



Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K18-69HN

Location SESE SEC8 T4N R66W

State COLORADO

Country USA

API Number 05-123-38069

Region DENVER-JULESBURG BASIN

Spud Date 1/21/2014

Surface Coordinates 862 FSL, 689 FEL

Bottom Hole Coordinates SEC7 T4N R66W

75' FSL, 535' FWL

Ground Elevation 4702'

Logged Interval 6500'

Formation TEEPEE BUTTES, SHARON SPRINGS, NIOBRARA

Type of Drilling Fluid LSND

County WELD

Rig Number PRECISION 828

AFE # 142005

Field WATTENBERG

Drilling Completed 2/7/2014

Lat/Long: 40.32131/-104.79468

K.B. Elevation 4718'

Total Depth 16145'

Company NOBLE ENERGY

Address 1625 Broadway
Denver, CO 80202

Name CASSIDY MILLER

Company NOBLE ENERGY

Address 1625 Broadway
Denver, CO 80202

Wellsite Geologists: GARY N. MILLER

WELLSITE

LOG CODE

CHALK

Operator

Y INC.

02

Geologist

三
五

Y, INC.

02

Other

MYERS, ELIZABETH VAN DIEPEN, JEREMY LOFTNESS

THE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.

CONTINUES FROM FILE: Five Rivers K18-69HN Vert.mplot

Rock Types

π π π π MARLSTONE

SANDSTONE

CLAY

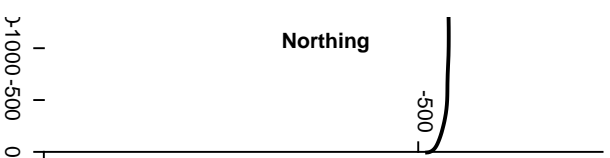
SILTY SHALE

Engineering



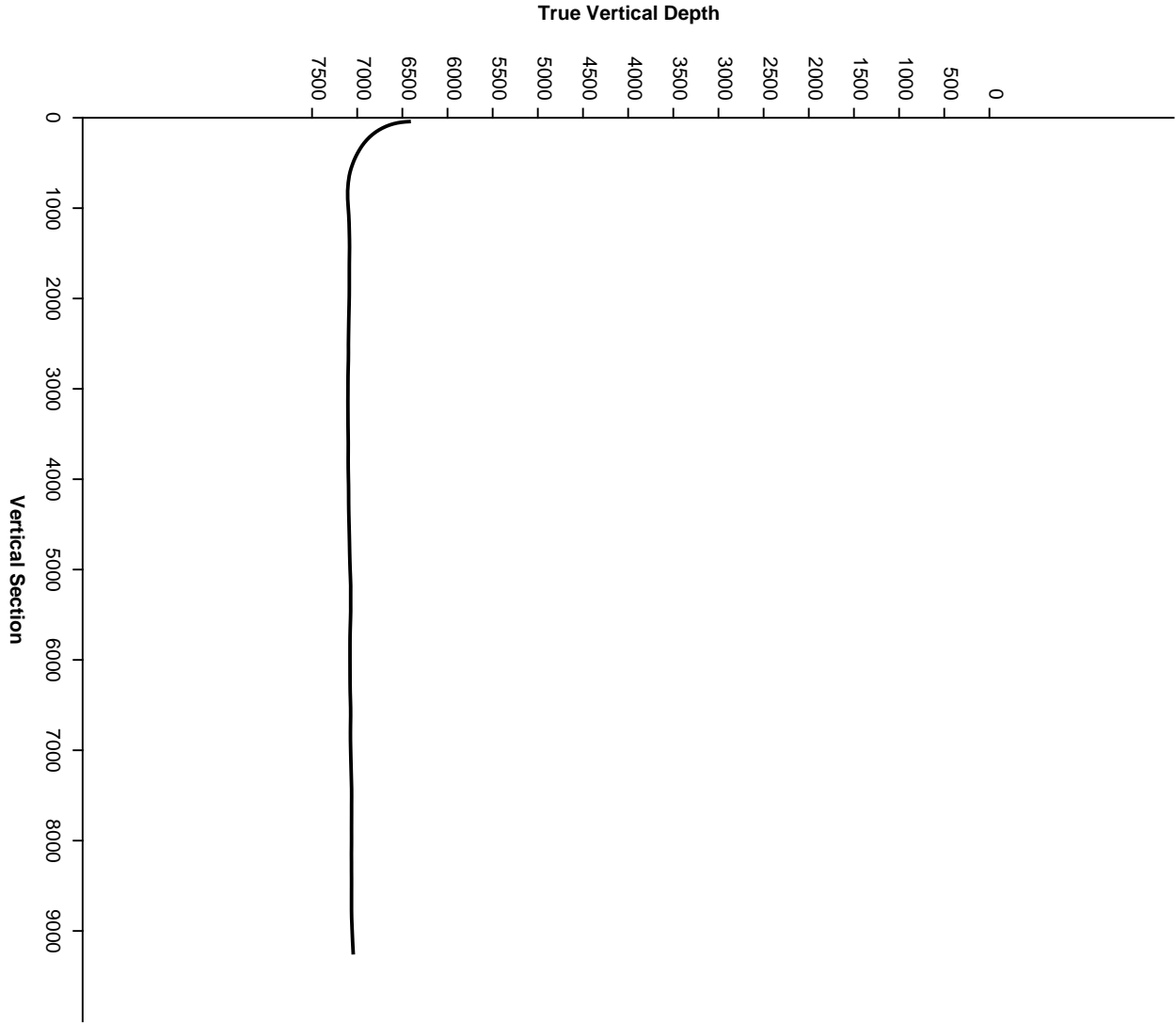
Other Symbols

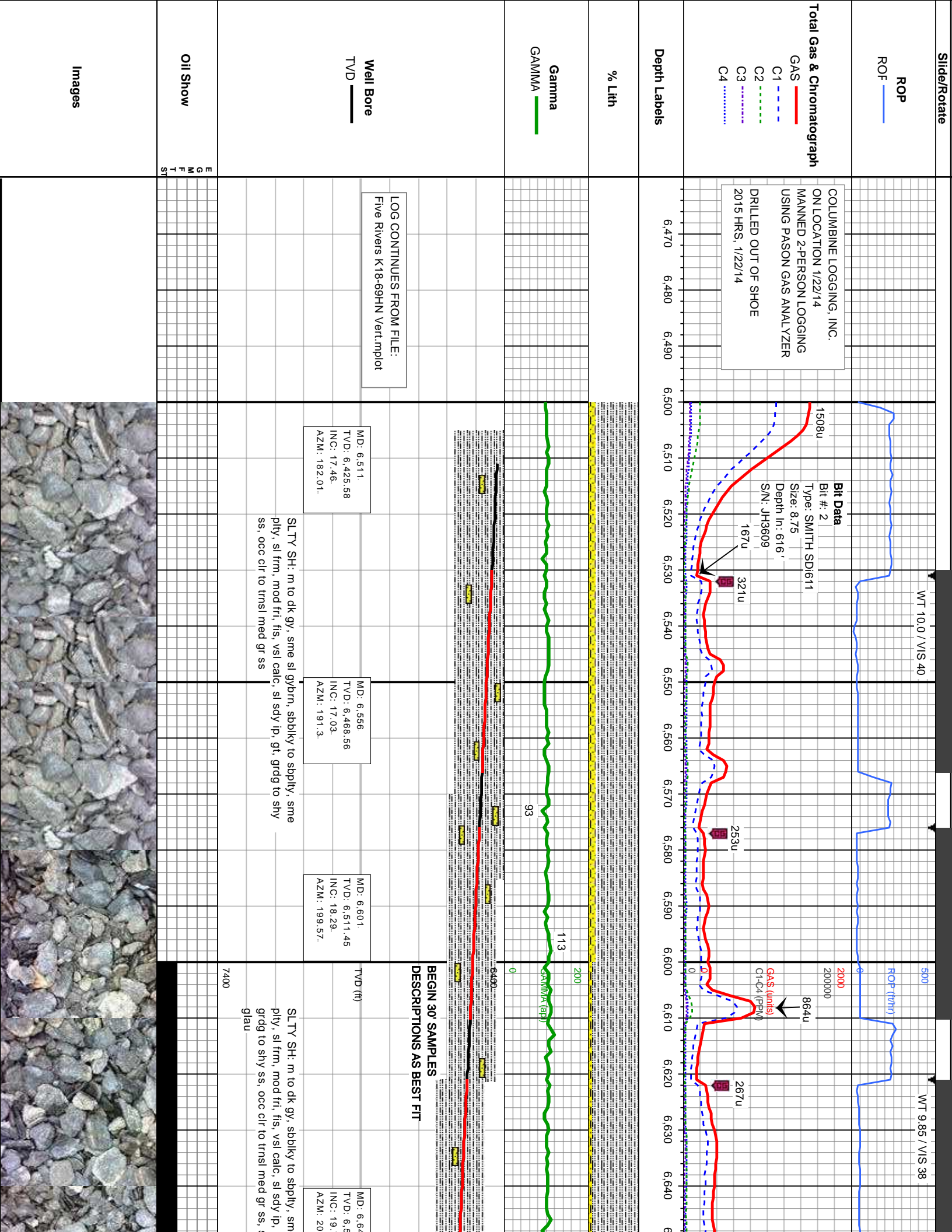
Survey Plan

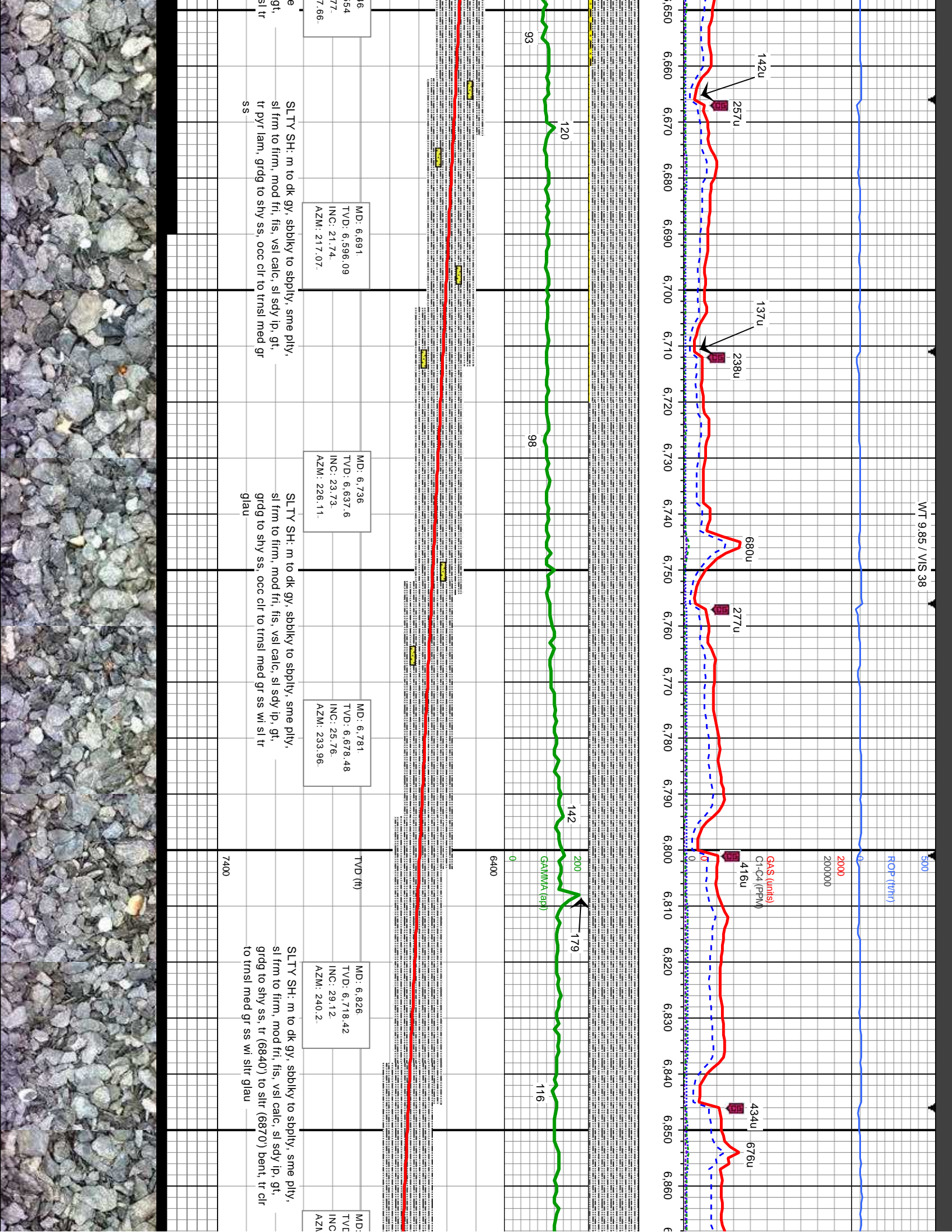


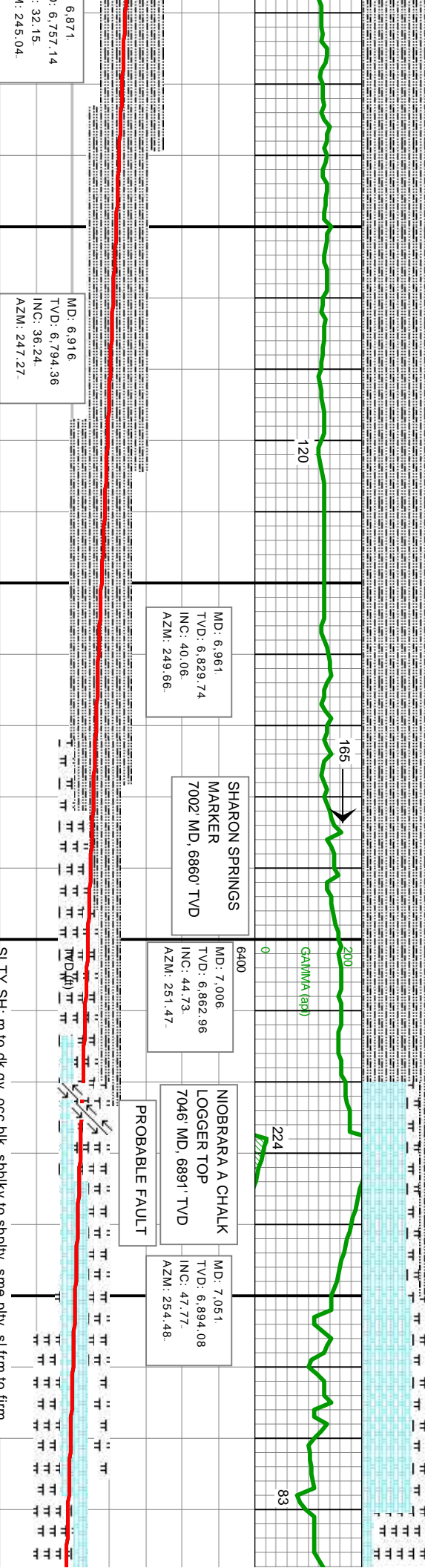
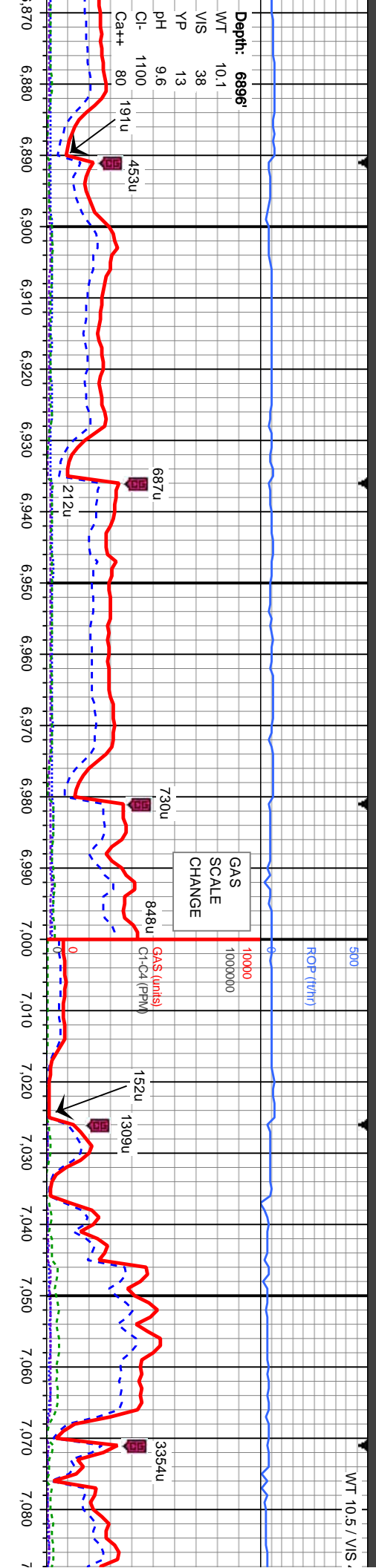
Easting

