



Scale: 5" / 100'
Measured Depth Log

Well Name Heartland State C31-79-1HN

Location SESE SEC25 T4N R65W

State COLORADO

Country USA

API Number 05-123-39553

Region DENVER-JULESBURG BASIN

Spud Date 9/9/2014

Surface Coordinates 282' FSL, 298' FEL

Lat/Long: 40.27673/-104.6034

County WELD

Rig Number PRECISION 828

AFE # 200376

Field WATTENBERG

Drilling Completed 9/17/2014

Ground Elevation 4845'

K.B. Elevation 4861'

Logged Interval 9300'

To 19111'

Total Depth 19111'

Formation PIERRE (TEEPEE BUTTES, SHARON SPRINGS), NIOBRARA (SMOKY HILLS A,B,& C LAYERS)

Type of Drilling Fluid LSND

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

Name EVAN HOWELL

Company NOBLE ENERGY INC.

Address 1625 Broadway
Denver, CO 80202

WELLSITE GEOLOGISTS:

CHALK

PI

Operator

Geologist

Other

MARY L. MYERS
J.S. METZ

LOG CONTINUES FROM FILE: Heartland State C31 -79-1HN Vert.mplot
GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC

Rock Types

TT MARLSTONE

SILTY SHALE

Other Symbols

Engineering

- CONNECTION (DOWN)
- CONNECTION GAS
- TRIP GAS
- DOWN TIME GAS
- NORMAL FAULT
- CASING
- MIN DEPTH

Survey Plan

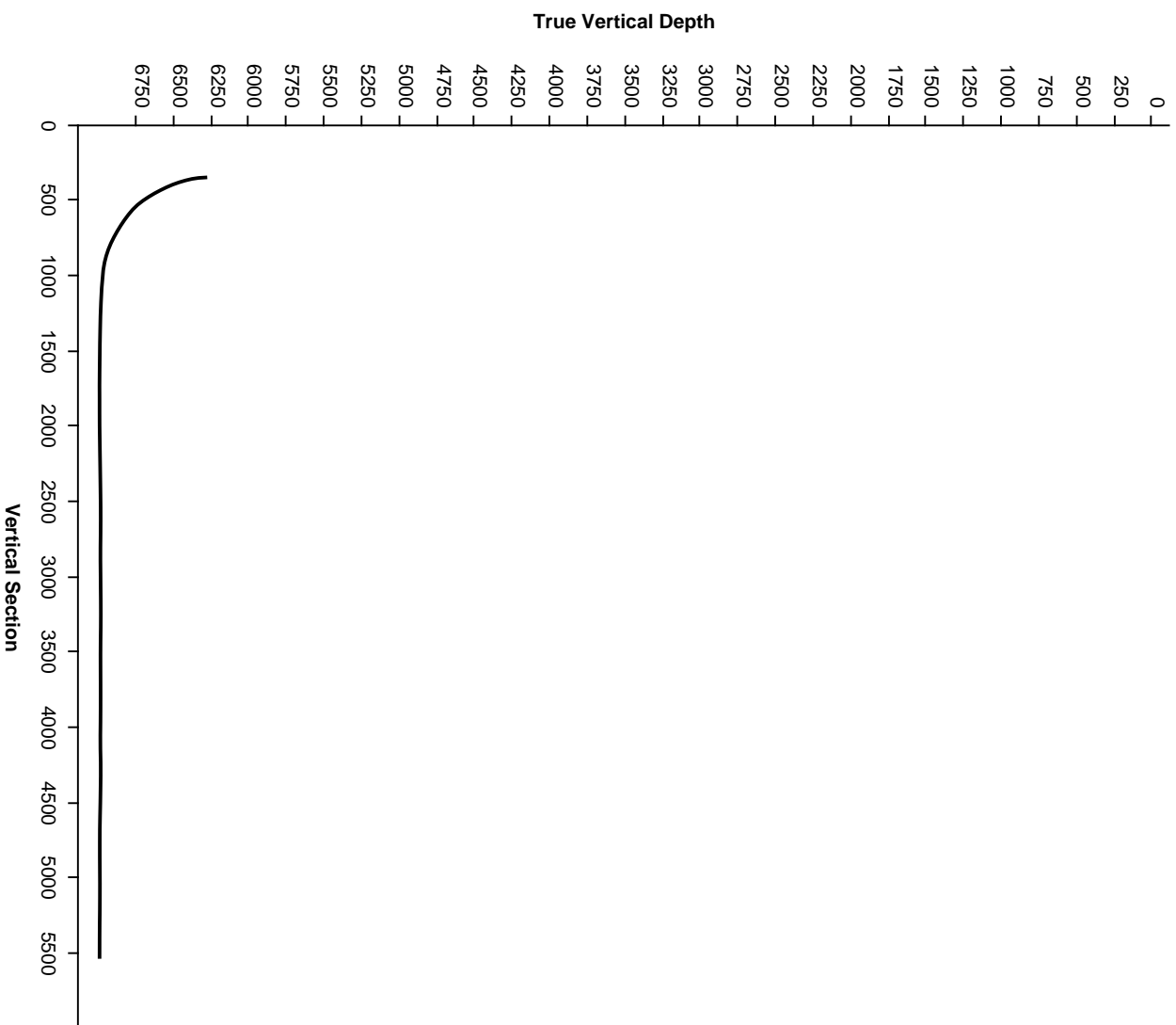
-1000 -
-500 -

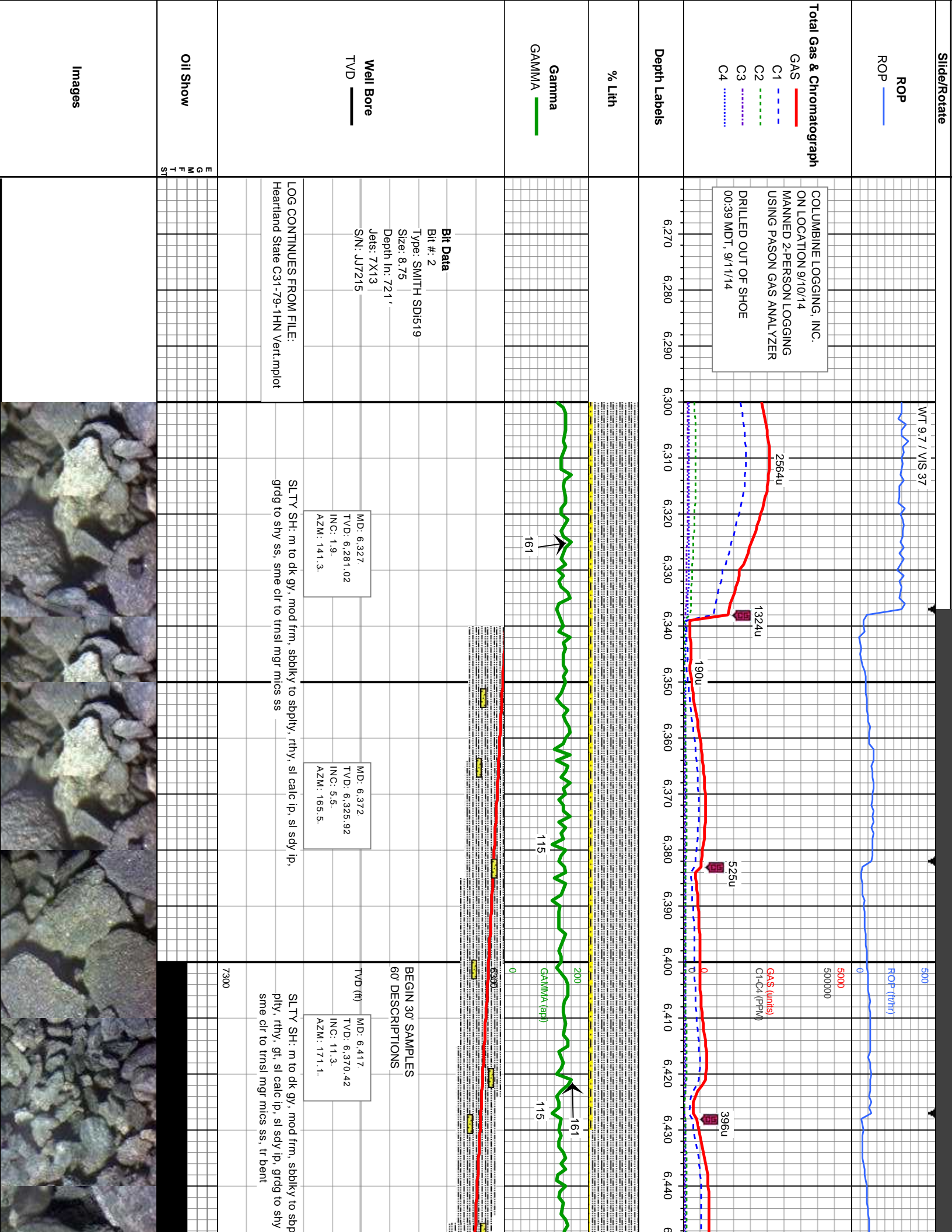
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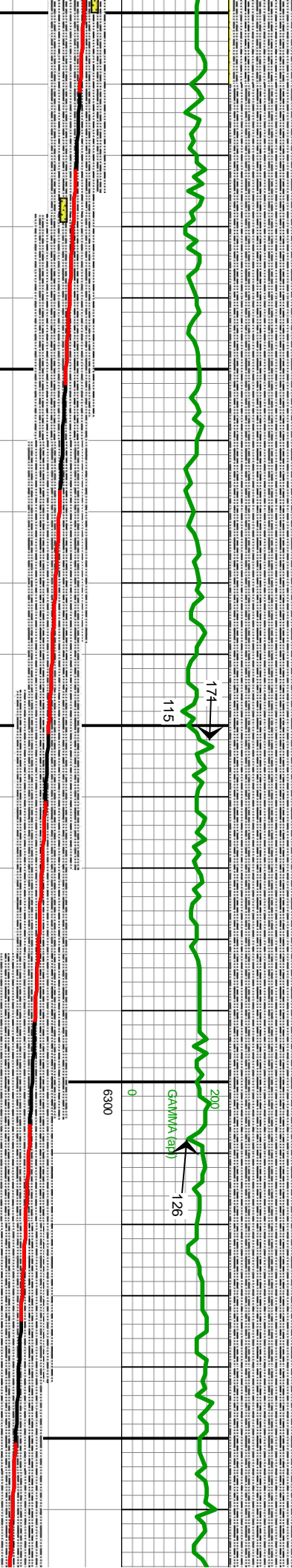
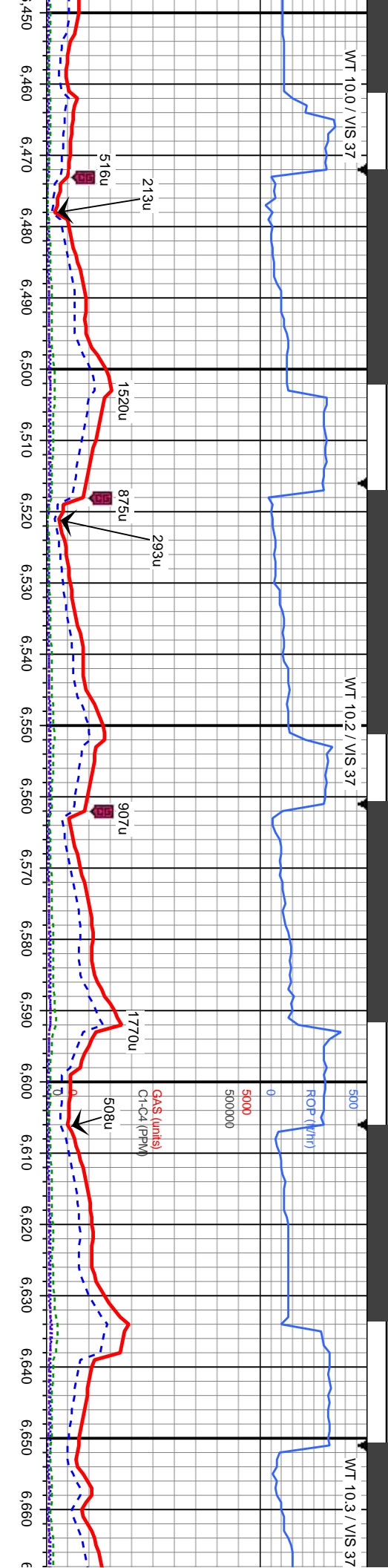
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Easting

