



Scale: 5" / 100'
Measured Depth Log

Well Name Rohn State LD10-65-1HN_HORZ

Location SEC. 9 T9N R58W

State CO

County WELD

Country USA

Rig Number PD 839

API Number 05-123-37621

AFE # 200228

Region DJ BASIN

Field WATTENBERG

Spud Date 10/26/2014

Drilling Completed 11/1/2014

Surface Coordinates 2125 FSL ; 330 FEL
40.76441 ; -103.86111

Bottom Hole Coordinates 2310 FSL ; 660 FEL
40.76502 ; -103.84328

Ground Elevation 4716'

K.B. Elevation 4732'

Logged Interval 5039' **To** 10243'

Total Depth 10243'

Formation NIOBRARA, C-CHALK

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

c
AY
2022

Geologist

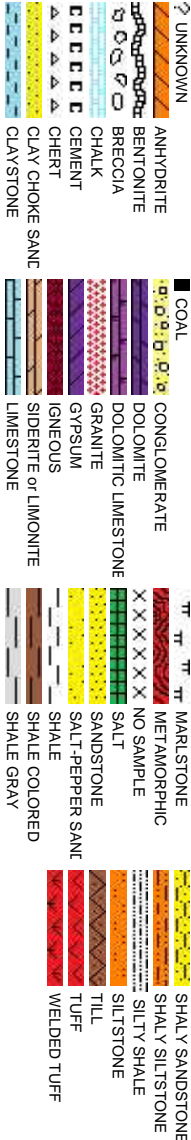
c.
AY
2022

Other

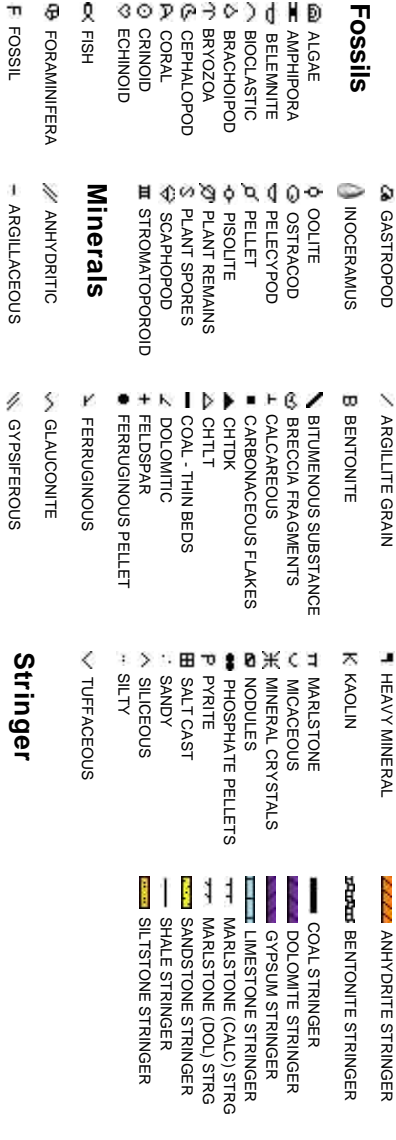
2385 S. Lipan St.
Denver, CO 80223

Ryan Shilling
Mark Norris

Rock Types



Accessories



Other Symbols

Oil Show P PINPOINT V VUGGY

D DEAD **Engineering**

● EVEN ○ QUESTIONABLE BIT

● SPOTTED STAINING ▲ CONNECTION (UP)

⋮ DST INTERVAL ⚡ FAULT

⇄ FORMATION TOP

● GAS SHOW ● OIL SHOW

▽ WIRELINE TESTED - LEFT E EARTHY
△ WIRELINE TESTED - RT FX FINELYXLN

LSB DRILL STEM TEST
MNDEPTH MN DEPTH L LITHOGRAPHIC
MX MICROXLN

Rounding MNDEPTH UP MS MUDSTONE

Porosity ▼ CONNECTION (DOWN)

CONNECTION GAS
E EARTHY CONNECTION GAS (LEFT)

FENESTRAL TRIP GAS

F FRACTURE TRIP GAS (LEFT)

X INTERCRYSTALLINE

INTEROOLITIC DOWN TIME GAS (LEFT)

MOLDIC CORE - LOST

DOWN TIME GAS
CORE - RECOVERED

MNDEPTH MNDEPTH
MN DEPTH (DOWN)

NORMAL FAULT
OVERTURNED STRATA

REVERSE FAULT

CASING

SIDEWALL CORE (LEFT)

SIDEWALL CORE (RIGHT)

SLIDE
SURVEY

▲ ANGULAR PS PACKSTONE

R ROUNDED WJ WACKSTONE

SUBANG

SUBRND

Sorting

M MODERATE

Textures

P POOR

W WELL

BS BOUNDSTONE

CHALKY

CRYPTOXLN

Slide/Rotate

ROP Scale
0-600 ft/hr

ROP
ROF
GAMMA

Gamma Scale
0 - 200 API

Gas Scale
0 - 2000 units
KOP = 5039'

COLUMBINE LOGGING, INC. RIGGED UP
ON 10/27/2014 MANNED 2-PERSON
LOGGING WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT # 0312

Total Gas & Chromatograph
GAS
C1
C2
C3
C4

Depth Labels

% Lith

TVD SCALE
4900'-5900'

Well Bore
TVD

Bit Data
Bit #: 2
Type: SDI 519
Size: 8.75
Depth In: 1,245 '
Depth Out: 6,148 '
Jets: 7x16
S/N: JJ8327

Log Continued from Rohn State
LD10-65-1HN

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb ply-bkly, vf gr, silty tex, sl calc, tr shly ss

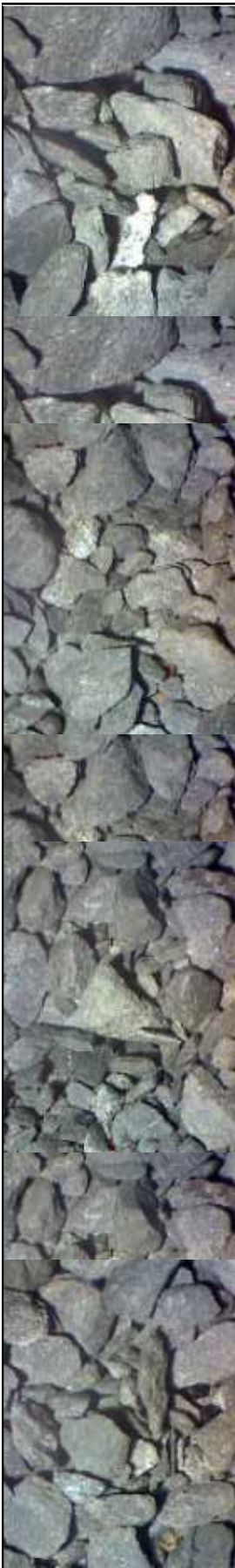
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb ply-bkly, vf gr, silty tex, sl calc, tr shly ss

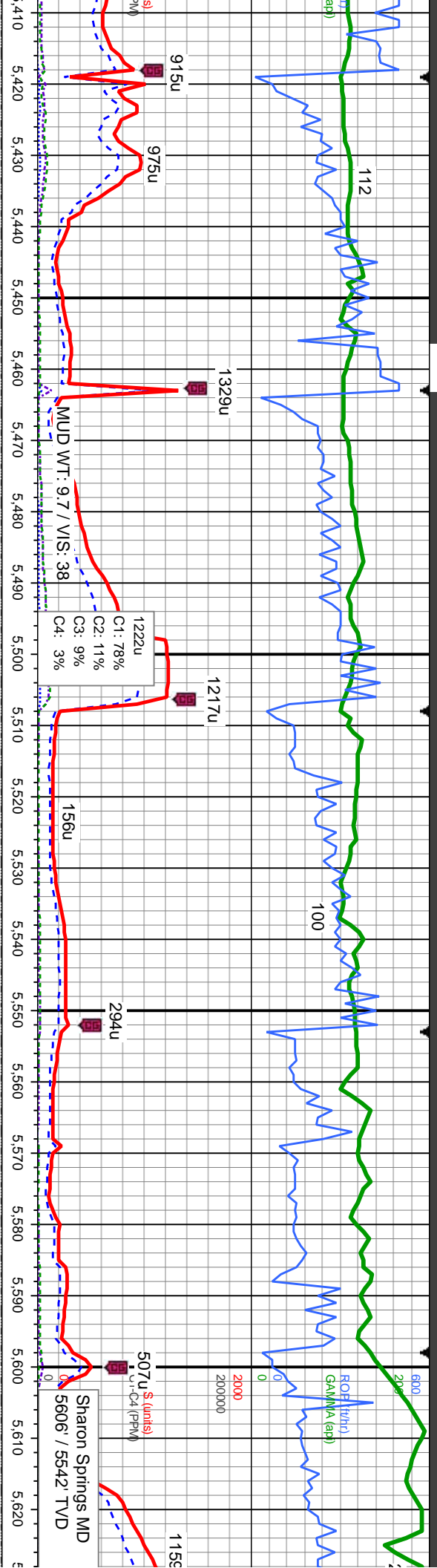
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb ply-bkly, vf gr, silty tex, sl calc, tr shly ss

Oil Show

exc
mod
tr
sl

Images





SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb
vif gr, silty tex, sl calc, tr shy ss

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb
ply-bkly, vif gr, silty tex, sl calc, tr shy ss

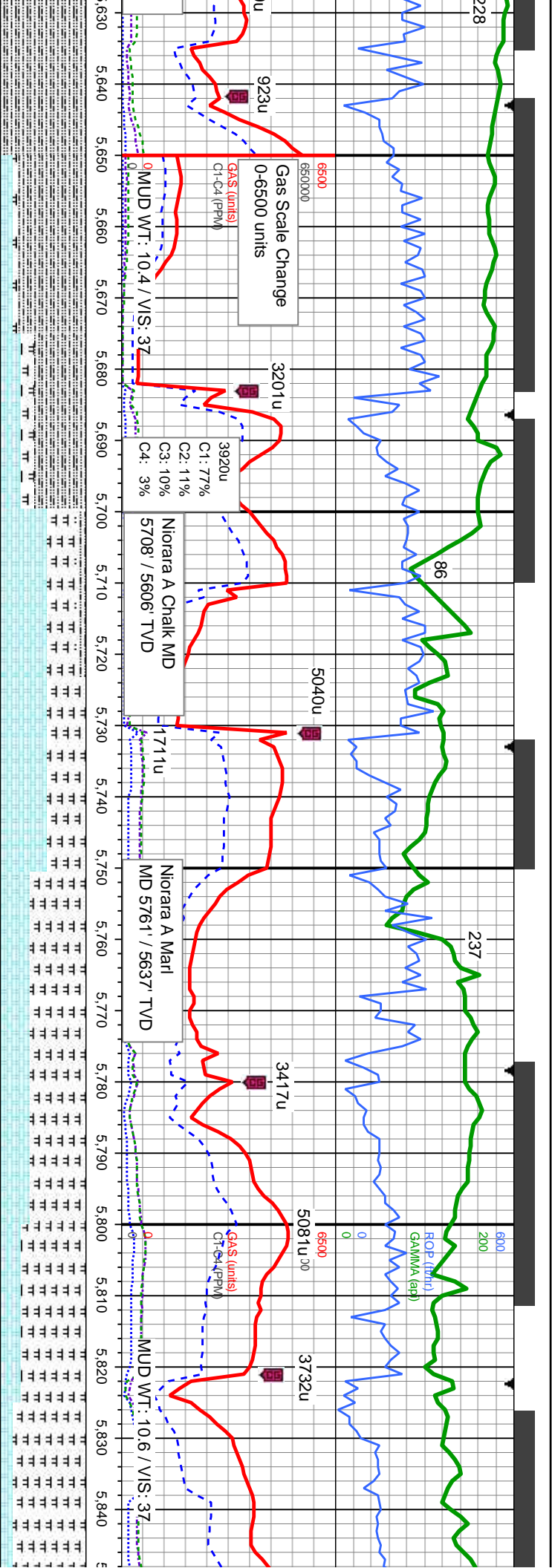
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb
ply-bkly, vif gr, silty tex, sl calc, tr shy ss

