



Scale: 5" / 100'  
Measured Depth Log

Well Name State Antelope O-K-30HNB

Location NWNW Section 30, T5N, R62W

State Colorado

County Weld

Country USA

Rig Number Cade 22

API Number 05-123-37291

Region DJ Basin

Field Wattenberg

Spud Date 7/1/2013

Drilling Completed 7/9/2013

Surface Coordinates 542' FNL x 1,256' FWL

Bottom Hole Coordinates 604' FSL X 2,816' FEL

Ground Elevation 4608'

K.B. Elevation 4625'

Logged Interval 6000' To 10980'

Total Depth 10980'

Formation Niobrara B Chalk

Type of Drilling Fluid FW LSND

Company Bonanza Creek  
Address 410 17th Street  
Denver, CO 80202

Name Paul McKay  
Company Bonanza Creek  
Address 410 17th Street  
Denver, CO 80202

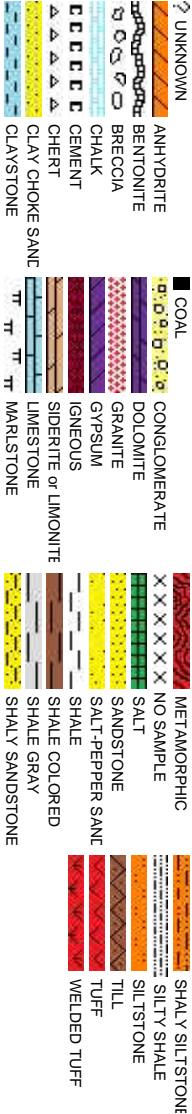
Columbine Logging, Inc.  
Well-site Geologists

Operator

Energy Inc.

Suite 1500  
202

Rock Types

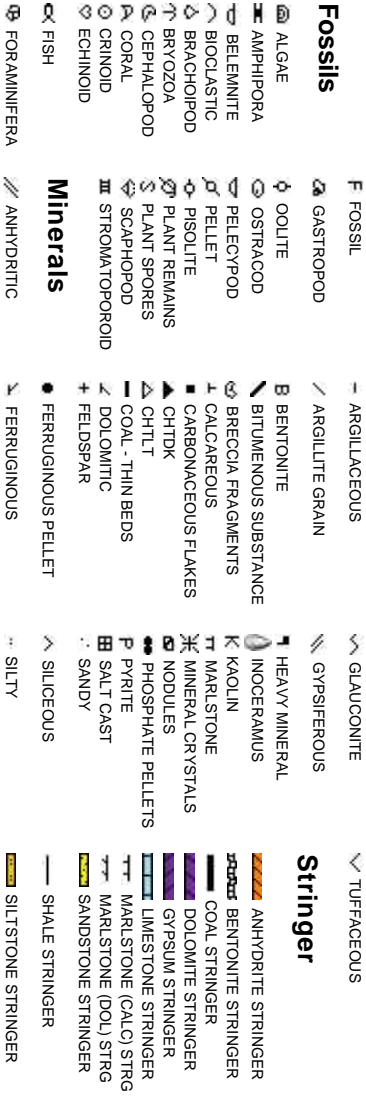


Geologist

Energy Inc.

, Suite 1500  
202

Accessories



Other

2385 S. Lipan St.  
Denver, CO 80223

Joey Luce  
Eli Smith

Other Symbols

Oil Show

- MOLDIC
- ORGANIC
- PINPOINT
- VUGGY
- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Engineering

- FAULT
- FORMATION TOP
- GAS SHOW
- MINDEPTH MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL
- BIT

Rounding

- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- ANGULAR
- ROUNDED
- SUBANG
- SUBRND
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE
- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE
- MODERATE
- POOR
- WELL

Porosity

- EARTHY
- FENESTRAL
- FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC

Textures

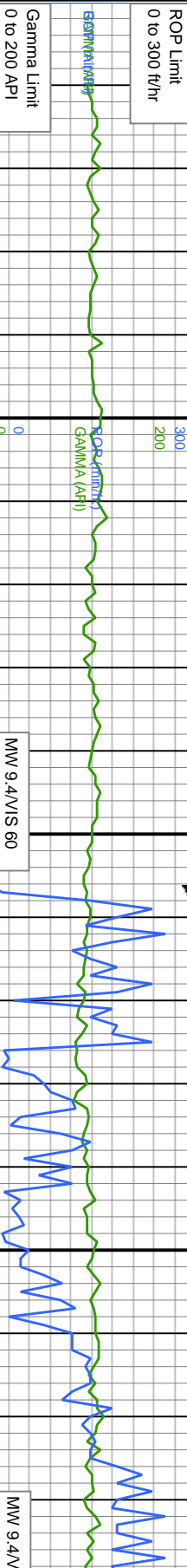
- SLIDE
- SURVEY
- TRIP GAS
- SIDEWALL CORE (RIGHT)

Sorting

- MODERATE
- POOR
- WELL

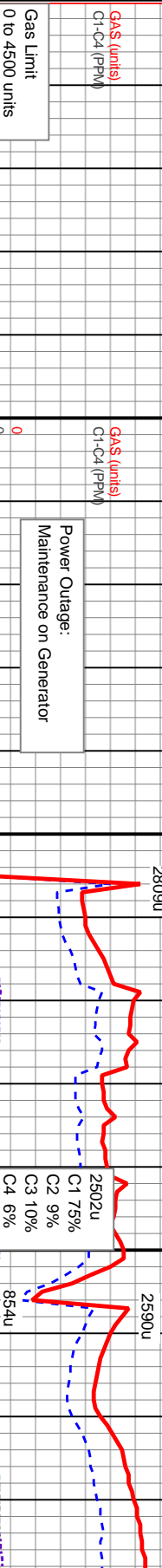
Slide/Rotate

ROP  
ROF  
GAMMA



Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4



Depth Labels



% Lith



Bit # 3  
Type: VM513S  
Size: 8.75"  
Depth in: 5,996'  
Jets: 7 x 14  
S/N: 4004946

30 Sample Interval

5800

MD: 6,012 '  
TVD: 5,812.67 '  
Azimuth: 180.9 °  
Inclination: 3.65 °  
VS: 533.05 '

MD: 6,060 '  
TVD: 5,860.36 '  
Azimuth: 184.41 °  
Inclination: 8.94 °  
VS: 527.8 '

MD: 6,107 '  
TVD: 5,906.45 '  
Azimuth: 183 °  
Inclination: 13.5 °  
VS: 518.67 '

Well Bore  
TVD

TVD (ft)

TVD (ft)

Columbine Logging, Inc.  
Rigged up on July 3, 2013  
Bloodhound Unit #0603  
Build Began 08:20 MST  
on July 4, 2013

75-80% SLTY SH: lt-med gy, gy brn, plty-bkly, sft-frm, fr-brit, rthy-grtly lsfr, sb wxy, silty-aren, grdg slist 25-20% SHY SS: wh, lt-med gy, s&p, cly cnt, vt-f gr, sb 6500 ang-bkly, sl frm-hd, brit, mod strg, grdg-ss

80-90% SLTY SH: lt-med gy, gy brn, plty-bkly, sft-frm, fr-brit, rthy-grtly lsfr, sb wxy, silty-aren, grdg slist 20-10% SHY SS: wh, lt-med gy, s&p, cly cnt, vt-f gr, sb ang-bkly, sl frm-hd, brit, mod strg, grdg-ss

90-85% S  
plty-bkly,  
wxy, silty-  
wh, lt-med  
ang-bkly,  
v rr pyr

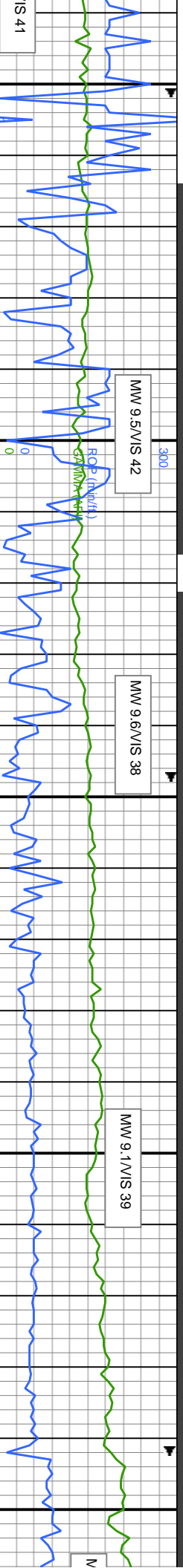
Oil Show

SL  
TR  
FM  
G

Images







MMW 9.5/VIS 42

MMW 9.6/VIS 38

MMW 9.1/VIS 39

3834u

3215u

4500

TOOH @ MD 6233' for MWD Tool and Mud Motor on 7/4/13 @ 18:57 MST

Drilling Resumed on 7/5/13 @ 03:53 MST

TOOH @ MD 6270' for new bit on 7/5/13 @ 11:20 MST

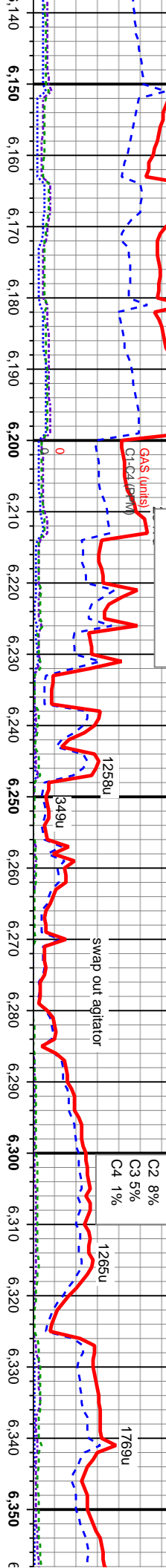
Drilling Resumed 7/6/13 @ 03:14 MST

1122u

1265u

1769u

Logger Top Sharon Springs MD 6343 / TVD 6123'



