



Scale: 5" / 100'
Measured Depth Log

Well Name Aggregate State 16N-16HZ

Location SEC 9 T2N R66W

State COLORADO

County WELD

Country UNITED STATES OF AMERICA

Rig Number ENSIGN 145

API Number 05-123-38330-00

AFE # 2086911

Region DJ BASIN

Field WATTENBERG

Spud Date 3/13/2014

Drilling Completed 3/21/2014

Surface Coordinates 2,389' FSL 910' FEL

Bottom Hole Coordinates 1' FSL 410' FEL

Ground Elevation 4,925'

K.B. Elevation 4,938'

Logged Interval 6,600' To 14,698'

Total Depth 14,698'

Formation NIOBRARA C

Type of Drilling Fluid FWLSND

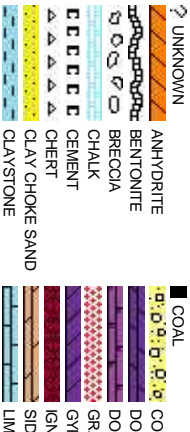
Company Anadarko

Address 1099 18TH ST.
Denver, CO 80202

Name RHEAD CANNON

Company ANADARKO PETROLEUM
Address 1099 18TH ST.
Denver, CO 80202

SENIOR WELLSITE GEOLOGIST
WELLSITE GEOLOGIST



Operator

Geologist

M CORPORATION

Other

LACEY LITTLE

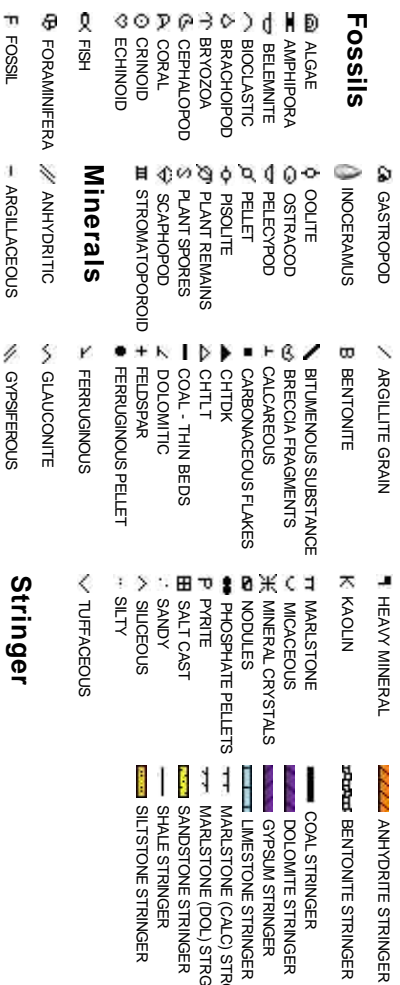
MOHAMMED AL-MUBARAK

Rock Types



Accessories

Fossils

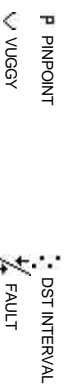


Minerals

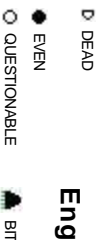
Springer

Other Symbols

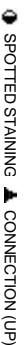
Oil Show



Engineering



Rounding

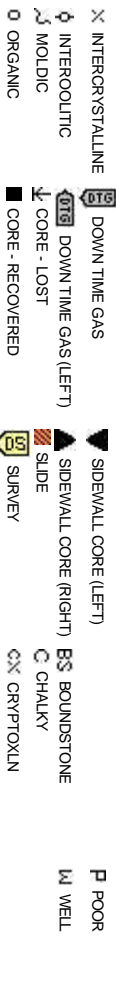


Porosity



Sorting

Textures



Slide/Rotate

ROP

ROP

Total Gas & Chromatograph
GAS

Depth Labels

% Lith

Curves
GAMMA

Well Bore
TVD

Oil Show

Images

E
G
M
FR
TR
SL

NMT: 9.5 VIS: 39

939u

982u

313u

221u



BIT 8.75
SMITH SD513
8X16 JETS
DEPTH IN: 1015'

MD: 6,644
TVD: 6,595
Inclination: 1.01
Azimuth: 312.13

MD: 6,714
TVD: 6,664.99
Inclination: 1.21
Azimuth: 191.44

MD: 6,759
TVD: 6,709.87
Inclination: 6.55
Azimuth: 184.3

COLUMBINE LOGGING 03/14/2014
MANNED 2-PERSON LOGGING
WITH PASON GAS

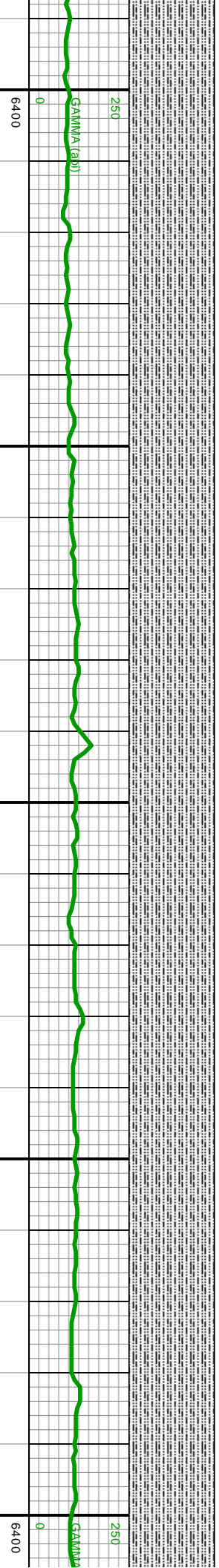
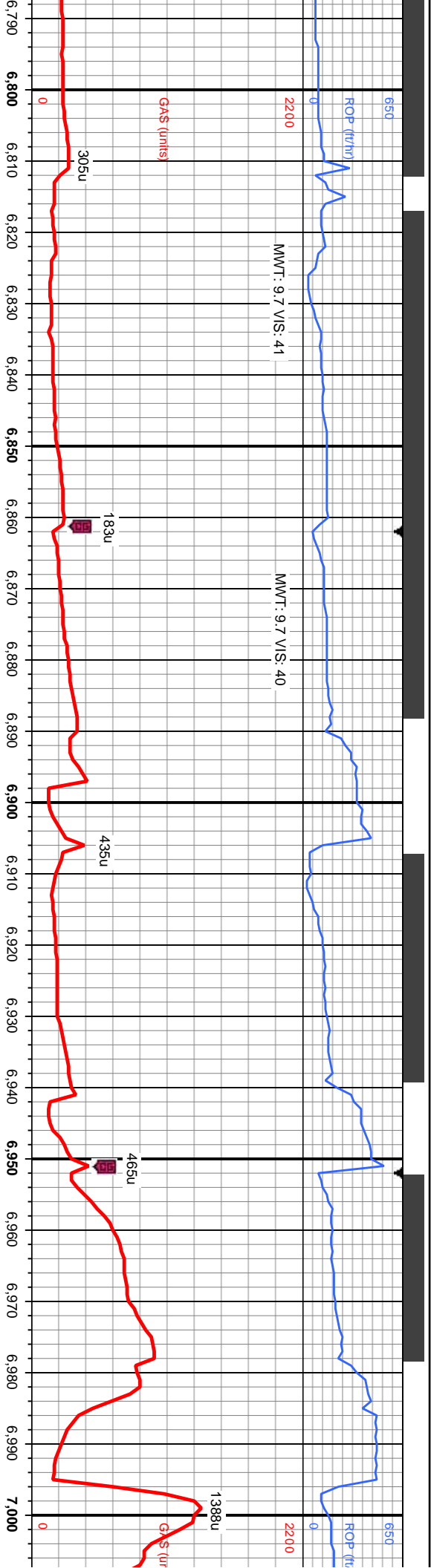
90% SLTY SH: lt - med gry, sft - mod, sb ply -
ply, v f gr, rthy lstr, slty, non calc; 10% SLTY SS:
s&p, wh - lt gy, mod frm, brit, v p srl, f gr, non
calc; O SHW: thk frt onrg/wh cut, fast thk mky
wh stmg, fr sin, fr o

100% SLTY SH: lt - med gry, sft - mod, sb ply -
ply, v f gr, rthy lstr, slty, non calc, tr ss; O SHW:
thk frt onrg/wh cut, fast thk mky wh stmg, fr sin,
fr o

100% SLTY SH: lt - med gry, sft - mod, sb ply -
ply, v f gr, rthy lstr, slty, non calc, tr ss; O SHW:
thk frt wh cut, fast thk mky wh stmg, tr sin, tr o

100% SLTY SH: lt - med gry, sft - mod, sb ply -
ply, v f gr, rthy lstr, slty, non calc, tr ss; O SHW:
thk frt wh cut, fast thk mky wh stmg, tr sin, tr o





MD: 6,804
TVD: 6,754.27
Inclination: 11.99
Azimuth: 185.4

MD: 6,849
TVD: 6,797.86
Inclination: 16.58
Azimuth: 186.32

MD: 6,894
TVD: 6,840.33
Inclination: 21.92
Azimuth: 185.53

MD: 6,939
TVD: 6,881.41
Inclination: 26.2
Azimuth: 183.81

MD: 6,984
TVD: 6,921.34
Inclination: 28.7
Azimuth: 185.32

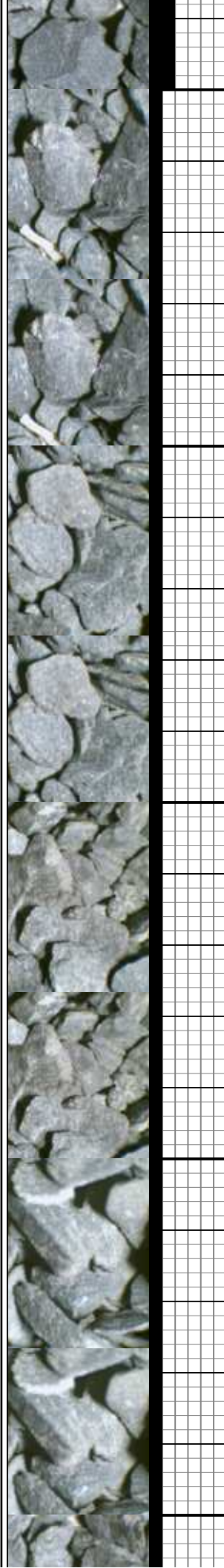
d, sb pily - 100% SLTY SH: lt - med gry, sft - mod, sb pily -
s; O SHW: pily, v f gr, rthy lst, silty, non calc; O SHW: thk fnt
tr sn, tr o wh cut, fast thk mky wh stmg, sl tr stn, sl tr o

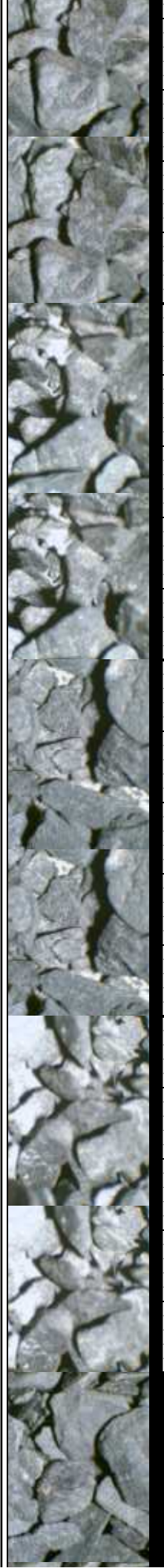
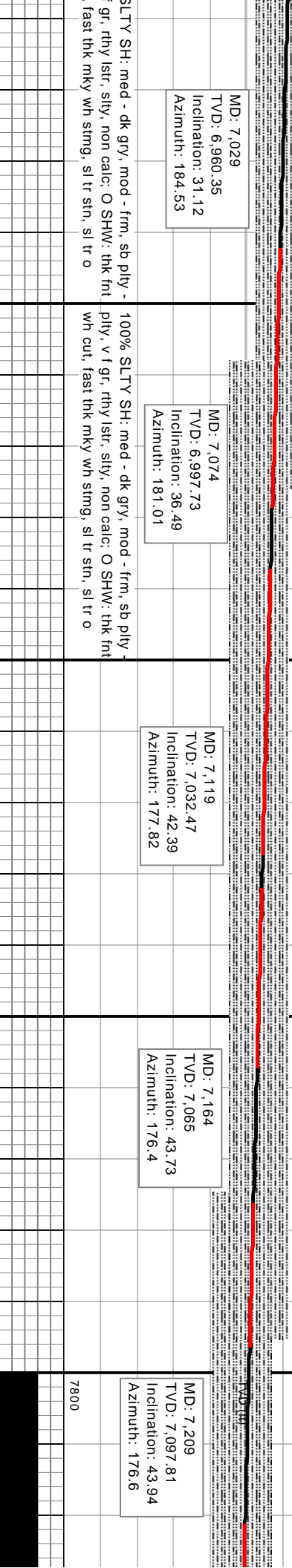
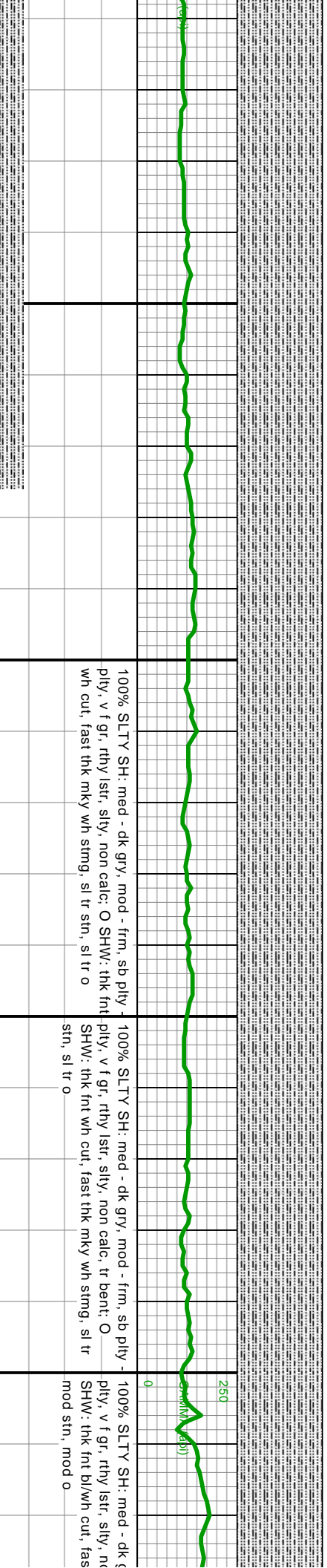
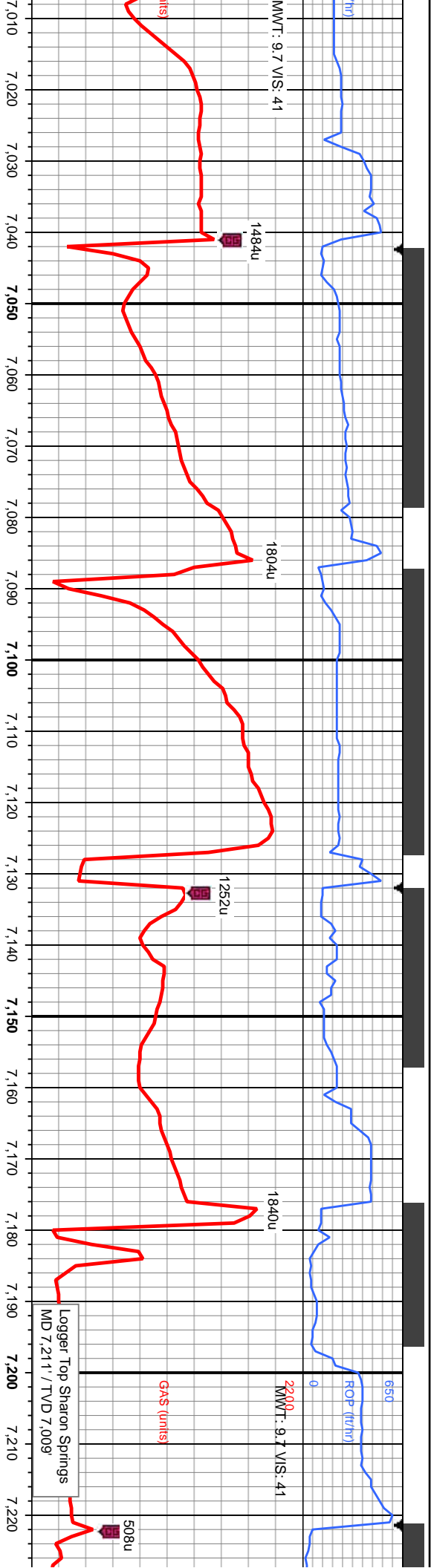
100% SLTY SH: lt - med gry, sft - mod, sb pily -
pily, v f gr, rthy lst, silty, non calc; O SHW: thk fnt
wh cut, fast thk mky wh stmg, sl tr stn, sl tr o