100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb
ply-bkly, vif gr, silty tex, sl calc, tr shy ss

4m
100% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb
ply-bkly, vif gr, silty tex, sl calc

MD: 5,453 TVD: 5,418.46 Inclination: 29.8 Azimuth: 96.9 VS: 186.33	MD: 5,498 TVD: 5,456.61 Inclination: 34.2 Azimuth: 96.5 VS: 183.55	MD: 5,543 TVD: 5,492.85 Inclination: 38.5 Azimuth: 94.2 VS: 181.09	MD: 5,588 TVD: 5,527.17 Inclination: 42.1 Azimuth: 91.3 VS: 179.73
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80-60% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb ply-blky, v gr, silty tex, sl calc; 15-25% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-blky, v calc; 5-15% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc; tr bent

MD: 5,677
TVD: 5,588.02
Inclination: 52
Azimuth: 87.4
VS: 180.7

55-55% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-blky, v calc; 35-45% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc; 10-0% SLTY SH: lt-med gy, occ dk gy, sft-sl frm, sb ply-blky, v gr, silty tex, sl calc; tr bent

MD: 5,722
TVD: 5,614.72
Inclination: 55.2
Azimuth: 86.6
VS: 182.6

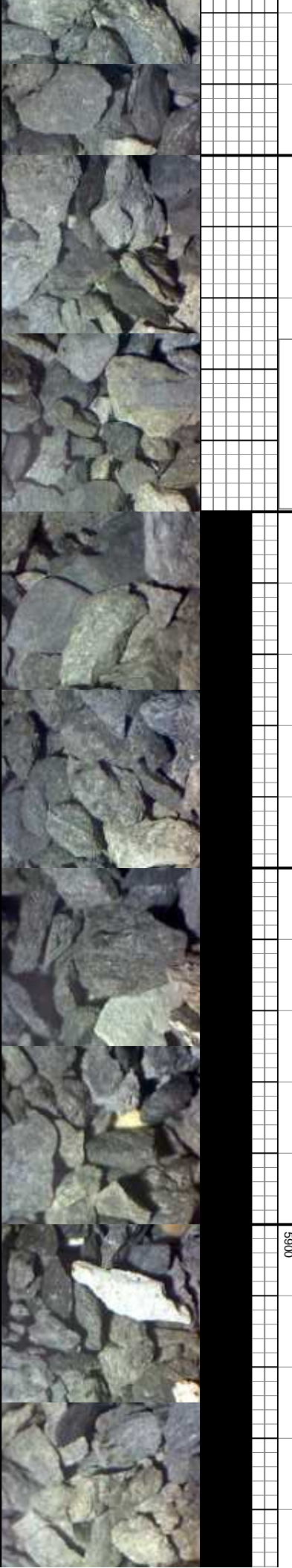
65-65% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc; 35-35% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-blky, v calc; tr bent

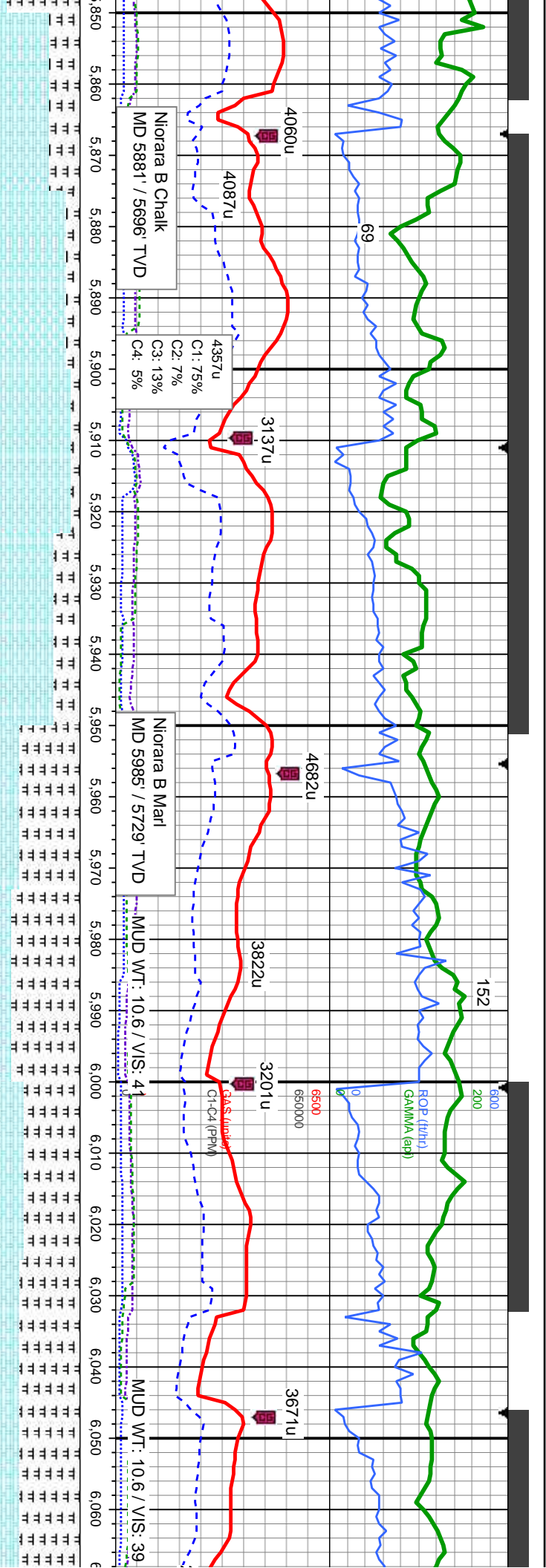
MD: 5,767
TVD: 5,639.98
Inclination: 56.5
Azimuth: 86.1
VS: 184.98

75-85% MRLST: med-dk gy, sl frm-mod hd, sb ply-blky, silty-mot tex, calc; 25-15% CHK: crm-illy to brn, mot, sft-mod frm, sb ply-blky, v calc;

MD: 5,812
TVD: 5,663.86
Inclination: 59.4
Azimuth: 86.5
VS: 187.43

OIL SHOWS BEGIN





65-85% CHK: crm-lyg to brn, mot, sft-mod frm, sb
ply-blky, v calc: 35-15% MRLST: med-dk gy, sl
frm-mod hd, sb ply-blky, silty-mot tex, calc;

90-70% CHK: crm-lyg to brn, mot, sft-mod frm, sb
ply-blky, v calc: 10-30% MRLST: med-dk gy, sl
frm-mod hd, sb ply-blky, silty-mot tex, calc; tr bent

70-80% MRLST: med-dk gy, sl frm-mod hd, sb
ply-blky, silty-mot tex, calc: 30-20% CHK: crm-lyg
to brn, mot, sft-mod frm, sb ply-blky, v calc;

65-70% MRLST: med-dk gy, sl frm-mod hd, sb
ply-blky, silty-mot tex, calc: 35-30% CHK: crm-lyg
to brn, mot, sft-mod frm, sb ply-blky, v calc: mod
bent

70-70% MRLST: m
ply-blky, silty-mot k
to brn, mot, sft-moc

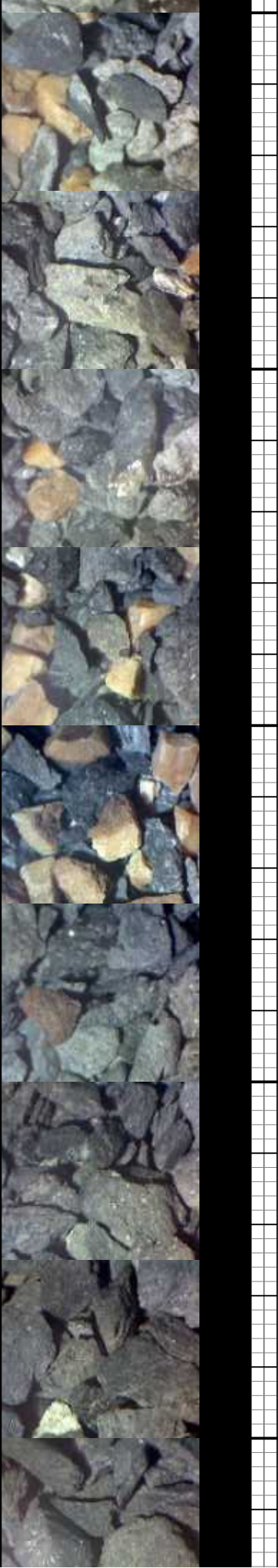
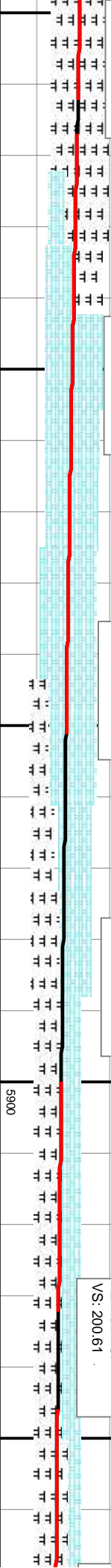
MD: 5.857
TVD: 5.685.7
Inclination: 62.5
Azimuth: 86.9
VS: 189.7

