

# Decollement Consulting Inc.



Scale: 5" / 100'  
Measured Depth Log

Well Name State Pronghorn U-32-31MRLNB

Location NE/NE Section 32, T5N - R61W

State Colorado

County Weld

Country USA

Rig Number Cade 21

API Number 05-123-40108-00

Field Wattenberg

Region D.J. Basin

Drilling Completed 12/11/2014

Spud Date 11/28/2014

Surface Coordinates 1278 FNL x 468 FEL (Lat: 40.36106, -104.22519)

Bottom Hole Coordinates 10 FNL x 2702 FEL (Lat: 40.36439, -104.25188)

Ground Elevation 4,564'

K.B. Elevation 4,581'

Logged Interval 5700' To 13,345'

Total Depth 13,345'

Formation Niobrara "B" Chalk

Type of Drilling Fluid Water Based Mud

## Operator

Company Bonanza Creek Energy, Inc.

Address 410 17th Street, Suite 1500  
Denver, Colorado 80202

## Geologist

Name Scott Sawyer / Paul Givens

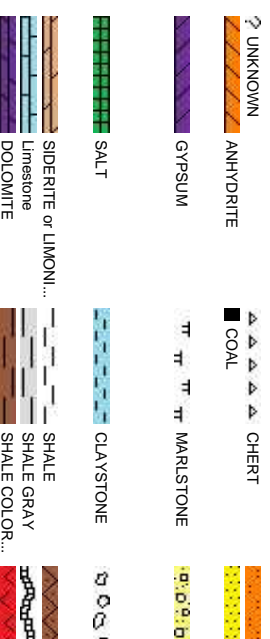
Company Decollement Consulting, Inc.

Address 13300 Braun Road  
Golden, CO 80401

## Zone Color Code



## Rock Types



Accessories

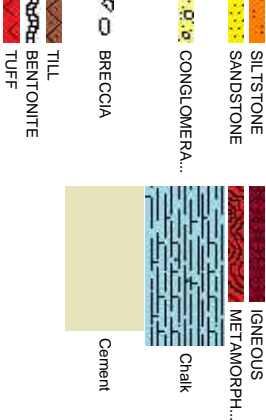
Fossils		Stringer	
F FOSSIL	- ARGILLACEOUS	GLAUCONITE	ANHYDRITE STRINGER
GASTROPOD	/ ARGILLITE GRAIN	GYPSIFEROUS	BENTONITE STRINGER
ALGAE	OOOLITE	HEAVY MINERAL	COAL STRINGER
AMPHIPORA	OSTRACOD	BITUMENOUS SUBSTAN..	DOLOMITE STRINGER
BELEMNITE	PELECYPOD	BRECCIA FRAGMENTS	GYPSUM STRINGER
BIOCLASTIC	PELLET	↑ CALCAREOUS	LIMESTONE STRINGER
BRACHIOPOD	PSOLITE	CARBONACEOUS FLAKES	MARLSTONE (CALC) ST...
BRYOZOA	PLANT REMAINS	CHTDK	MARLSTONE (DOL) STRG
CERHALOPOD	PLANT SPORES	CHTLT	SANDSTONE STRINGER
CORAL	SCAPHOPOD	COAL - THIN BEDS	SHALE STRINGER
CRINOID	STROMATOPORO..	DOLOMITIC	SILTSTONE STRINGER
ECHINOID	FELDSPAR	SLICEOUS	
FISH	FERRUGINOUS PELLETT	SILTY	
FORAMINIFE...	ANHYDRITIC	TUFFACEOUS	

Other Symbols

Oil Show		Engineering		Textures		Sorting	
D DEAD	ORGANIC	GAS SHOW	GLAUCONITE	BOUNDSTONE	POOR	MODERATE	WELL
EVEN	P PINPOINT	MN DEPTH	ANGULAR	MUDSTONE	PACKSTONE	WACKESTONE	
QUESTIONABLE	VUGGY	NORMAL FAULT	OIL SHOW	OVERTURNED STRATA	SUBANG	SUBRND	
SPOTTED STAINING	BIT	REVERSE FAULT					
Porosity		Faults		Chalk		Chalk	
E EARTHY	CONNECTION (LEFT)	SIDEWALL CORE (LEFT)	CRYPTOXLN	E EARTHY	GRAINSTONE	LITHOGRAPHIC	
F FRACTURE	CONNECTION (RIGHT)	SIDEWALL CORE (RIGHT)	TRIP GAS	WIREFINE TESTED - LEFT	WIREFINE TESTED - RT		
INTERCRYSTALLINE	CONNECTION GAS	SLIDE	SURVEY				
INTERROOTIC	CORE - LOST	COAL - RECOVERED					
MOLDIC	DST INTERVAL	FAULT	FORMATION TOP				

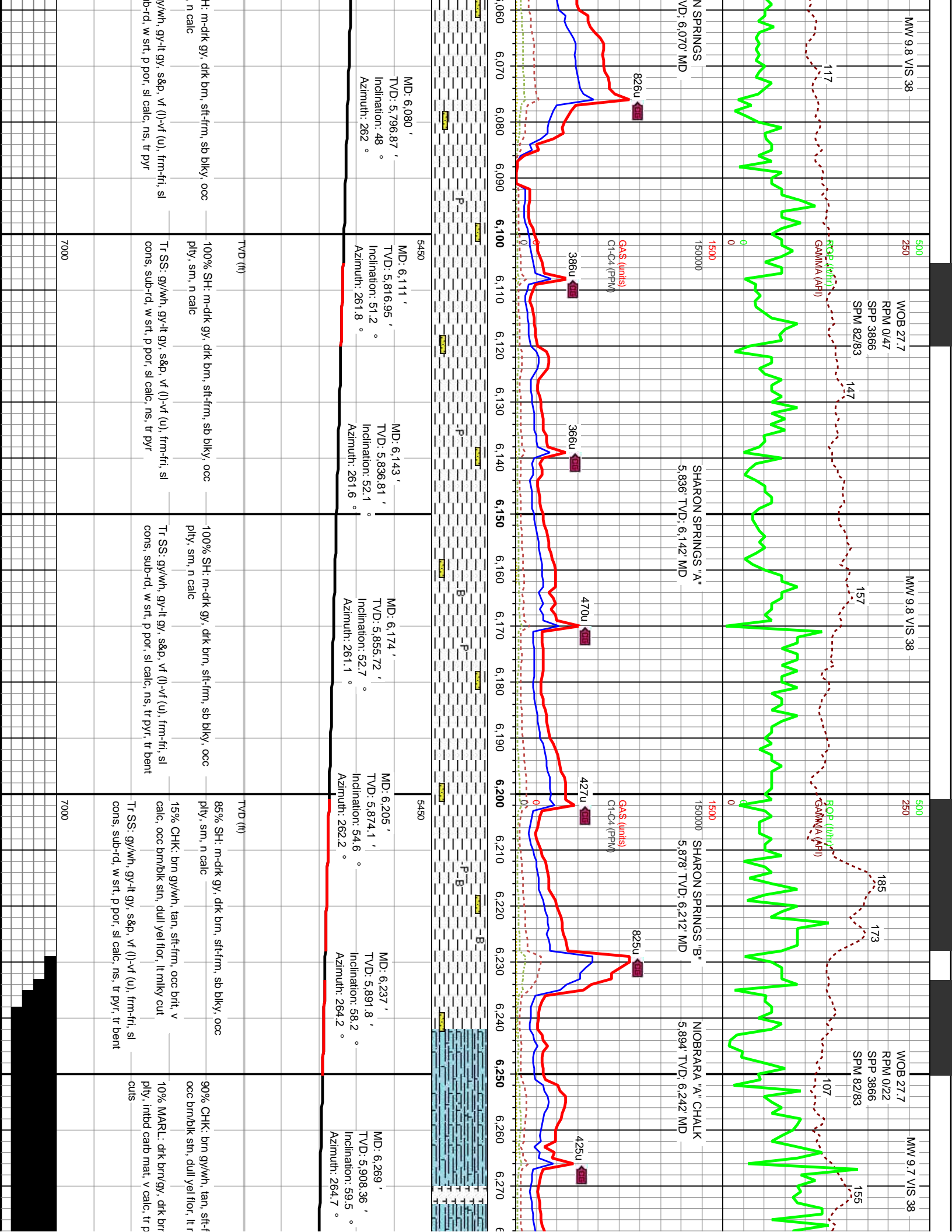
Rounding

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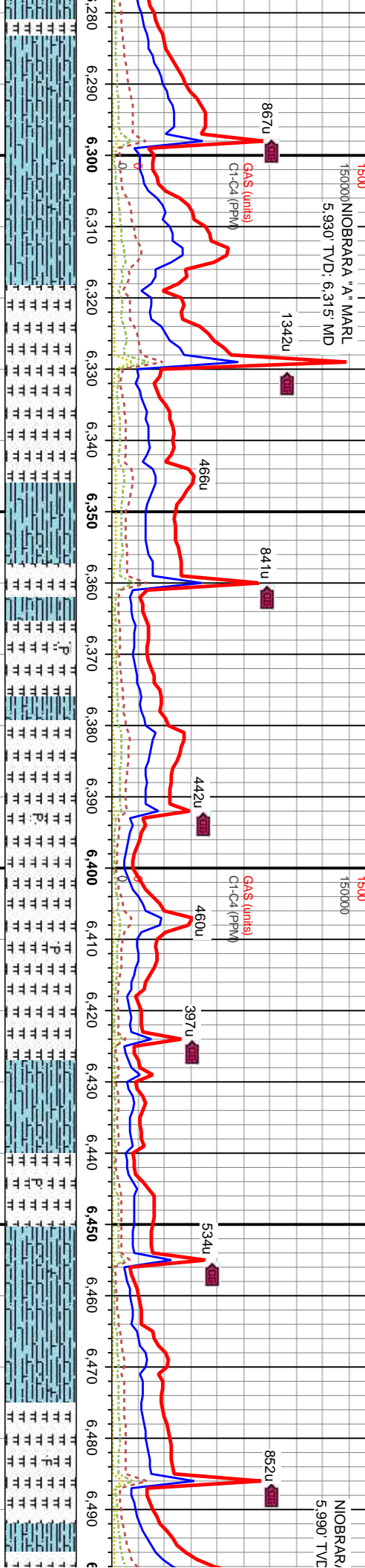
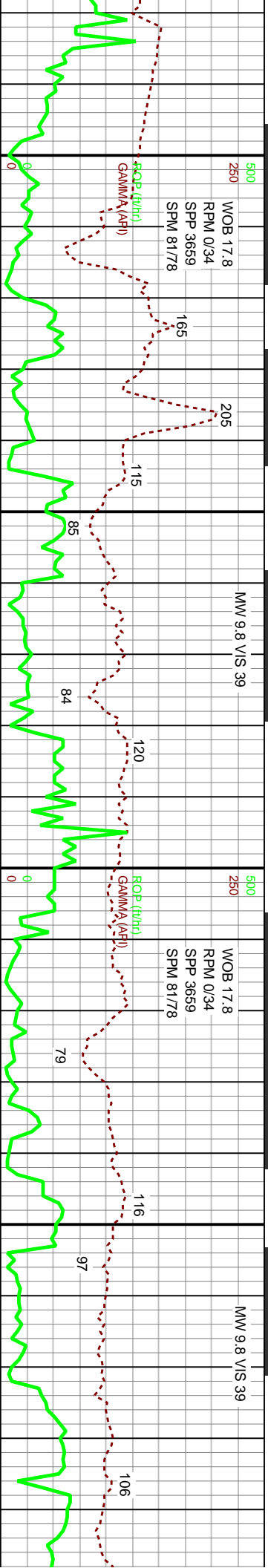