Survey Elevation









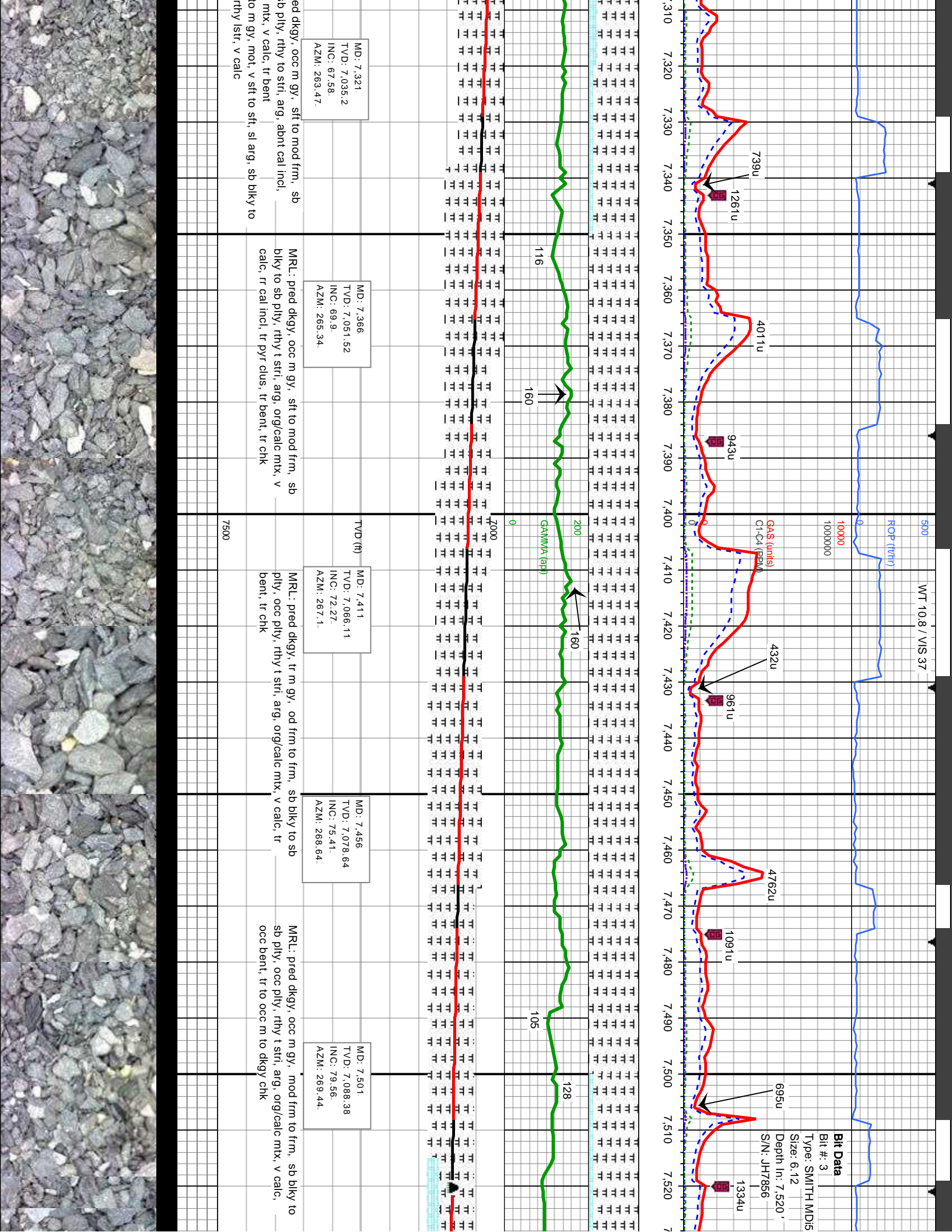
SLTY SH: m to dk gy, sbbiky to sbply, sme ply,
sl frm to firm, mod fri, fis, vsi calc, sl sdy ip, gt,
grdg to shy ss, tr clt to trnsi med gr ss

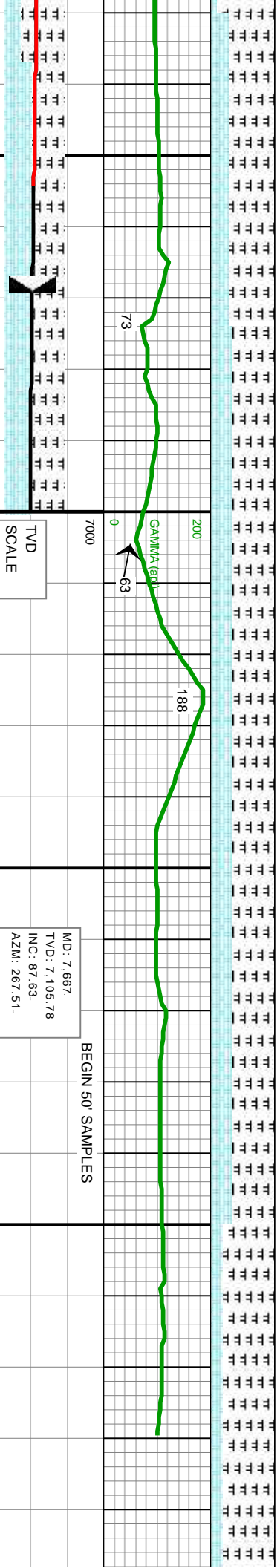
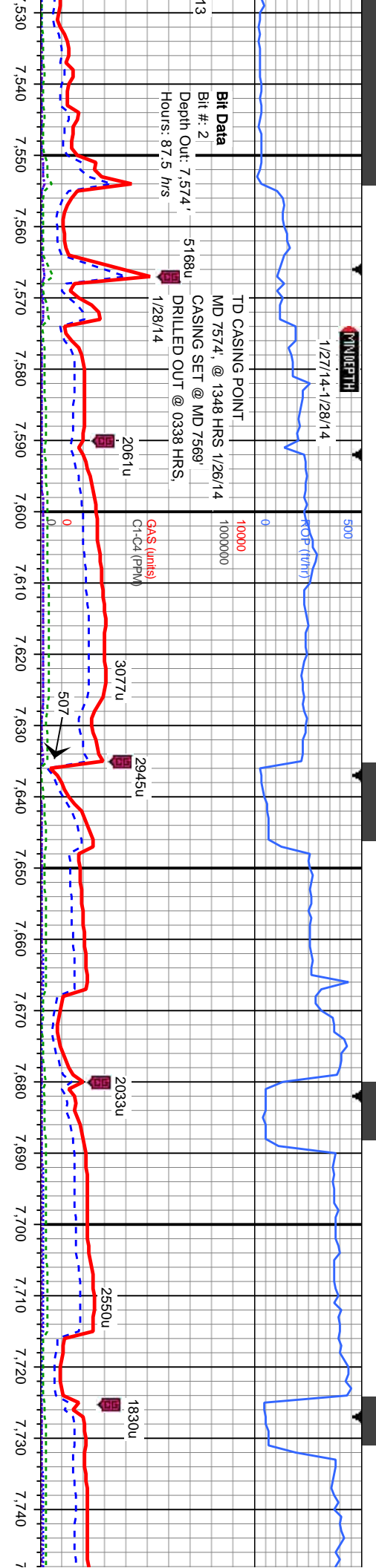
SLTY SH: m to dk gy, occ lt gy, sbbiky to sbply,
sme ply, sl frm to firm, mod fri, fis, vsi calc, sl
sdy ip, occ grdg to shy ss

SLTY SH: m to dk gy, occ blk, sbbiky to sbply, sme ply, sl frm to firm,
mod fri, fis, vsi calc, sl sdy ip, grdg to lt gy shy ss,
MRL: med to dk gy, sft to mod frm, sb biky to sb ply, occ ply, rthy to
stri, arg, org/calc mnx, v calc
CHK: lt to med gy, mot, v sft to sl frm, sl arg, sb biky to sb ply, rthy lstr,
v calc, cal incl, tr (7020) to sltr bent

MRL:
ply, r
CHK:
ply, r







TVD
SCALE
CHANGE

BEGIN 50' SAMPLES

MD: 7,667
TVD: 7,105.78
INC: 87.63.
AZM: 267.51.

NIOBRARA C CHALK
LOGGER TOP
~7574' MD, ~7099' TVD

MD: 7,577
TVD: 7,099.23
INC: 84.02
AZM: 269.48.

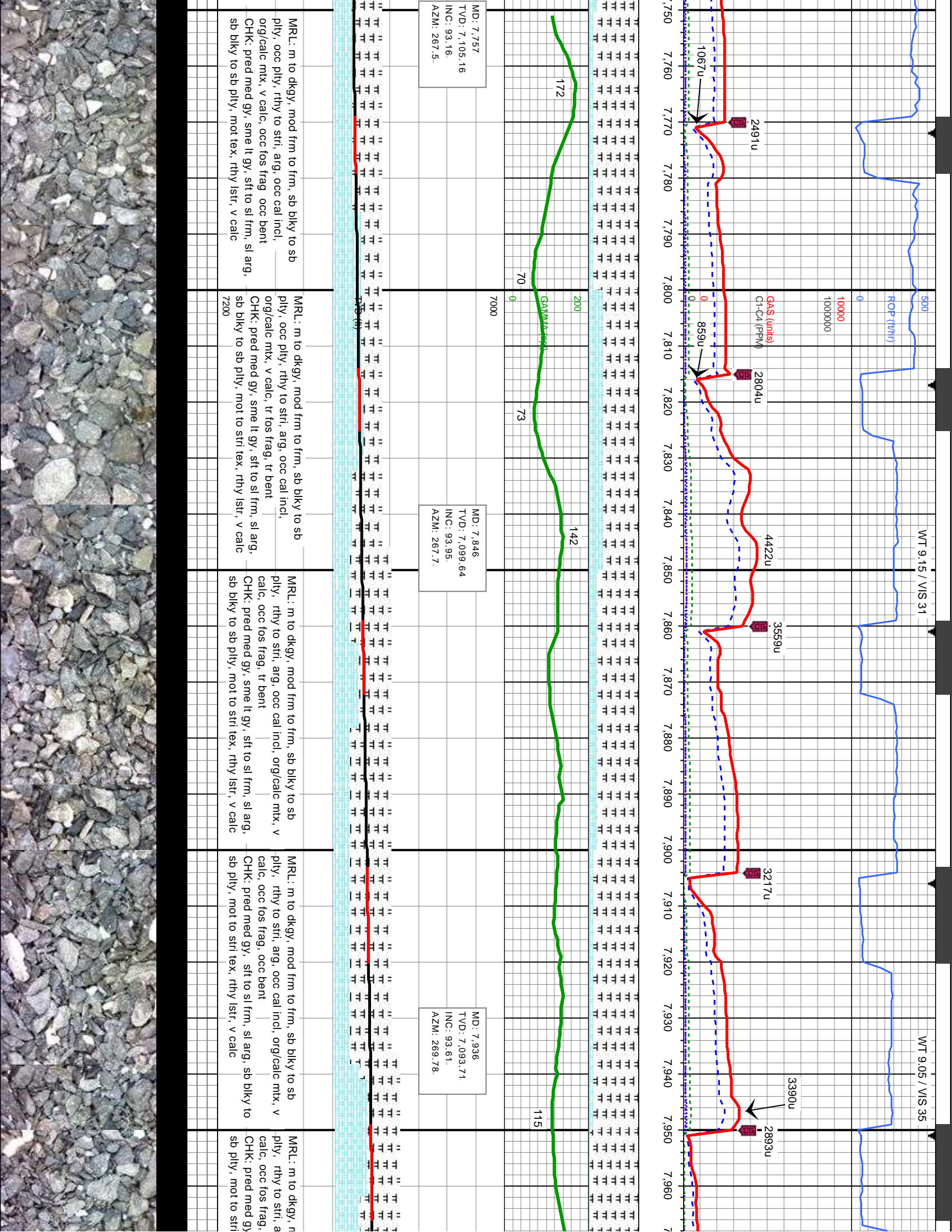
MRL: pred dkgy, occ m gy, m frm to frm,
sb blkly to sb pily, occ pily, rthy to strf, arg,
occ cal incl, org/calc mtx, v calc, abnt
bent
CHK: It to m gy, sme sl dkgy, mot w calc
incl, v sft to sft, sl arg, sb blkly to sb pily,
rthy lstr, v calc

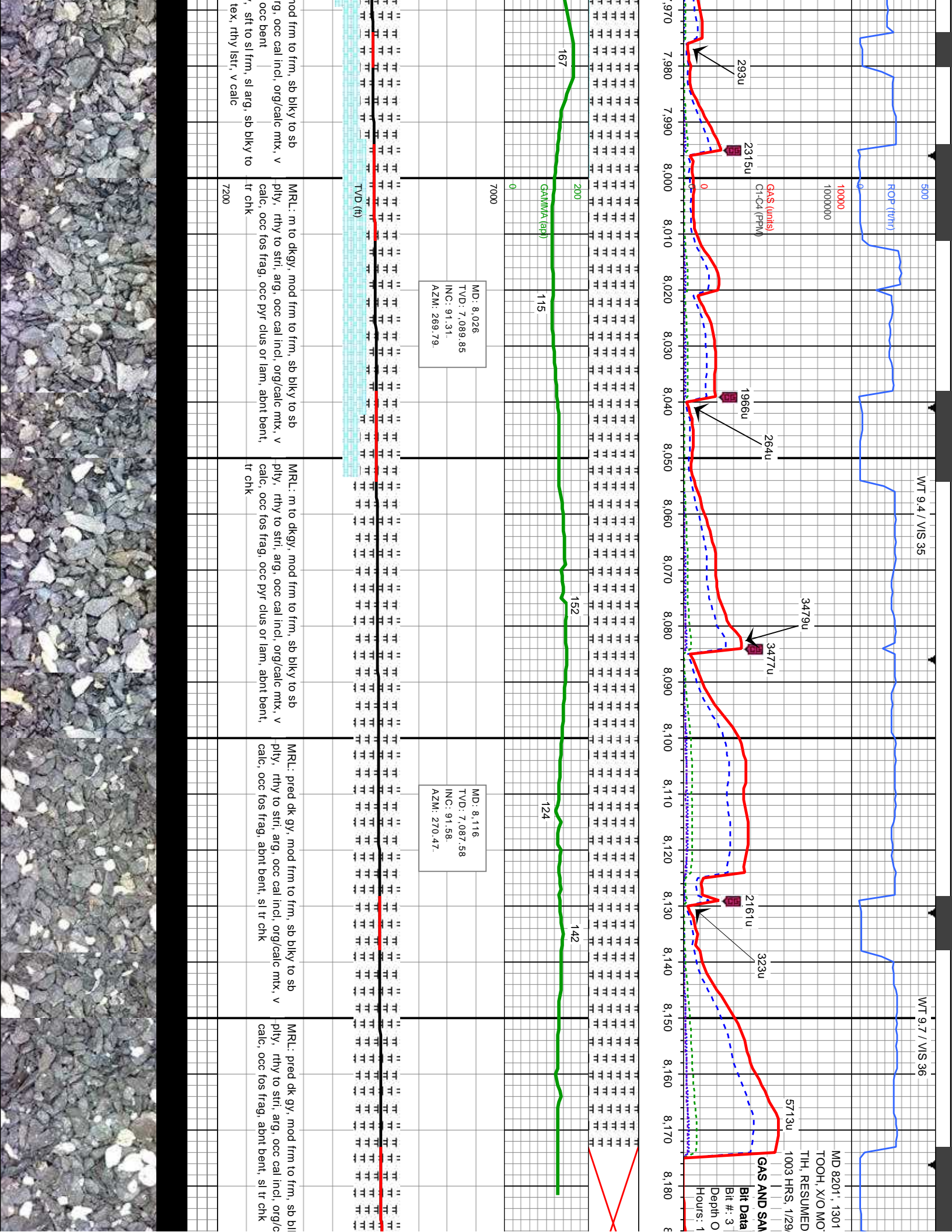
MRL: m to dkgy, mod frm to frm, sb blkly to sb
pily, occ pily, rthy to strf, arg, occ cal incl,
org/calc mtx, v calc, tr pyr clus, abnt fos frag
occ bent
CHK: It to m gy, sft sl frm, sl arg, sb blkly to sb
pily, mot tex, rthy lstr, v calc

