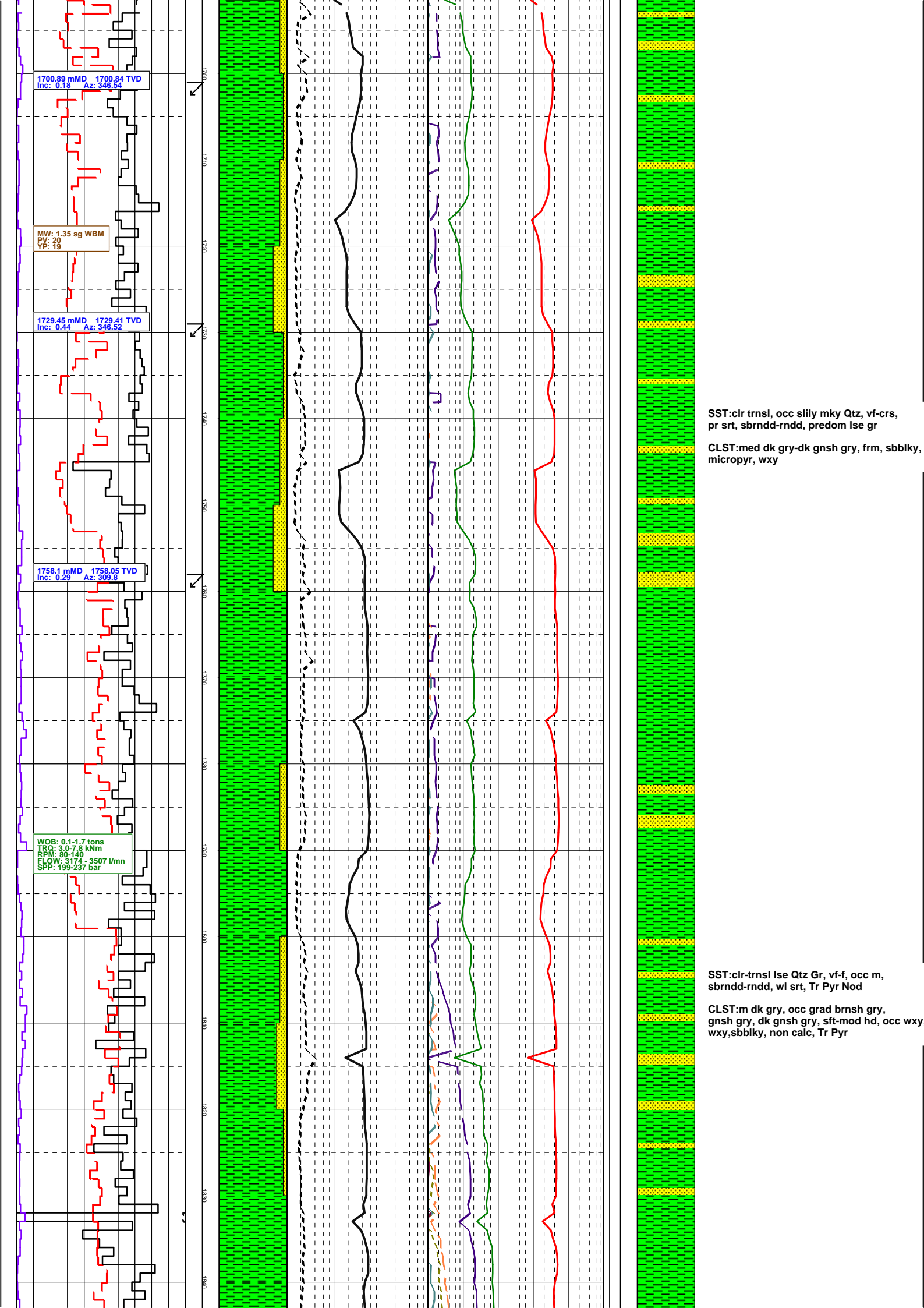
SST:clr trnsi Qtz, vf-f, mnr m, r crs, wl srt, sbang-sbrnd, predom lse gr, gr, occ fri agg, lt gry, sil cmt, occ glauc,mnr pyr nod