Slide/Rotate			
		<div>ROP ROP <span style="color: green;">—</span> GAMMA <span style="color: red;">- - -</span></div> <div>Decollement Consulting on location and rigged up on 12/1/2014.</div> <div>Start logging at 5,700' on 12/1/2014 at 1820 hours.</div> <div>ROP (ft/hr) GAMMA (API) 91</div> <div>WOB 10.4 RPM 0 SPP 3939 SPM 84/82</div> <div>MMW 9.8 V/S 40</div> <div>ROP (ft/hr) GAMMA (API) 91</div> <div>WOB 19.5 RPM 0 SPP 3655 SPM 84/81</div>	
		<div>Total Gas &amp; Chromatograph</div> <div>GAS <span style="color: red;">—</span> C1 <span style="color: blue;">—</span> C2 <span style="color: red;">- - -</span> C3 <span style="color: green;">- - -</span> C4 <span style="color: yellow;">- - -</span></div> <div>Bit #: 2 Size: 8 3/4" MFG: Smith Type: SD513 Depth In: 800 ' Depth Out: 6,725 ' Hours: 31.5 hrs Jets: 8X14 S/N: JJS346</div> <div>GAS (units) C1-C4 (PPM) 31u <span style="color: purple;">█</span></div> <div>177u <span style="color: purple;">█</span> 380u 349u 428u <span style="color: purple;">█</span></div> <div>GAS (units) C1-C4 (PPM) 323u <span style="color: purple;">█</span></div>	
Depth Labels		5,660 5,670 5,680 5,690 5,700 5,710 5,720 5,730 5,740 5,750 5,760 5,770 5,780 5,790 5,800 5,810 5,820 5,830	
Interp Lith		<div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> <div>5450</div> <div>P</div> 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MD: 6,300'   
TVD: 5,923.5'   
Inclination: 62 °   
Azimuth: 264.8 °

MD: 6,331'   
TVD: 5,937.33'   
Inclination: 65 °   
Azimuth: 265 °

MD: 6,363'   
TVD: 5,949.96'   
Inclination: 68.5 °   
Azimuth: 264.9 °

MD: 6,395'   
TVD: 5,961.04'   
Inclination: 71 °   
Azimuth: 264.8 °

MD: 6,426'   
TVD: 5,970.2'   
Inclination: 74.6 °   
Azimuth: 266.2 °

MD: 6,459'   
TVD: 5,978.19'   
Inclination: 77.4 °   
Azimuth: 268.9 °

MD: 6,491'   
TVD: 5,984.84'   
Inclination: 78.6 °   
Azimuth: 269.9 °

TVD (ft)

TVD (ft)

70% MARL: dk brn/gy, dk brn, frm-sft, blk, occ ply, intbd carb mat, v calc, tr pyr, no flr, poor wh cuts

30% CHK: brn gy/wh, tan, sft-frm, occ brt, v calc, occ brn/blk sin, dull yel flr, lt milky cut

80% MARL: dk brn/gy, dk brn, frm-sft, blk, occ ply, intbd carb mat, v calc, tr pyr, no flr, poor wh cuts

20% CHK: brn gy/wh, tan, sft-frm, occ brt, v calc, occ brn/blk sin, dull yel flr, lt milky cut

60% MARL: dk brn/gy, dk brn, frm-sft, blk, occ ply, intbd carb mat, v calc, tr fos, tr pyr, no flr, poor wh cuts

40% CHK: brn gy/wh, tan, sft-frm, occ brt, v calc, occ brn/blk sin, dull yel flr, lt milky cut

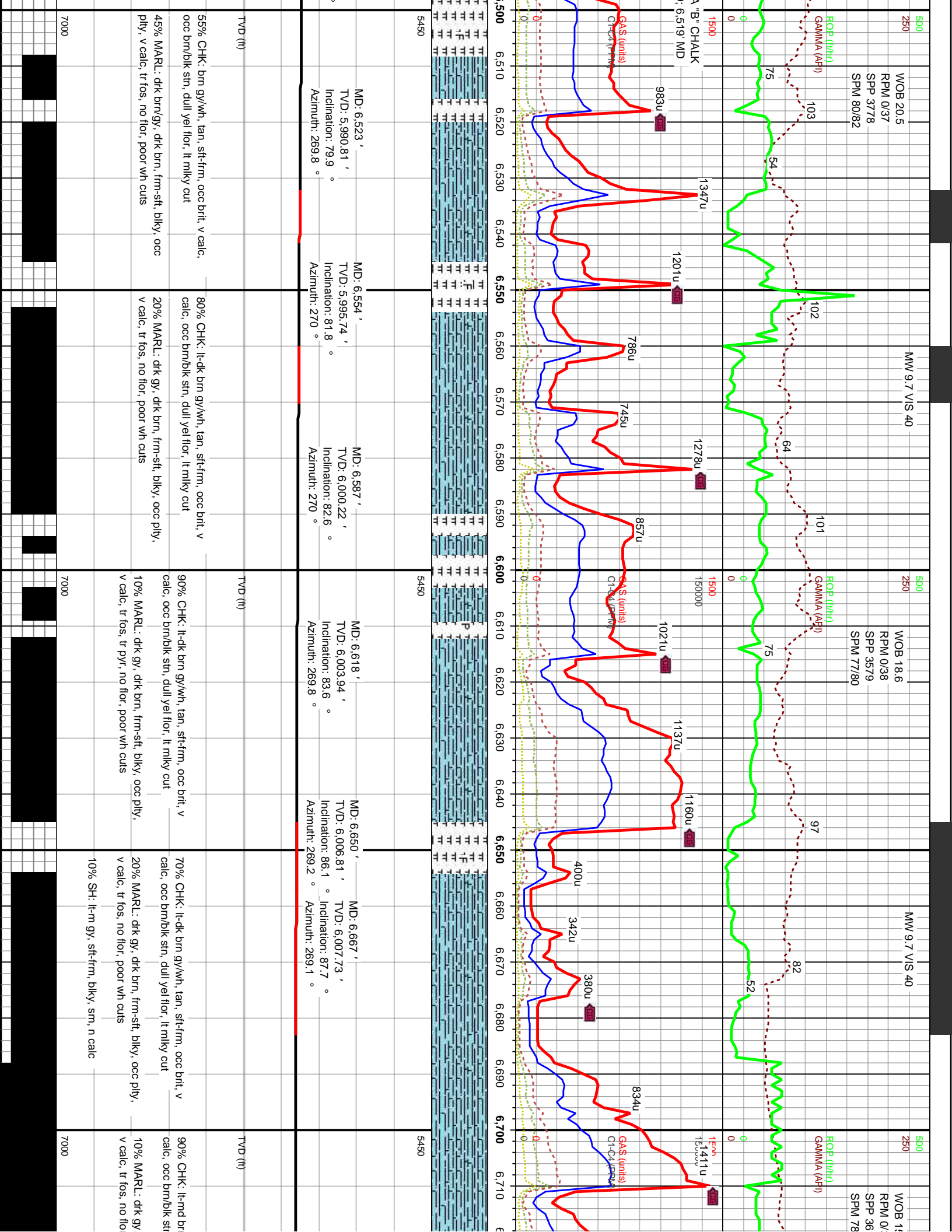
60% MARL: dk brn/gy, dk brn, frm-sft, blk, occ ply, v calc, tr fos, tr pyr, no flr, poor wh cuts

40% CHK: brn gy/wh, tan, sft-frm, occ brt, v calc, occ brn/blk sin, dull yel flr, lt milky cut