5800

MD: 6.248

TV D: 6,039.91

Azimuth: 178.06 °

Inclination: 23.04 °

VS: -112.98 °

MD: 6.295

TV D: 6,082.24

Azimuth: 178.43 °

Inclination: 28.37 °

VS: -93.23 °

MD: 6.344

TV D: 6,123.54

Azimuth: 179.18 °

Inclination: 36.61 °

VS: -67.82 °

MD: 6.154

TV D: 5,951.67

Azimuth: 180.39 °

Inclination: 18.08 °

VS: 505.89 °

MD: 6.201

TV D: 5,996.14

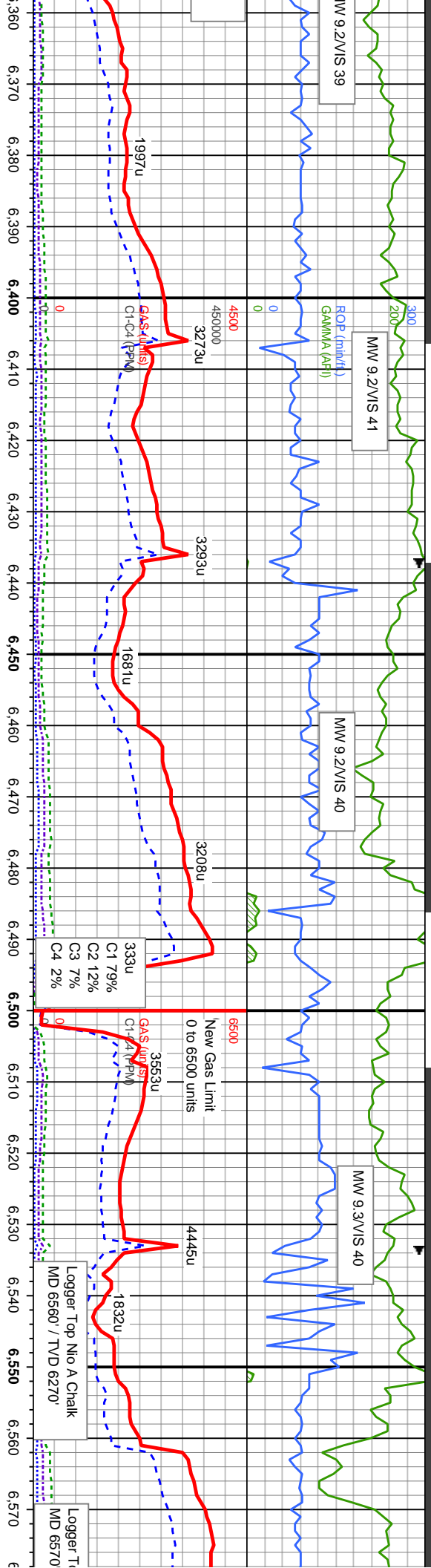
Azimuth: 173.55 °

Inclination: 19.7 °

VS: -129.72 °

SLTY SH: lt-med gy, gy brn, sft-frm, fri-brit, rthy-grtly lst, sb aren, grdg slst 10-15% SHY SS: d gy, s&p, cly cnt, vf-f gr, sb sl frm-hd, brit, mod strg, grdg-ss, 85-90% SLTY SH: lt-med gy, gy brn, ply-biky, sft-frm, fri-brit, rthy-grtly lst, sb wxy, silty-aren, grdg slst 15-10% SHY SS: wh, lt-med gy, s&p, cly cnt, vf-f gr, sb ang-biky, sl frm-hd, brit, mod strg, grdg-ss, 90-95% SLTY SH: lt-med gy, olv gy, gy brn, ply-biky, sft-frm, fri-brit, rthy-grtly lst, sb wxy, silty-aren, grdg slst 10-5% SHY SS: lt-med gy, ooc wh-clr, s&p, cly cnt, vf-f gr, sb ang-biky, sl frm-hd, brit, mod strg, grdg-ss, v tr pyr 100-100% SLTY SH: lt-med gy, dk gy lp, gy brn, ply-biky, sft-frm, fri-brit, rthy-grtly lst, sb wxy, silty-aren, grdg sh, tr bl-gn slst





MD: 6.389  
TVD: 6.158.23  
Azimuth: 178.98  
Inclination: 42.46  
VS: -40.18

MD: 6.438  
TVD: 6.193.63  
Azimuth: 178.78  
Inclination: 45  
VS: -7.45

MD: 6.485  
TVD: 6.225.5  
Azimuth: 177.67  
Inclination: 49.58  
VS: 26.01

MD: 6.534  
TVD: 6.255.86  
Azimuth: 177.8  
Inclination: 53.83  
VS: 63.35

MD: 6.534  
TVD: 6.255.86  
Azimuth: 177.8  
Inclination: 53.83  
VS: 63.35

100-100% SLTY SH: lt-med gy, dk gy, gy  
brn, pily-blky, sft-frm, fri-brt, rthy-gritty lstr,  
sb wxy, sily-arg, grdg sh, tr bent

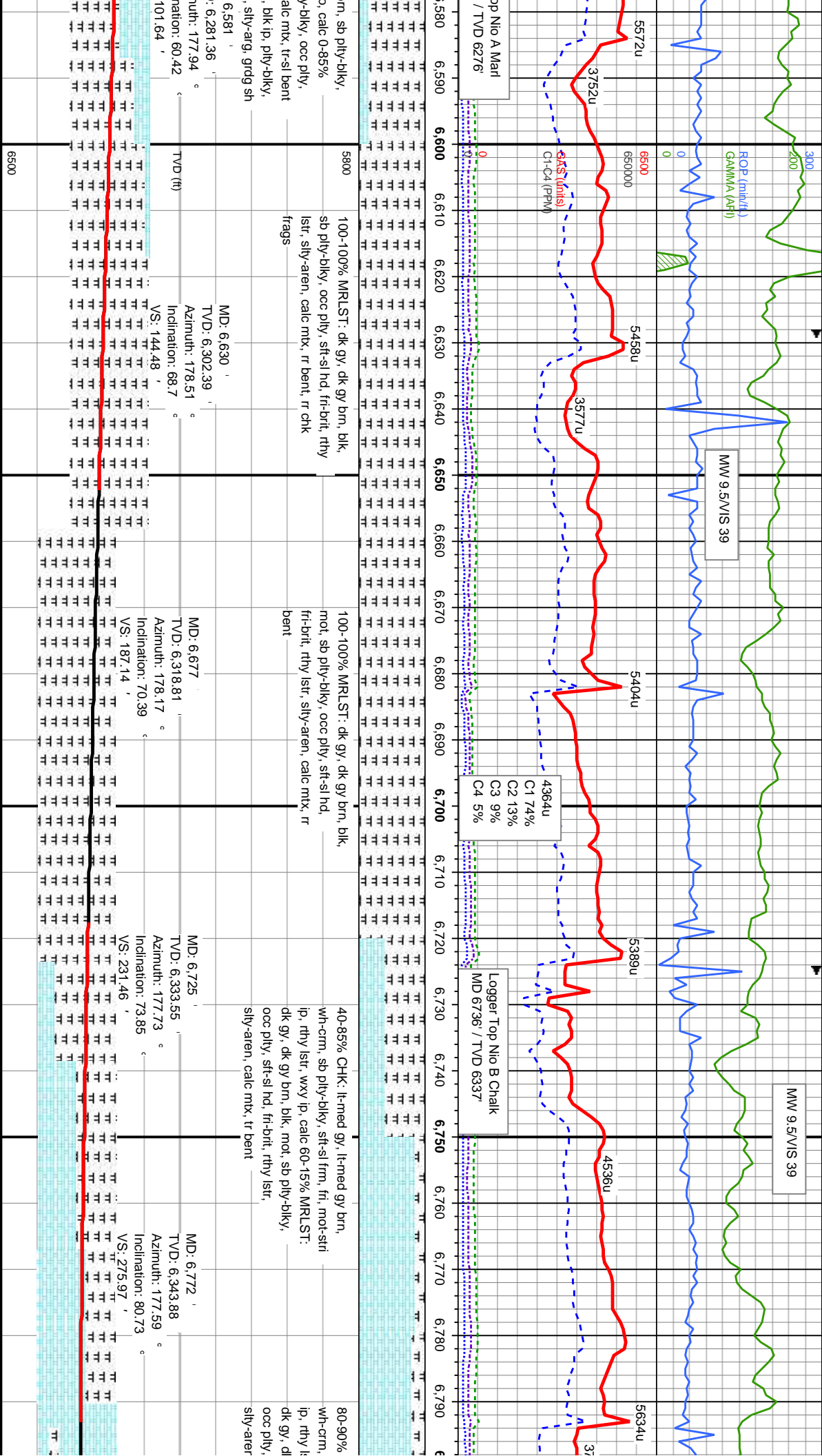
100-100% SLTY SH: med-dk gy, gy brn,  
blk ip, pily-blky, sft-frm, fri-brt, rthy-gritty  
lstr, sb wxy, sily-arg, grdg sh, tr bent

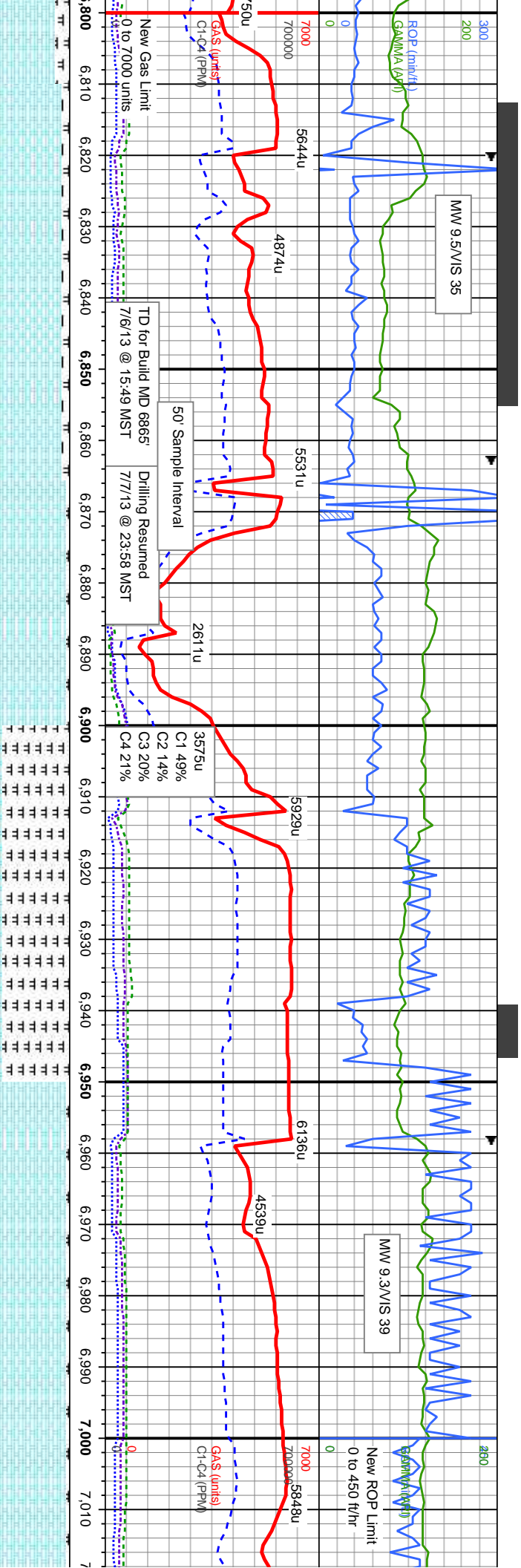
100% SLTY SH: med-dk gy, gy brn, blk ip,  
pily-blky, sft-frm, fri-brt, rthy-gritty lstr, sb  
wxy, sily-arg, grdg sh, abnt bent, tr pyr, tr  
chk

75-15% CHK: lt-med gy, lt-med gy b  
sft-sl frm, fri, mot-srt, rthy lstr, wxy ip  
MRLST: dk gy, dk gy brn, blk, sb pte  
sft-sl nd, fri-brt, rthy lstr, sily-aren, c  
25-0% SLTY SH: med-dk gy, gy brn  
sft-frm, fri-brt, rthy-gritty lstr, sb wxy