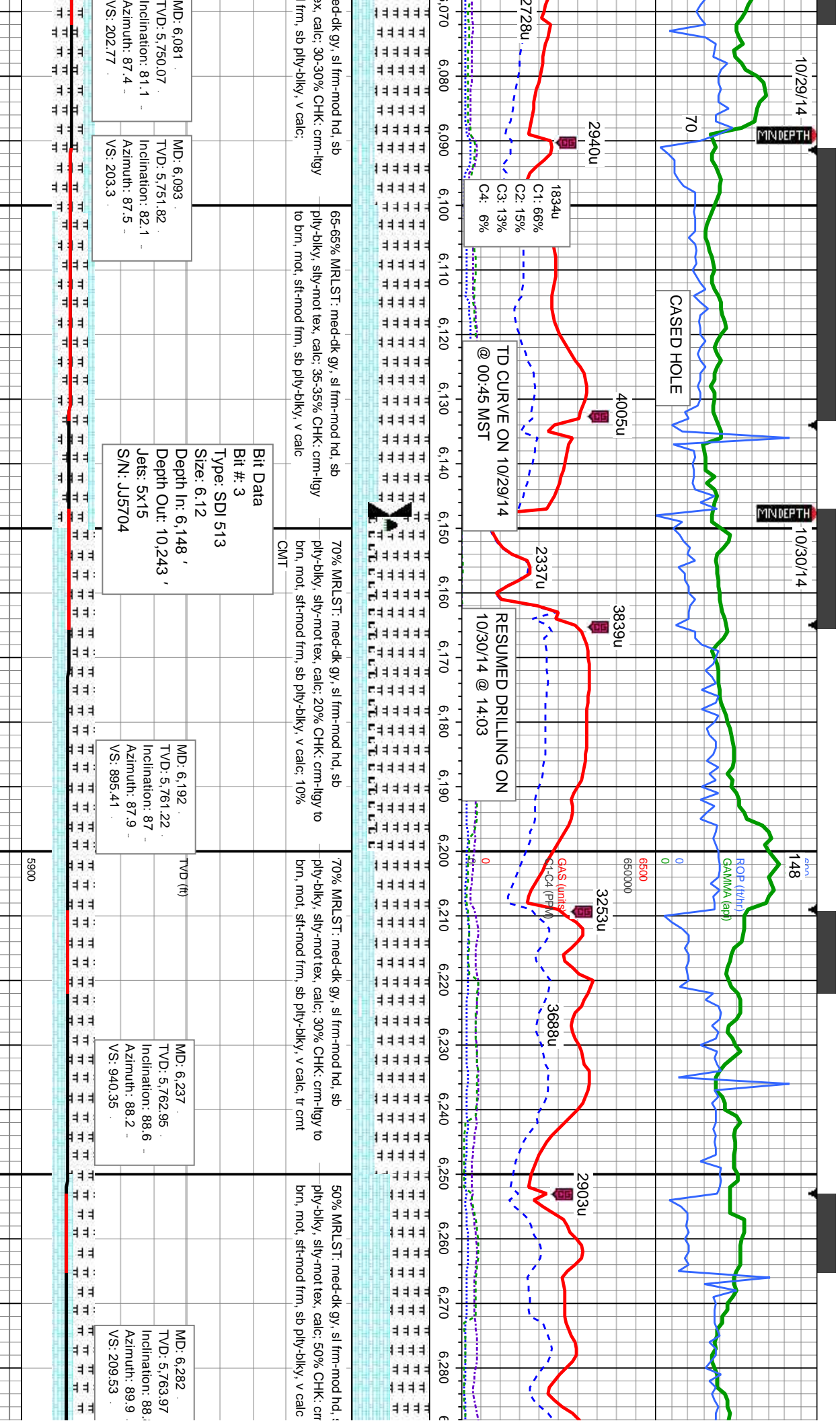
MD: 5.901
TVD: 5.704.05
Inclination: 68.2
Azimuth: 86.3
VS: 192.07

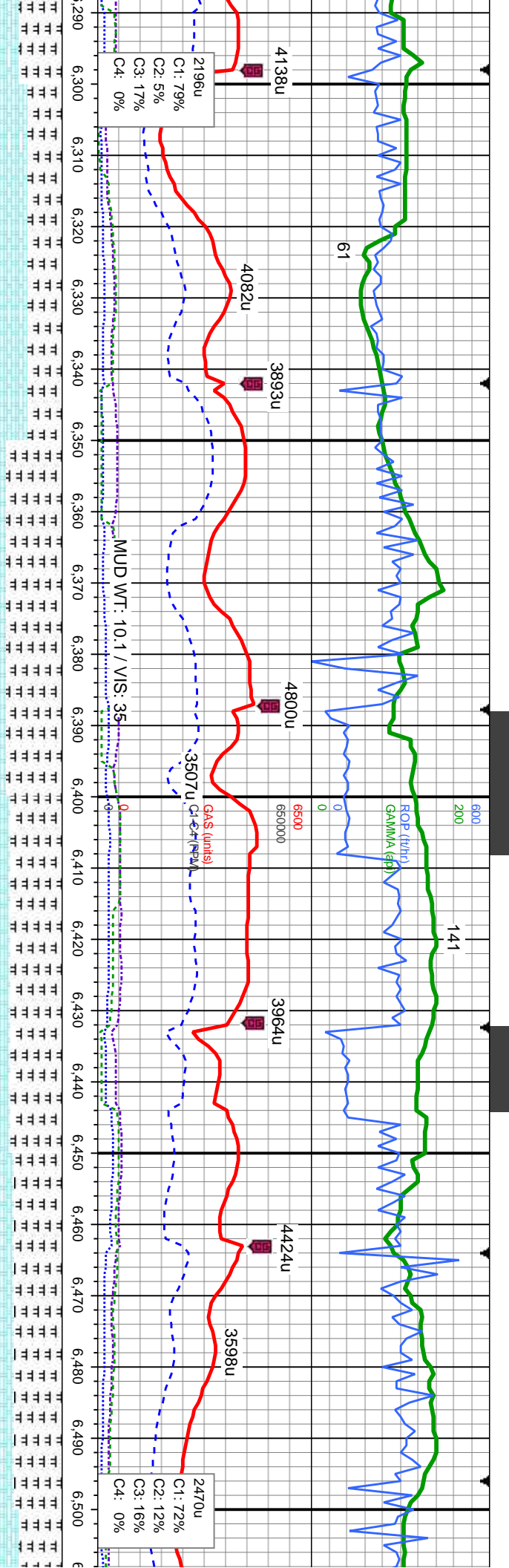
MD: 5.946
TVD: 5.718.77
Inclination: 73.6
Azimuth: 85.9
VS: 194.97

MD: 5.991
TVD: 5.731.02
Inclination: 74.8
Azimuth: 86.1
VS: 197.99

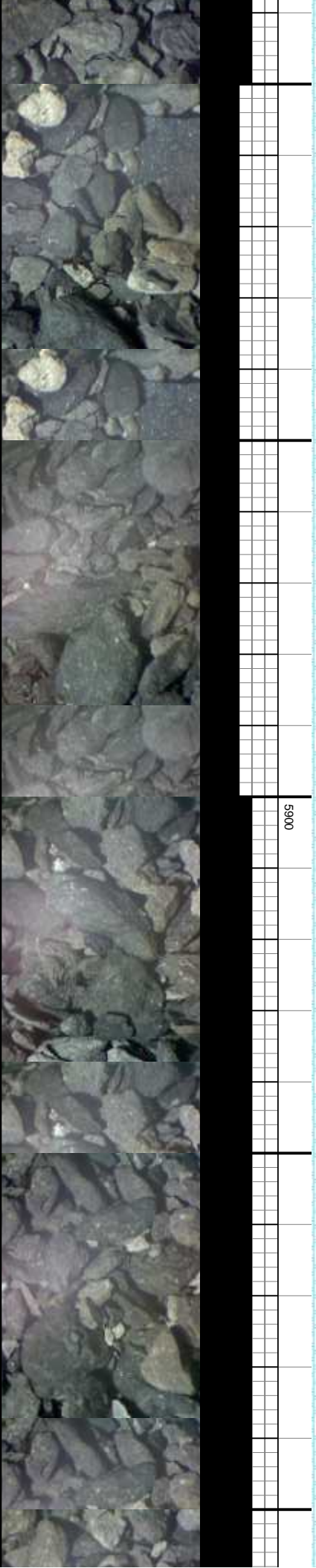
MD: 6.036
TVD: 5.741.75
Inclination: 77.6
Azimuth: 87
VS: 200.61

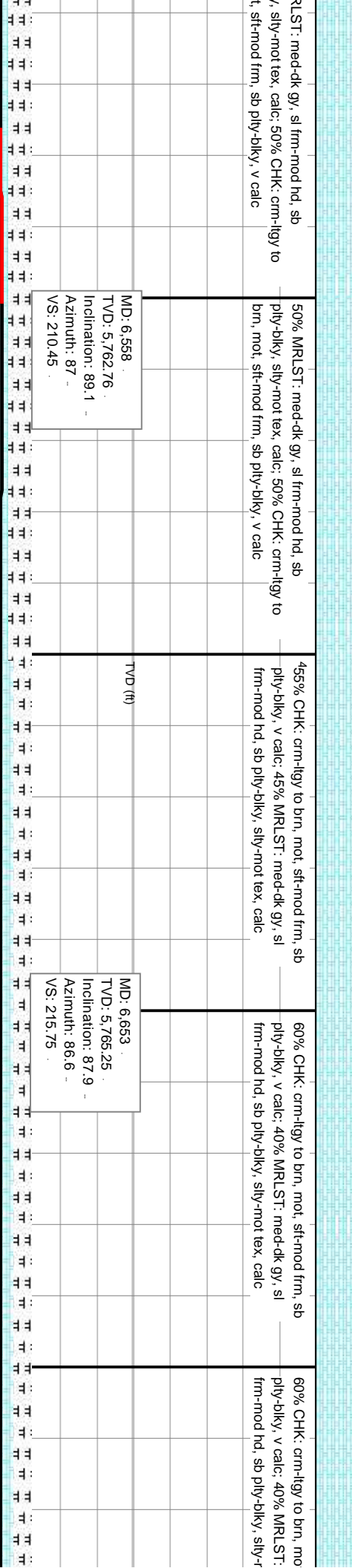
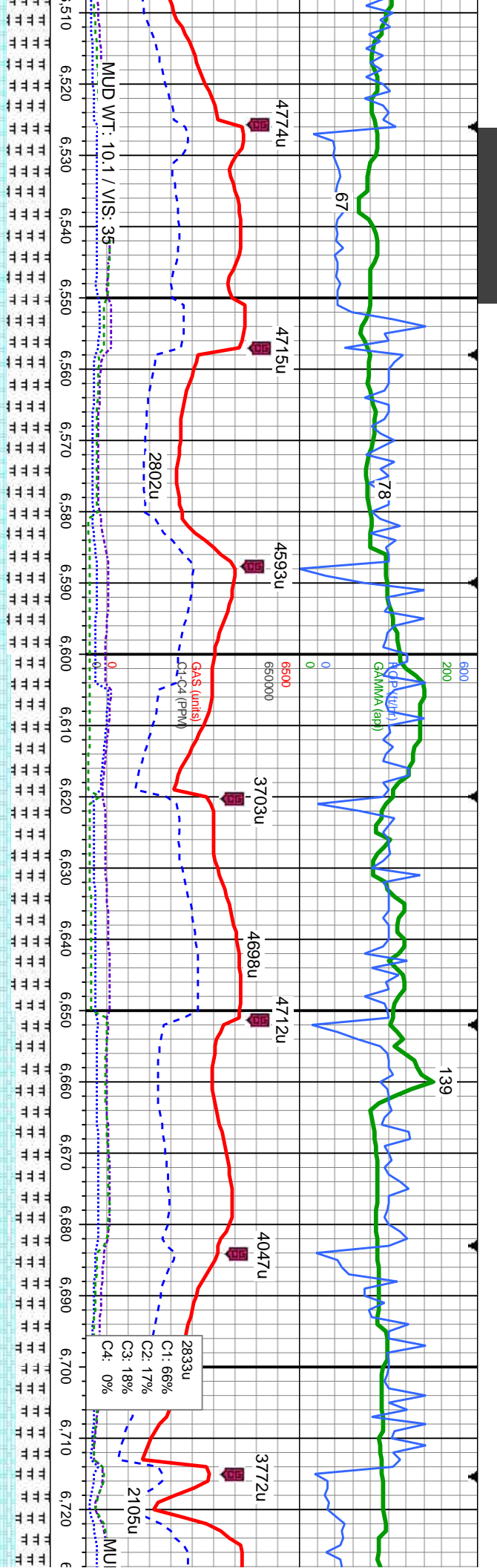