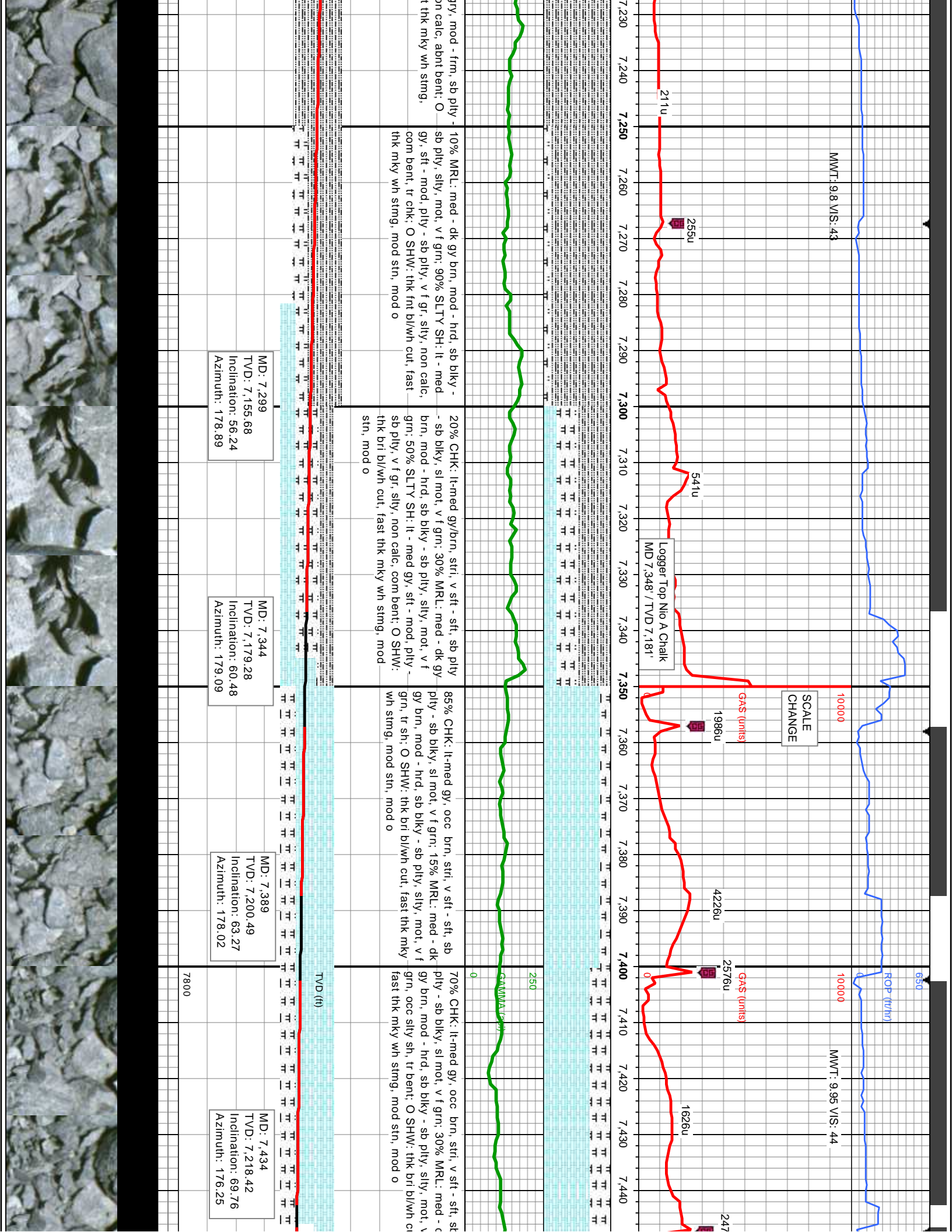
100% SLTY SH: lt - med gry, sft - mod, sb pily -
pily, v f gr, rthy lst, silty, non calc; O SHW: thk fnt
wh cut, fast thk mky wh stmg, sl tr stn, sl tr o

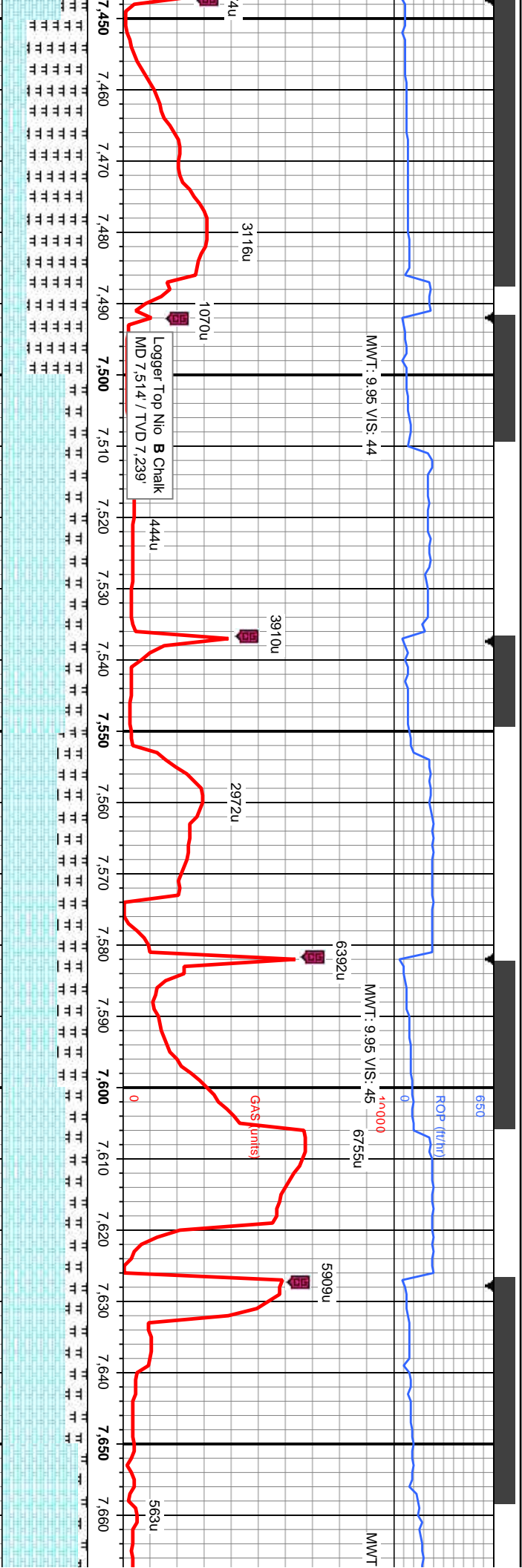
100% SLTY SH: lt - med gry, sft - mod, sb pily -
pily, v f gr, rthy lst, silty, non calc; O SHW: thk fnt
wh cut, fast thk mky wh stmg, sl tr stn, sl tr o

100% SLTY SH: lt - med gry, sft - mod, sb pily -
pily, v f gr, rthy lst, silty, non calc; O SHW: thk fnt
wh cut, fast thk mky wh stmg, sl tr stn, sl tr o









| | | | | |
|---|---|---|--|---|
| 30% CHK: lt-med gy, occ brn, stri, v sft - sft, sb ply - sb blk, sl mot, v f grn; 70% MRL: med - dk gy brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn, occ silty sh, tr bent; O SHW: thk bri bl/wh cut, fast thk mky wh sting, mod stn, mod o | 75% CHK: lt-med gy, occ brn, stri, v sft - sft, sb ply - sb blk, sl mot, v f grn; 25% MRL: med - dk gy brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn, occ silty sh, tr bent; O SHW: thk bri bl/wh cut, fast thk mky wh sting, mod stn, mod o | 65% CHK: lt-med gy, occ brn, stri, v sft - sft, sb ply - sb blk, sl mot, v f grn; 35% MRL: med - dk gy brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn, occ silty sh, tr bent; O SHW: thk bri bl/wh cut, fast thk mky wh sting, mod stn, mod o | 75% CHK: lt-med gy, occ brn, stri, v sft - sft, sb ply - sb blk, sl mot, v f grn; 25% MRL: med - dk gy brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn, occ silty sh, com bent; O SHW: thk bri bl/wh cut, fast thk mky wh sting, fr stn, fr o | 90% CHK: lt-n blk, sl mot, v blk - sb ply, thk bri bl/wh c |
| MD: 7,479 TVD: 7,231.11 Inclination: 76.22 Azimuth: 176.59 | MD: 7,524 TVD: 7,240.47 Inclination: 79.78 Azimuth: 178.17 | MD: 7,569 TVD: 7,247.74 Inclination: 81.6 Azimuth: 177.73 | MD: 7,614 TVD: 7,253.03 Inclination: 84.9 Azimuth: 177.24 | MD: 7,658 TVD: 7,255.1 Inclination: 89.74 Azimuth: 177.2 |



03/15/14
03/16/14

MINDEPTH

9.95 VIS: 45

MMWT: 10.0 VIS: 43

8084u

TD Curve 7,716'

@ 22:23 MST

143u

Gas values too low to record on set scale

Gas (units)

10000

MMWT: 10.4 VIS: 38

8022u

10325u

Gas values too low to record c

7,670 7,680 7,690 7,700 7,710 7,720 7,730 7,740 7,750 7,760 7,770 7,780 7,790 7,800 7,810 7,820 7,830 7,840 7,850 7,860 7,870 7,880



med gy, occ brn, stri, v sft - sft, sb pily - sb
f grn, 10% MRL: med - dk gy brn, mod - hrd, sb
sily, mot, v f grn, occ sily sh, com bent; O SHW:
ut, fast thk mky wh stmg, fr stn, fr o

40% MRL: med - dk gy/brn, mod - hrd, sb blk y - sb pily, sily, mot, v f grn; 60%
SLTY SH: dk gy, blk, mod nd, sb pily - sb blk y, v f grn, tr fos; O SHW: thk bri
bl/wh cut, fast thk mky wh stmg, fr stn, fr o

6420% MRL: med - dk gy/brn, mod - hrd, sb blk y - sb pily, sily, mot, v f grn; 80% SLTY S
mod nd, sb pily - sb blk y, v f grn, tr fos; O SHW: thk bri bl/wh cut, fast thk mky wh stn
sl tr o

BIT 6.125
VAREI VS513D
5 X 18 JETS
DEPTH IN: 7716'

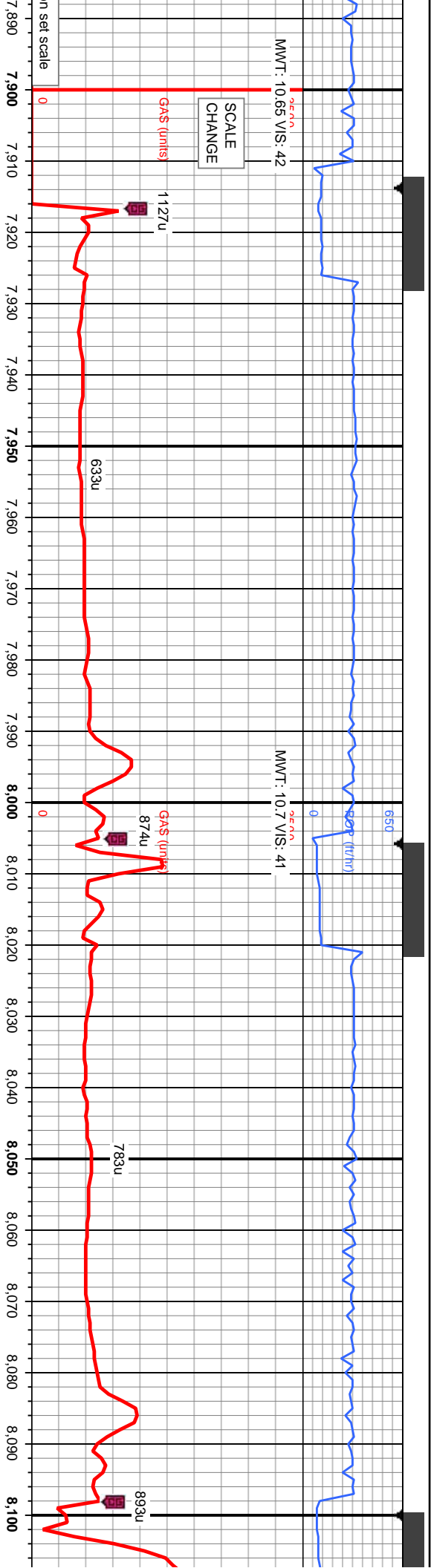
MD: 7,716
TVD: 7,255.35
Inclination: 89.77
Azimuth: 177.2

MD: 7,733
TVD: 7,254.88
Inclination: 90.64
Azimuth: 176.86

MD: 7,764
TVD: 7,254.62
Inclination: 90.27
Azimuth: 176.18

MD: 7,858
TVD: 7,254.3
Inclination: 90.12
Azimuth: 177.3

7800

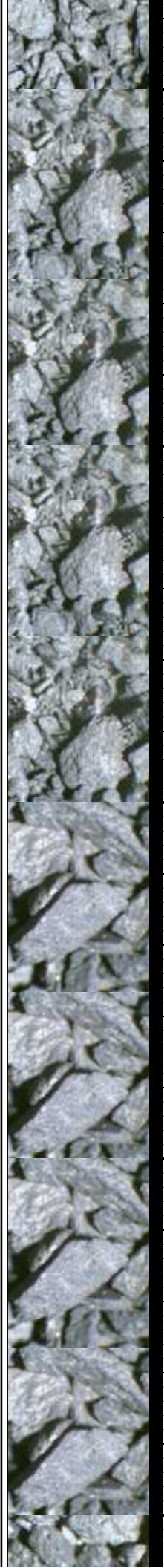


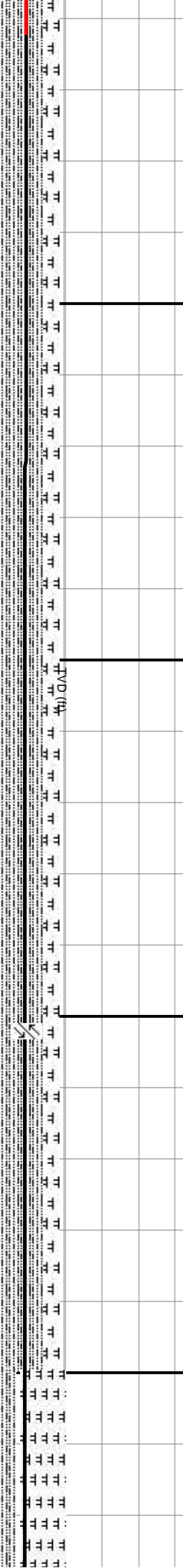
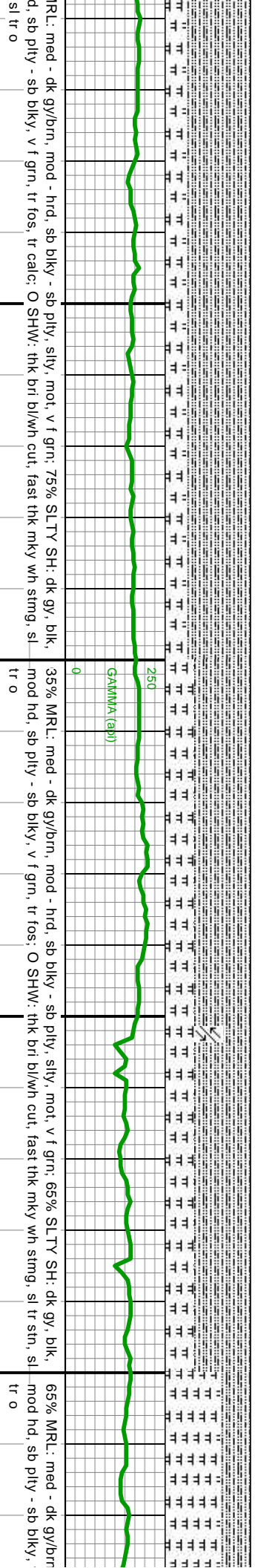
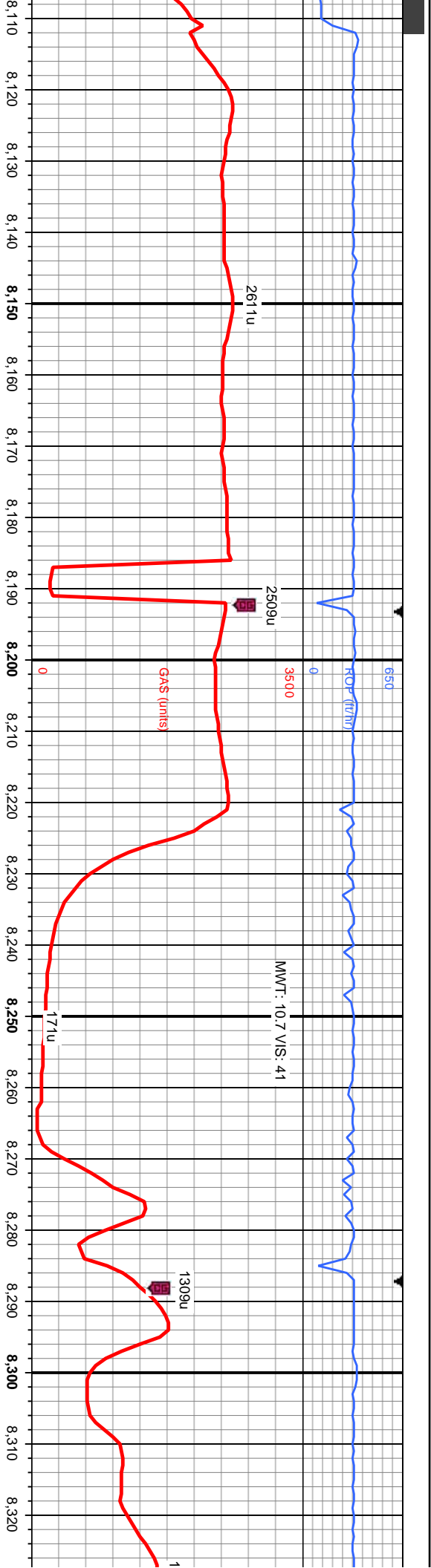
10% MRL: med - dk gy/brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn; 90% S.L.T.Y SH: dk gy, blk, mod hd, sb ply - sb blk, v f grn, tr fos, tr calc; O SHW: thk bri bl/wh cut, mod thk mky wh string, sl tr stn, sl tr o

25% MRL: med - dk gy/brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn; 85% S.L.T.Y SH: dk gy, blk, mod hd, sb ply - sb blk, v f grn, tr fos, tr calc; O SHW: thk bri bl/wh cut, fast thk mky wh string, sl tr stn, sl tr o