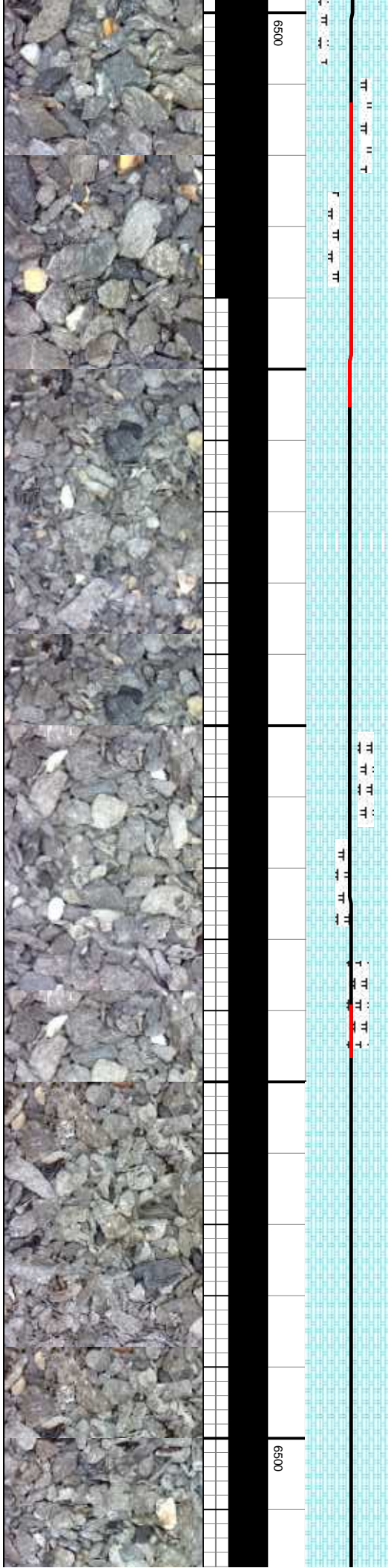




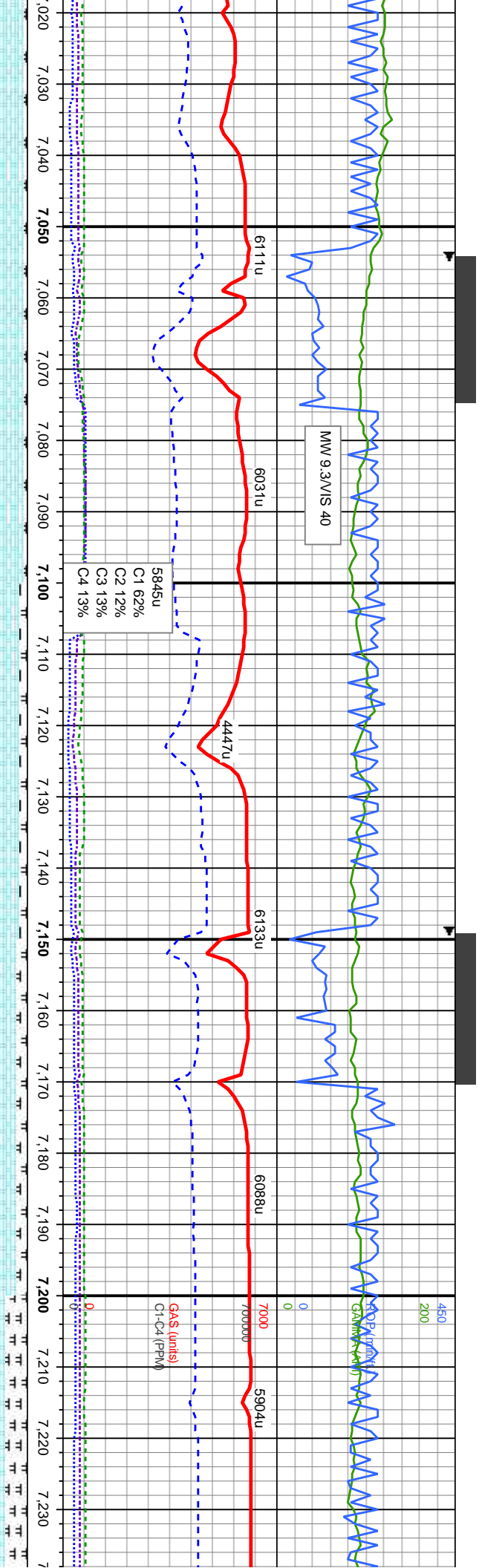




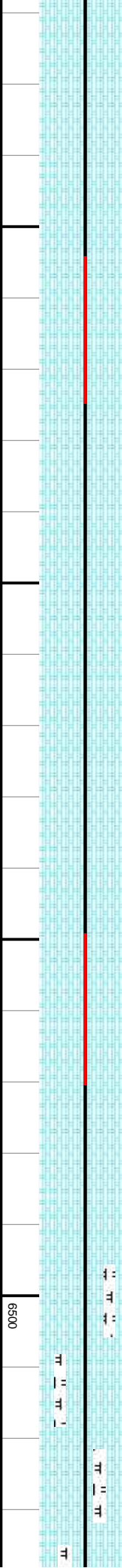
CHK: lt-med gy, lt-med gy brn, sb ply-bkly, sft-sl frm, frt, mot-sfri str, wxy ip, calc 20-10% MRLST: gy brn, blk, mot, sb ply-bkly, sft-sl hd, frt-brt, rthy lstr, calc mtx, tr inoc frags, rr bent		90-95% CHK: lt gy, lt-med gy brn, buff ip, sb ply-bkly, sft-frm, frt-brt, mot, str, rthy lstr, wxy ip, calc 10-5% MRLST: med-dk gy, blk, sb ply-bkly, frm-sl hd, frt-brt, rthy lstr, silty-aren, calc mtx, tr inoc frags		95% MRLST: med-dk gy, blk, sb ply-bkly, frm-sl hd, frt-brt, rthy lstr, silty-aren, calc mtx 5% CHK: lt gy-med, med gy brn, sb ply-bkly, sft-frm, frt-brt, mot, str, rthy lstr, wxy ip, calc, abnt inoc frags		95% CHK: lt gy, lt-med gy brn, sb ply-bkly, sft-sl frm, frt-brt, mot, str, rthy lstr, wxy, calc 5% MRLST: dk gy, blk, sb ply-bkly, frm-sl hd, frt-brt, rthy lstr, silty-aren, calc mtx, tr inoc frags		5800 95% CHK: lt-r ply-sb bkly, str rthy lstr, wxy, sb ply-bkly, fr silty-aren, calc	
MD: 6,818 ' TVD: 6,348.9 ' Azimuth: 179.02 ° Incination: 86.36 ' VS: 320.34 '		MD: 6,880 ' TVD: 6,350.36 ' Azimuth: 180.65 ° Incination: 90.94 ' VS: 379.94 '		MD: 6,903 ' TVD: 6,349.97 ' Azimuth: 180.68 ° Incination: 91.02 ' VS: 401.96 '		MD: 6,999 ' TVD: 6,348.44 ' Azimuth: 179.2 ° Incination: 90.8 ' VS: 494.23 '			

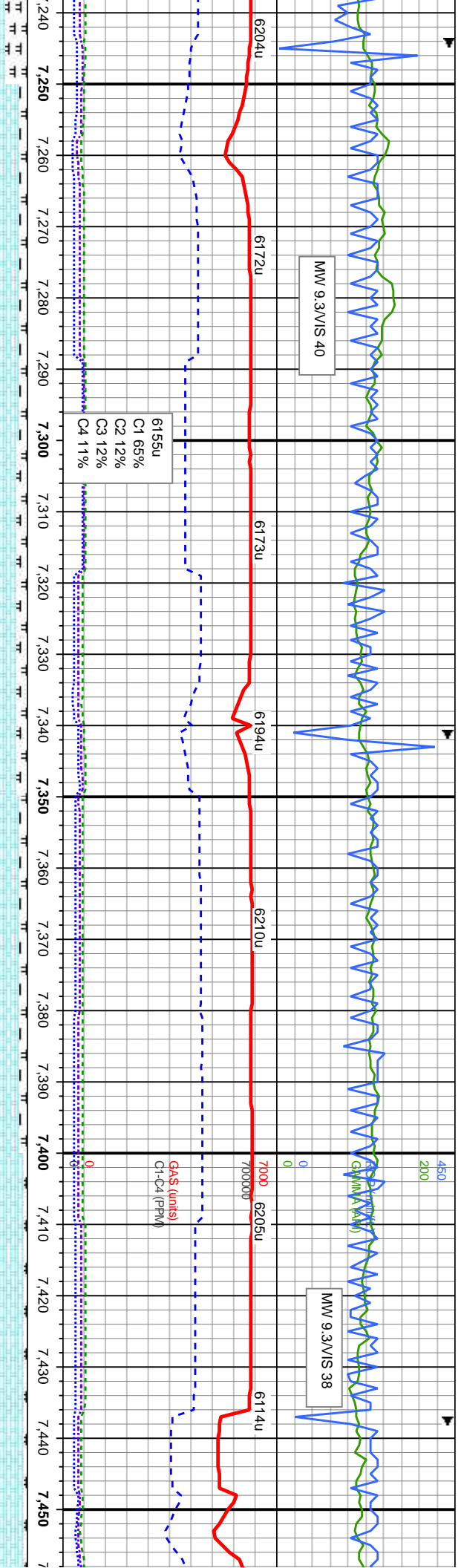






med gy, lt-med gy brn, fr-brit, mot, str, calc 5% MRLST: dk gy, blk, m-si hd, fr-brit, rthy lstr, mx, tr inoc frags	95% CHK: lt-med gy, lt-med gy brn, sb ply-bkly, sft-si frm, fr-brit, mot, str, rthy lstr, wxy, calc 5% MRLST: dk gy, blk, sb ply-bkly, frm-si hd, fr-brit, rthy lstr, silty-aren, calc mx, tr inoc frags	90% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-bkly, sft-si frm, fr-brit, mot, str, rthy lstr, wxy, calc 10% MRLST: dk gy, blk, sb ply-bkly, frm-si hd, fr-brit, rthy lstr, silty-aren, calc mx, tr inoc frags	85% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-bkly, sft-si frm, fr-brit, mot, str, rthy lstr, wxy, calc 15% MRLST: med-dk gy, blk, sb ply-bkly, frm-si hd, fr-brit, rthy lstr, silty-aren, calc mx, tr inoc frags	5800 70% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-bkly, sft-si frm, fr-brit, mot, str, rthy lstr, wxy, calc 30% MRLST: med-dk gy, blk, sb ply-bkly, frm-si h fr-brit, rthy lstr, silty-aren, calc mx, tr inoc frags
	MD: 7.094 TVD: 6,347.55 Azimuth: 178.1 Inclination: 90.28 VS: 586.12		MD: 7.189 TVD: 6,348.01 Azimuth: 179.83 Inclination: 89.16 VS: 677.87	





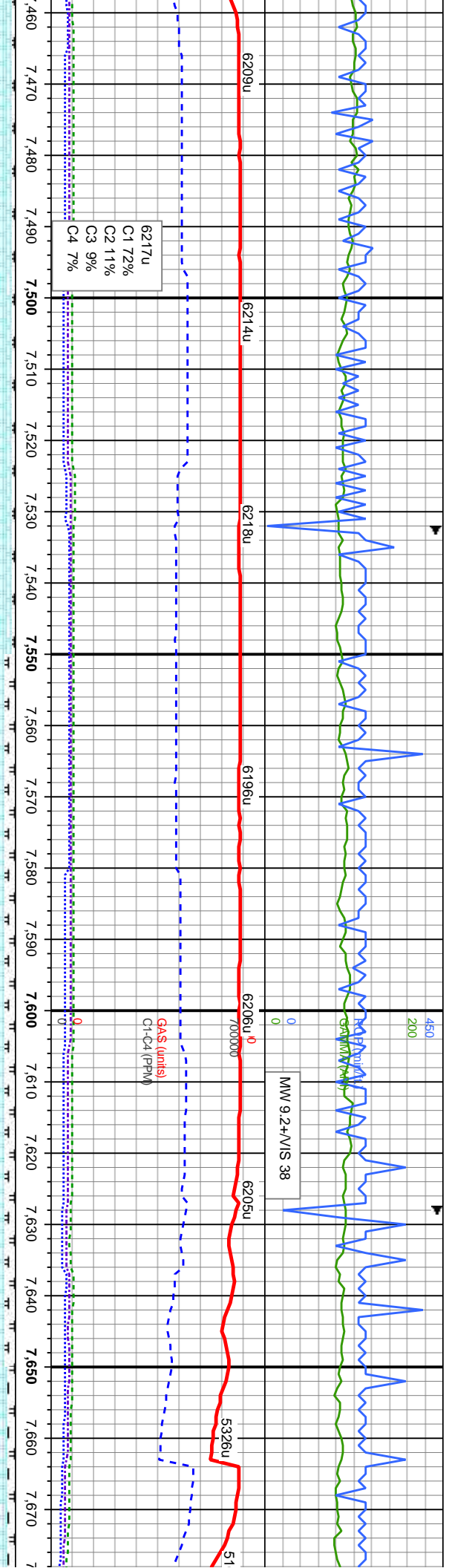
90% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 90% MRLST: med-dk gy, blk, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr inoc frags, tr bent	MD: 7.285 TVD: 6,349.16 Azimuth: 180.38 Inclination: 89.47	85% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 15% MRLST: med-dk gy, blk, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr inoc frags, tr bent	90% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 10% MRLST: med-dk gy, blk, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent	MD: 7.381 TVD: 6,350.1 Azimuth: 179.88 Inclination: 89.41
	VS: 770.07			VS: 862.26

95% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags	MD: 7.381 TVD: 6,350.1 Azimuth: 179.88 Inclination: 89.41	VS: 862.26
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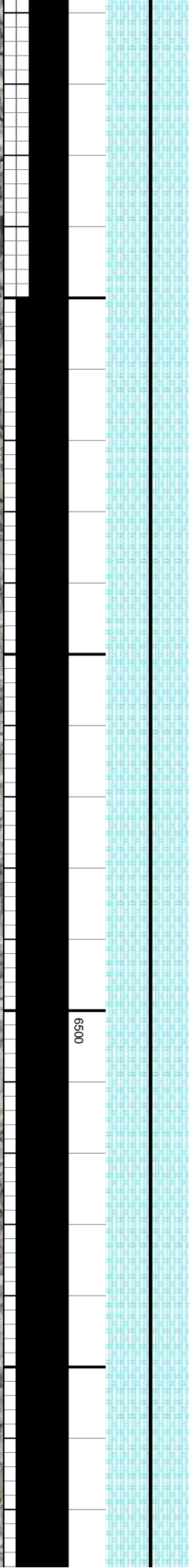
95% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags	MD: 7.381 TVD: 6,350.1 Azimuth: 179.88 Inclination: 89.41	VS: 862.26
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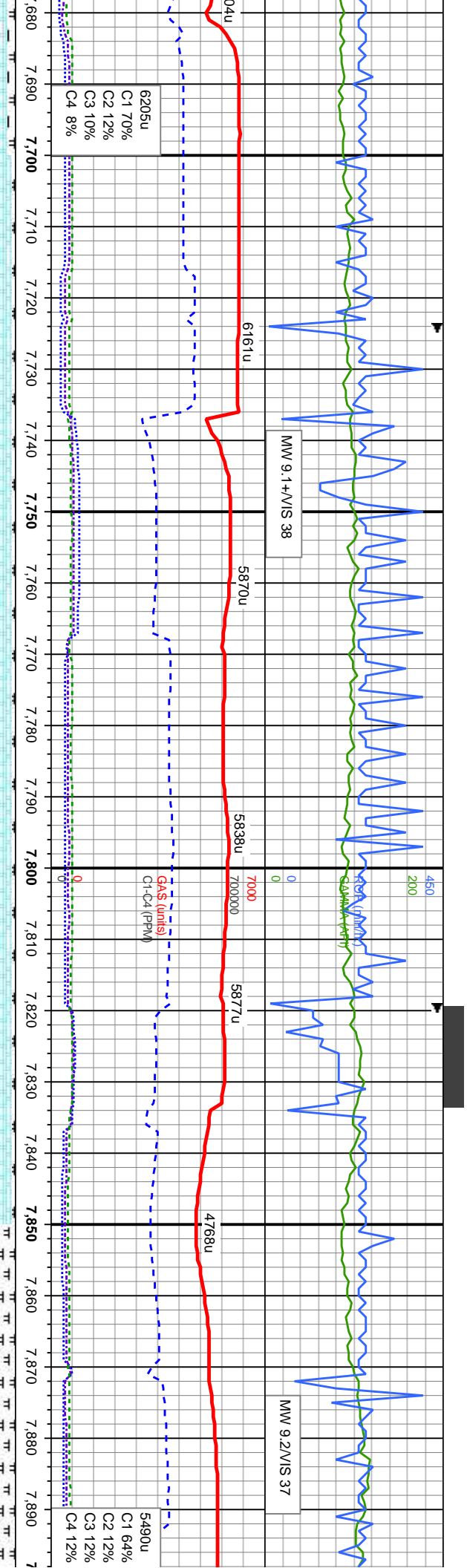




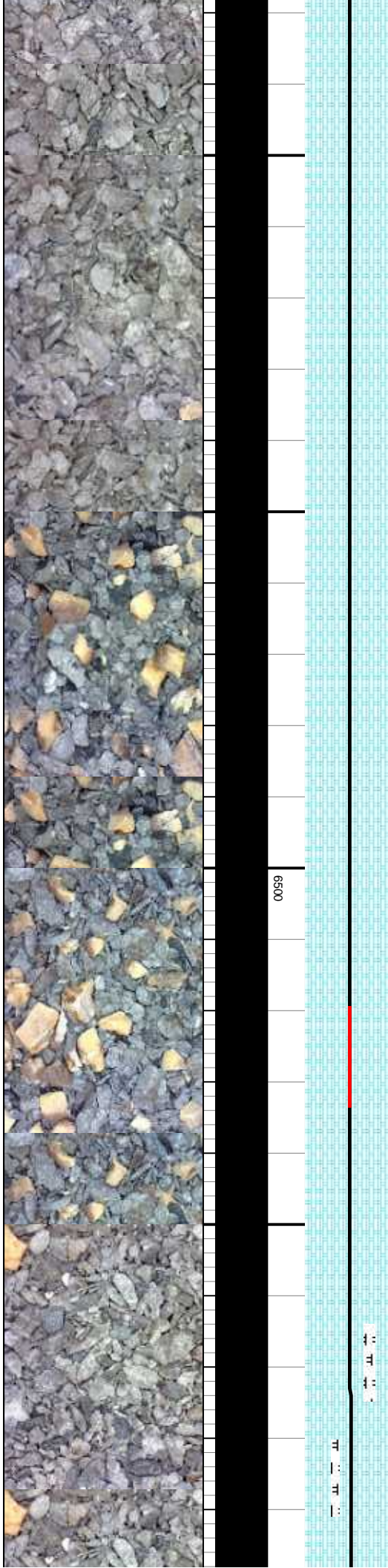


95% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-blky, sft-sl frm, fr-brt, mot, strf, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk, sb ply-blky, frm-sl hd, fr-brt, rthy lstr, silv-aren, calc mtx, rr inoc frags, v rr bent		85% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-blky, sft-sl frm, fr-brt, mot, strf, rthy lstr, wxy, calc 15% MRLST: med-dk gy, blk, sb ply-blky, frm-sl hd, fr-brt, rthy lstr, silv-aren, calc mtx, rr inoc frags, rr bent		85% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-blky, sft-sl frm, fr-brt, mot, strf, rthy lstr, wxy, calc 15% MRLST: med-dk gy, blk, sb ply-blky, frm-sl hd, fr-brt, rthy lstr, silv-aren, calc mtx, rr inoc frags, rr bent		90% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-blky, sft-sl frm, fr-brt, mot, strf, rthy lstr, wxy, calc 15% MRLST: med-dk gy, blk ip, sb ply-blky, frm-sl hd, fr-brt, rthy lstr, silv-aren, calc mtx, rr inoc frags, v rr bent	
MD: 7,476 ' TVD: 6,350.82' Azimuth: 180.14 ° Inclination: 89.72 ° VS: 963.55 '		MD: 7,571 ' TVD: 6,351.26' Azimuth: 179.78 ° Inclination: 89.75 ° VS: 1,044.87 '		MD: 7,571 ' TVD: 6,351.26' Azimuth: 179.78 ° Inclination: 89.75 ° VS: 1,044.87 '		MD: 7,571 ' TVD: 6,351.26' Azimuth: 179.78 ° Inclination: 89.75 ° VS: 1,044.87 '	

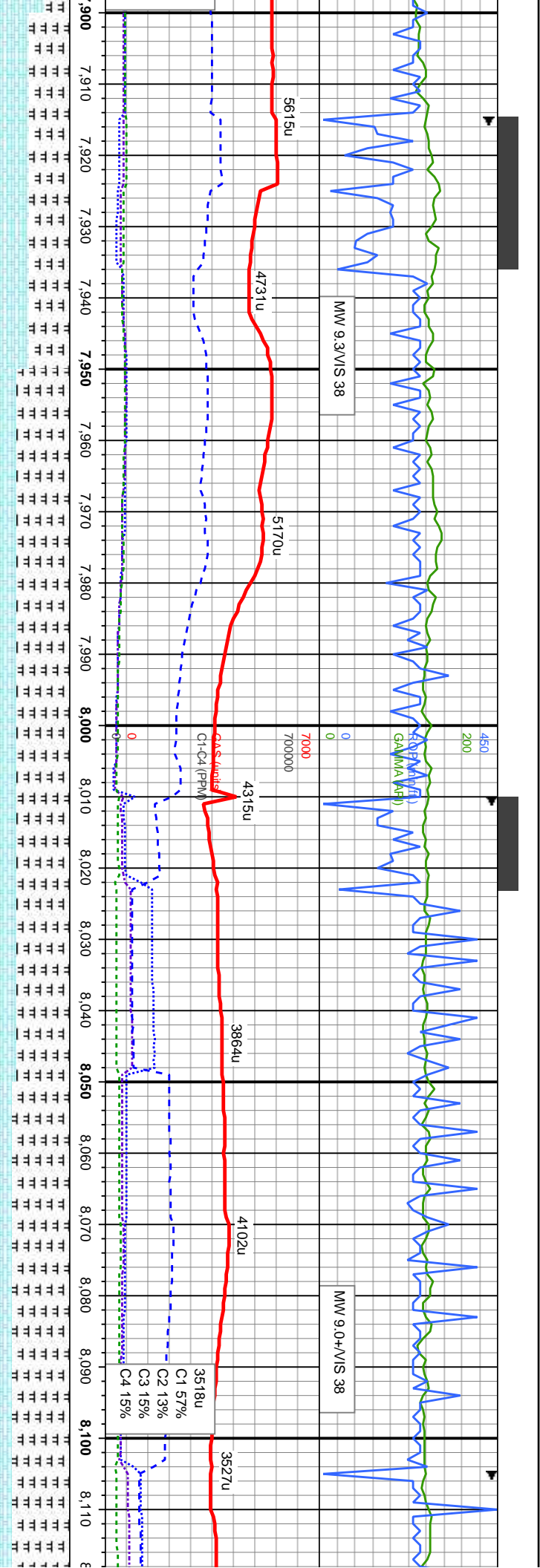




95% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-biky, sft-sl frm, fr-brit, mot, sfti, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk ip, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr Inoc frags, v rr bent	95% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-biky, sft-sl frm, fr-brit, mot, sfti, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk ip, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr Inoc frags, v rr bent	95% CHK: lt-med gy, lt-med gy brn, wh-crm, sb ply-biky, sft-sl frm, fr-brit, mot, sfti, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk ip, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr Inoc frags, v rr bent	65% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb ply-biky, sft-sl frm, fr-brit, mot, sfti, rthy lstr, wxy, calc 35% MRLST: med-dk gy, blk ip, sb ply-biky, frm-sl hd, fr-brit, rthy lstr, silty-aren, calc mtx, tr Inoc frags
MD: 7.681 D: 6.351.2 muth: 179.76 ination: 90.31 1,150.7	MD: 7.762 TVD: 6.350.8 Azimuth: 179.34 Inclination: 90.25 VS: 1,228.71	MD: 7.762 TVD: 6.350.8 Azimuth: 179.34 Inclination: 90.25 VS: 1,228.71	MD: 7.857 TVD: 6.349.85 Azimuth: 181.56 Inclination: 90.9 VS: 1,319.79