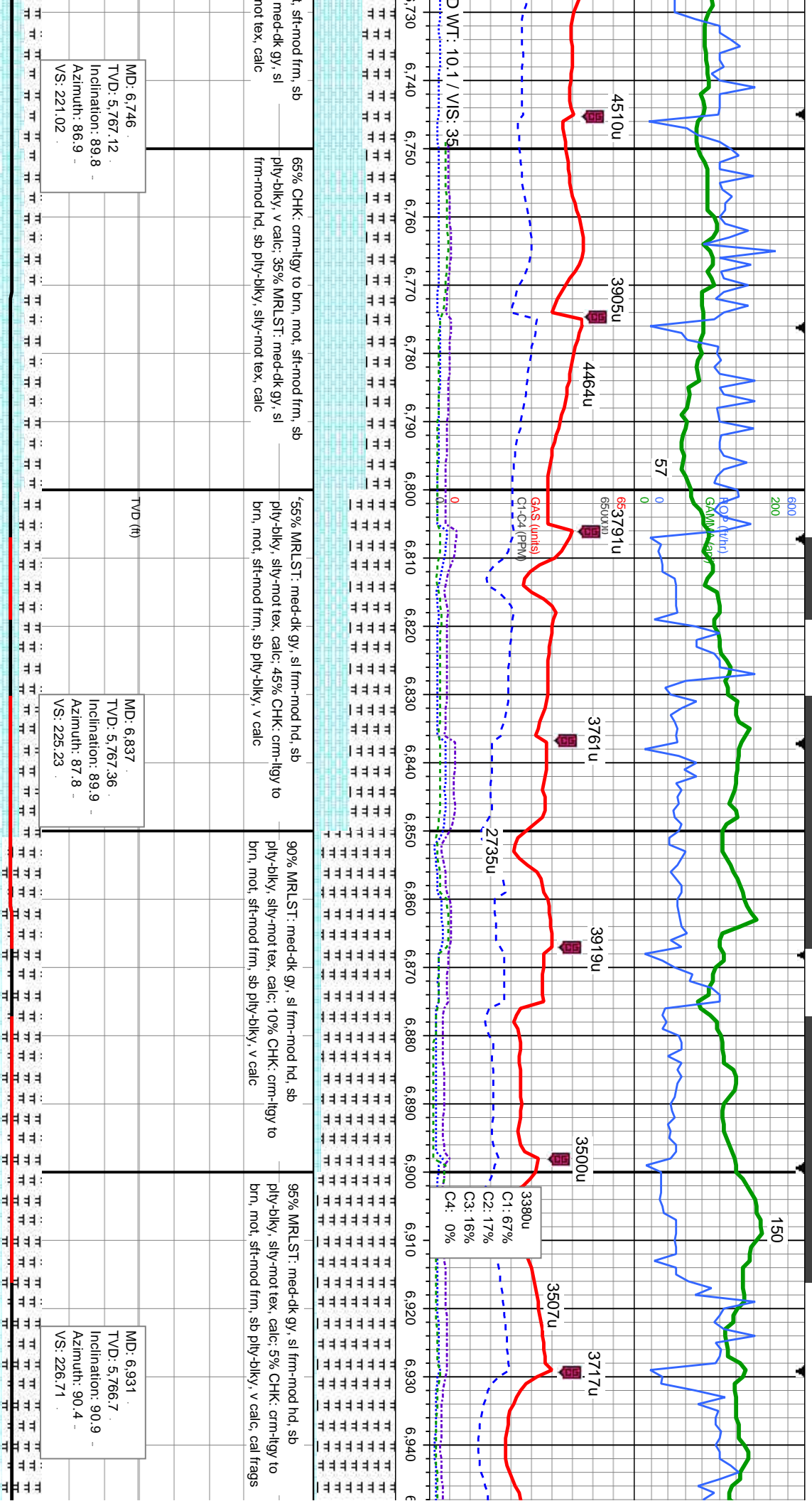




60% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc; 40% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc	65% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 35% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc	60% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 40% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc	55% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 45% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc	50% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc; 50% CHK: crm-lygy to brn, mot, sft-mod frm, sb ply-biky, v calc
MD: 6,326 TVD: 5,764.93 Inclination: 88.7 Azimuth: 90 VS: 209.57	MD: 6,371 TVD: 5,766.19 Inclination: 88.1 Azimuth: 89.8 VS: 209.65	MD: 6,465 TVD: 5,764.87 Inclination: 93.5 Azimuth: 91.1 VS: 208.91		







i, sft-mod frm, sb	65% CHK: crm-ilty to brn, mot, sft-mod frm, sb	55% MRLST: med-dk gy, sl frm-mod hd, sb	90% MRLST: med-dk gy, sl frm-mod hd, sb	95% MRLST: med-dk gy, sl frm-mod hd, sb
med-dk gy, sl	ply-biky, v calc: 35% MRLST: med-dk gy, sl	ply-biky, silty-mot tex, calc: 45% CHK: crm-ilty to	ply-biky, silty-mot tex, calc: 10% CHK: crm-ilty to	ply-biky, silty-mot tex, calc: 5% CHK: crm-ilty to
not tex, calc	frm-mod hd, sb ply-biky, silty-mot tex, calc	brn, mot, sft-mod frm, sb ply-biky, v calc	brn, mot, sft-mod frm, sb ply-biky, v calc	brn, mot, sft-mod frm, sb ply-biky, v calc, cal frags

MD: 6.746
TVD: 5,767.12
Inclination: 89.8
Azimuth: 86.9
VS: 221.02

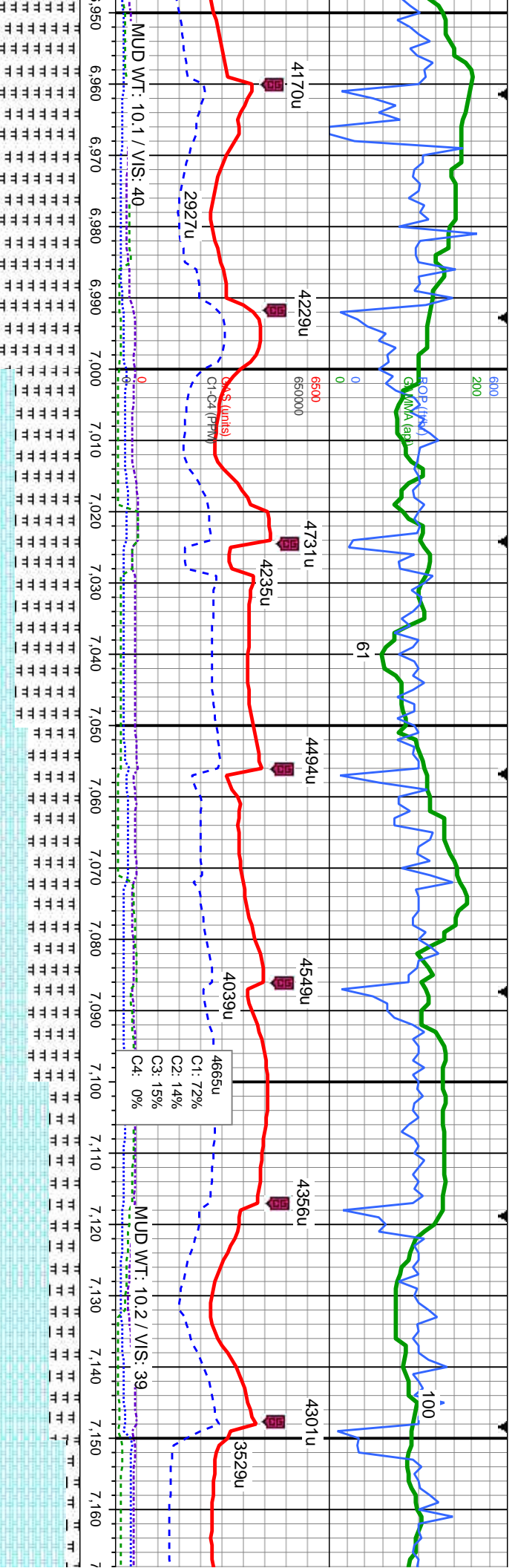
TVD (ft)

MD: 6.837
TVD: 5,767.36
Inclination: 89.9
Azimuth: 87.8
VS: 225.23

MD: 6.931
TVD: 5,766.7
Inclination: 90.9
Azimuth: 90.4
VS: 226.71

5900





95% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 5% CHK: crm-ilty to brn, mot, sft-mod frm, sb ply-biky, v calc, cal frags	475% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 25% CHK: crm-ilty to brn, mot, sft-mod frm, sb ply-biky, v calc	60% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc: 40% CHK: crm-ilty to brn, mot, sft-mod frm, sb ply-biky, v calc	65% CHK: crm-ilty to brn, mot, sft-mod frm, sb ply-biky, v calc: 35% MRLST: med-dk gy, sl frm-mod hd, sb ply-biky, silty-mot tex, calc:	85% CHK: crm-ilty ply-biky, v calc: 15% frm-mod hd, sb ply
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TVD (ft)