7000

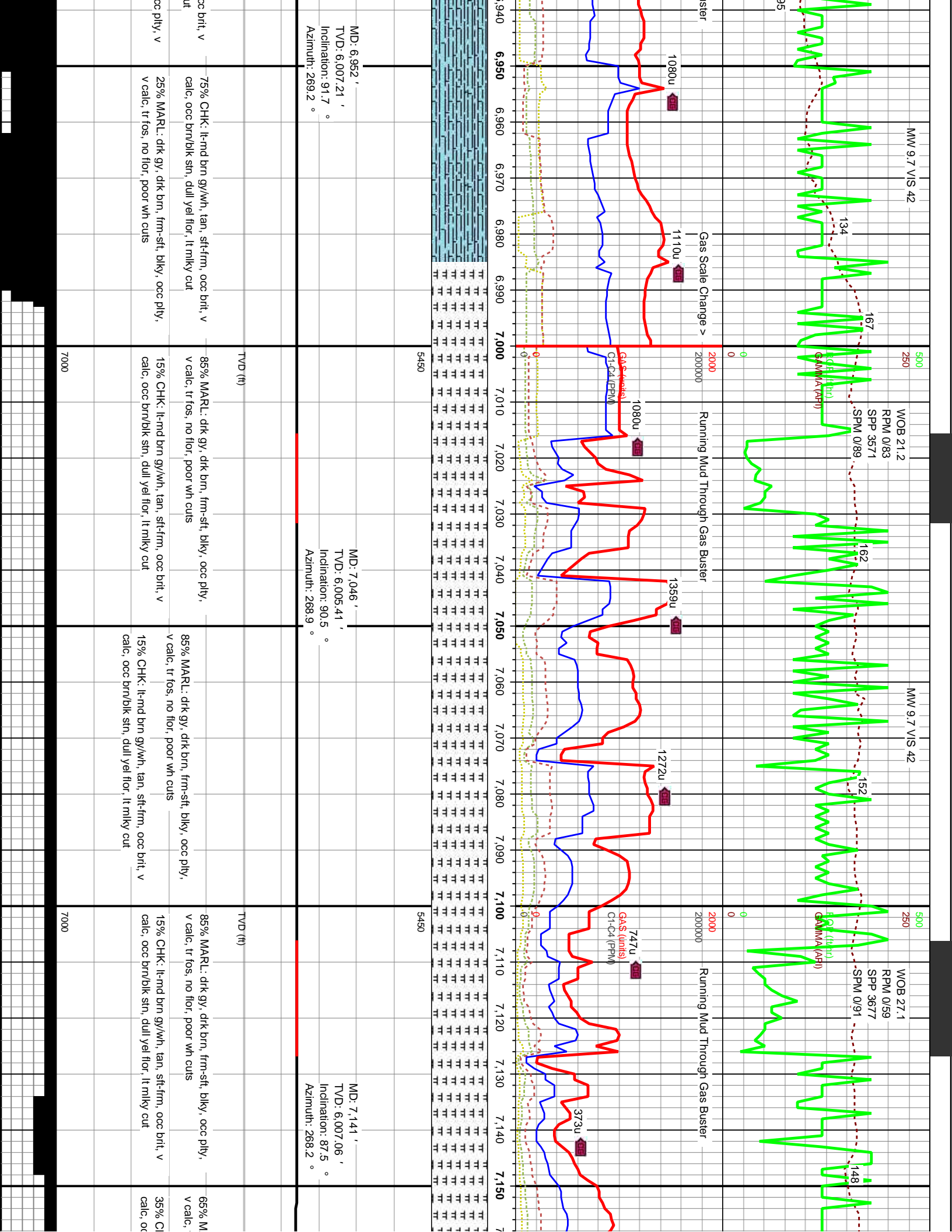
7000

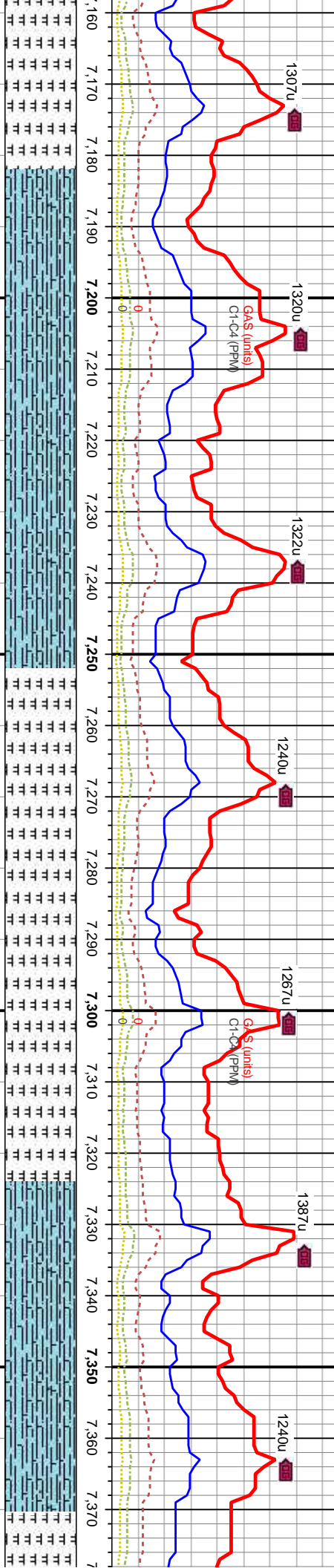
7000

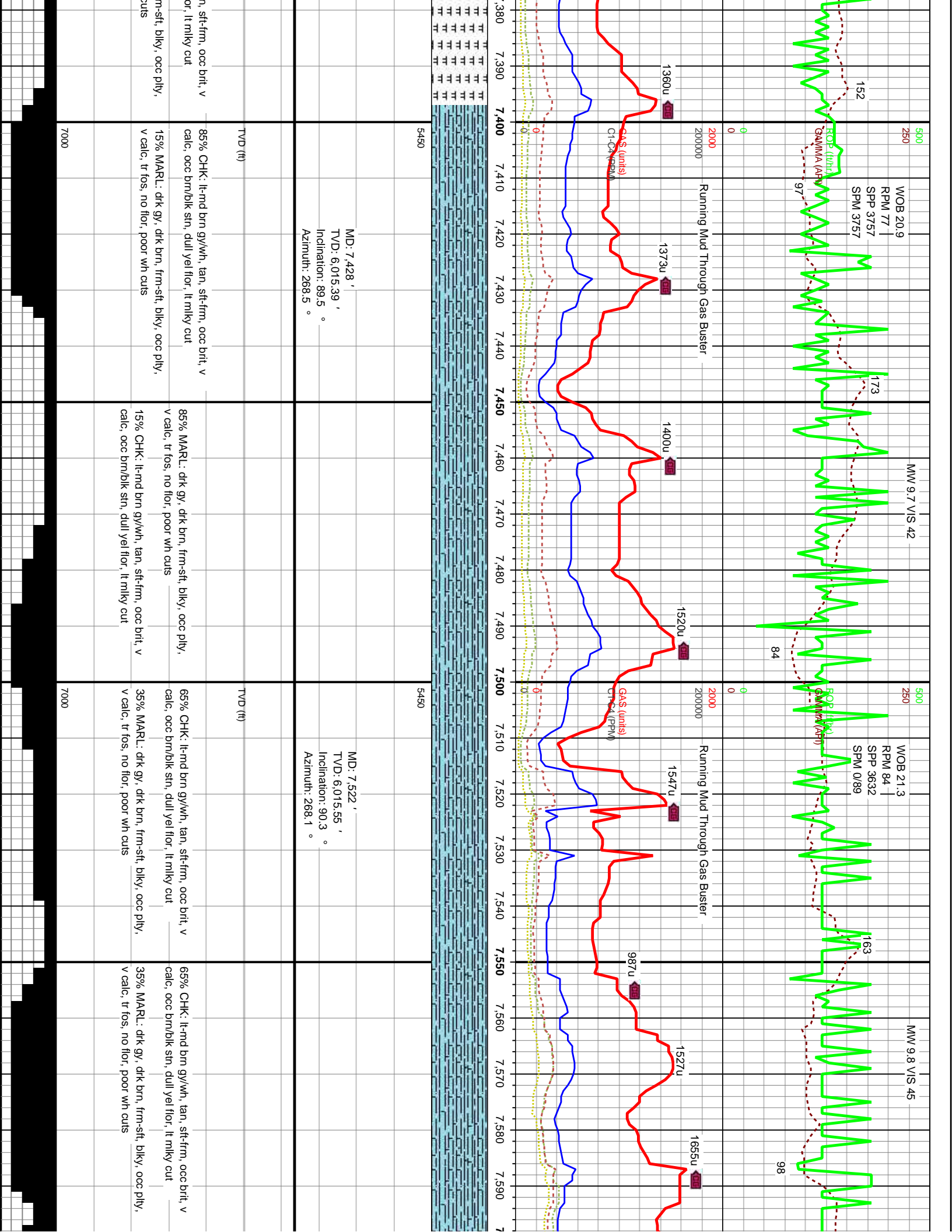










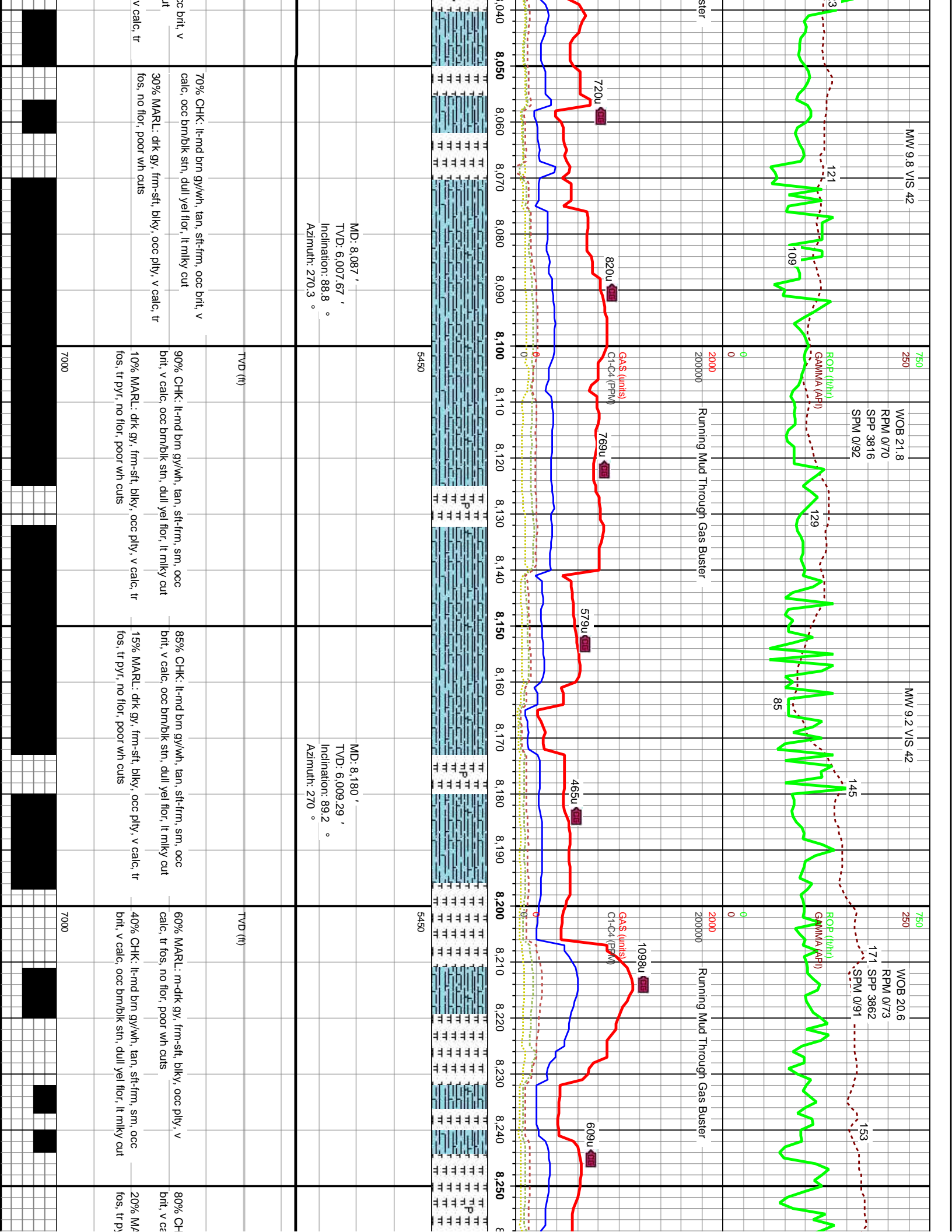














12/7/2014

750  
250

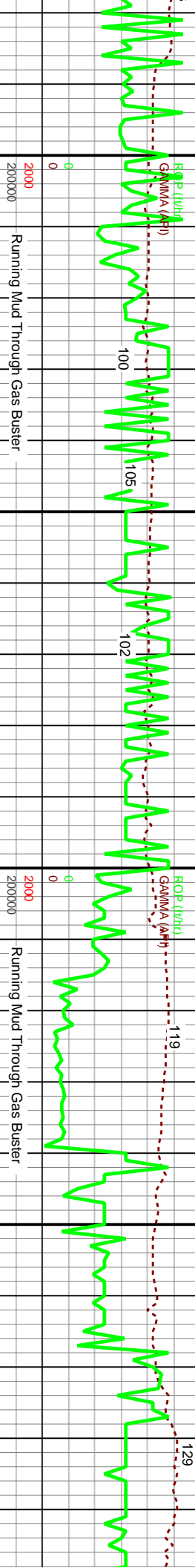
WOB 2.1, 4  
RPM 0/73  
SPP 3874  
SPM 0/91

MW 9.7 VIS 41

750  
250

WOB 7.6  
RPM 0/73  
SPP 3532  
SPM 0/90

MW 9.8 VIS 39



ROP (ft/hr)  
GAMA (API)

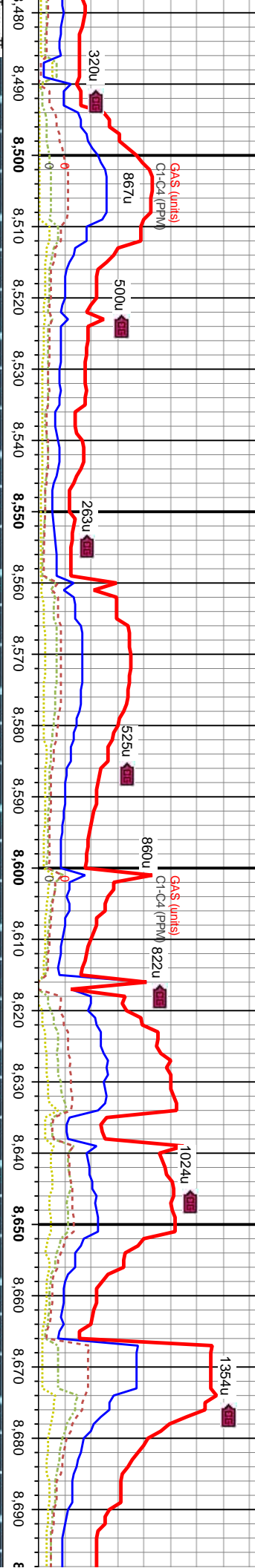
ROP (ft/hr)  
GAMA (API)

ROP (ft/hr)  
GAMA (API)

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster



Gas (units)  
C1-C4 (PPM)

Gas (units)  
C1-C4 (PPM)

Gas (units)  
C1-C4 (PPM)

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster



TVD (ft)  
MD (ft)

TVD (ft)  
MD (ft)

TVD (ft)  
MD (ft)

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster

20000  
Running Mud Through Gas Buster

MD: 8.552 '  
TVD: 6.009.46 '  
Inclination: 90 °  
Azimuth: 269.1 °

MD: 8.645 '  