Survey Elevation







MD: 6.461
TVD: 6,413.23
INC: 15.3
AZM: 172.6

MD: 6.506
TVD: 6,456.39
INC: 17.6
AZM: 171.8

MD: 6.551
TVD: 6,498.78
INC: 21.5
AZM: 172

MD: 6.596
TVD: 6,540.09
INC: 25.2
AZM: 174.8

MD: 6.641
TVD: 6,580.52
INC: 26.9
AZM: 177.5

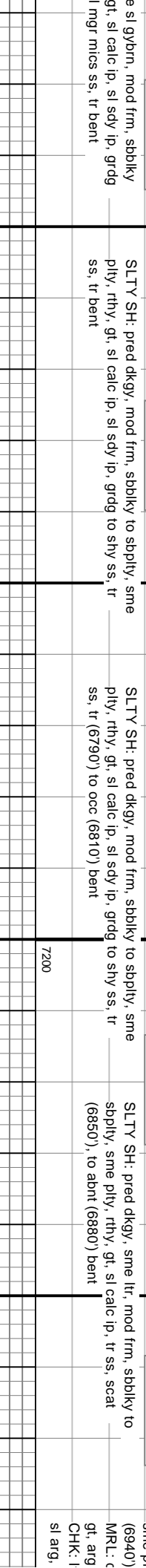
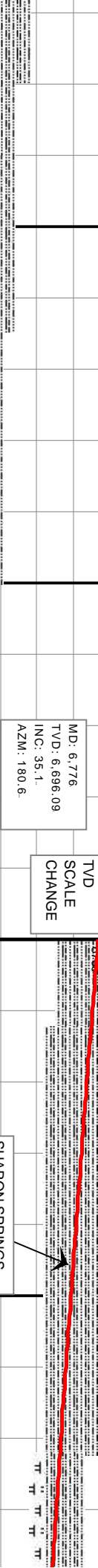
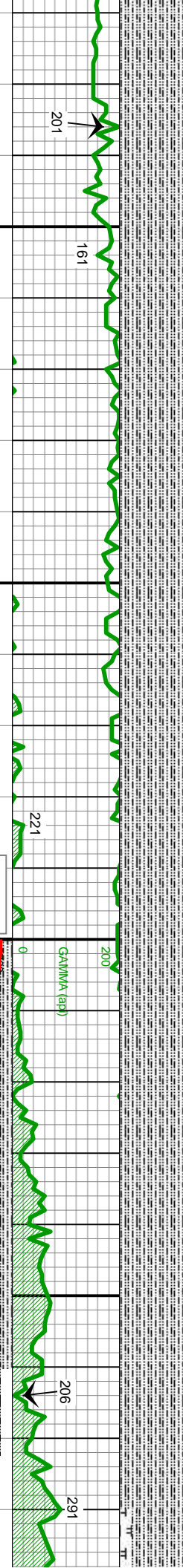
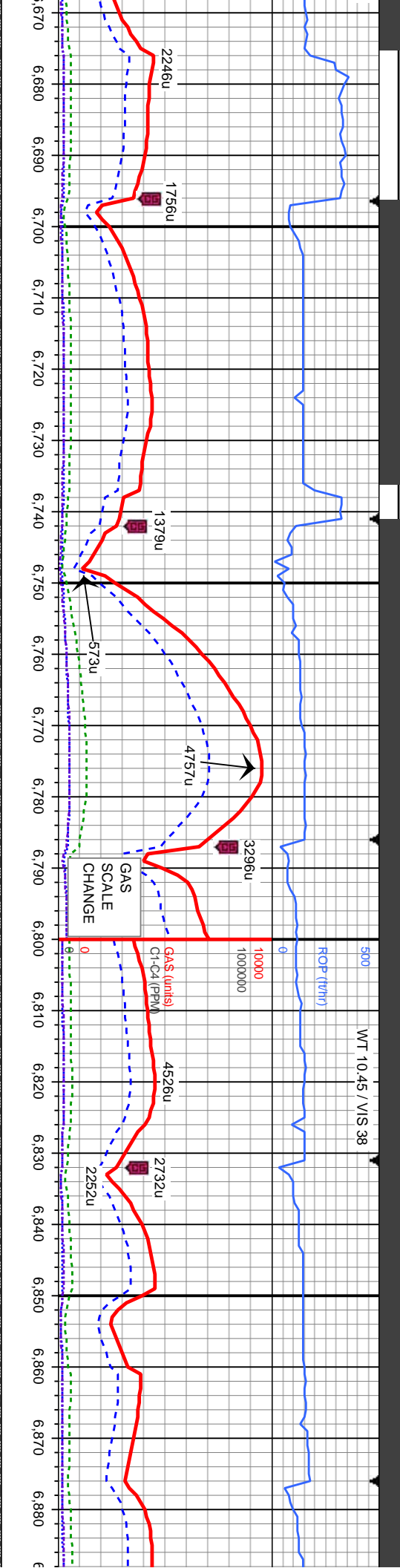
SLTY SH: m to dk gy, mod frm, sbblky to spbly, sme
ply, rthy, gt, sl calc ip, sl sdy ip, grdg to shy ss,
sme clr to trns mgr mics ss, tr bent

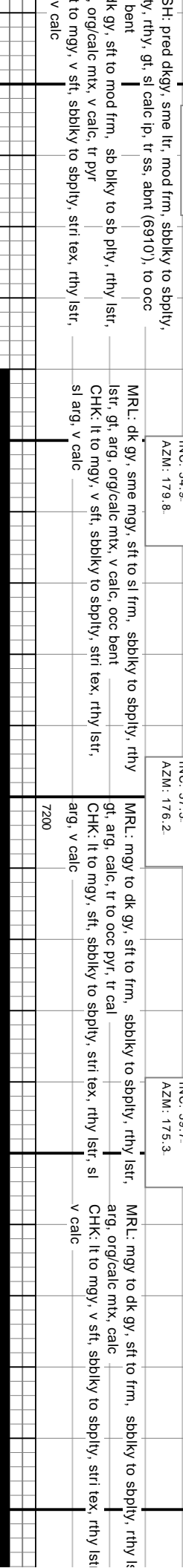
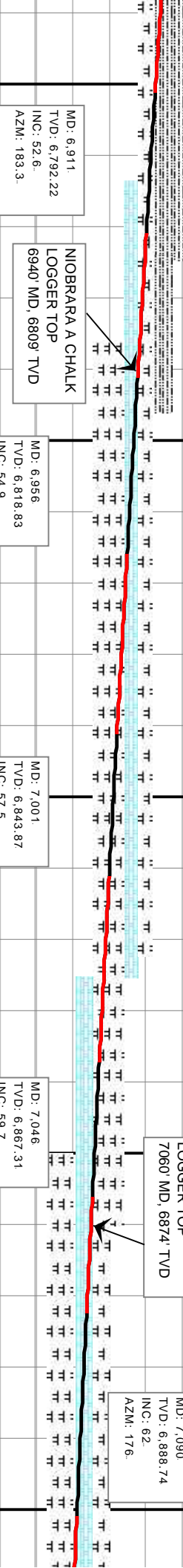
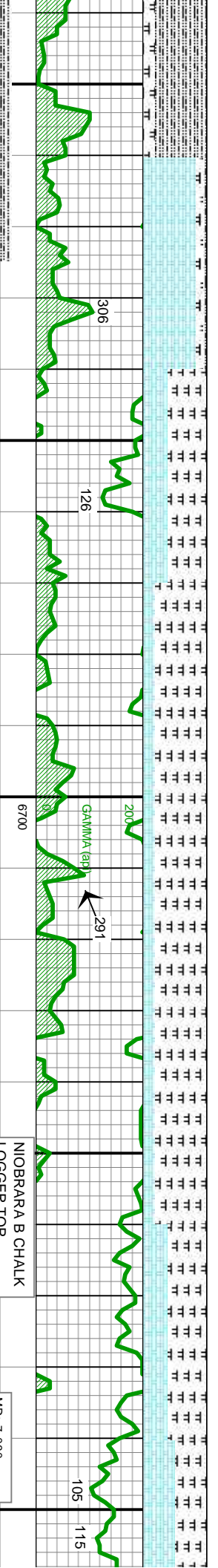
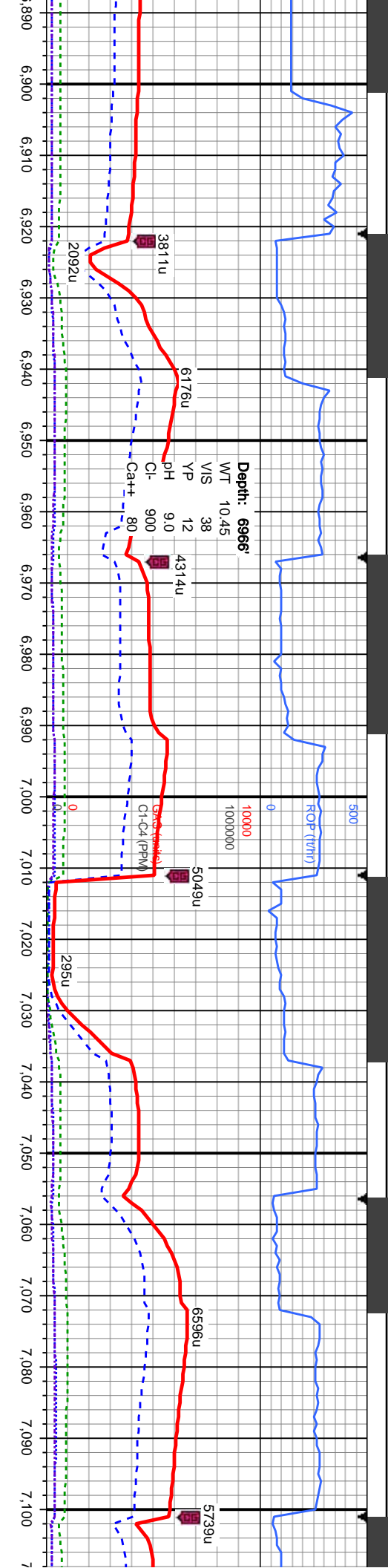
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ply, rthy, gt, sl calc ip, sl sdy ip, grdg to shy ss,
sme clr to trns mgr mics ss, tr bent