MD: 7,951
TVD: 7,253.63
Inclination: 90.7
Azimuth: 177.52

MD: 8,045
TVD: 7,252.76
Inclination: 90.36
Azimuth: 179.78

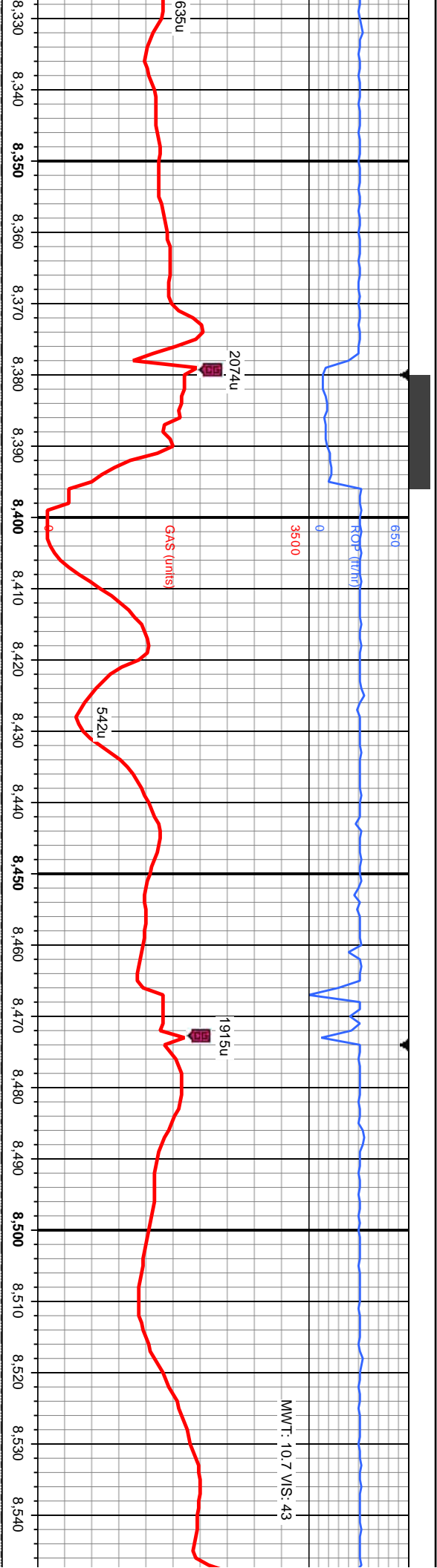




MD: 8,138
TVD: 7,252.74
Inclination: 89.66
Azimuth: 180.34

MD: 8,232
TVD: 7,253.79
Inclination: 89.07
Azimuth: 180.17



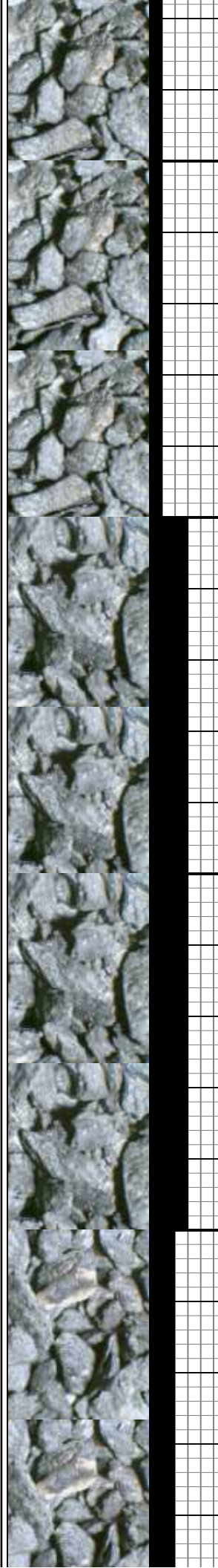


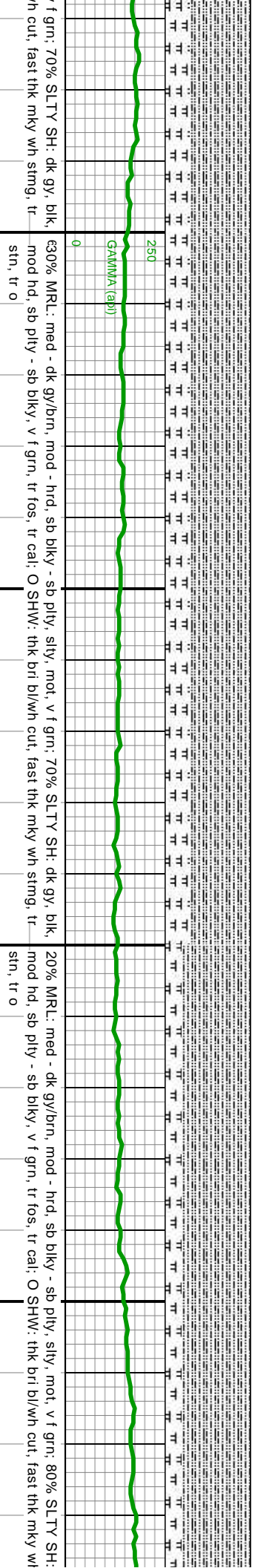
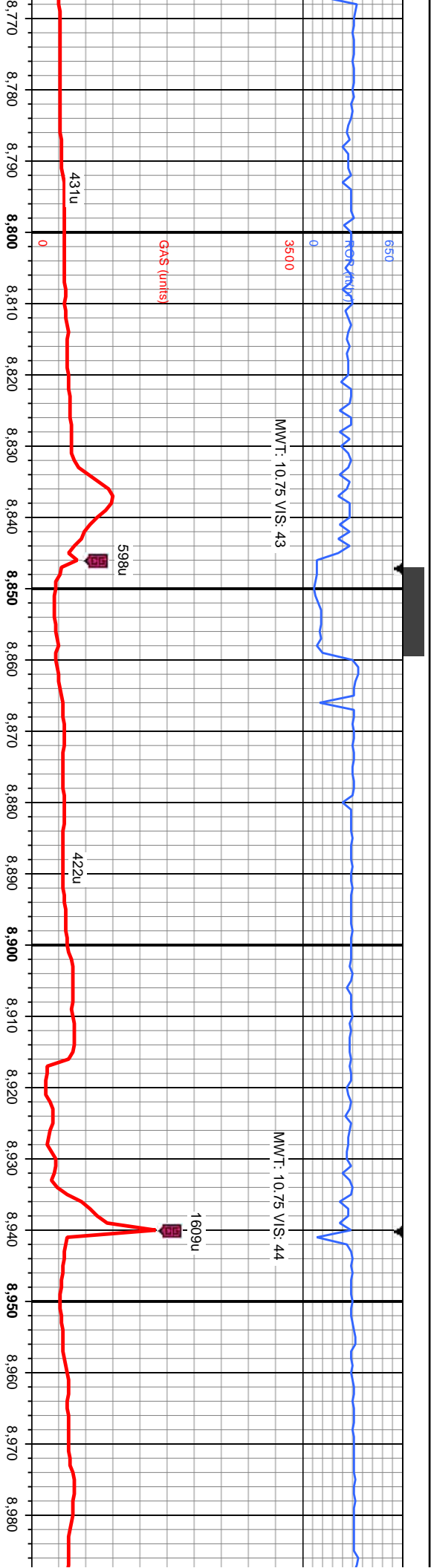
mod - hrd, sb blk - sb ply, silty, mot, v f grn, 35% SLTY SH: dk gy, blk, v f grn, tr fos; O SHW: thk brn bl/wh cut, fast thk mky wh string, sl tr stn, sl stn, tr o

680% MRL: med - dk gy/brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn; 20% SLTY SH: dk gy, blk, mod hd, sb ply - sb blk, v f grn, tr fos, tr cal; O SHW: thk brn bl/wh cut, fast thk mky wh string, fr stn, tr o

80% MRL: med - dk gy/brn, mod - hrd, sb blk - sb ply, silty, mot, v f grn, tr fos, tr cal; O SHW: thk brn bl/wh cut, fast thk mky wh string, fr stn, tr o

| | |
|---|--|
| MD: 8,419 TVD: 7,257.12 Inclination: 88.89 Azimuth: 181.21 | MD: 8,512 TVD: 7,258.97 Inclination: 88.82 Azimuth: 181.3 |
|---|--|



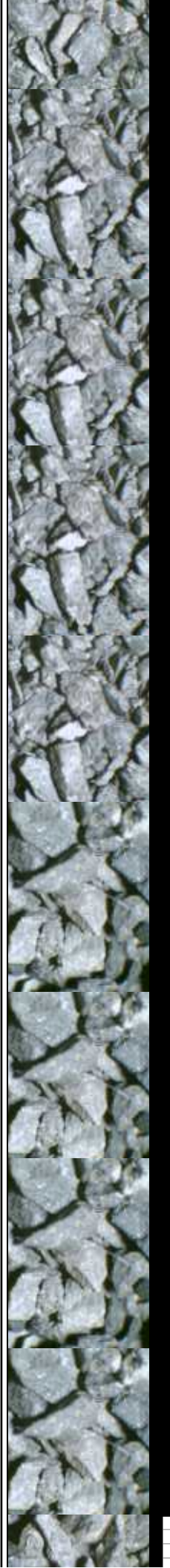
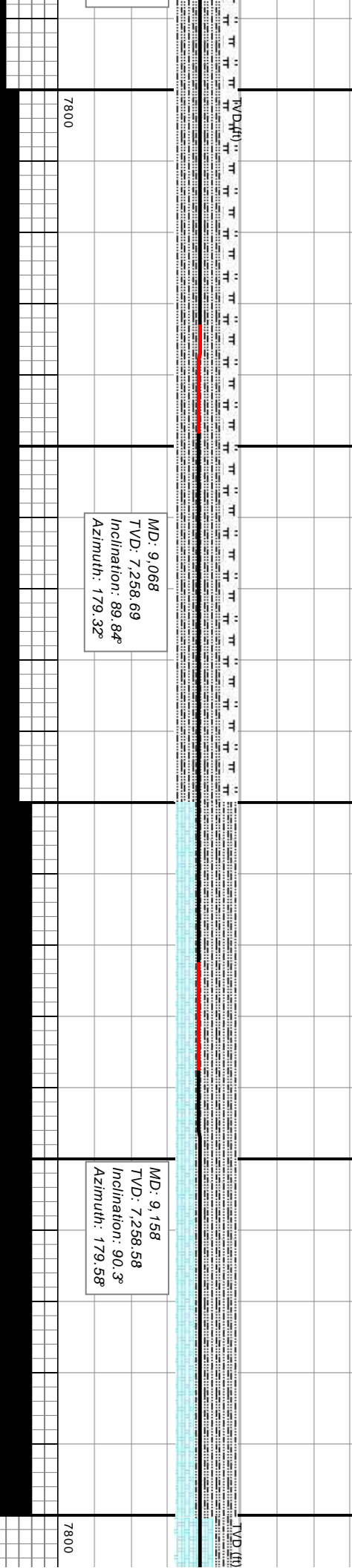
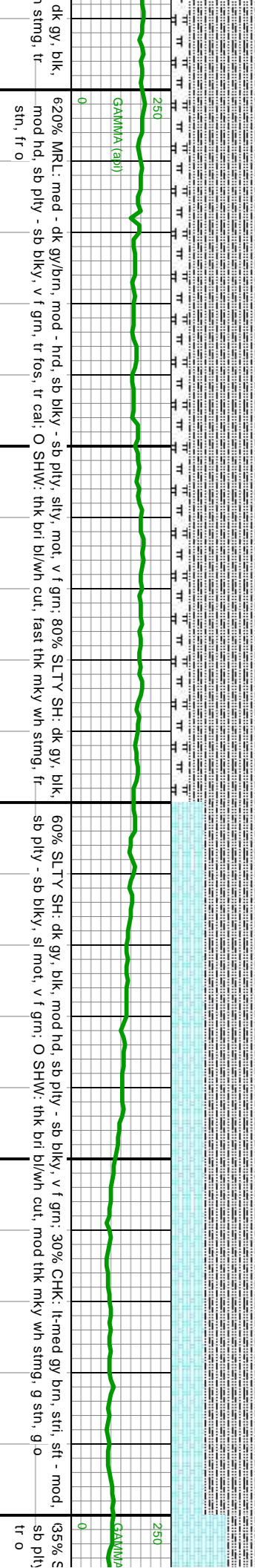
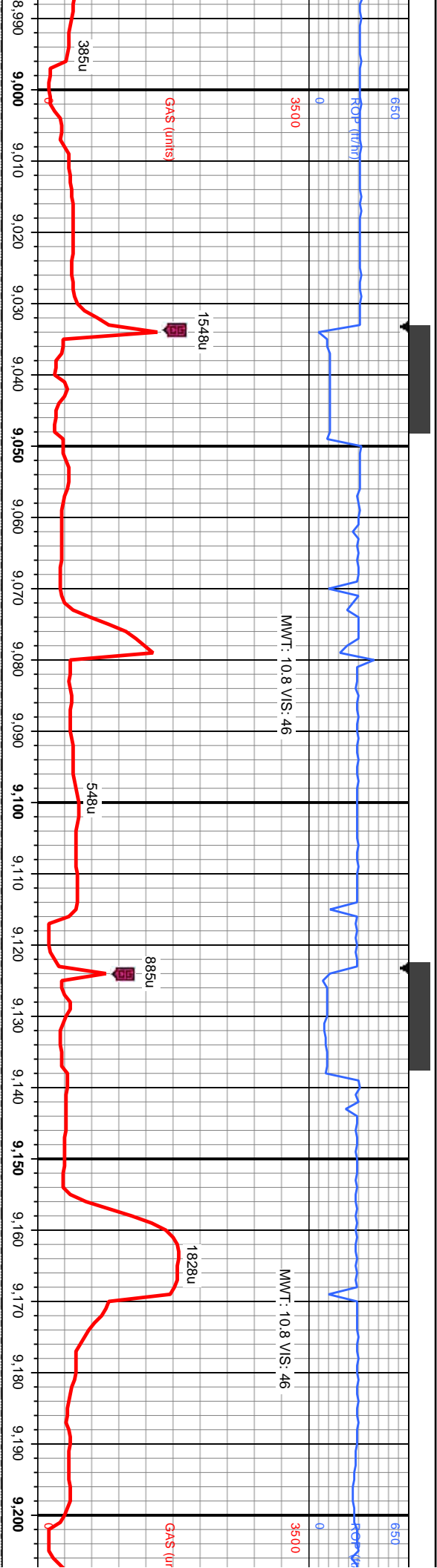


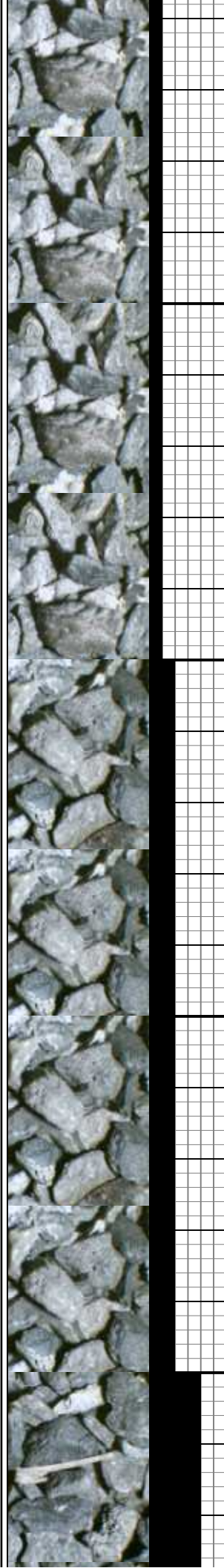
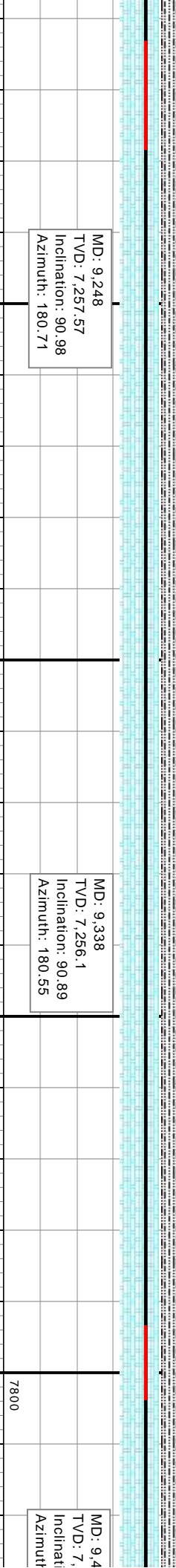
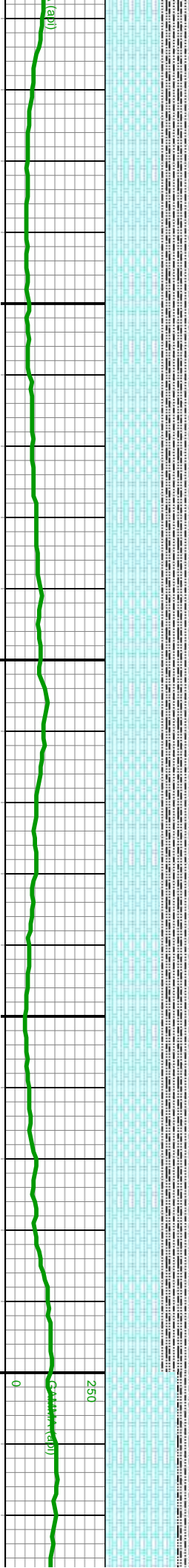
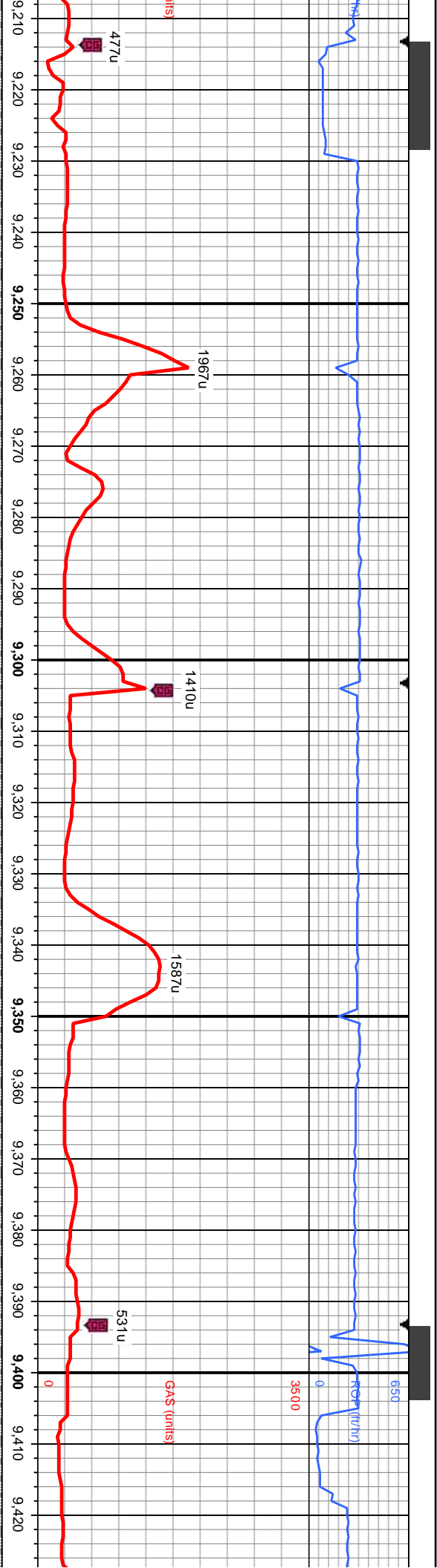
MD: 8,792
TVD: 7,259.3
Inclination: 90.3
Azimuth: 179.5