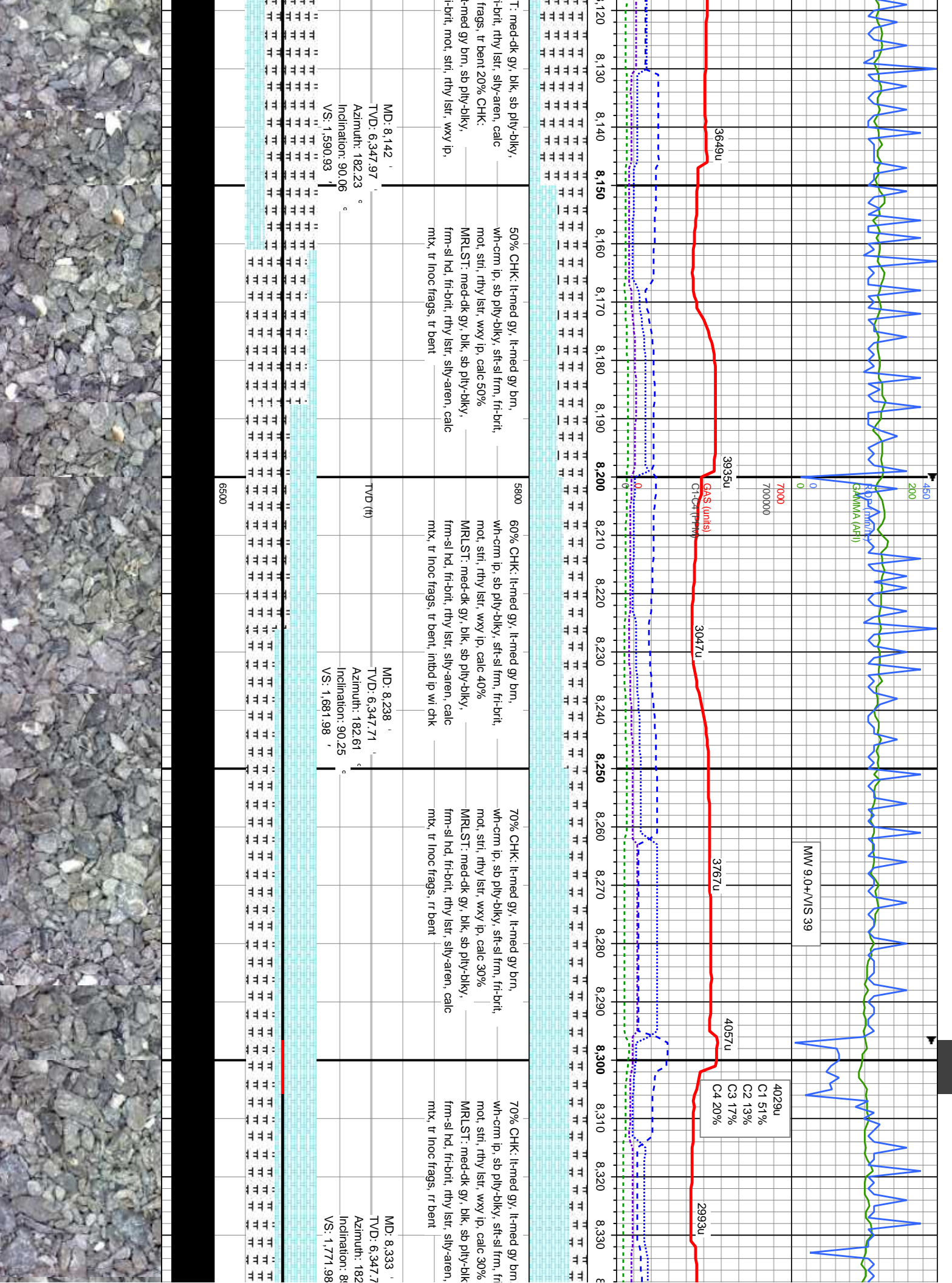






55% MRLST: med-dk gy, blk, sb pily-blky, frm-sl hd, fri-bit, rthy lstr, silty-aren, calc mx, tr inoc frags, tr bent 45% CHK: lt-med gy, lt-med gy brn, sb pily-blky, sft-sl frm, fri-bit, mot, str, rthy lstr, wxy ip, calc	75% MRLST: med-dk gy, blk, sb pily-blky, frm-sl hd, fri-bit, rthy lstr, silty-aren, calc mx, tr inoc frags, tr bent 25% CHK: lt-med gy, lt-med gy brn, sb pily-blky, sft-sl frm, fri-bit, mot, str, rthy lstr, wxy ip, calc	5800	75% MRLST: med-dk gy, blk, sb pily-blky, frm-sl hd, fri-bit, rthy lstr, silty-aren, calc mx, tr inoc frags, tr bent 25% CHK: lt-med gy, lt-med gy brn, sb pily-blky, sft-sl frm, fri-bit, mot, str, rthy lstr, wxy ip, calc	80% MRLST: med-dk gy, blk, sb pily-blky, frm-sl hd, fri-bit, rthy lstr, silty-aren, calc mx, tr inoc frags, tr bent 20% CHK: lt-med gy, lt-med gy brn, sb pily-blky, sft-sl frm, fri-bit, mot, str, rthy lstr, wxy ip, calc	80% MRLST: med-dk gy, blk, sb pily-blky, frm-sl hd, fri-bit, rthy lstr, silty-aren, calc mx, tr inoc frags, tr bent 20% CHK: lt-med gy, lt-med gy brn, sb pily-blky, sft-sl frm, fri-bit, mot, str, rthy lstr, wxy ip, calc
MD: 7.953 TVD: 6,348.58 Azimuth: 182.12 Inclination: 90.62 VS: 1,411.14	MD: 8.047 TVD: 6,348.04 Azimuth: 181.65 Inclination: 90.03 VS: 1,500.57	MD: 8.047 TVD: 6,348.04 Azimuth: 181.65 Inclination: 90.03 VS: 1,500.57	MD: 8.047 TVD: 6,348.04 Azimuth: 181.65 Inclination: 90.03 VS: 1,500.57	MD: 8.047 TVD: 6,348.04 Azimuth: 181.65 Inclination: 90.03 VS: 1,500.57	MD: 8.047 TVD: 6,348.04 Azimuth: 181.65 Inclination: 90.03 VS: 1,500.57

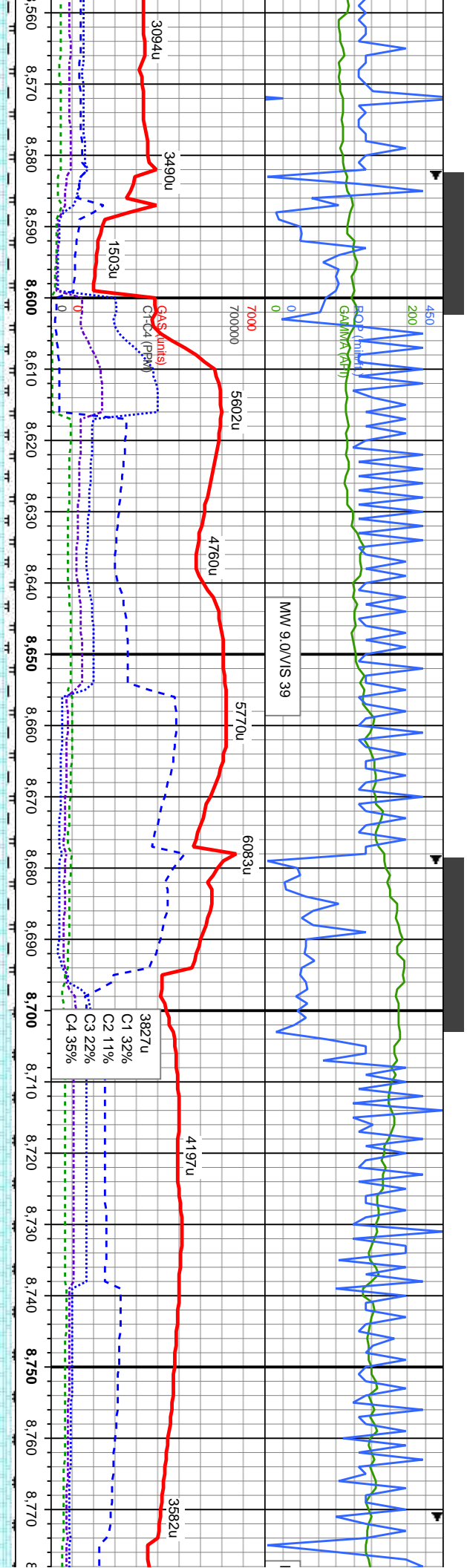












% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb pily-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 10% MRLST: dk gy, dk gy brn, blk, sb pily-biky, frm-sl hd, fr-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, bent

5800 85% CHK: lt-med gy, lt-med gy brn, wh-crm ip, sb pily-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 15% MRLST: dk gy, dk gy brn, blk, sb pily-biky, frm-sl hd, fr-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, tr bent

90% CHK: lt-med gy, lt-med gy brn, sb pily-biky, ooc pily, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 10% MRLST: dk gy, blk, sb pily-biky, frm-sl hd, fr-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, bent

95% CHK: lt gy, lt-med gy brn, wh-crm, sb pily-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 5% MRLST: dk gy, blk, sb pily-biky, frm-sl hd, fr-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, tr bent

95% CHK: lt-med gy, lt-med gy brn, wh-crm, sb pily-biky, sft-sl frm, fr-brit, mot, strf, rthy lstr, wxy, calc 10% MRLST: dk gy, dk gy brn, blk, sb pily-biky, frm-sl hd, fr-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, bent

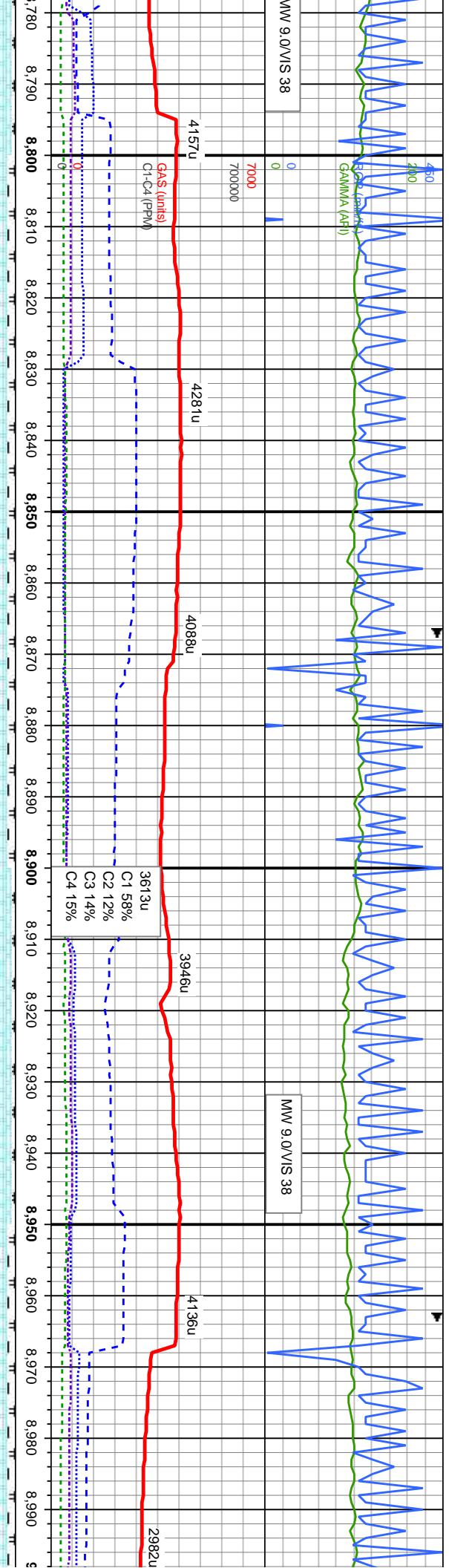
MD: 8,620 ' TVD: 6,346.8 ' Azimuth: 182.4 ° Incination: 90.77 ° VS: 2,043.61 '

MD: 8,715 ' TVD: 6,346.7 ' Azimuth: 180.95 ° Incination: 89.35 ° VS: 2,134.1 '