TVD: 6.008.81 '  
Inclination: 90.8 °  
Azimuth: 271.2 °

85% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
15% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, no flor, poor wh cuts

90% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
10% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flor, poor wh cuts

95% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
5% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flor, poor wh cuts

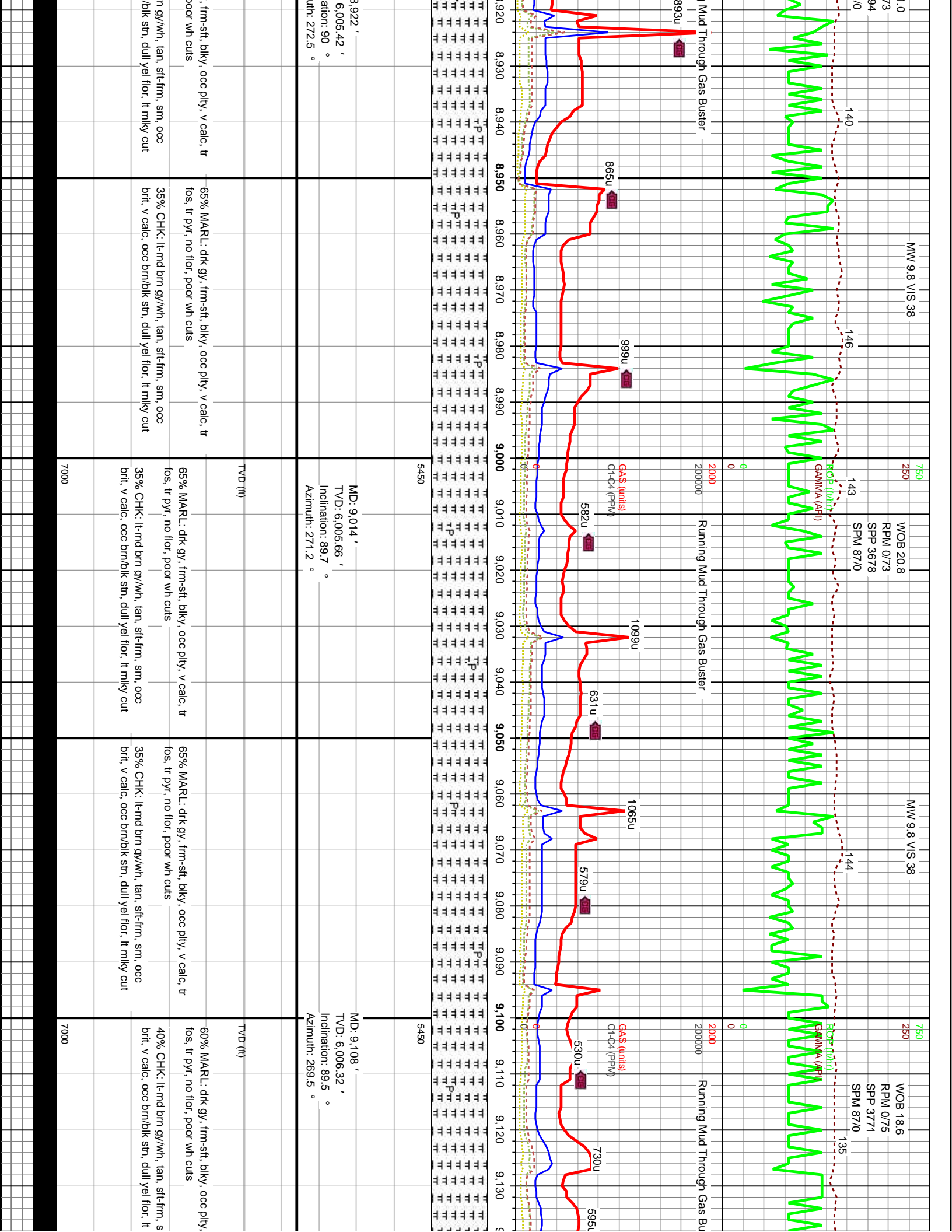
85% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
15% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, no flor, poor wh cuts

90% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
10% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flor, poor wh cuts

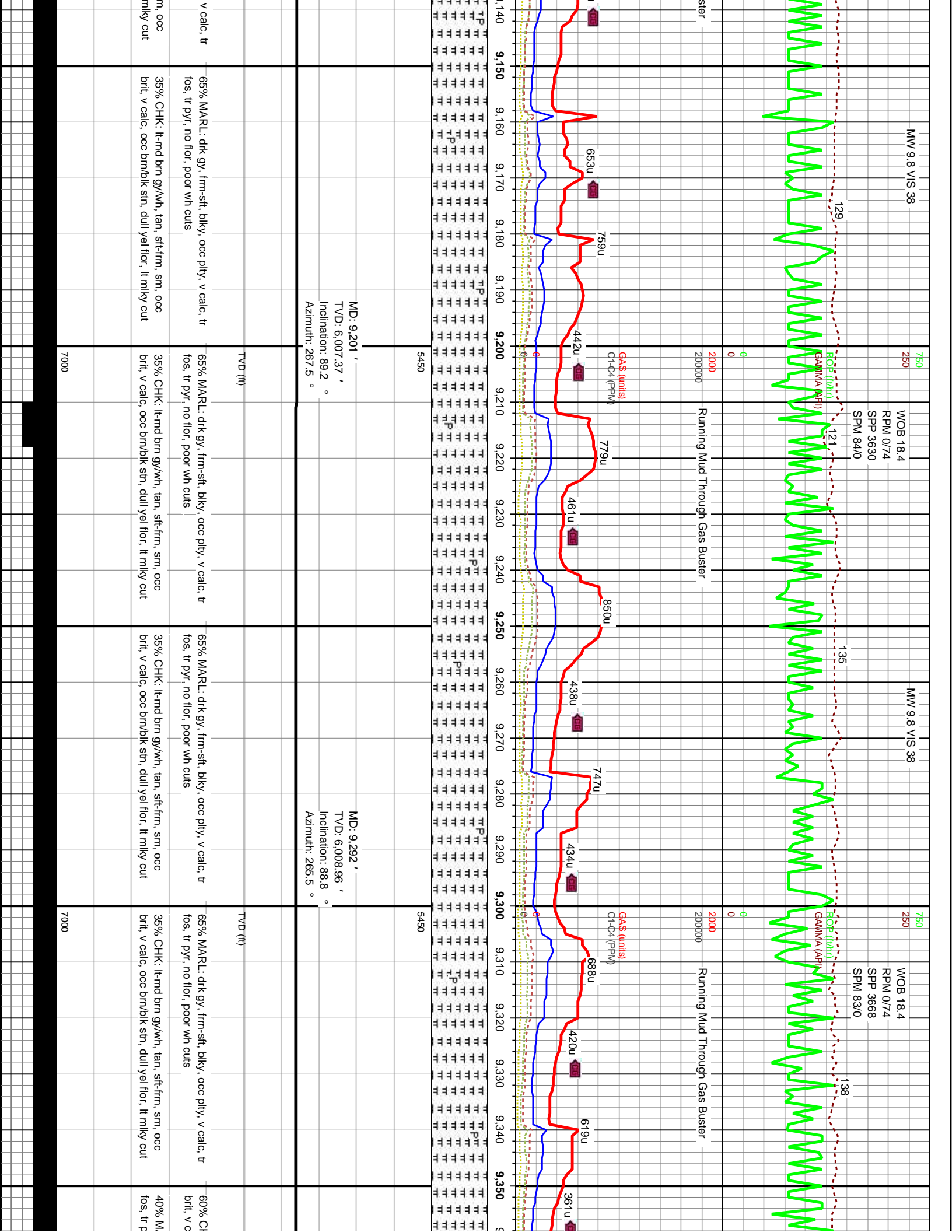
95% CHK: lt-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flor, lt mlky cut  
5% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flor, poor wh cuts