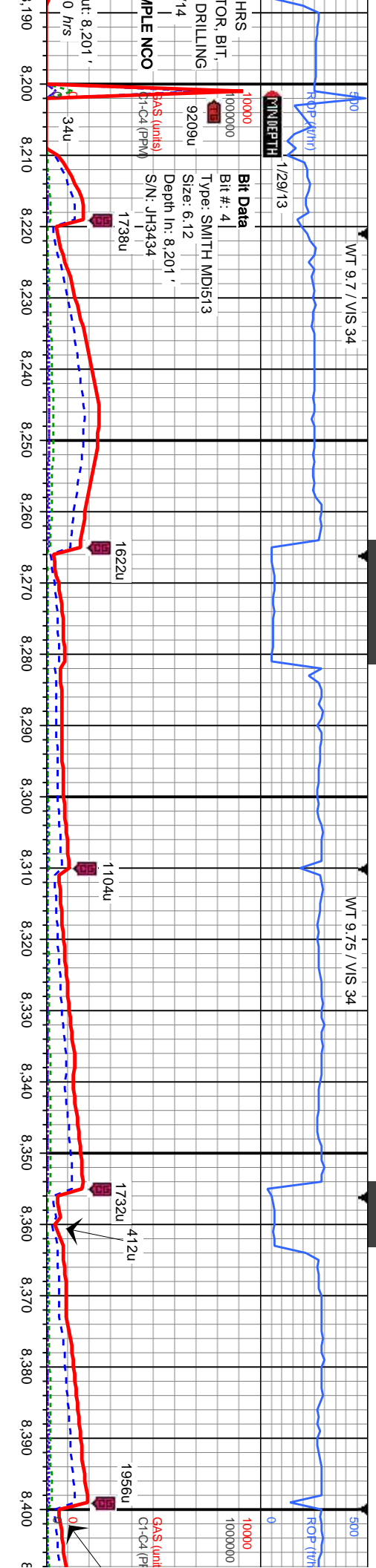
MRL: m to dkgy, mod frm to frm, sb blkly to sb
pily, occ pily, rthy to strf, arg, occ cal incl,
org/calc mtx, v calc, occ fos frag occ bent
CHK: It to m gy, sft to sl frm, sl arg, sb blkly to sb
pily, mot tex, rthy lstr, v calc

MRL: m to dkgy, mod frm to frm, sb blkly to sb
pily, occ pily, rthy to strf, arg, occ cal incl,
org/calc mtx, v calc, occ fos frag occ bent
CHK: pred med gy, sme lt gy, sft to sl frm, sl arg,
sb blkly to sb pily, mot tex, rthy lstr, v calc





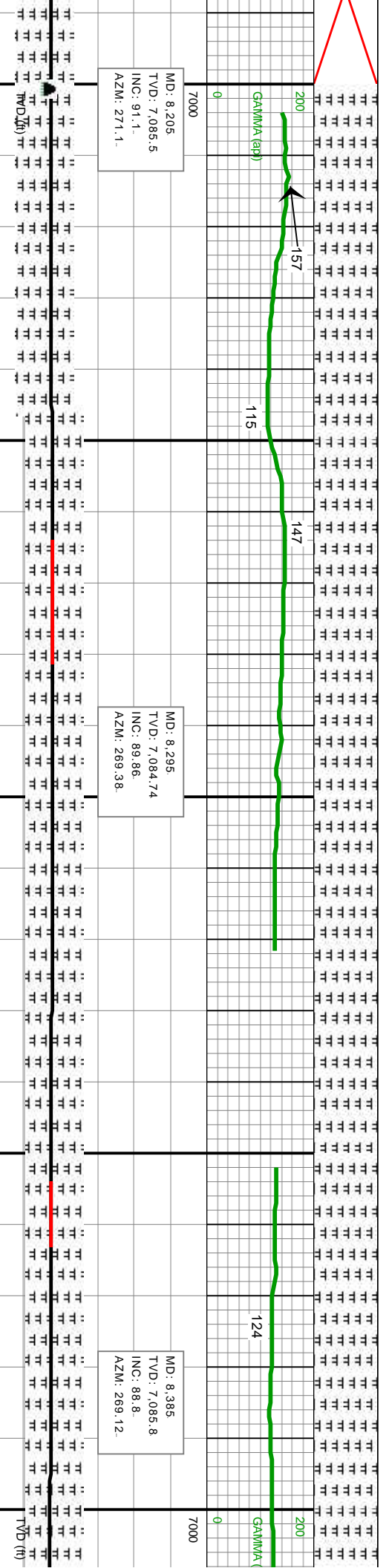




MD: 8,205
TVD: 7,085.5
INC: 91.1.
AZM: 271.1.

MD: 8,295
TVD: 7,084.74
INC: 89.86
AZM: 269.38.

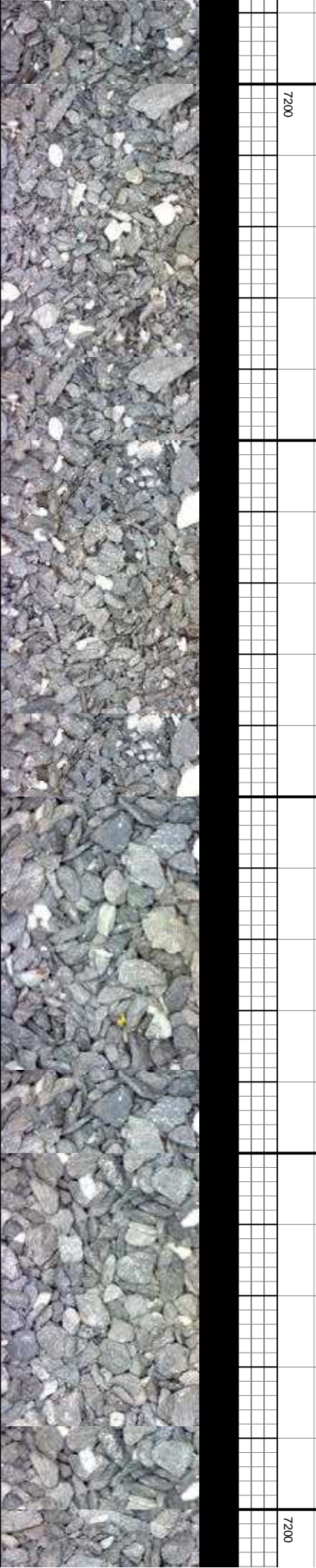
MD: 8,385
TVD: 7,085.8
INC: 88.8.
AZM: 269.12.

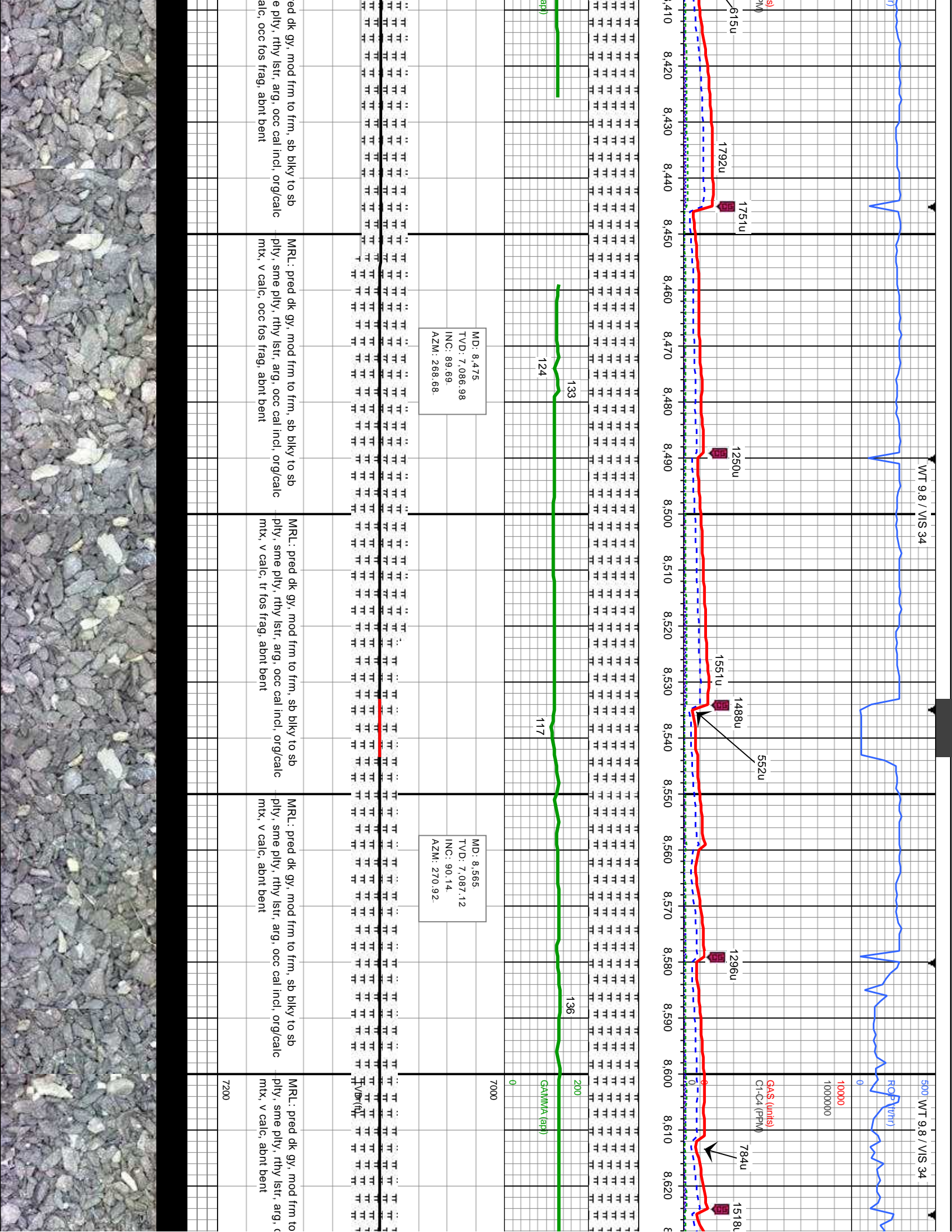


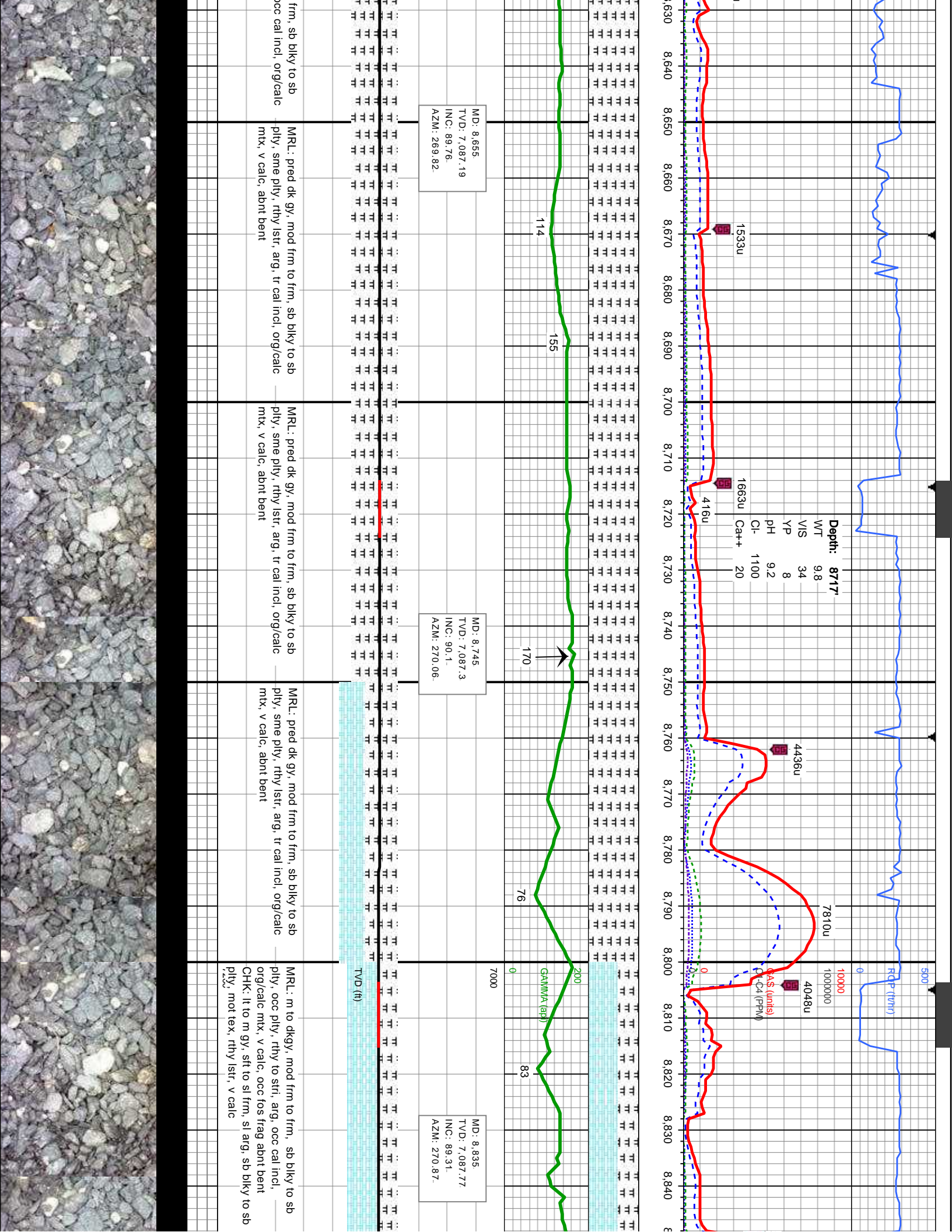
MRU: pred dk gy, mod frm to frm, sb blkly to sb pty, sme pty, rthy to strf, arg, occ cal incl, org/calc mt, v calc, tr fos frag, abnt bent

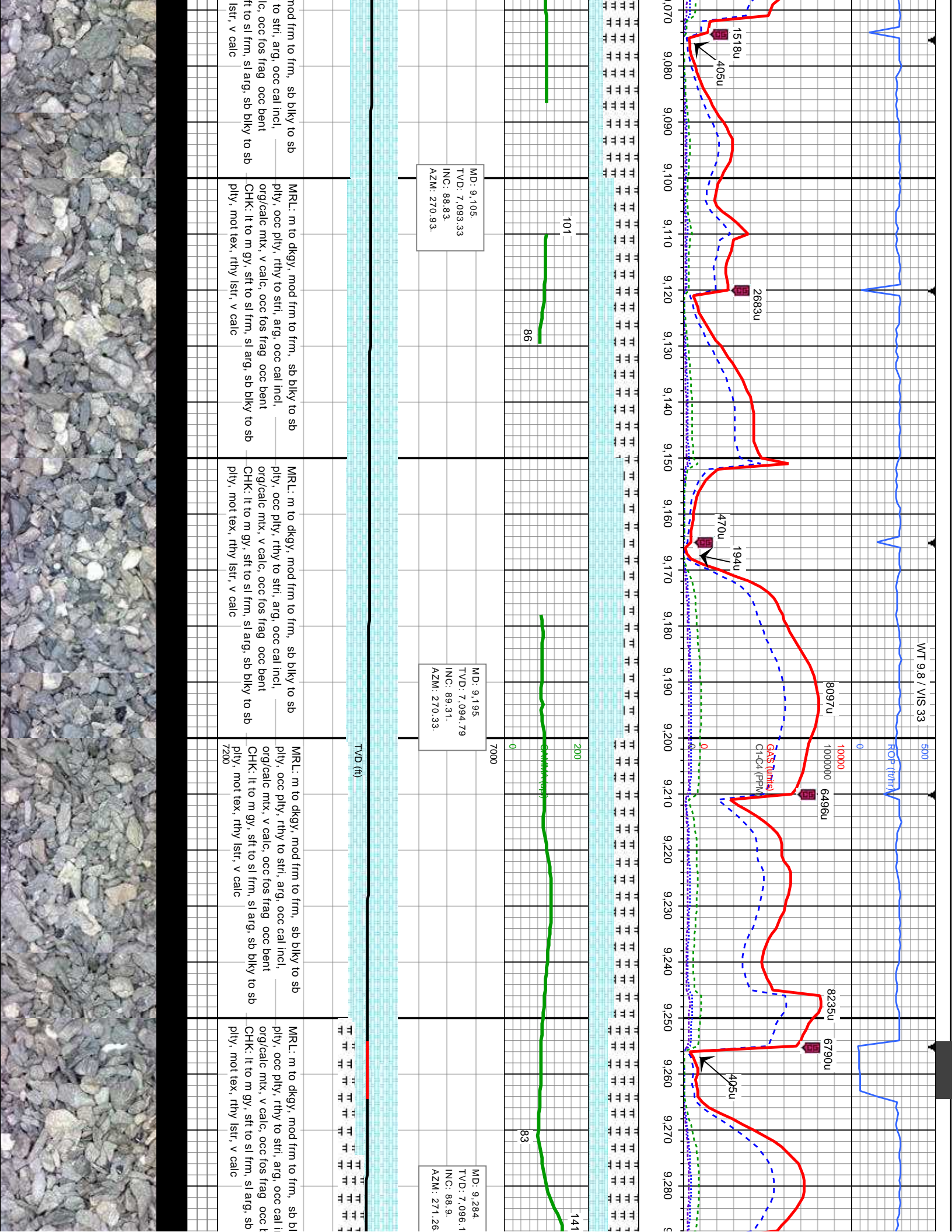
MRU: pred dk gy, mod frm to frm, sb blkly to sb pty, sme pty, rthy to strf, arg, occ cal incl, org/calc mt, v calc, tr fos frag, abnt bent

