



Scale: 6.98" / 100'
Measured Depth Log

Well Name	Five Rivers K07-63-1HN-HORZ		
Location	SECTION 8, T4N, R66W		
State	COLORADO	County	WELD
Country	USA	Rig Number	PRECISION 829
API Number	05-123-38257	AFE #	142007
Region	DJ BASIN	Field	WATTENBERG
Spud Date	1/23/2014	Drilling Completed	2/7/2014
Surface Coordinates	1616' FSL x 131' FEL		
Bottom Hole Coordinates	SECTION 7, T4N, R65W 990' FSL x 535' FWL		
Ground Elevation	4701'	K.B. Elevation	4717'
Logged Interval	6400'	To	16650'
Formation	NIOBRARA C CHALK	Total Depth	16550'
Type of Drilling Fluid	FW LSND		

Company Noble Energy Inc
Address 1625 BROADWAY
DENVER, CO 80202

Name Holly Duncan
Company Noble Energy, Inc
Address 1625 BROADWAY
DENVER, CO 80202

COLUMBINE LOGGING, INC
WELL SITE GEOLOGISTS

Operator

MAY
2022

10

Geologist

nc.

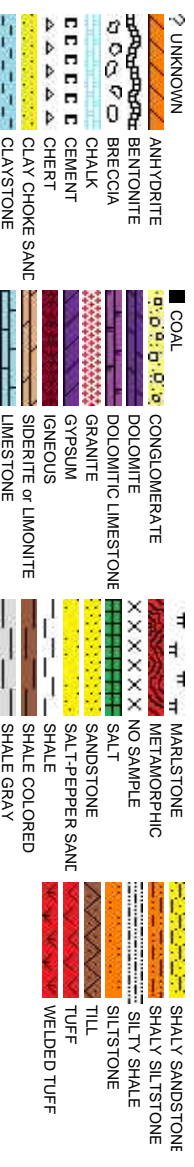
MAY 2022

Other

2385 S. LIPAN STREET
DENVER, CO 80223

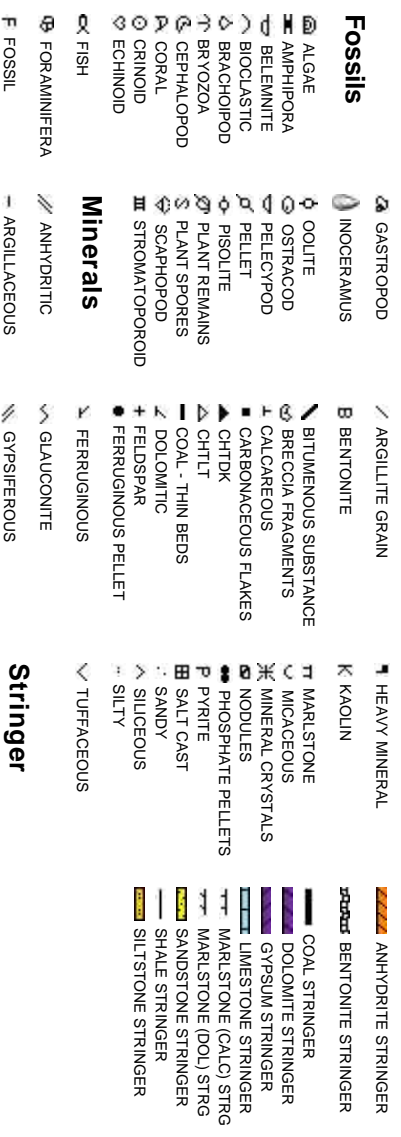
RYAN SHILLING
JOEY LUCE
CHRISTIAN VENTURINO

Rock Types



Accessories

Fossils



Stringer

Slide/Rotate

ROP Scale
0-500 ft/hr

ROP
ROF
GAMMA

Gamma Scale
0 - 200 API

Gas Scale
0 - 6000 units

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

COLUMBINE LOGGING, INC.
RIGGED UP ON 01/24/2014
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT # 0715

Depth Labels

% Lith

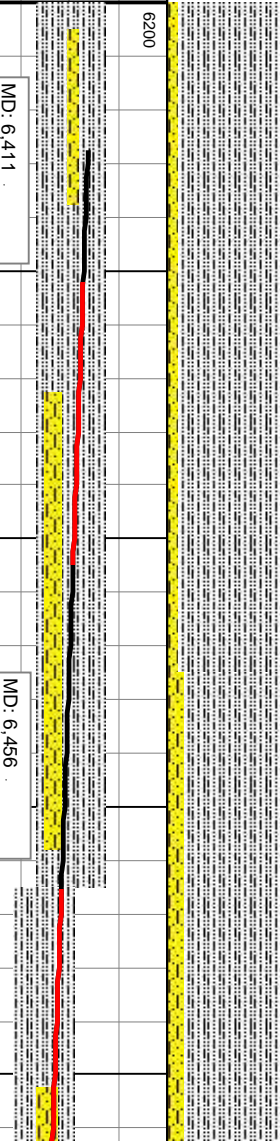
TVD SCALE
6200'-7200'

Begin 50' Samples

6200

01/27/14
107
MINDEPTH

6,360 6,370 6,380 6,390 6,400 6,410 6,420 6,430 6,440 6,450 6,460 6,470 6,480



Well Bore
TVD

Bit Data
Bit #: 2
Type: SD1611
Size: 8.75"
Depth In: 628 '
Depth Out: 7,514 '
Jets: 3x13 3x14
S/N: JH4934

LOG CONTINES FROM FIVE
RIVERS K07-63-1HN VERTICAL

90% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb ply-blky, v fr, silty
tex, rthy lsrt, sl calc, tr pyr, 10% SHY SS: lt-med gy, s&p, occ wh,
blky, frm, v fr gr, sb md-ang, p srt, cl sup, arg cnt

MD: 6,411
TVD: 6,362.59
Inclination: 11.9
Azimuth: 187.3
VS: 58.22

MD: 6,456
TVD: 6,406.6
Inclination: 12.2
Azimuth: 187.9
VS: 60.03

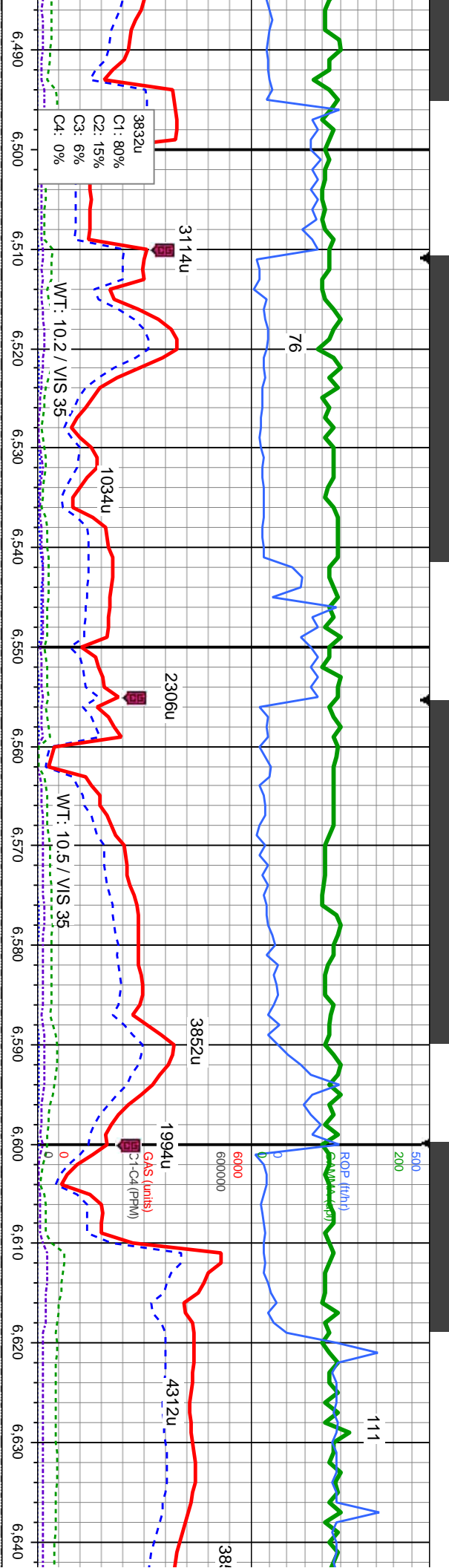
85% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb p
tex, rthy lsrt, sl calc, tr pyr, 15% SHY SS: lt-med gy,
fr gr, sb md-ang, p srt, cl sup, arg cnt

Oil Show

exc
gd
mod
tr
st

Images





MD: 6,500
TVD: 6,449.57
Inclination: 12.7
Azimuth: 201.8
VS: 63.02

MD: 6,545
TVD: 6,493.43
Inclination: 13.3
Azimuth: 218.3
VS: 68.59

MD: 6,590
TVD: 6,537.04
Inclination: 15.3
Azimuth: 228.6
VS: 76.73

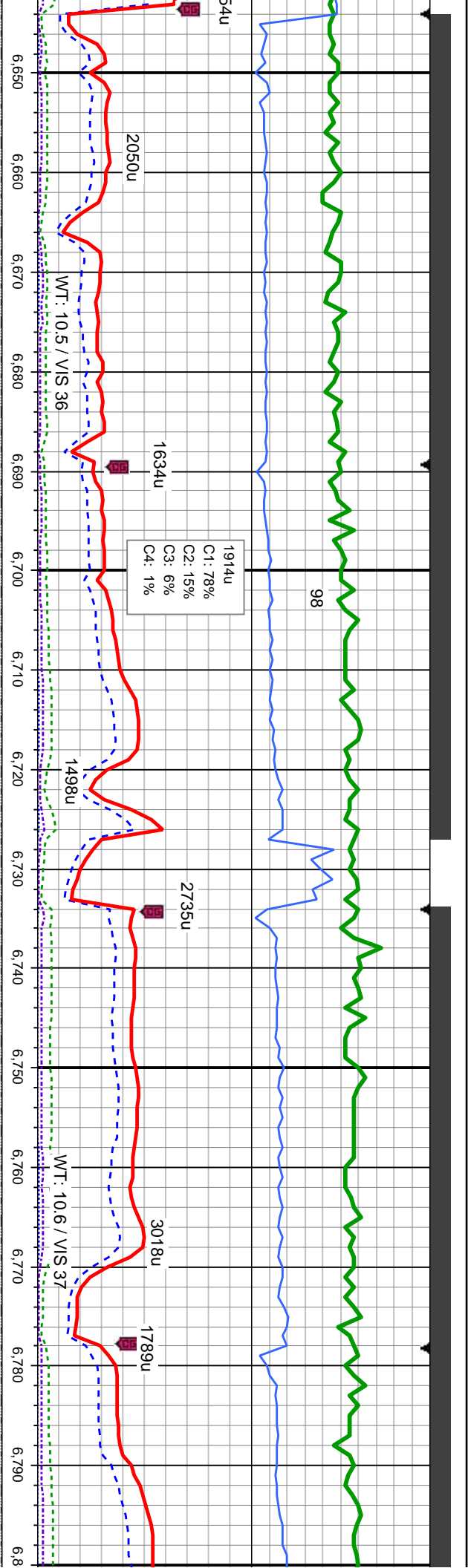
MD: 6,635
TVD: 6,580.26
Inclination: 17.1
Azimuth: 231.7
VS: 86.86

86% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb pily-biky, v f gr, silty
tex, rthy lsir, sl calc, tr pyr, 15% SHY SS: lt-med gy, s&p, biky, frm, v
v f f gr, sb rnd-ang, p srt, cl sup, arg cmt

90% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb pily-biky, v f gr, silty
tex, rthy lsir, sl calc, 10% SHY SS: lt-med gy, s&p, biky, frm, v f f gr, sb
rnd-ang, p srt, cl sup, arg cmt

96% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb pily-biky, v f gr, silty
tex, rthy lsir, sl calc, 5% SHY SS: lt-med gy, s&p, biky, frm, v
v f f gr, sb rnd-ang, p srt, cl sup, arg cmt





MD: 6.680
TVD: 6,622.92
Inclination: 20
Azimuth: 237.6
VS: 99.03

MD: 6.725
TVD: 6,664.59
Inclination: 24.3
Azimuth: 243.4
VS: 114.3

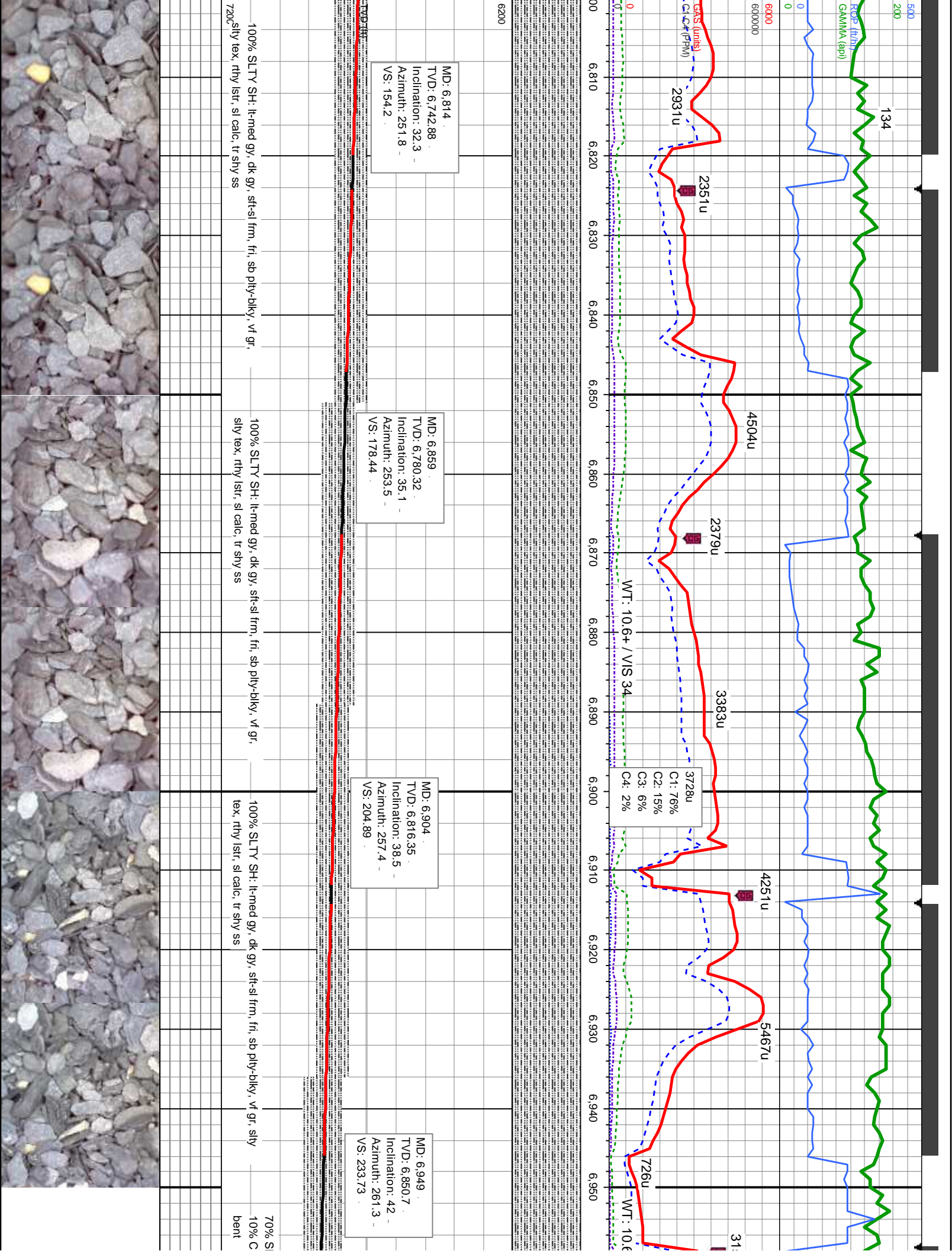
MD: 6.769
TVD: 6,704.03
Inclination: 28.3
Azimuth: 247.2
VS: 132.48

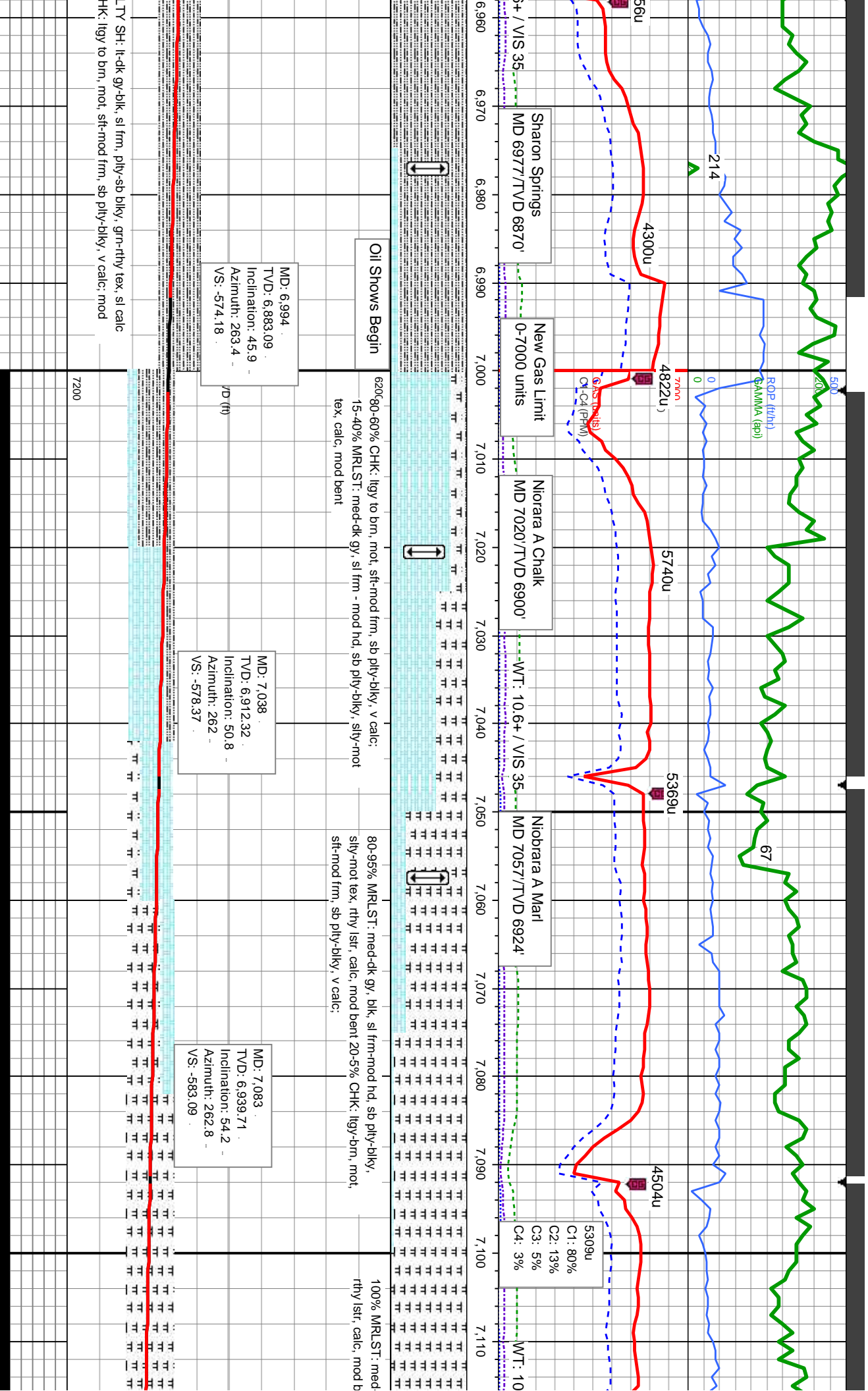
100% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb ply-blky, vf gr, silty
tex, rthy lst, sl calc, tr shy ss

100% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb ply-blky, vf gr, silty
tex, rthy lst, sl calc, tr shy ss

100% SLTY SH: lt-med gy, dk gy, sft-sl frm, fri, sb ply-blky, vf gr,
silty tex, rthy lst, sl calc, tr shy ss







LTLY SH: lt-dk gy-blk, sl frm, ply-sb blk, grn-rthy tex, sl calc
HK: llyg to brn, mot, sft-mod frm, sb ply-blyk, v calc; mod

7200

Oil Shows Begin

620C 80-60% CHK: ltgy to brn, mot, sft-mod frm, sb pily-blky, v calc;

80-95% MRLST: med-dk gy, blk, sl frm-mod hd, sb plty-blky,

100% MRLST: med.
rhyth Istr, calc, mod b

Sharon Springs

MD 6977' / TVD 6870'

New Gas Lim
0-7000 units

Niorara A Chalk

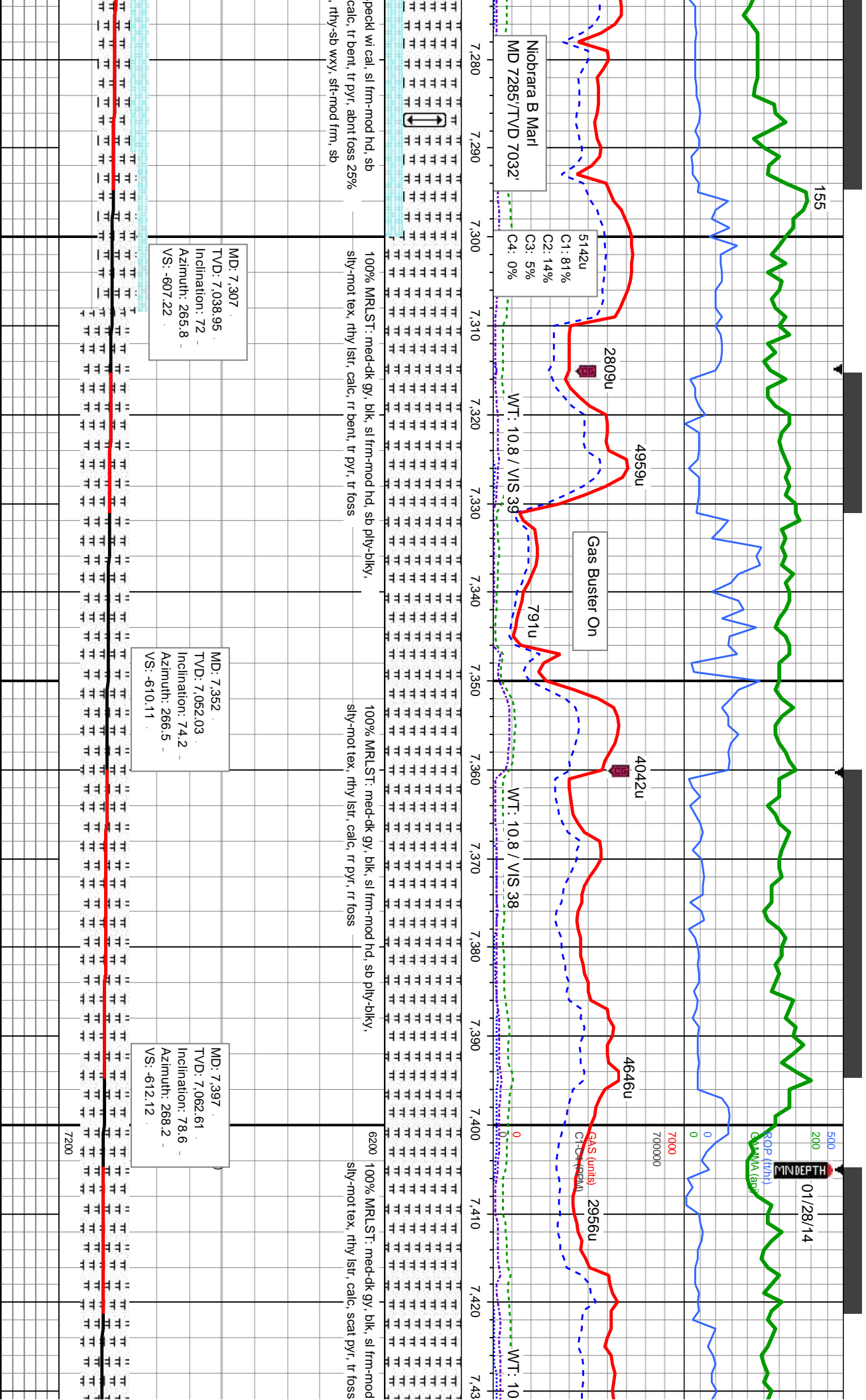
MD 7020'/TVD 6900'