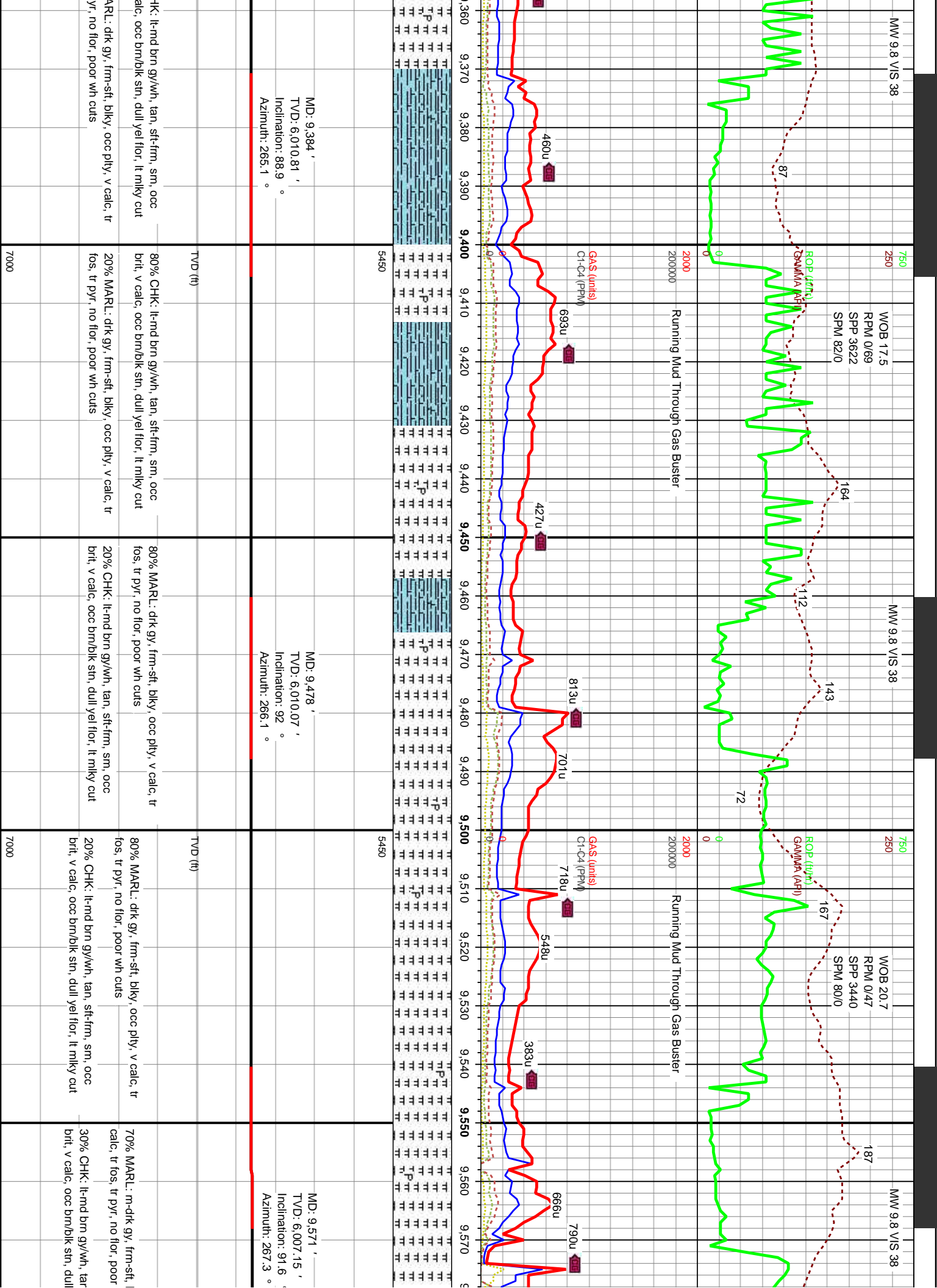


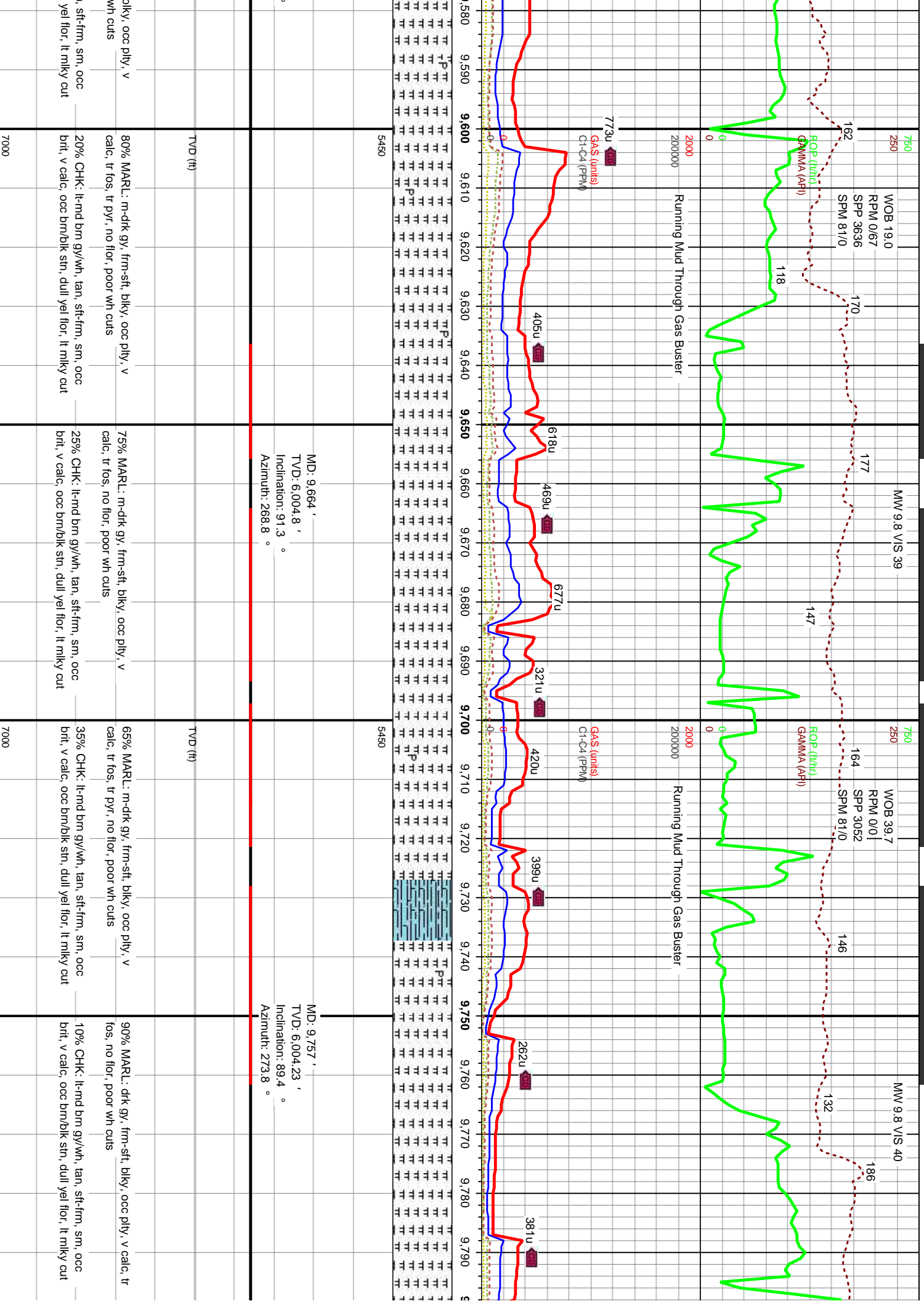


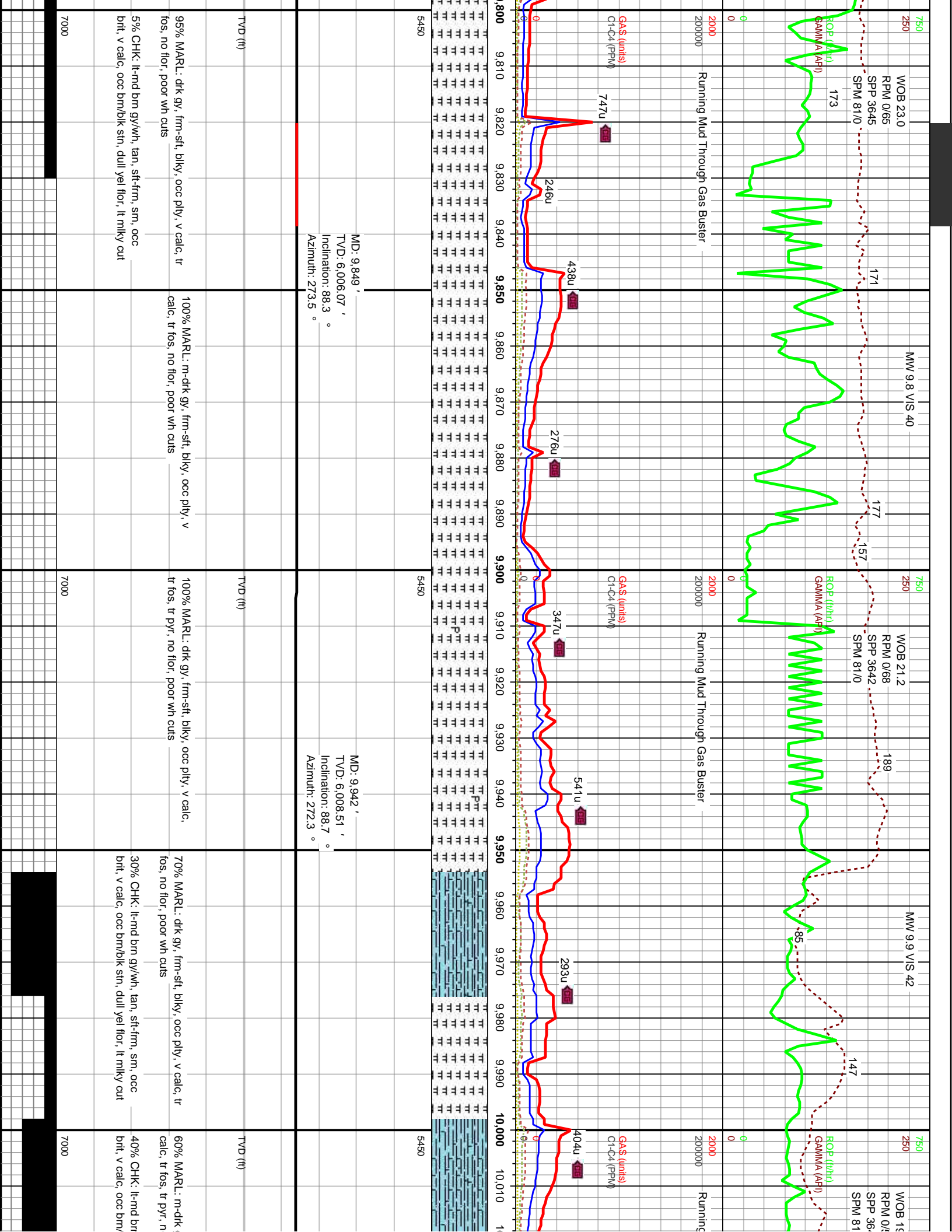