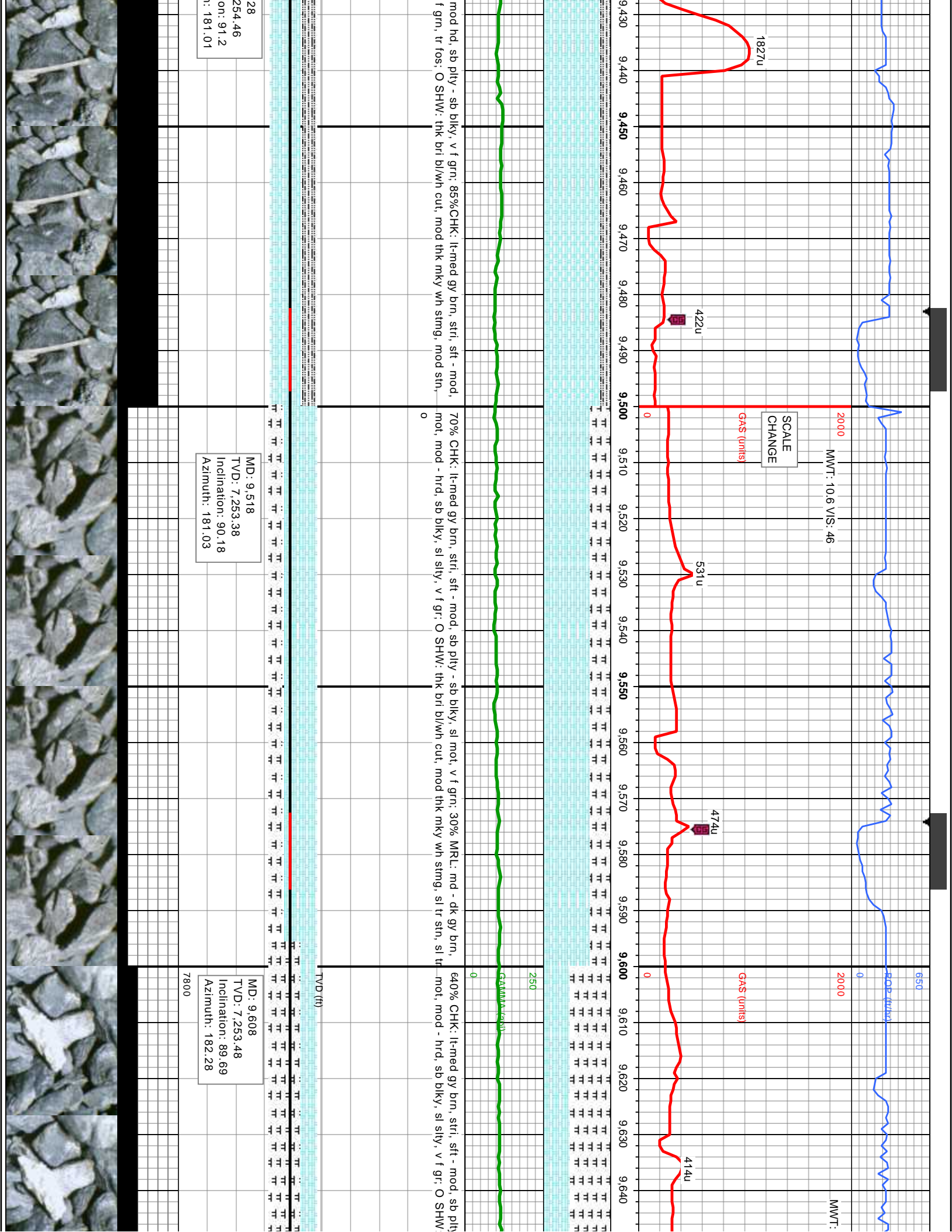
MD: 8,885
TVD: 7,258.75
Inclination: 90.61
Azimuth: 179.24

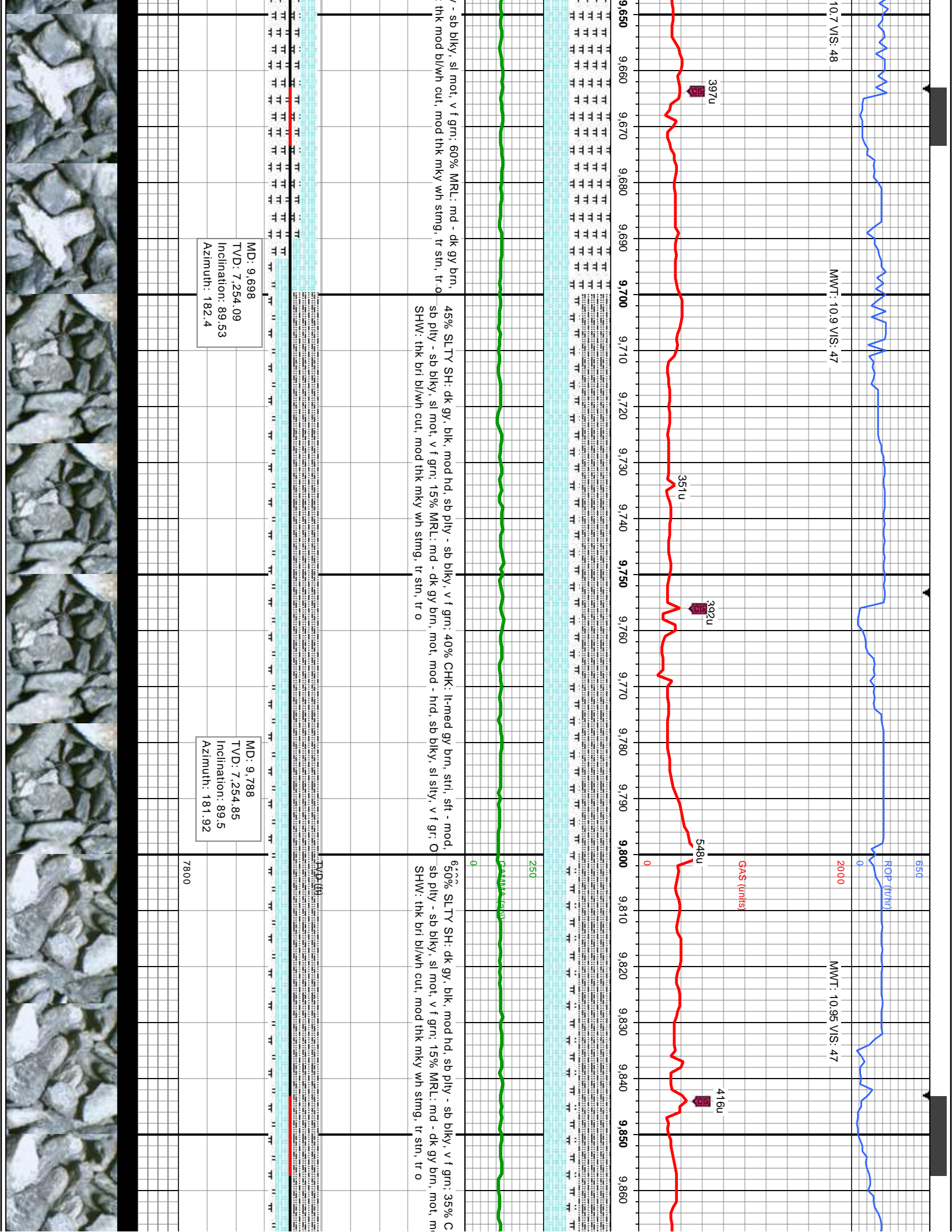
MD: 8,978
TVD: 7,258.41
Inclination: 89.81
Azimuth: 178.43

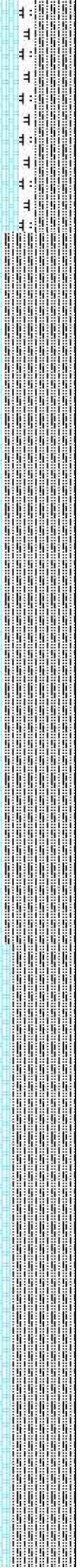
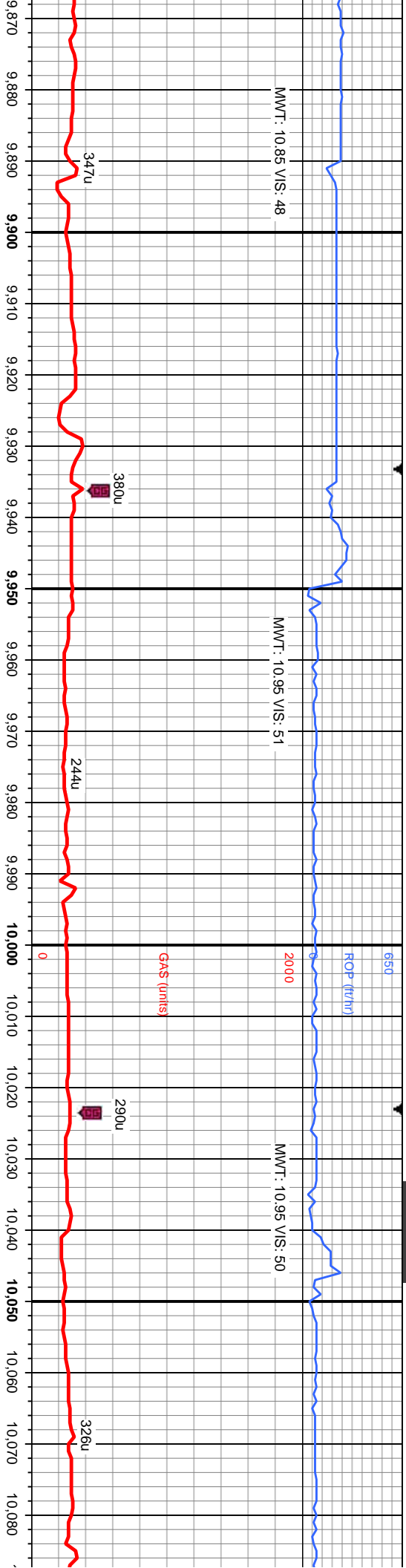












CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blkly, sl mot, v f gr; O SHW: thk bri bl/wh cut, fast thk mky wh string, tr sin, tr o

85% SLTY SH: dk gy, blk, mod hd, sb pily - sb blkly, v f gr; 15% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blkly, sl mot, v f gr; O SHW: thk bri bl/wh cut, fast thk mky wh string, tr sin, tr o

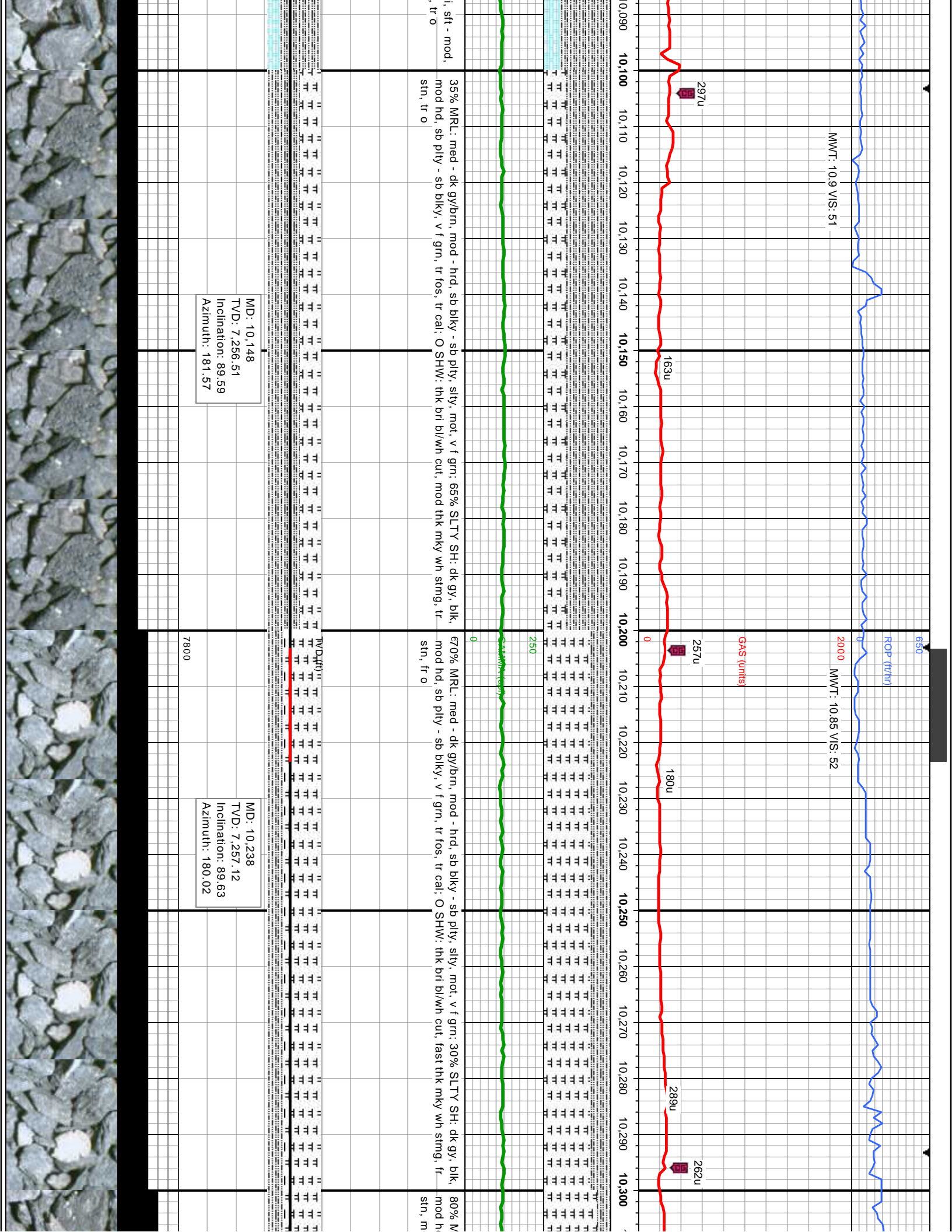
75% SLTY SH: dk gy, blk, mod hd, sb pily - sb blkly, v f gr; 25% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blkly, sl mot, v f gr; O SHW: thk bri bl/wh cut, mod thk mky wh string, tr sin, tr o

MD: 9,878
TVD: 7,255.78
Inclination: 89.32
Azimuth: 181.97

MD: 9,968
TVD: 7,256.2
Inclination: 90.15
Azimuth: 182.75

MD: 10,058
TVD: 7,256.13
Inclination: 89.93
Azimuth: 182.18





650

ROP (ft/hr)

MMWT: 10.9 V/S: 51

2000

MMWT: 10.85 V/S: 52

Gas (units)

297u

163u

257u

180u

289u

262u

10,090 10,100 10,110 10,120 10,130 10,140 10,150 10,160 10,170 10,180 10,190 10,200 10,210 10,220 10,230 10,240 10,250 10,260 10,270 10,280 10,290 10,300

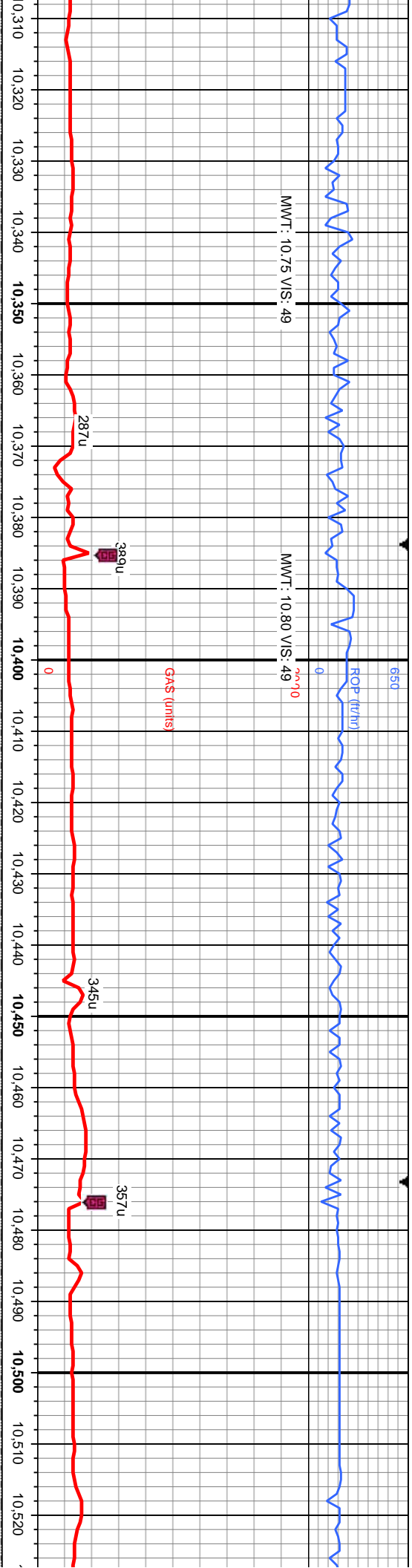
35% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb ply, silty, mot, v f grn, 65% SLTY SH: dk gy, blk, mod hd, sb ply - sb blkly, v f grn, tr fos, tr cal; O SHW: thk bri bl/wh cut, mod thk mky wh string, fr stn, tr o

80% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb ply, silty, mot, v f grn, 30% SLTY SH: dk gy, blk, mod hd, sb ply - sb blkly, v f grn, tr fos, tr cal; O SHW: thk bri bl/wh cut, fast thk mky wh string, fr stn, m

MD: 10,148
TVD: 7,256.51
Inclination: 89.59
Azimuth: 181.57

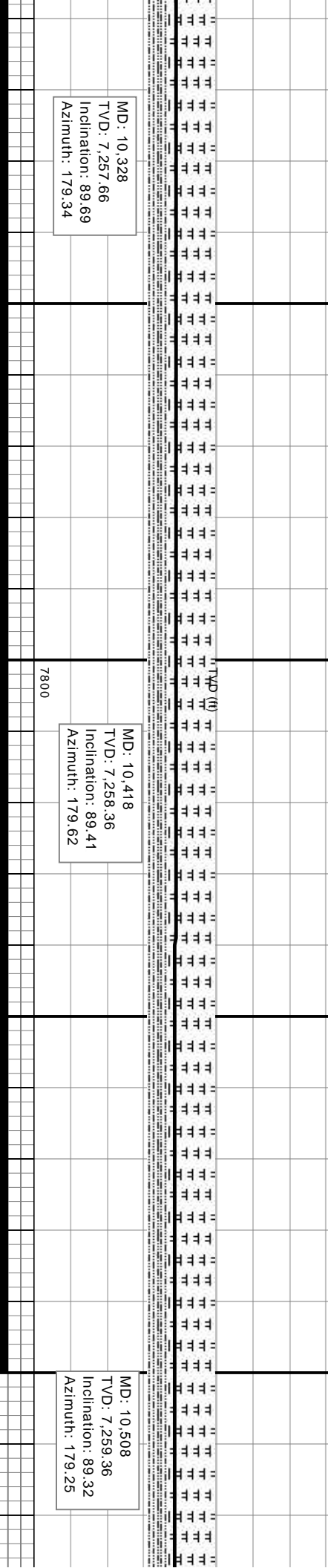
MD: 10,238
TVD: 7,257.12
Inclination: 89.63
Azimuth: 180.02

7800



RL: med - dk gy/brn, mod - hrd, sb blkly - sb pty, silty, mot, v f grn, 20% SLTY SH: dk gy, blk, mod hd, sb pty - sb blkly, v f grn, tr fos, tr cal; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, mod o

80% MRL: med - dk gy/brr, mod hd, sb pty - sb blkly, stn, fr o

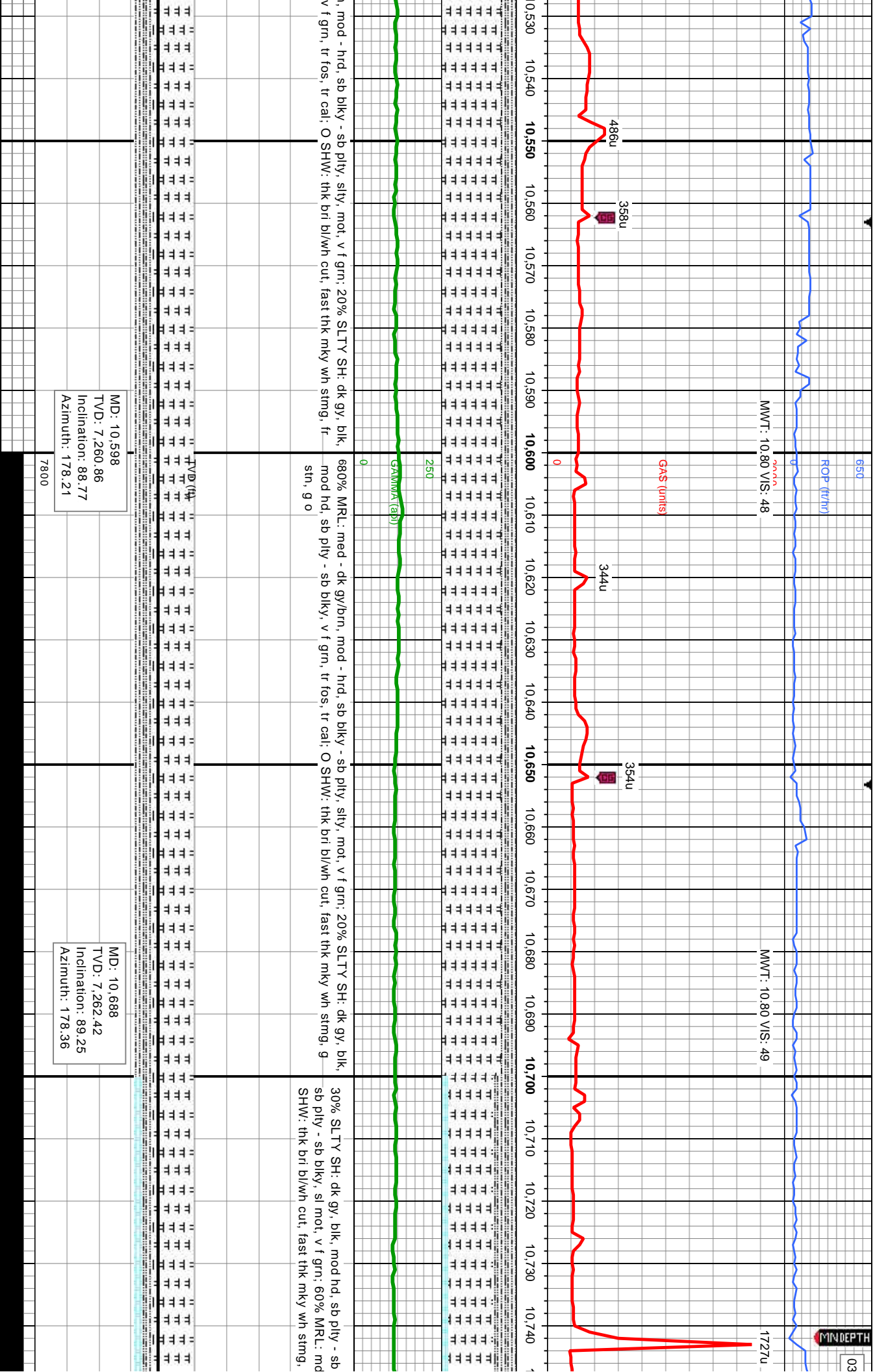


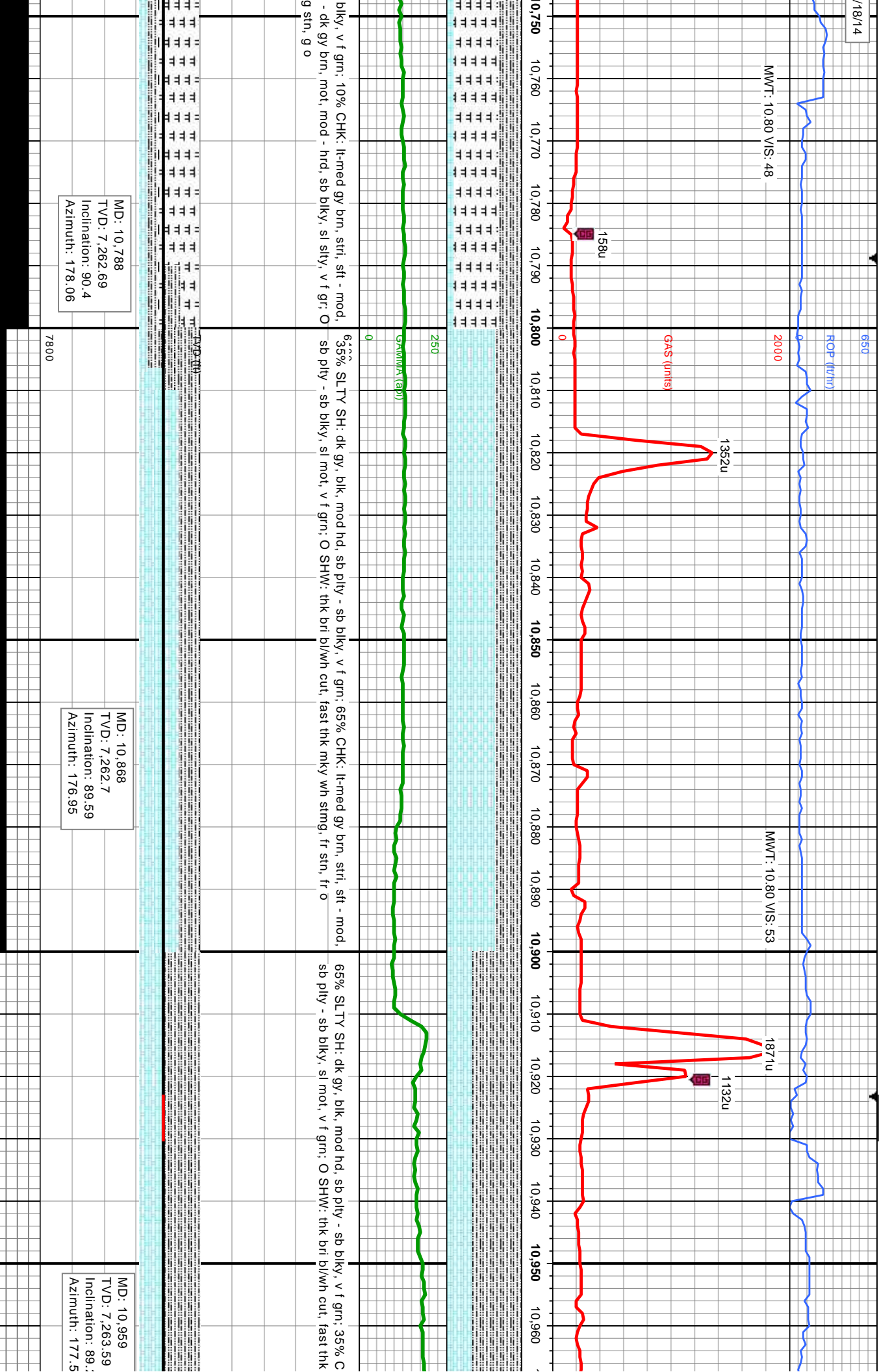
MD: 10,328
TVD: 7,257.66
Inclination: 89.69
Azimuth: 179.34

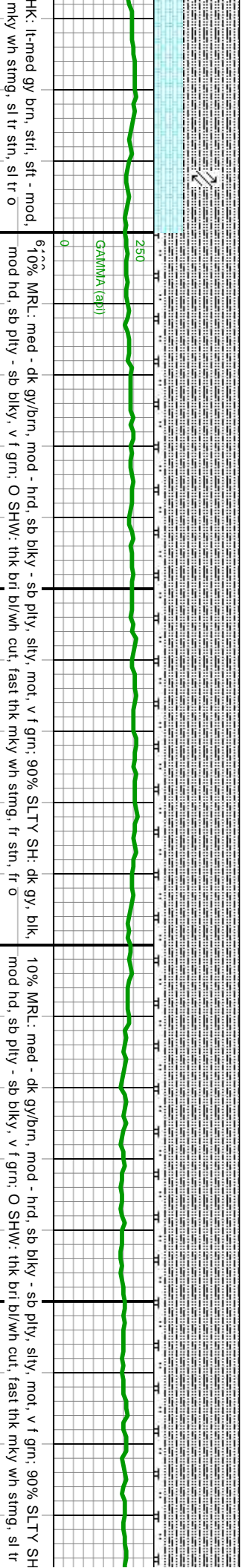
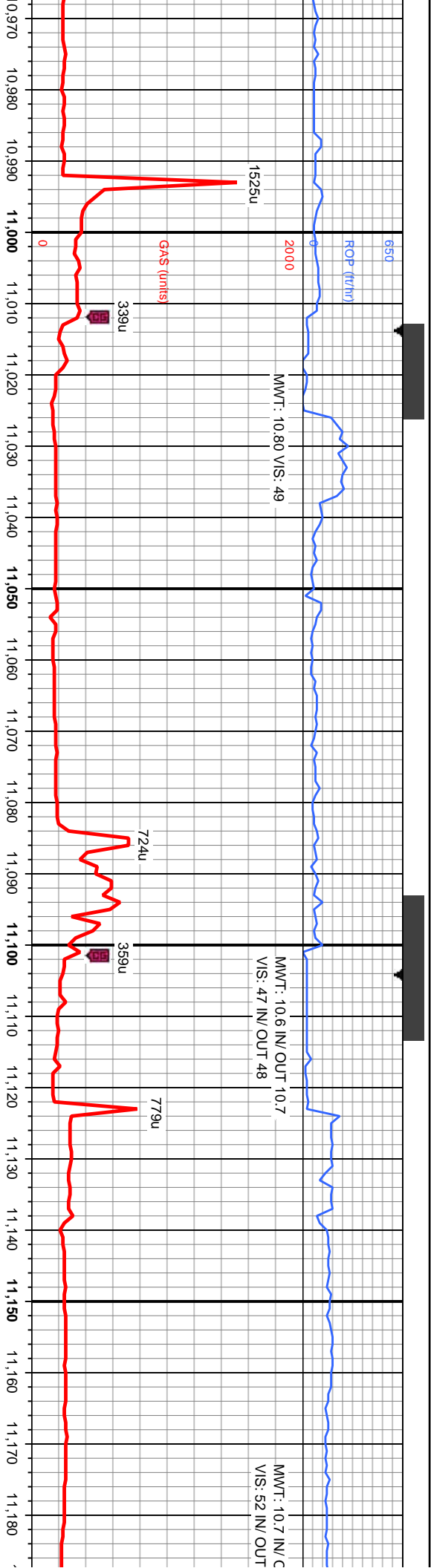
MD: 10,418
TVD: 7,258.36
Inclination: 89.41
Azimuth: 179.62

MD: 10,508
TVD: 7,259.36
Inclination: 89.32
Azimuth: 179.25



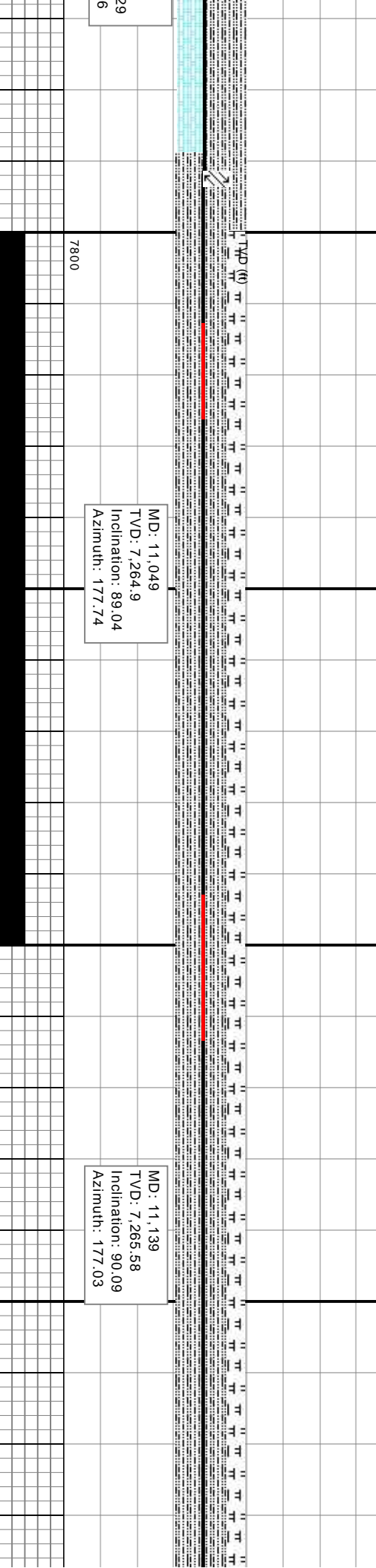






6.1%
10% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb plty, silty, mot, v f grn; 90% SLTY SH: dk gy, blk, mod hd, sb plty - sb blkly, v f grn; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr sin, fr o

10% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb plty, silty, mot, v f grn; 90% SLTY SH: mod hd, sb plty - sb blkly, v f grn; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, sl tr



MD: 11,049
TVD: 7,264.9
Inclination: 89.04
Azimuth: 177.74

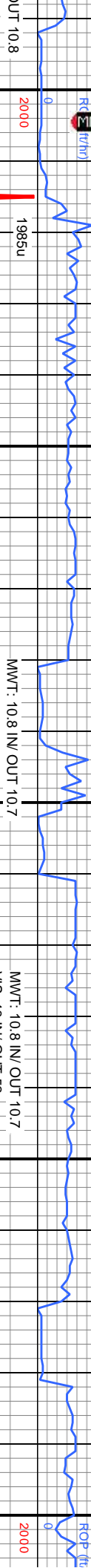
MD: 11,139
TVD: 7,265.58
Inclination: 90.09
Azimuth: 177.03



03/19/14

MINDEPTH

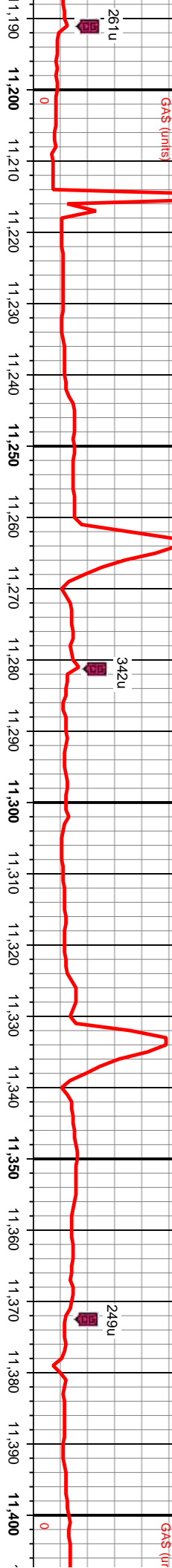
ROP (ft/min)