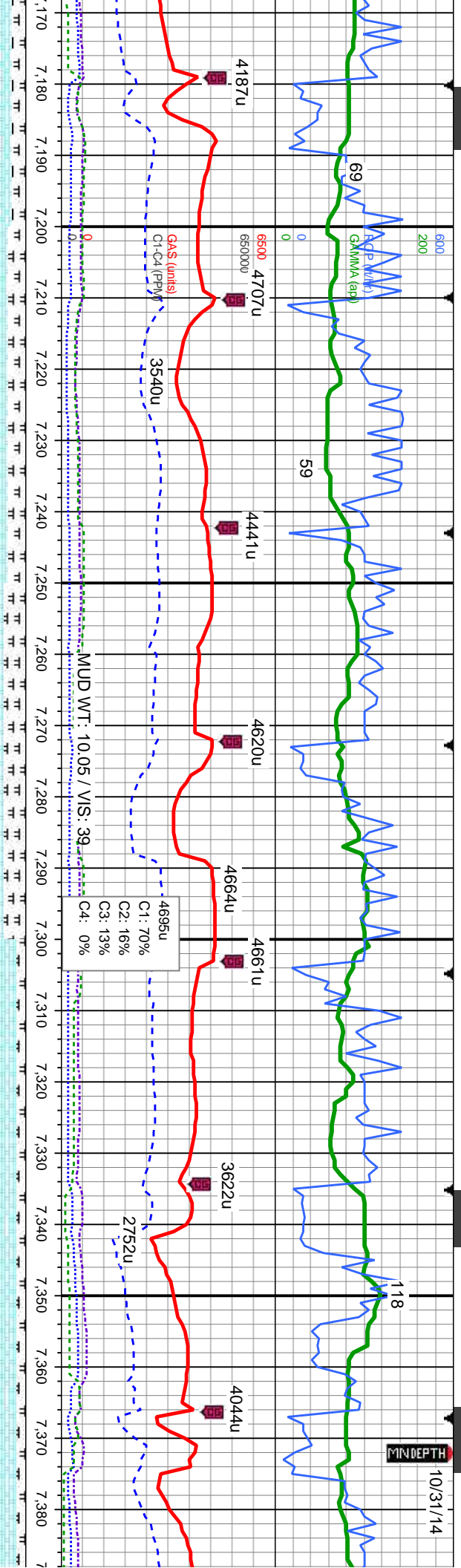
MD: 7,024
TVD: 5,765.48
Inclination: 90.6
Azimuth: 90.1
VS: 226.3

MD: 7,118
TVD: 5,765.07
Inclination: 89.9
Azimuth: 89.5
VS: 226.63

5900



MINDEPTH



to brn, mot, sft-mod frm, sb
% MRLST: med-dk gy, sl
biky, silty-mot tex, calc;

80% CHK: crm-lyg to brn, mot, sft-mod frm, sb
ply-biky, v calc: 20% MRLST: med-dk gy, sl
frm-mod hd, sb ply-biky, silty-mot tex, calc;

75% CHK: crm-lyg to brn, mot, sft-mod frm, sb
ply-biky, v calc: 25% MRLST: med-dk gy, sl
frm-mod hd, sb ply-biky, silty-mot tex, calc;

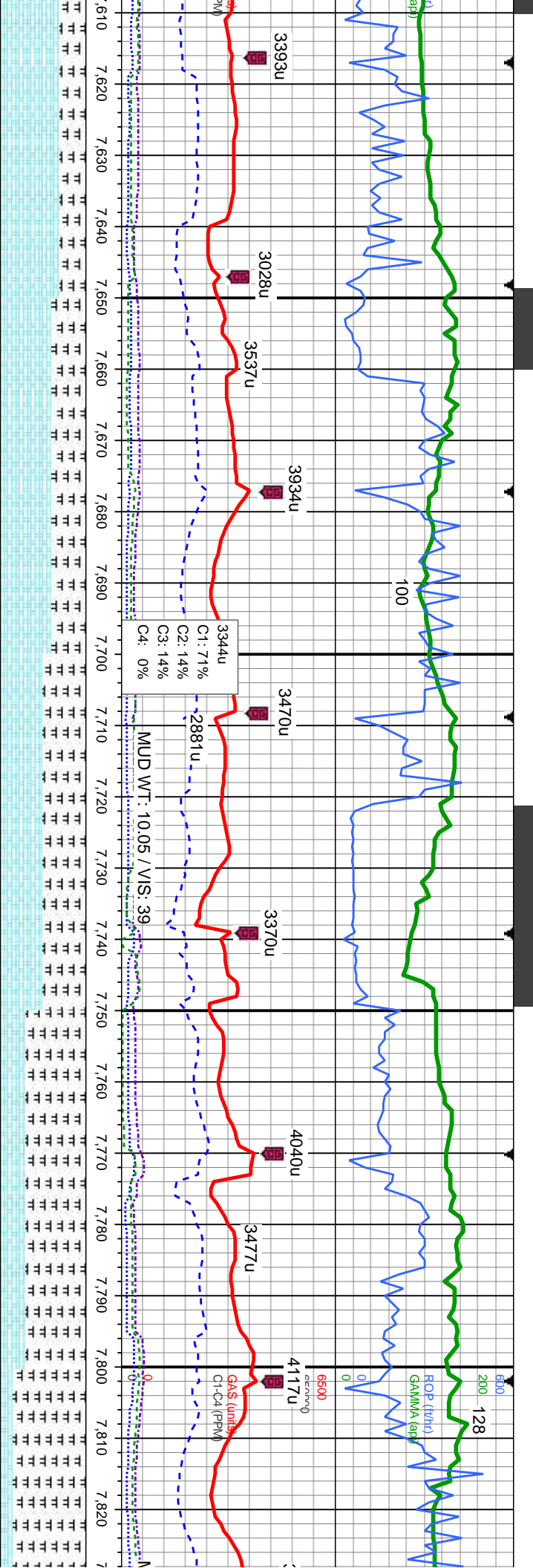
90% CHK: crm-lyg to brn, mot, sft-mod frm, sb
ply-biky, v calc: 10% MRLST: med-dk gy, sl
frm-mod hd, sb ply-biky, silty-mot tex, calc;

90% CHK: crm-lyg to brn, mot, sft-mod frm
ply-biky, v calc: 10% MRLST: med-dk gy,
frm-mod hd, sb ply-biky, silty-mot tex, calc;

TV
MD: 7.211
TVD: 5,763.94
Inclination: 91.5
Azimuth: 88.5
VS: 228.25

MD: 7.304
TVD: 5,762.31
Inclination: 90.5
Azimuth: 87.7
VS: 231.34





60% CHK: crm-llgy to brn, mot, sft-mod frm, sb
ply-bkly, v calc; 40% MRLST: med-dk gy, sl
frm-mod hd, sb ply-bkly, silty-mot tex, calc

50% CHK: crm-llgy to brn, mot, sft-mod frm, sb
ply-bkly, v calc; 50% MRLST: med-dk gy, sl
frm-mod hd, sb ply-bkly, silty-mot tex, calc

70% MRLST: med-dk gy, sl frm-mod hd, sb
ply-bkly, silty-mot tex, calc; 30% CHK: crm-llgy to
brn, mot, sft-mod frm, sb ply-bkly, v calc

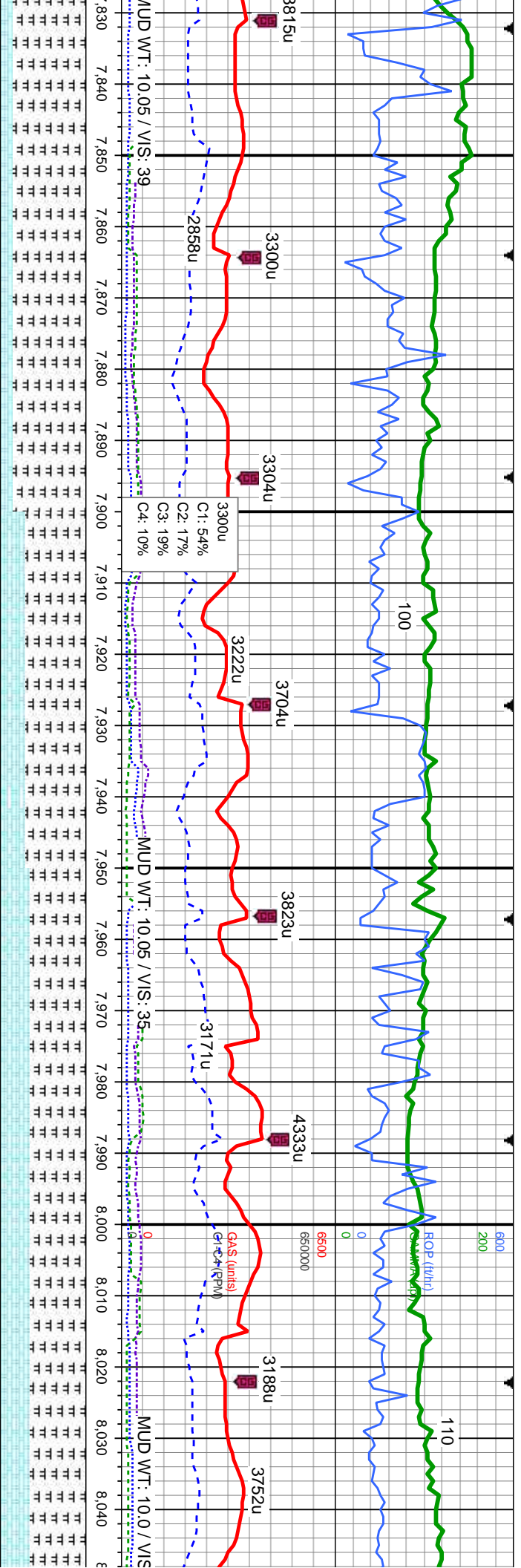
45% MRLST: med-dk gy, sl frm-mod hd, sb
ply-bkly, silty-mot tex, calc; 1
to brn, mot, sft-mod frm, sb p

MD: 7.678
TVD: 5,758.07
Inclination: 90.9
Azimuth: 88.4
VS: 2,379.71

MD: 7.772
TVD: 5,756.02
Inclination: 91.6
Azimuth: 89.2
VS: 2,473.6

TVD (ft)
5900





815u
3300u
3304u
3704u
3823u
4333u
3188u
3752u

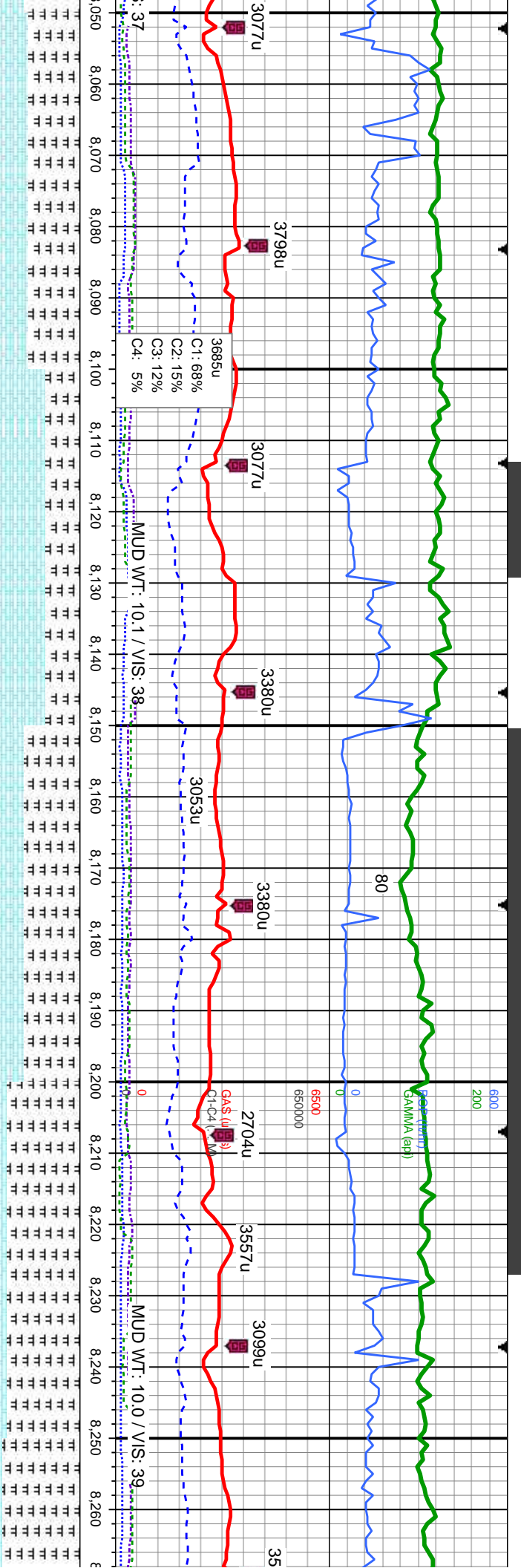
MD: 7.866
TVD: 5,753.07
Inclination: 92
Azimuth: 87.7
VS: 2,567.49