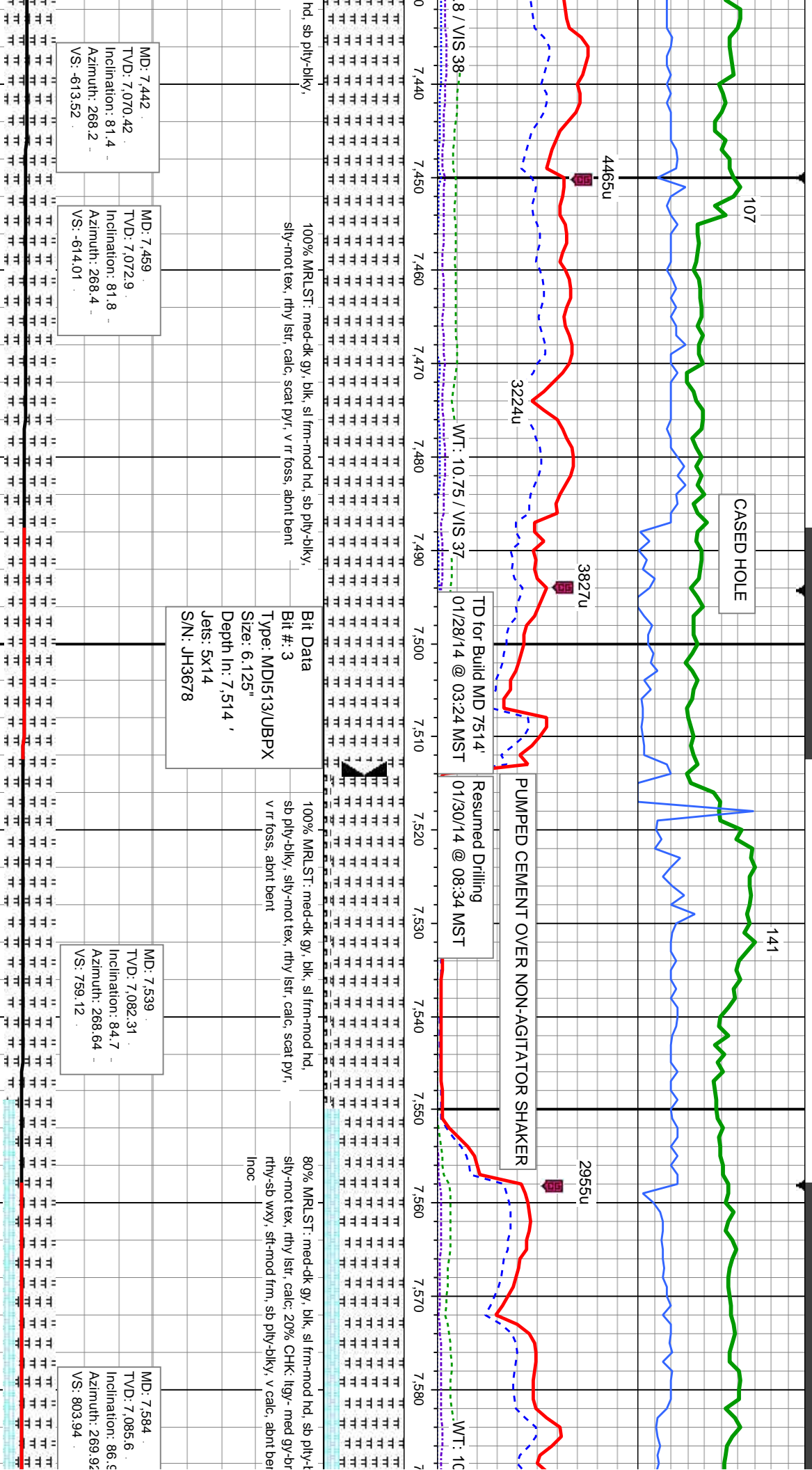
Niobrara A Mart

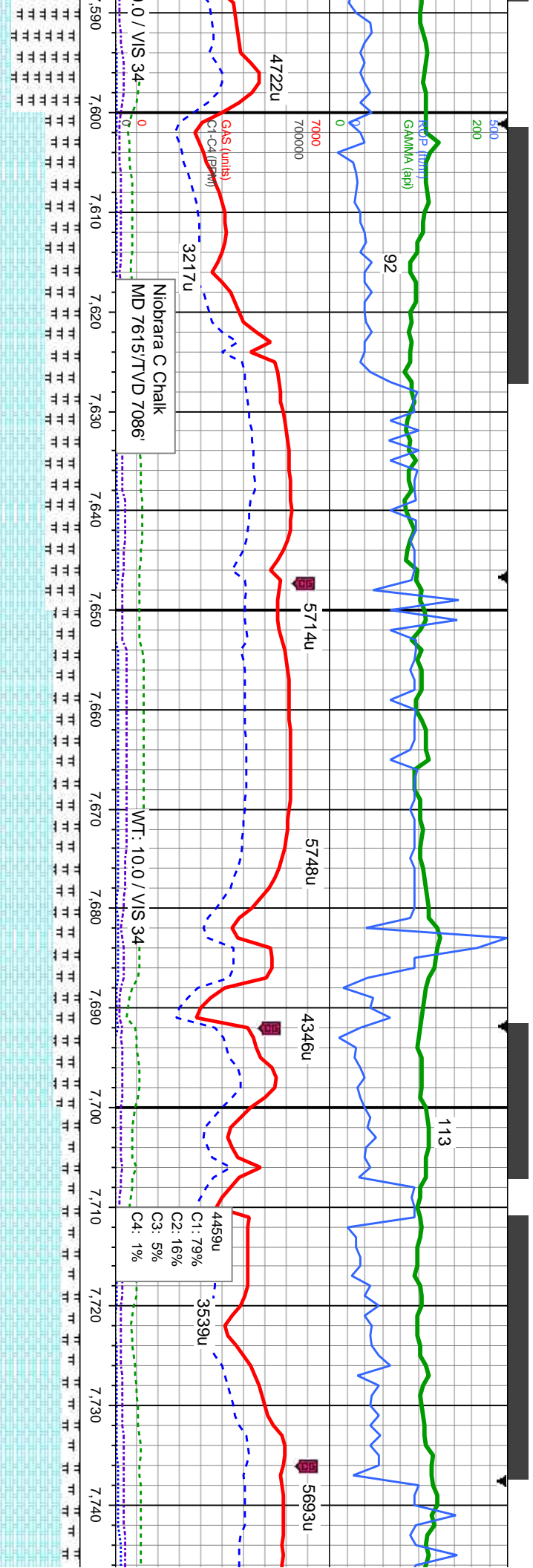
MD 70571/TVD 69241

C4: 3%

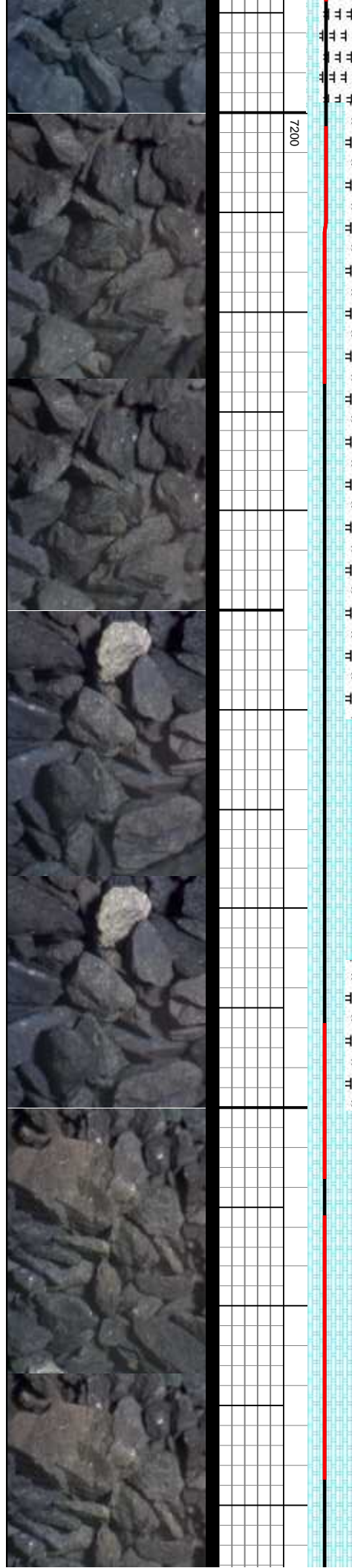
WT: 10

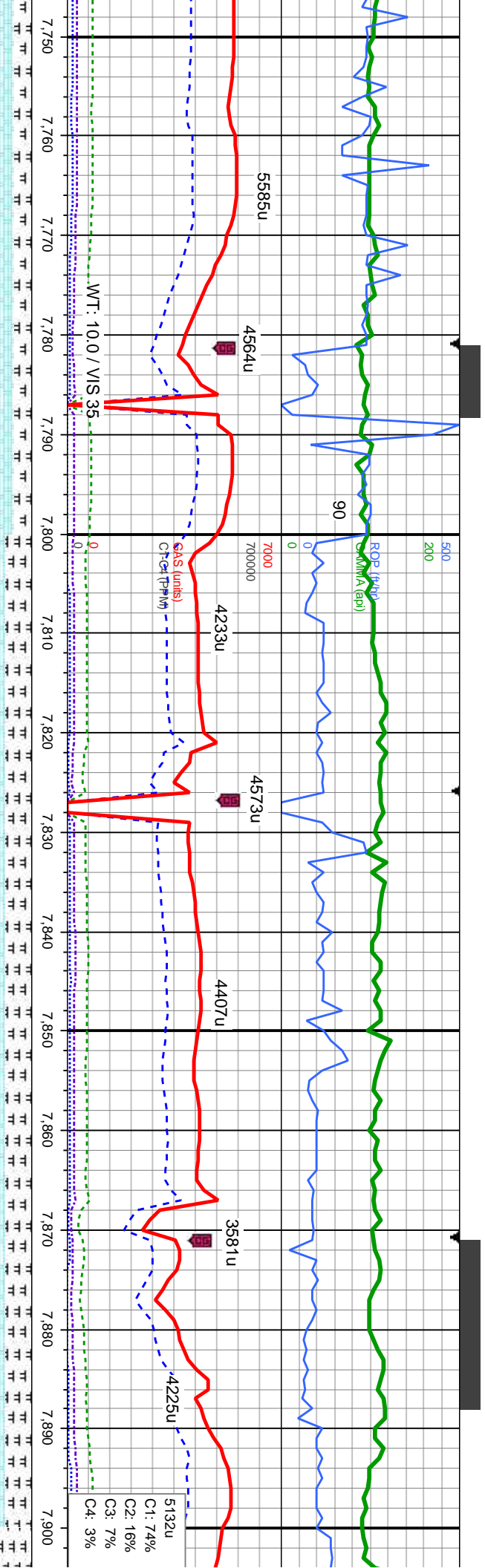






62% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb ply-biky, v calc: 40% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky, silty-mot tex, rthy lstr, calc, abnt bent, tr inoc	70% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb ply-biky, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky, silty-mot tex, rthy lstr, calc, abnt bent, tr inoc	80% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb ply-biky, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky, silty-mot tex, rthy lstr, calc, tr inoc
TVD (ft) MD: 7.629 TVD: 7.087.41 Inclination: 88.5 Azimuth: 272.4 VS: 848.75	MD: 7.673 TVD: 7.088.37 Inclination: 89 Azimuth: 272.46 VS: 892.51	MD: 7.718 TVD: 7.088.52 Inclination: 90.6 Azimuth: 271.82 VS: 937.29





80% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, slty-mot tex, rthy lstr, calc, tr inoc

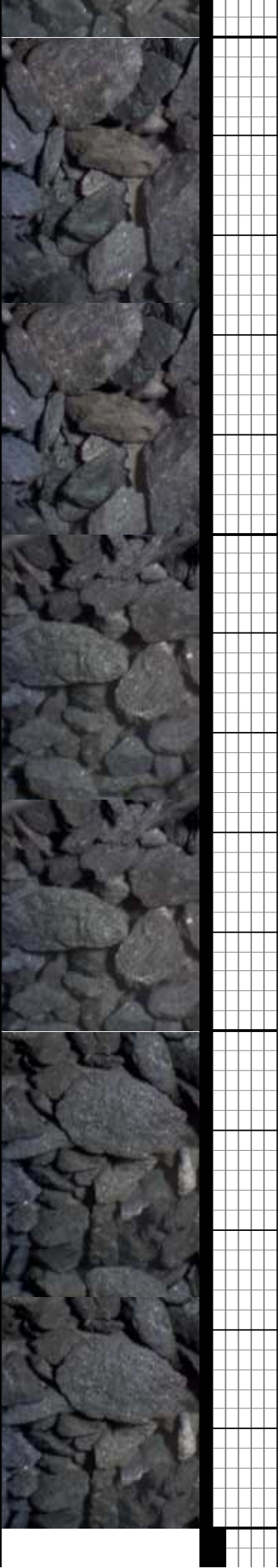
MD: 7.808
TVD: 7,086.95
Inclination: 91.4
Azimuth: 270.9
VS: 1,026.95

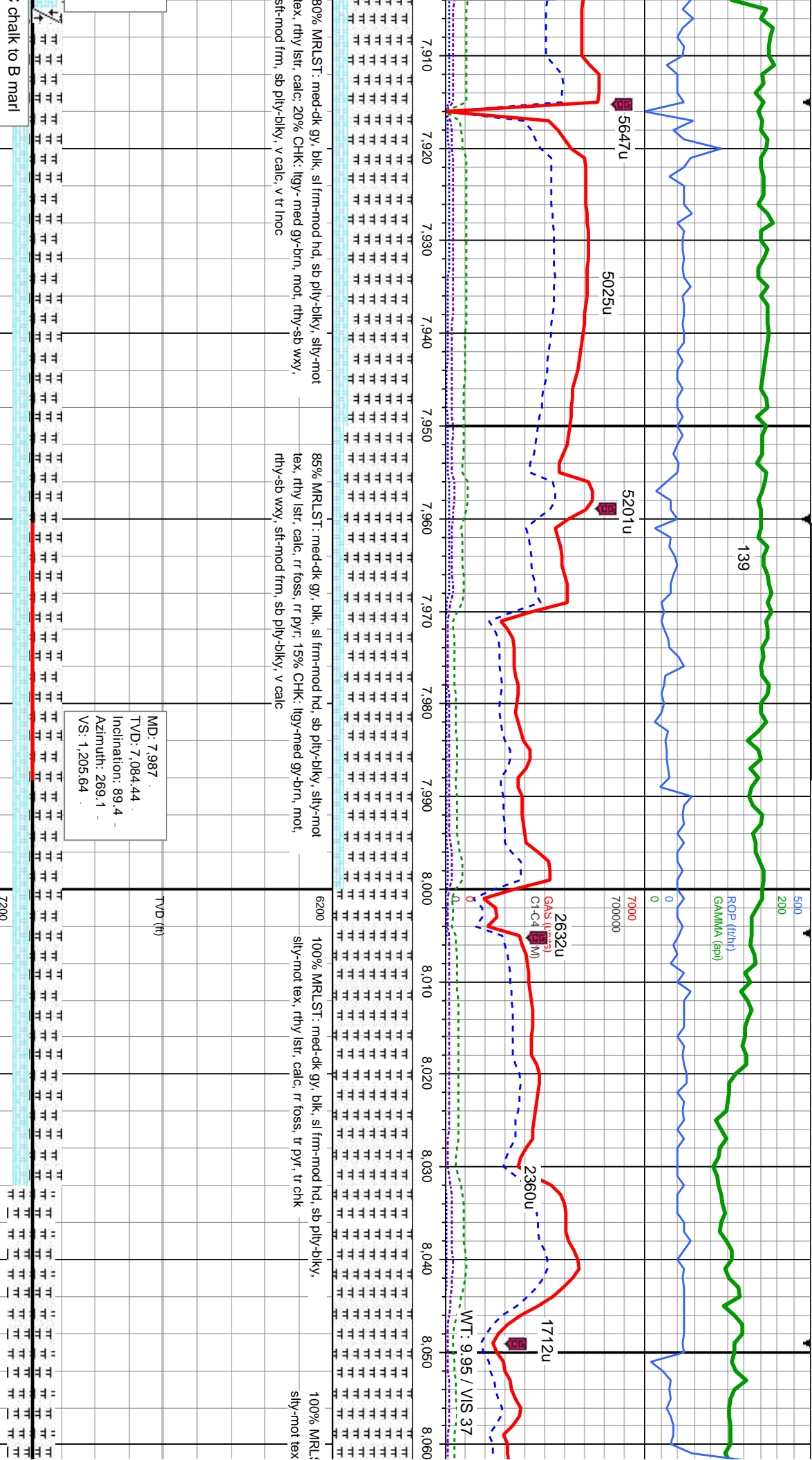
62070% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, slty-mot tex, rthy lstr, calc, tr inoc, tr foss

70% CHK: lgy- med gy-brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, slty-mot tex, rthy lstr, calc, tr inoc

MD: 7.898
TVD: 7,084.91
Inclination: 91.2
Azimuth: 269.5
VS: 1,116.75

U/D Fault C

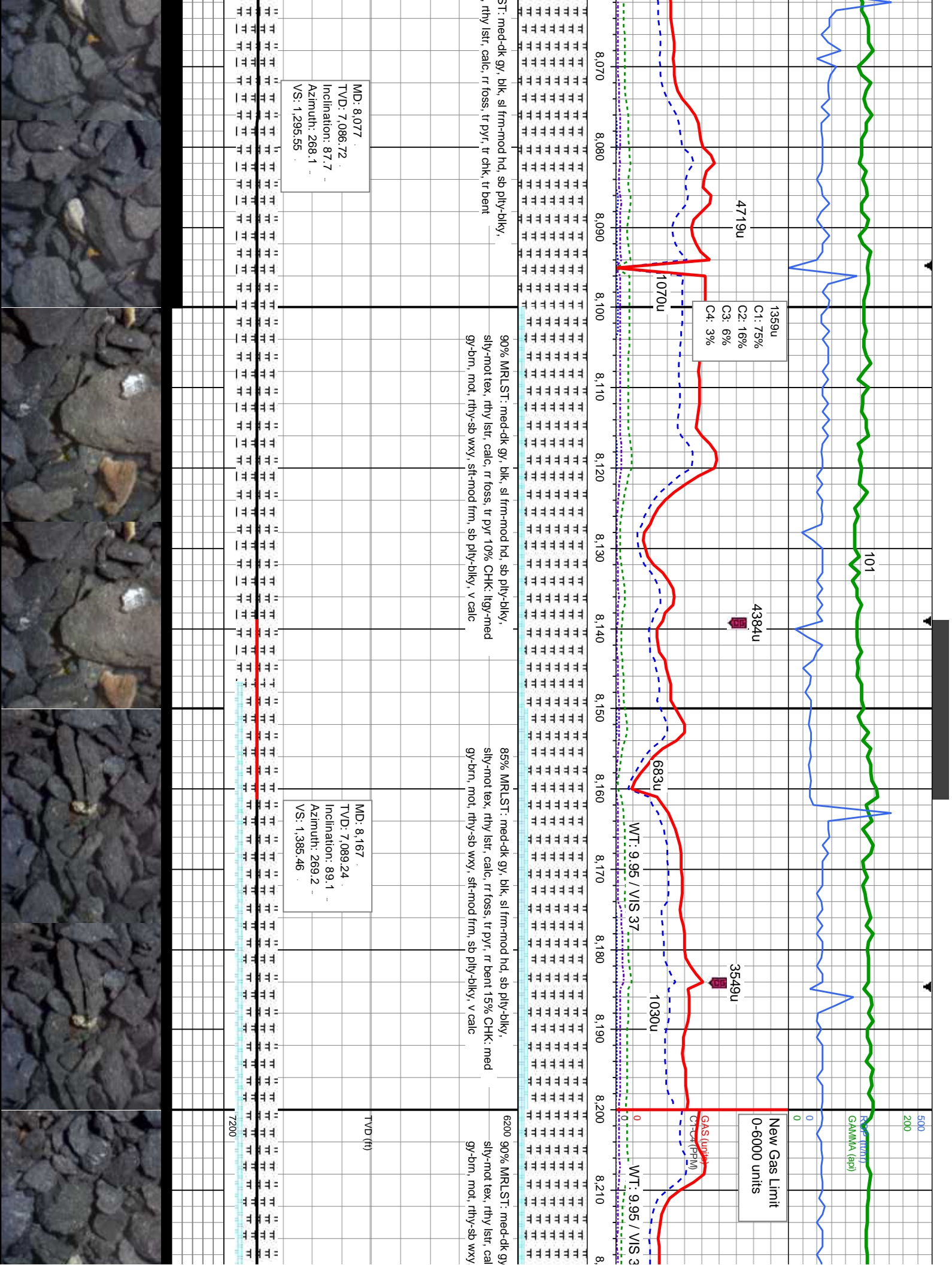


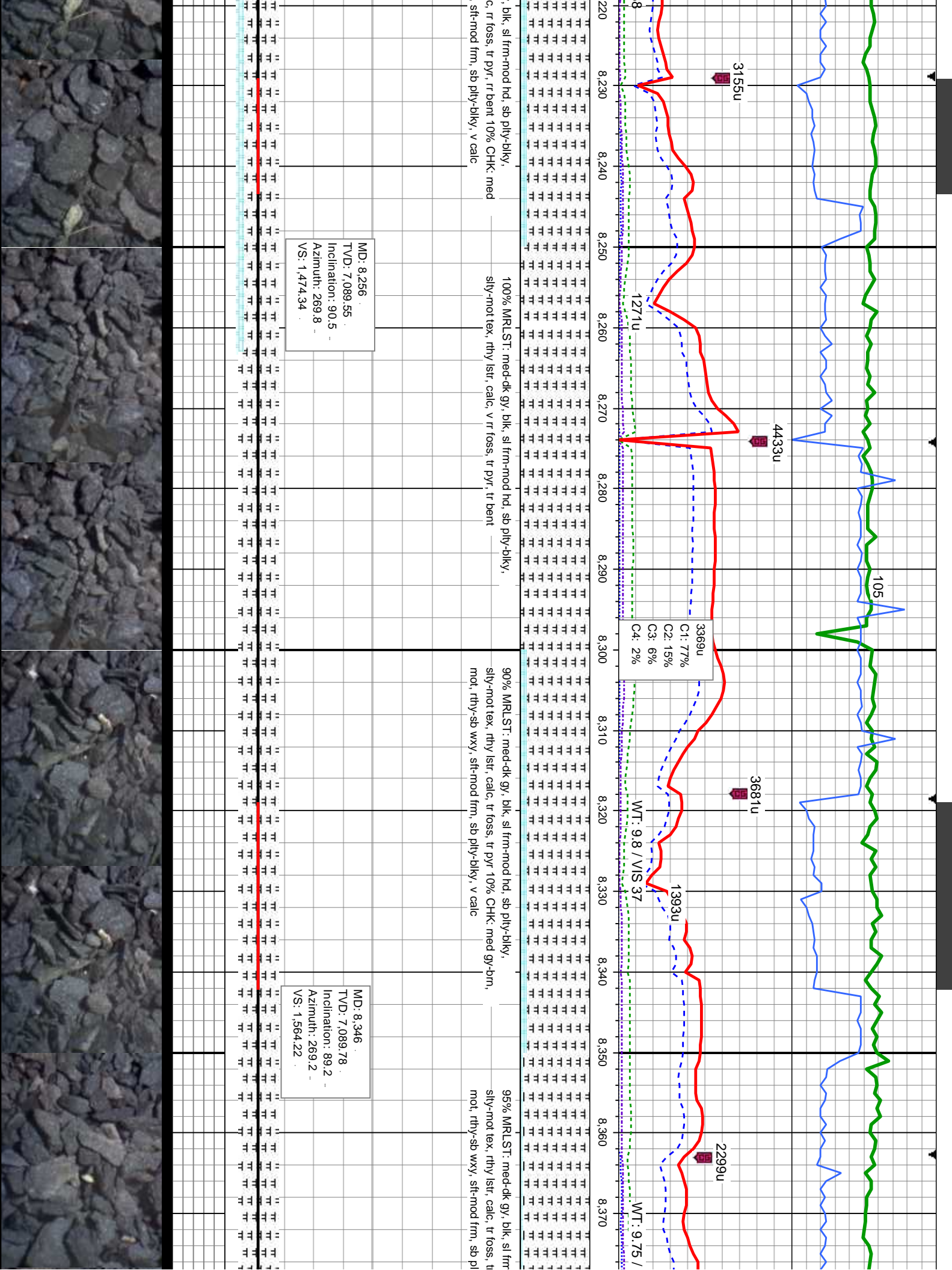


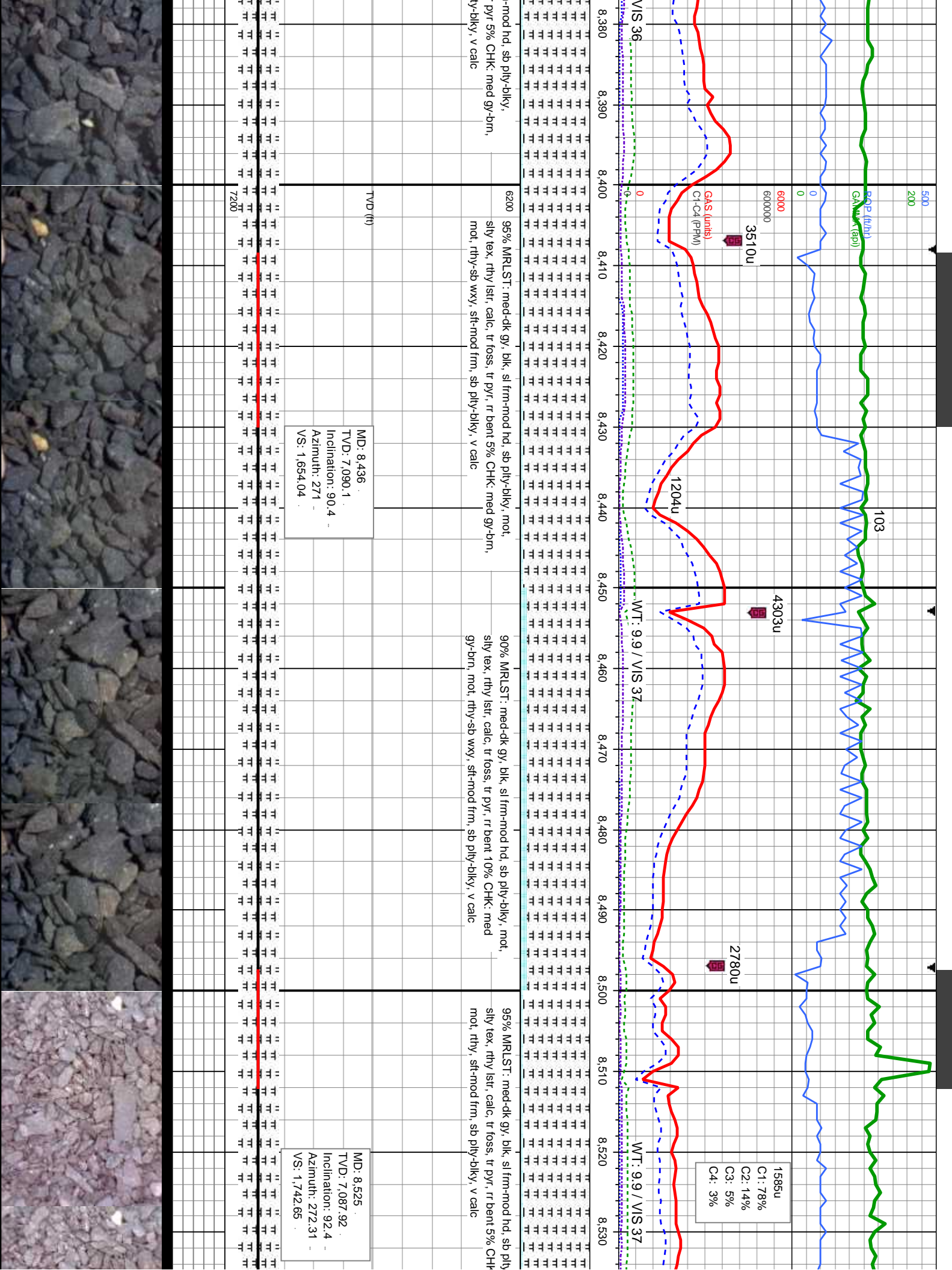
MD: 7.987
TVD: 7.084.44
Inclination: 89.4
Azimuth: 269.1
VS: 1.205.64

chalk to B marl









01/31/14

MINDEPTH

109

KOP (in)

GAMMA (api)

0

6000

600000

GAS (units)

C1 C4 (ppm)

2357u

432u

WT: 9.95 / VIS 38

2788u

960u

3277u

1157u

WT: 9.95 / VIS 37

2377u

AI

FI

blky, mot
med gy-brn,
95% MRSLT: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
sily tex, rthy lstf, calc, tr foss, tr pyr, tr bent 5% CHK: med gy-brn,
mot, rthy, slt-mod frm, sb ply-blky, v calc

6200
100% MRSLT: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
sily tex, rthy lstf, calc, tr foss, tr pyr, abnt bent, tr chk

100% MRSLT: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
sily tex, rthy lstf, calc, tr foss, tr pyr, abnt bent

TVD (ft)

MD: 8.615
TVD: 7.084.94
Inclination: 91.4
Azimuth: 271.1
VS: 1.832.22

7200



500
200
143

RQP (ft/h)
GAMMA (api)

0
60000
600000

GAS (units)
COC4 (PPM)

8,700 8,710 8,720 8,730 8,740 8,750 8,760 8,770 8,780 8,790 8,800 8,810 8,820 8,830 8,840 8,850

226u 1424u 4924u 4118u 1237u 3023u 3825u

AGITATOR CUT OFF
FROM POWER SUPPLY

100% MRLST: med-dk gy, blk, sl frm-mod hd, sb pily-blky, mot, silty tex, rthy lstf, calc, rr pyr, abnt bent

85% MRLST: med-dk gy, blk, sl frm-mod hd, sb pily-blky, mot, silty tex, rthy lstf, calc, rr pyr 15% BENT: yel-bf, gn, cly mtx, mckln, sb pily-pily, sft, brt-frn

6200 70% MRLST: med-dk gy, blk, sl frm-mod hd, sb pily-blky, mot, silty tex, rthy lstf, calc, rr pyr 30% BENT: yel-bf, gn, cly mtx, mckln, sb pily-pily, sft, brt-frn