MRU: pred dk gy, mod frm to frm, sb blkly to sb pty, sme pty, rthy lstr, arg, occ cal incl, org/calc mt, v calc, tr pyr clus, occ fos frag, abnt bent









WT 9.8 / VIS 33

ROP (ft/hr)

G4S (turns)
C1-C4 (PPM)

MD: 9.105
TVD: 7.093.33
INC: 88.83
AZM: 270.93

MD: 9.195
TVD: 7.094.79
INC: 89.31
AZM: 270.33

MD: 9.284
TVD: 7.096.1
INC: 88.9
AZM: 271.26

mod frm to frm, sb blkly to sb
to strf, arg, occ cal incl,
ic, occ fos frag occ bent
ft to sl frm, sl arg, sb blkly to sb
lst, v calc

MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to strf, arg, occ cal incl,
org/calic mtx, v calc, occ fos frag occ bent
CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lst, v calc

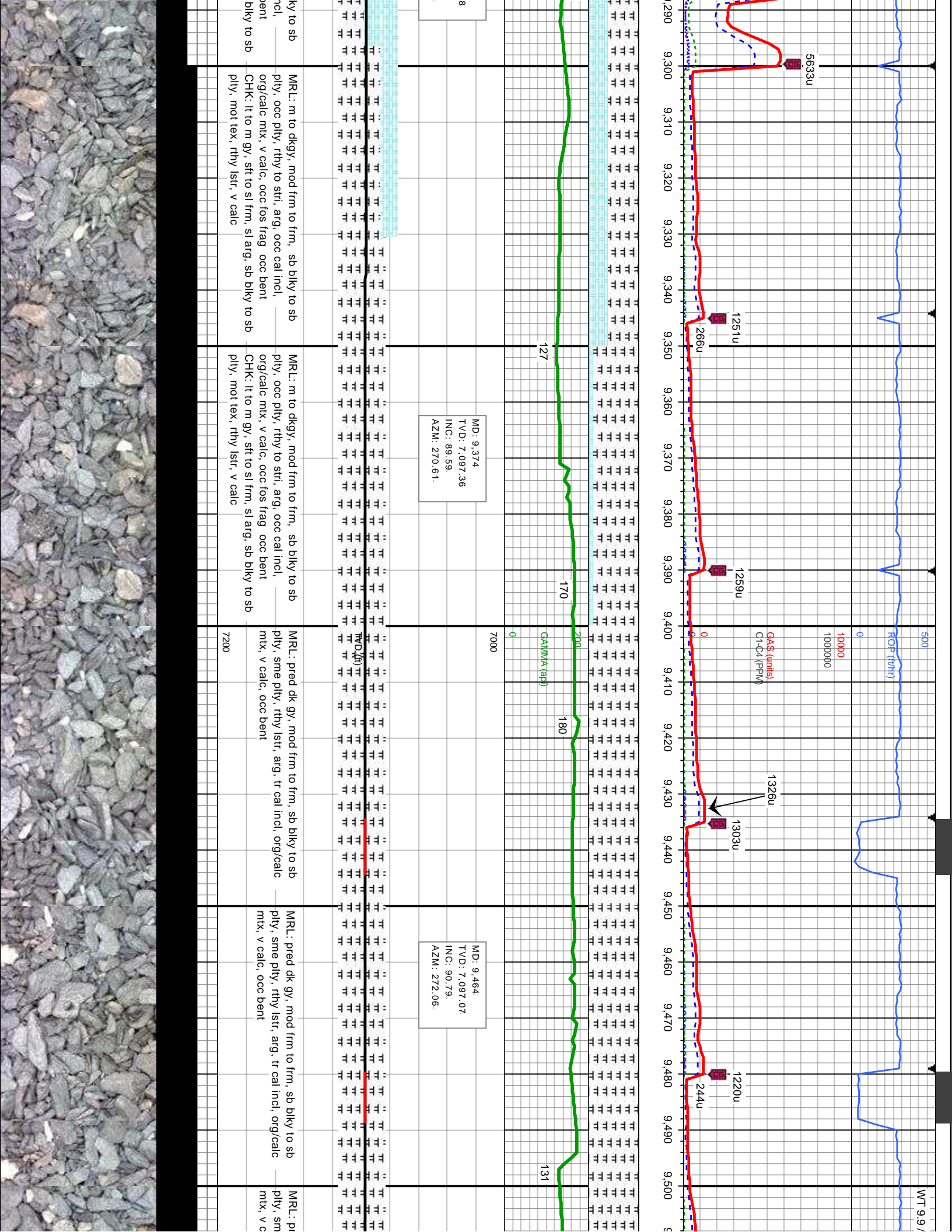
MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to strf, arg, occ cal incl,
org/calic mtx, v calc, occ fos frag occ bent
CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lst, v calc

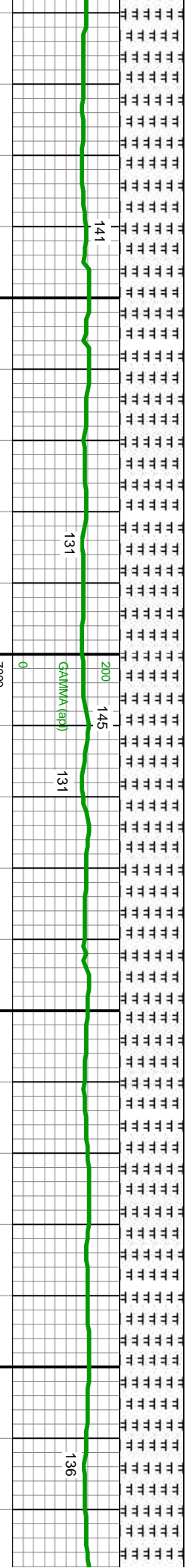
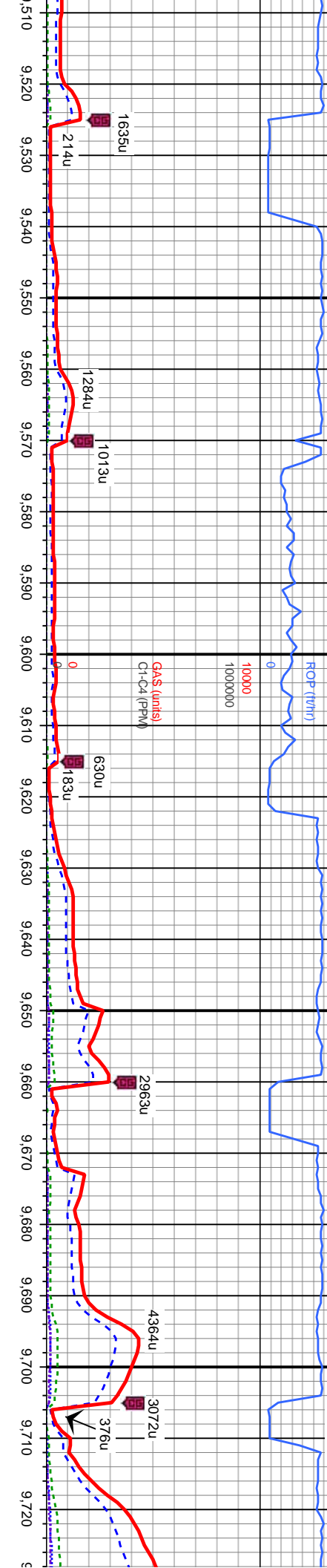
MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to strf, arg, occ cal incl,
org/calic mtx, v calc, occ fos frag occ bent
CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lst, v calc

MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to strf, arg, occ cal incl,
org/calic mtx, v calc, occ fos frag occ bent
CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lst, v calc

TVD (ft)





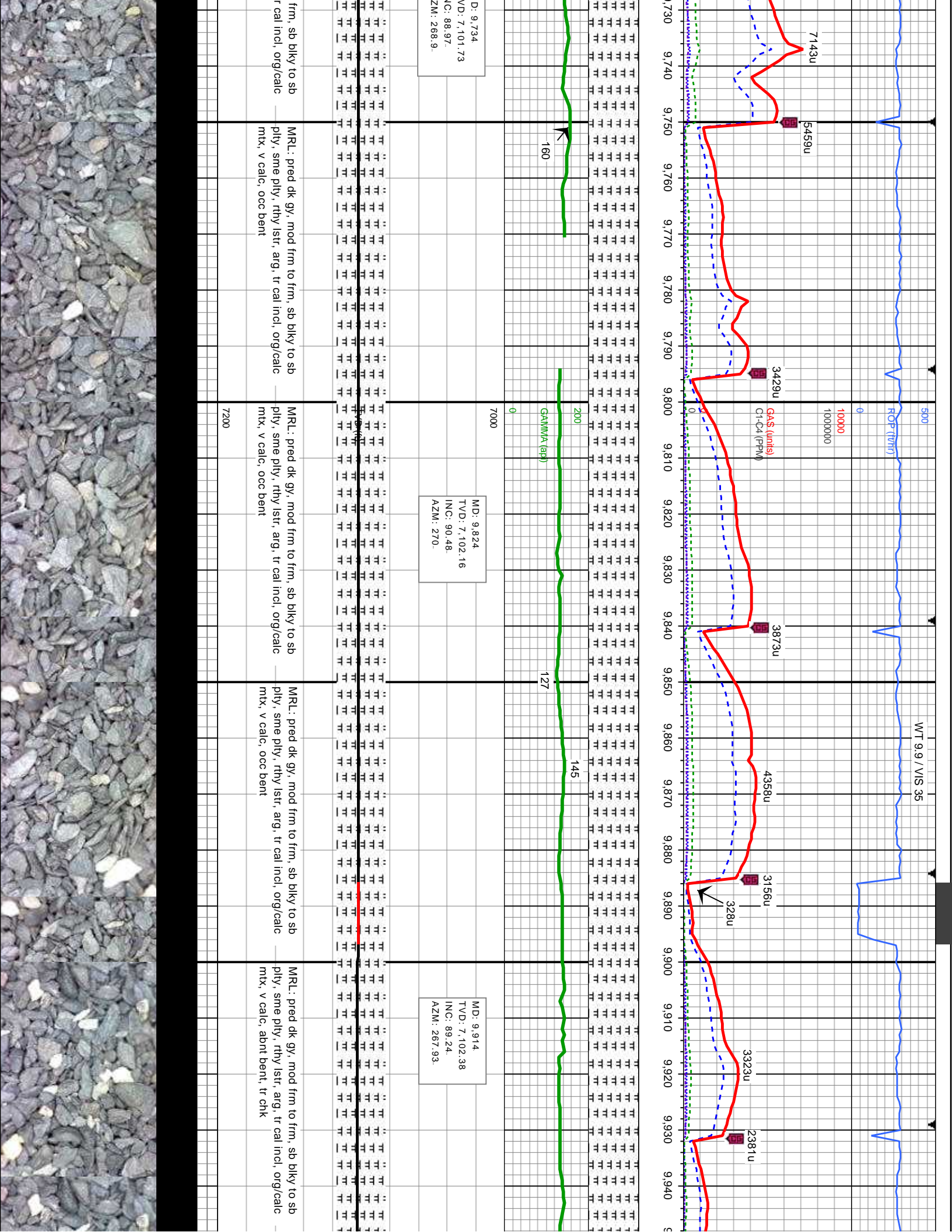


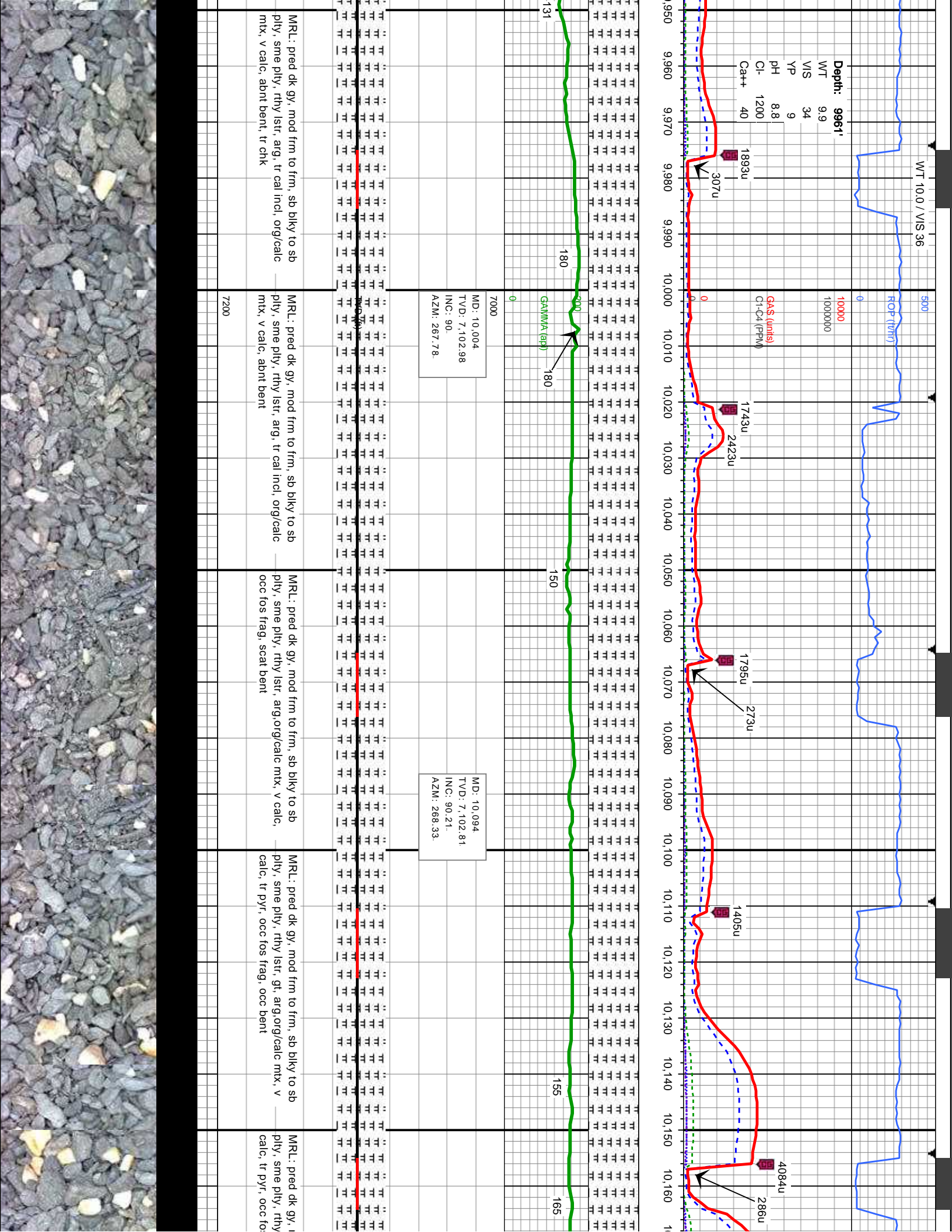
MD: 9.554
TVD: 7.097.82
INC: 88.25
AZM: 271.86