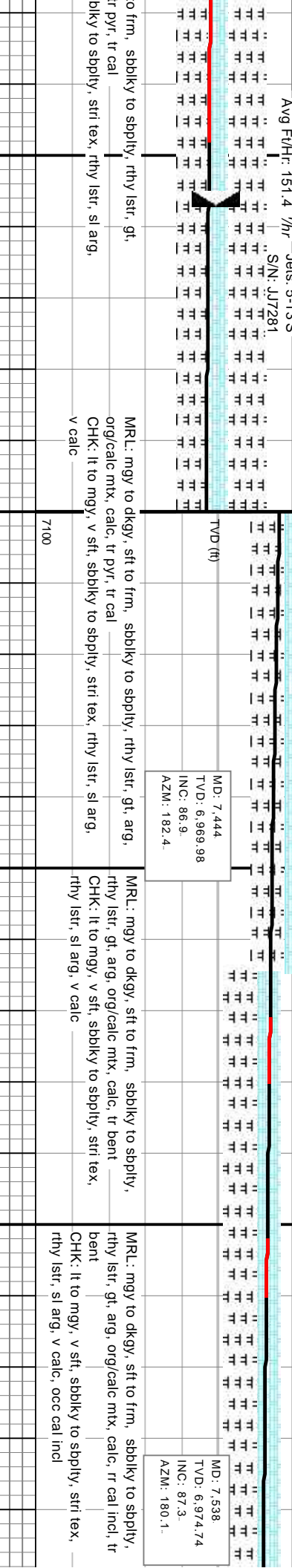
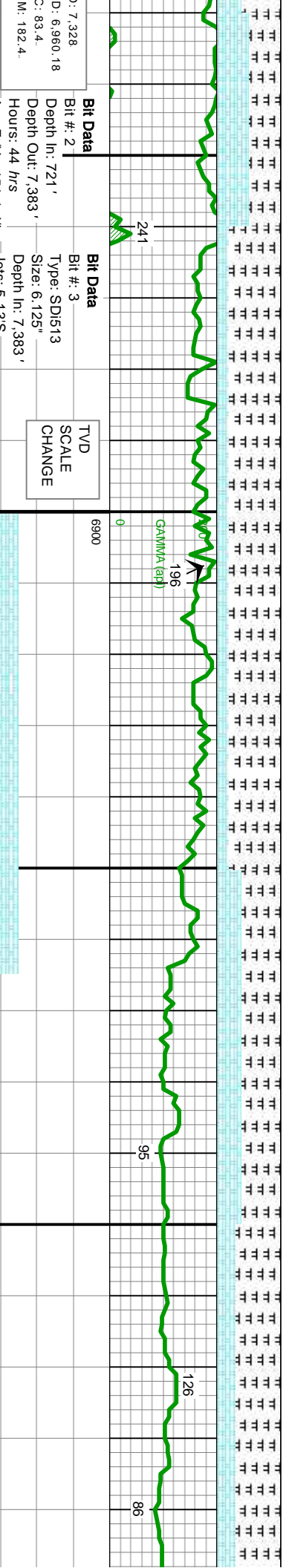
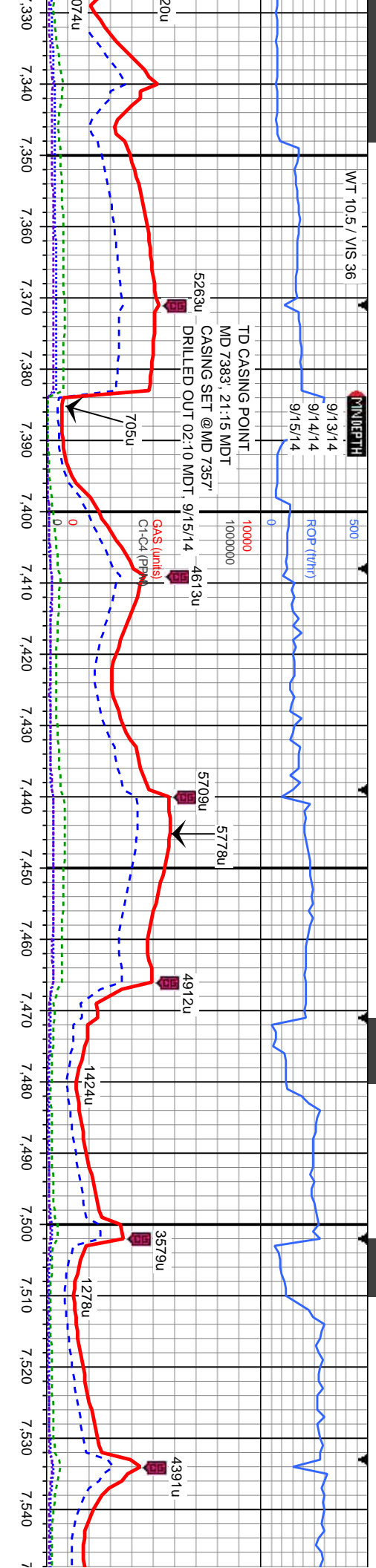
SLTY SH: m to dk gy, mod frm, sbblky to spbly, sme
ply, rthy, gt, sl calc ip, sl sdy ip, grdg to shy ss,
sme clr to trns mgr mics ss, tr bent

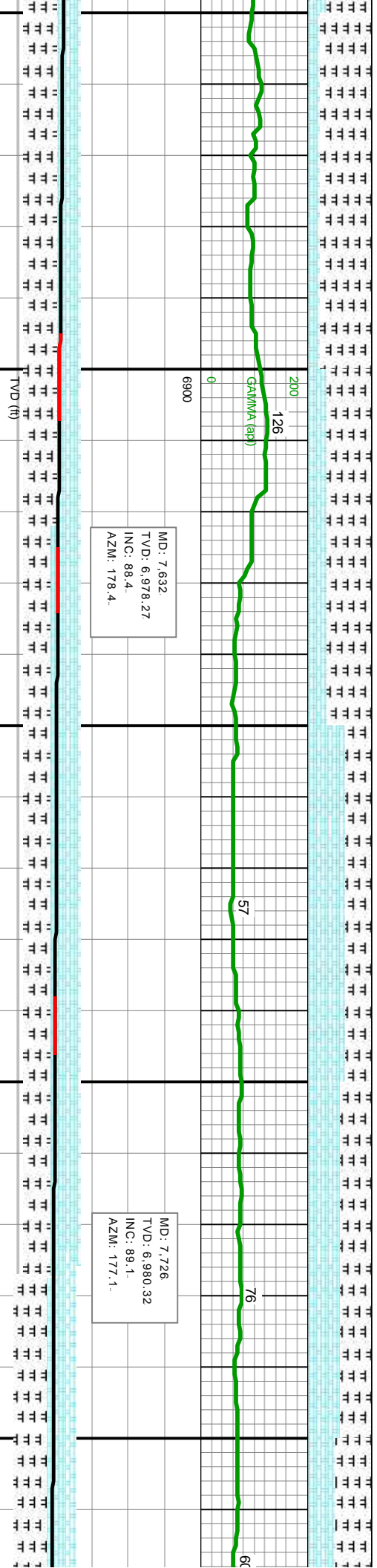
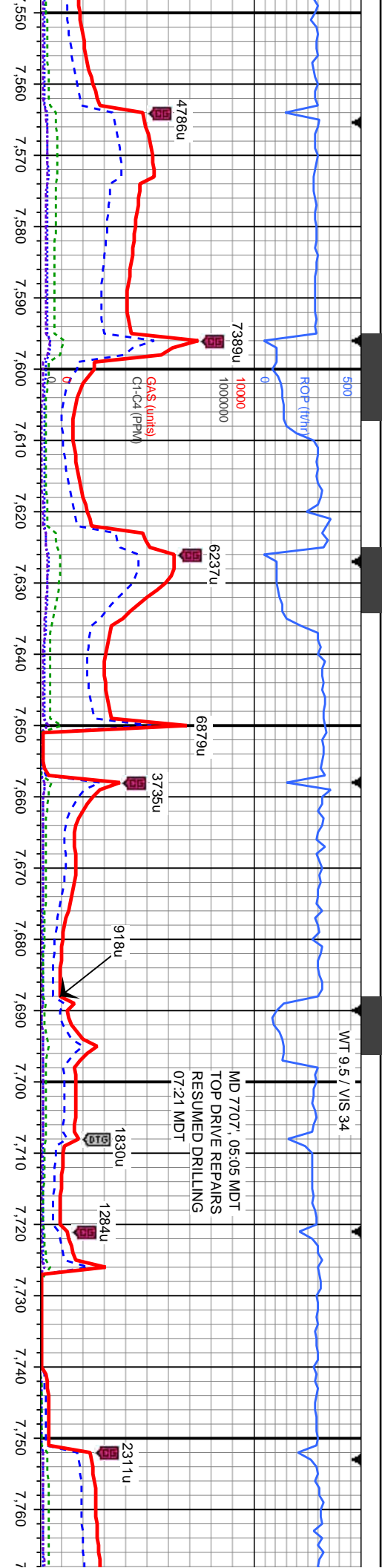
SLTY SH: m to dkgy, sm
to spbly, sme ply, rthy,
to shy ss, sme clr to trns