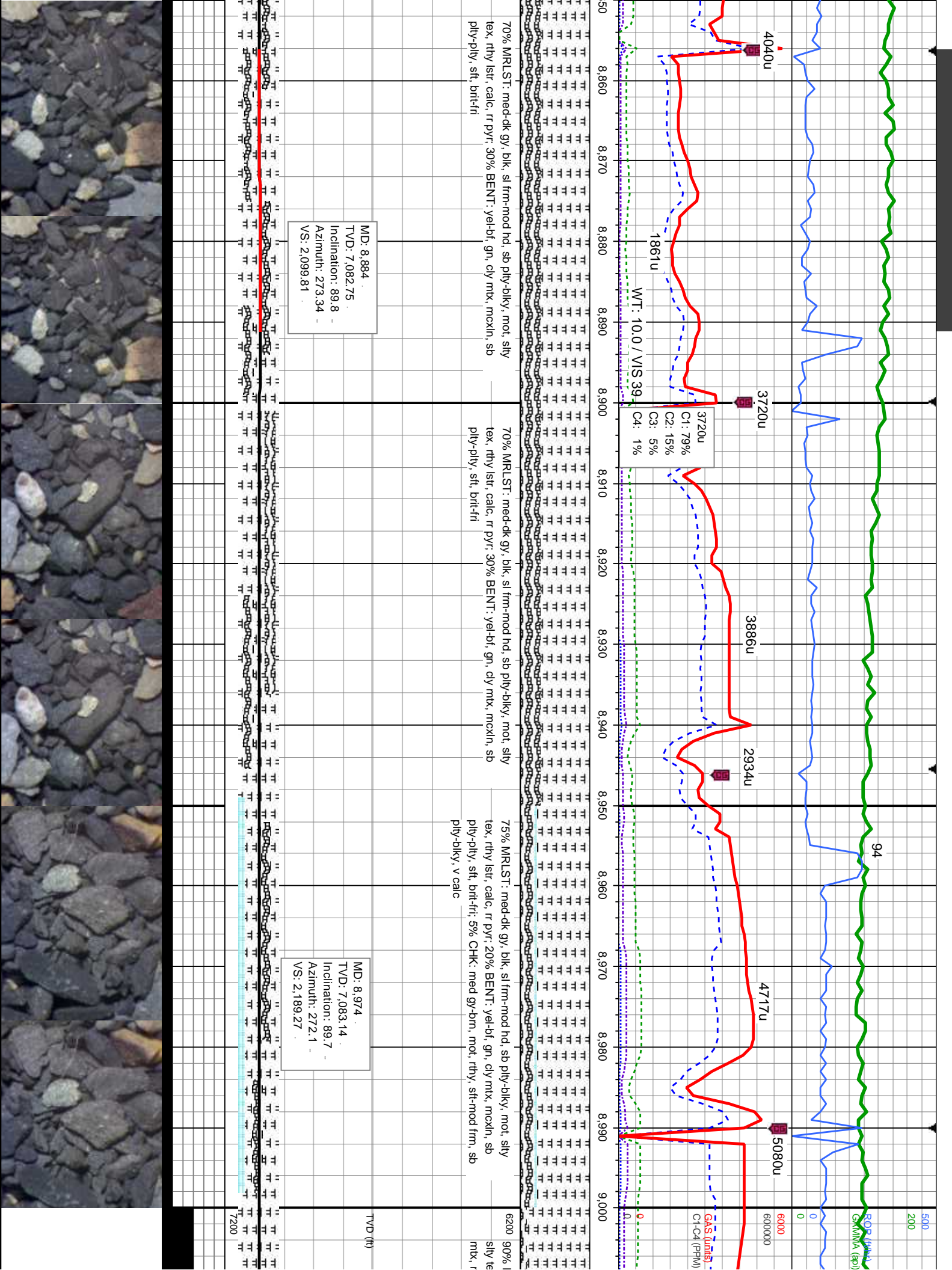
MD: 8,705
TVD: 7,083.84
Inclination: 90
Azimuth: 270.37
VS: 1,921.99

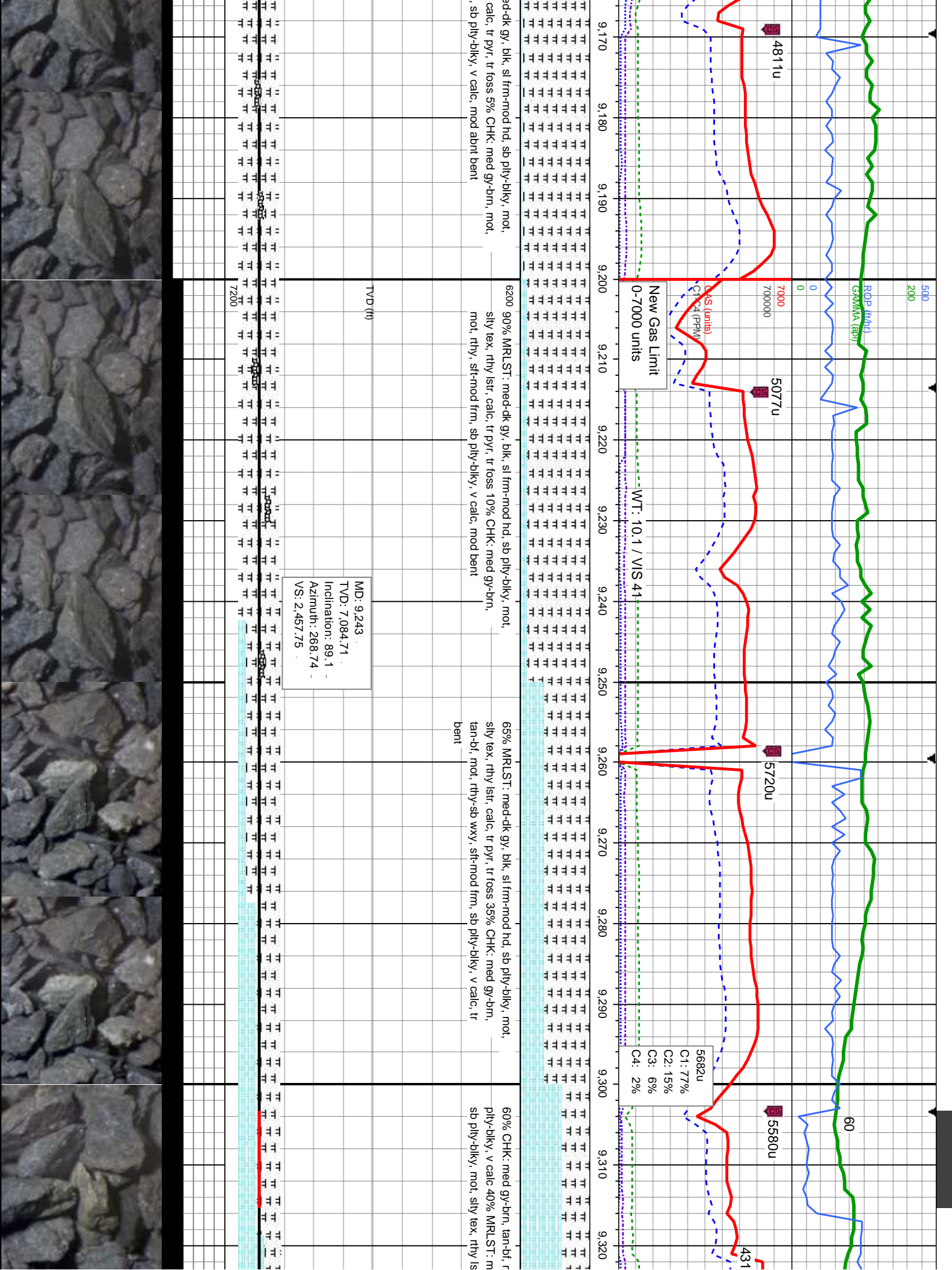
MD: 8,794
TVD: 7,083.22
Inclination: 90.8
Azimuth: 274.1
VS: 2,010.52

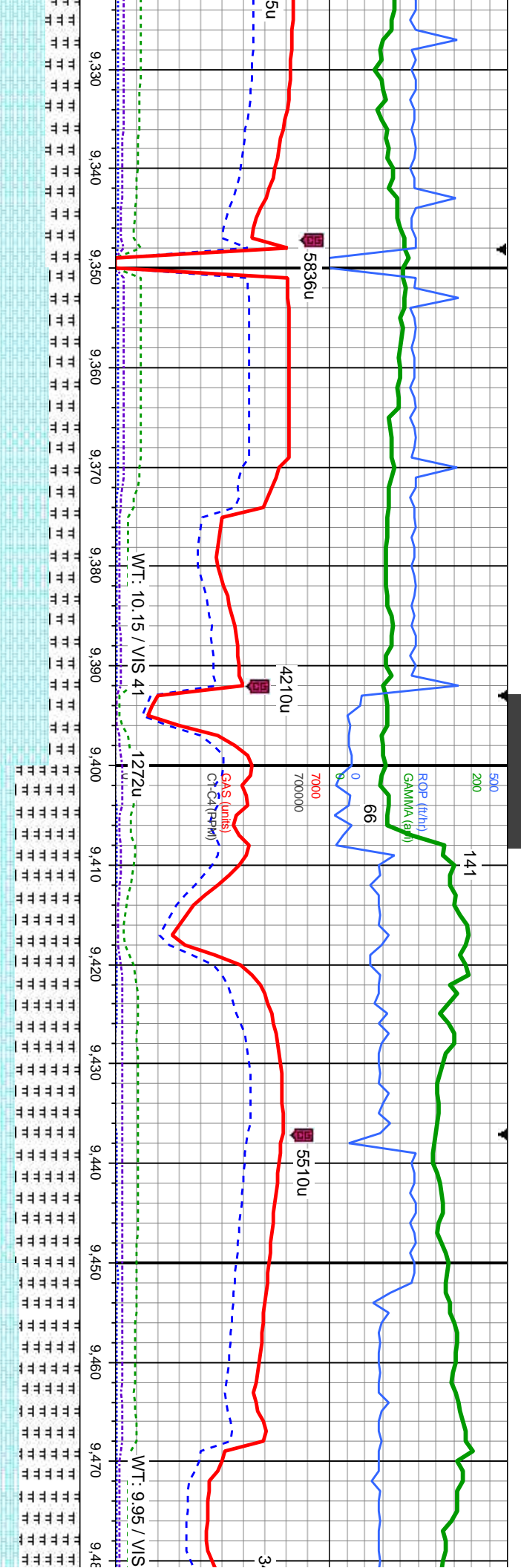
TVD (ft)

7200









not, rthy-sb wxy, sft-mod frm, sb
bed-dk gy, blk, sl frm-mod hd,
tr, calc, tr pyr, r foss, tr bent

65% CHK: lt-med gy, brn-tan-bl, mot, rthy-sb wxy, sft-mod frm,
sb ply-biky, v calc 35% MRLST: med-dk gy, blk, sl frm-mod
hd, sb ply-biky, mot, silty tex, rthy lstr, calc, tr pyr, tr foss, tr
bent

6200 75% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky, mot,
silty tex, rthy lstr, calc, tr pyr, tr foss, mod abnt bent 25% CHK:
lt-med gy, gy brn, mot, rthy-sb wxy, sft-mod frm, sb ply-biky, v
calc

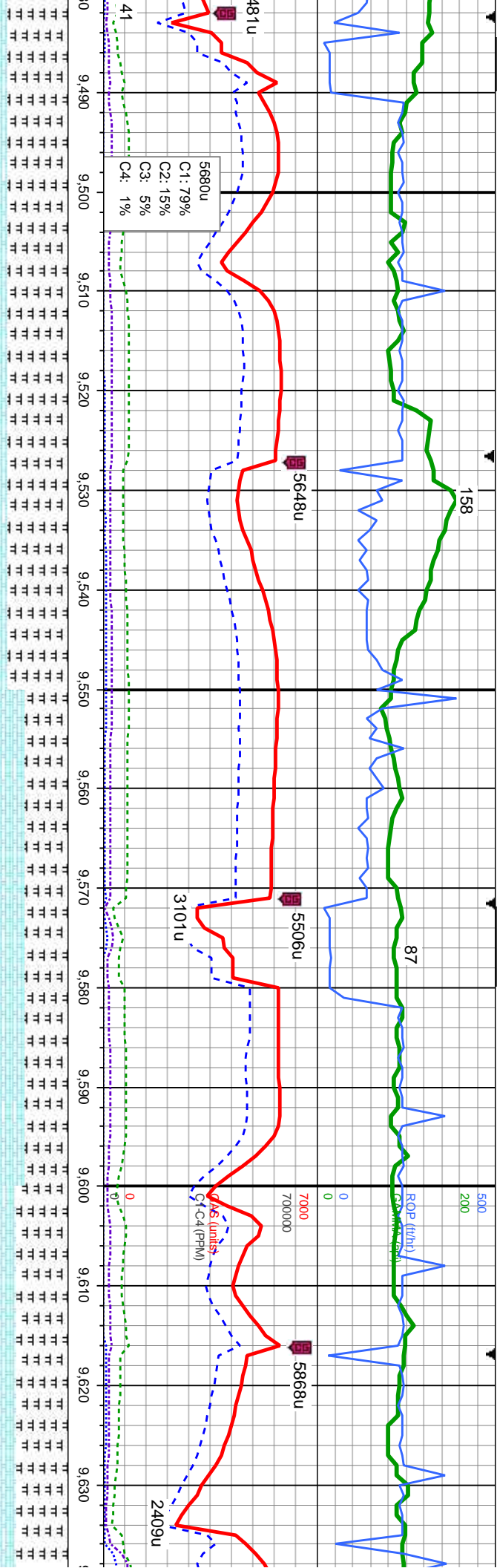
70% MRLST: med-dk gy, blk, sl frm-mod
silty tex, rthy lstr, calc, tr pyr, tr foss, m
lt-med gy, gy brn, mot, rthy-sb wxy, sft
calc

MD: 9.333
TVD: 7.085.97
Inclination: 89.3
Azimuth: 269.8
VS: 2.547.63

MD: 9.422
TVD: 7.085.81
Inclination: 90.9
Azimuth: 270.43
VS: 2.636.46

U/D Fault C chalk to B marl





mod hd, sb ply-bkly, mot, ad abnt bent 30% CHK: mot frm, sb ply-bkly, v

70% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstf, calc, tr pyr, tr bent 30% CHK: lt-med gy, gy brn, occ wh spec, mot, rthy-sb wxy, stf-mod frm, sb ply-bkly, v calc

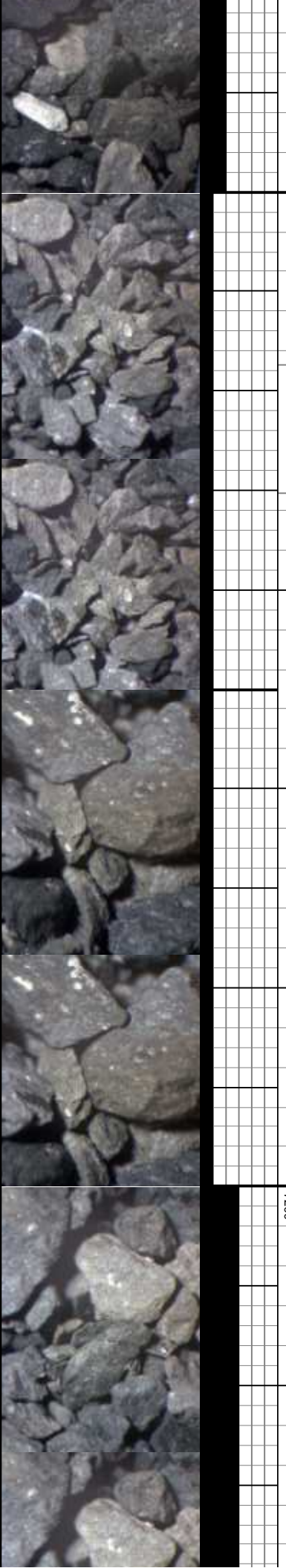
50% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstf, calc, tr pyr, tr bent 50% CHK: lt-med gy, gy brn, occ wh spec, mot, rthy-sb wxy, stf-mod frm, sb ply-bkly, v calc, intbd ip wi marl

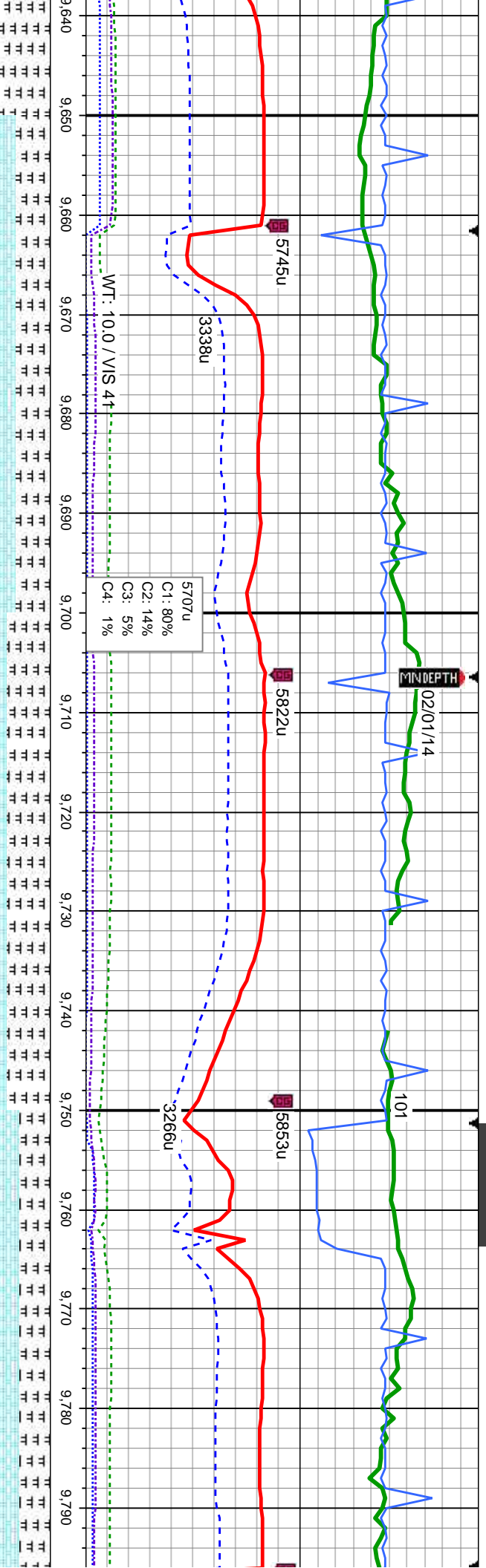
6200 60% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstf, calc, tr pyr, tr bent 40% CHK: gy, gy brn, occ wh spec, mot, rthy-sb wxy, stf-mod frm, ply-bkly, v calc, intbd ip wi marl

MD: 9,512
TVD: 7,085.1
Inclination: 90
Azimuth: 270.1
VS: 2,726.26

MD: 9,602
TVD: 7,084.4
Inclination: 90.9
Azimuth: 269.21
VS: 2,816.12

Potential Fault





60% CHK: lt-med gy, brn-gy brn, occ wh spec, mot, rthy-sb
wxy, sft-mod frm, sb ply-blky, v calc, inbd ip wi marl 40%
MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty
tex, rthy lst, calc, tr pyr, tr foss, rr bent

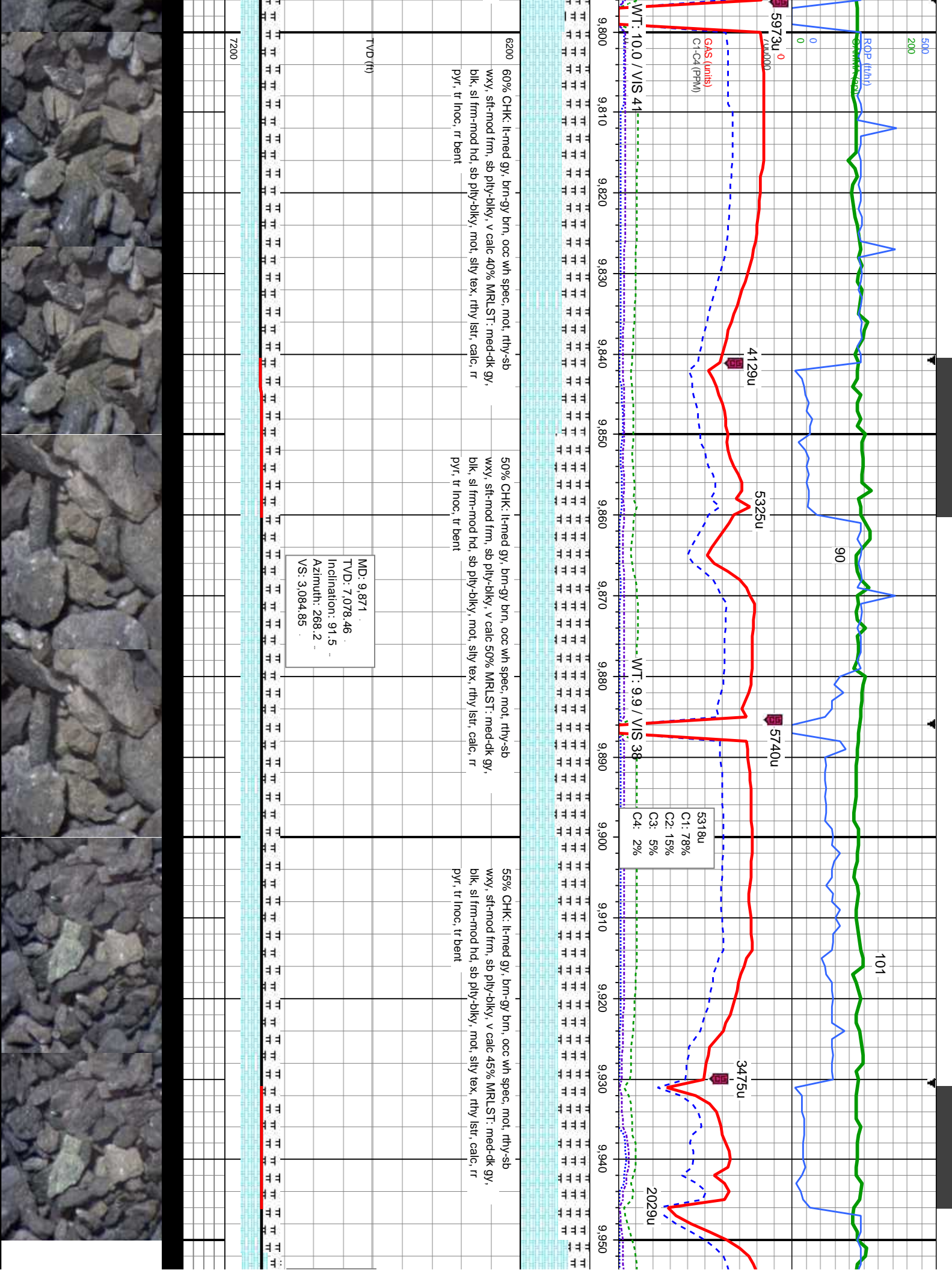
50% CHK: lt-med gy, brn-gy brn, occ wh spec, mot, rthy-sb
wxy, sft-mod frm, sb ply-blky, v calc, inbd ip wi marl 50%
MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty
tex, rthy lst, calc, tr pyr, tr foss, rr bent

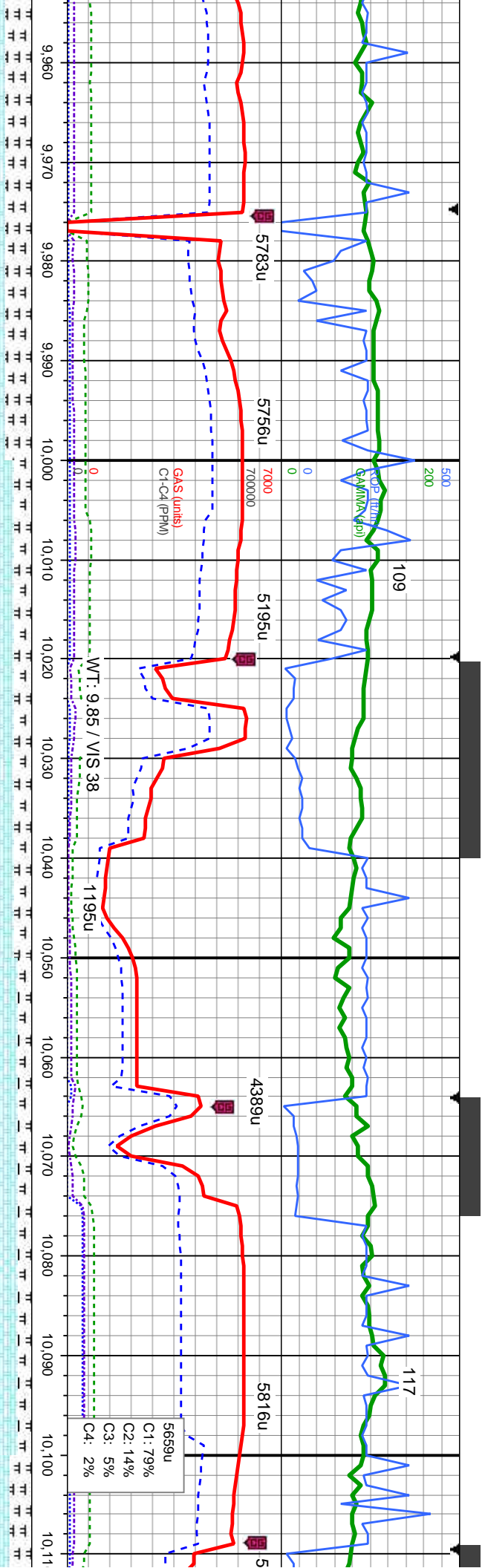
65% CHK: lt-med gy, brn-gy brn, occ wh spec, mot, rthy-sb
wxy, sft-mod frm, sb ply-blky, v calc 35% MRLST: med-dk gy,
blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lst, calc, rr
pyr, tr inoc, rr bent

MD: 9.691
TVD: 7.081.99
Inclination: 92.2
Azimuth: 269.4
VS: 2.904.98

MD: 9.781
TVD: 7.079.95
Inclination: 90.4
Azimuth: 267.64
VS: 2.994.9







70% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb ply-bkly, v calc 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstr, calc, tr pyr, tr inoc, tr bent

620%80% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb ply-bkly, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstr, calc, tr inoc, tr bent

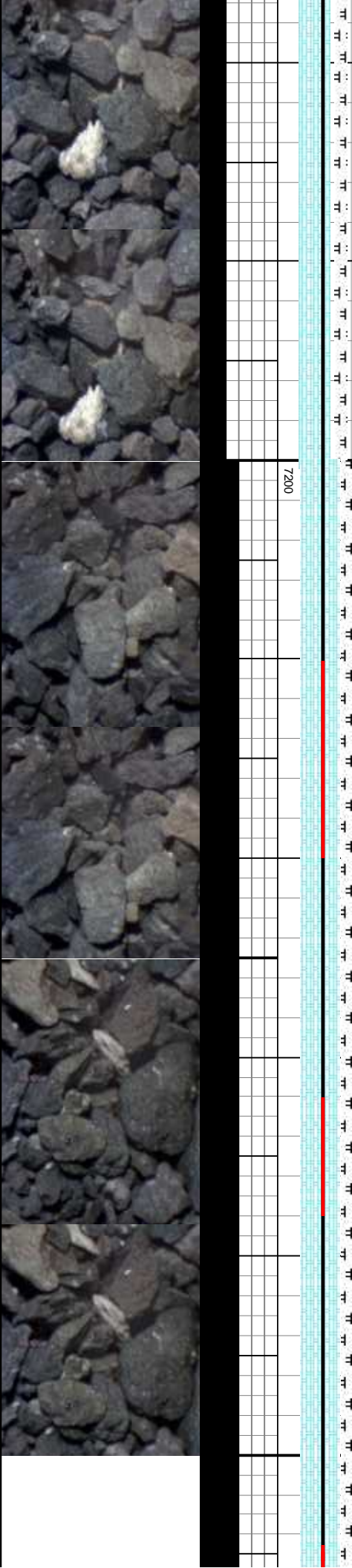
85% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb ply-bkly, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lstr, calc, tr inoc, tr bent