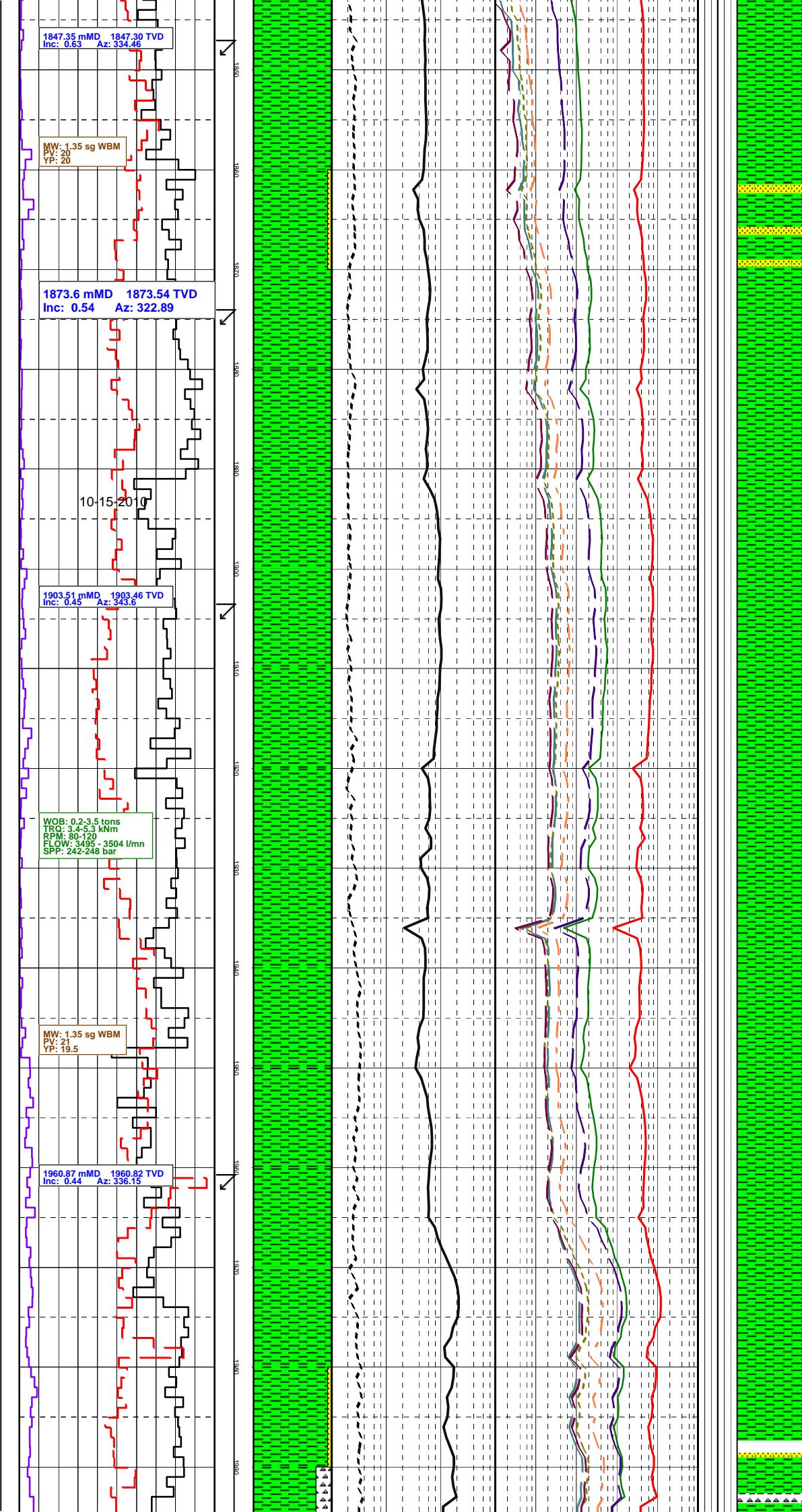
CLST:dk gnsh gry, frm, sbblky, non calc, slily mica, loc micropyr, wxy

DOL:pl yelsh gry, , frm, loc hd,sbblky-crmbl, loc subsplin, microxl, slily arg

SST: clr trnsi, occ slily mky Qtz, vf-m, occ crs, mod srt, sbrndd-rndd, occ sbang, predom lse gr, occ frm, sil cmt, lt gry, occ hd, pyr cmt, pyr nod