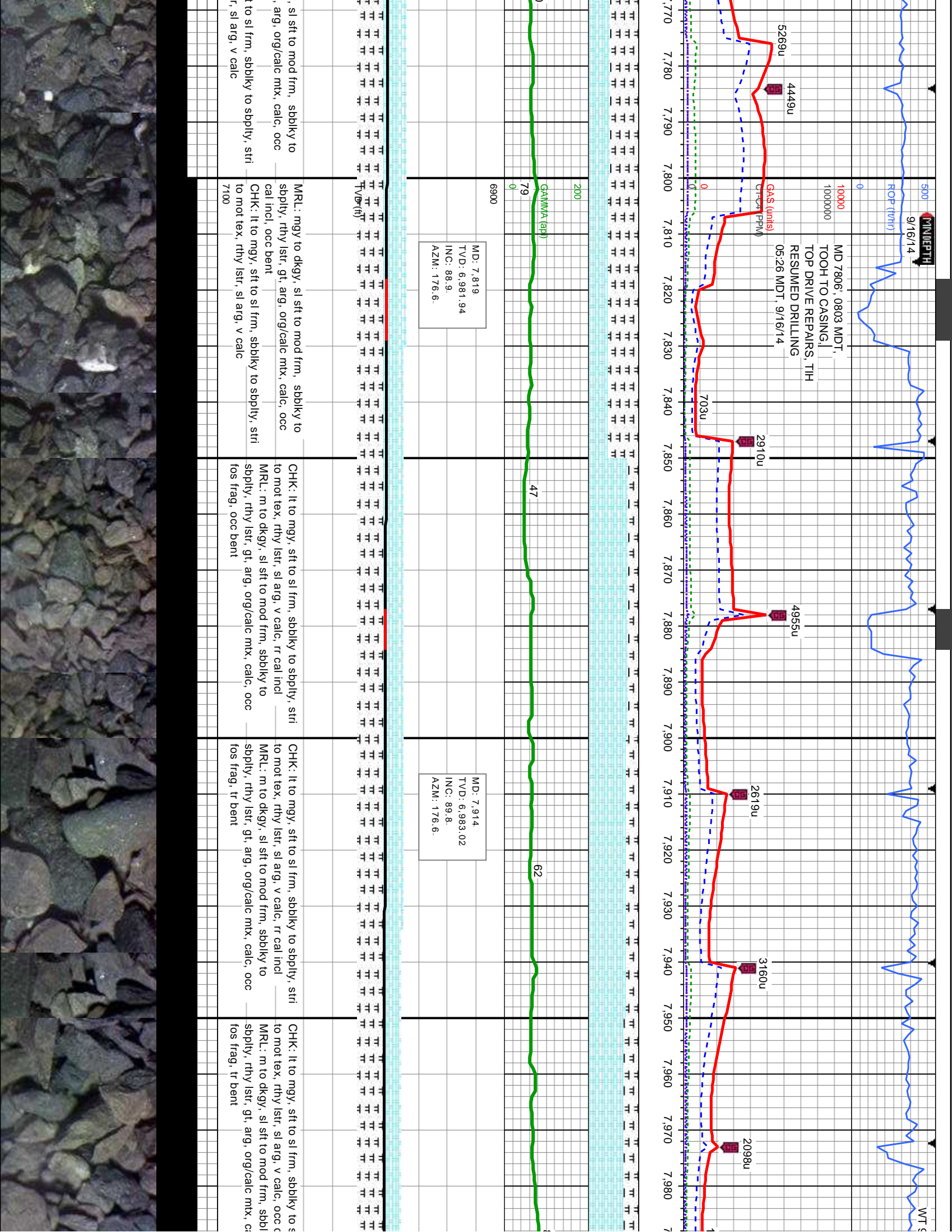


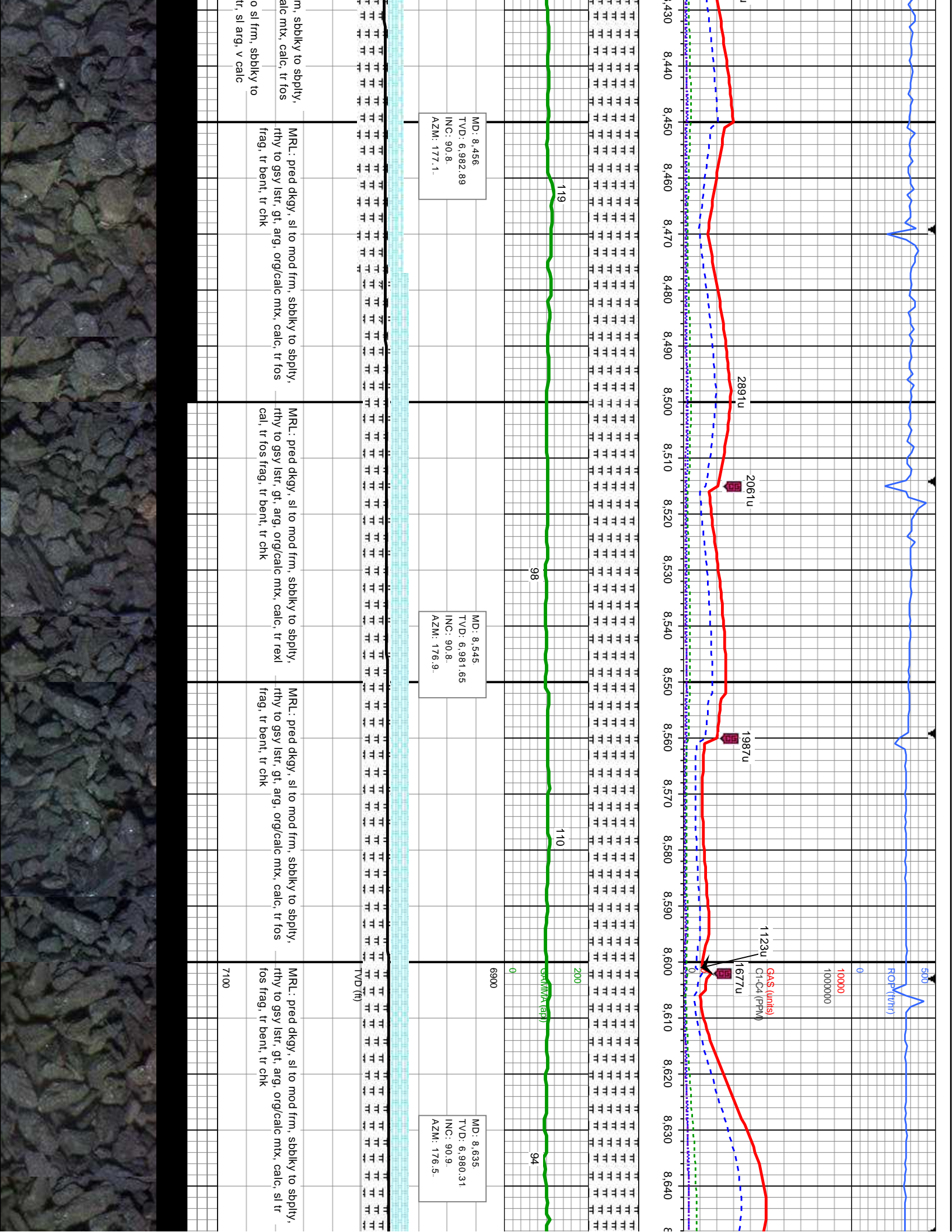


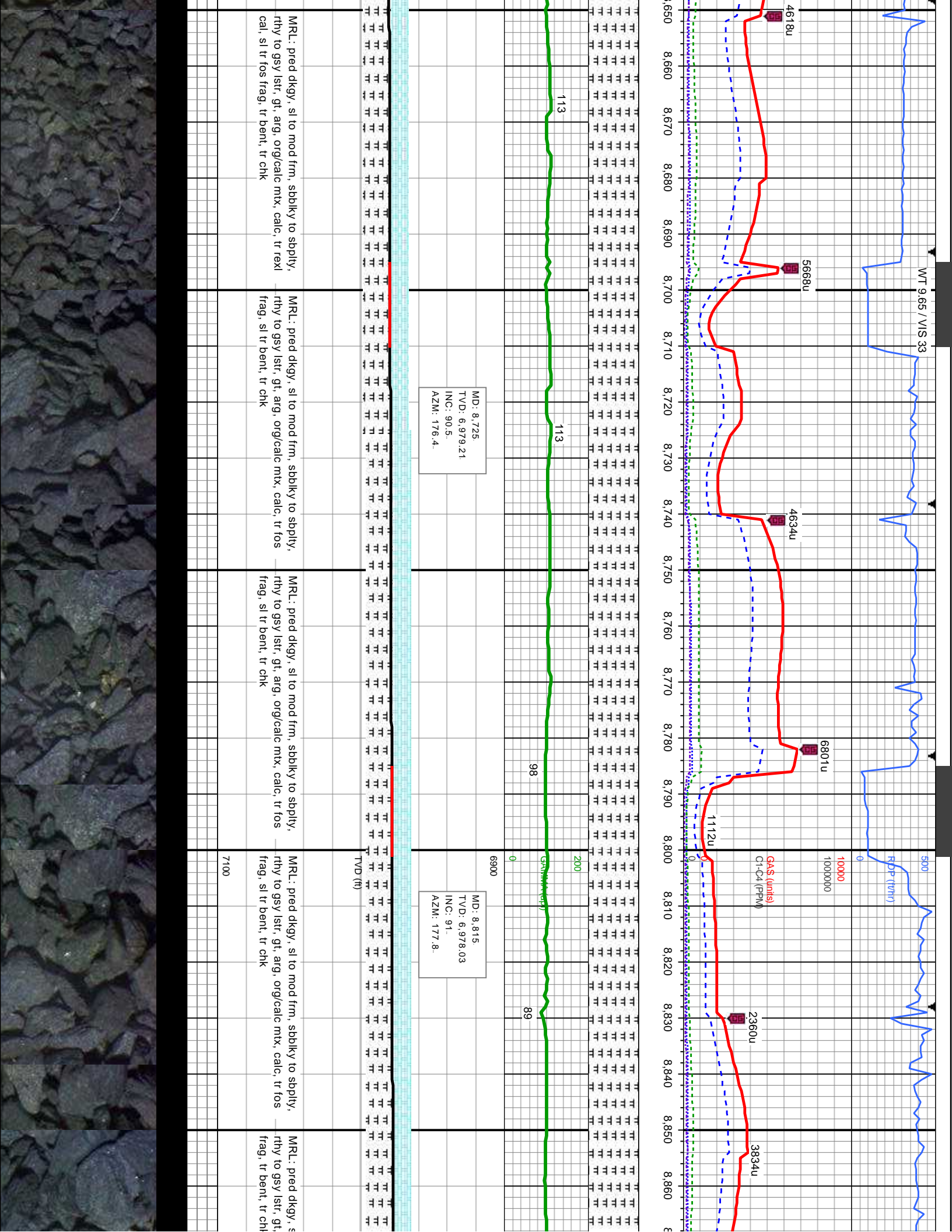


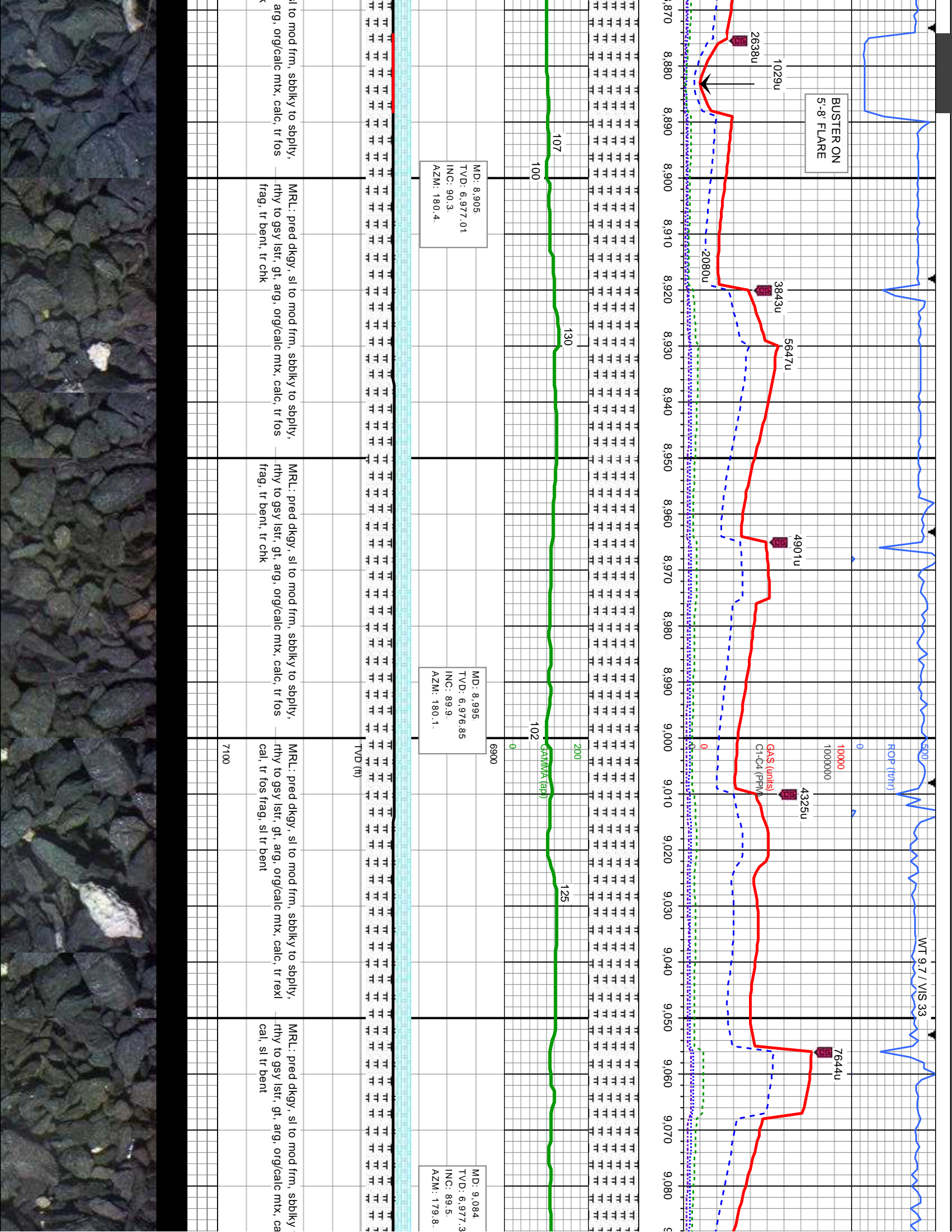
MRL: mgy to dkgy, sft to frm, sbbkly to sbply, rthy lstr, gt, arg, org/calc mix, calc, rr cal incl, tr bent	MRL: mgy to dkgy, sft to frm, sbbkly to sbply, rthy lstr, gt, arg, org/calc mix, calc, occ cal incl	CHK: It to mgy, sft to sl frm, sbbkly to sbply, stri to mot tex, rthy lstr, sl arg, v calc	CHK: It to mgy, sft to sl frm, sbbkly to sbply, stri to mot tex, rthy lstr, sl arg, v calc	MRL: mgy to dkgy, sft to frm, sbbkly to sbply, rthy lstr, gt, arg, org/calc mix, calc, tr bent
CHK: It to mgy, v sft, sbbkly to sbply, stri tex, rthy lstr, sl arg, v calc, occ cal incl	7100			