MD: 7.960
TVD: 5,749.79
Inclination: 92
Azimuth: 87.1
VS: 2,661.42

MD: 8
TVD: 5,749.79
Inclination: 92
Azimuth: 87.1
VS: 2,661.42

85% MR LST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 15% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc	70% MR LST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 30% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc, v tr sec cal	65% MR LST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 35% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc	65% MR LST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 35% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc
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60% MRLST: med-dk gy, sl frm-mod hd, sb
ply-biky, silty-mot tex, calc: 40% CHK: crm-ligy
to brn, mot, sft-mod frm, sb ply-biky, v calc

60% CHK: crm-ligy to brn, mot, sft-mod frm, sb
ply-biky, v calc: 40% MRLST: med-dk gy, sl
frm-mod hd, sb ply-biky, silty-mot tex, calc

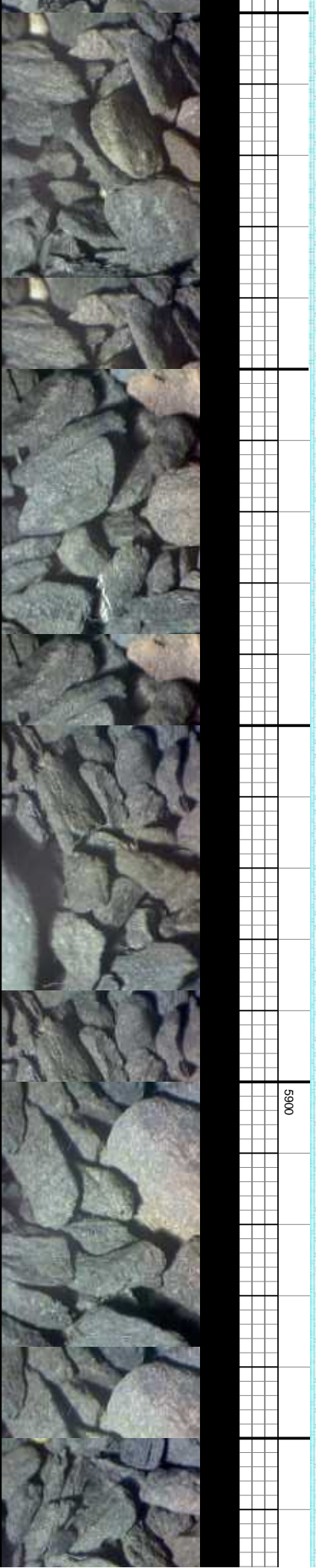
65% MRLST: med-dk gy, sl frm-mod hd, sb
ply-biky, silty-mot tex, calc: 35% CHK: crm-ligy to
brn, mot, sft-mod frm, sb ply-biky, v calc

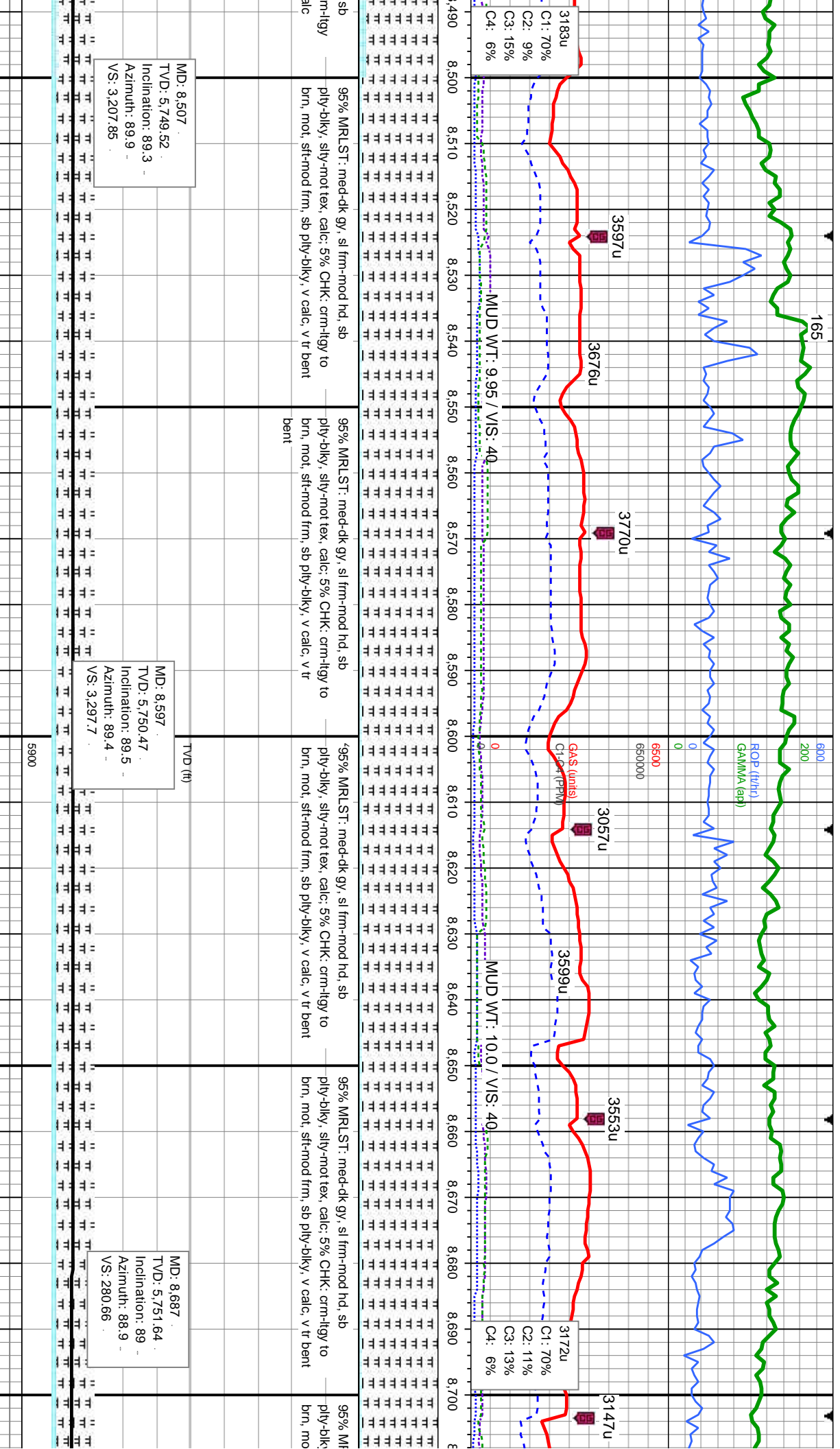
85% MRLST: med-dk gy, sl frm-mod hd, sb
ply-biky, silty-mot tex, calc: 15% CHK: crm-ligy to
brn, mot, sft-mod frm, sb ply-biky, v calc, v tr foss