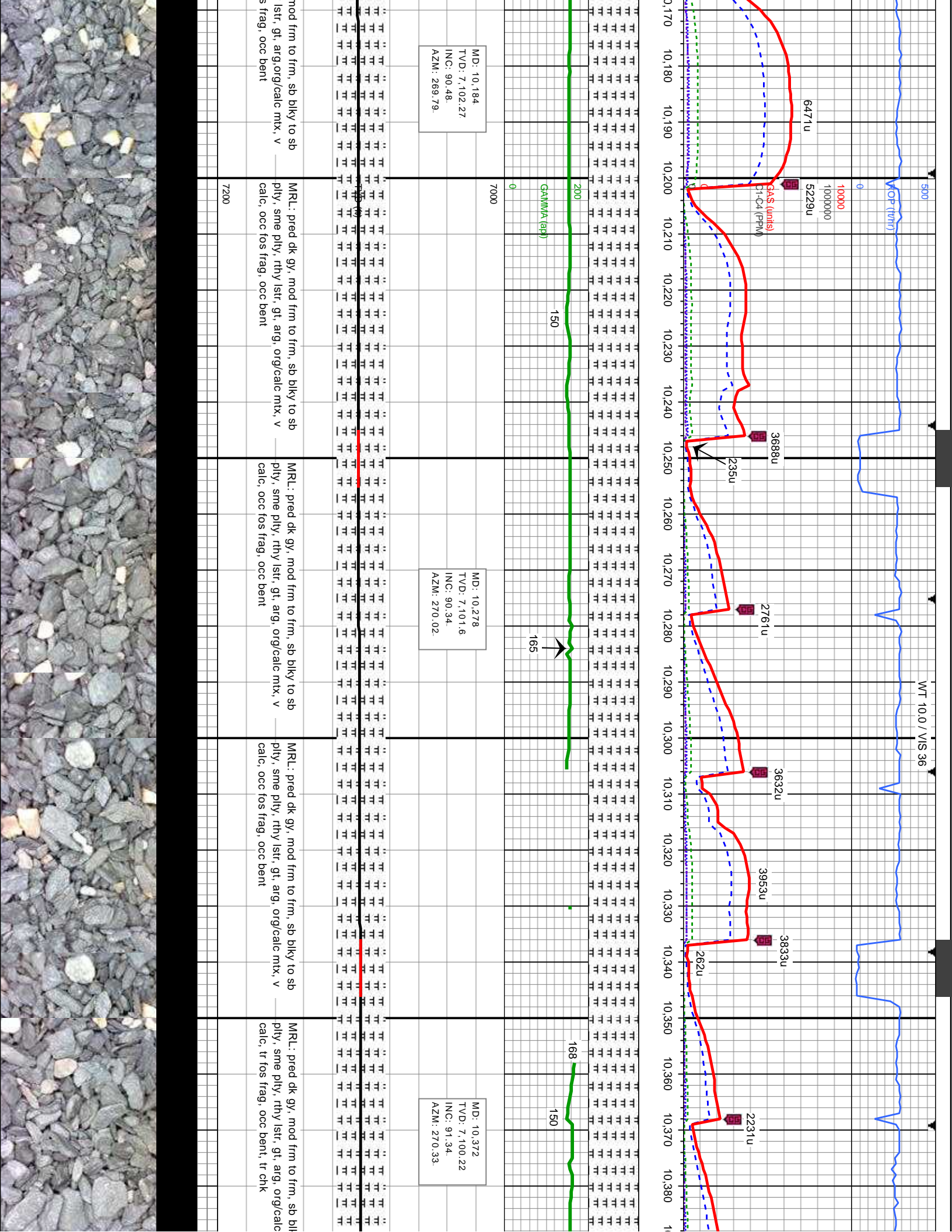
MD: 9.644
TVD: 7.100.06
INC: 88.9
AZM: 270.3

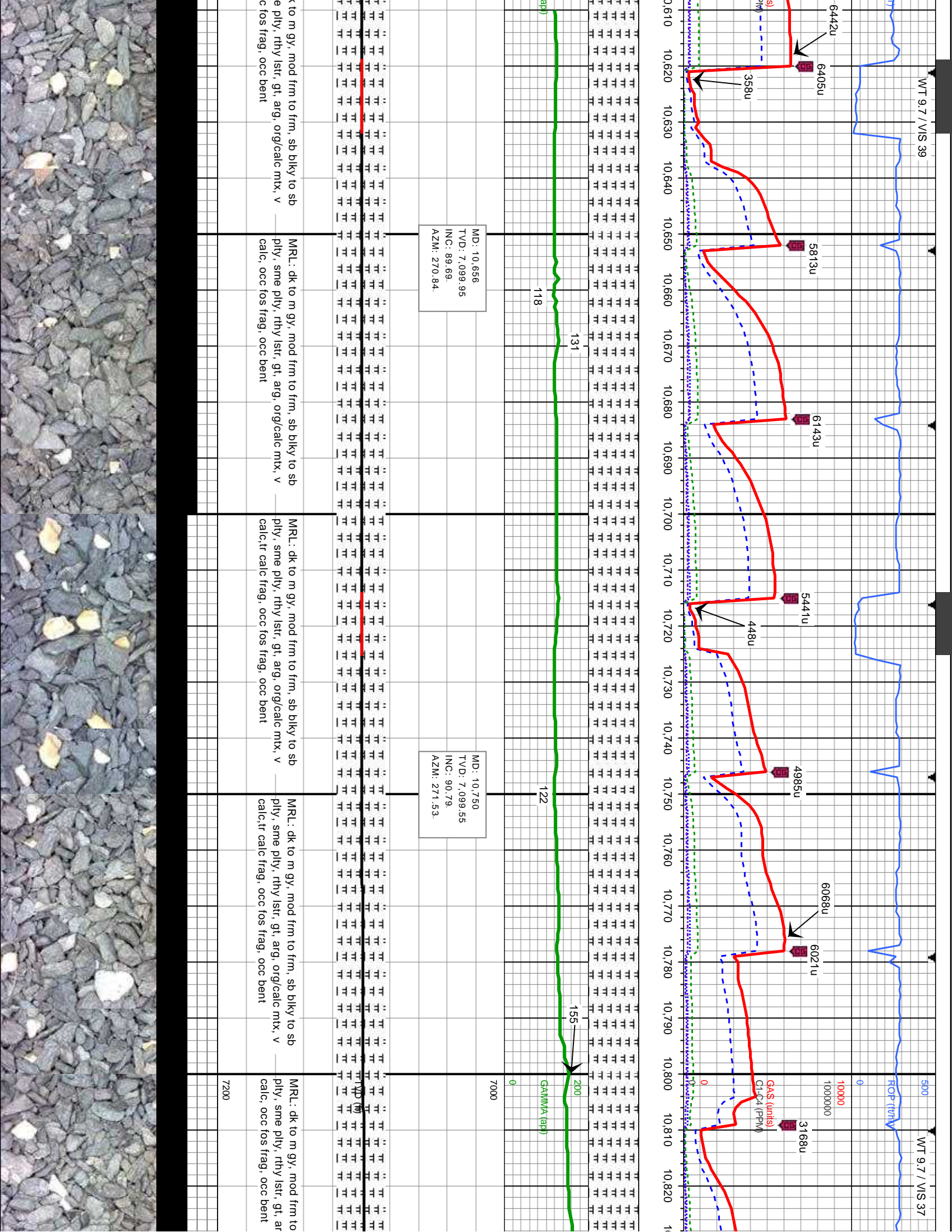
pred dk gy, mod frm to frm, sb blkly to sb	MRU: pred dk gy, mod frm to frm, sb blkly to sb	MRU: pred dk gy, mod frm to frm, sb blkly to sb	MRU: pred dk gy, mod frm to frm, sb blkly to sb
ply, rthy lstr, arg, tr cal incl, org/calc	ply, sme ply, rthy lstr, arg, tr cal incl, org/calc	ply, sme ply, rthy lstr, arg, tr cal incl, org/calc	ply, sme ply, rthy lstr, arg, tr cal incl, org/calc
calc, occ bent	mtx, v calc, occ bent	mtx, v calc, abnt bent	mtx, v calc, occ bent

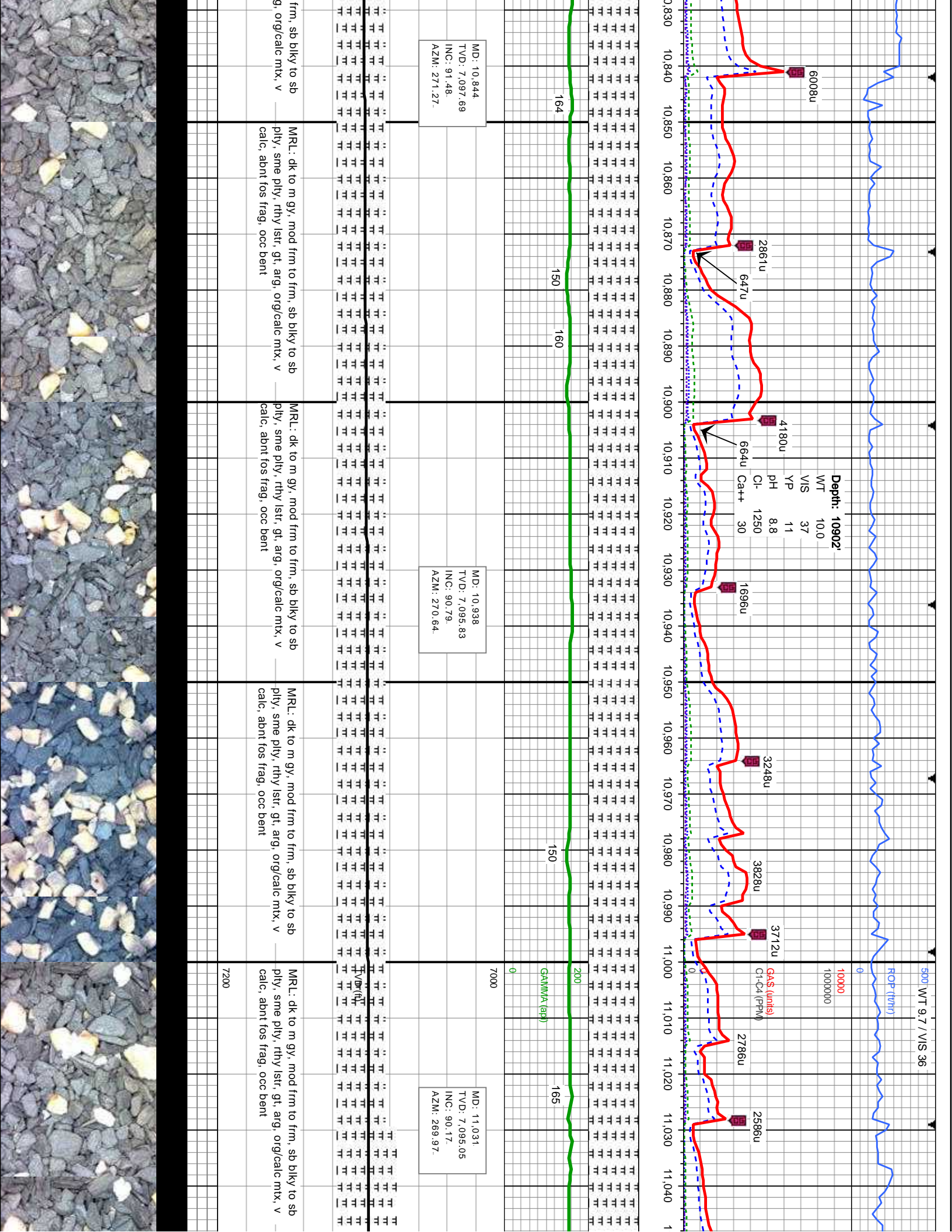


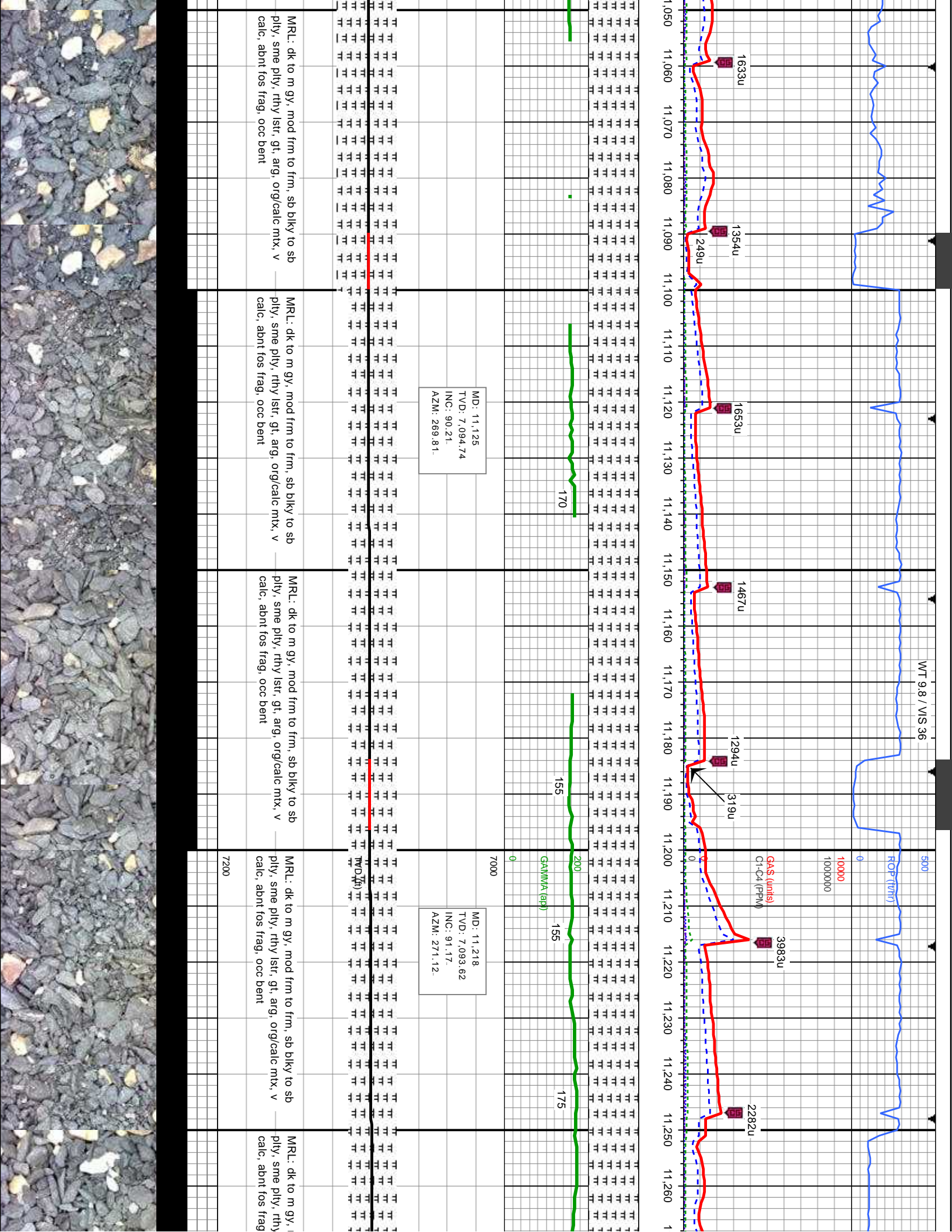




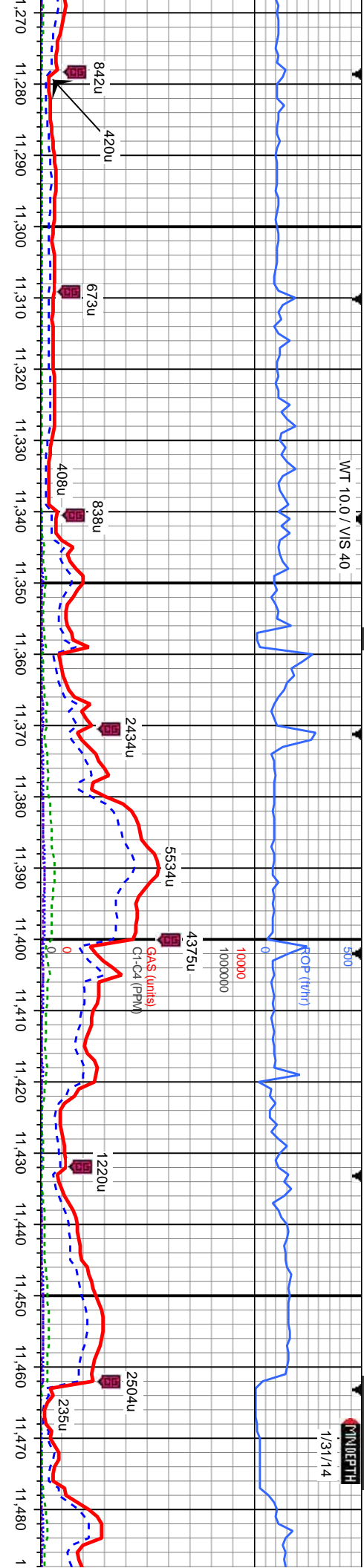








WT 10.0 / VIS 40



MD: 11,311.
TVD: 7,091.61
INC: 91.3
AZM: 271.41.