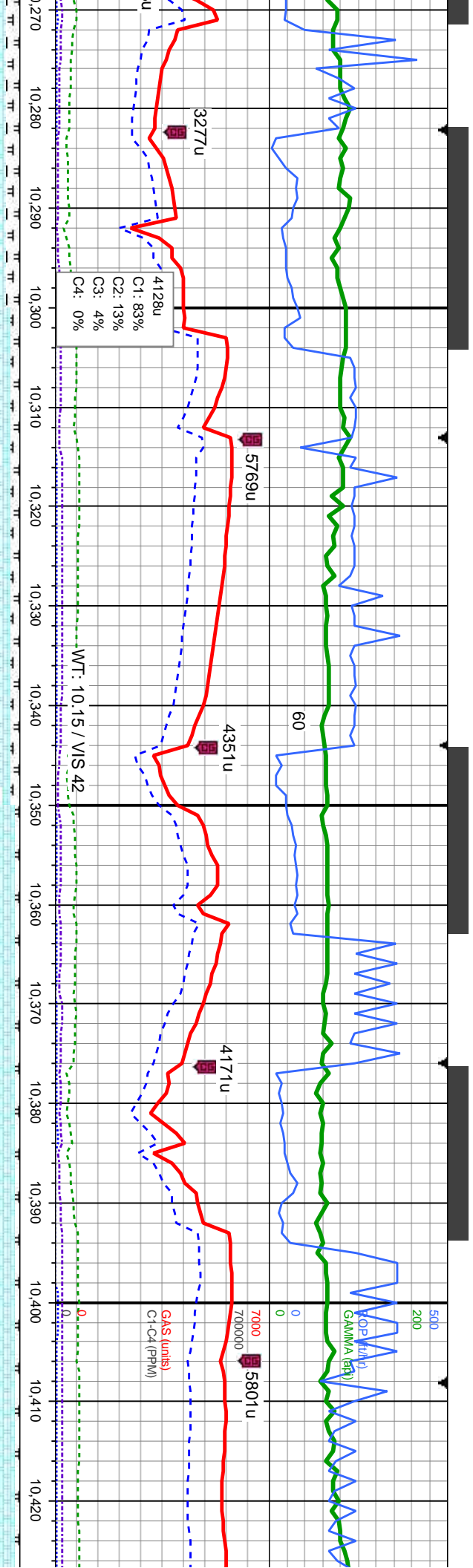
75% CHK: lt-r

MD: 9.960
TVD: 7.076.2
Inclination: 91.4
Azimuth: 268.16
VS: 3.173.79

TVD (ft)

MD: 10.050
TVD: 7.075.1
Inclination: 90
Azimuth: 266.78
VS: 3.263.77



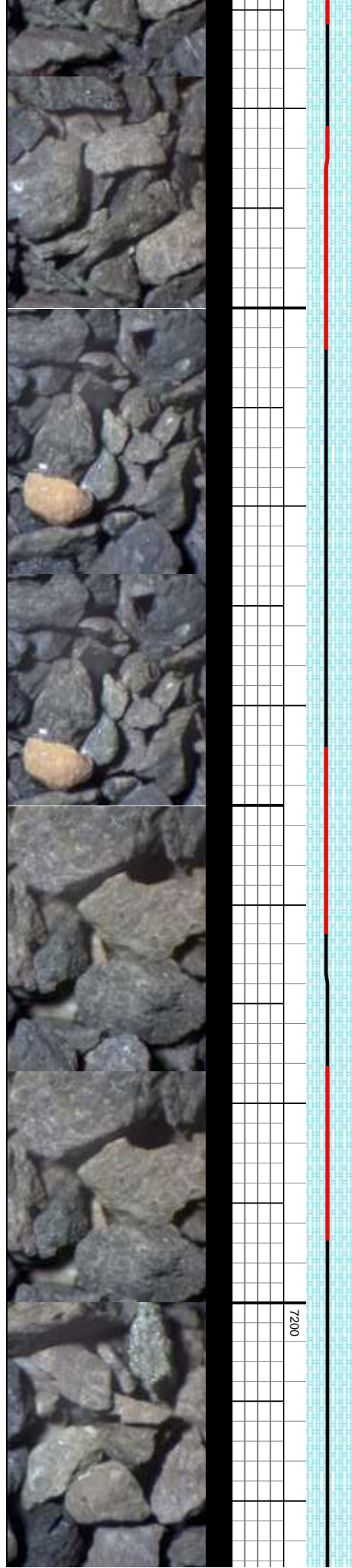


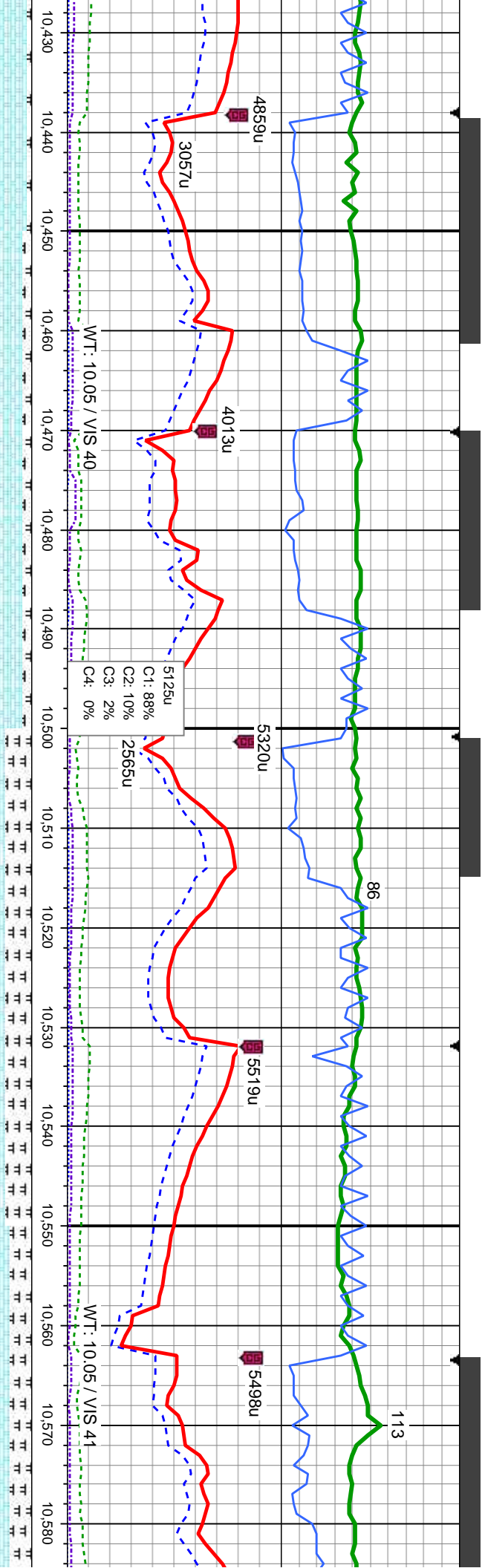
62% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy istr, calc, v tr inoc

90% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy istr, calc, v tr inoc

95% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 5% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy istr, calc, tr bent, v tr inoc

62% 95% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 5% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy istr, calc, tr





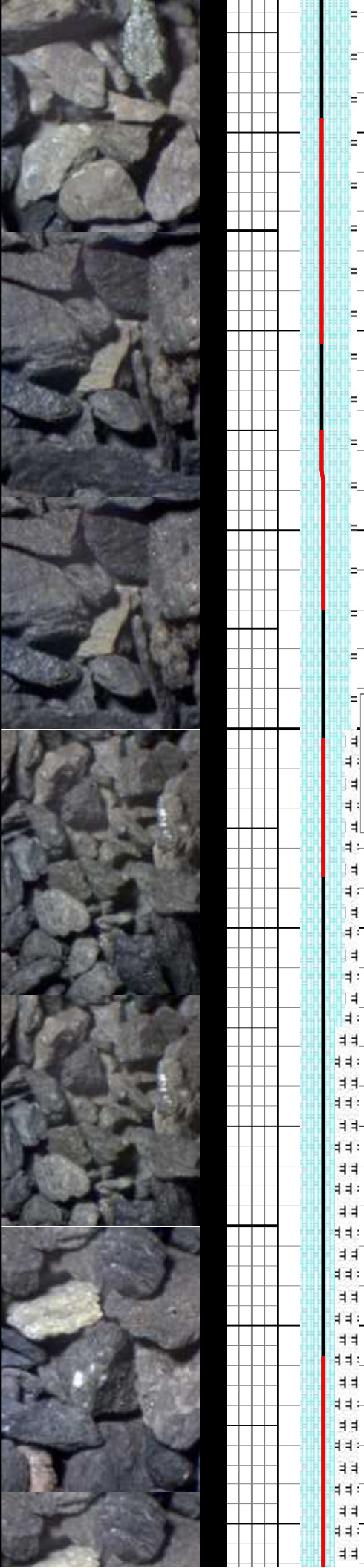
rtty-sb wxy, sft-mod frm, sb
gy, blk, sl frm-mod hd, sb
bent, v tr inoc

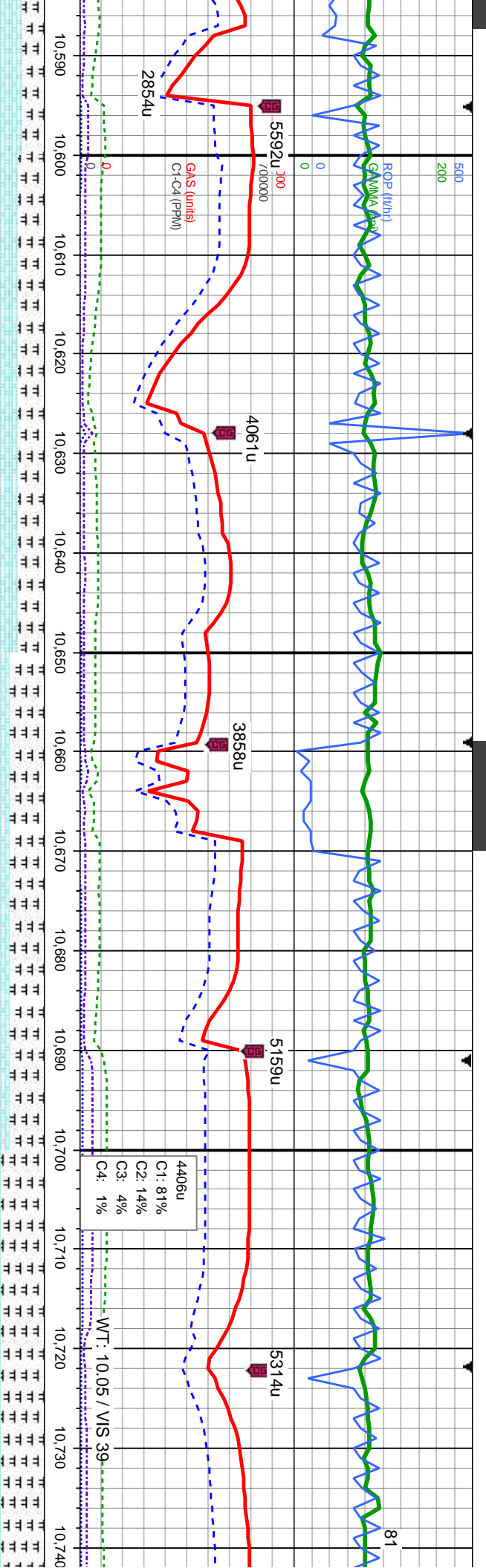
90% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc, 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr bent, v tr inoc

70% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc, 30% MRLST: med-dk gy, gy brn-blk, sl frm-mod hd,
sb ply-blky, mot, silty tex, rthy lstr, calc, tr bent, tr inoc, rr pyr

75% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy
ply-blky, v calc, 25% MRLST: med-dk gy, gy brn-blk
sb ply-blky, mot, silty tex, rthy lstr, calc, tr bent, tr l

MD: 10.503
TVD: 7.0776
Inclination: 92.3
Azimuth: 269.93
VS: 3.71391





MD: 10.597
TVD: 7,075.55
Inclination: 90.2
Azimuth: 270
VS: 3,807.71

sft-mod frm, sb
ply-biky, v calc: 30% MRLST: med-dk gy, gy brn-bik, sl frm-mod hd,
noc, rr pyr

6200 70% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 30% MRLST: med-dk gy, gy brn-bik, sl frm-mod hd,
sb ply-biky, mot, silty tex, rthy lstr, calc, tr bent, tr inoc, rr pyr

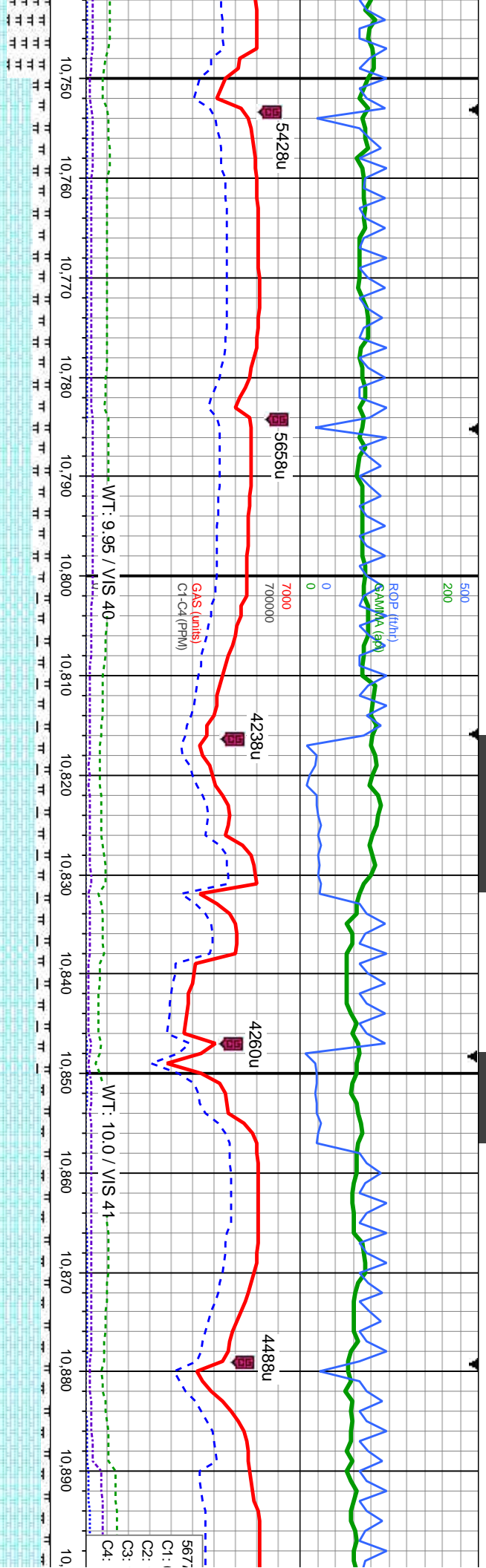
60% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 40% MRLST: med-dk gy, gy brn-bik, sl frm-mod
hd, sb ply-biky, mot, silty tex, rthy lstr, calc, mod abnt bent, tr
inoc, rr pyr

MD: 10.692
TVD: 7,075.71
Inclination: 89.6
Azimuth: 270.48
VS: 3,902.51

50% CHK: lt-med gy, brn-gy brn, mot, rthy-sb wxy, sft-mod frm
ply-biky, v calc: 50% MRLST: med-dk gy, gy brn-bik, sl frm-n
hd, sb ply-biky, mot, silty tex, rthy lstr, calc, mod abnt bent, tr
inoc, rr pyr

7200





80% CHK: wh-lt-gy, med gy-brn, occ bf, mot, rthy-wxy, sft-mod frm, sb pily-blky, v calc; 20% MRLST: med-dk gy, gy brn-blk, sl frm-mod hd, sb pily-blky, mot, sily tex, rthy lstr, calc, tr inoc, r pyr, rr bent

MD: 10,786
TVD: 7,075.47
Inclination: 90.7
Azimuth: 269.4
VS: 3,996.33

6200 85% CHK: wh-lt-gy, med gy-brn, occ bf, mot, rthy-wxy, sft-mod frm, sb pily-blky, v calc; 15% MRLST: med-dk gy, gy brn-blk, sl frm-mod hd, sb pily-blky, mot, sily tex, rthy lstr, calc, tr inoc, r pyr, rr bent

TVD (ft)

7200

90% CHK: wh-lt-gy, brn-crm-bl, mot, rthy-wxy, sft-mod frm, sb pily-blky, v calc; 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb pily-blky, mot, sily tex, rthy lstr, calc, tr inoc, rr bent

MD: 10,880
TVD: 7,075.22
Inclination: 89.6
Azimuth: 269.5
VS: 4,090.22



ROP (ft/hr)

71

5529u

4350u

2188u

5319u

4309u

5671u

CAS (Joints)

Cl-Cd (PPM)

WT: 10.0 /

WT: 10.0 /

WT: 10.0 / VIS 40

WT: 10.0 / VIS 40

80%
ply-b

90% CHK: wh-lt gy, brn-crm-bl, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy lstr, calc, tr inoc, rr bent

85% CHK: wh-lt gy, brn-crm-bl, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy lstr, calc, tr inoc, rr bent

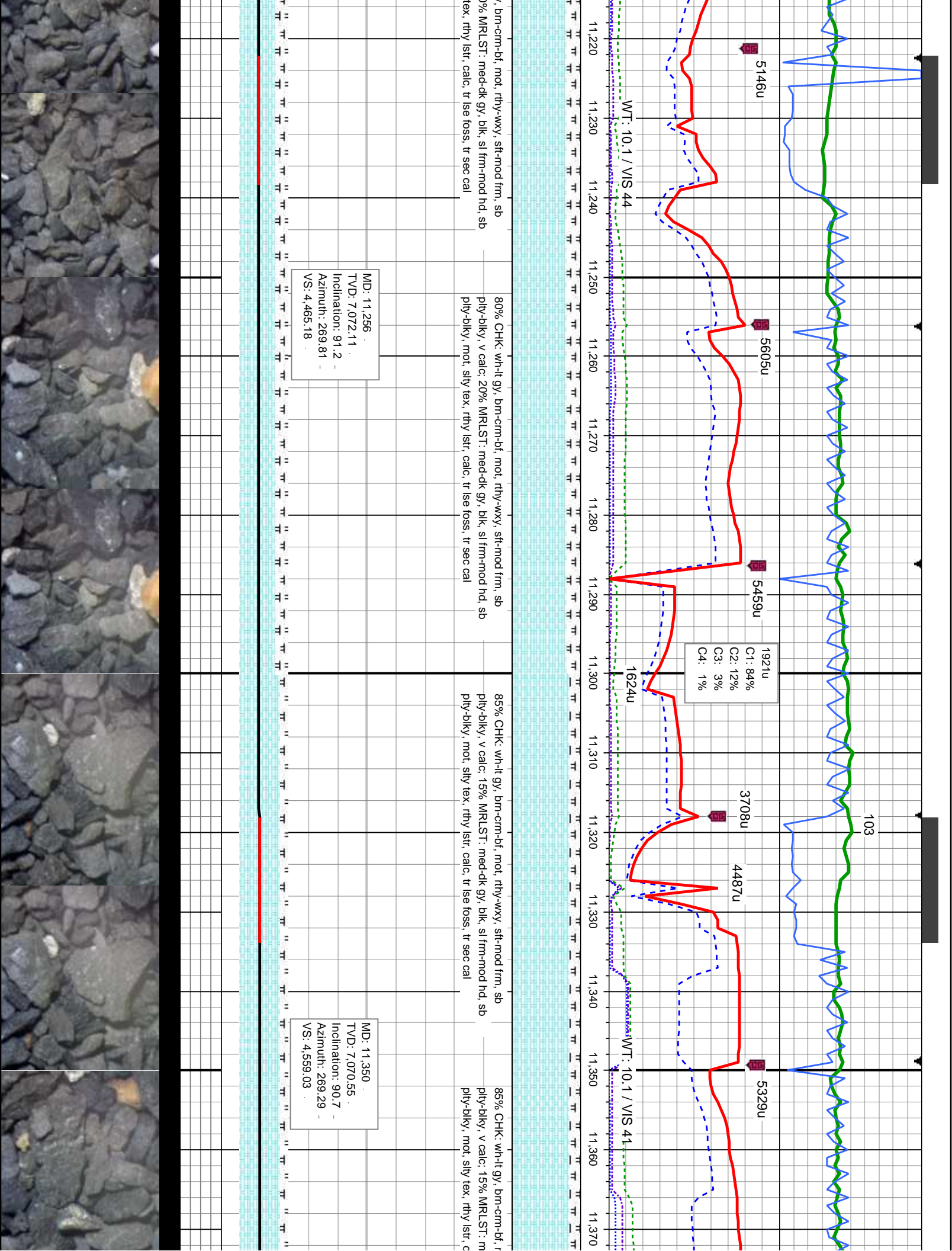
95% CHK: wh-lt gy, brn-crm-bl, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 5% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, sily tex, rthy lstr, calc, tr inoc, rr bent

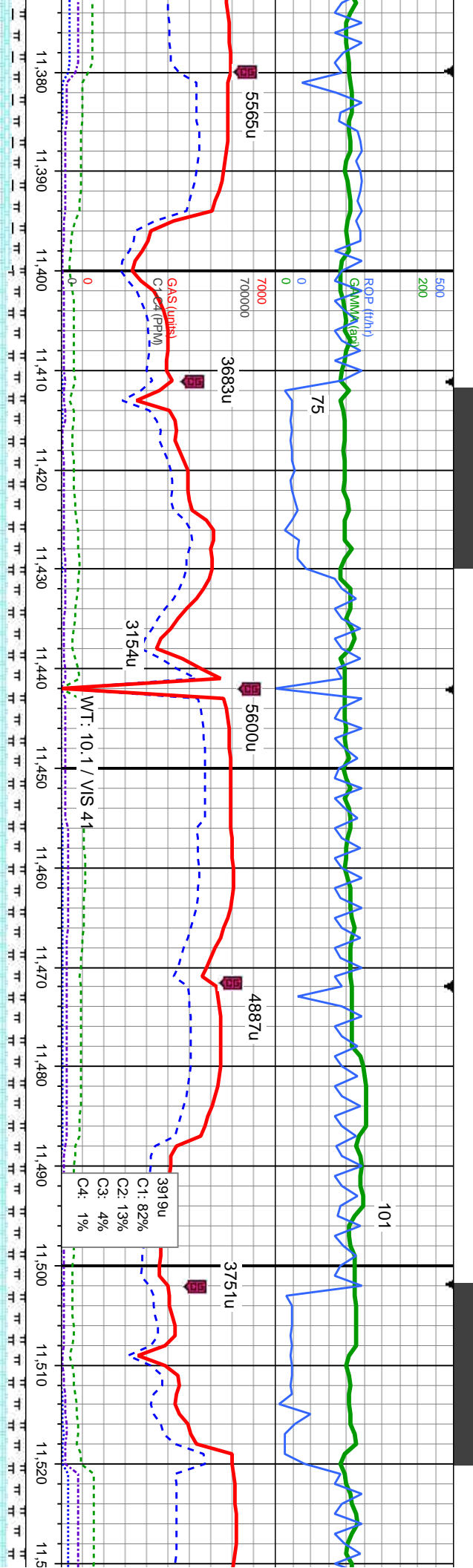
MD: 10,974
TVD: 7,076.04
Inclination: 89.4
Azimuth: 271
VS: 4,184.01

TVD (ft)

7200







mot, rthy-wxy, sft-mod frm, sb
ed-dk gy, blk, sl frm-mod hd, sb
alc, tr lse foss, tr sec cal

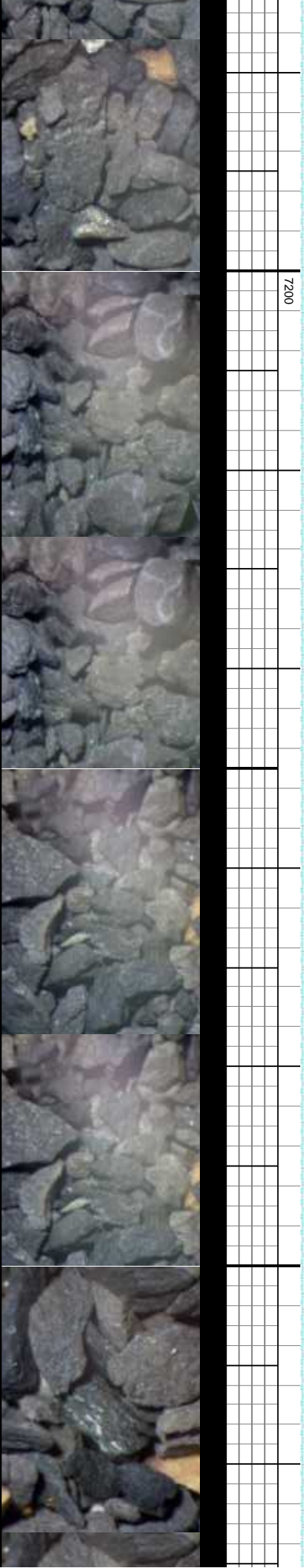
6200 80% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr sec cal, v tr inoc

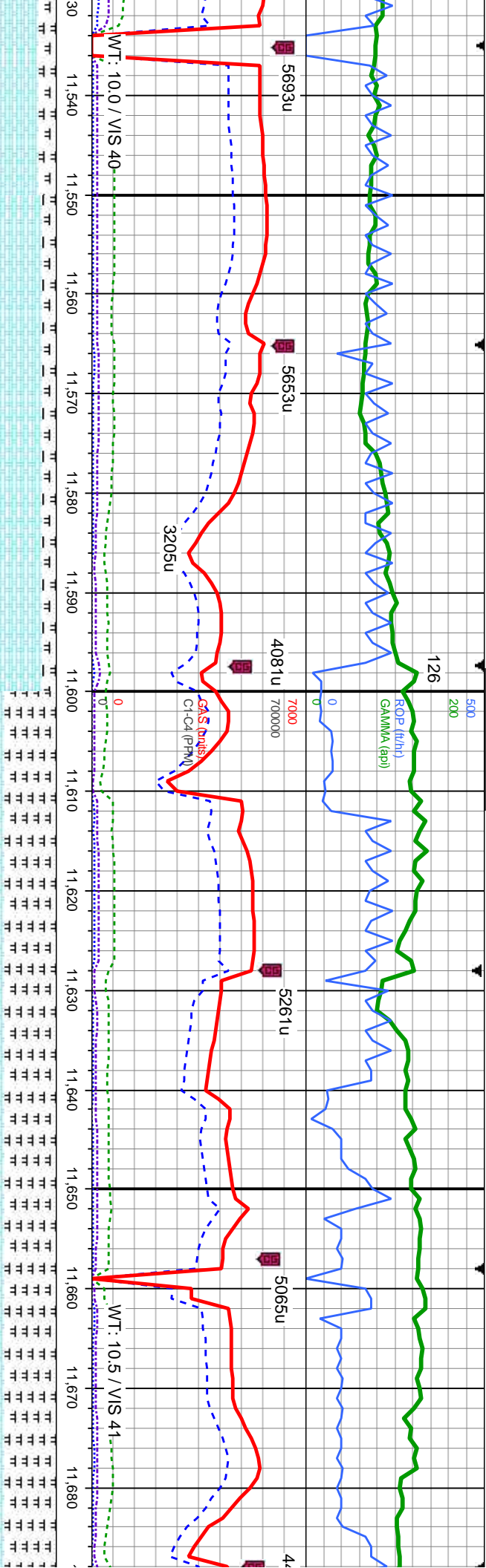
80% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr sec cal, v tr inoc

80% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr sec cal

MD: 11,442
TVD: 7,070.31
Inclination: 89.6
Azimuth: 268.61
VS: 4,650.94

ML
TV
Inc
AZ
VS





85% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-bkly, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr sec cal, v tr inoc, tr lse foss