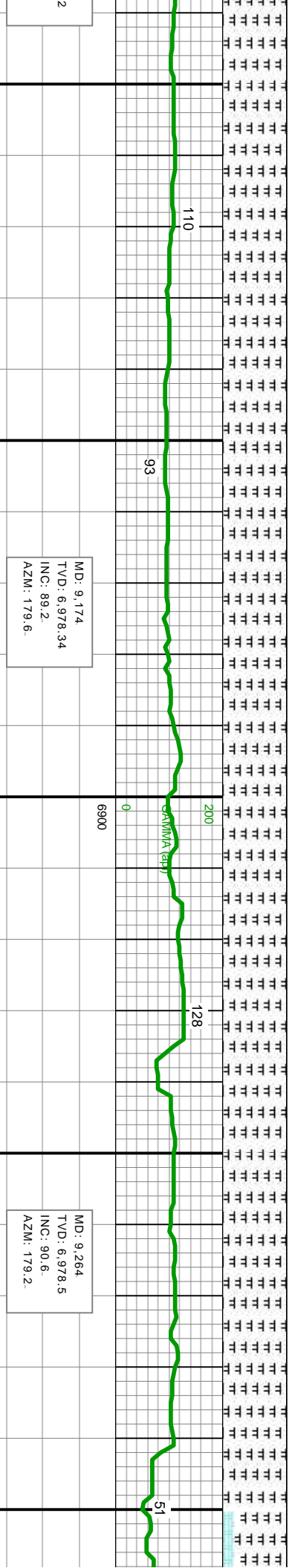
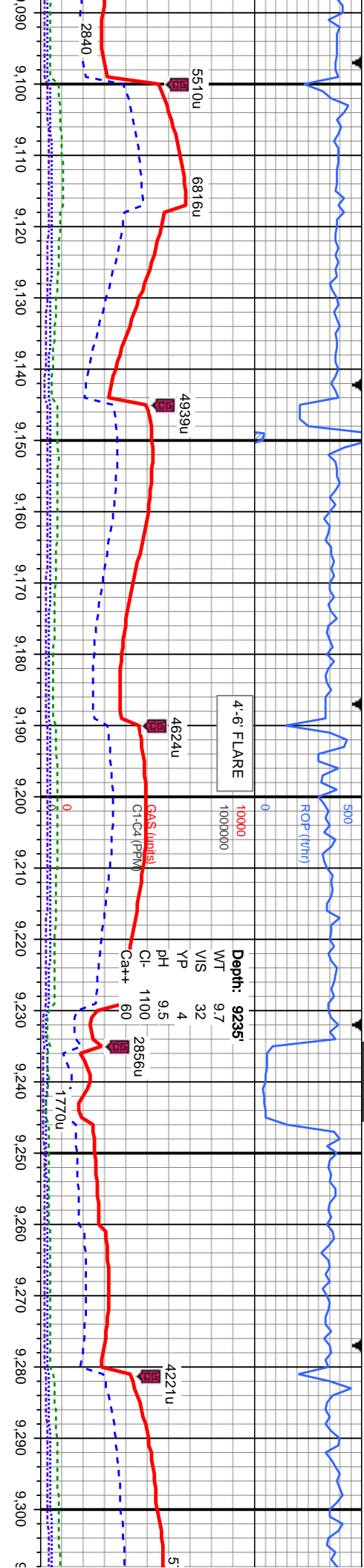




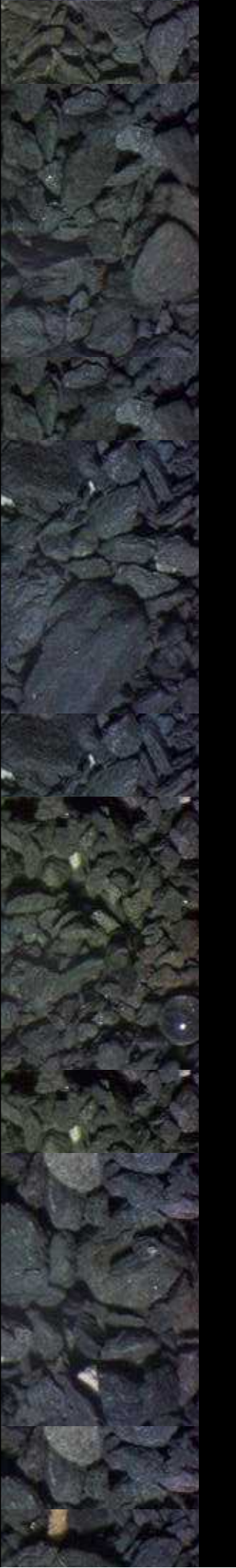


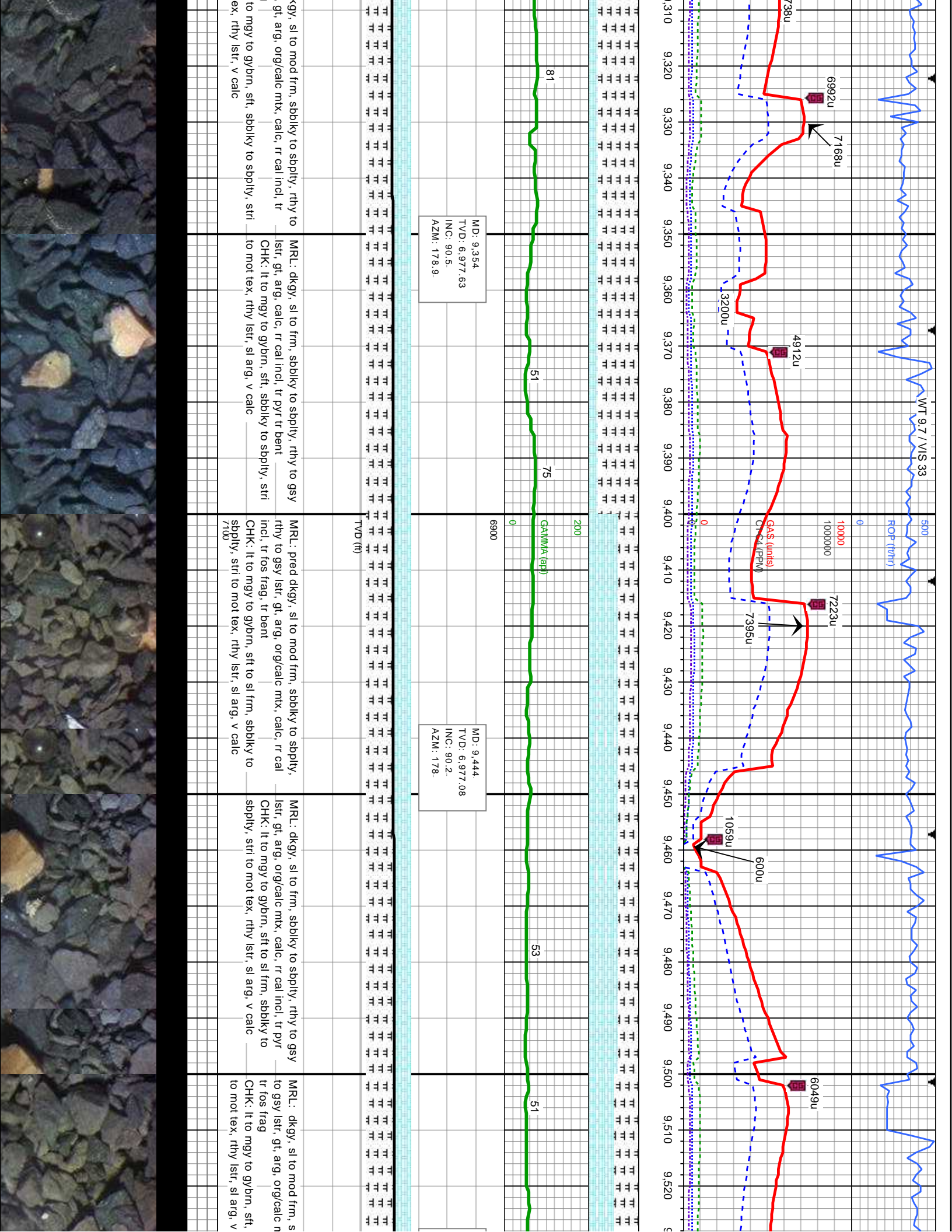


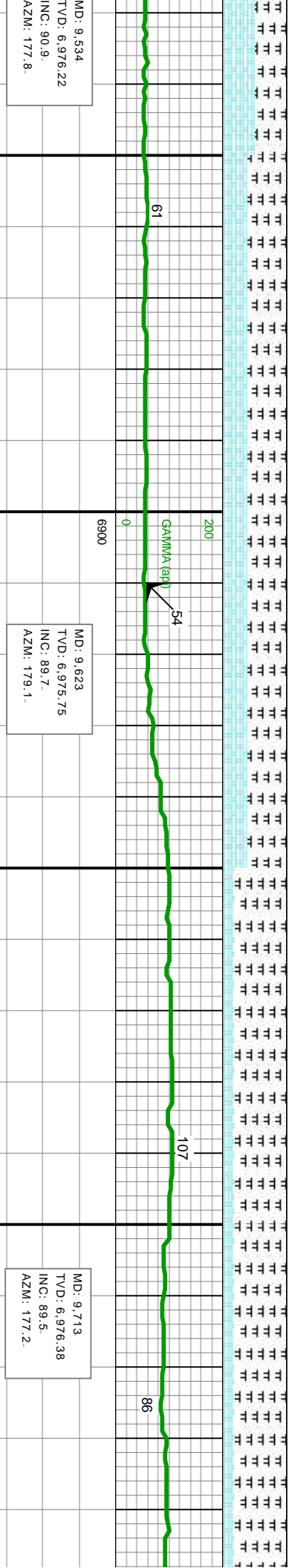
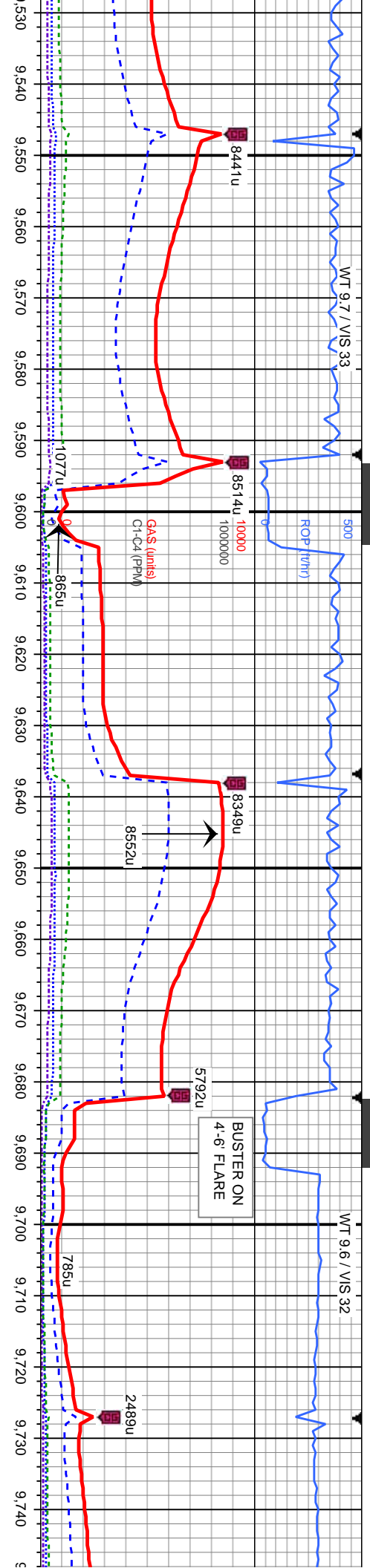