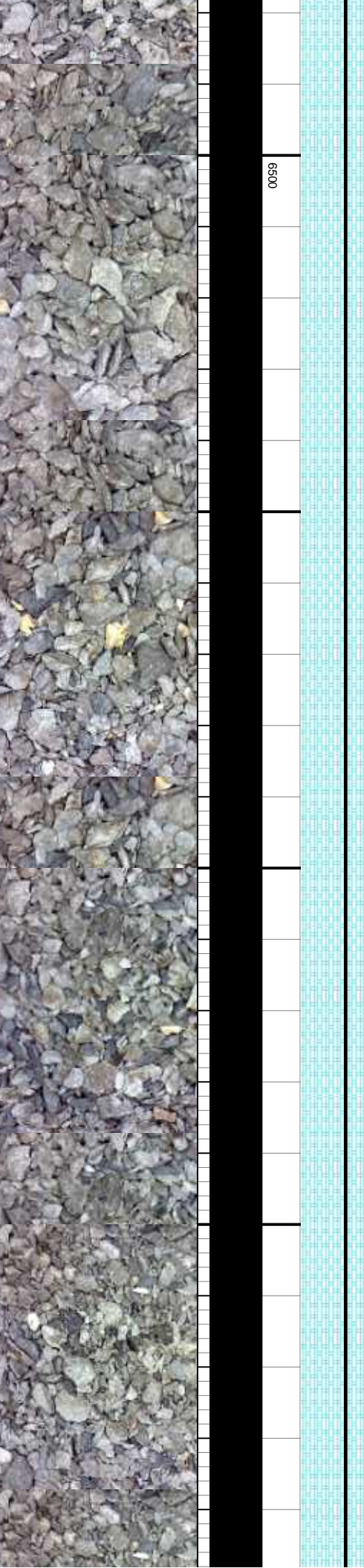
6500



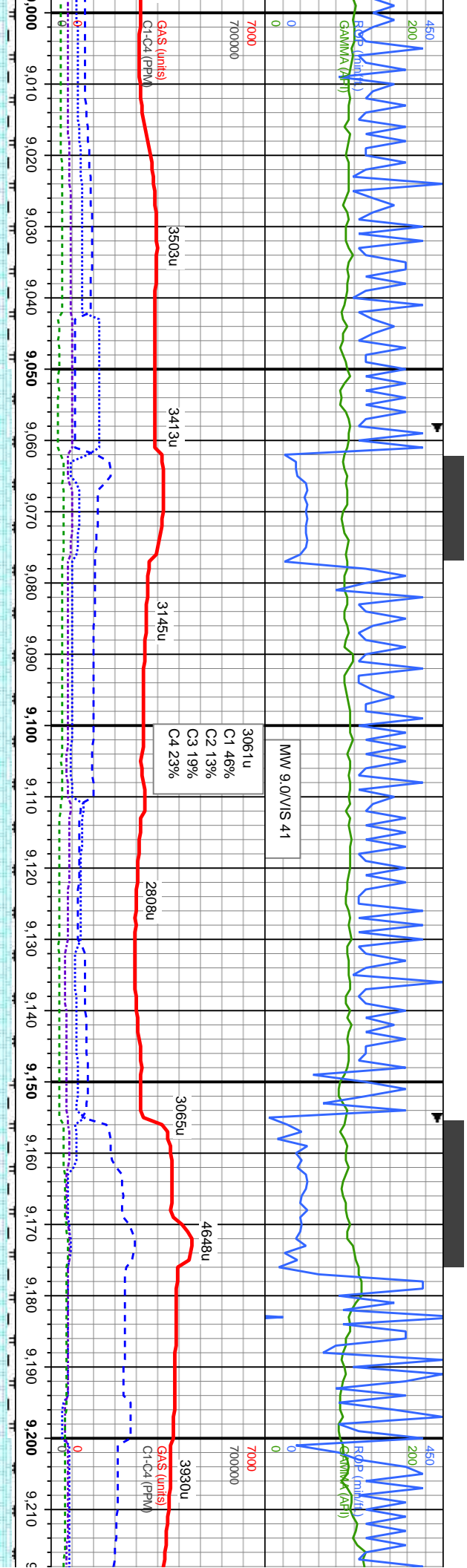




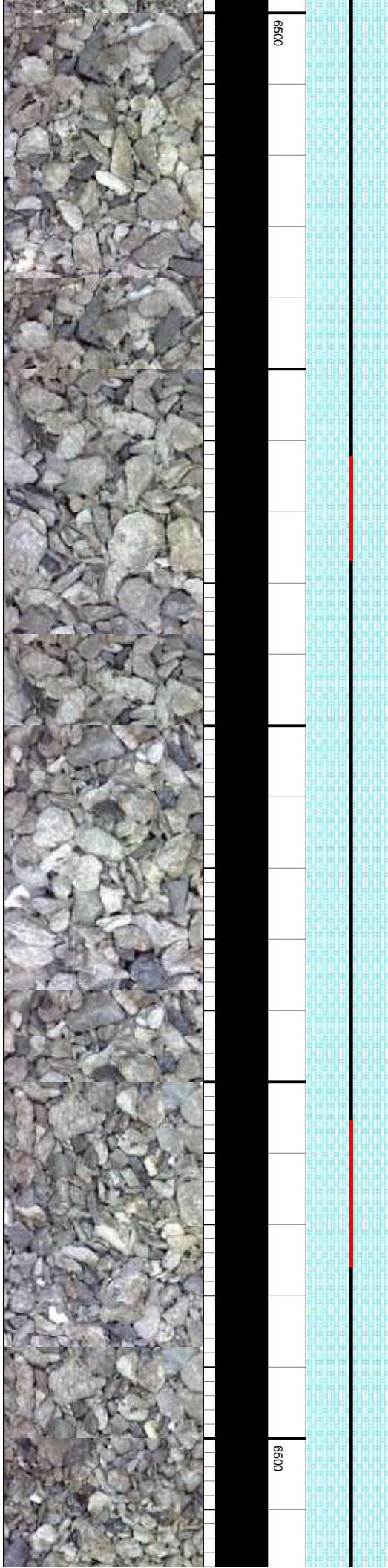
bed gy brn, frm, fri-brit, ic 5% MRLST: ply-bkly, frm-sl, calc mtx, rr	5800 90% CHK: lt gy, lt-med gy brn, wh-crm, ip, sb ply-bkly, sft-sl frm, fri-brit, mot, str, rthy lstr, wxy, calc 10% MRLST: dk gy, blk, sb ply-bkly, frm-sl hd, fri-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, tr bent	90% CHK: lt-med gy, lt gy brn, wh-crm, ip, sb ply-bkly, sft-sl frm, fri-brit, mot, str, rthy lstr, wxy, calc 10% MRLST: dk gy, blk, sb ply-bkly, frm-sl hd, fri-brit, rthy lstr, sily-aren, calc mtx, rr inoc frags, tr bent	95% CHK: lt gy, lt-med gy brn, wh-crm, sb ply-bkly, sft-frm, fri-brit, mot, str, rthy lstr, wxy, calc 5% MRLST: dk gy, blk, sb ply-bkly, frm-sl hd, fri-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, rr bent	90% CHK: lt gy, lt-med gy brn, wh-crm, sb ply-bkly, sft-sl frm, fri-brit, mot, str, rthy lstr, wxy, calc 10% MRLST: dk gy, blk, sb ply-bkly, frm-sl hd, fri-brit, rthy lstr, sily-aren, calc mtx, tr inoc frags, rr bent
	MD: 8,812 ' TVD: 6,347.64 ' Azimuth: 181.16 ° Inclination: 89.54 ° VS: 2,226.8 '	MD: 8,908 ' TVD: 6,348.37 ' Azimuth: 181.24 ° Inclination: 89.6 ° VS: 2,318.79 '		MD: 8,950 ' TVD: 6,348.37 ' Azimuth: 181.24 ° Inclination: 89.6 ° VS: 2,318.79 '



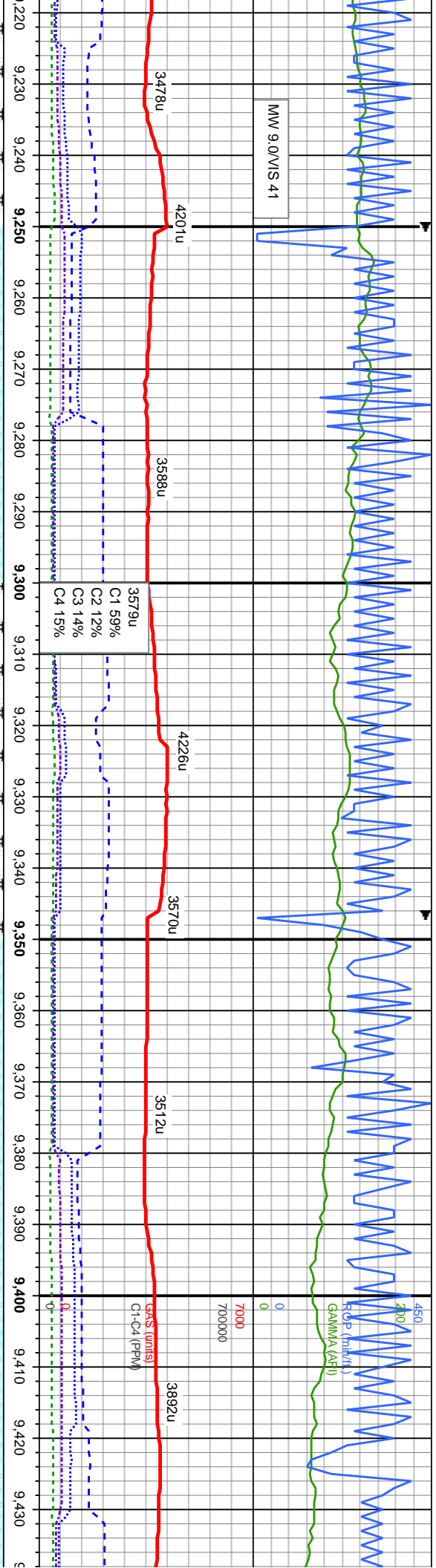




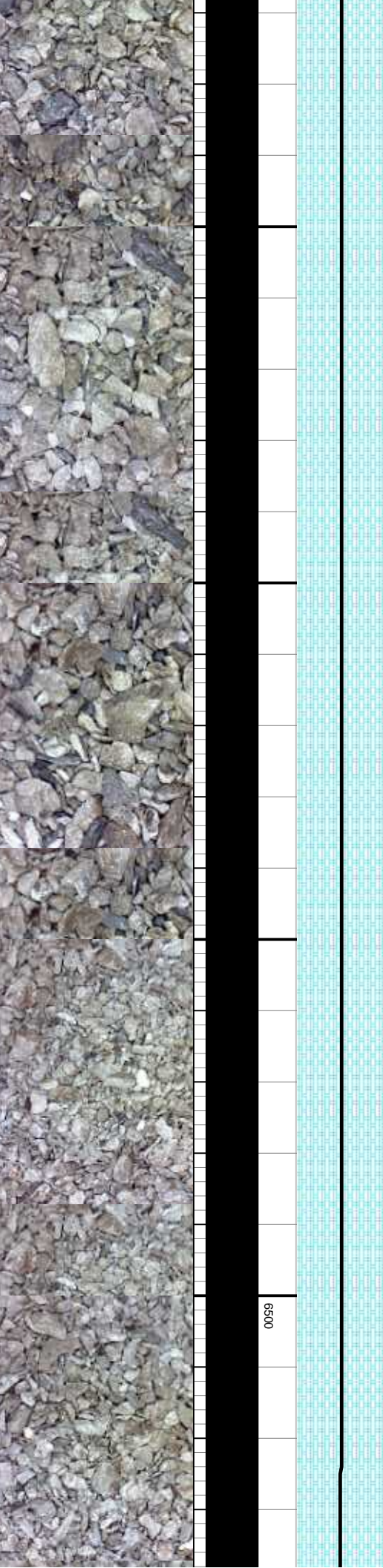
5800	90% CHK: lt gy, lt-med gy brn, wh-crm, sb pily-biky, sft-frn, fri-brit, mot, stri, rthy lstr, wxy, calc 10% MRLST: med-dk gy, blk, sb pily-biky, sft-frn, fri-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent	95% CHK: lt gy, lt-med gy brn, wh-crm, sb pily-biky, sft-frn, fri-brit, mot, stri, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk, sb pily-biky, sft-frn, fri-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent	95% CHK: lt gy, lt-med gy brn, wh-crm, sb pily-biky, sft-frn, fri-brit, mot, stri, rthy lstr, wxy, calc 5% MRLST: med-dk gy, blk, sb pily-biky, sft-frn, fri-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent	90% CHK: lt-med gy, lt-med gy brn, wh-crm, sb pily-biky, sft-si frn, fri-brit, mot, stri, rthy lstr, wxy, calc 10% MRLST: med-dk gy, blk, sb pily-biky, sft-frn, fri-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent	5800	95% CHK: lt gy, lt-med gy brn, wh-crm, sb pily-biky, sft-si frn, fri-brit, mot, stri, rthy lstr, wxy, calc 10% MRLST: med-dk gy, blk, sb pily-biky, sft-frn, fri-brit, rthy lstr, silty-aren, calc mtx, rr inoc frags, rr bent
9,003 '	MD: 6,348.34 TVD: 6,347.39 Azimuth: 181.77 Inclination: 90.43 VS: 2,409.06	MD: 9,099 '	MD: 9,195 '	MD: 9,195 '		MD: 9,195 '