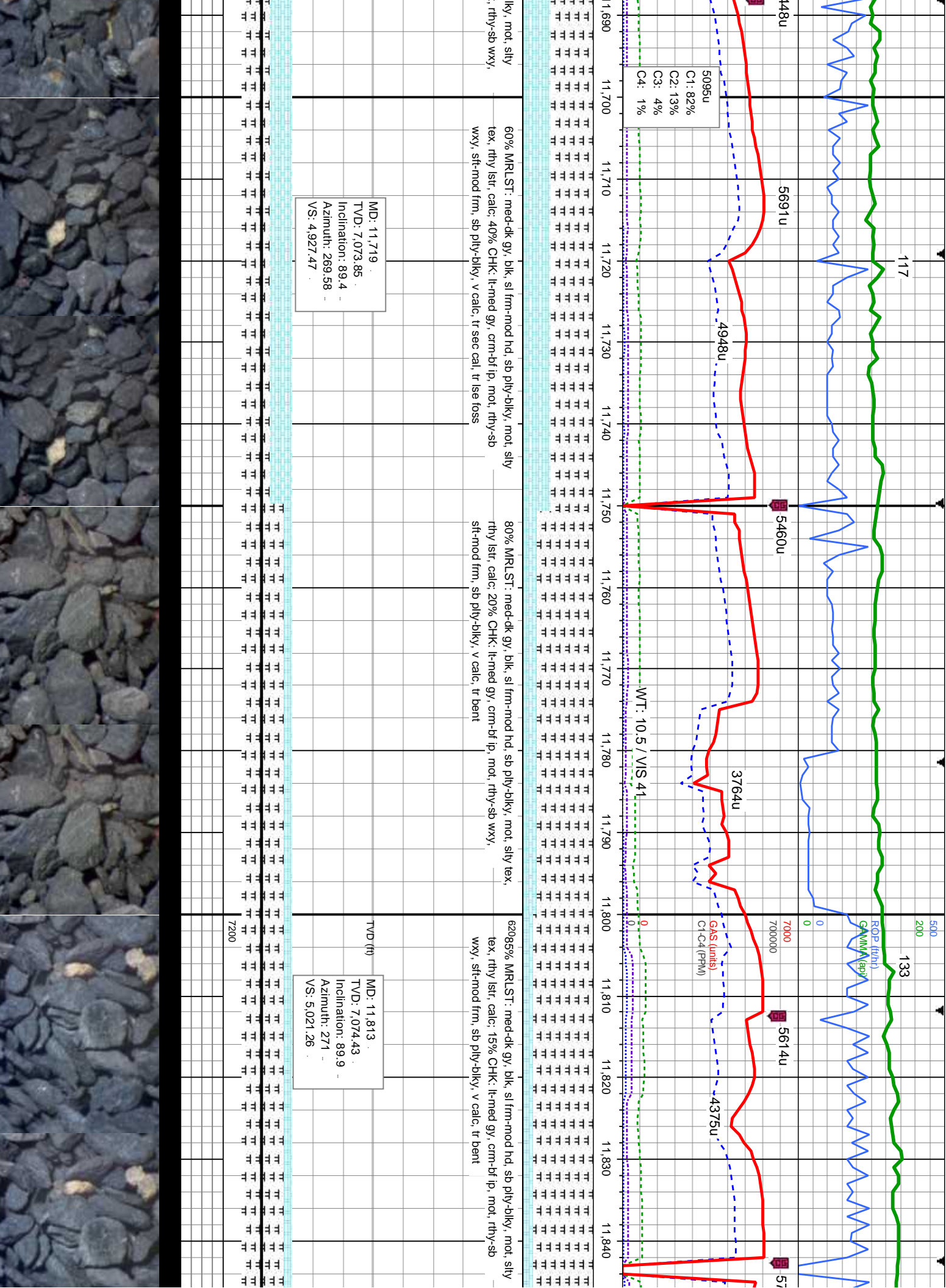
6200 60% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
tex, rthy lstr, calc: 40% CHK: lt-med gy, crm-bf ip, mot, rthy-sb
wxy, sft-mod frm, sb ply-bkly, v calc, tr sec cal, tr lse foss

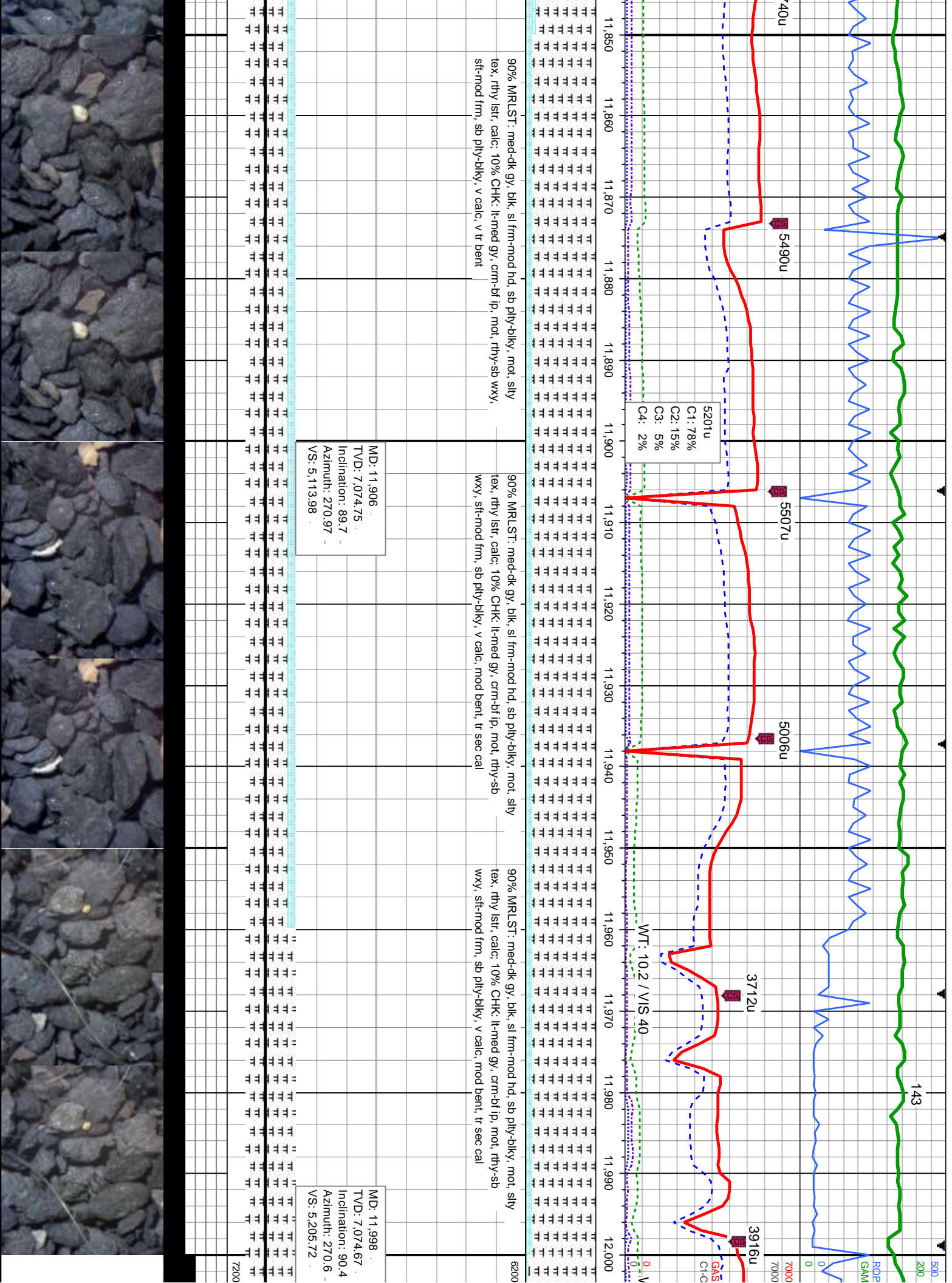
60% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-b
tex, rthy lstr, calc: 40% CHK: lt-med gy, crm-bf ip, mot
sft-mod frm, sb ply-bkly, v calc, tr sec cal, tr lse foss

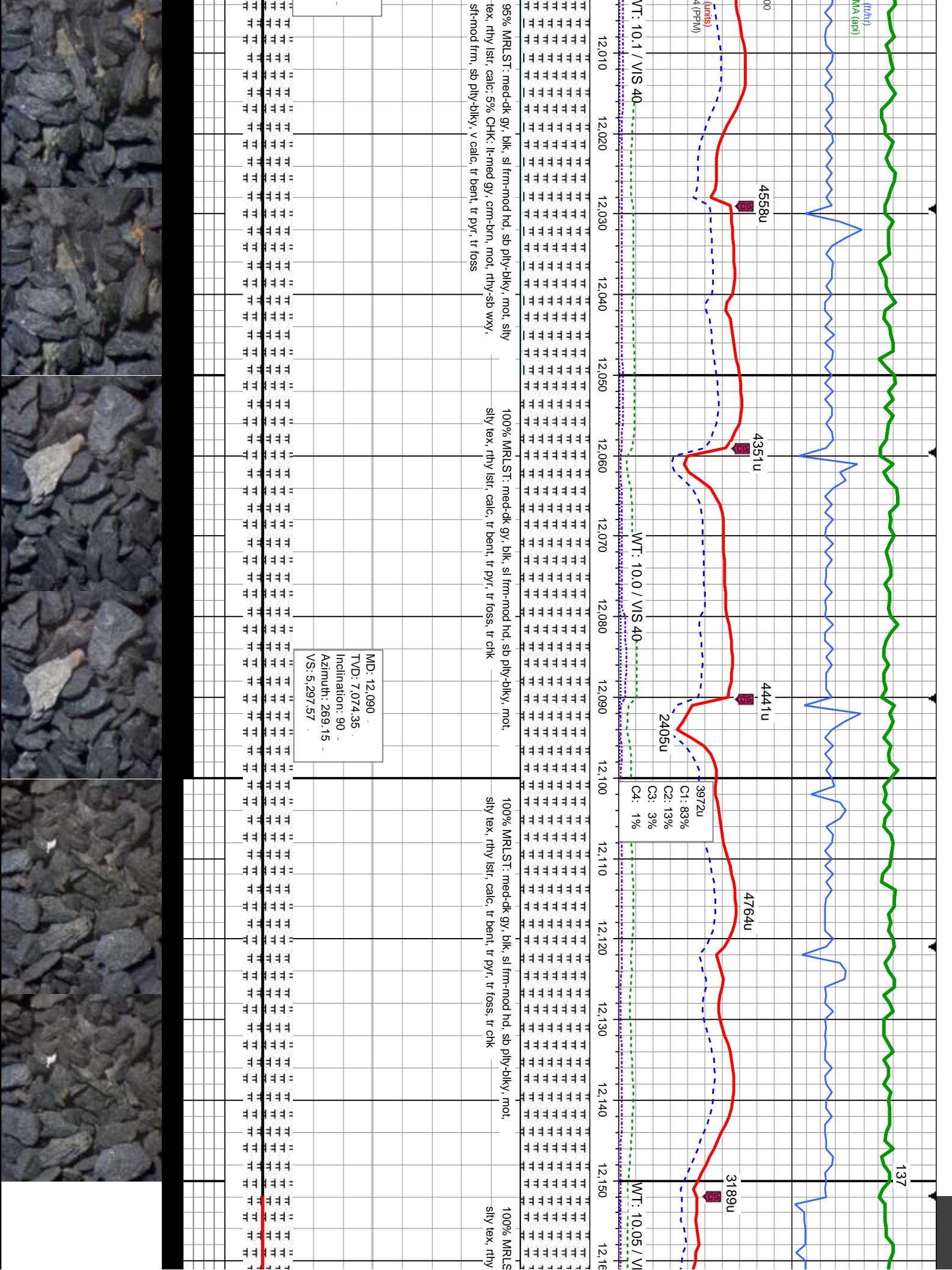
D: 11,535
D: 7,071.36
Inclination: 89.1
Azimuth: 269.7
VS: 4,743.83

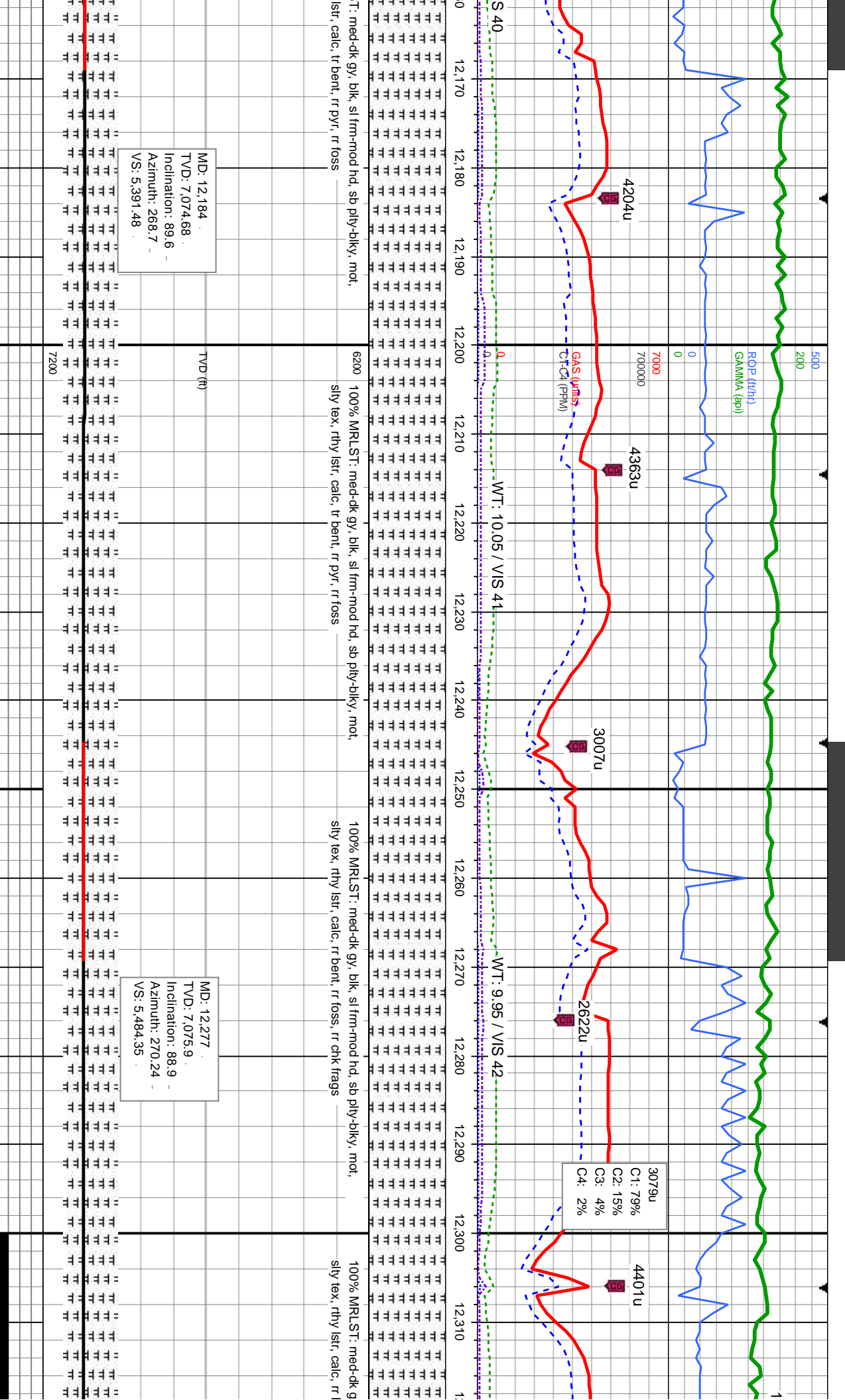
TVD (ft)
MD: 11,627
TVD: 7,072.73
Inclination: 89.2
Azimuth: 270.45
VS: 4,835.65











02/03/14

MINDEPTH

152

107
GAMMA (pp)

4864u

4859u
10000

5625u

4964u

4470u

2292u

1464u

GAS (unit)
Ct-C4 (ppm)

WT: 10.0 / VIS 40

WT: 10.0 / VIS 41

blk, sl frm-mod hd, sb ply-bkly, mot, bent, rr foss, rr chk frags
100% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lsfr, calc, tr bent, rr foss
620400% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty tex, rthy lsfr, calc, tr bent, rr foss
100% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, tex, rthy lsfr, calc, tr bent, rr foss

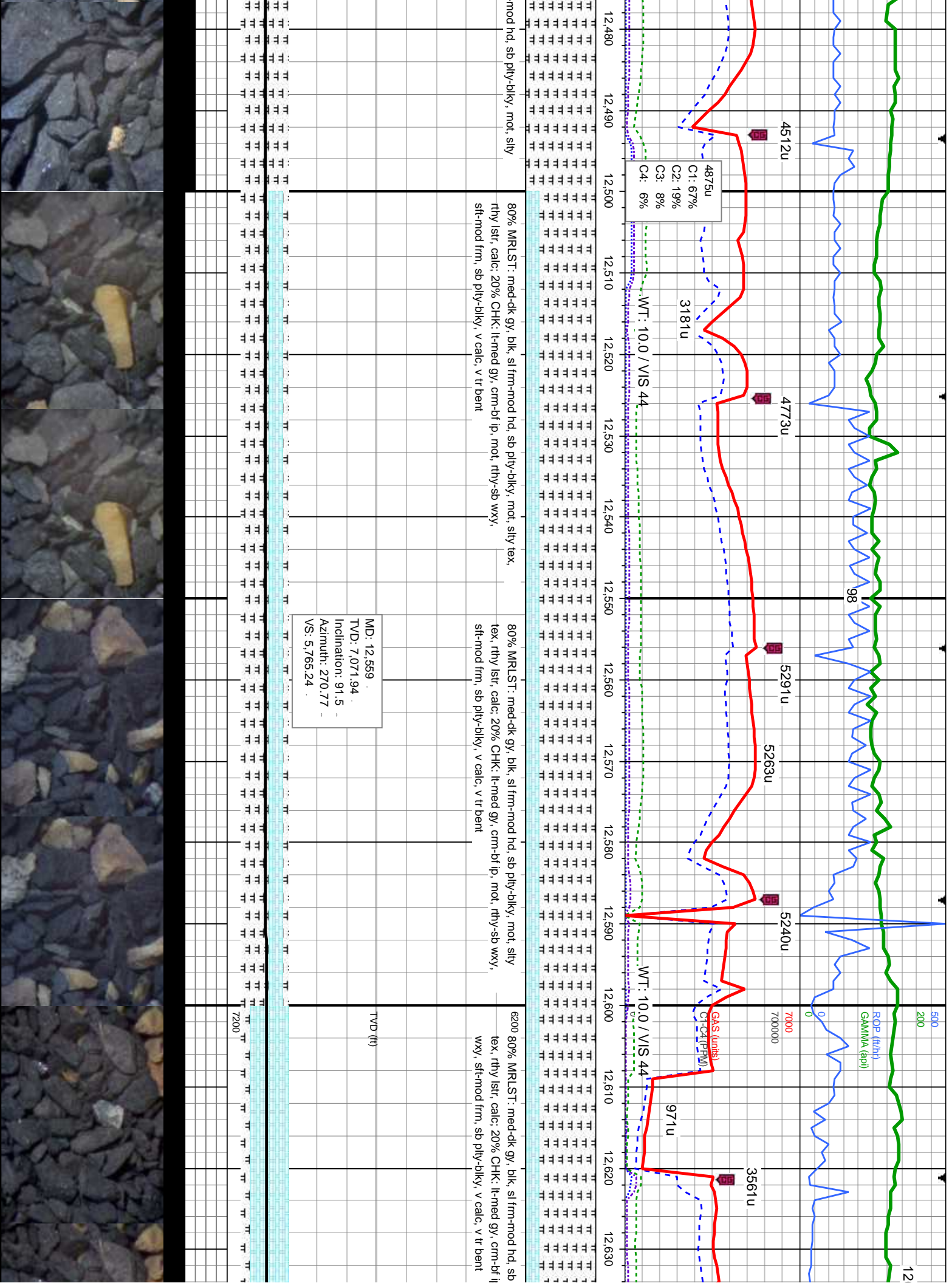
MD: 12,370
TVD: 7,075.98
Inclination: 91
Azimuth: 272.2
VS: 5,577.02

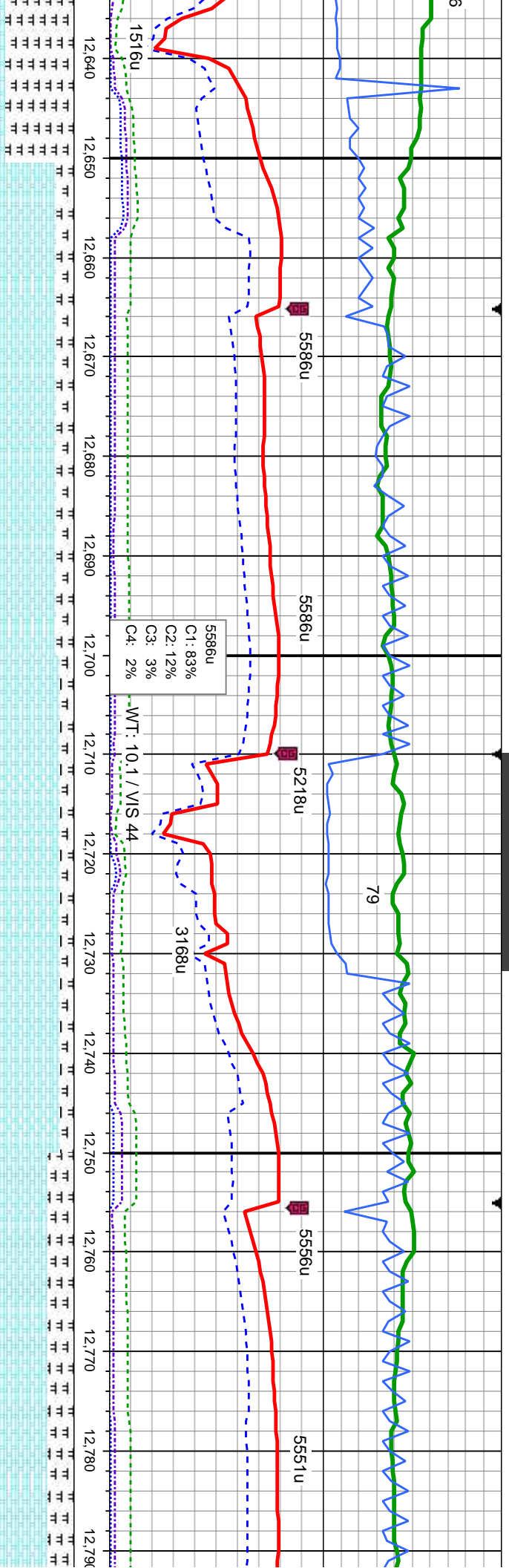
TVD (ft)

MD: 12,465
TVD: 7,074.15
Inclination: 91.2
Azimuth: 271.65
VS: 5,671.59

7200



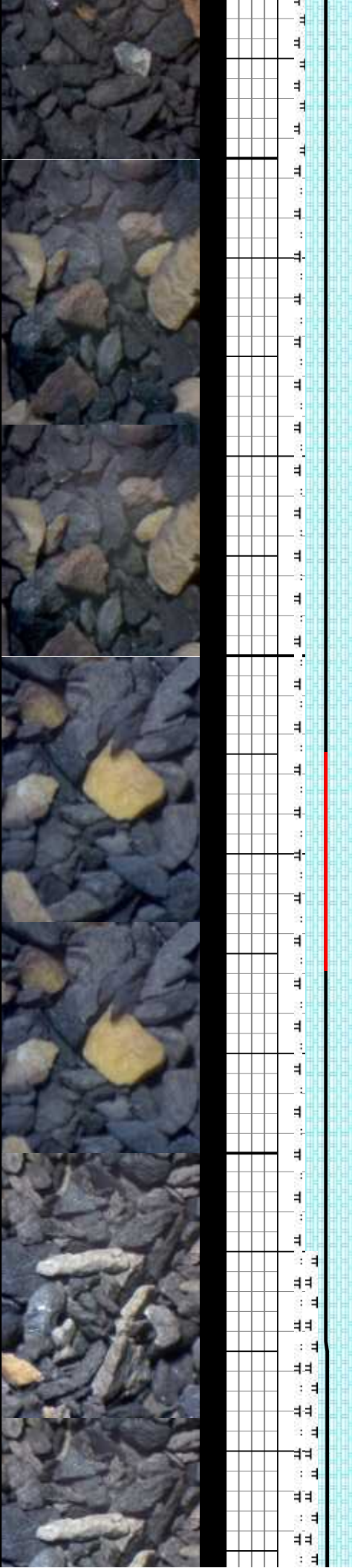


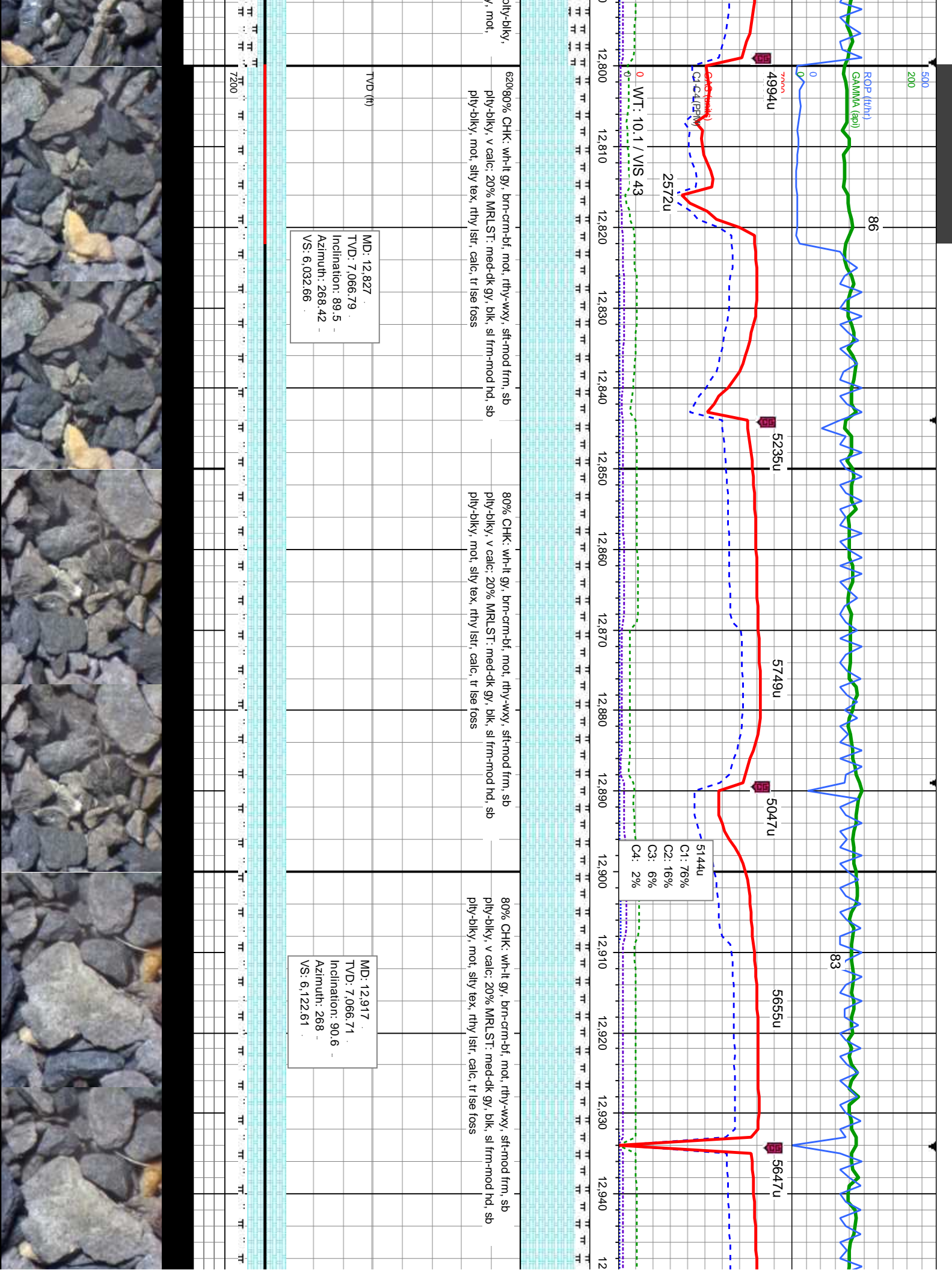


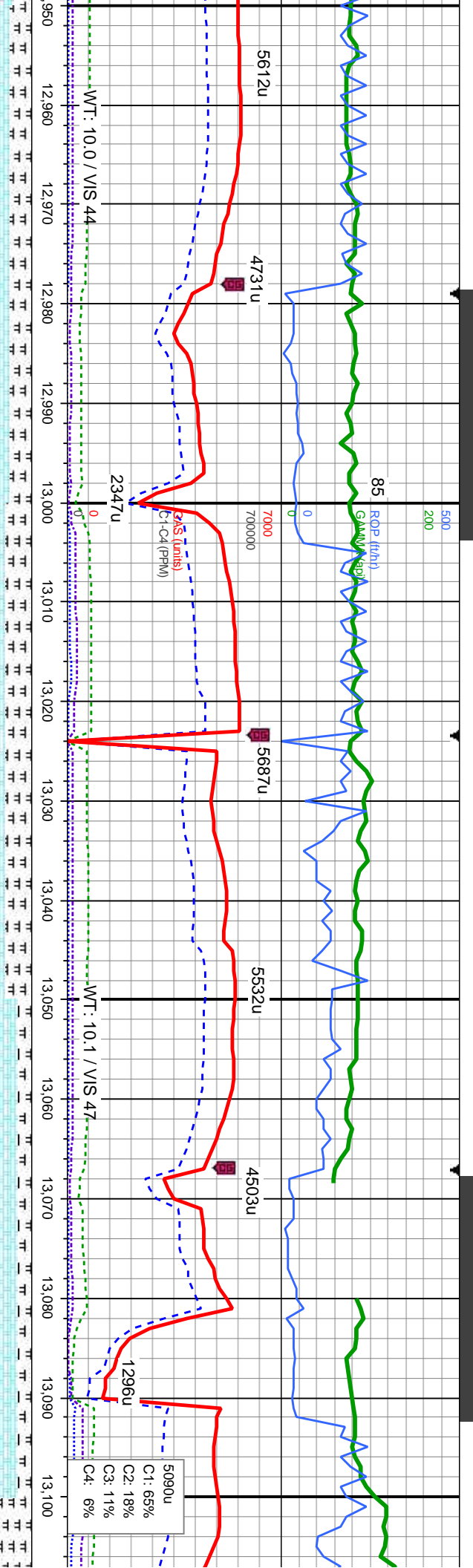
ply-biky, mot, silty
80% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-biky, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc, tr sec cal
85% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
ply-biky, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd,
sb ply-biky, mot, silty tex, rthy lstr, calc, tr sec cal
70% CHK: wh-lt gy, brn-crm-bf, mot, rthy-wxy, sft-mod frm, sb
v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky
silty tex, rthy lstr, calc, tr lse foss