to sbply, ic, tr rexl	MRL: pred dkgy, sl to mod frm, sbblky to sbply, rthy to gsy istr, gt, arg, org/calc mix, calc, tr rexl cal, sl tr fos frag, tr bent	MRL: pred dkgy, sl to mod frm, sbblky to sbply, rthy to gsy istr, gt, arg, org/calc mix, calc, tr rexl cal, sl tr fos frag, occ bent	MRL: pred dkgy, sl to mod frm, sbblky to sbply, rthy to gsy istr, gt, arg, org/calc mix, calc, sl tr fos frag, occ bent	MRL: pred dkgy, sl to mod frm, sbblky to sbply, rthy to gsy istr, gt, arg, org/calc mix, calc, sl tr fos frag, occ bent	MRL: d gsy istr fos frag CHK: It to mot t
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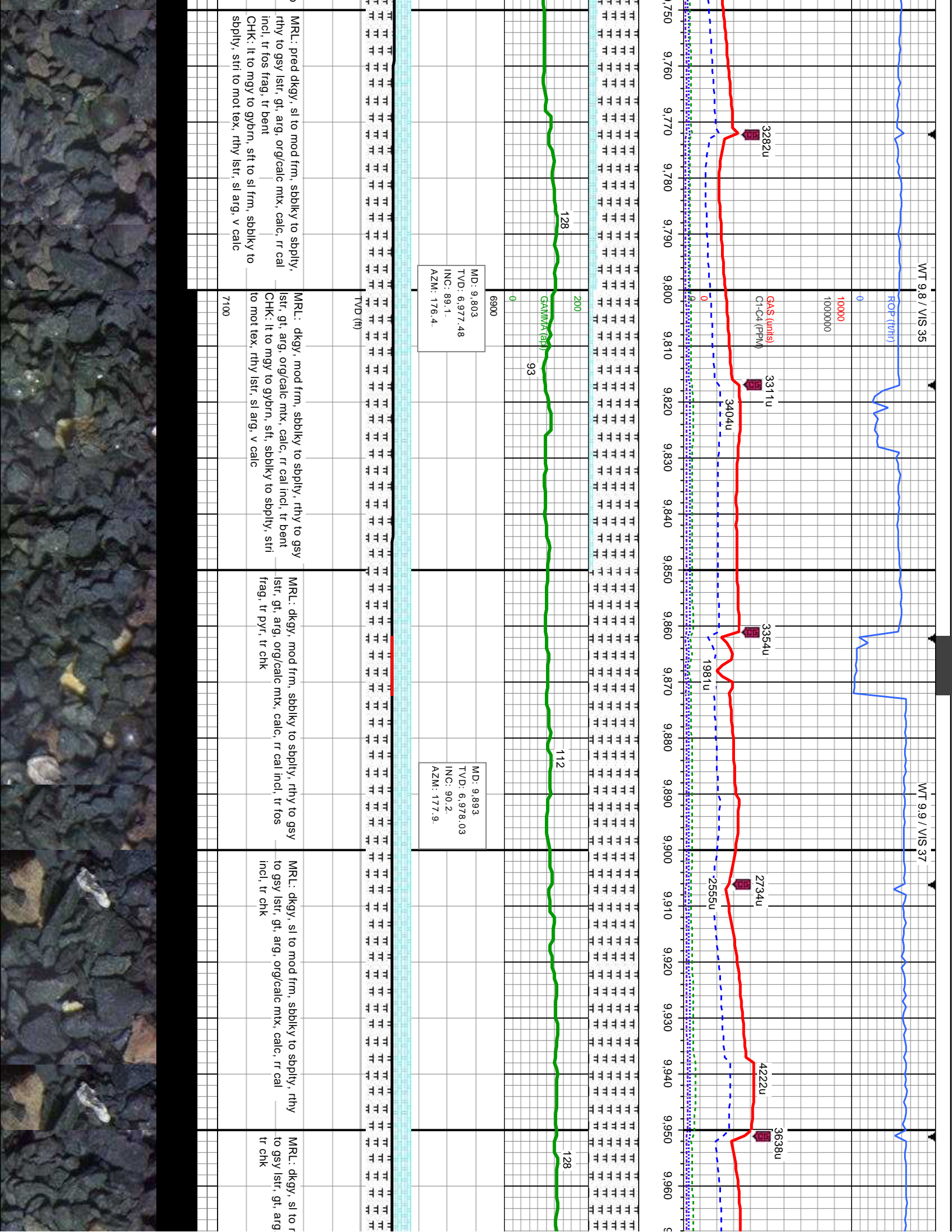


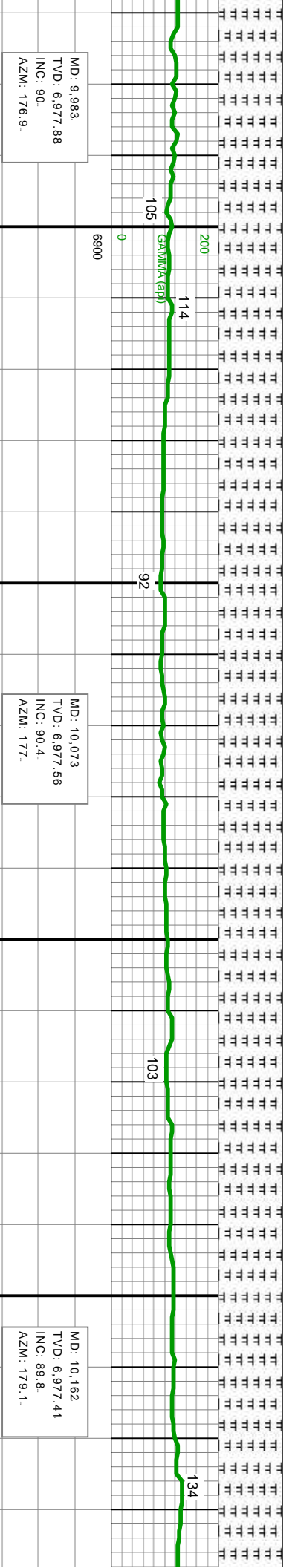
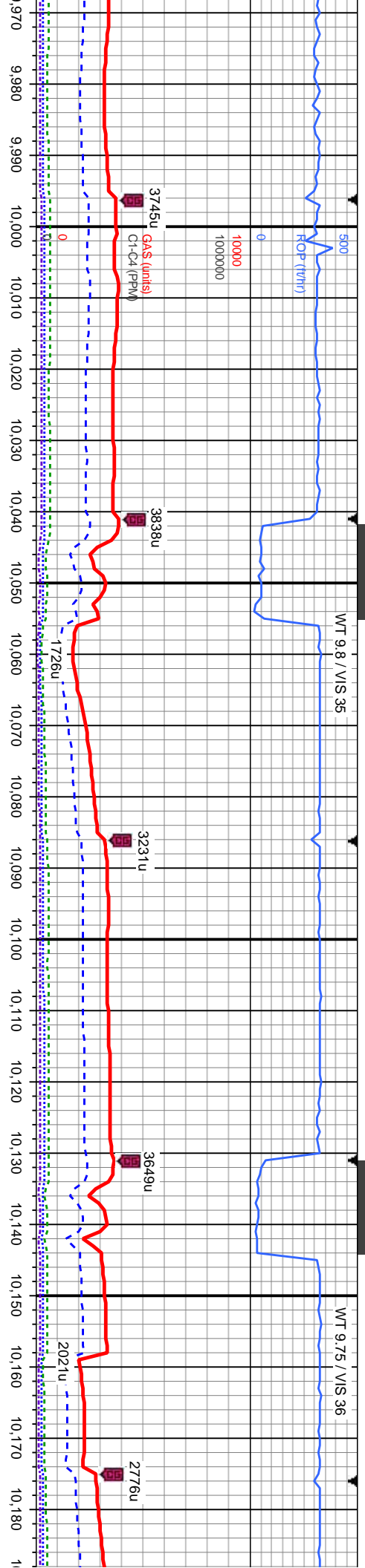




sbblky to sbply, rthy ntx, calc, rr cal incl,	MRL: pred dkgy, sl to mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, rr cal incl, tr fos frag, tr bent	MRL: dkgy, frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, rr cal incl	MRL: dkgy, sl to mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, tr bent	MRL: dkgy, sl to mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, tr pyr
sbblky to sbply, stri calc	CHK: It to mgy to gybrn, sft to sl frm, sbblky to sbply, stri to mot tex, rthy lstr, sl arg, v calc	CHK: It to mgy to gybrn, sft to sl frm, sbblky to sbply, stri to mot tex, rthy lstr, sl arg, v calc	CHK: It to mgy to gybrn, sft to sl frm, sbblky to sbply, stri to mot tex, rthy lstr, sl arg, v calc	CHK: It to mgy to gybrn, sft to sl frm, sbblky to sbply, stri to mot tex, rthy lstr, sl arg, v calc







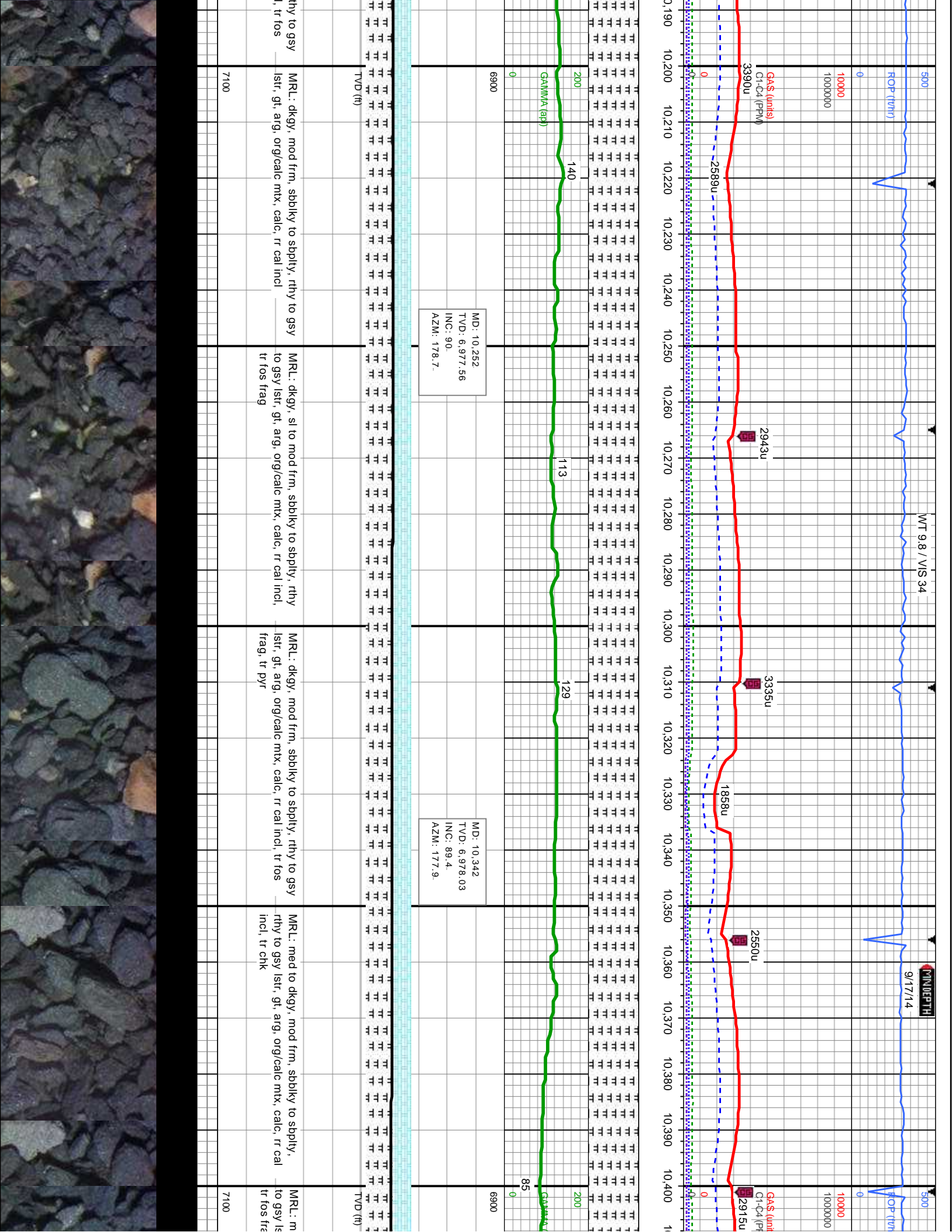
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TVD: 6,977.88
INC: 90
AZM: 176.9