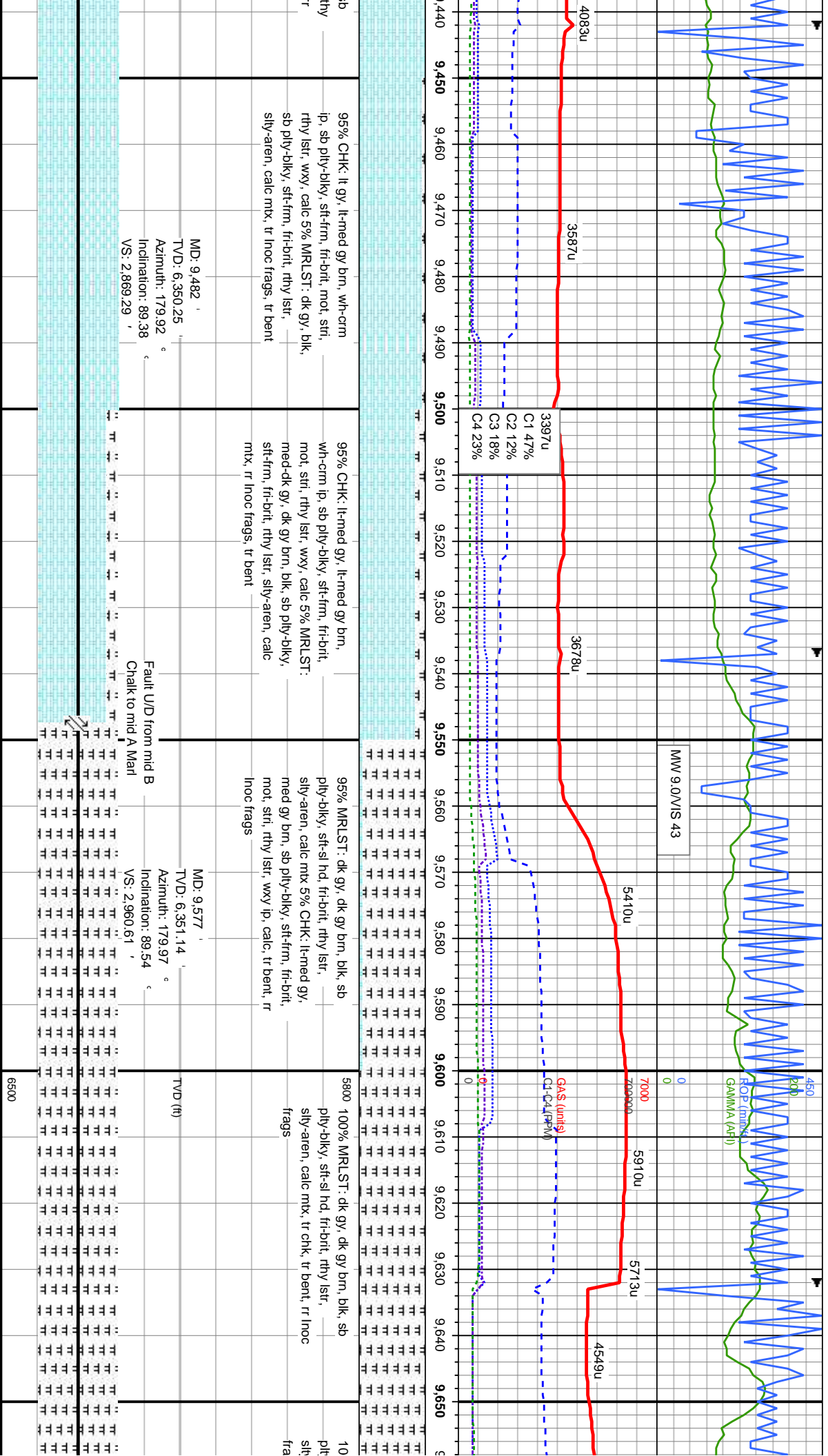






lt-med gy brn, wh-crm, ft-sil frm, fri-brit, mot, str, calc 5% MRLST: dk gy, blk, ft-frm, fri-brit, rthy lst, mtx, tr inoc frags, tr bent	100% CHK: lt gy, lt gy brn, wh-crm, sb ply-biky, sft-sil frm, fri-brit, mot, str, rthy lst, wxy, calc, tr mltst, tr inoc frags, tr bent	95% CHK: lt gy, lt gy brn, wh-crm, sb ply-biky, sft-sil frm, fri-brit, mot, str, rthy lst, wxy, calc 5% MRLST: dk gy, blk, sb ply-biky, sft-frm, fri-brit, rthy lst, silty-aren, calc mtx, tr inoc frags, tr bent	100% CHK: lt gy, lt gy brn, wh-crm, sb ply-biky, sft-sil frm, fri-brit, mot, str, rthy lst, wxy, calc, tr mltst, tr inoc frags, tr bent	5800 100% CHK: lt gy, lt gy brn, wh-crm, sb ply-biky, sft-sil frm, fri-brit, mot, str, rthy lst, wxy, calc, tr mltst, tr inoc frags, tr bent
	MD: 9.291 TVD: 6,348.29 Azimuth: 179.33 Inclination: 89.51 VS: 2,685.49		MD: 9.387 TVD: 6,349.22 Azimuth: 179.81 Inclination: 89.38 VS: 2,777.94	MD: 9.387 TVD: 6,349.22 Azimuth: 179.81 Inclination: 89.38 VS: 2,777.94





95% CHK: lt gy, lt-med gy brn, wh-crm  
ip, sb ply-biky, sft-firm, fri-brit, mot, str,  
rthy lstr, wxy, calc 5% MRLST: dk gy, blk,  
sb ply-biky, sft-firm, fri-brit, rthy lstr,  
sily-aren, calc mix, tr inoc frags, tr bent

MD: 9,482 '  
TVD: 6,350.25 '  
Azimuth: 179.92 °  
Inclination: 89.38 °  
VS: 2,869.29 '

95% CHK: lt-med gy, lt-med gy brn,  
wh-crm ip, sb ply-biky, sft-firm, fri-brit,  
mot, str, rthy lstr, wxy, calc 5% MRLST:  
med-dk gy, dk gy brn, blk, sb ply-biky,  
sft-firm, fri-brit, rthy lstr, sily-aren, calc  
mix, tr inoc frags, tr bent

95% MRLST: dk gy, dk gy brn, blk, sb  
ply-biky, sft-sl hd, fri-brit, rthy lstr,  
sily-aren, calc mix 5% CHK: lt-med gy,  
med gy brn, sb ply-biky, sft-firm, fri-brit,  
mot, str, rthy lstr, wxy ip, calc, tr bent, tr  
inoc frags

5800 100% MRLST: dk gy, dk gy brn, blk, sb  
ply-biky, sft-sl hd, fri-brit, rthy lstr,  
sily-aren, calc mix, tr chk, tr bent, tr inoc  
frags

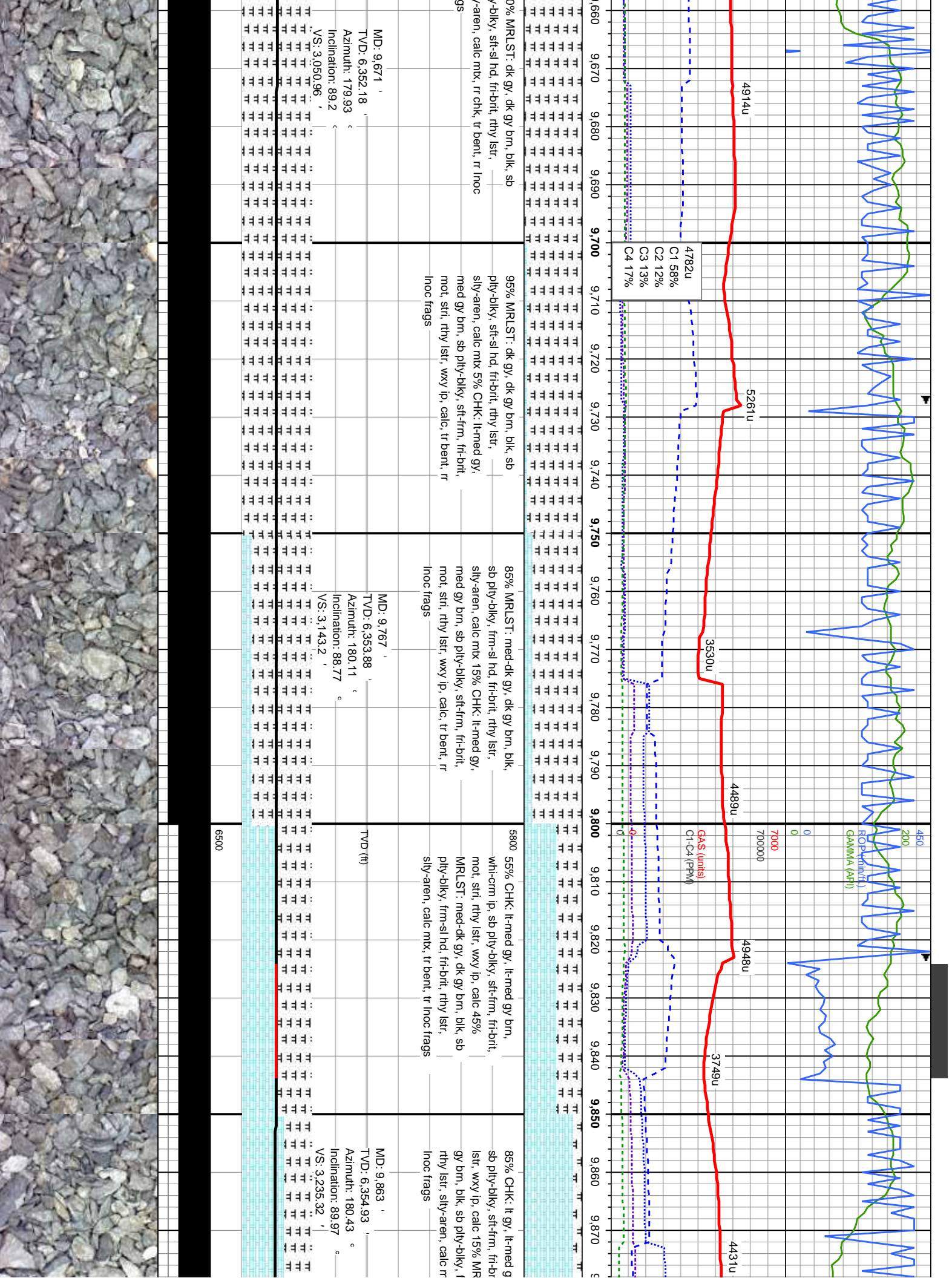
MD: 9,577 '  
TVD: 6,351.14 '  
Azimuth: 179.97 °  
Inclination: 89.54 °  
VS: 2,960.61 '

TVD (ft)

6500







MD: 9.671  
TVD: 6.352.18  
Azimuth: 179.93  
Inclination: 89.2  
VS: 3.050.96

95% MRLST: dk gy, dk gy brn, blk, sb  
ply-bkly, sft-sl hd, fri-brt, rthy lstr,  
sily-aren, calc mix 5% CHK: lt-med gy,  
med gy brn, sb ply-bkly, sft-frn, fri-brt,  
mot, strl, rthy lstr, wxy ip, calc, tr bent, tr  
Inoc frags