MMWT: 10.8 IN/ OUT 10.7
VIS: 47 IN/ OUT 49

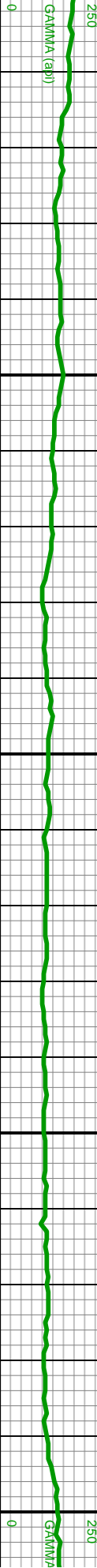
MMWT: 10.8 IN/ OUT 10.7
VIS: 48 IN/ OUT 52

GAS (units)



GAS (units)

GAMMA (api)



65% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb pily, sily, mot, v f grn. 65% SLTY SH: dk gy, blk, mod hd, sb pily - sb blkly, v f grn; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, tr stn, tr o

45% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb pily, sily, mot, v f grn. 55% SLTY SH: dk gy, blk, mod hd, sb pily - sb blkly, v f grn, tr fos; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, tr stn, tr o

67% MRL: med - dk gy/brn, mod - hrd, sb blkly - sb pily, sily, mot, v f grn. 55% SLTY SH: dk gy, blk, mod hd, sb pily - sb blkly, v f grn, tr fos; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, tr stn, tr o

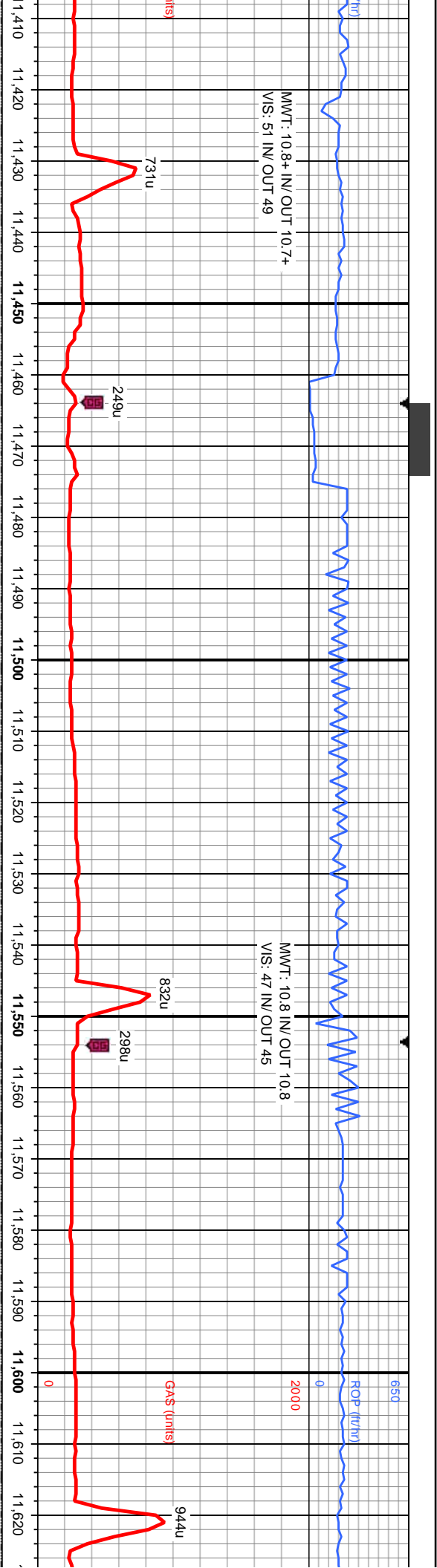
MD: 11,230
TVD: 7,264.7
Inclination: 91.02
Azimuth: 179.31

MD: 11,320
TVD: 7,263.04
Inclination: 91.1
Azimuth: 180.18

7800

7800





MMWT: 10.8+ IN/OUT 10.7+
VIS: 51 IN/OUT 49

MMWT: 10.8 IN/OUT 10.8
VIS: 47 IN/OUT 45

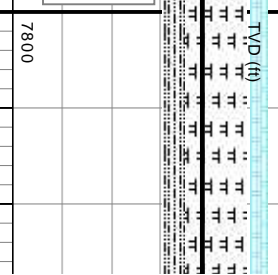


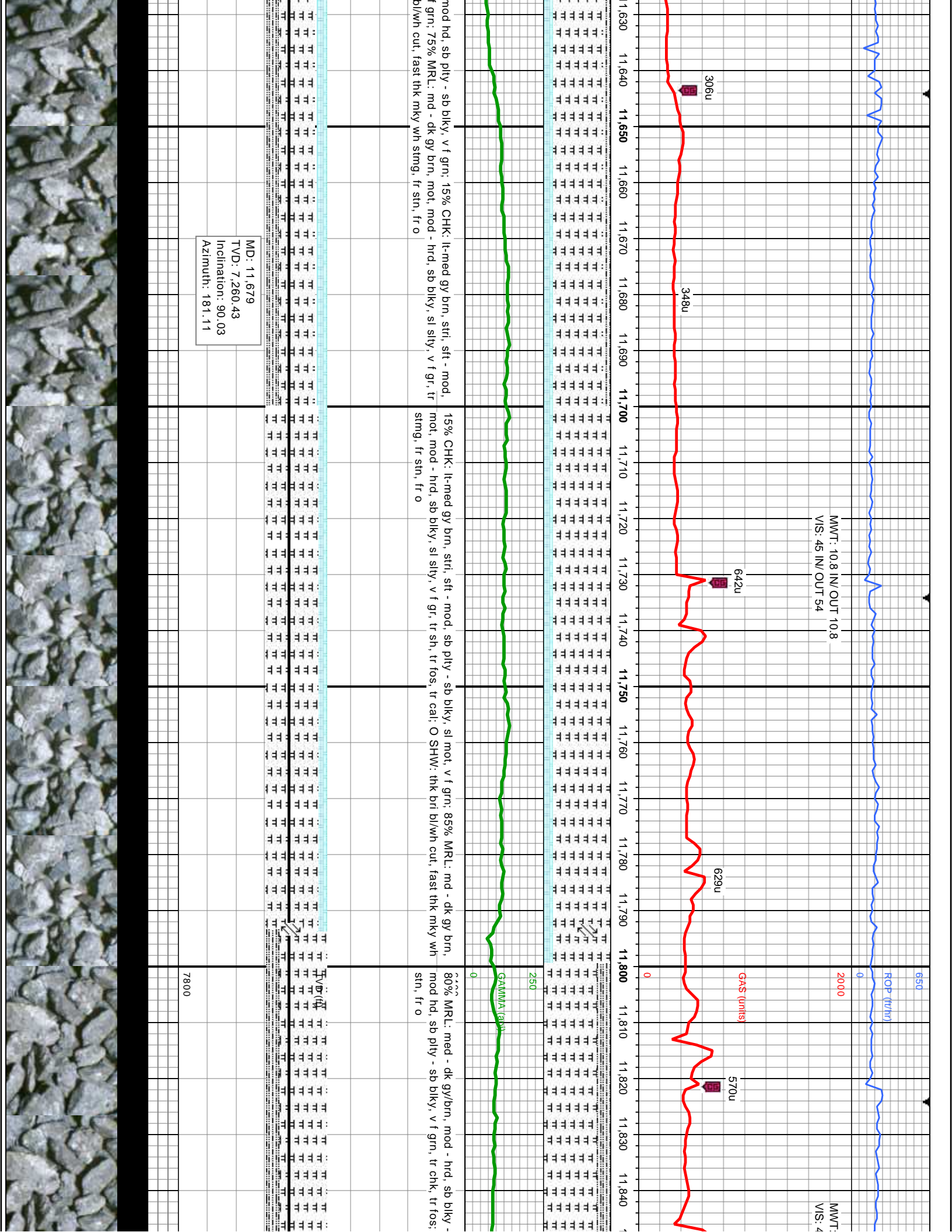
MR: med - dk gy/brn, mod - hrd, sb blk - sb pily, silty, mot, v f grn; 30% SLTY SH: dk gy, blk, sb pily - sb blk, v f grn, tr chk, tr fos; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr
10% SLTY SH: dk gy, blk, mod hd, sb pily - sb blk, v f grn; 20% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blk, sl mot, v f grn; 70% MRL: md - dk gy brn, mot, mod - hrd, sb blk, sl silty, v f gr; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr sin, fr o
10% SLTY SH: dk gy, blk, sb pily - sb blk, v f grn, tr chk, tr fos; O SHW: thk bri

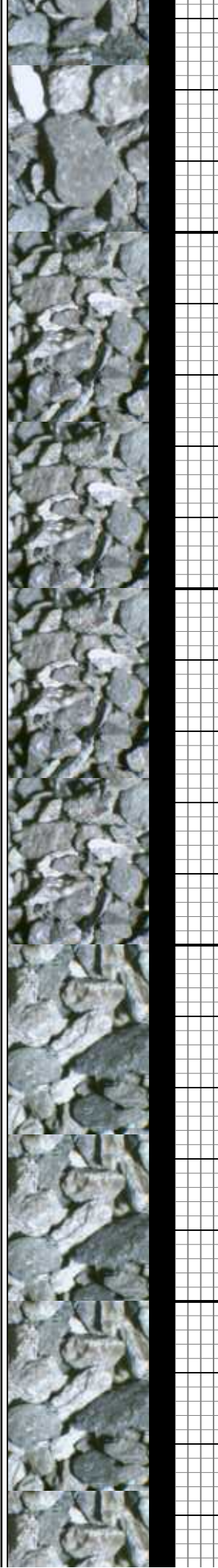
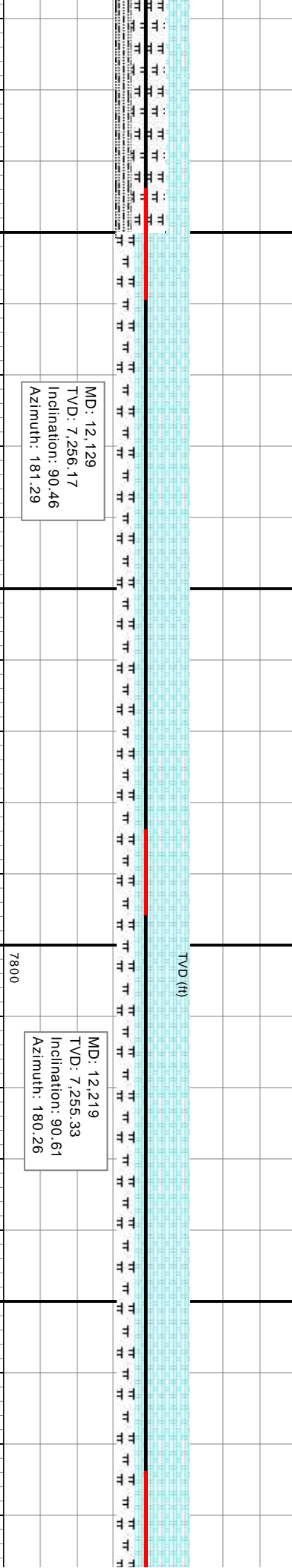
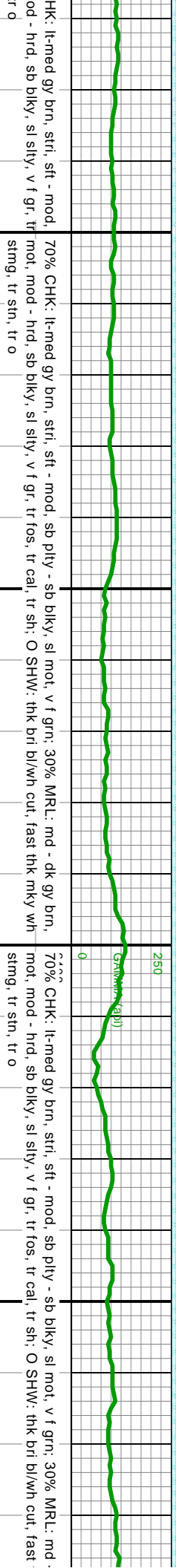
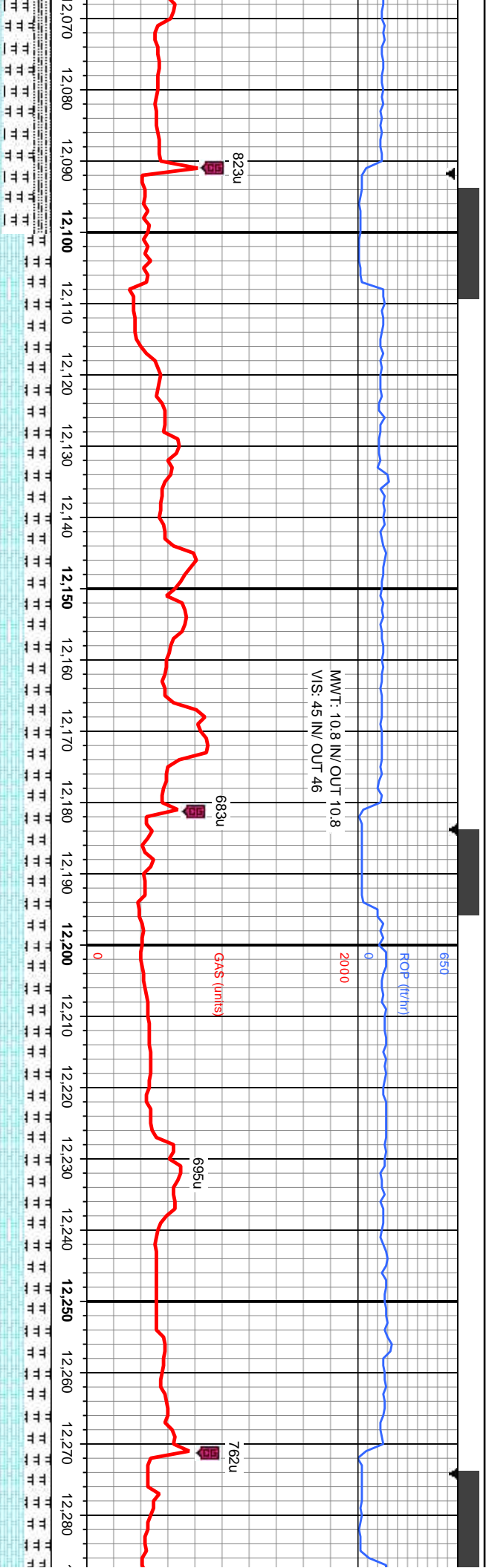
11,410
7,261.21
ation: 91.23
Azimuth: 181.04

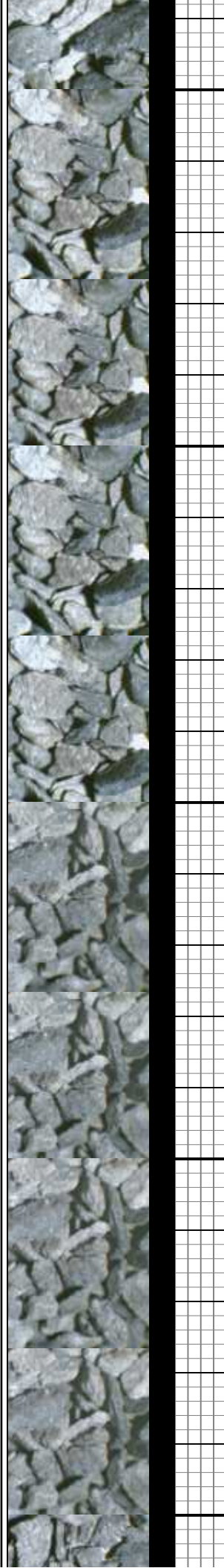
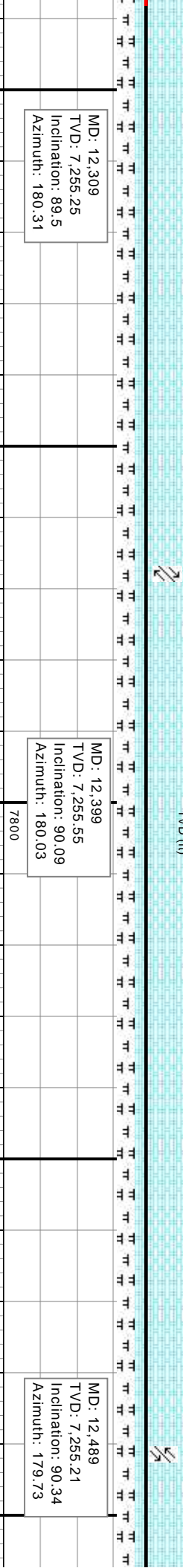
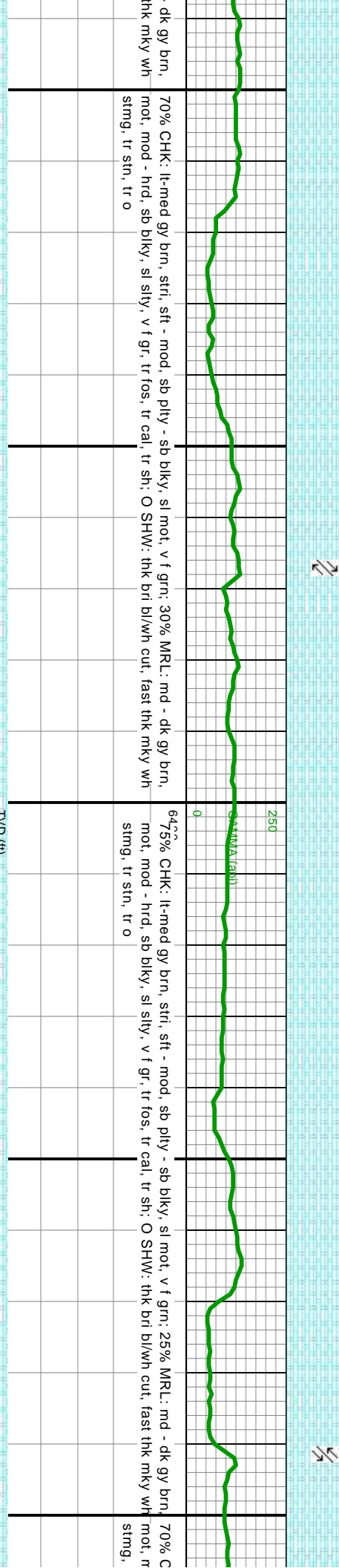
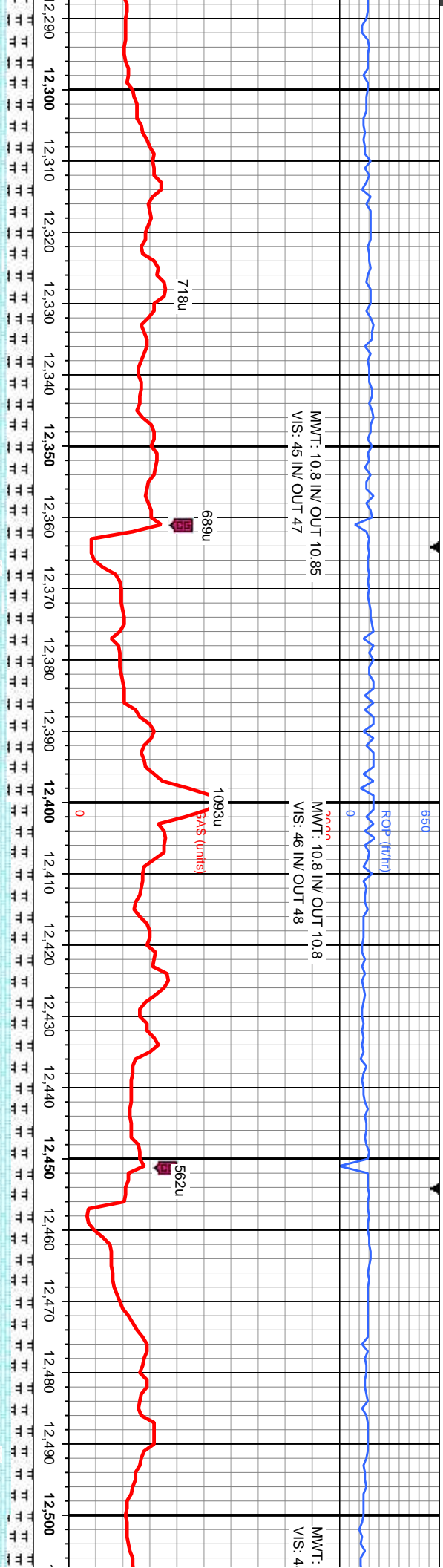
MD: 11,499
TVD: 7,260.49
Inclination: 89.69
Azimuth: 181.51