CLST:dk gnsh gry, frm, sbblky, non calc, slily mica, loc micropyr, wxy

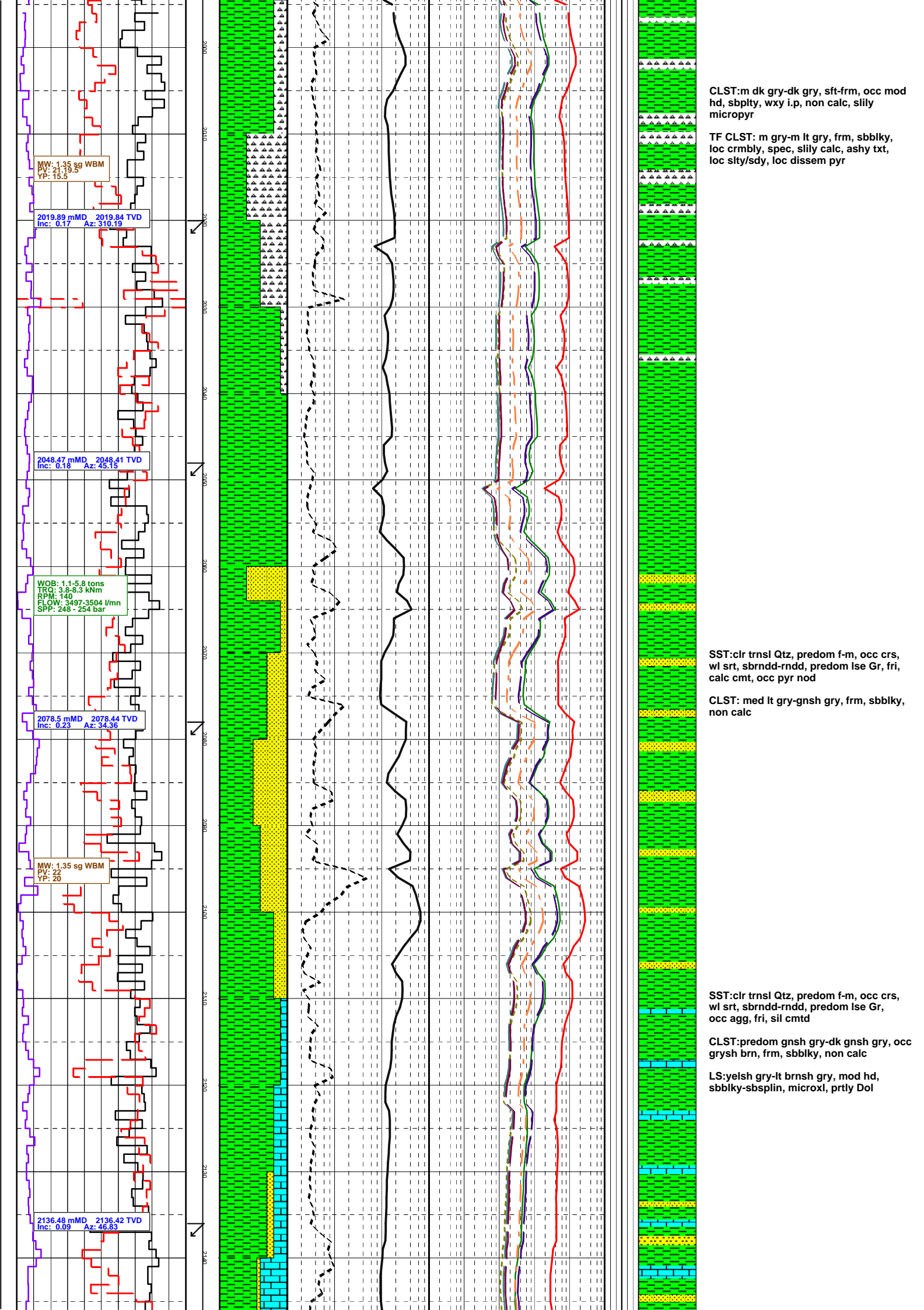




SST:pred lse Qtz Gr, vf-m, pred vf-f, sbrn-dd-rn-dd, wl srt, Tr agg

CLST:m dk gry-dk gry, grad olv gry-olv blk, occ gnsh gry-dk gnsh gry, sft-mod hd, sbblky-sbply, non-sli calc, micropyr, i.p