MD: 11,403
TVD: 7,089.55
INC: 91.27
AZM: 269.51.

mod frm to frm, sb blkly to sb
ply, gt, arg, org/calc mt, v
occ bent

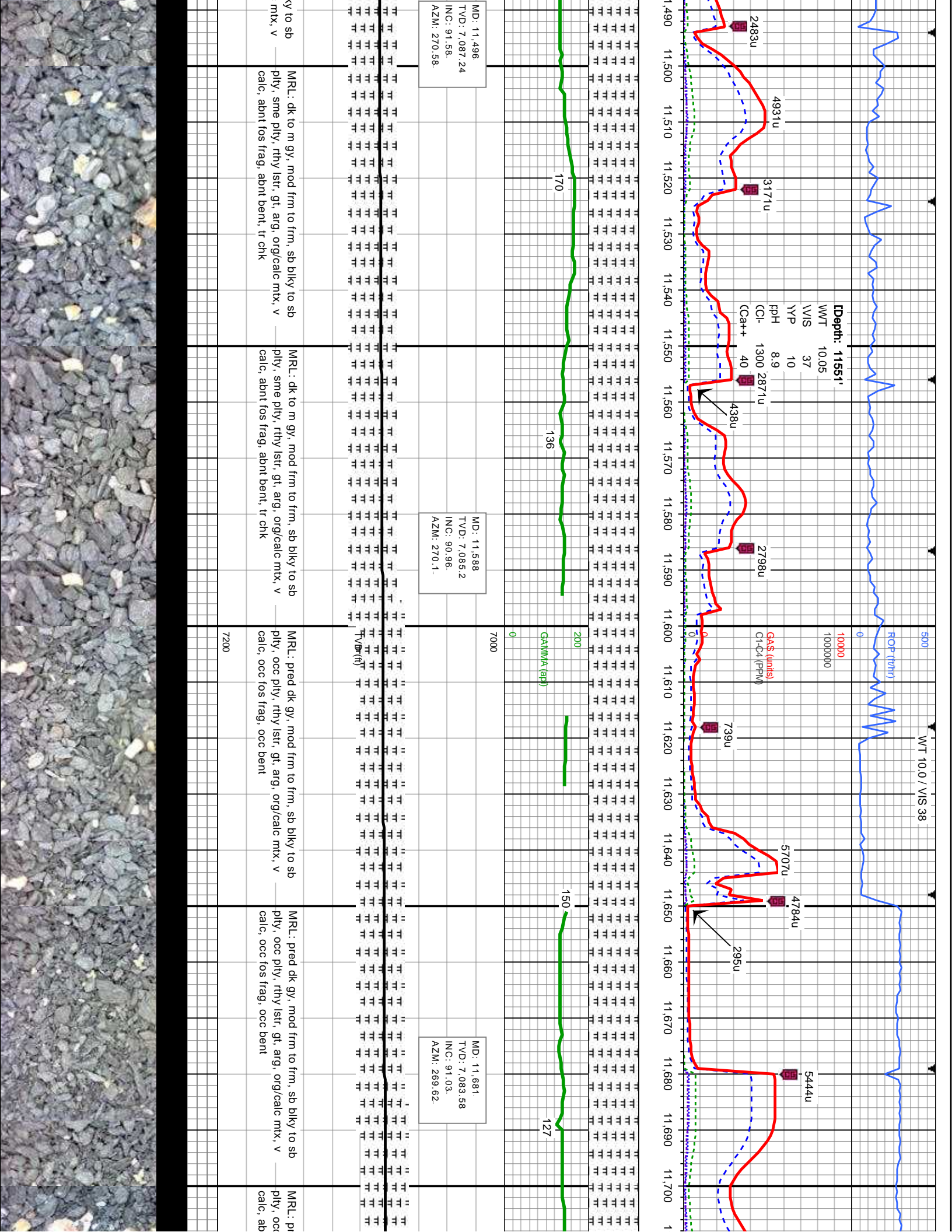
MRL: dk to m gy, mod frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, gt, arg, org/calc mt, v
calc, abnt fos frag, occ bent

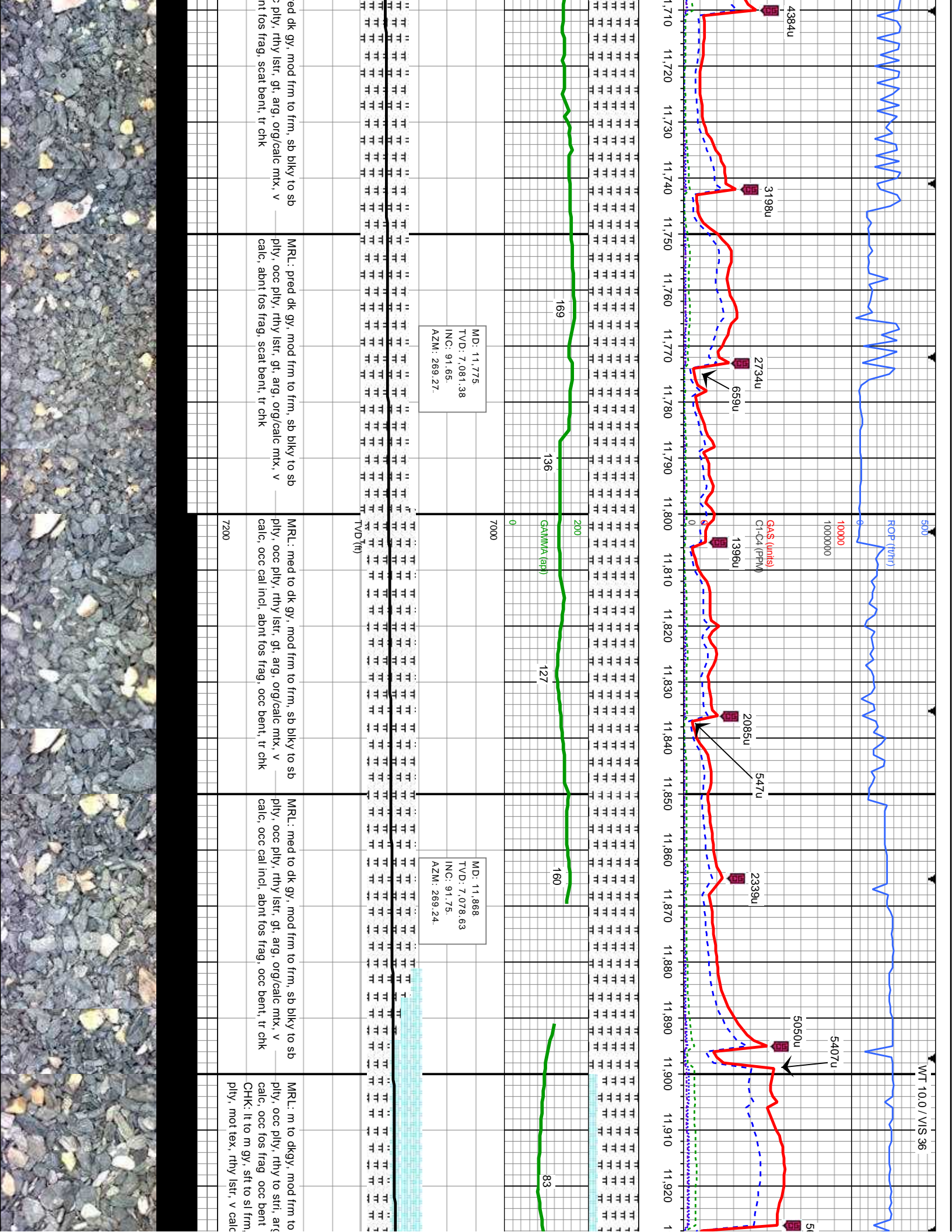
MRL: dk to m gy, mod frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, gt, arg, org/calc mt, v
calc, abnt fos frag, abnt bent

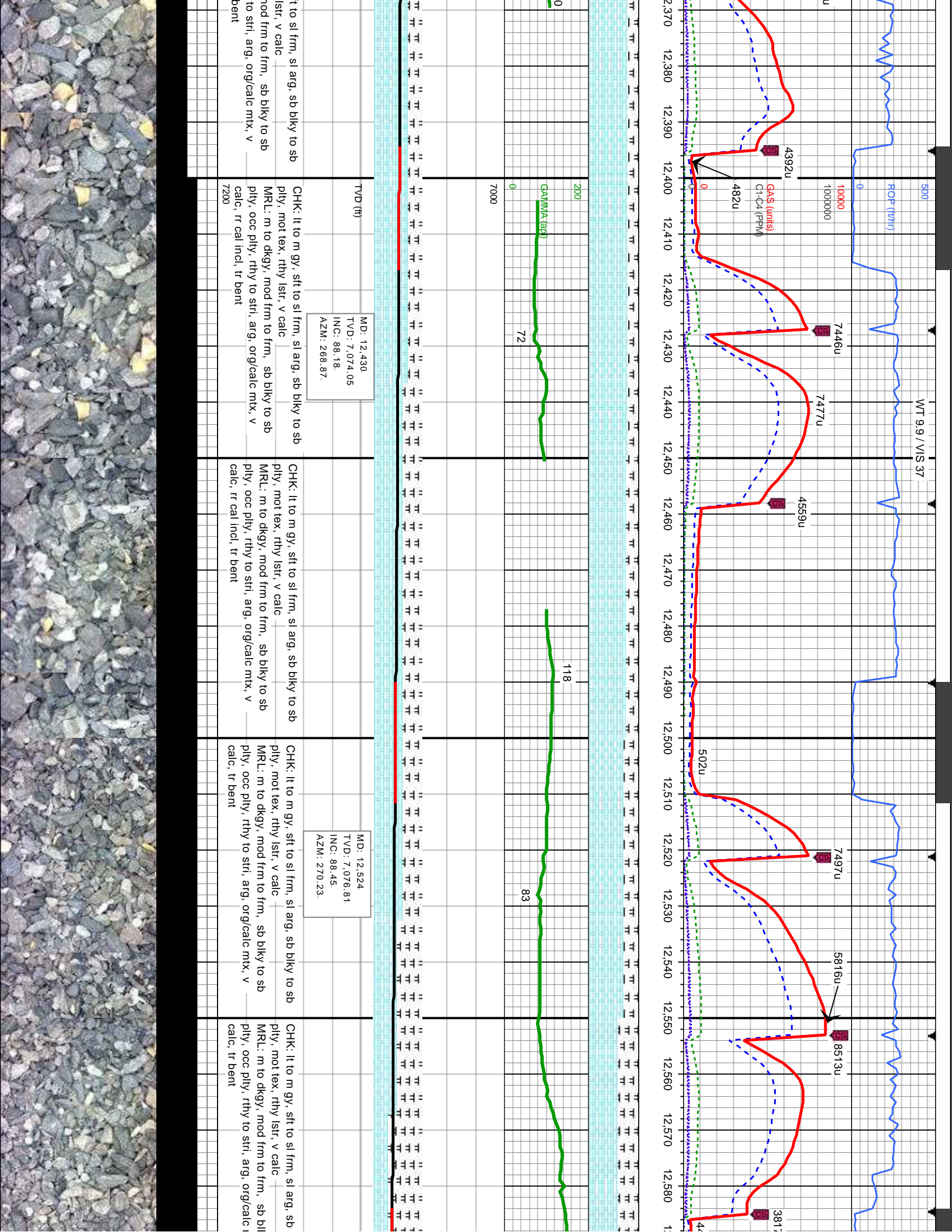
MRL: dk to m gy, mod frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, gt, arg, org/calc mt, v
calc, abnt fos frag, abnt bent

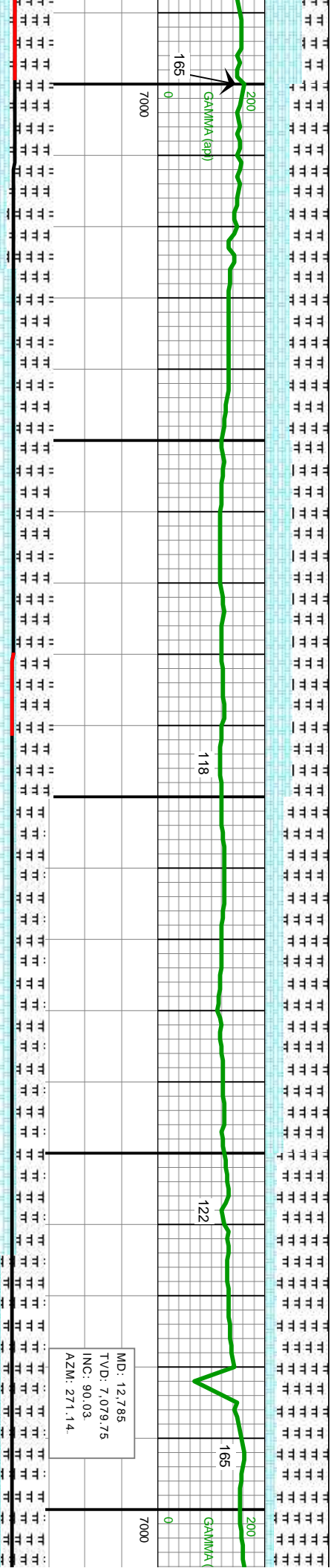
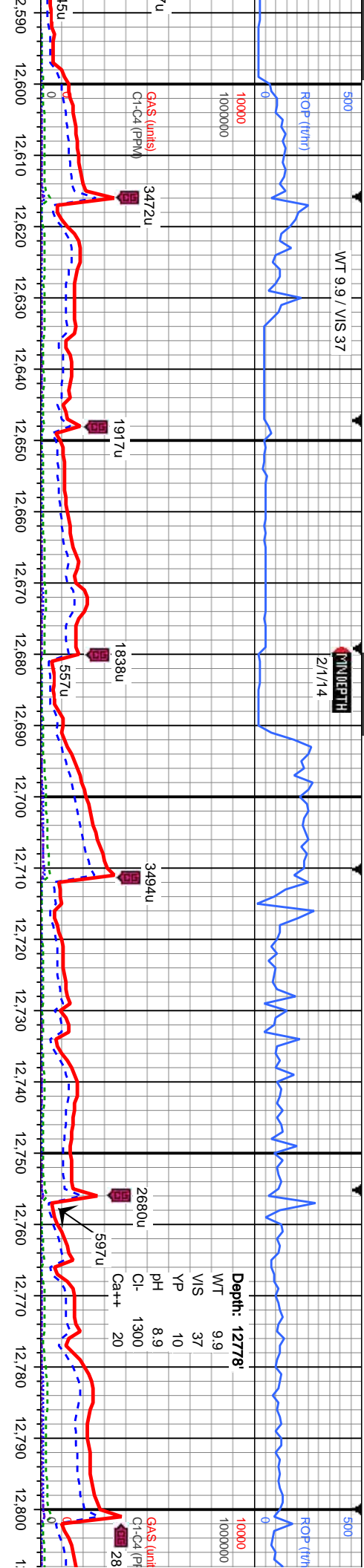
MRL: dk to m gy, mod frm to frm, sb blkly to sb
ply, sme ply, rthy lstr, gt, arg, org/calc
calc, abnt fos frag, abnt bent, ir chk