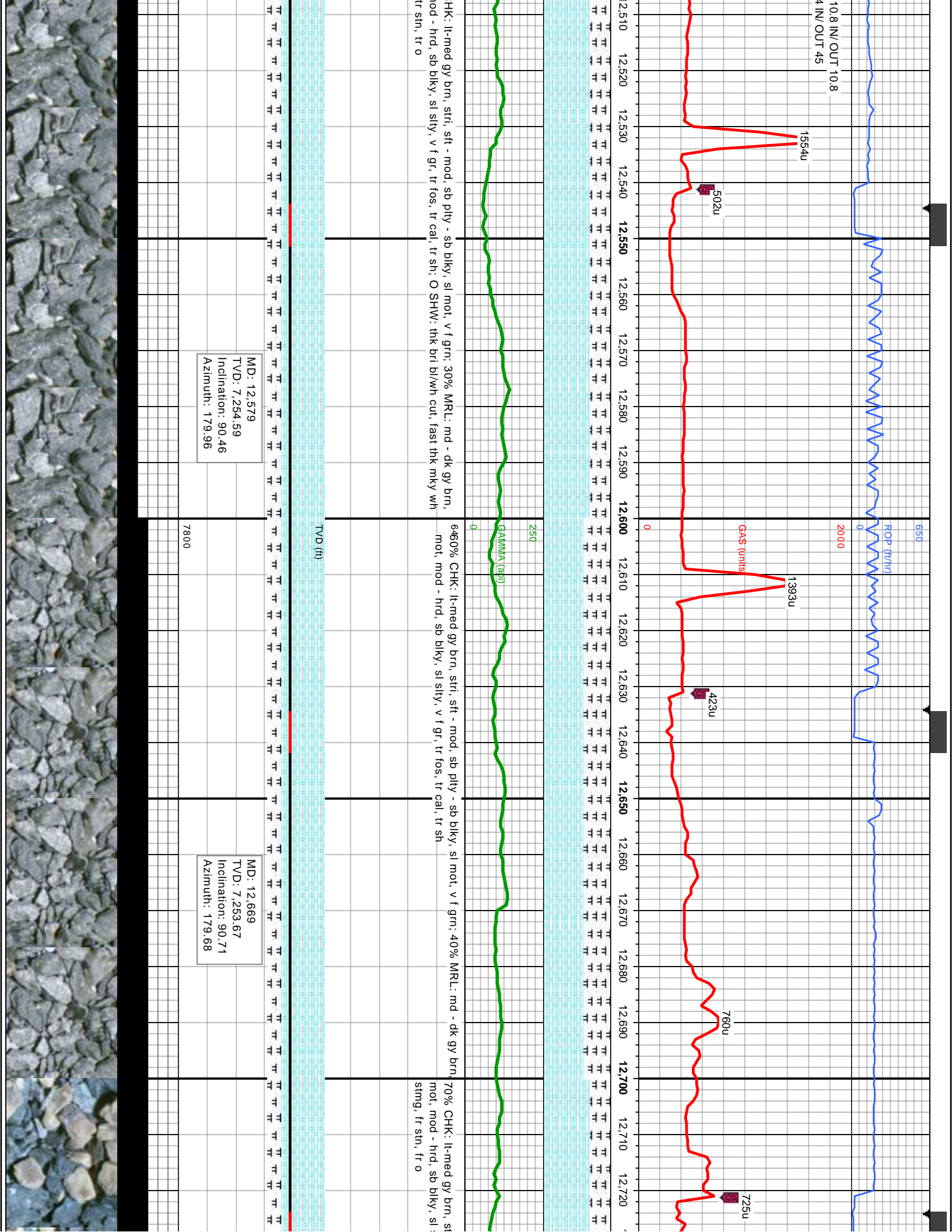
MD: 11,589
TVD: 7,260.59
Inclination: 90.18
Azimuth: 180.74

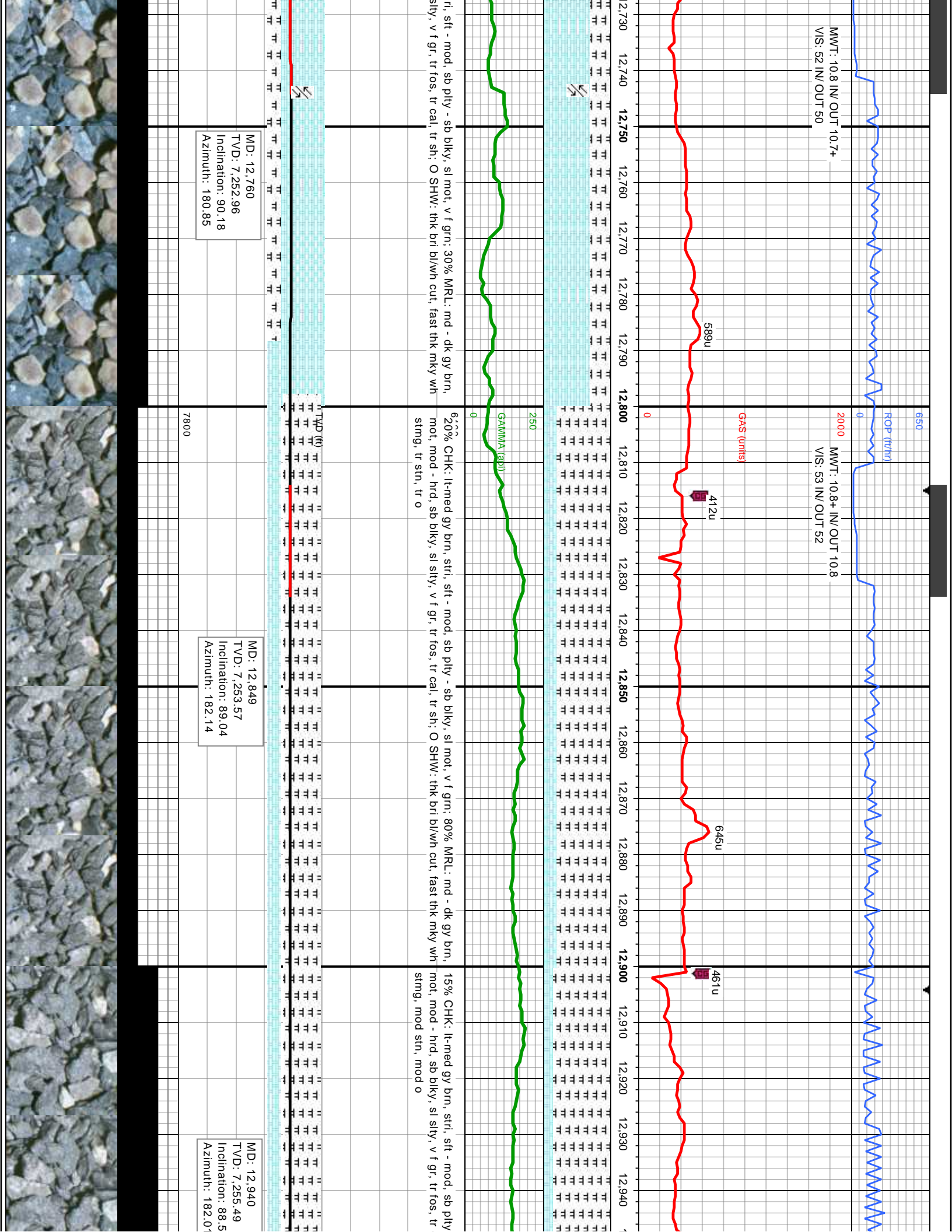


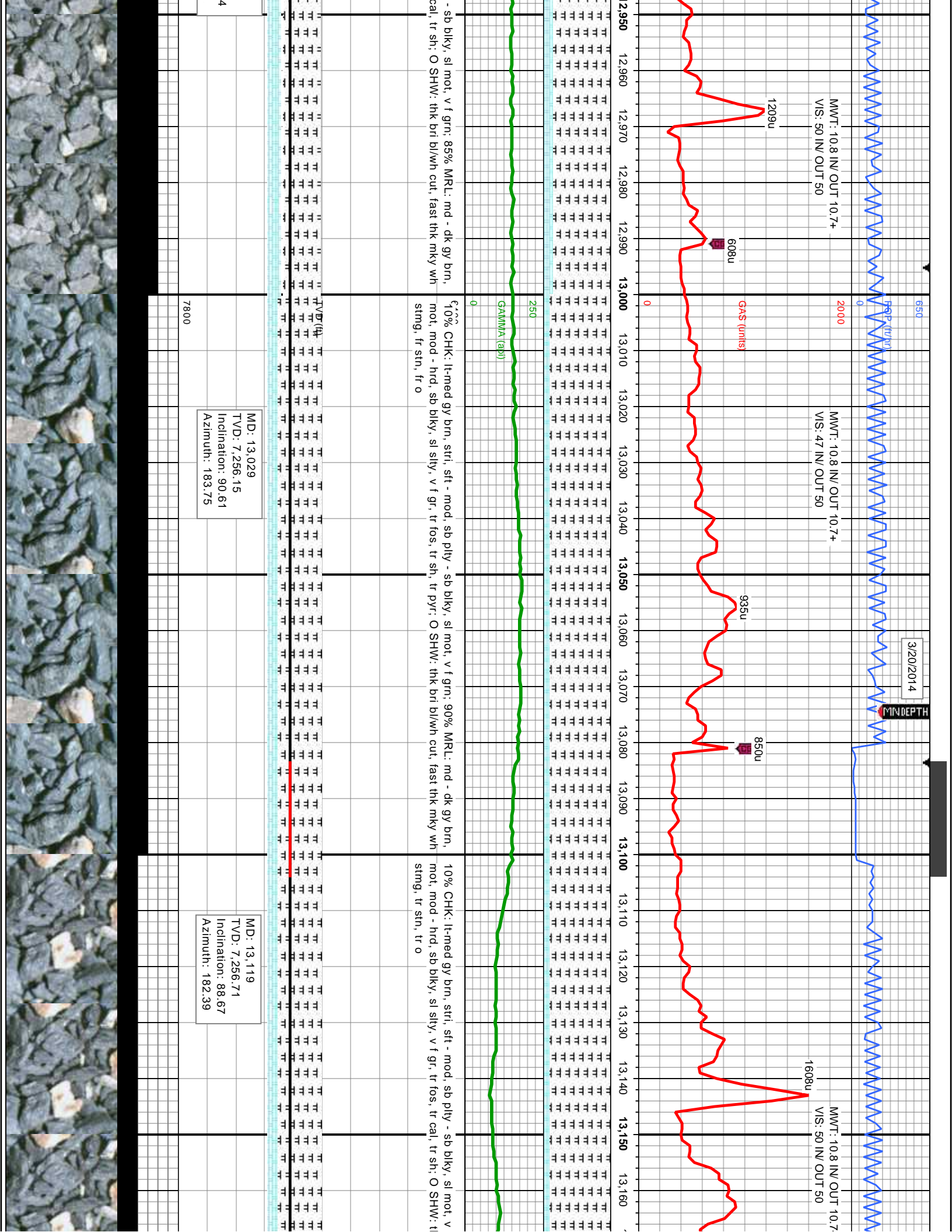


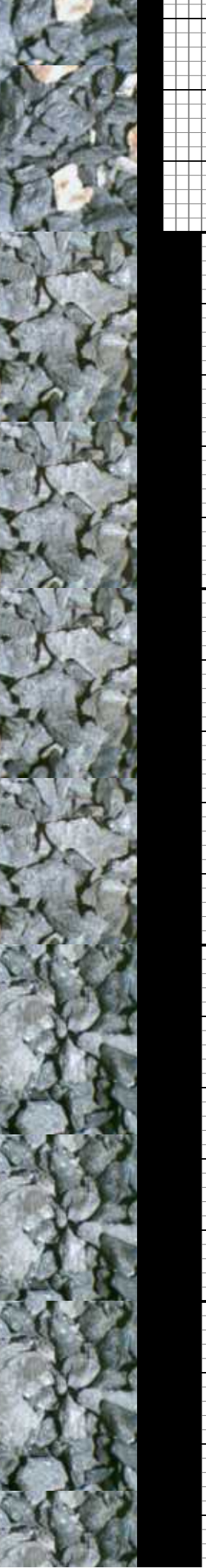
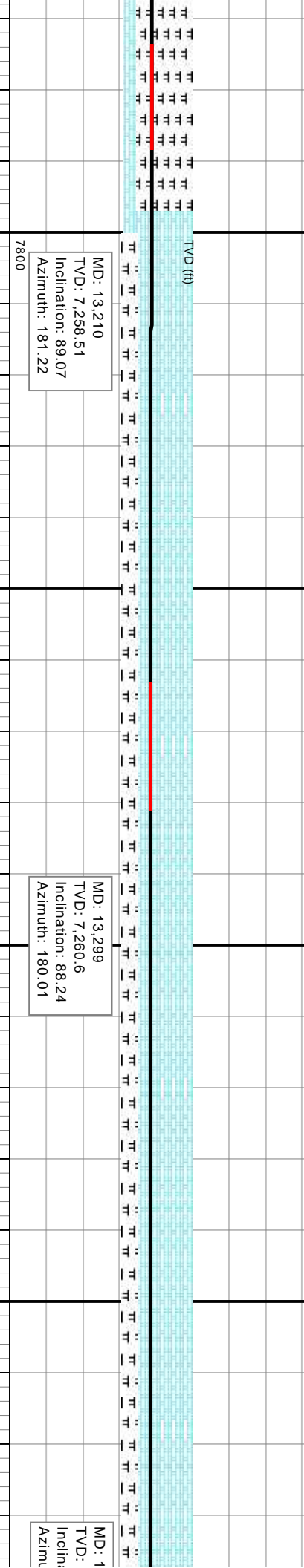
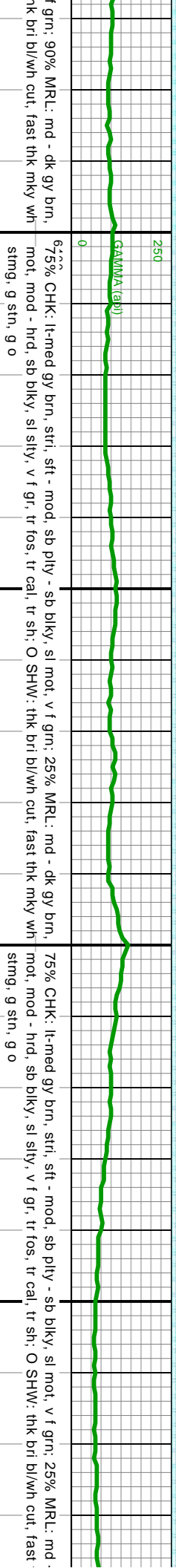
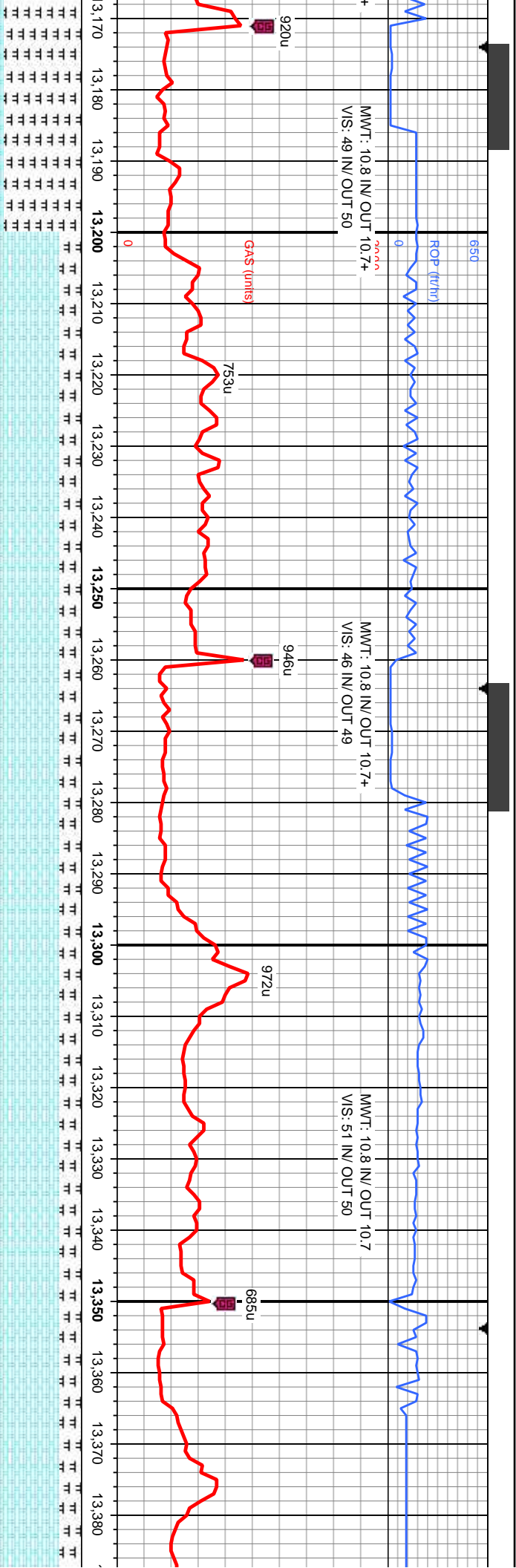