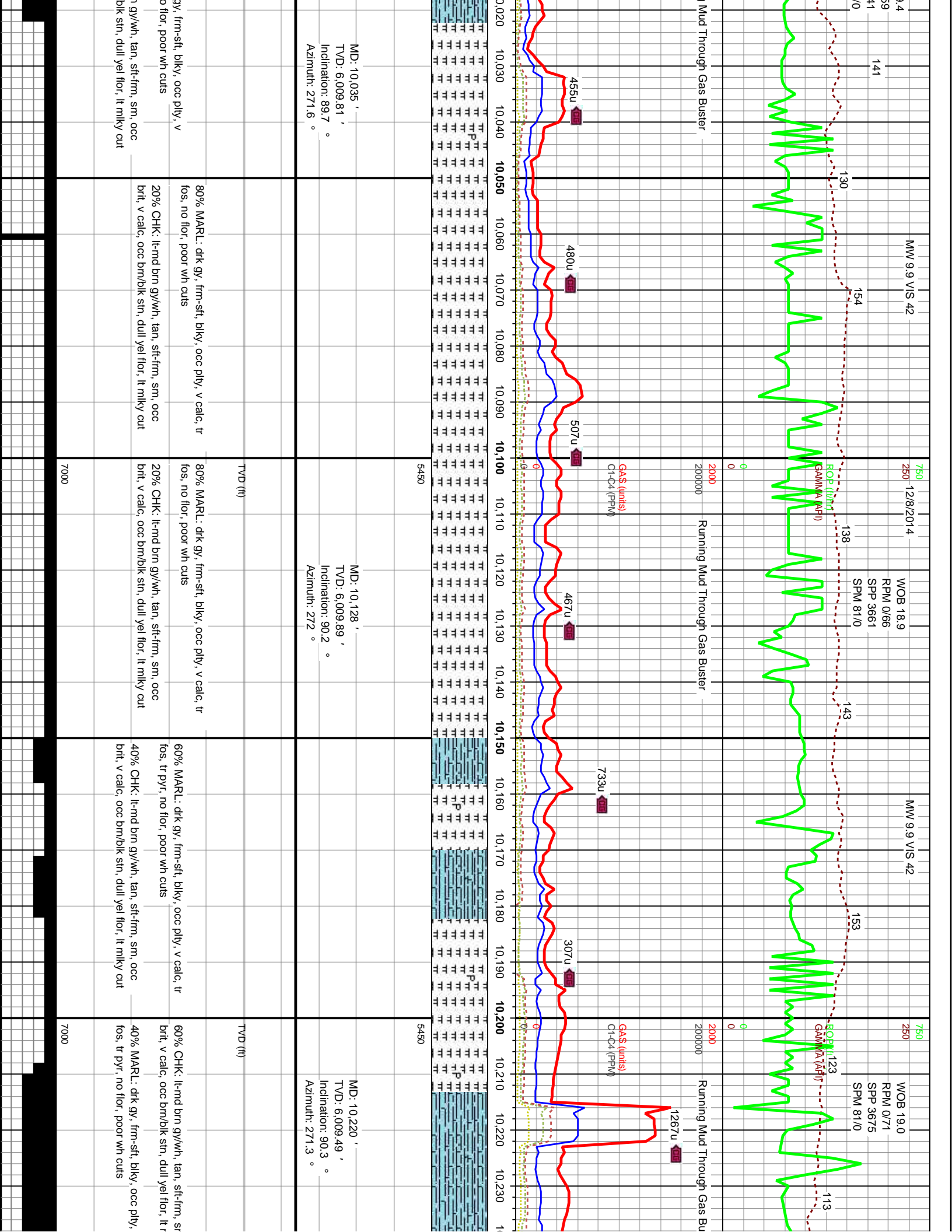




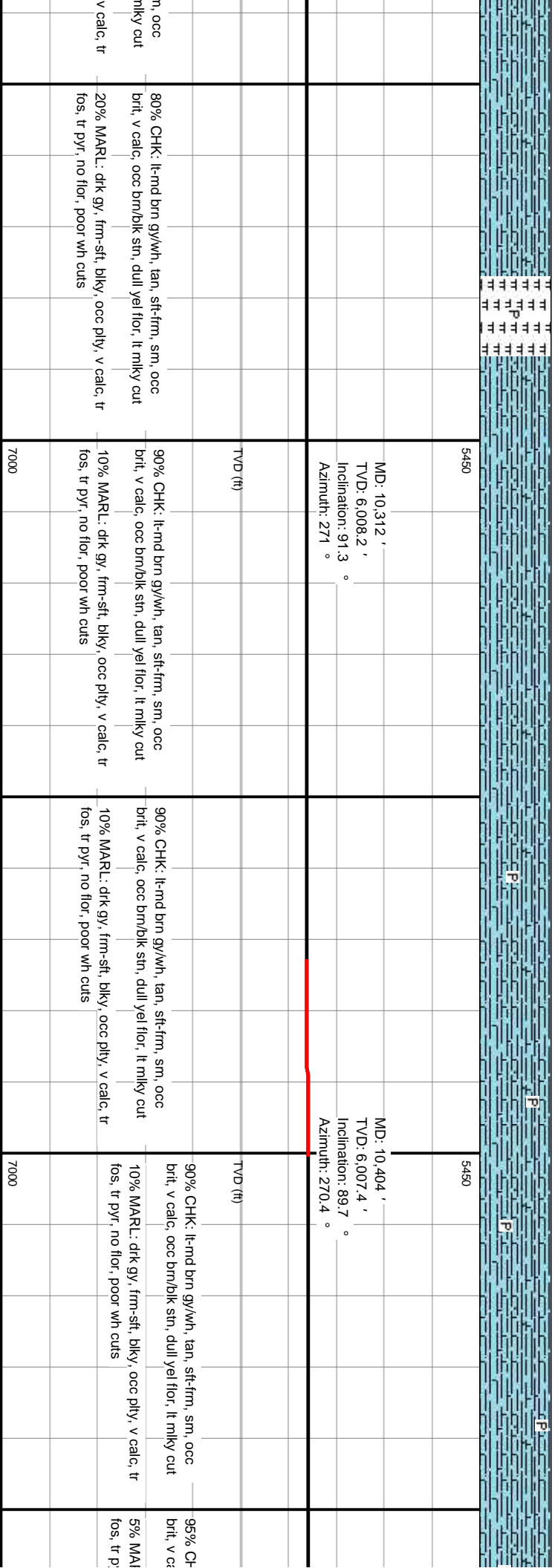
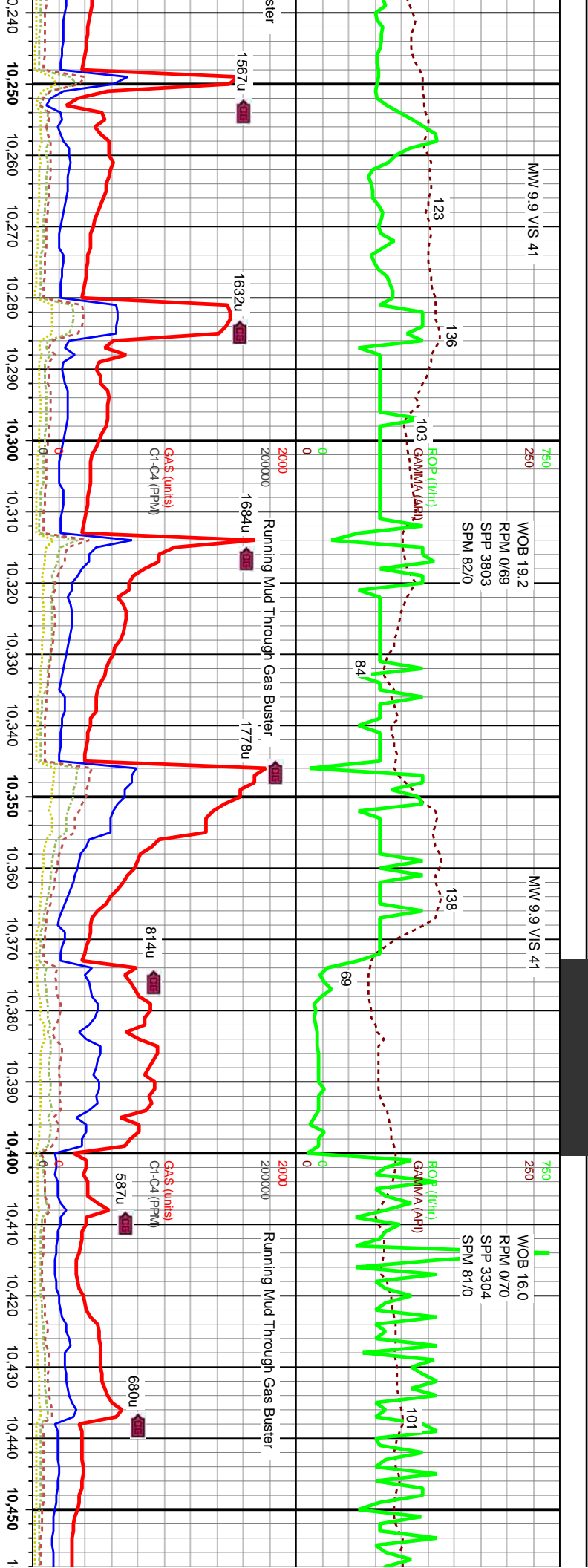