CLST:, blsh gry-m dk gry, dk gry-m dk gry, grysh brn-mod brn, gnsh gry-dk gnsh gry, grysh rd-v dsky rd-v dsky rd purp, sft-mod hd, sbblky-blky, non calc, micropyr i.p



WOB: 0.0-6.8 tons
TRC: 3.5-10.5 kNm
RPM: 100-160
FLOW: 3400 - 3800 l/mn
SPP: 253-266 bar

2194.33 mMD 2194.27 TVD
Inc: 0.18 Az: 11.83

2221.91 mMD 2221.85 TVD
Inc: 0.22 Az: 177.27

MW: 1.20 sg WBM
PV: 19
YP: 20.5

2235.52 mMD 2235.47 TVD
Inc: 0.33 Az: 131.74

10-28-2010
10-29-2010

BHA#8, Bit#7 8.5"
Reed Hycalog TC11P, 3x18
In at 2235m, Out at 2373m
Made 138m in 22.1h
Circ: 30.5, kreys: 138
Grade: 2-2-WT-A-E-I-NO-CP

WOB: 6.0-11.0 tons
TRC: 2.5-4.1 kNm
RPM: 120
FLOW: 2485 l/mn
SPP: 186 bar

SST:mky-lt gry, loc grysh gn, m-gran,
predom gran, mod srt, sbrn-dd-rndd

CLST:m dk gry-m gry,frm, sbbly, non calc

MRL:mod brn-lt brn, m lt gry, grysh pk,
frm, sbbly, occ crmb

LS:wh-v lt gry, loc slily gnsh, frm,
sbbly-crbly, microxl

CHT:slily trns l mky, m lt gry,lt blsh wh,
i.p dk gnsh gry, ang, occ sbang, v hd
spln, hom, occ pyr

9 5/8" csg shoe
at 2227.5mMD

CLST:m dk gry-m gry,olv gry-grnsh gry,
mod hd-hd,blky-sub blky.

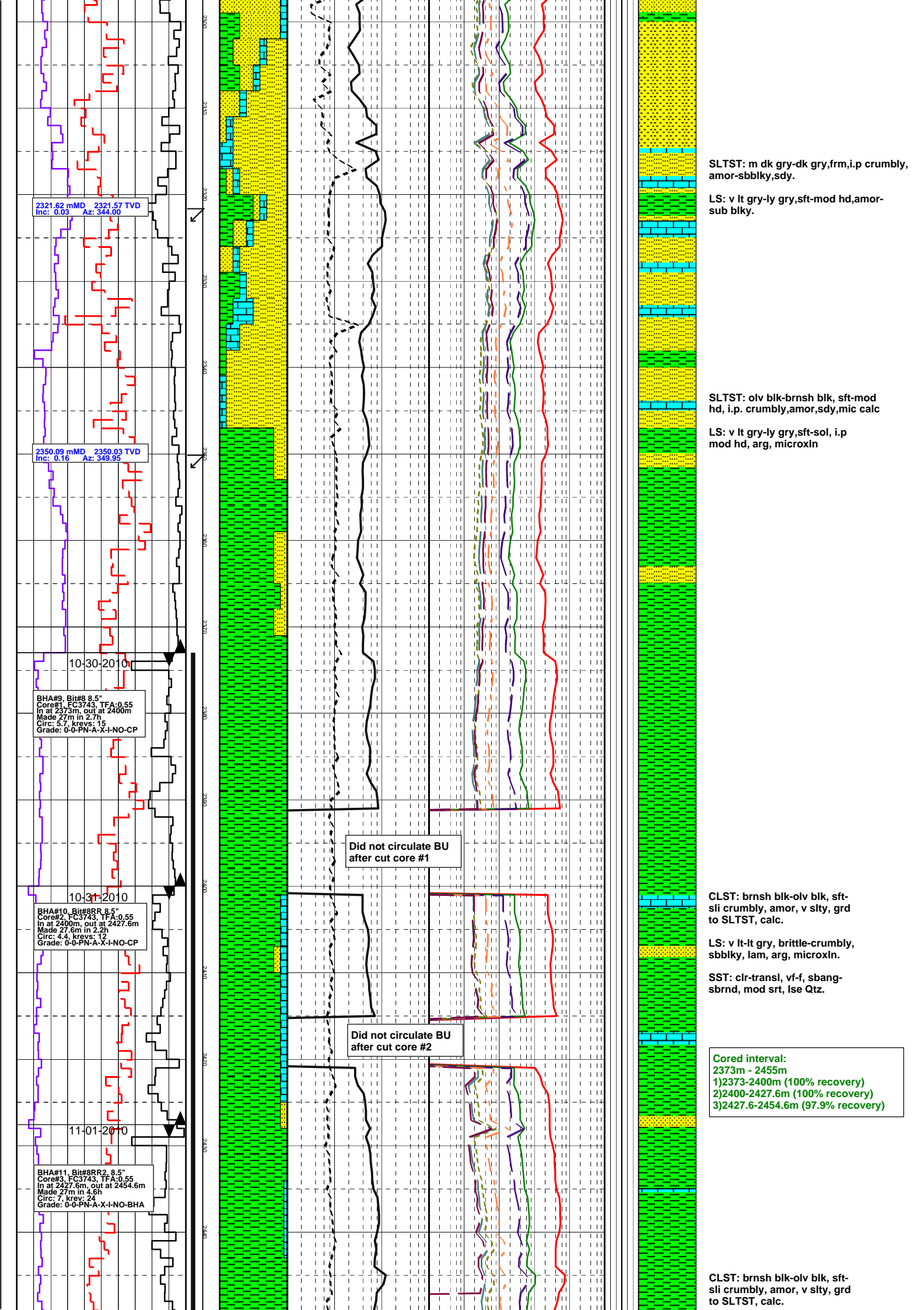
SST: Lse qtz,ar-trans,vhd,vcrs,pr srted.