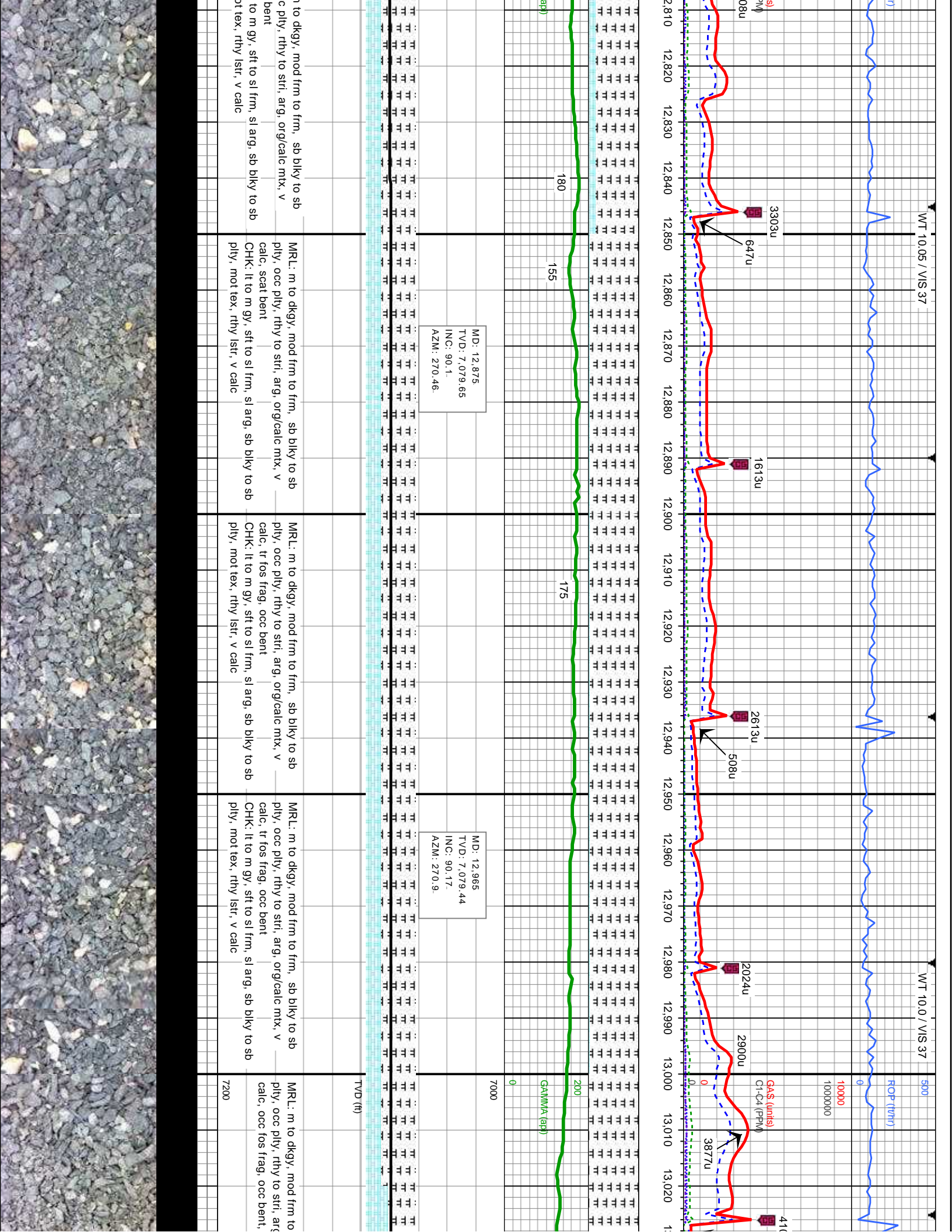


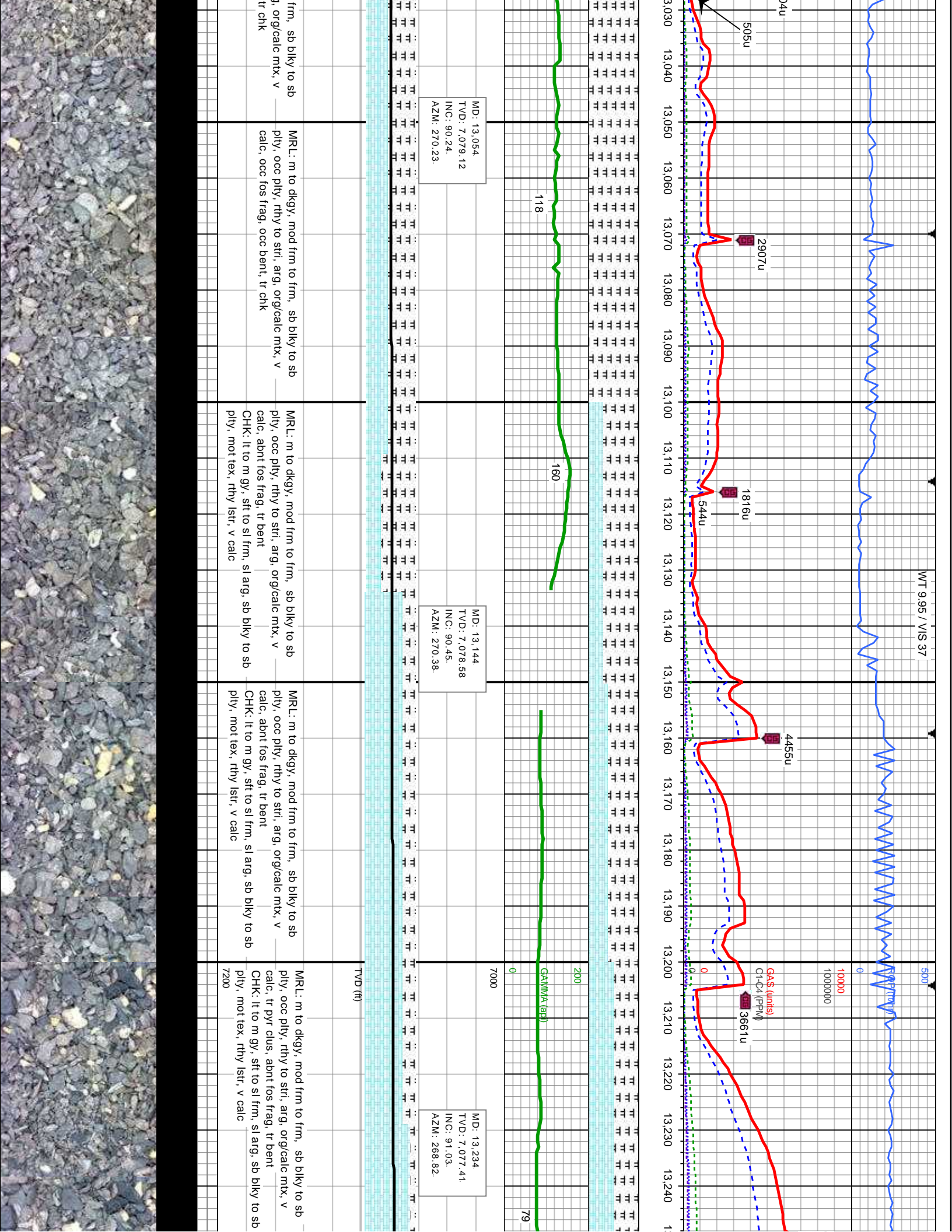


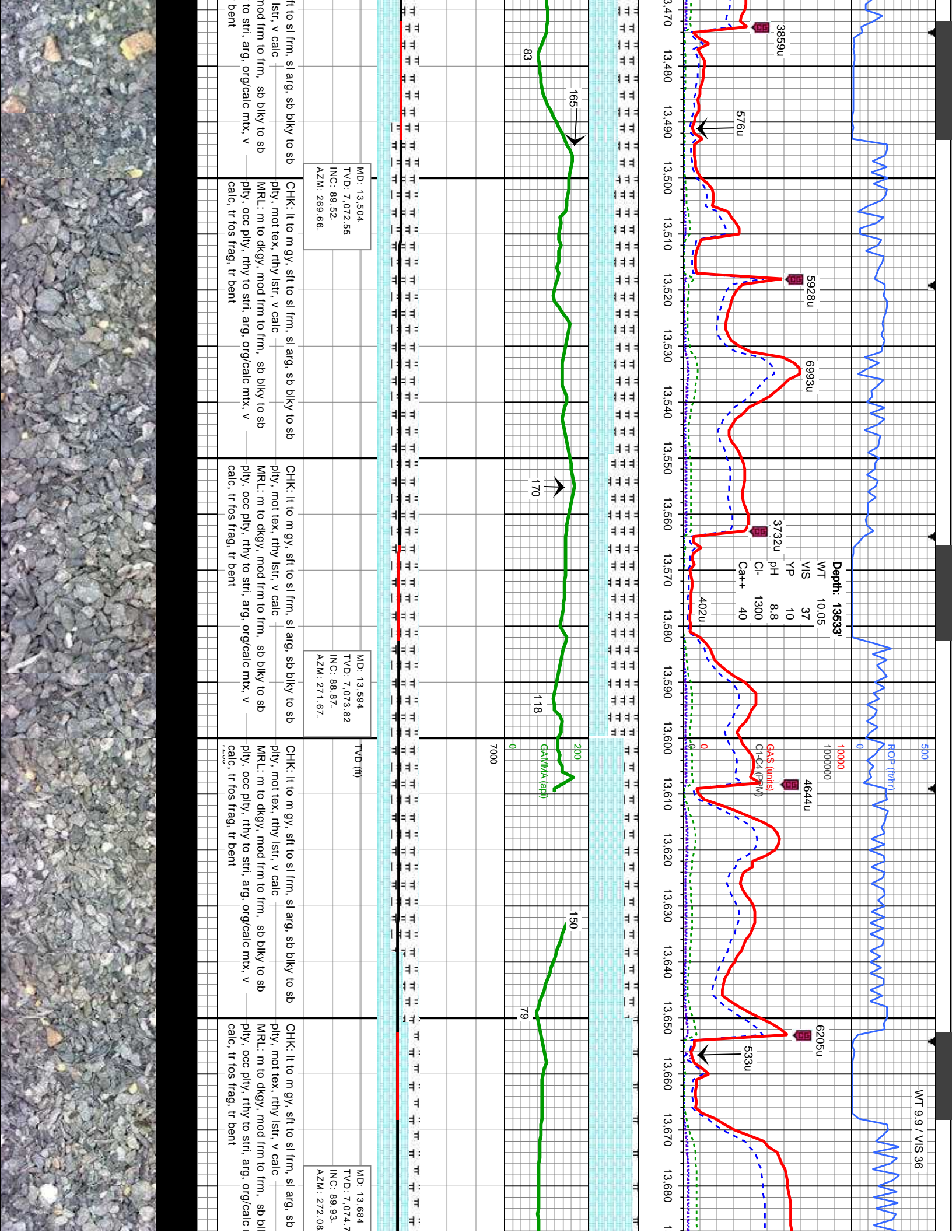


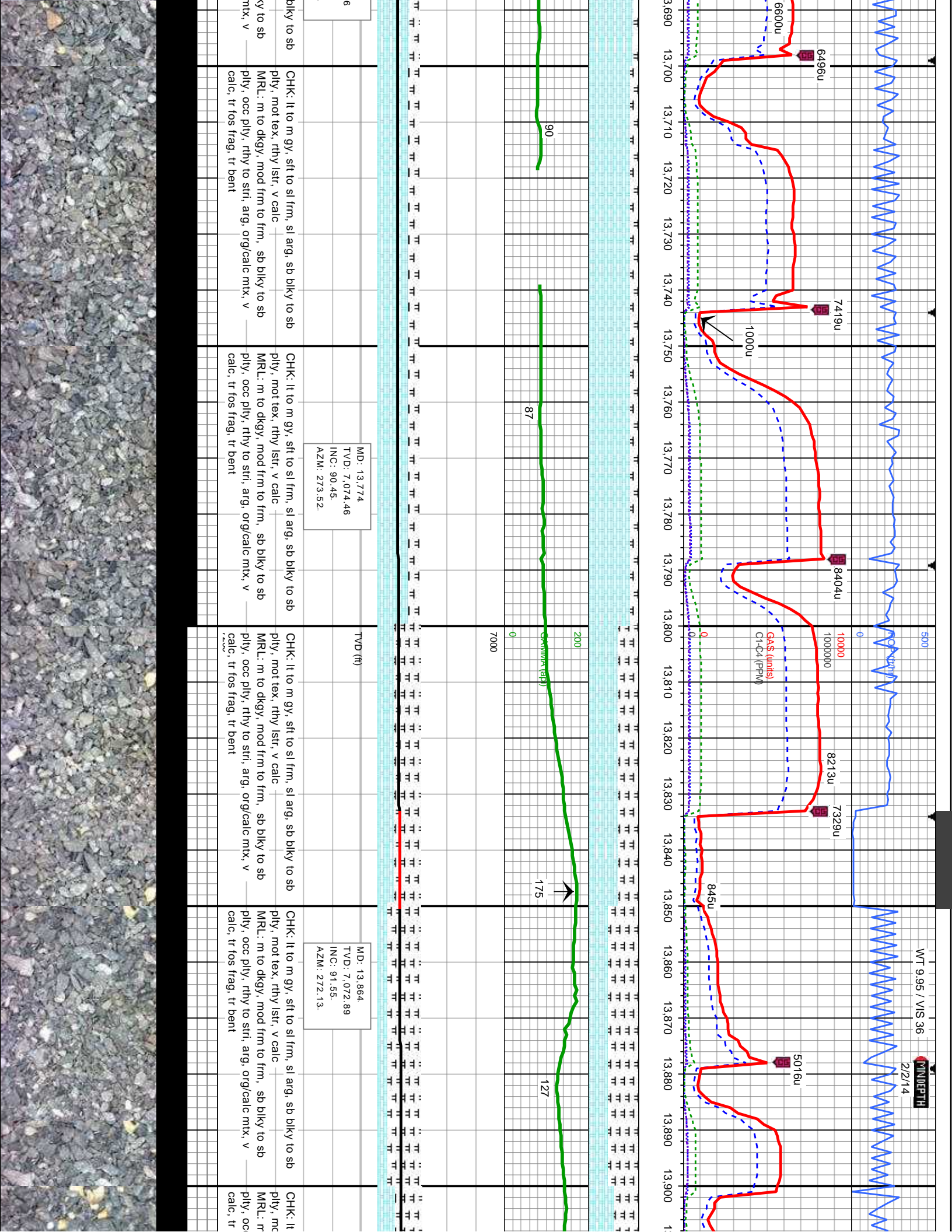
TVD (ft)	MD: 12.618 TVD: 7,079.07 INC: 88.8 AZM: 271.15.	MRL: m to dkgy, mod frm to frm, sb blkly to sb ply, occ ply, rthy to strf, arg, org/calc mix, v calc, tr bent CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb ply, mot tex, rthy lstr, v calc	MRL: m to dkgy, mod frm to frm, sb blkly to sb ply, occ ply, rthy to strf, arg, org/calc mix, v calc, tr bent CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb ply, mot tex, rthy lstr, v calc	MRL: m to dkgy, mod frm to frm, sb blkly to sb ply, occ ply, rthy to strf, arg, org/calc mix, v calc, tr bent CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb ply, mot tex, rthy lstr, v calc	MRL: m to dkgy, mod frm to frm, sb blkly to sb ply, occ ply, rthy to strf, arg, org/calc mix, v calc, tr bent CHK: lt to m gy, sft to sl frm, sl arg, sb blkly to sb ply, mot tex, rthy lstr, v calc