MD: 12.648
TVD: 7.069.61
Inclination: 91.5
Azimuth: 270.76
VS: 5.853.96

MD: 12.738
TVD: 7.067.41
Inclination: 91.3
Azimuth: 269.52
VS: 5.943.75







75% CHK: wh-it gy, brn-cr-bf, mot, rthy-wxy, sft-mod frm, sb
ply-blky, v calc: 25% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, sily tex, rthy lstr, calc, tr lse foss, tr linc

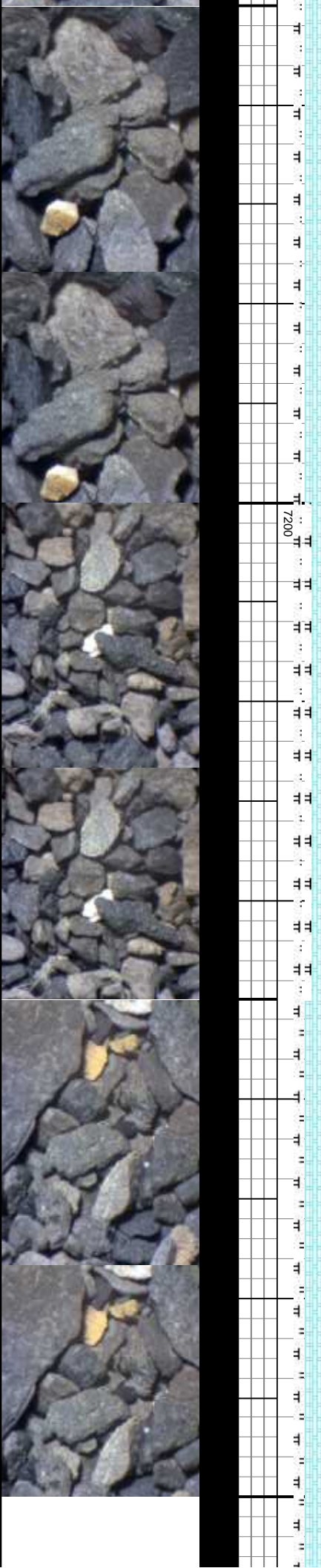
6200 70% CHK: wh-it gy, brn-cr-bf, mot, rthy-wxy, sft-mod frm, sb
ply-blky, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, sily tex, rthy lstr, calc, v tr lse foss

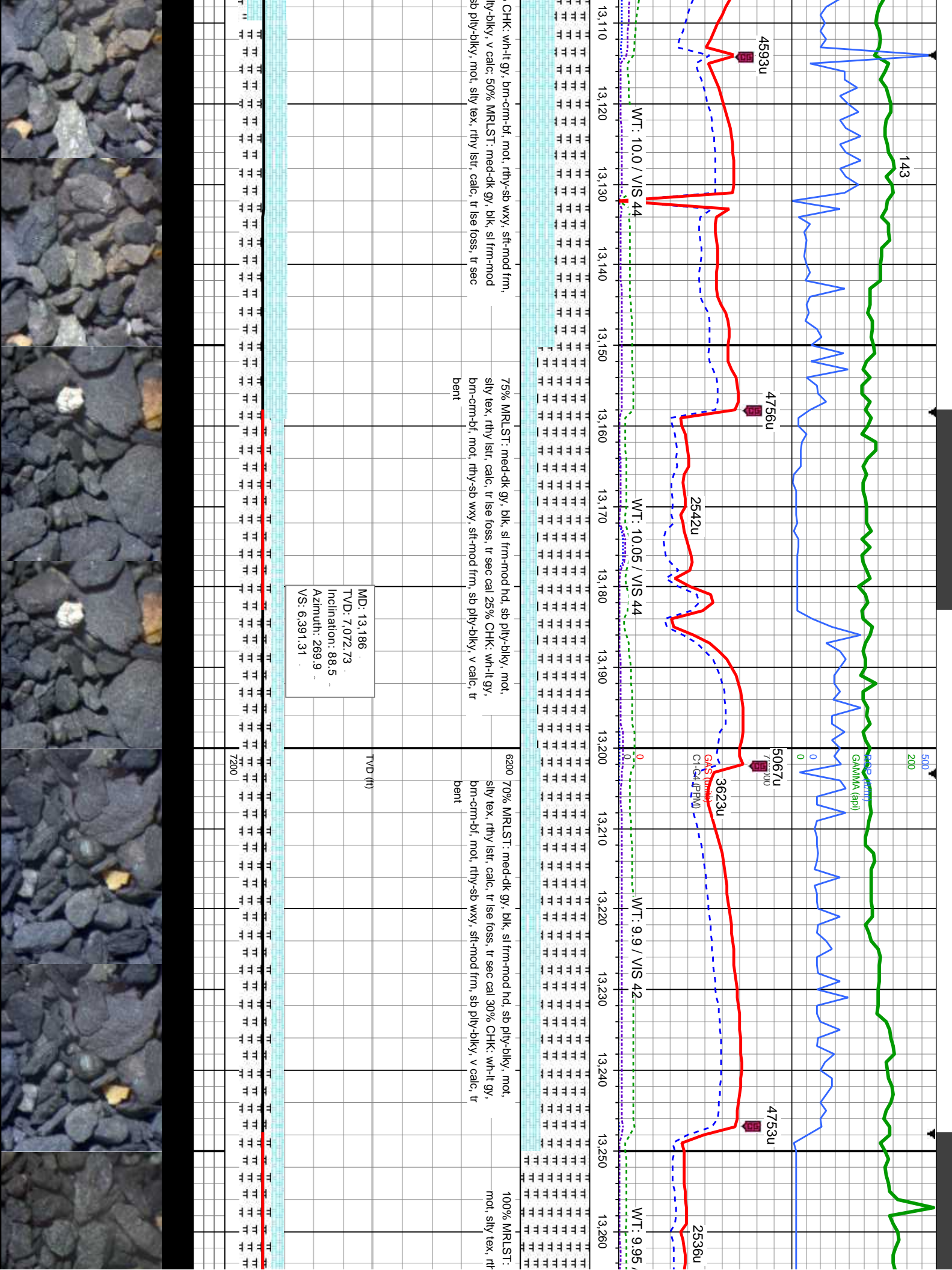
85% CHK: wh-it gy, brn-cr-bf, mot, rthy-wxy, sft-mod frm, sb
ply-blky, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, sily tex, rthy lstr, calc, tr lse foss, tr sec cal

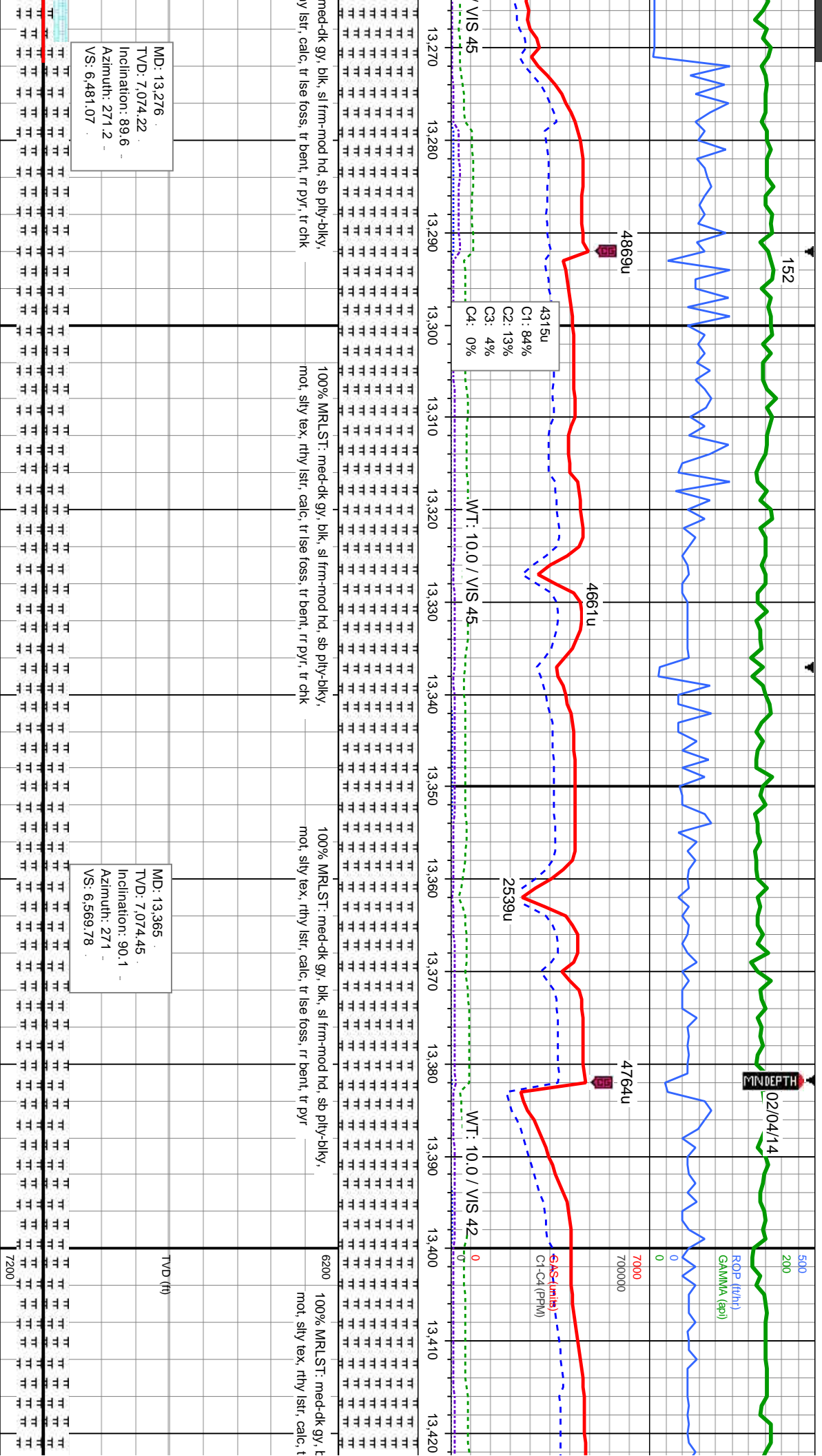
50%
sb p
hd, i
cal

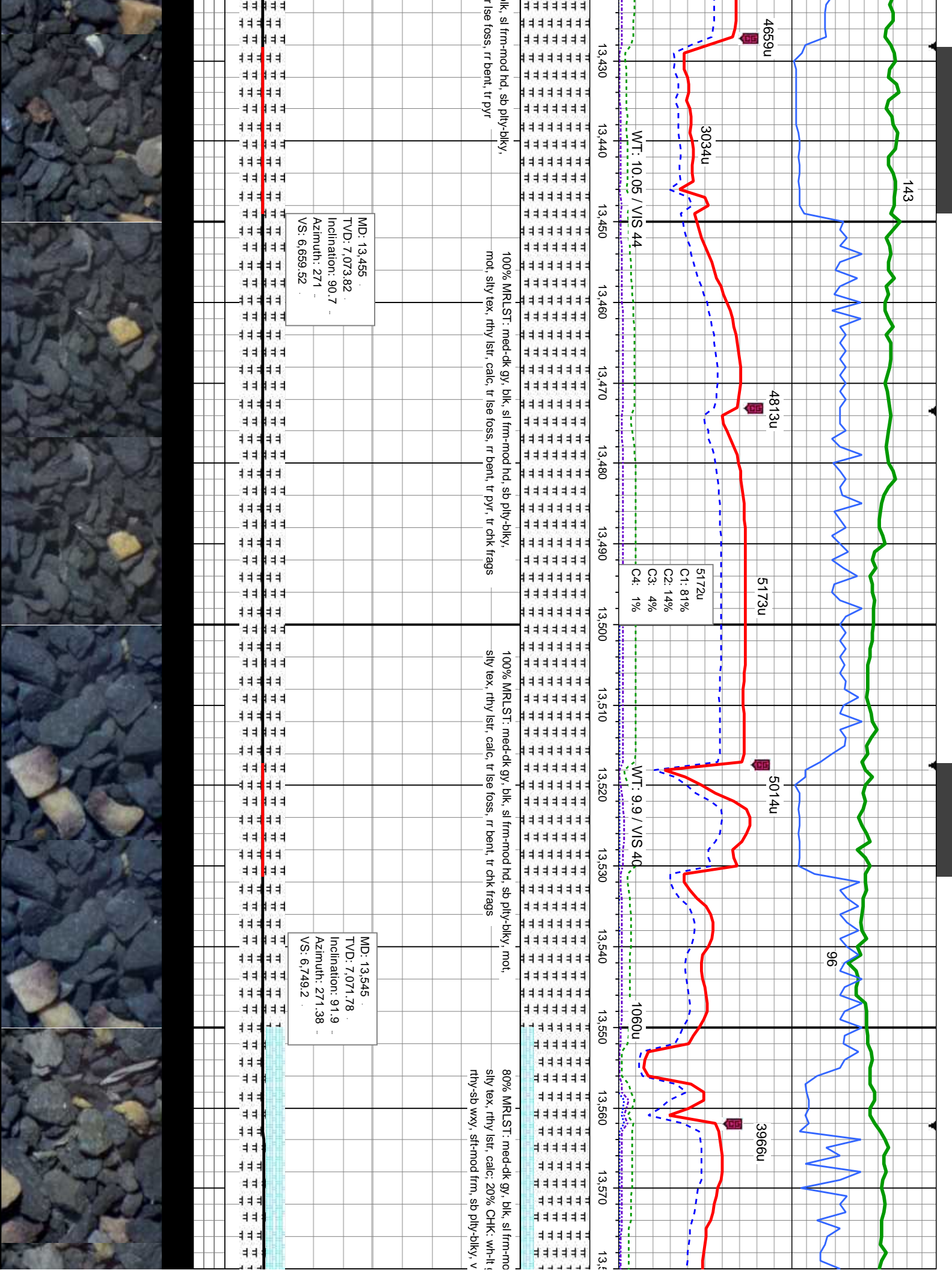
MD: 13.007
TVD: 7,067.26
Inclination: 88.7
Azimuth: 268.1
VS: 6.212.58

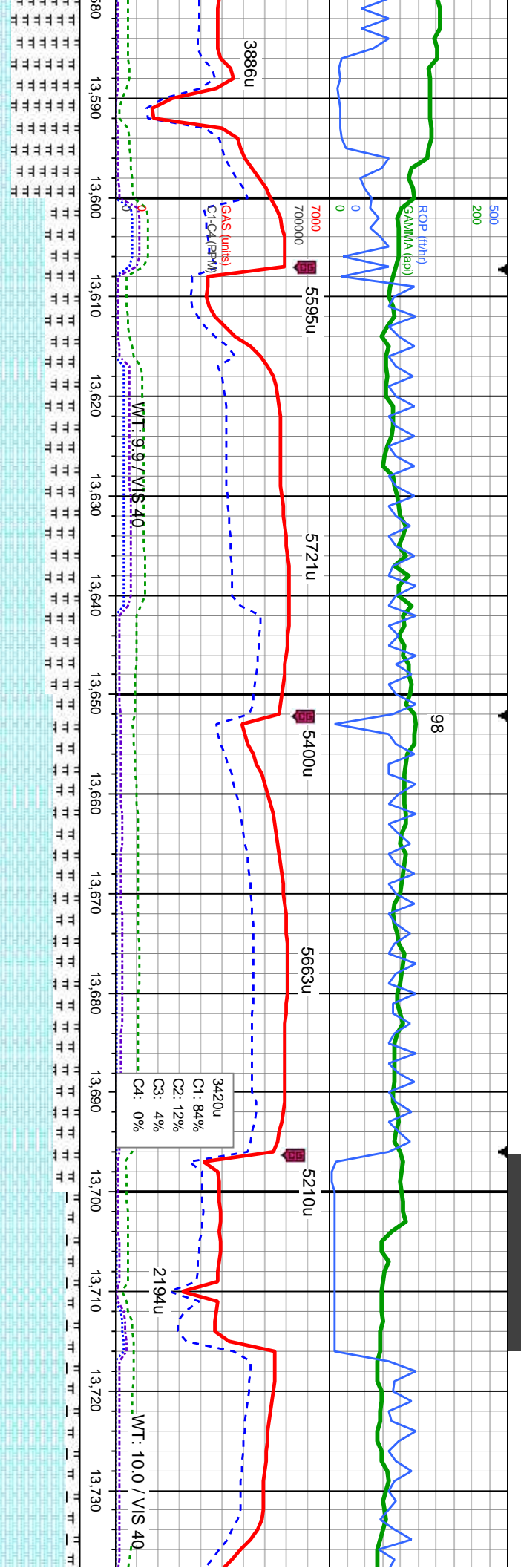
MD: 13.096
TVD: 7,069.9
Inclination: 87.9
Azimuth: 269.14
VS: 6.301.48











hd, sp ply-biky, mot, ply-biky, v calc: 40% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc, tr ise foss, tr bent

6200 60% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 40% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc, tr ise foss

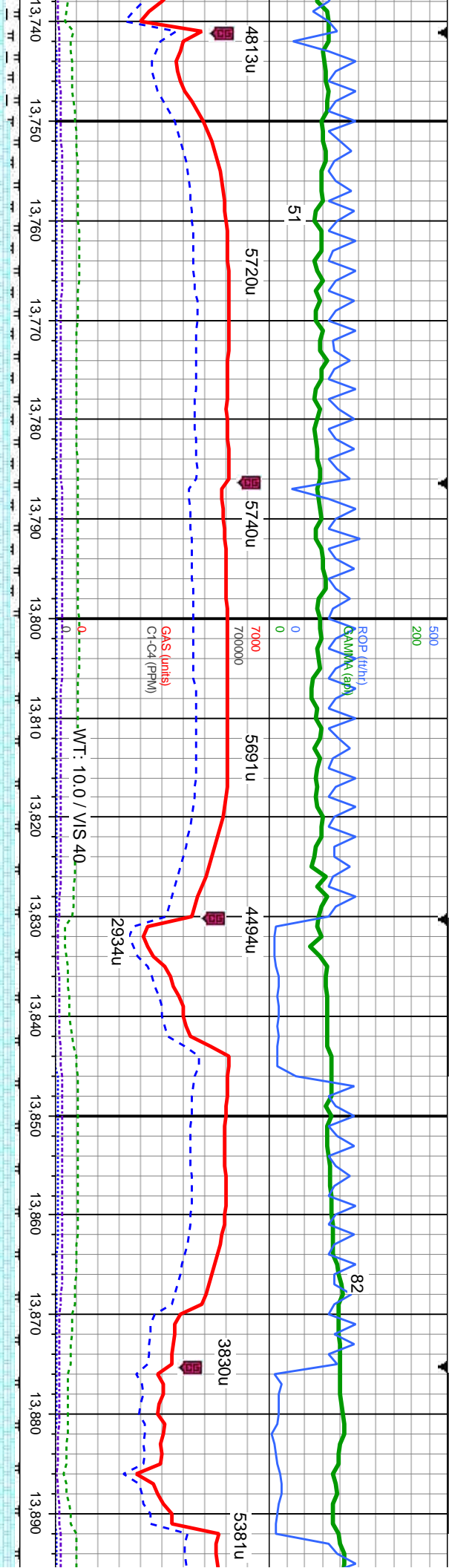
70% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc, tr ise foss

85% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc, tr ise foss

TVD (ft)
MD: 13,635
TVD: 7,068.41
Inclination: 92.4
Azimuth: 270.98
VS: 6,838.84

TVD (ft)
MD: 13,724
TVD: 7,065.92
Inclination: 90.8
Azimuth: 270.55
VS: 6,927.55





d frm, sb
—
d hd, sb

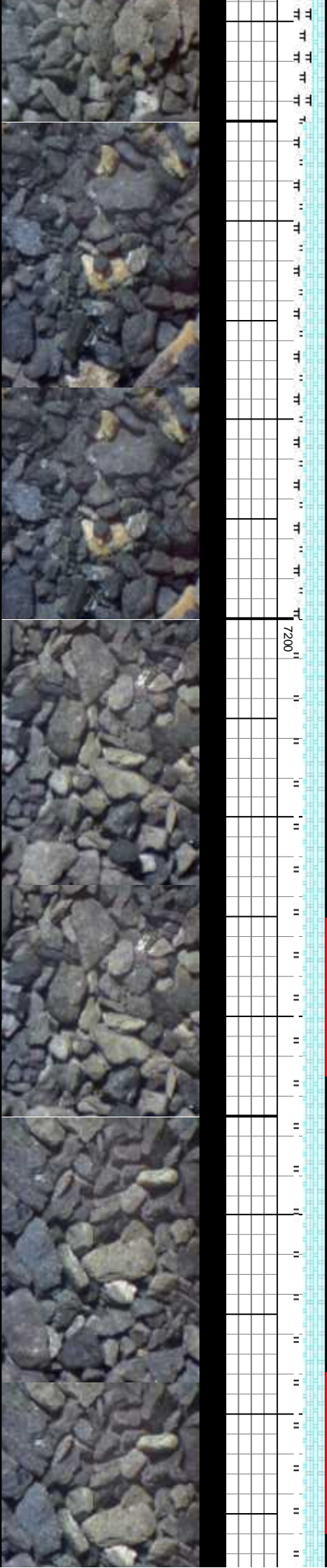
90% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
—
ply-biky, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
—
ply-biky, mot, silty tex, rthy lstr, calc, tr lse foss

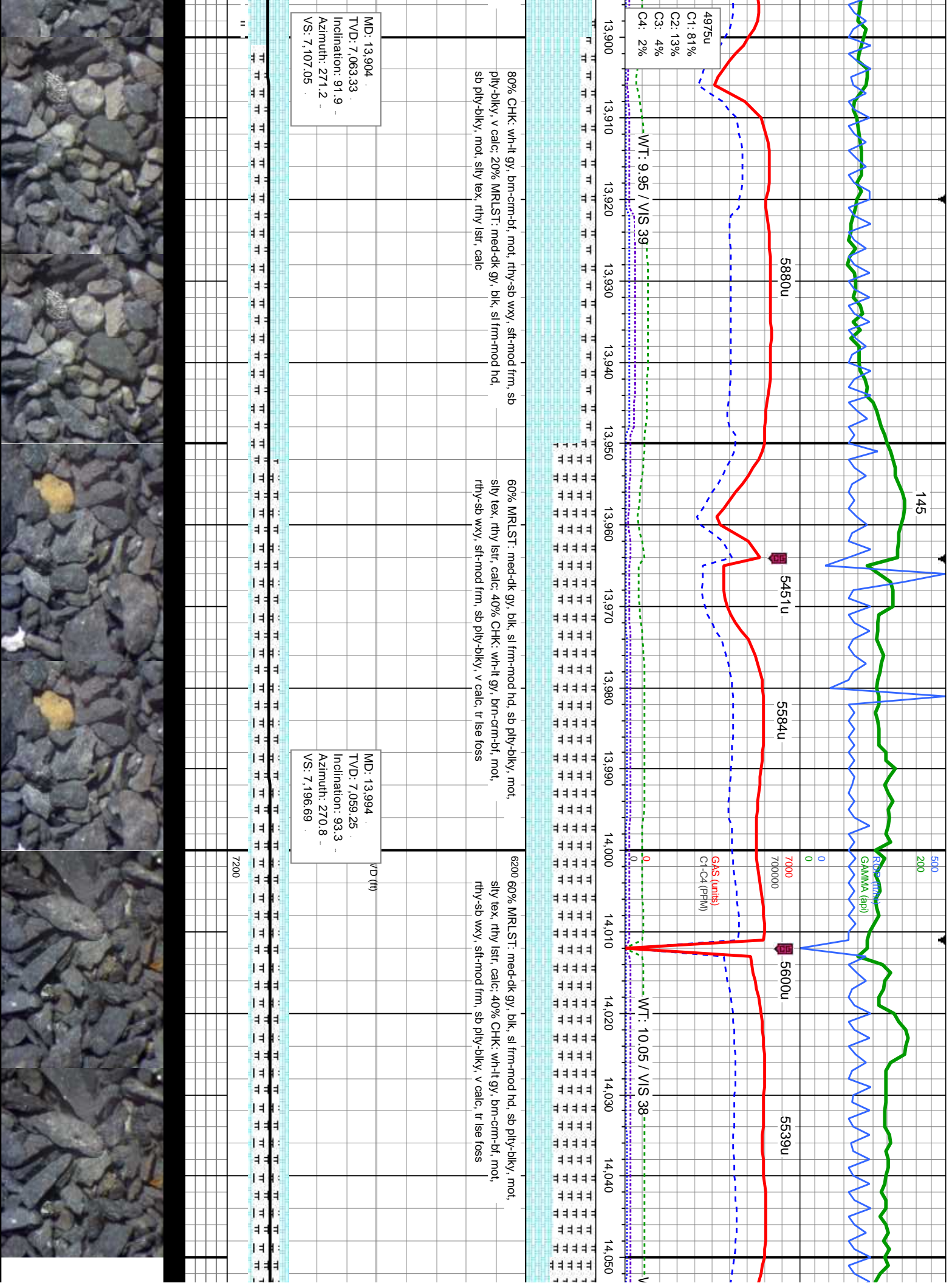
TVD (ft)