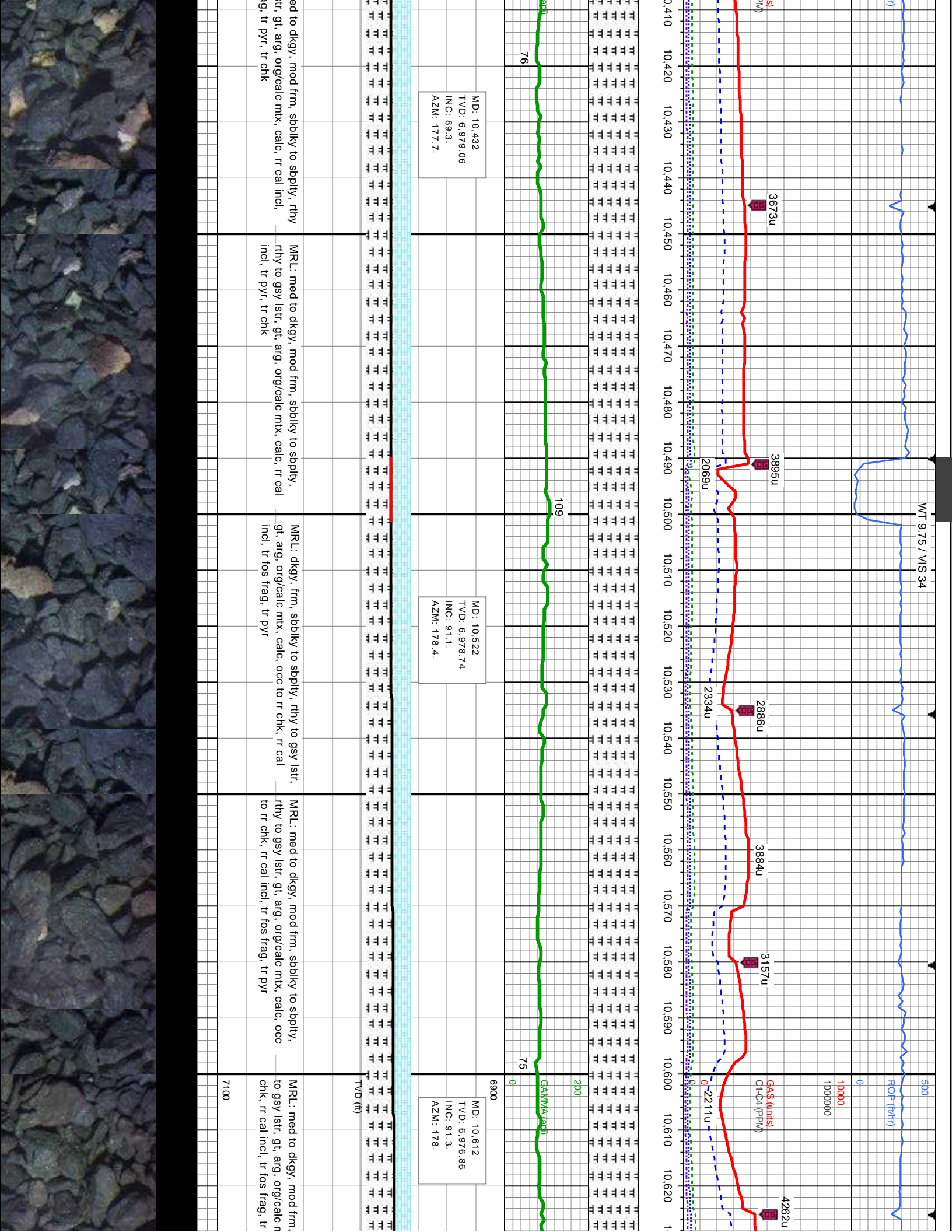
MD: 10.073
TVD: 6,977.56
INC: 90.4
AZM: 177

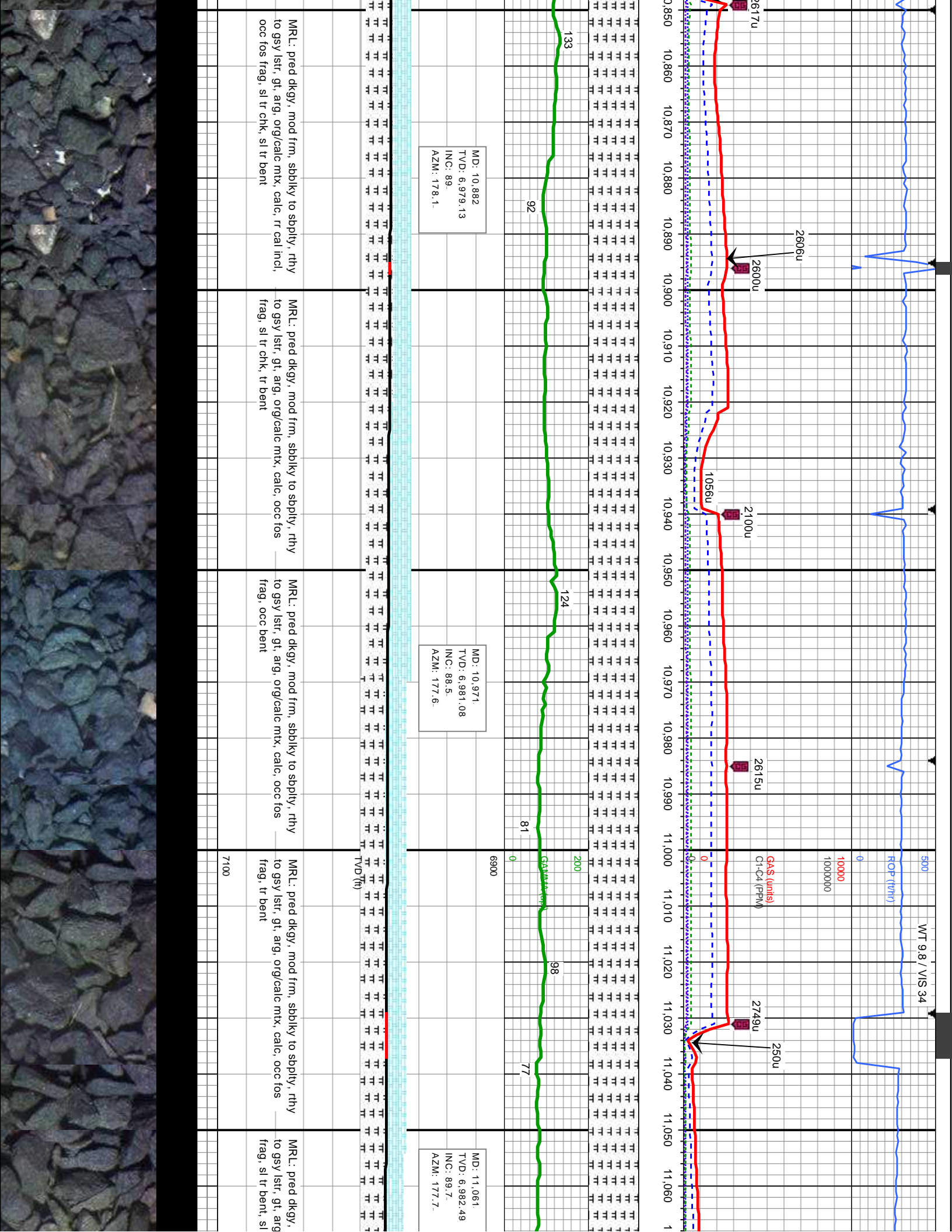
MD: 10.162
TVD: 6,977.41
INC: 89.8
AZM: 179.1