85% MRLST: med-dk gy, dk gy brn, blk, sb  
ply-bkly, frn-sl hd, fri-brt, rthy lstr,  
sily-aren, calc mix 15% CHK: lt-med gy,  
med gy brn, sb ply-bkly, sft-frn, fri-brt,  
mot, strl, rthy lstr, wxy ip, calc, tr bent, tr  
Inoc frags

MD: 9.767  
TVD: 6.353.88  
Azimuth: 180.11  
Inclination: 88.77  
VS: 3.143.2

TVD (ft)

5800 55% CHK: lt-med gy, lt-med gy brn,  
whi-crm ip, sb ply-bkly, sft-frn, fri-brt,  
mot, strl, rthy lstr, wxy ip, calc 45%  
MRLST: med-dk gy, dk gy brn, blk, sb  
ply-bkly, frn-sl hd, fri-brt, rthy lstr,  
sily-aren, calc mix, tr bent, tr inoc frags

MD: 9.863  
TVD: 6.354.93  
Azimuth: 180.43  
Inclination: 89.97  
VS: 3.235.32



7/9/13

MINIDEPTH

NEO

HOE (m/m)

GAMMA (API)

MMW 9.0/VIS 43

7000

700000

GA\$ (units)

C1-C4 (PPM)

4580u

C1 20%

C2 8%

C3 22%

C4 49%

4632u

3081u

4548u

3396u

4288u

4560u

9.880 9.890 9.900 9.910 9.920 9.930 9.940 9.950 9.960 9.970 9.980 9.990 10.000 10.010 10.020 10.030 10.040 10.050 10.060 10.070 10.080 10.090 1

50% CHK: lt gy, lt-med gy brn, whi-crm, ip, sb pty-biky, sft-frn, fri-brt, mot, str, rthy lstr, wxy ip, calc 50% MRLST: dk gy, dk gy brn, blk, sb pty-biky, frm-sl hd, fri-brt, rthy lstr, silty-aren, calc mtx, tr bent, tr inoc frags, rr pyr

50% CHK: lt gy, lt gy brn, whi-crm, sb pty-biky, sft-frn, fri-brt, mot, str, rthy lstr, wxy ip, calc 50% MRLST: med-dk gy, dk gy brn, blk, sb pty-biky, frm-sl hd, fri-brt, rthy lstr, silty-aren, calc mtx, tr bent, tr inoc frags

5800 95% CHK: lt gy, lt-med gy brn, whi-crm, sb pty-biky, sft-sl frm, fri-brt, mot, str, rthy lstr, wxy ip, calc 5% MRLST: med-dk gy, dk gy brn, blk, sb pty-biky, frm-sl hd, fri-brt, rthy lstr, silty-aren, calc mtx, tr bent, tr inoc frags

90% CHK: lt gy, lt-med gy brn, whi-crm, sb pty-biky, sft-sl frm, fri-brt, mot, str, rthy lstr, wxy, calc 10% MRLST: med-dk gy, dk gy brn, blk, sb pty-biky, frm-sl hd, fri-brt, rthy lstr, silty-aren, calc mtx, tr inoc frags

MD: 9.959  
TVD: 6.355.17  
Azimuth: 180.36  
Inclination: 89.75  
VS: 3.327.4

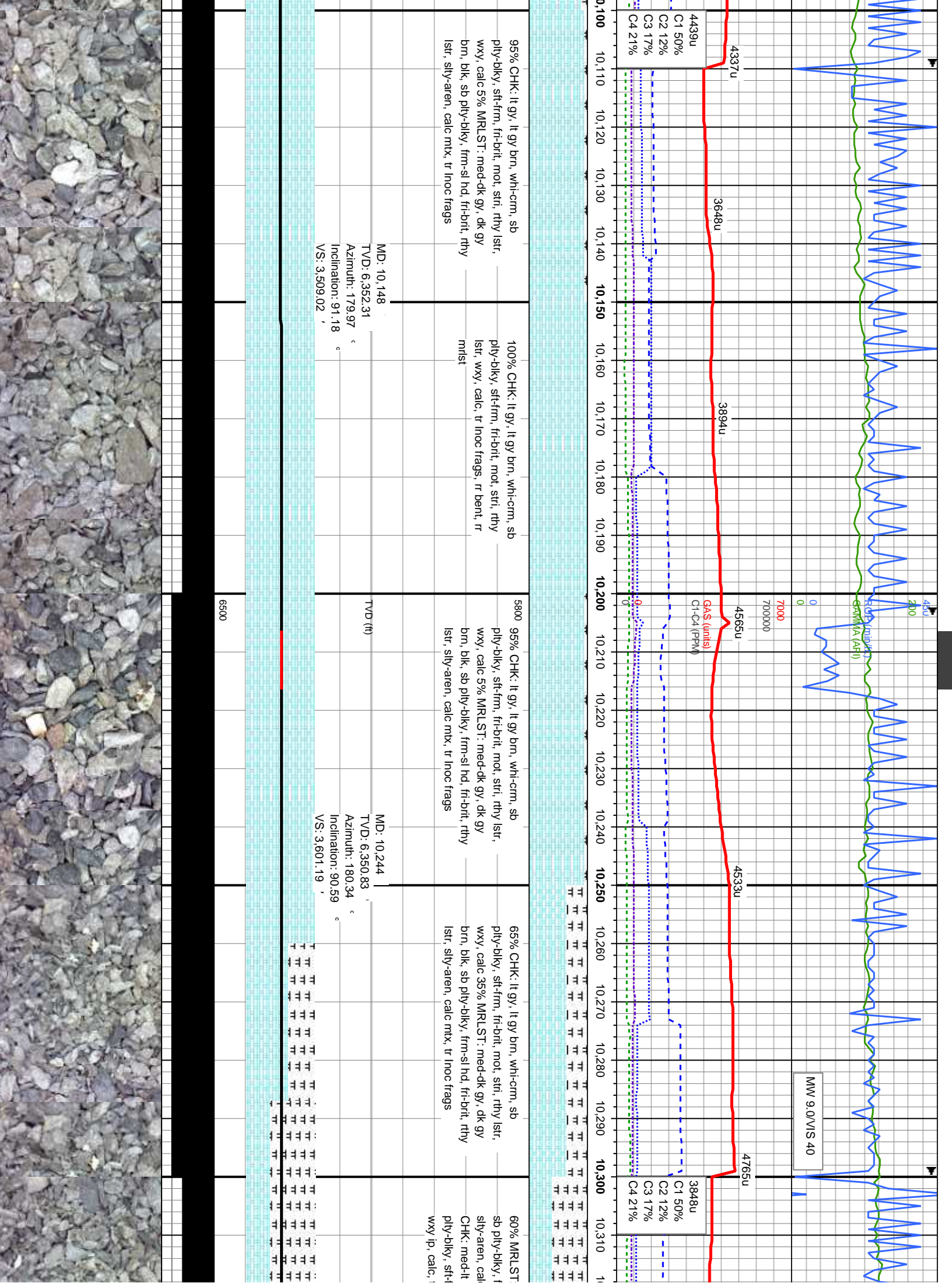
TVD (ft)

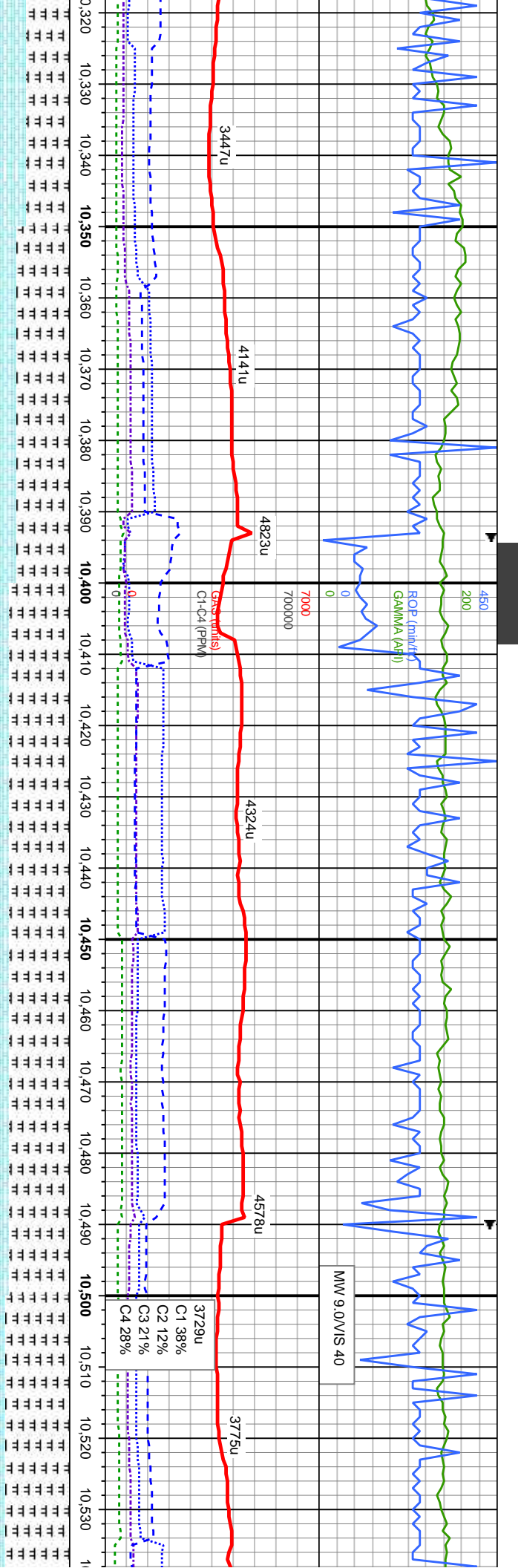
MD: 10.054  
TVD: 6.354.32  
Azimuth: 179.79  
Inclination: 91.27  
VS: 3.418.65

6500









med-dk gy, dk gy brn, blk, frn-si hd, fr-brit, rthy lst, c mix, tr inoc frags 40% gy, med-lt gy brn, sb frn, fr-brit, mot, stri, rthy lst, tr bent	75% MRLST: med-dk gy, dk gy brn, blk, sb ply-bkly, frn-si hd, fr-brit, rthy lst; sily-aren, calc mix, tr inoc frags 25% CHK: med-lt gy, med-lt gy brn, sb ply-bkly, sft-frn, fr-brit, mot, stri, rthy lst, calc, tr bent	5800 85% MRLST: med-dk gy, dk gy brn, blk, sb ply-bkly, frn-si hd, fr-brit, rthy lst; sily-aren, calc mix, tr inoc frags 15% CHK: med-lt gy, med-lt gy brn, sb ply-bkly, sft-frn, fr-brit, mot, stri, rthy lst, calc, tr bent	85% MRLST: med-dk gy, dk gy brn, blk, sb ply-bkly, frn-si hd, fr-brit, rthy lst, sily-aren, calc mix, tr inoc frags 15% CHK: med-lt gy, med-lt gy brn, sb ply-bkly, sft-frn, fr-brit, mot, stri, rthy lst, calc, tr bent, tr pyr	90% MRLST: med-dk gy, dk gy brn sb ply-bkly, frn-si hd, fr-brit, rthy ls sily-aren, calc mix, tr inoc frags 10% CHK: med-lt gy, med-lt gy brn, sb ply-bkly, sft-frn, fr-brit, mot, stri, rth calc, tr bent, tr pyr
MD: 10,338 TVD: 6,349.66 Azimuth: 180.52 Inclination: 90.84 VS: 3,691.33		MD: 10,434 TVD: 6,348.88 Azimuth: 181.42 Inclination: 90.09 VS: 3,783.12		MD: 10,529 TVD: 6,348.65 Azimuth: 180.3 Inclination: 90.1 VS: 3,874