MW 9.8 V/S 38

MW 9.7 V/S 38

MW 9.7 V/S 38

750  
250

WOB 16.9  
RPM 0/71  
SPP 3504  
SPM 81/0

750  
250

WOB 24.9  
RPM 0/73  
SPP 3768  
SPM 81/0

750  
250

WOB 24.9  
RPM 0/73  
SPP 3768  
SPM 81/0



Running Mud Through Gas Buster

Running Mud Through Gas Buster

Running Mud Through Gas Buster

Gas (units)  
C1-C4 (PPM)

Gas (units)  
C1-C4 (PPM)

Gas (units)  
C1-C4 (PPM)

619u

627u

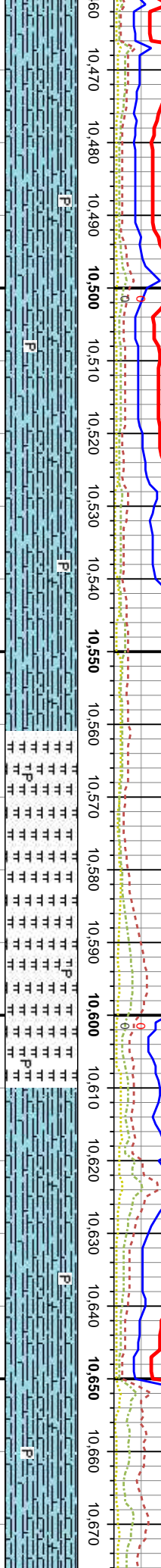
520u

827u

867u

1187u

1120u



MD: 10,497 '  
TVD: 6,007.07 '  
Inclination: 90.7 °  
Azimuth: 270 °

MD: 10,588 '  
TVD: 6,006.52 '  
Inclination: 90 °  
Azimuth: 270.3 °

MD:   
TVD:   
Inclir  
Azir

li-mnd brn gy/wh, tan, sft-firm, sm, occ  
calc, occ brn/bk sin, dull yel flr, lt mlky cut

85% CHK: li-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flr, lt mlky cut

15% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts

li-mnd brn gy/wh, tan, sft-firm, sm, occ  
calc, occ brn/bk sin, dull yel flr, lt mlky cut

85% CHK: li-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flr, lt mlky cut

15% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts

li-mnd brn gy/wh, tan, sft-firm, sm, occ  
calc, occ brn/bk sin, dull yel flr, lt mlky cut

85% CHK: li-mnd brn gy/wh, tan, sft-firm, sm, occ  
brit, v calc, occ brn/bk sin, dull yel flr, lt mlky cut

15% MARL: drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts

drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts

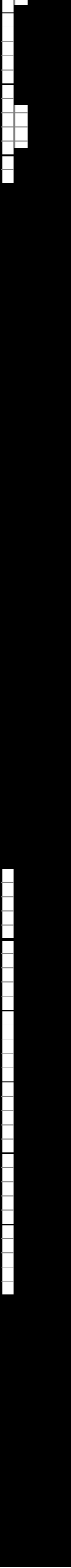
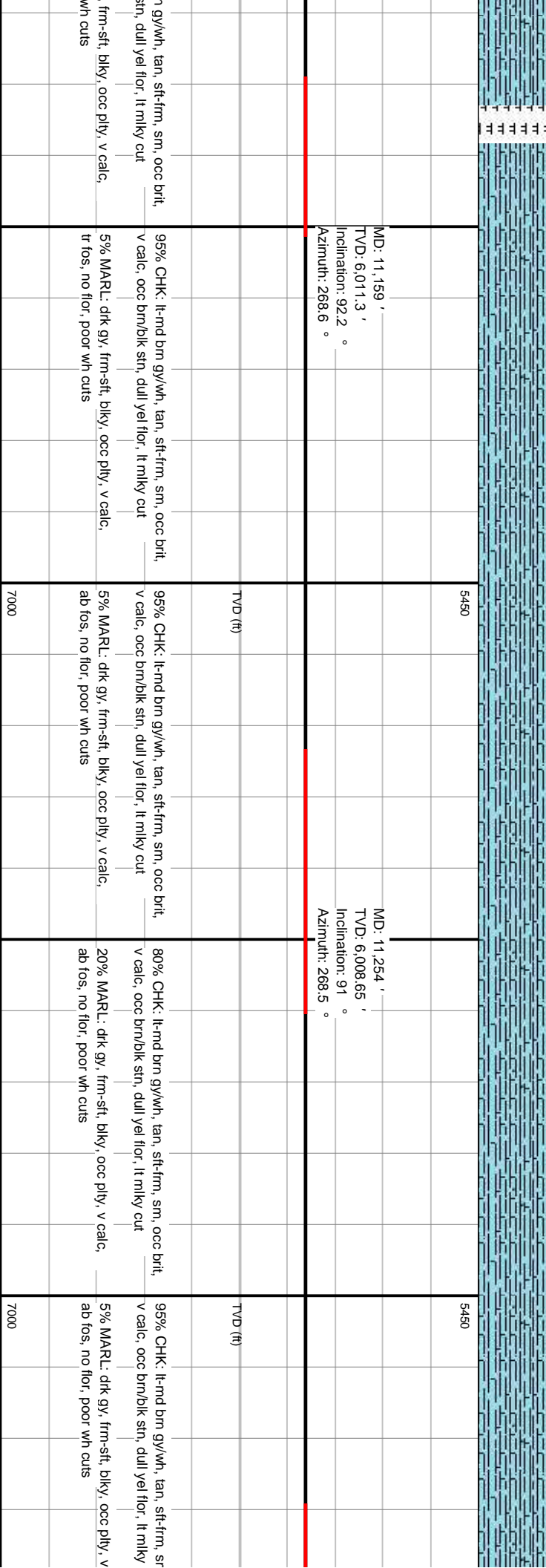
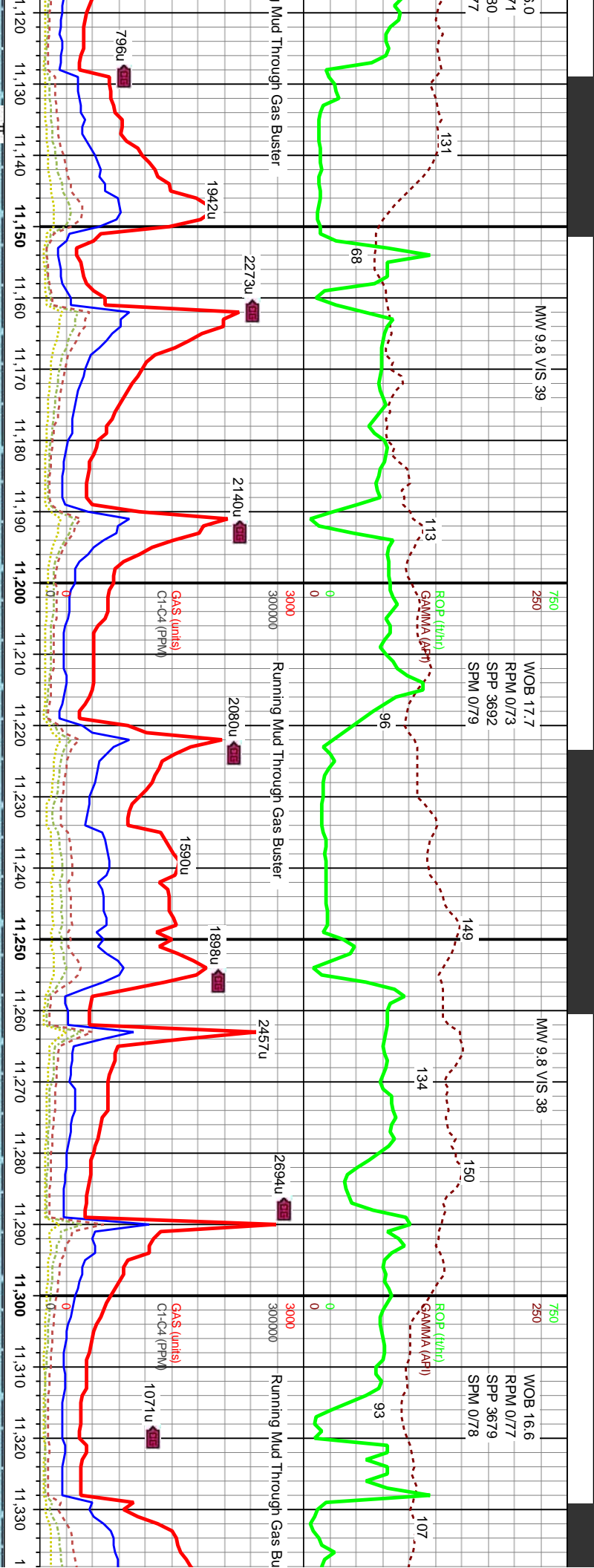
drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts