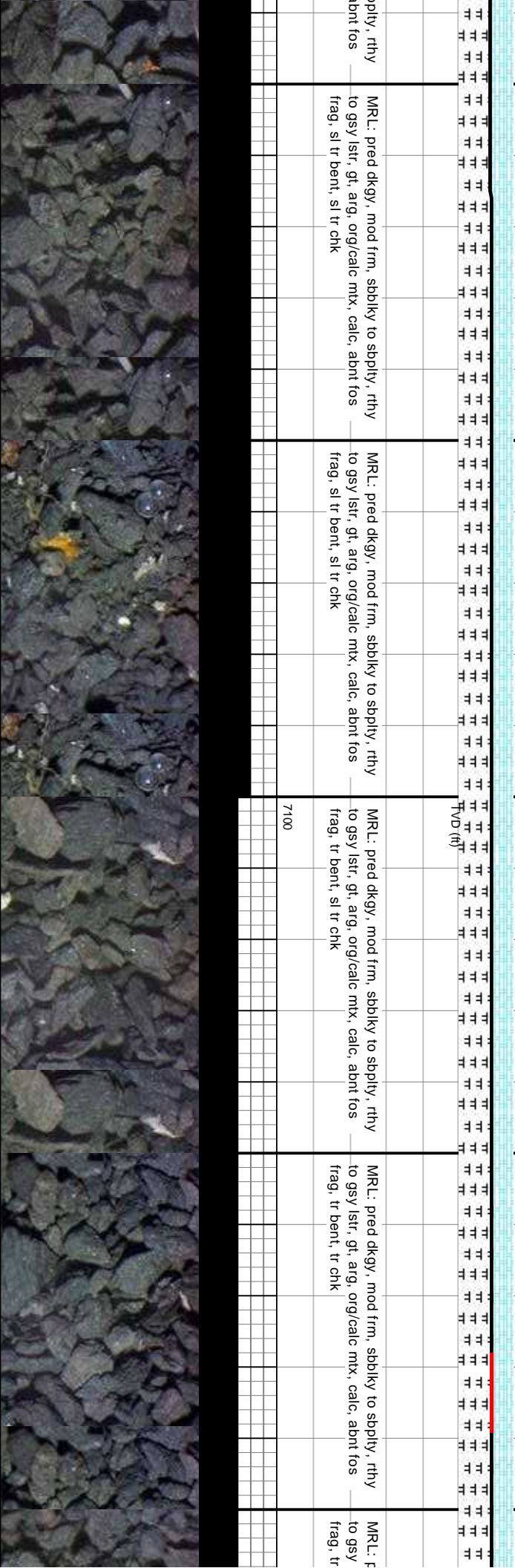
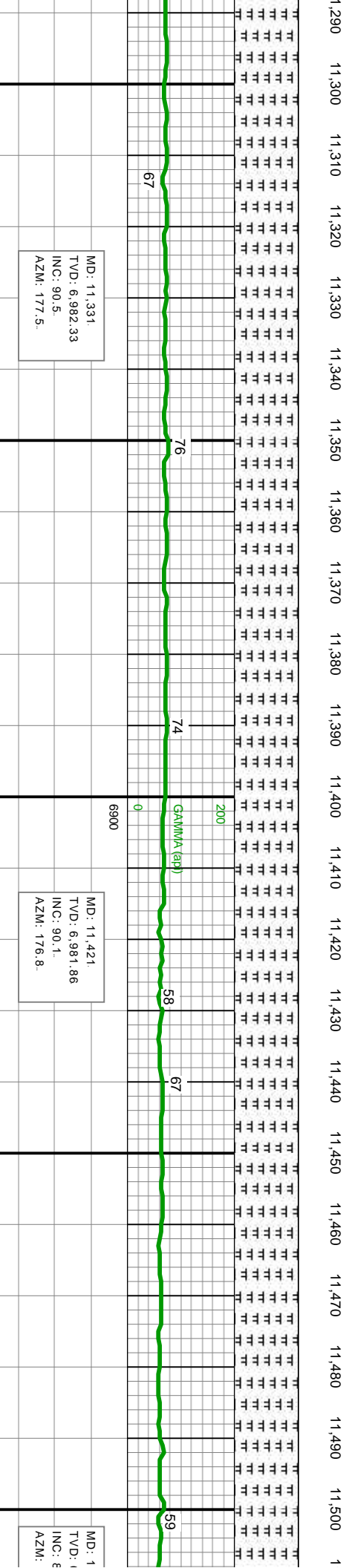
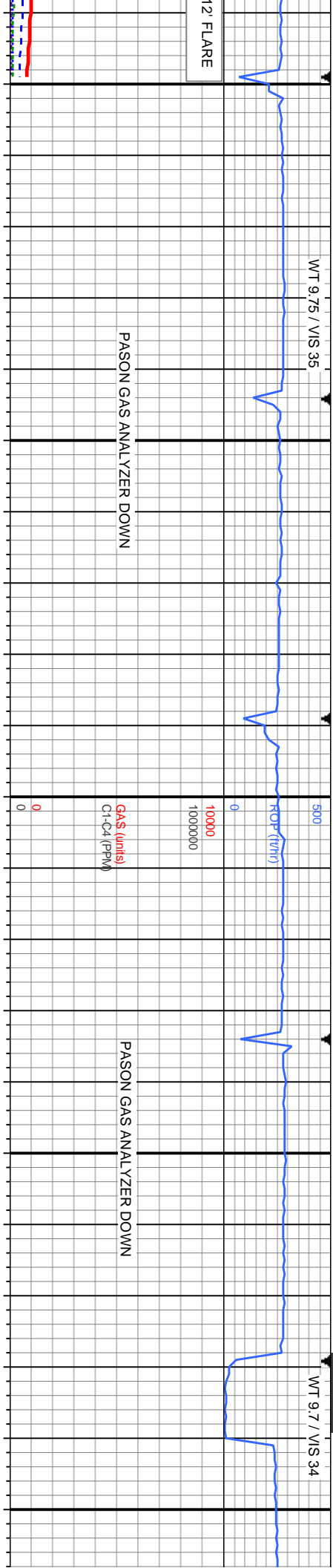
mod frm, sbblky to sbply, rthy org/calc mtx, calc, rr cal incl.	MRL: dkgy, sl to mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, occ to rr rr cal incl, tr fos frag, tr pyr	MRL: dkgy, mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, occ to rr chk, rr cal incl, tr fos frag, tr pyr	MRL: dkgy, sl to mod frm, sbblky to sbply, rthy to gsy lstr, gt, arg, org/calc mtx, calc, occ to rr chk, rr cal incl, tr pyr	MRL: dkgy, mod frm, sbblky to sbply, r lstr, gt, arg, org/calc mtx, calc, rr cal inc frag, tr pyr
7100				

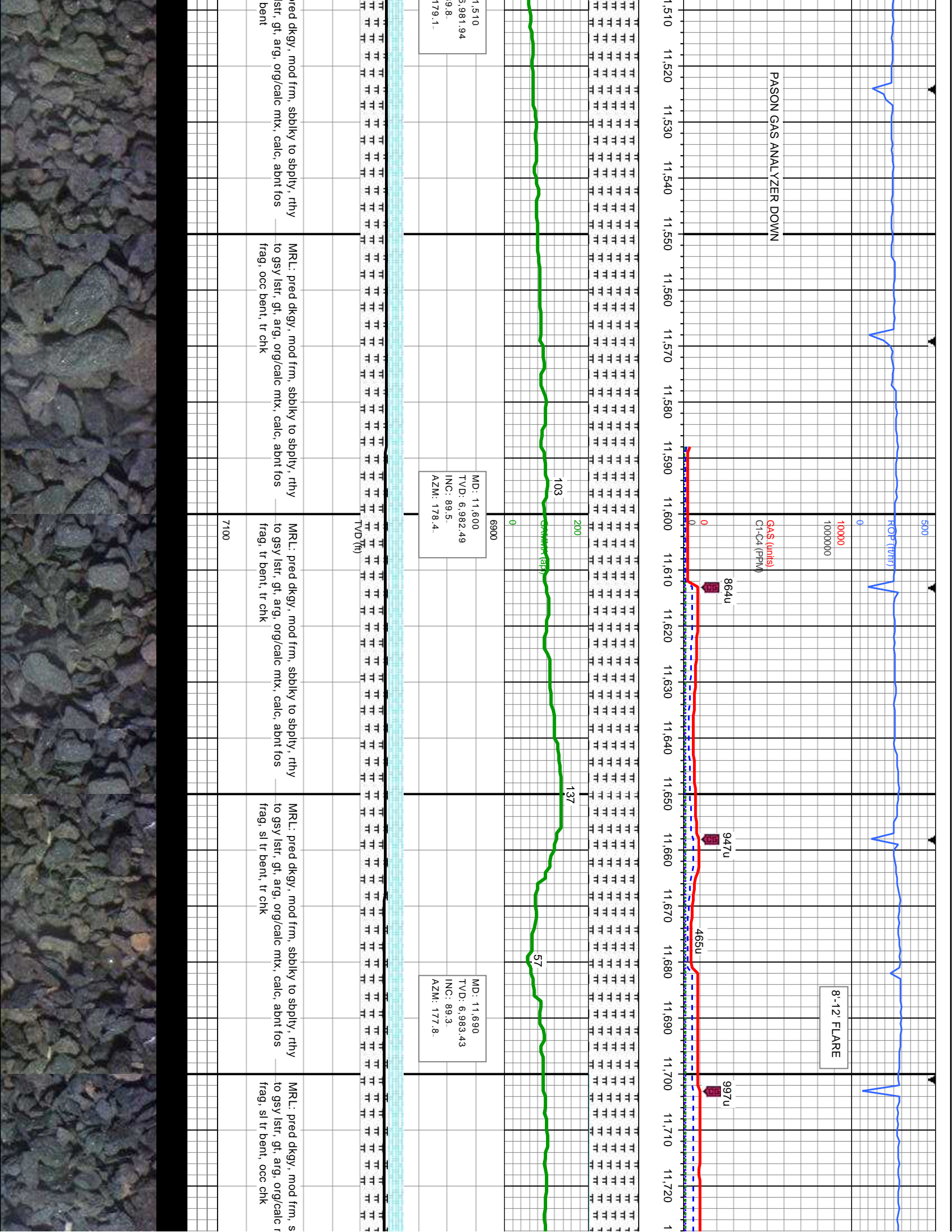


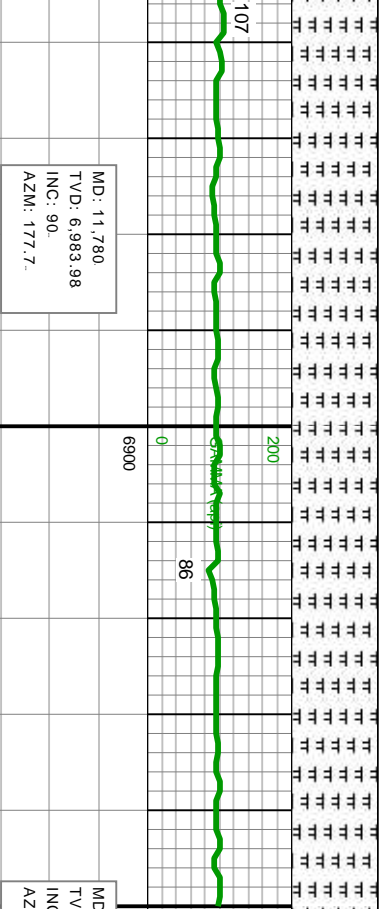
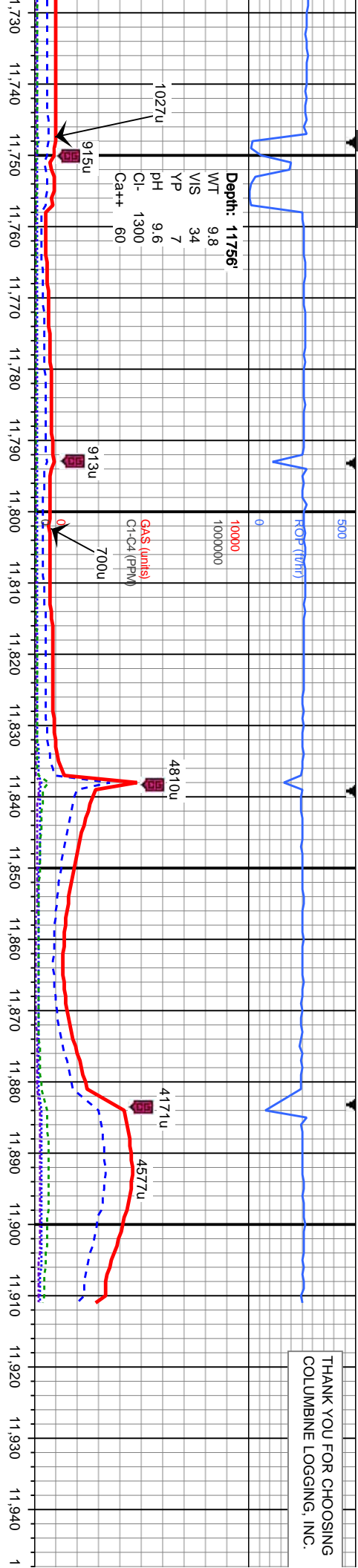








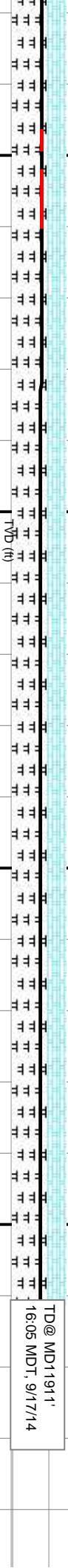




MD: 11,853
TVD: 6,984.11
INC: 89.8
AZM: 177.9.

PROJECTION TO BIT

MD: 11,911
TVD: 6,984.31
INC: 89.8
AZM: 177.9.



Bit Data
Bit #: 3
Depth In: 7,383 '
Depth Out: 11,911 '
Hours: 26 hrs
Avg FV/hr: 174.2 /hr

MRL: pred dkgy, mod frm, sbbkly to sbply, rthy
to gsy lstr, gt, arg, org/calc mx, calc, abnt fos
frag, sl tr bent, occ chk

MRL: dkgy, mod frm, sbbkly to sbply, rthy to gsy
lstr, gt, arg, org/calc mx, calc, sl tr bent, occ
chk

MRL: dkgy, mod frm, sbbkly to sbply, rthy to gsy
lstr, gt, arg, org/calc mx, calc, occ chk