90% MRLST: med
ply-biky, silty-mot t
brn, mot, sft-mod fr

MD: 8.145
TVD: 5,746.11
Inclination: 89.4
Azimuth: 84
VS: 2,846.33

MD: 8.239
TVD: 5,747.42
Inclination: 89
Azimuth: 86.1
VS: 2,940.29



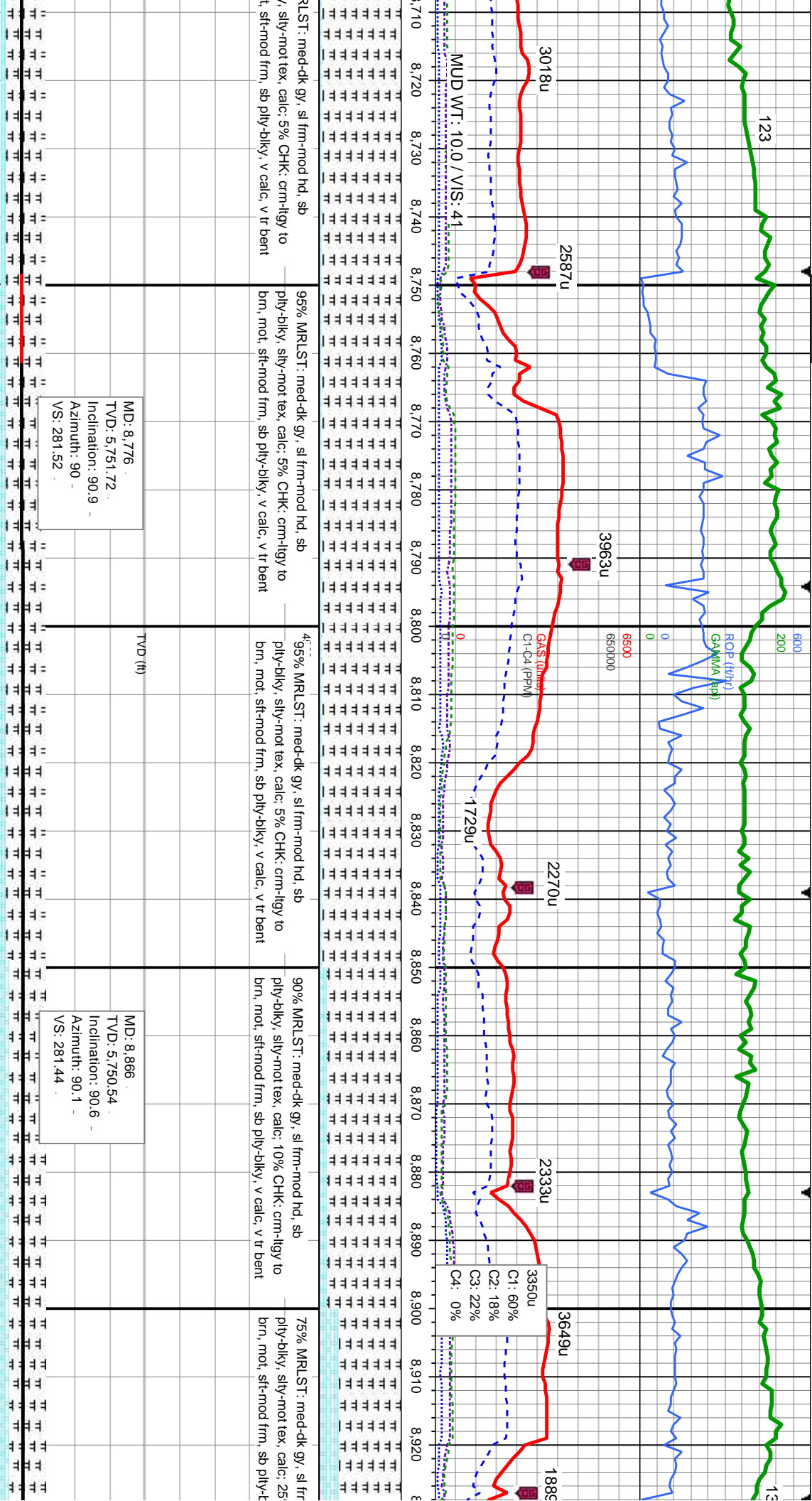


MD: 8.507
TVD: 5,749.52
Inclination: 89.3
Azimuth: 89.9
VS: 3,207.85

MD: 8.597
TVD: 5,750.47
Inclination: 89.5
Azimuth: 89.4
VS: 3,297.7

MD: 8.687
TVD: 5,751.64
Inclination: 89
Azimuth: 88.9
VS: 280.66





MD: 8,776
TVD: 5,751.72
Inclination: 90.9
Azimuth: 90
VS: 281.52

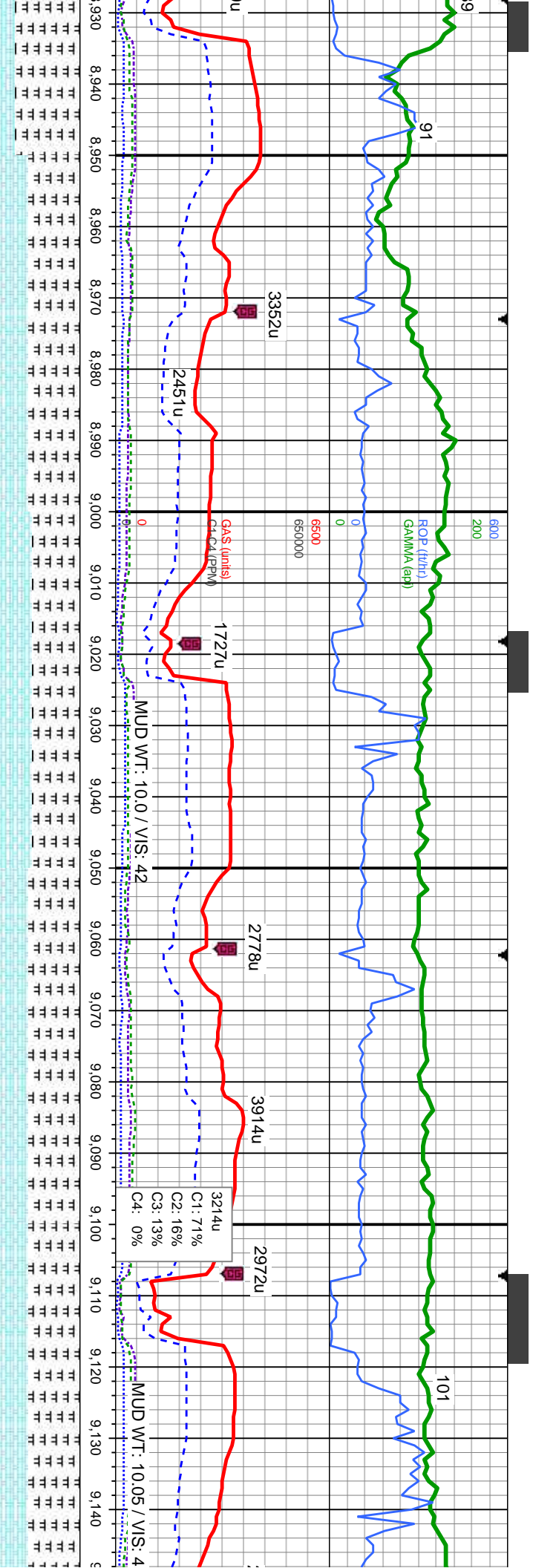
TVD (ft)

5900

MD: 8,866
TVD: 5,750.54
Inclination: 90.6
Azimuth: 90.1
VS: 281.44

3350u
C1: 60%
C2: 18%
C3: 22%
C4: 0%





60% MRLST: med-dk gy, sl frm-mod hd, sb
ply-blky, silty-mot tex, calc: 40% CHK: crm-llgy to
brn, mot, sft-mod frm, sb ply-blky, v calc, v tr bent

MD: 8.956
TVD: 5,748.74
Inclination: 91.7
Azimuth: 91.2
VS: 280.42

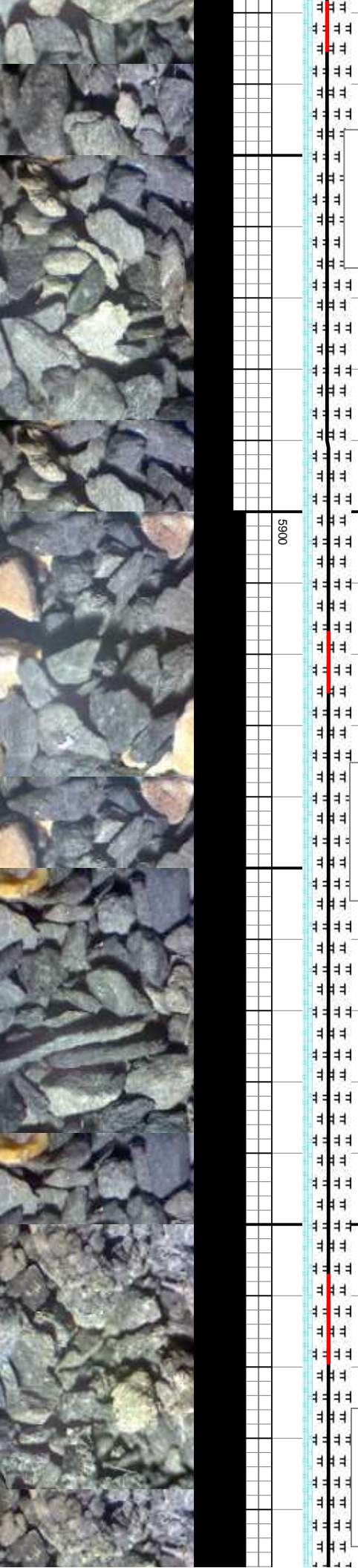
TVD (ft)

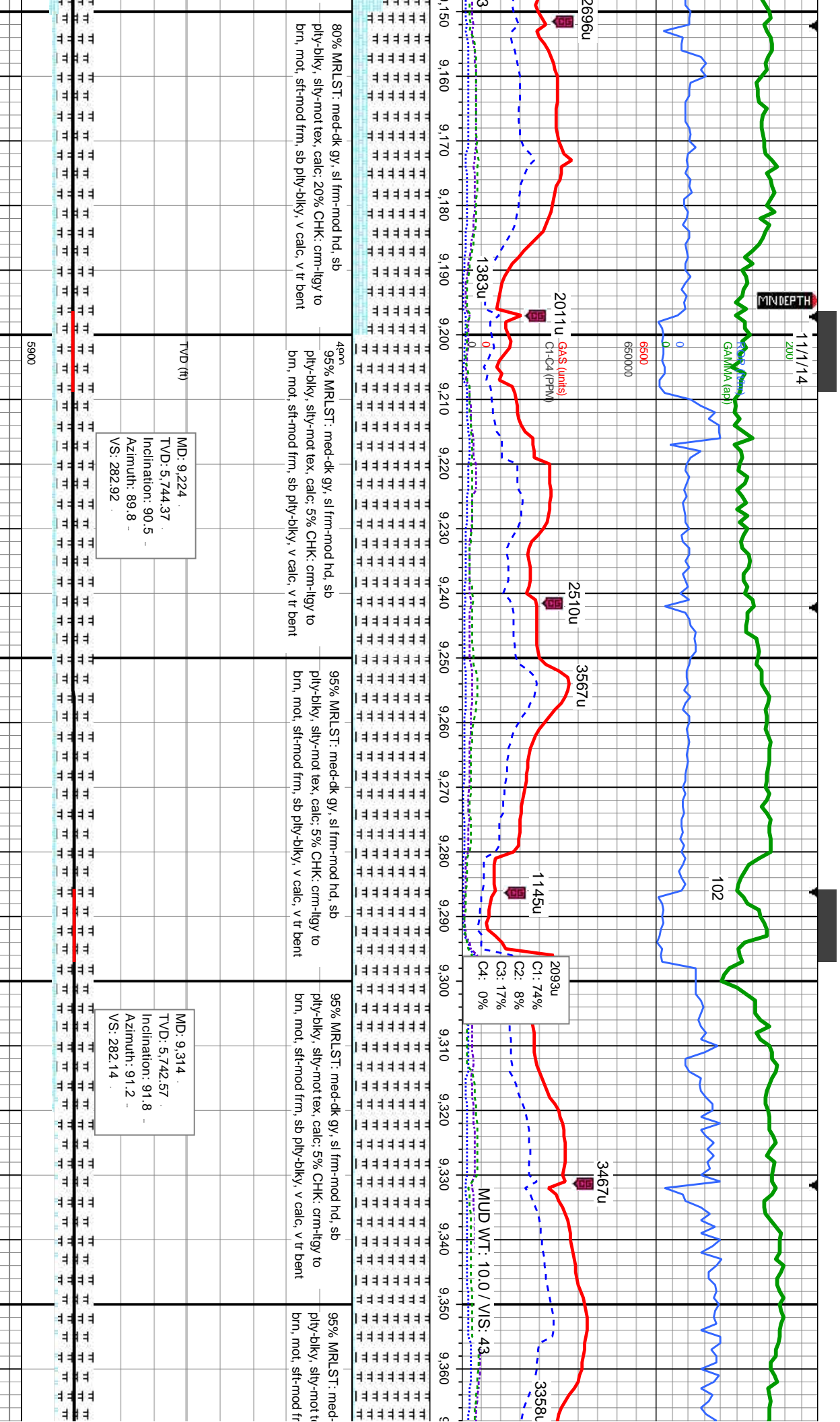
MD: 9.045
TVD: 5,745.94
Inclination: 91.9
Azimuth: 89.2
VS: 280.11