LS:wh-yelsh gry, sft, amor, micoxla,
rar tr pyrite.

CLST:brnsh gry,olv gry,md drk gry,amor
sft,ccc blky,hd,silty mtrx.

SST: clr-transl,smky gry,lse qtz,hd,
vf,pred f, occ sil cmt.

LS:lt brnsh gry,blsh wh,hd,blky-subblky,
microxl.



BHA#12, Bit#9, 8.5"
Reed Hycalog, 8x12
In at 2454.6m, out at 2550m
Made 95.4m in 11.7h
Circ: 18.2 krev: 66
Grade: 1-1-BU-A-X-I-PN-TD

Did not circulate BU
after cut core #3

11-03-2010

MW: 1.20 sg WBM
PV: 17
YP: 17

WOB: 3.6-13.8 tons
TRQ: 4.1-6.9 kNm
RPM: 77-140
FLOW: 2187-2206 l/min
SPP: 143-183 bar

SLTST: m dk gry-olv gry, olv blk,
sbfis,ang,slily arg,slily calc,
Tr Mic, carb mat.

SST: lse Qtz, clr, v lt gry, v f-f,
occ m, sbrndd-rndd, Mic incl.

SST: Trc Glauc

SST: lse Qtz, v lt gry-lt olv gry,
occ clr, tmsl, v f-v crs, pred v crs,
sbrndd-rndd, I.P. shattered, Tr Mic
incl, Pyr Nod.

LS/DOL: dk yellsh brn, from-hd,
blky, microxin

SST: Qtz Agg, lt gry-lt blsh gry,
v-f-f,hd sbrndd-rndd, Sil cmt, I.P
calc cmt, glauc.

CLST: m brn-grysh rd,sft,amor,ea,slily
sity, slily calc, Tr carb Mat

SST: lse Qtz, clr, v lt gry, v-f-f,
occ m-crs, sbrndd-rndd, Mis Incl

LS: v lt gry-lt gnsh gry, sft, amor,
microxin, Tr carb Mat, I.P. glauc, Mic

CLST: m brn-grysh rd, sft, amor, ea,
slily sity, v slily clac, Tr carb Mat

SST: lt gry-lt gnsh gry, rk flour, I.P
lse Qtz, clr, v lt gry, v f-f, occ m-crs,
sbrndd-rndd, clac cmt I.P., Mic incl

SST: lt gry-lt gnsh gry, lt brn, fri Agg,
Rk Flour, clr-trnsl, occ pksh gry (hem),
Qtz, f-gran, pr strt, sbang-rndd.

Rk Frag: mod brn, hd, ang, Fspr?

Well TD at 2550mMD