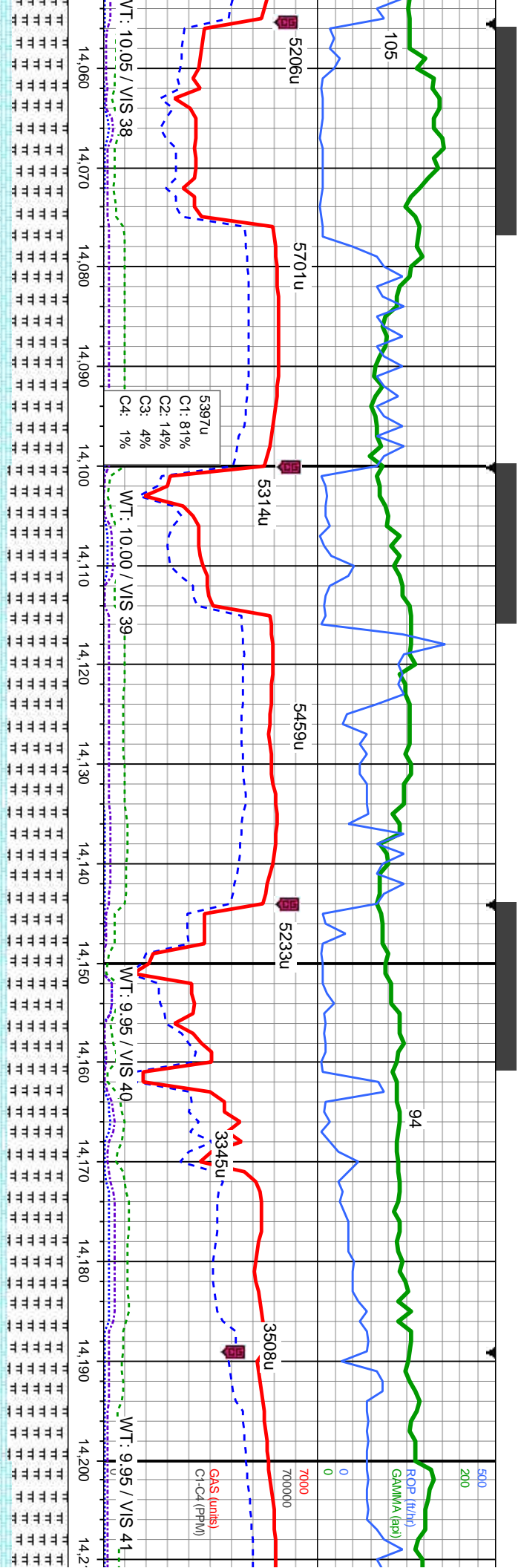
MD: 13,814
TVD: 7,065.06
Inclination: 90.3
Azimuth: 270.35
VS: 7.017.33

62.95% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
—
ply-biky, v calc: 5% MRLST: med-dk gy, blk, sl frm-mod hd, sb
—
ply-biky, mot, silty tex, rthy lstr, calc, tr lse foss

95% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
—
ply-biky, v calc: 5% MRLST: med-dk gy, blk, sl frm-mod hd, sb
—
ply-biky, mot, silty tex, rthy lstr, calc, tr lse foss







2/5/2014

MINDEPTH

83

103

FROZEN GAS LINE

5696u

5043u

5341u

3579u

5450u

C1: 80%

C2: 15%

C3: 4%

C4: 1%

WT: 10.0 / VIS 42

5748u

902u

1: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, slstr, calc, 35% CHK, wh-lt gy, brn-crm-bf, mot, sft-mod frm, sb ply-blky, v calc, tr lse foss, tr inoc

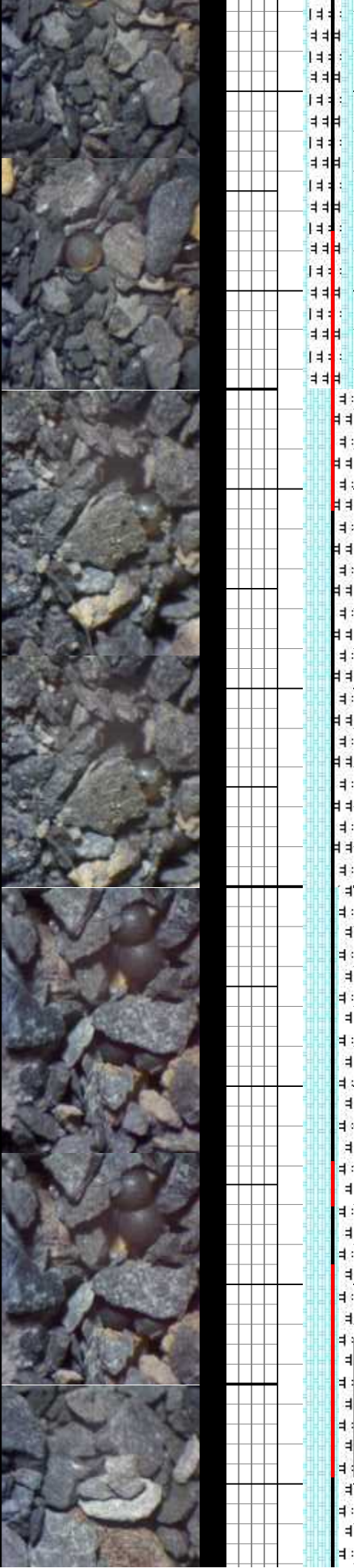
75% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, 25% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc

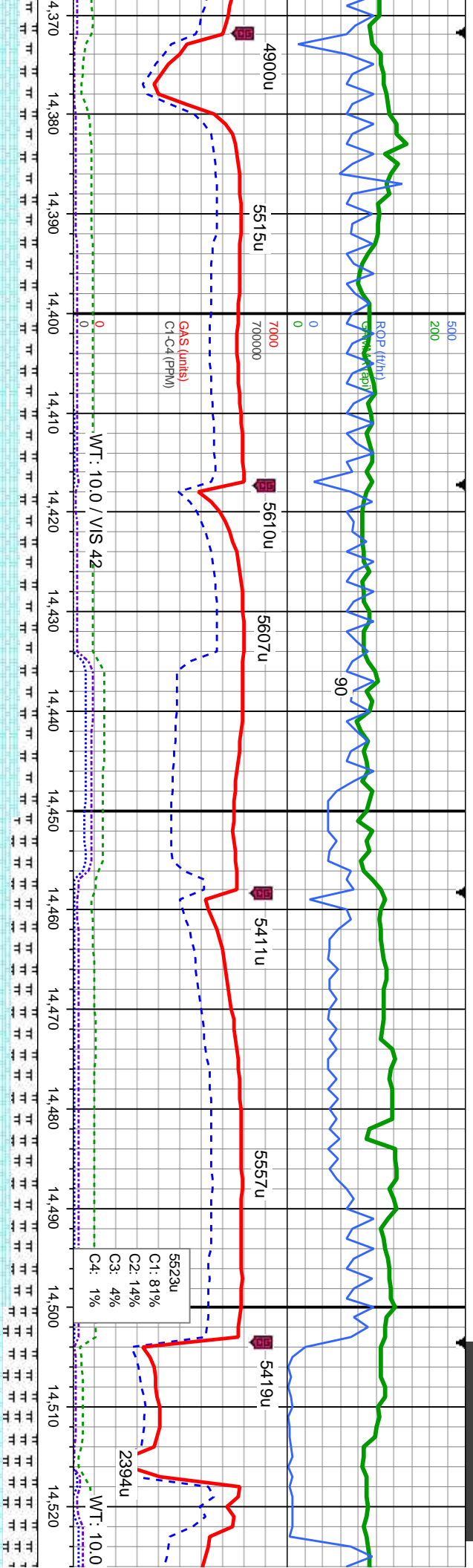
85% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, 15% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc

80% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc

MD: 14,262
TVD: 7,048.18
Inclination: 90.7
Azimuth: 267.62
VS: 7,464.02

MD: 14,352
TVD: 7,048.02
Inclination: 89.5
Azimuth: 270.5
VS: 7,553.92





arm-bf, mot, rthy-sb wxy, sft-mod frm, sb
LST: med-dk gy, blk, sl frm-mod hd, sb
y/str, calc

620% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc

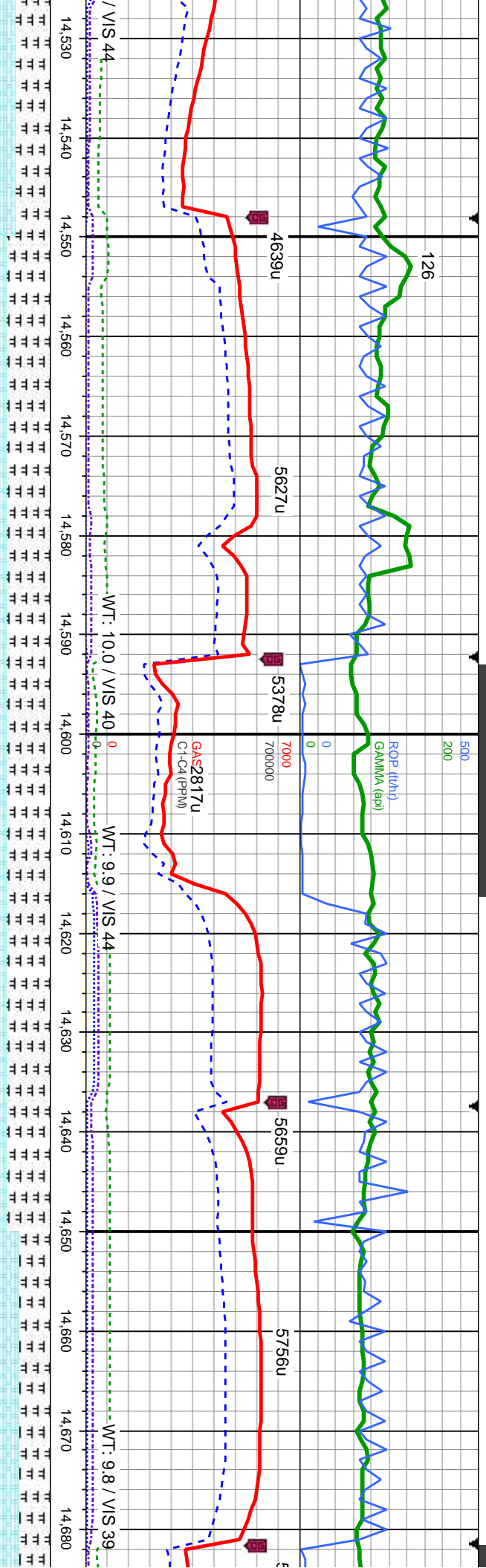
70% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 30% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc

60% CHK: wh-it gy, brn-crm-bf, mot, r
ply-biky, v calc: 40% MRLST: med-dk
ply-biky, mot, silty tex, rthy lstr, calc, t

MD: 14.442
TVD: 7,047.47
Inclination: 91.2
Azimuth: 269.9
VS: 7,643.73

7200





126
500
200
ROP (ft/hr)
GAMMA (gpc)
C-1-C4 (PPM)
WT: 10.0 / VIS 40
WT: 9.9 / VIS 44
WT: 9.8 / VIS 39

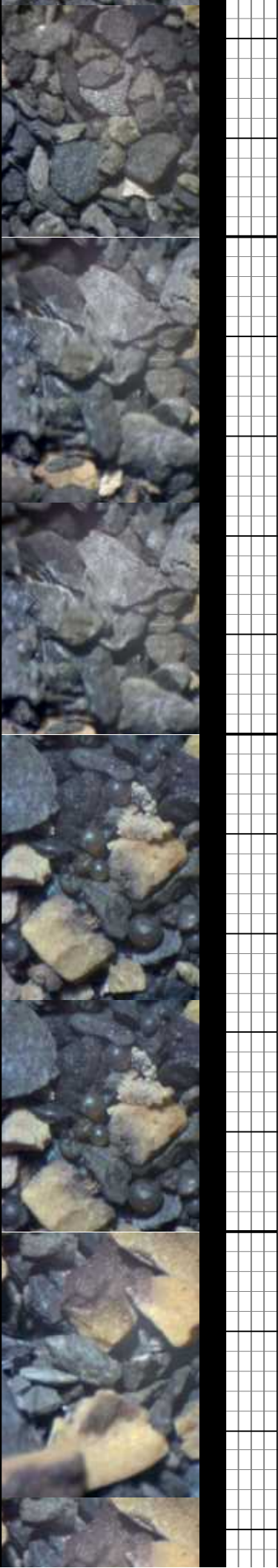
MD: 14.532
TVD: 7.047.08
Inclination: 89.3
Azimuth: 269.2
VS: 7.733.61

MD: 14.620
TVD: 7.048.92
Inclination: 88.3
Azimuth: 268.37
VS: 7.821.52

50% CHK: wh-lt-gy, brn-crm-bl, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc: 50% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss

50% CHK: wh-lt-gy, brn-crm-bl, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc: 50% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss

65% CHK: wh-lt-gy, brn-crm-bl, mot, rthy-sb wxy,
ply-blky, v calc: 35% MRLST: med-dk gy, blk, sl
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss



2/6/2014

MINDEPTH

116

62

ROD (ft/lb)
GAMMA (cpm)

5072u

0

7000

700000

5718u

2006u

3125u

1425u

WT

C1: 84%
C2: 12%
C3: 3%
C4: 1%

GAS (units)
C1-C4 (PPM)

WT: 9.85 / VIS 41

14,690 14,700 14,710 14,720 14,730 14,740 14,750 14,760 14,770 14,780 14,790 14,800 14,810 14,820 14,830 14,84

sft-mod frm, sb
frm-mod hd, sb

65% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc, 35% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss

70% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
silty tex, rthy lstr, calc, 30% CHK: wh-lt gy, brn-crm-bf, mot,
rthy-sb wxy, sft-mod frm, sb ply-blky, v calc

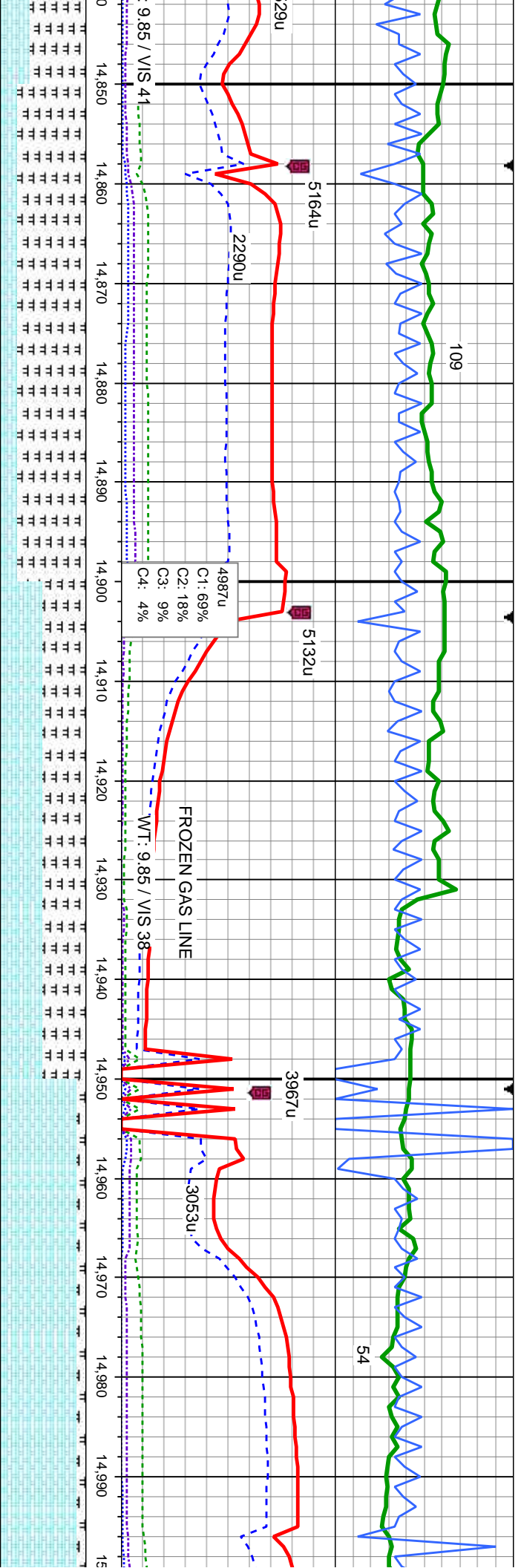
6200 65% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky,
silty tex, rthy lstr, calc, 35% CHK: wh-lt gy, brn-crm-bf, mo
rthy-sb wxy, sft-mod frm, sb ply-blky, v calc

MD: 14,710
TVD: 7,051.43
Inclination: 88.5
Azimuth: 270.3
VS: 7,911.37

MD: 14,800
TVD: 7,054.42
Inclination: 87.7
Azimuth: 270.5
VS: 8,001.12

7200





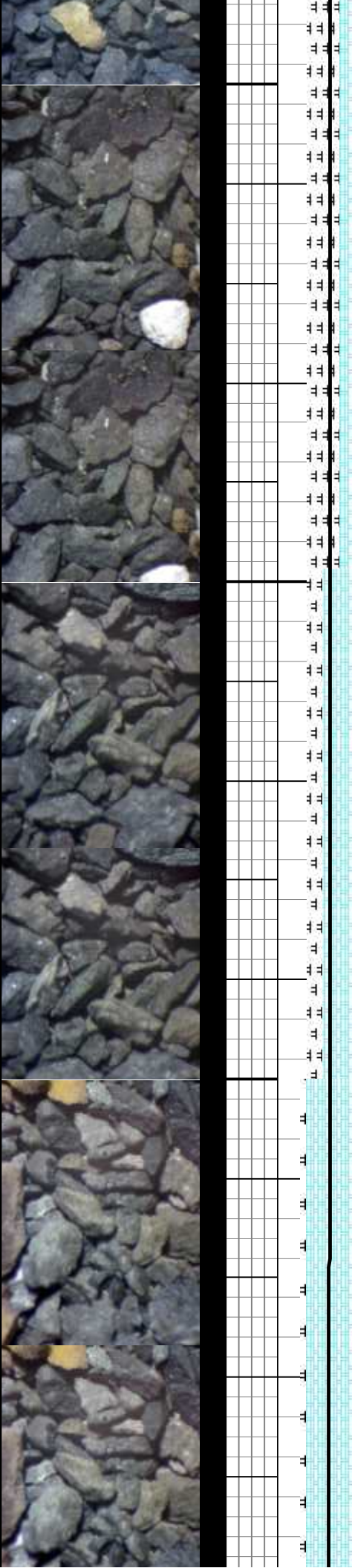
mot.
80% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
sily tex, rthy lstr, calc: 20% CHK: wh-it gy, brn-crm-bf, mot,
rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, tr lse foss

50% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot,
sily tex, rthy lstr, calc, tr lse foss: 50% CHK: wh-it gy,
brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc

90% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, sily tex, rthy lstr, calc, tr lse foss

MD: 14.889
TVD: 7,057.45
Inclination: 88.4
Azimuth: 270.2
VS: 8,089.88

MD: 14.979
TVD: 7,059.64
Inclination: 88.8
Azimuth: 270.16
VS: 8,179.67



500

200

107

ROP (ft/hr)

GAMMA

0

0

7000

5834u

5720u

5455u

5563u

5367u

2564u

WT: 10.0 / VIS 38

WT: 9.9 / VIS 39

5513u

C1: 81%

C2: 14%

C3: 4%

C4: 2%

6200 85% CHK: wh-it-gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb

60% CHK: wh-it-gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb

60% MRLST: med-dk-gy, blk, sl frm-mod hd, sb

50% N

ply-blky, v calc: 15% MRLST: med-dk-gy, blk, sl frm-mod hd, sb

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

ply-blky, mot, sily tex, rthy lstr, calc

TVD (ft)

MD: 15,068

TVD: 7,061.43

Inclination: 88.9

Azimuth: 270.13

VS: 8,268.47

MD: 15,

TVD: 7,0

Inclinati

Azimuth

VS: 8,35

MD: 15,

TVD: 7,0

Inclinati

Azimuth

VS: 8,35

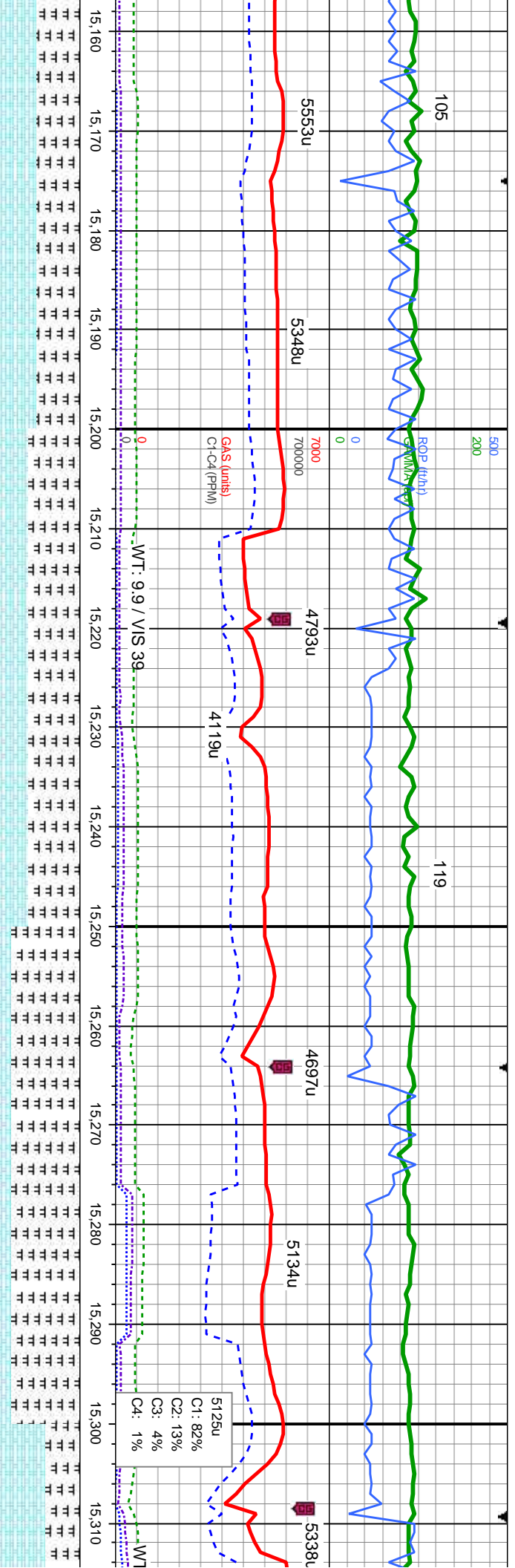
MD: 15,

TVD: 7,0

Inclinati

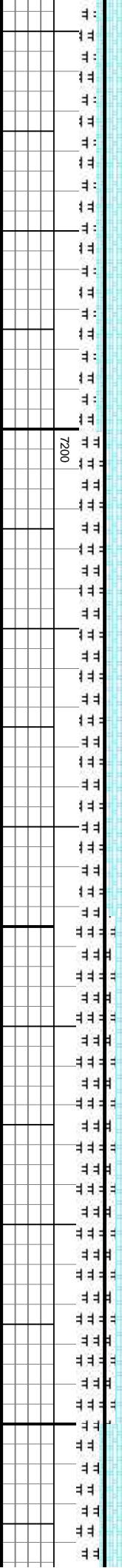
Azimuth

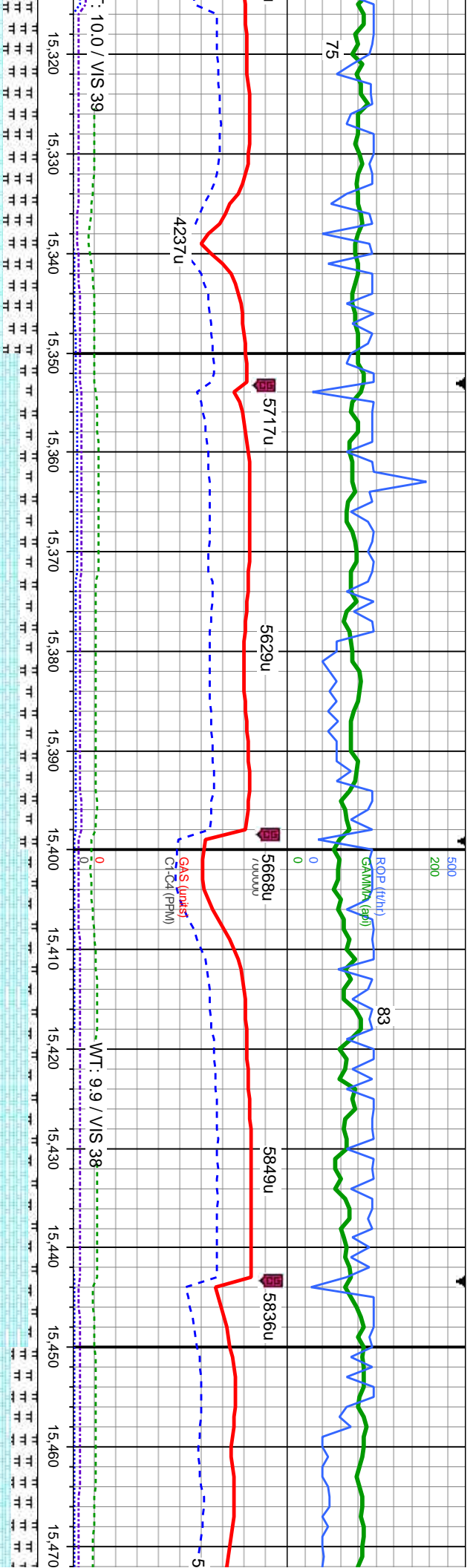
VS: 8,35



6200 60% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-biky, mot, silty
silty tex, rthy lstr, calc: 40% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-biky, v calc, tr lse foss