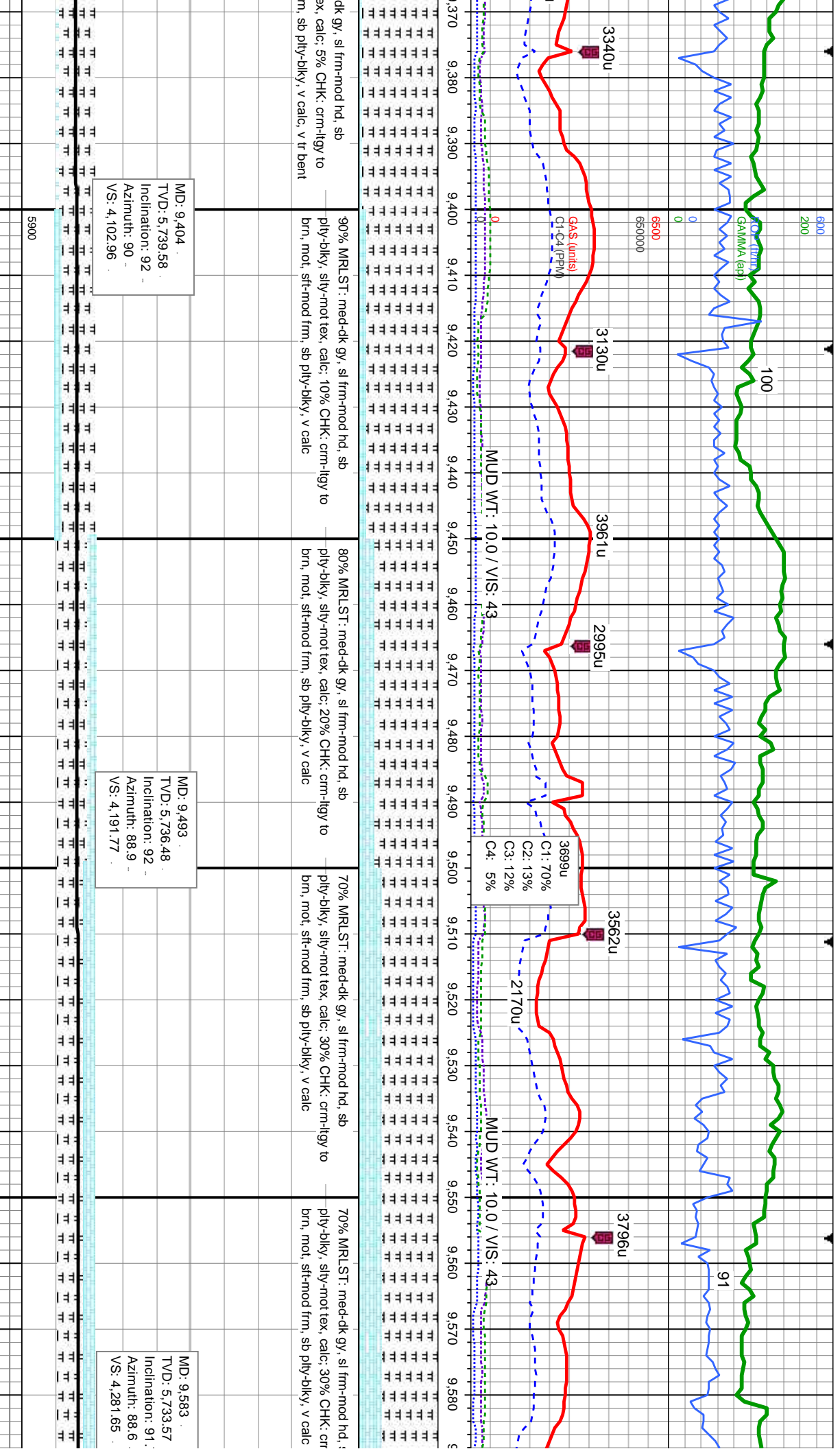
60% MRLST: med-dk gy, sl frm-mod hd, sb
ply-blky, silty-mot tex, calc: 40% CHK: crm-llgy to
brn, mot, sft-mod frm, sb ply-blky, v calc, v tr bent

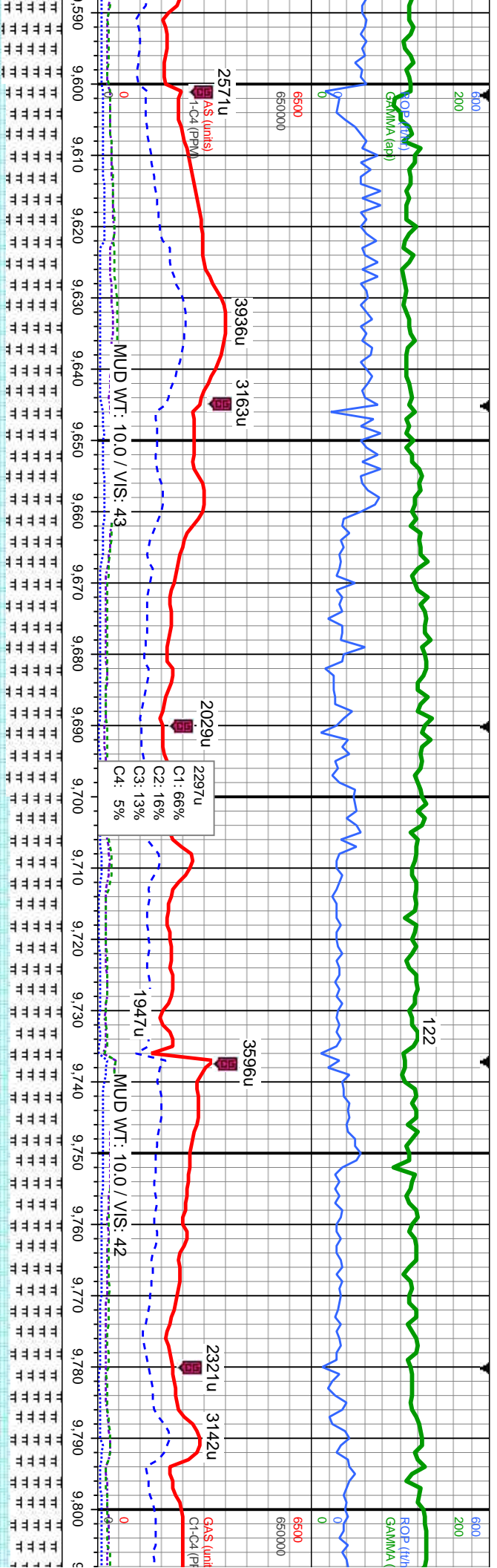
60% MRLST: med-dk gy, sl frm-mod hd, sb
ply-blky, silty-mot tex, calc: 40% CHK: crm-llgy to
brn, mot, sft-mod frm, sb ply-blky, v calc, v tr bent

MD: 9.135
TVD: 5,744.61
Inclination: 89.8
Azimuth: 88.7
VS: 281.76



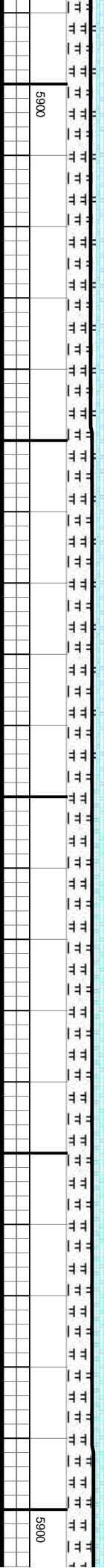


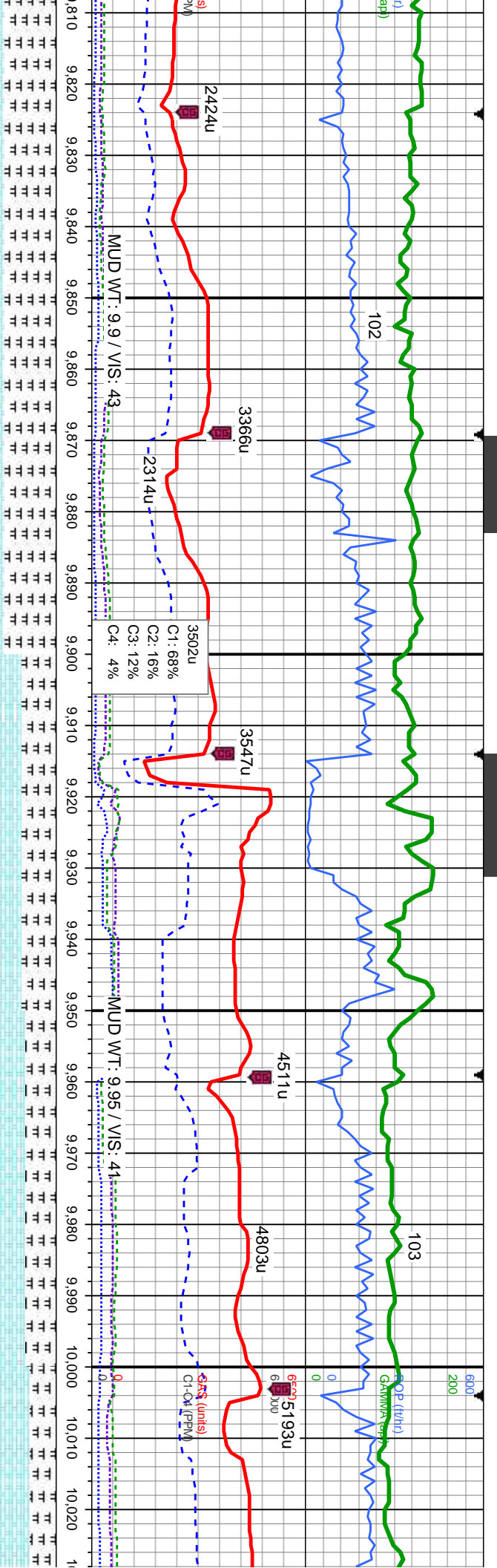




65% MRLST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 35% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc	65% MRLST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 35% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc	60% MRLST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 40% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc	60% MRLST: med-dk gy, sl frm-mod hd, sb ply-bkly, silty-mot tex, calc: 40% CHK: crm-llgy to brn, mot, sft-mod frm, sb ply-bkly, v calc
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TVD (ft)	MD: 9.672 TVD: 5,731.47 Inclination: 91 Azimuth: 88.3 VS: 4,370.56	TVD (ft)
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60% MRLST: med-dk gy, sl frm-mod hd, sb
ply-bkly, silty-mot tex, calc: 40% CHK: crm-ilty
to brn, mot, sft-mod frm, sb ply-bkly, v calc, tr
sec cal

60% CHK: crm-ilty to brn, mot, sft-mod frm, sb
ply-bkly, v calc: 40% MRLST: med-dk gy, sl
frm-mod hd, sb ply-bkly, silty-mot tex, calc, tr
Inoc, tr sec cal

65% CHK: crm-ilty to brn, mot, sft-mod frm, sb
ply-bkly, v calc: 35% MRLST: med-dk gy, sl
frm-mod hd, sb ply-bkly, silty-mot tex, calc, tr Inoc,
tr sec cal

70% CHK: crm-ilty to brn, mo
ply-bkly, v calc: 30% MRLST: sily-

MD: 9.852
TVD: 5,725.74
Inclination: 92.7
Azimuth: 88.5
VS: 4,550.37

MD: 9.941
TVD: 5,723.41
Inclination: 90.3
Azimuth: 87.7
VS: 4,639.29

MD: 10
TVD: 5
Inclina
Azimu
VS: 4,7

TVD (ft)

5900