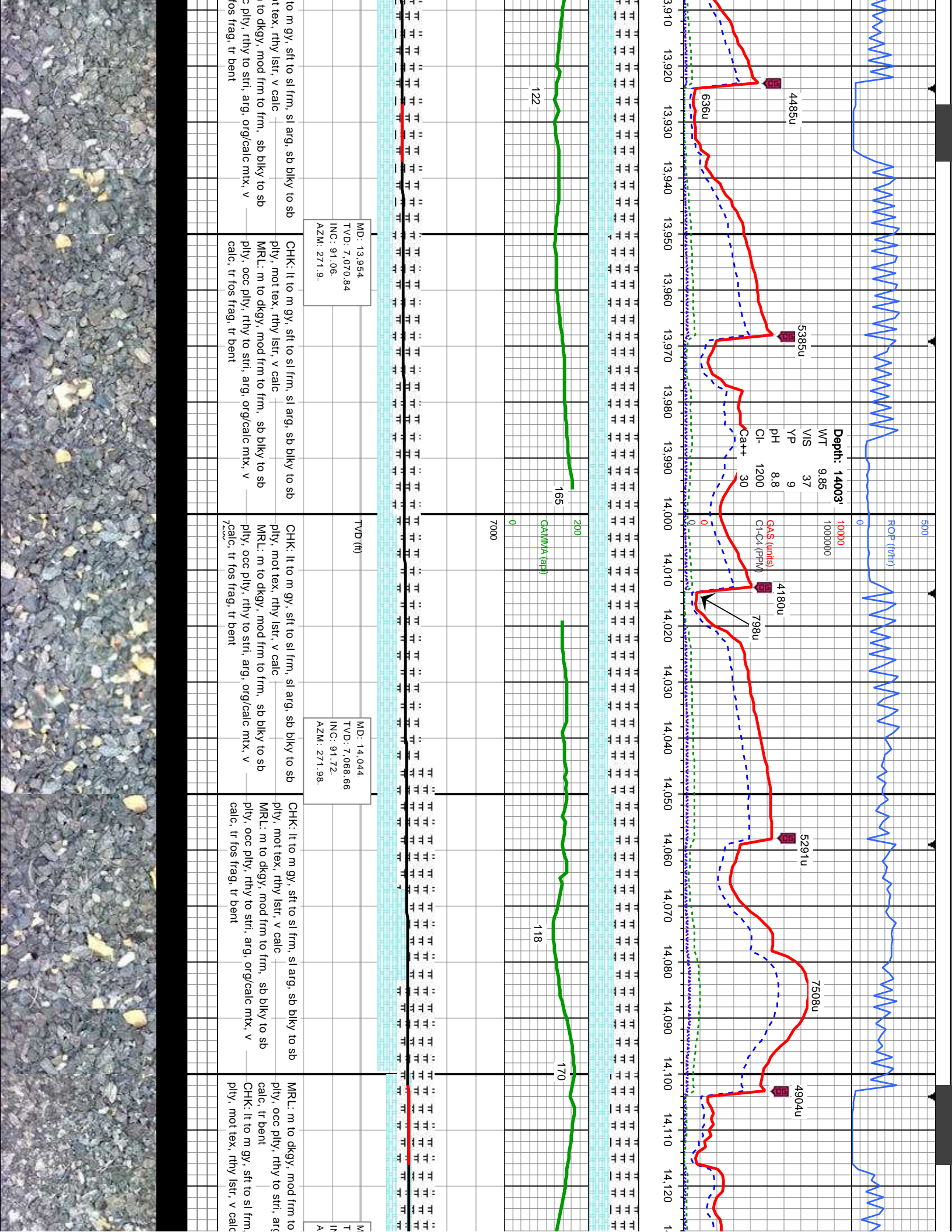


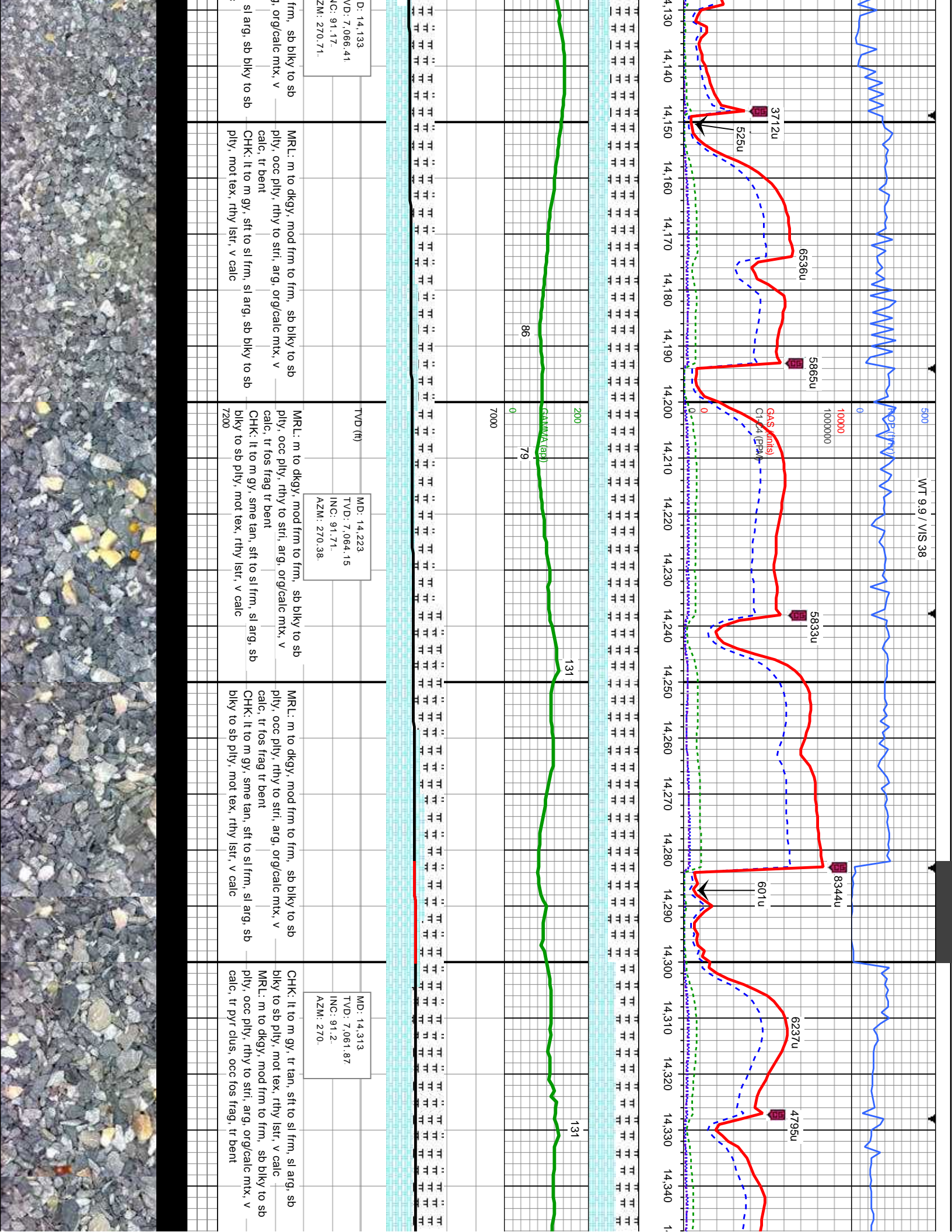


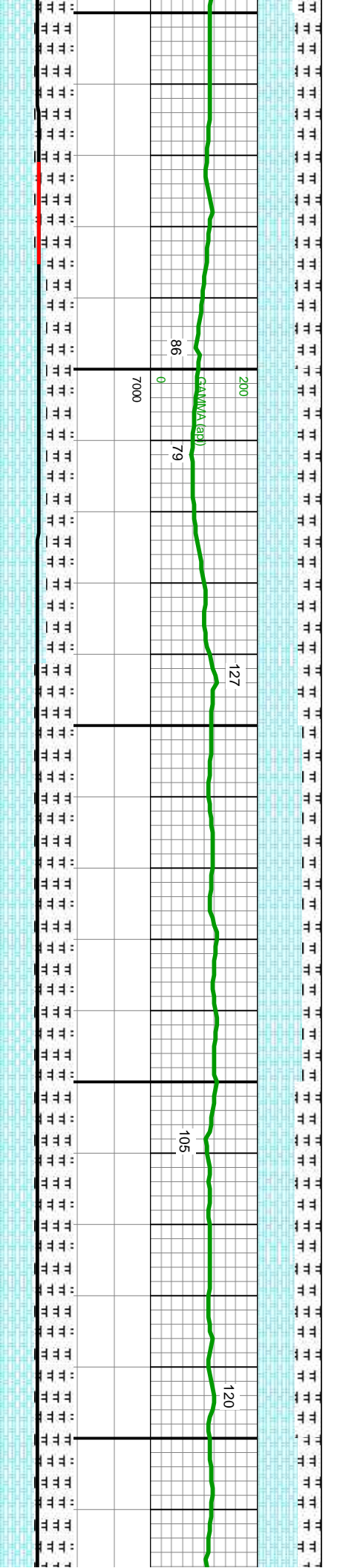
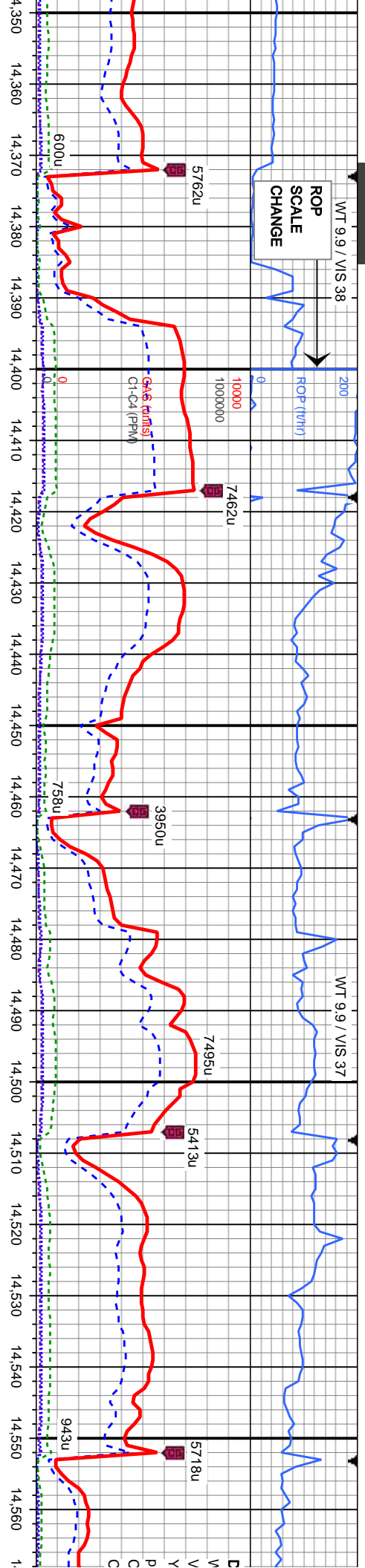


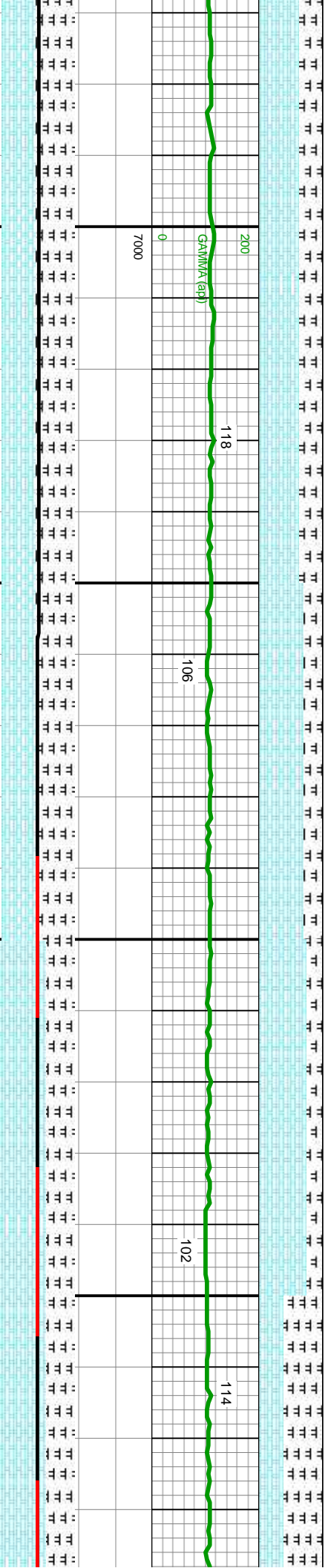
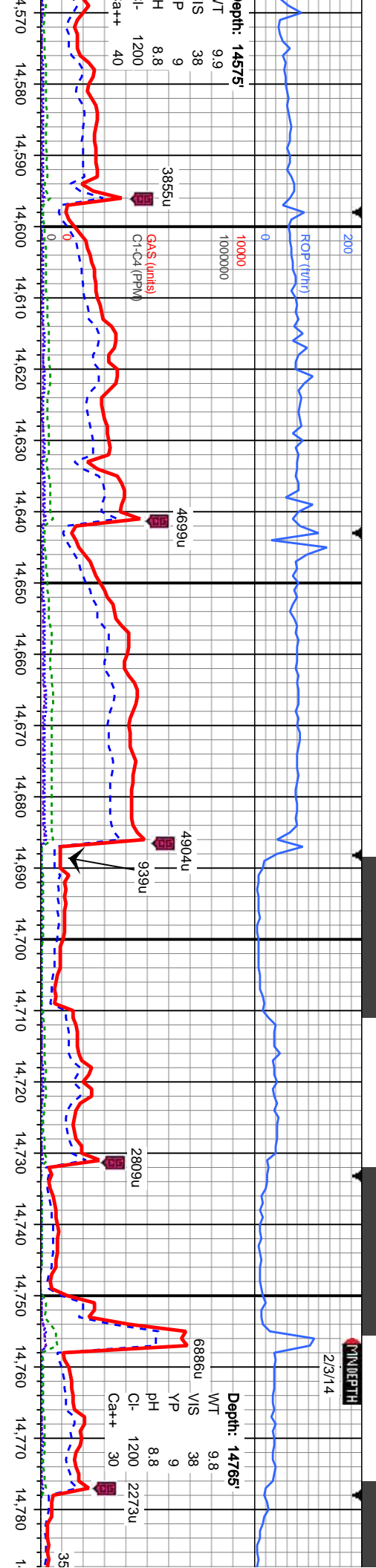








[illegible]



MD: 14.583
TVD: 7,062.21
INC: 89.66
AZM: 268.23

TVD (ft)

MD: 14.673
TVD: 7,062.56
INC: 89.9
AZM: 262.92

TVD (ft)

MD: 14.763
TVD: 7,062.85
INC: 89.73
AZM: 263.09

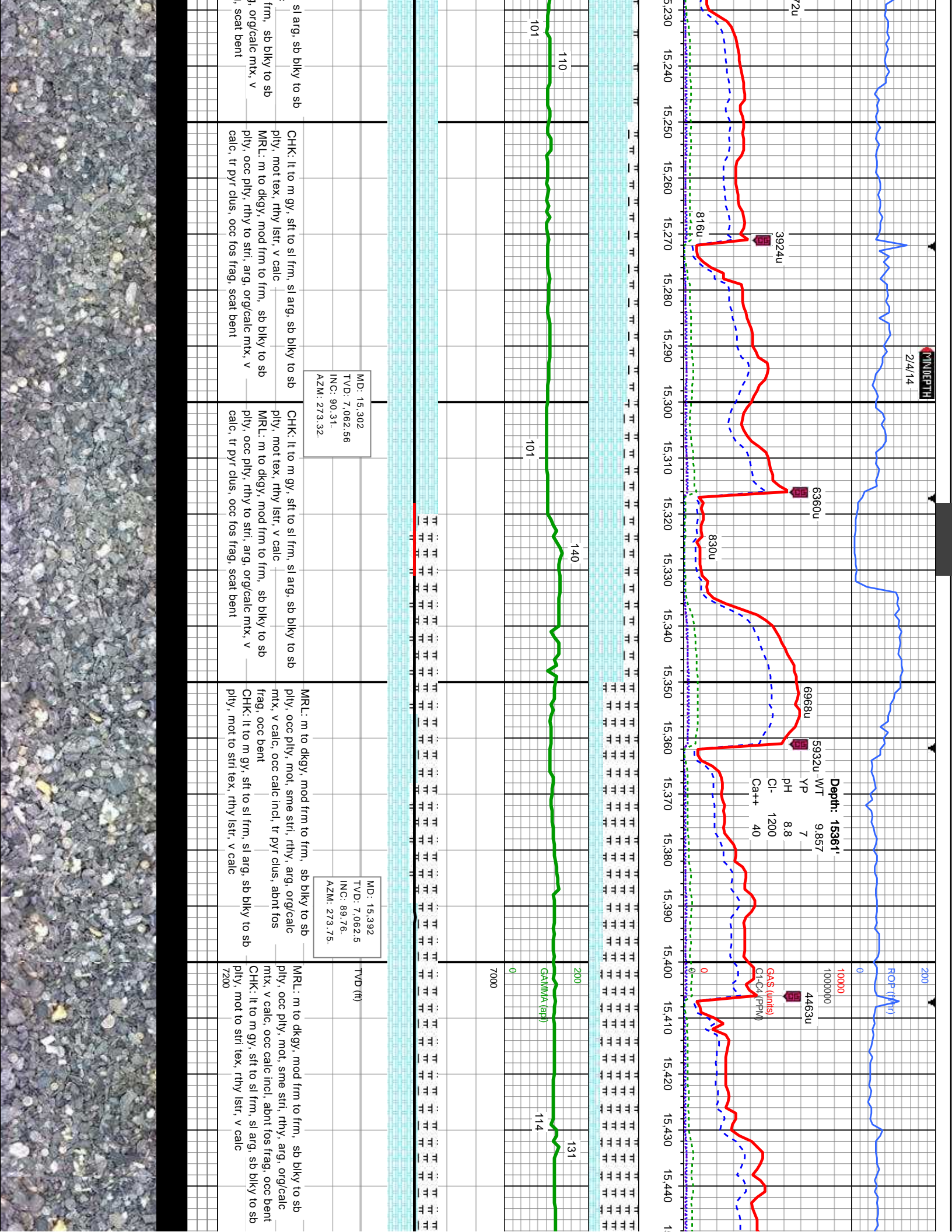
it to sl frm, sl arg, sb blkly to sb
slstr, v calc
mod frm to frm, sb blkly to sb
to stri, arg, orgcalc mix, v
tr bent

CHK: It to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lstr, v calc
MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to stri, arg, orgcalc mix, v
calc, occ los frag, tr bent

CHK: It to m gy, sft to sl frm, sl arg, sb blkly to sb
ply, mot tex, rthy lstr, v calc
MRL: m to dkgy, mod frm to frm, sb blkly to sb
ply, occ ply, rthy to stri, arg, orgcalc mix, v
calc, occ los frag, occ bent

MRL: m to dkgy, mod frm to frm, sb bl
calc, occ ply, rthy to stri, arg, orgcalc
CHK: It to m gy, sft to sl frm, sl arg, sb
ply, mot tex, rthy lstr, v calc





ROP SCALE
CHANGE

ROP (f/min)

10000

Depth: 15605'

MD 15663, 2309 HRS
TOOH, XO MOTOR, BIT
TIH, RESUMED DRILLING

97

WT 9.85
VIS 36
YP 9
pH 8.8
CI- 1200
Ca++ 40

Bit Data
Bit #: 4
Depth Out: 15,663'
Hours: 148.5 hrs

1000000

GA\$ (units)
C1-C4 (PPM)

5608u

4844u

637u

651u

5910u

5432u

753u

127

115

122

98

7000

200

GAMMA (cp)

0

127

115

122

98

7000

200

GAMMA (cp)

0

127

115

122

98

7000

200

GAMMA (cp)

0

127

115

122

98

7000

200

GAMMA (cp)

0

127

115

122

98

7000

200

GAMMA (cp)

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GAMMA (cp)

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7000

200

GAMMA (cp)

0

127

115

122

98

7000

200

GAMMA (cp)

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GAMMA (cp)

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GAMMA (cp)

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