60% CHK: wh-it gy, ply-biky, v calc: 4% ply-biky, mot, silty



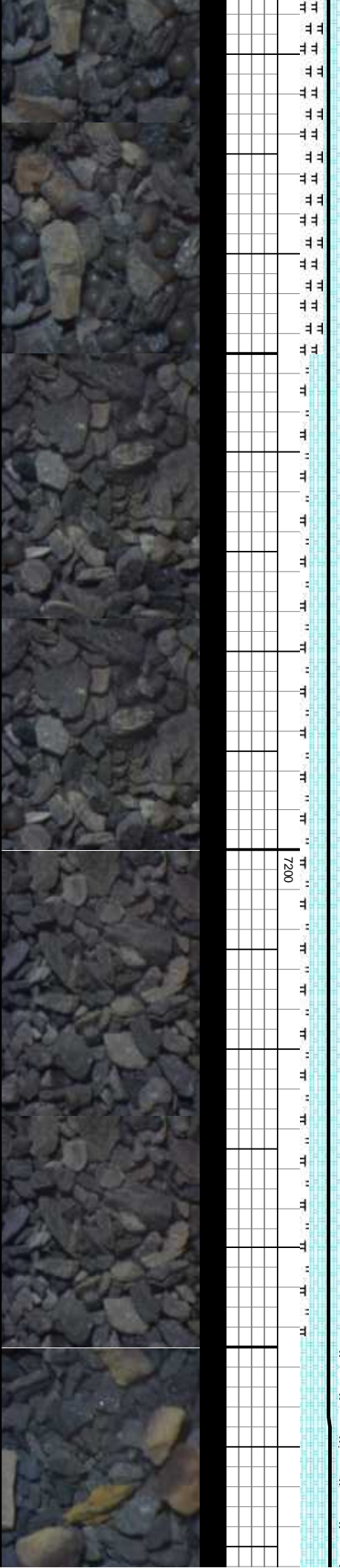


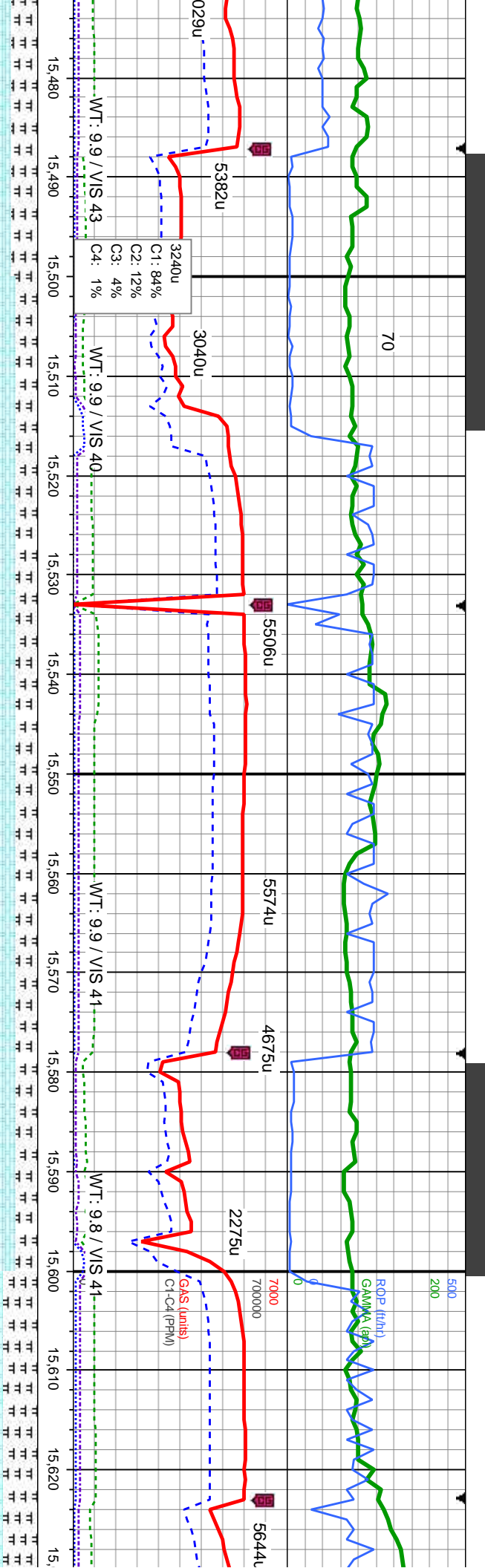
MD: 15,337
TVD: 7,062.14
Inclination: 90.6
Azimuth: 268.78
VS: 8,536.92

80% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 20% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc

MD: 15,427
TVD: 7,060.25
Inclination: 91.8
Azimuth: 268.7
VS: 8,626.83

620% 90% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-biky, v calc: 10% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-biky, mot, silty tex, rthy lstr, calc





mot, rthy-sb wxy, sft-mod frm, sb
med-dk gy, blk, sl frm-mod hd, sb
calc

75% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm,
sb ply-blky, v calc; 25% MRLST: med-dk gy, blk, sl frm-mod
hd, sb ply-blky, mot, silty tex, rthy lstr, calc

75% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc; 25% MRLST: med-dk gy, blk, sl frm-mod
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss

60% CHK: wh-it gy, brn-crm-bf, mot, rth
sb ply-blky, v calc; 40% MRLST: med-c
hd, sb ply-blky, mot, silty tex, rthy lstr, c

MD: 15,516
TVD: 7,057.69
Inclination: 91.5
Azimuth: 268.37
VS: 8,715.74

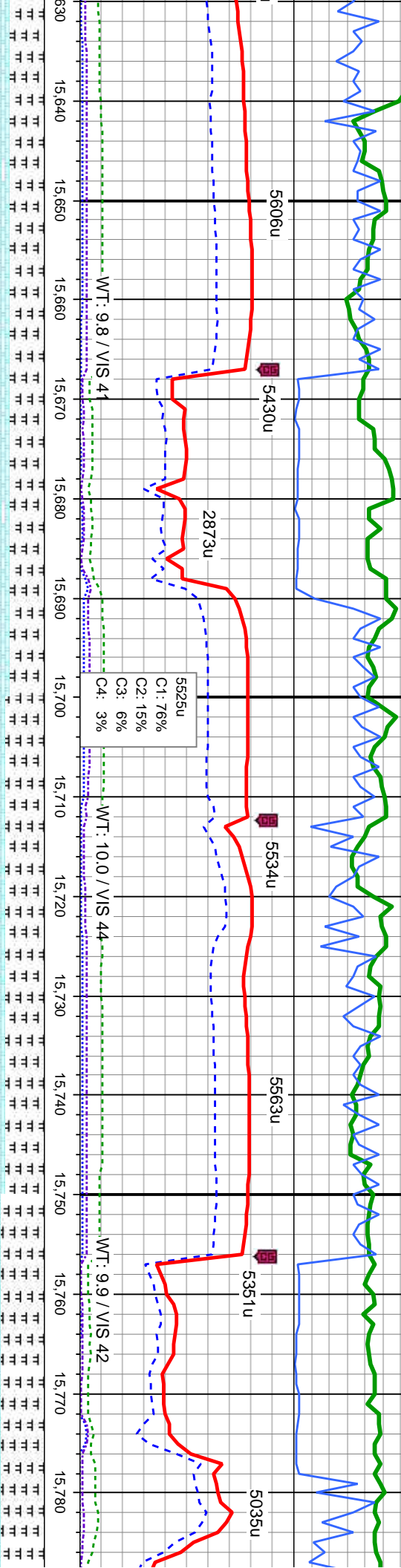
MD: 15,606
TVD: 7,055.96
Inclination: 90.7
Azimuth: 269.12
VS: 8,805.65

Possible



MINDEPTH

96



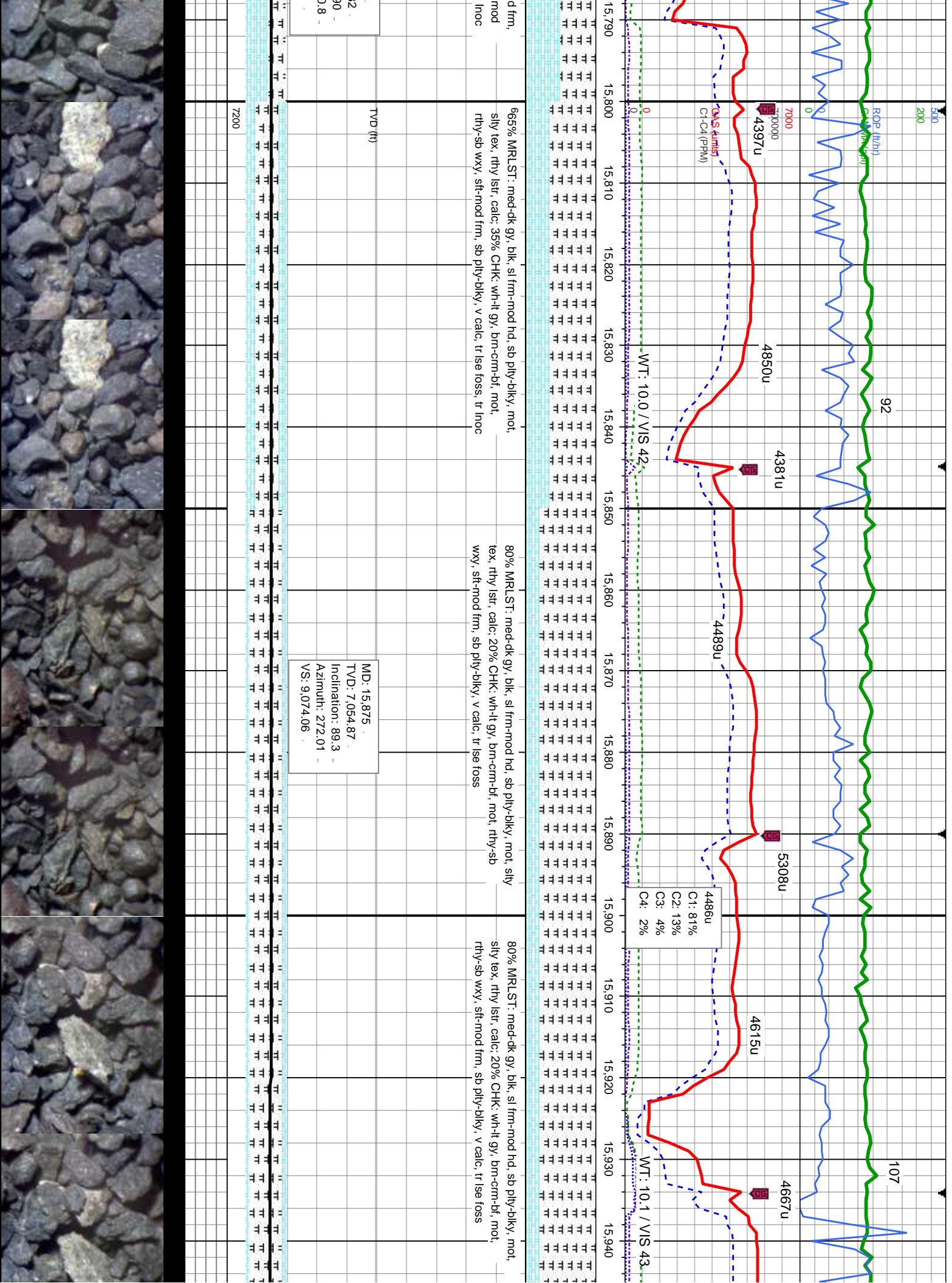
y-sb wxy, sft-mod frm, blk gy, blk, sl frm-mod
60% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc: 40% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss
55% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-blky, v calc: 45% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss, tr inoc
50% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-no
sb ply-blky, v calc: 50% MRLST: med-dk gy, blk, sl frm-
hd, sb ply-blky, mot, silty tex, rthy lstr, calc, tr lse foss, tr

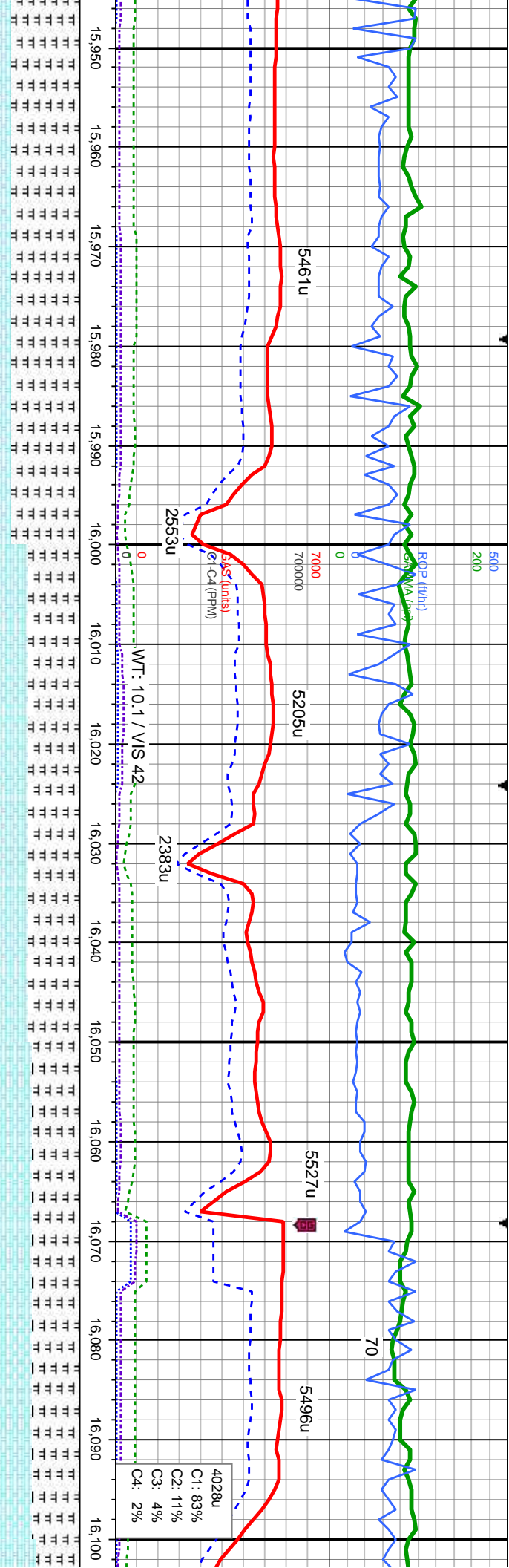
MD: 15,696
TVD: 7,054.86
Inclination: 90.7
Azimuth: 269.1
VS: 8,895.55

MD: 15,785
TVD: 7,054.3
Inclination: 5
Azimuth: 270
VS: 8,984.38

ie U/D Fault







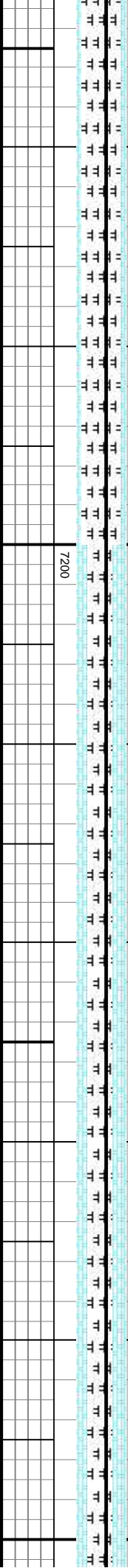
80% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc; 20% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, tr lse foss

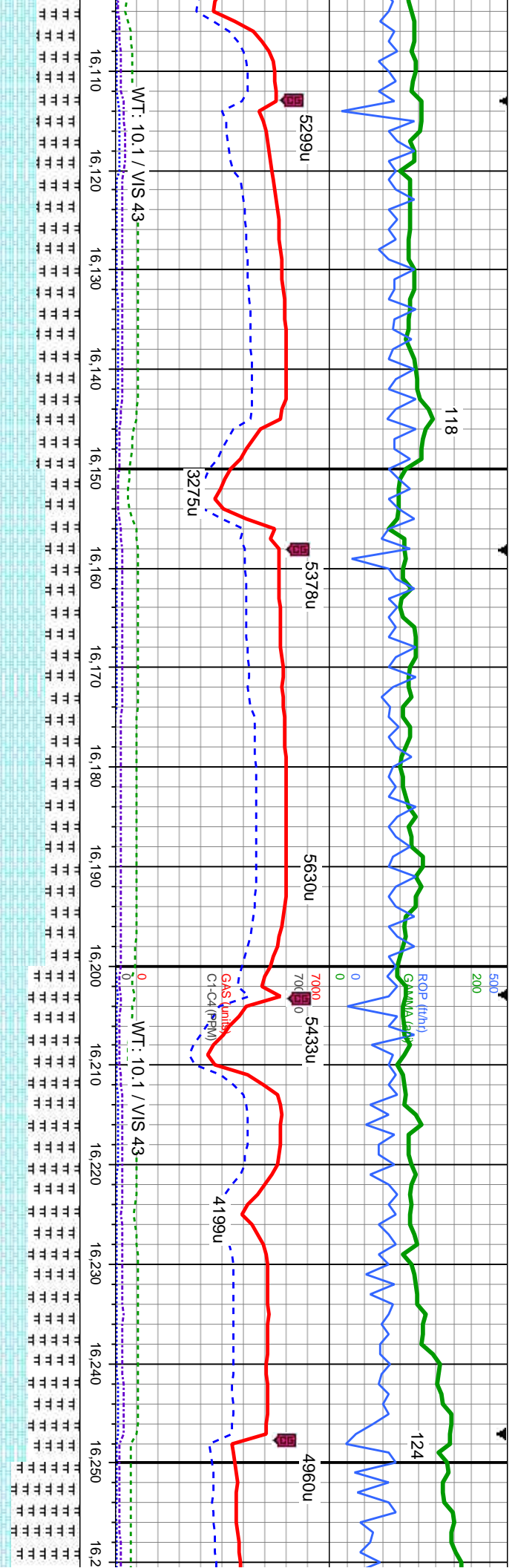
620/60% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc; 40% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, tr lse foss

55% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-blky, mot, silty tex, rthy lstr, calc; 45% CHK: wh-lt gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb ply-blky, v calc, tr lse foss

MD: 15,965
TVD: 7,056.05
Inclination: 89.2
Azimuth: 273.94
VS: 9,163.47

MD: 16,054
TVD: 7,056.75
Inclination: 89.9
Azimuth: 276.31
VS: 9,251.45





0% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 50% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr lse foss

60% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy, sft-mod frm, sb
ply-bkly, v calc: 40% MRLST: med-dk gy, blk, sl frm-mod hd, sb
ply-bkly, mot, silty tex, rthy lstr, calc, tr lse foss

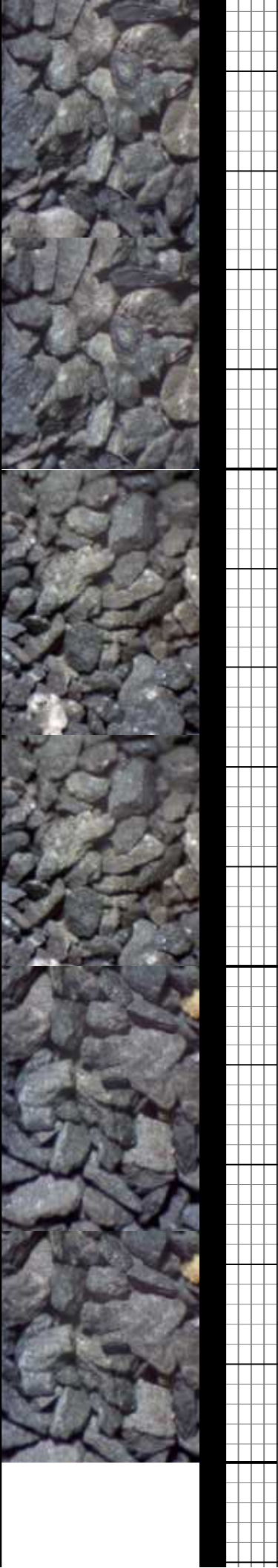
62% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
tex, rthy lstr, calc: 40% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy,
sft-mod frm, sb ply-bkly, v calc, tr lse foss

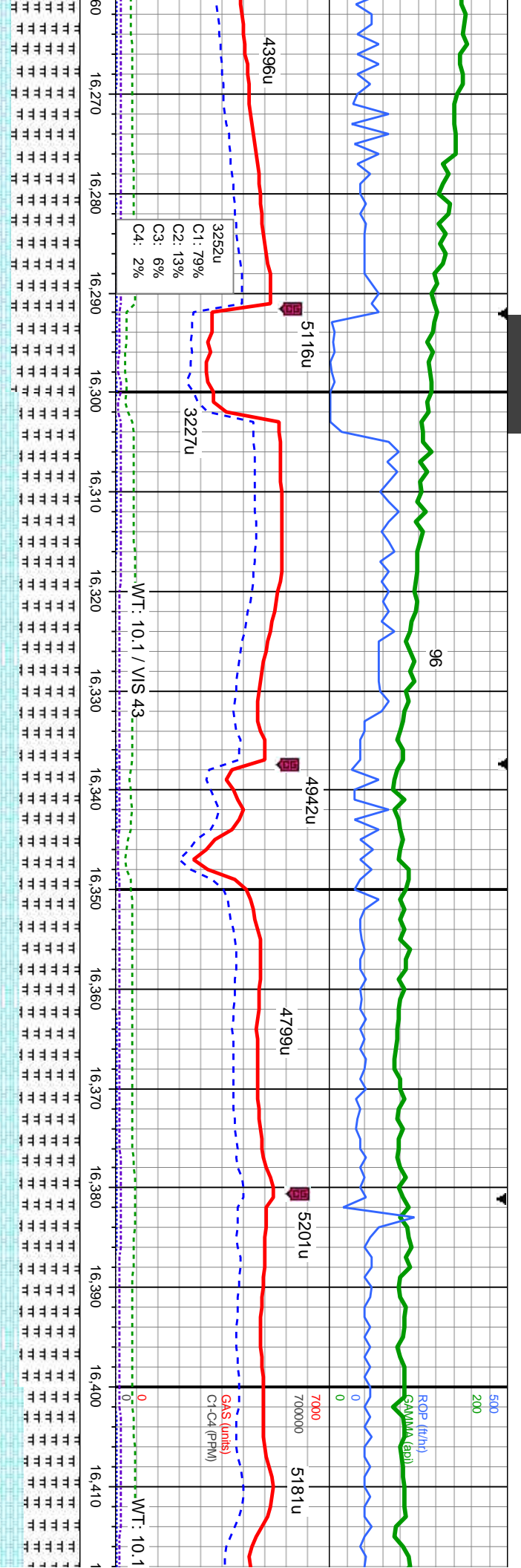
80% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
tex, rthy lstr, calc: 40% CHK: wh-it gy, brn-crm-bf, mot, rthy-sb wxy,
sft-mod frm, sb ply-bkly, v calc, tr lse foss

MD: 16,144
TVD: 7,055.73
Inclination: 91.4
Azimuth: 276.76
VS: 9,340.05

MD: 16,233
TVD: 7,053.09
Inclination: 92
Azimuth: 276.64
VS: 9,427.6

TVD (ft)





med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
calc, 20% CHK: wh-t gy, brn-crm-bf, mot, rthy-sb
d frm, sb ply-bkly, v calc, tr lse foss

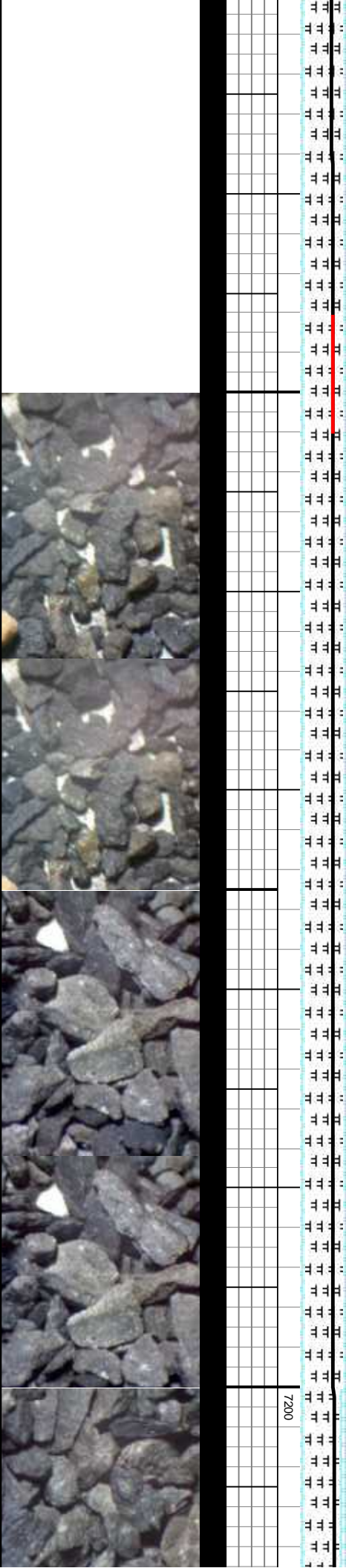
70% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
tex, rthy lstr, calc: 30% CHK: wh-t gy, brn-crm-bf, mot, rthy-sb wxy,
sft-mod frm, sb ply-bkly, v calc, tr lse foss

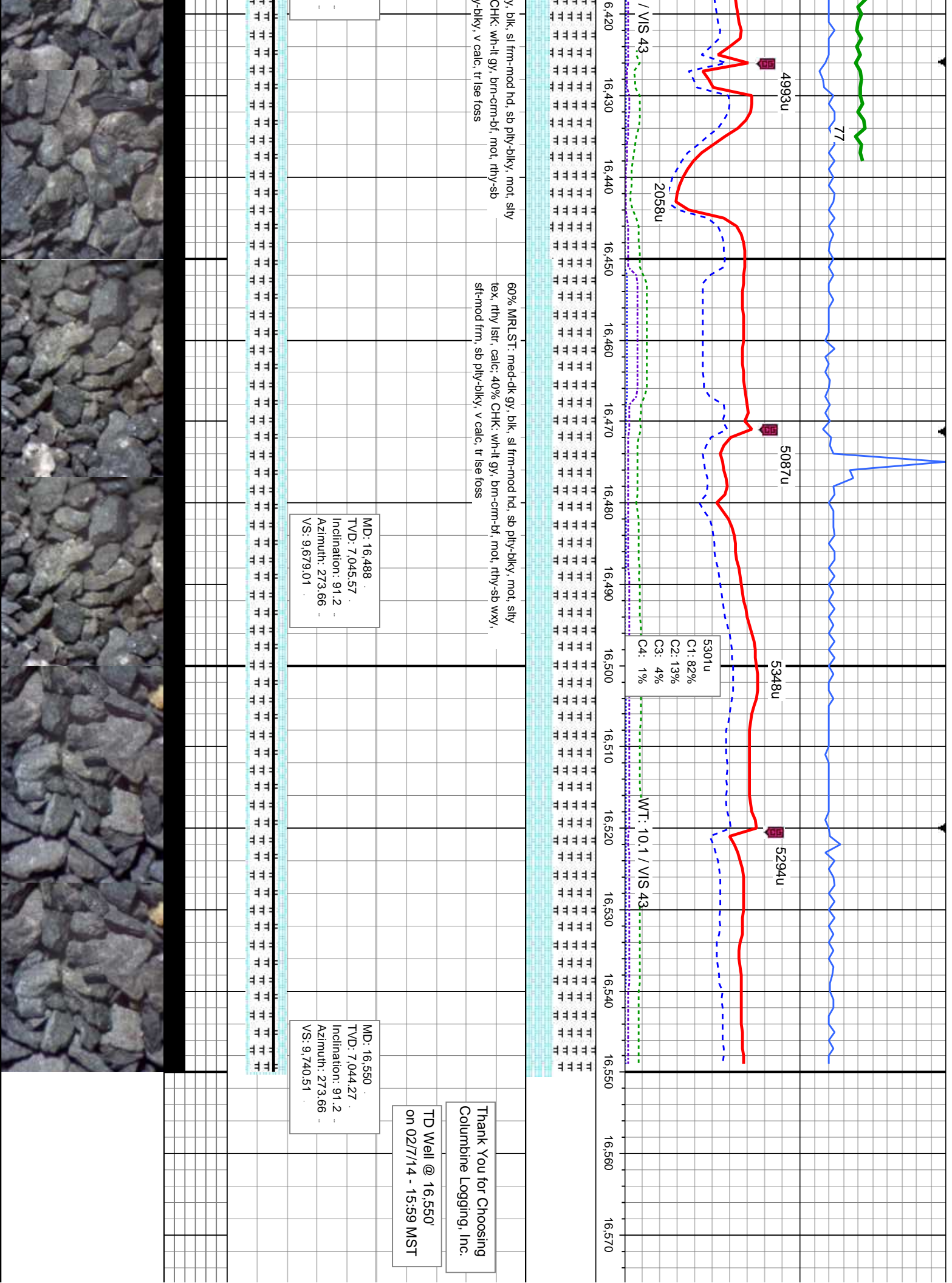
70% MRLST: med-dk gy, blk, sl frm-mod hd, sb ply-bkly, mot, silty
tex, rthy lstr, calc: 30% CHK: wh-t gy, brn-crm-bf, mot, rthy-sb wxy,
sft-mod frm, sb ply-bkly, v calc, tr lse foss

620% MRLST: med-dk g
tex, rthy lstr, calc: 35%
wxy, sft-mod frm, sb ply

MD: 16,323
TVD: 7,049.95
Inclination: 92
Azimuth: 277
VS: 9,516.08

MD: 16,413
TVD: 7047.28
Inclination: 91.4
Azimuth: 275.32
VS: 9,604.77





MD: 16,488
TVD: 7,045.57
Inclination: 91.2
Azimuth: 273.66
VS: 9,679.01

5307u
C1: 82%
C2: 13%
C3: 4%
C4: 1%

MD: 16,550
TVD: 7,044.27
Inclination: 91.2
Azimuth: 273.66
VS: 9,740.51

Thank You for Choosing
Columbine Logging, Inc.
TD Well @ 16,550'
on 02/7/14 - 15:59 MST