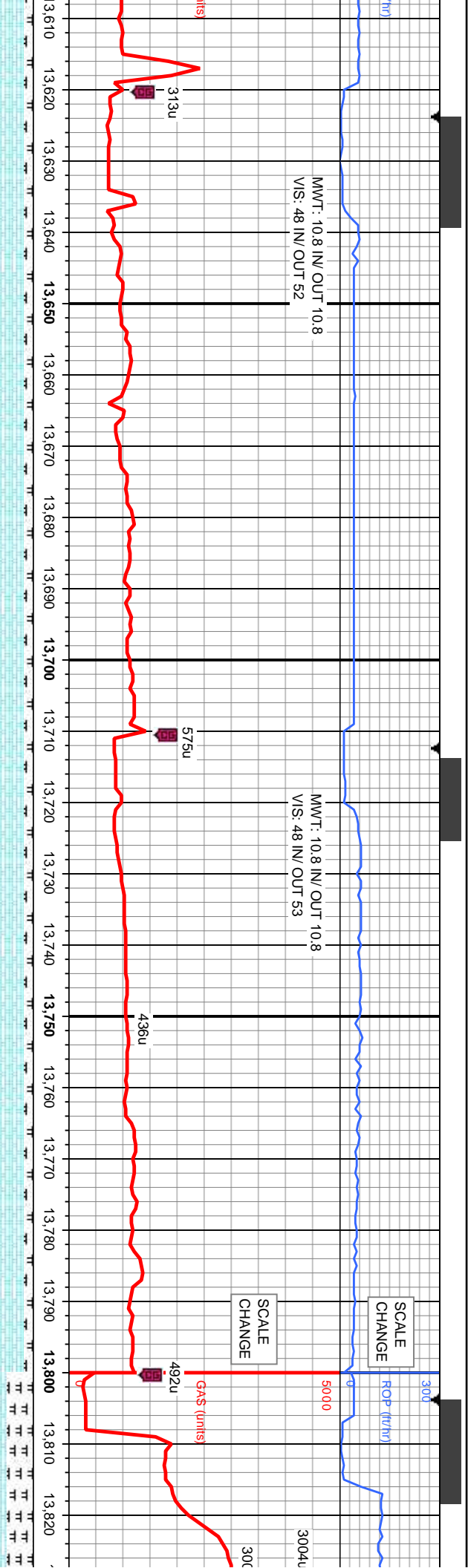












MMWT: 10.8 IN/ OUT 10.8
VIS: 48 IN/ OUT 52

MMWT: 10.8 IN/ OUT 10.8
VIS: 48 IN/ OUT 53

SCALE
CHANGE

SCALE
CHANGE

Gas (units)

ROP (ft/hr)

GAMMA (api)

CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blk, sl mot, v f grn, 10% MRL: md - dk gy brn, fr o
mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr o

90% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blk, sl mot, v f grn, 10% MRL: md - dk gy brn, fr o
mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr o

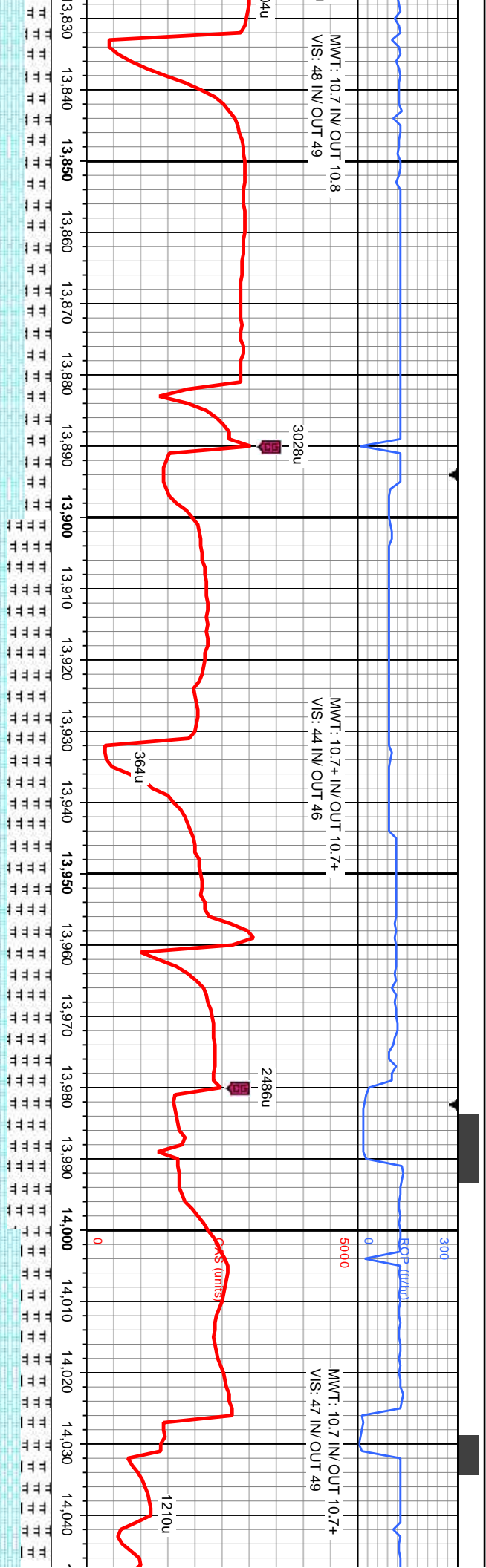
70% CHK: lt-med gy brn, s, mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, fr o

MD: 13,659
TVD: 7,264.78
Inclination: 89.5
Azimuth: 179.76

MD: 13,749
TVD: 7,265.32
Inclination: 89.81
Azimuth: 180.58

7800

TVD (ft)



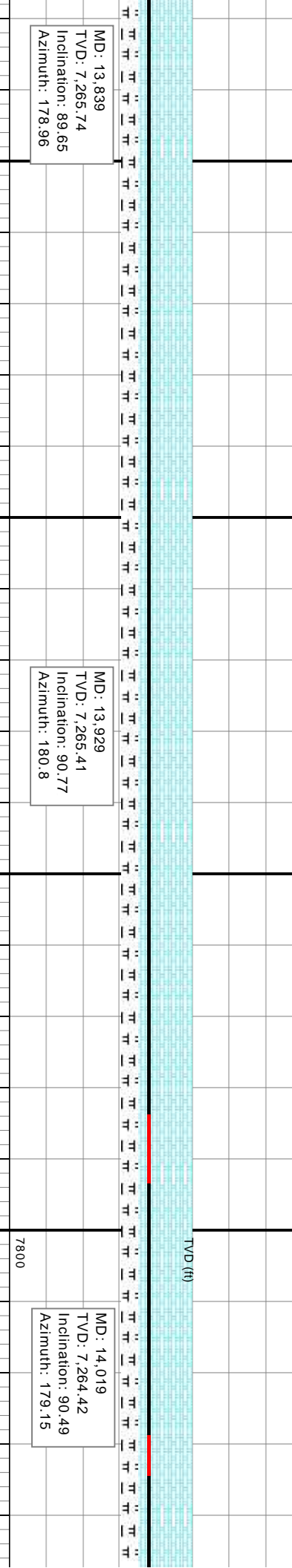
stri, sft - mod, sb ply - sb blk, sl mot, v f grn: 30% MRU: md - dk gy brn, sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh sting.

50% CHK: lt-med gy brn, stri, sft - mod, sb ply - sb blk, sl mot, v f grn: 50% MRU: md - dk gy brn, mot, mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh sting.

fr sin, fr o

65% CHK: lt-med gy brn, stri, sft - mod, sb ply - sb blk, sl mot, v f grn: 50% MRU: md - dk gy brn, mot, mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh sting.

fr sin, fr o



3/21/2014

MINDEPTH

300

ROI (ft/m)

1000
MMWT: 10.8 IN/ OUT 10.7+
VIS: 47 IN/ OUT 49

2747u

SCALE
CHANGE
Units

1000
MMWT: 10.8 IN/ OUT 10.7+
VIS: 47 IN/ OUT 50

405u

138u

14,050 14,060 14,070 14,080 14,090 14,100 14,110 14,120 14,130 14,140 14,150 14,160 14,170 14,180 14,190 14,200 14,210 14,220 14,230 14,240 14,250 14,260

- sb blkly, sl mot, v f grn; 35% MRL: md - dk gy brn, str; O SHW: thk bri bl/wh cut, fast thk mky wh string.
60% CHK: lt-med gy brn, stri, sft - mod, sb ply - sb blkly, sl mot, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh string.
65% CHK: lt-med gy brn, stri, sft - mod, sb ply - sb blkly, sl mot, v f gr, tr fos, tr sh; O SHW: thk bri fr str, fr o

MD: 14,109
TVD: 7,264.92
Inclination: 88.88
Azimuth: 179.51

MD: 14,199
TVD: 7,267.47
Inclination: 87.87
Azimuth: 180.04

7800

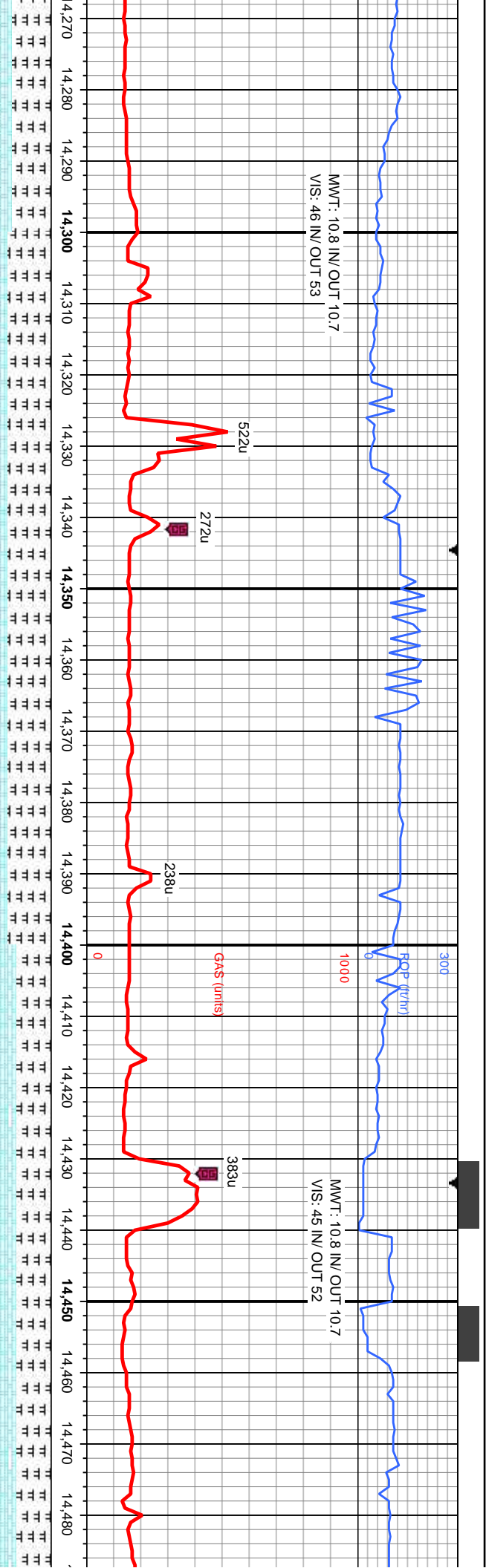
TVD (ft)

250

GAMMA (gpi)

0





60% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blk, sl mot, v f grn, 50% MRL: md - dk gy brn, mot, mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, tr stn, tr o

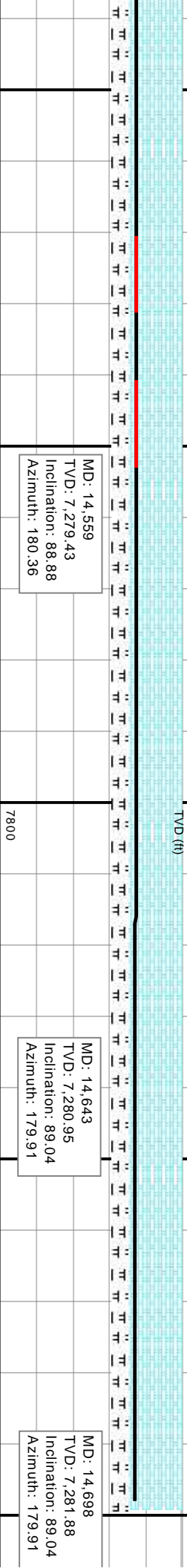
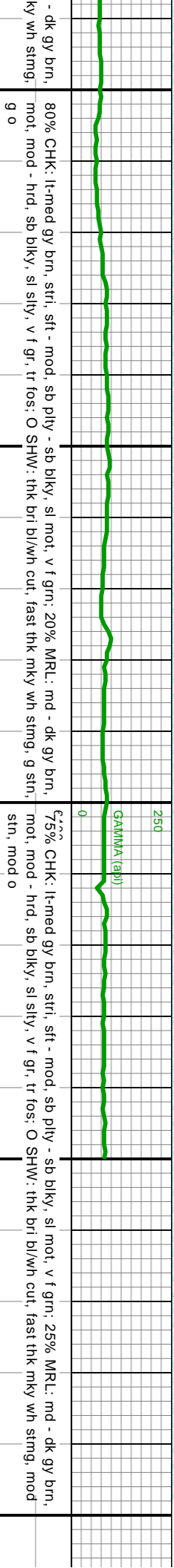
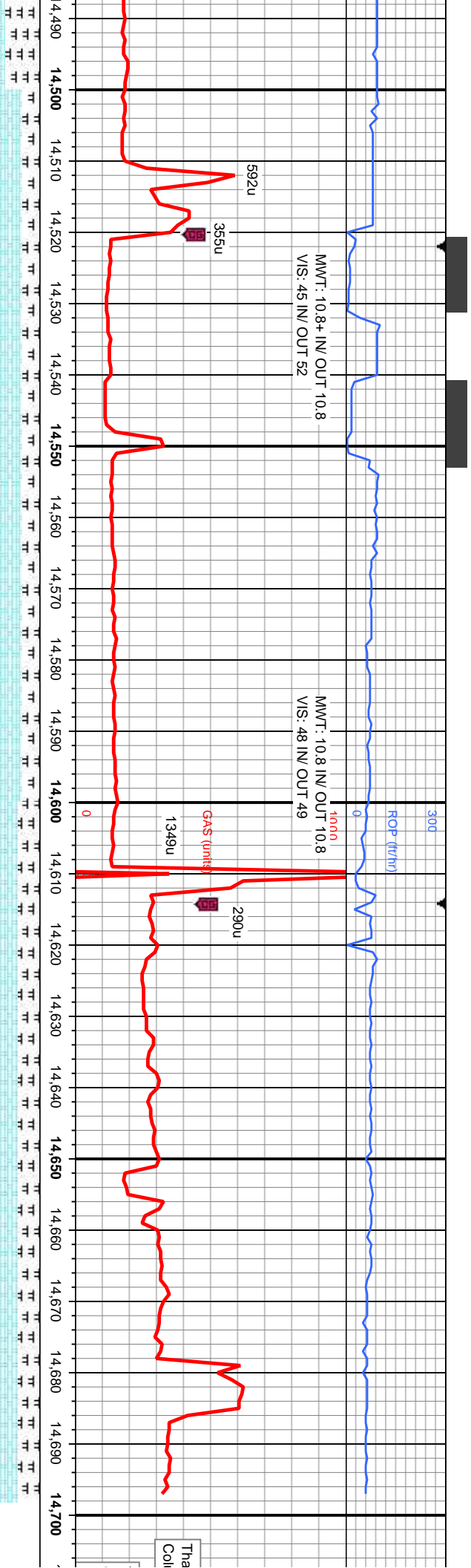
60% CHK: lt-med gy brn, stri, sft - mod, sb pily - sb blk, sl mot, v f grn, 40% MRL: md - dk gy brn, mot, mod - hrd, sb blk, sl sily, v f gr, tr fos, tr sh; O SHW: thk bri bl/wh cut, fast thk mky wh stmg, tr stn, tr o

MD: 14,289
TVD: 7,270.84
Inclination: 87.84
Azimuth: 179.65

MD: 14,379
TVD: 7,274.21
Inclination: 87.87
Azimuth: 180.17

MD: 14,469
TVD: 7,277.21
Inclination: 88.3
Azimuth: 179.34





Thank you for using
Jumpline Logging, Inc.

TD @ 14,698' N
on 03/21/2014
@ 14:22 MST

14,710 14,720 14,730

[illegible]