drk gy, firm-sft, blk, occ ply, v calc, tr  
fos, tr pyr, no flr, poor wh cuts











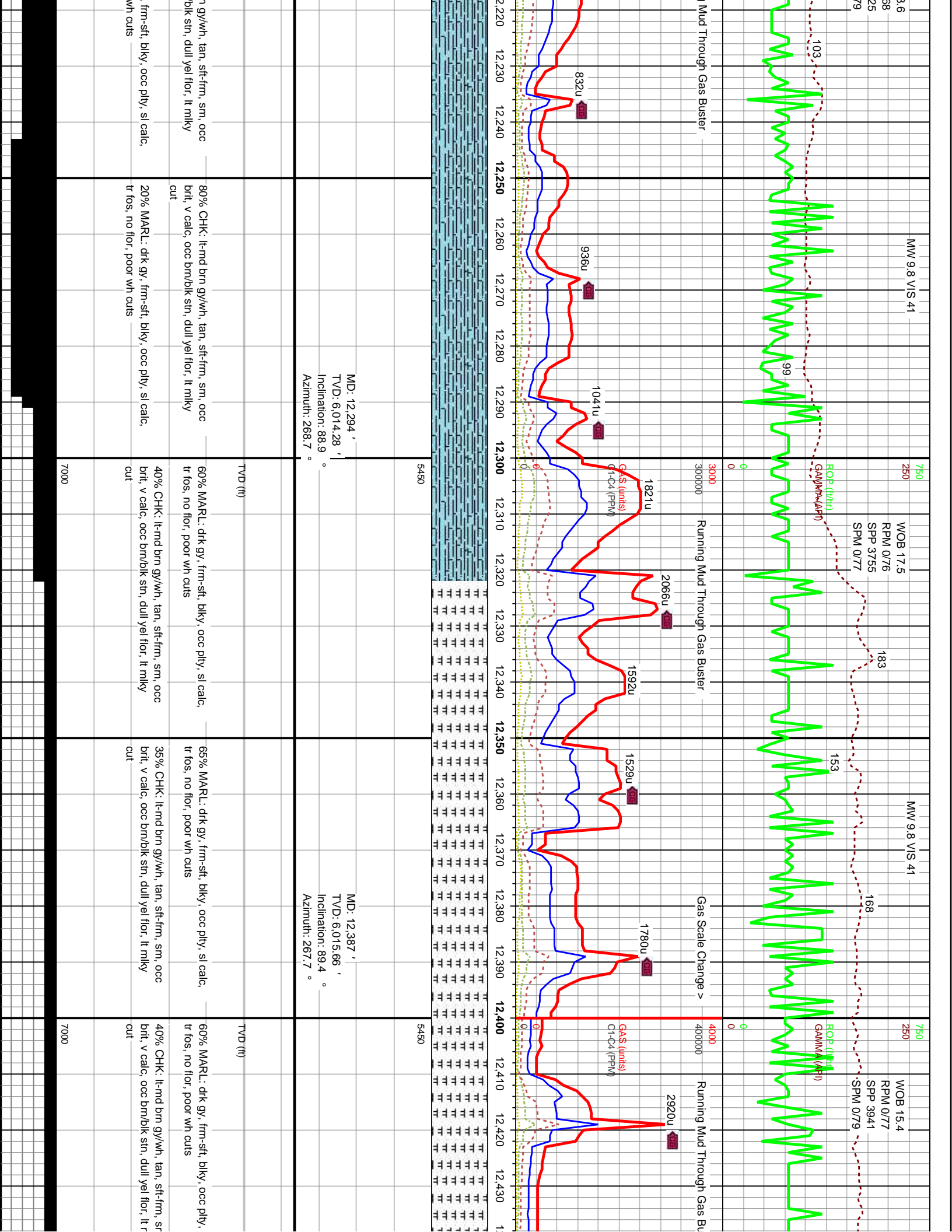




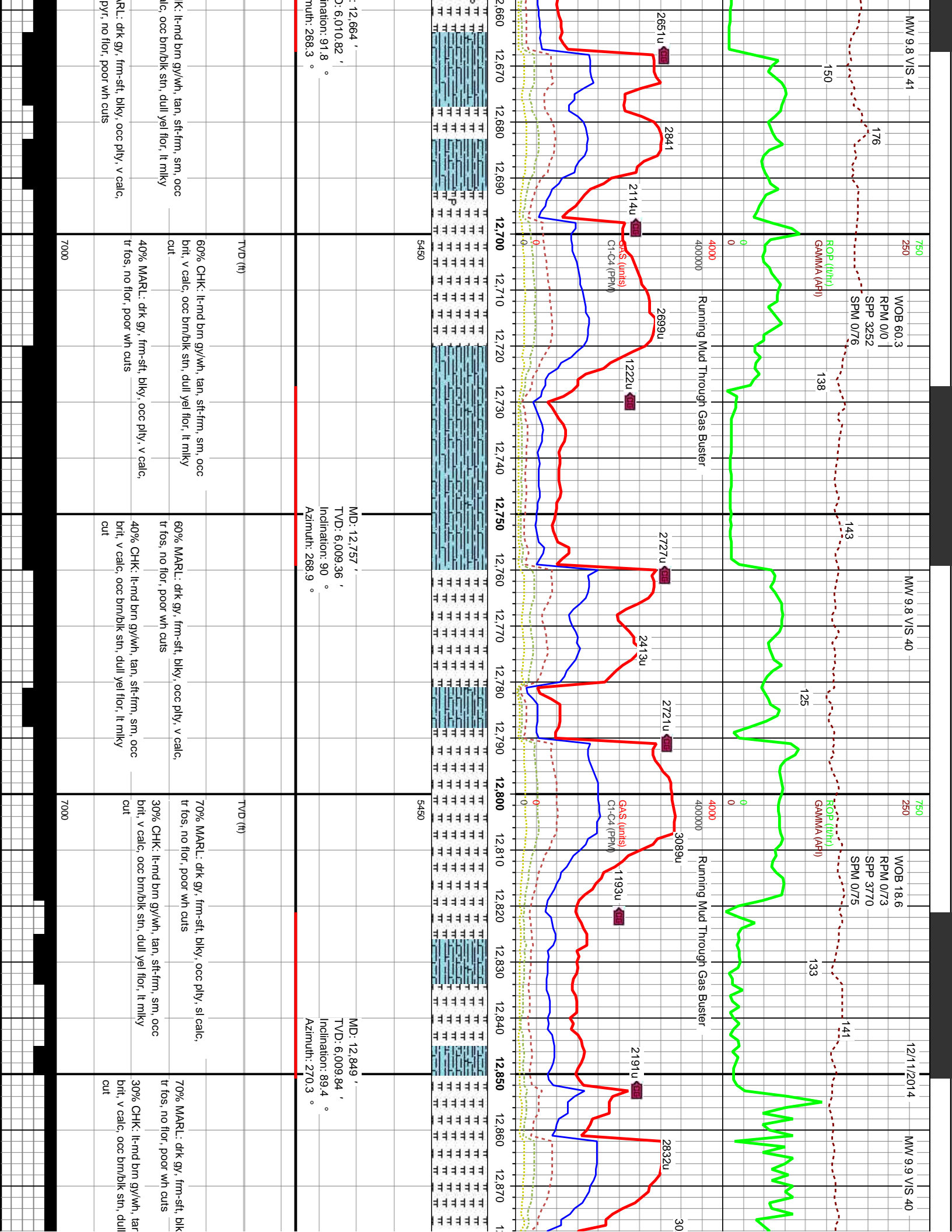


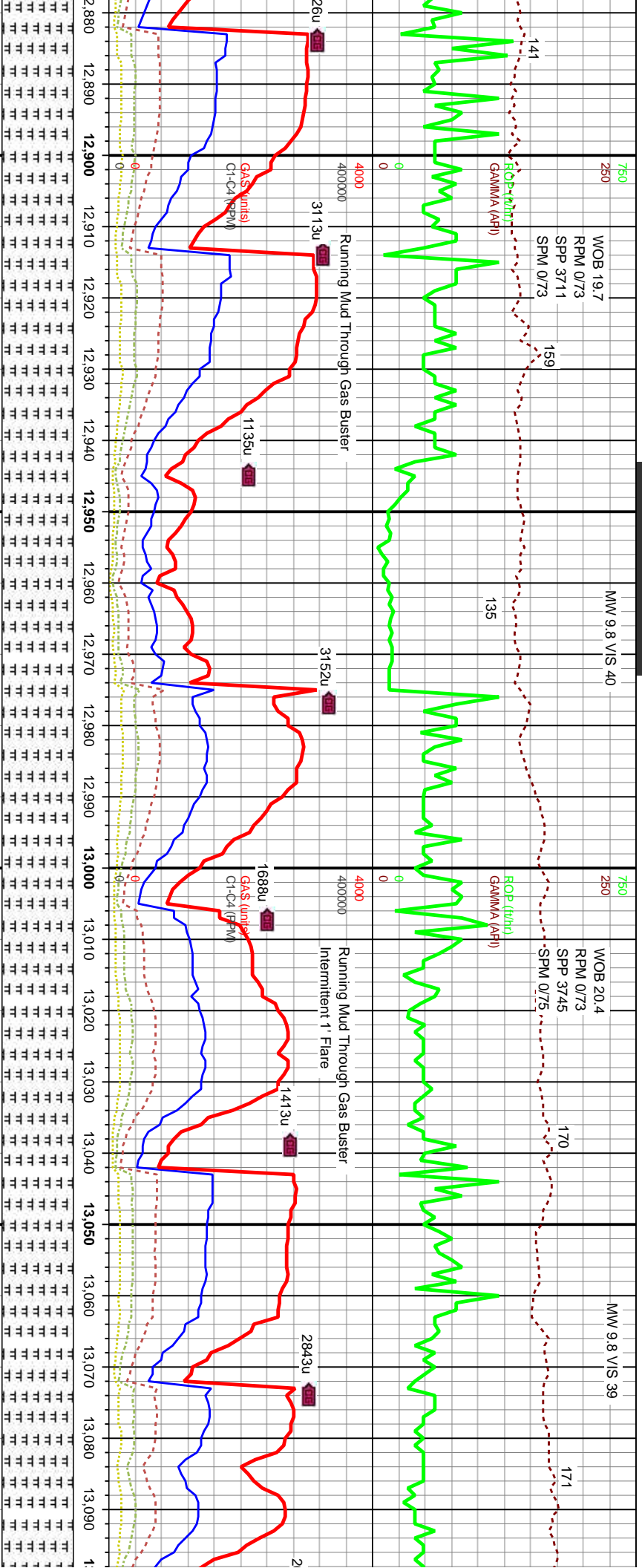




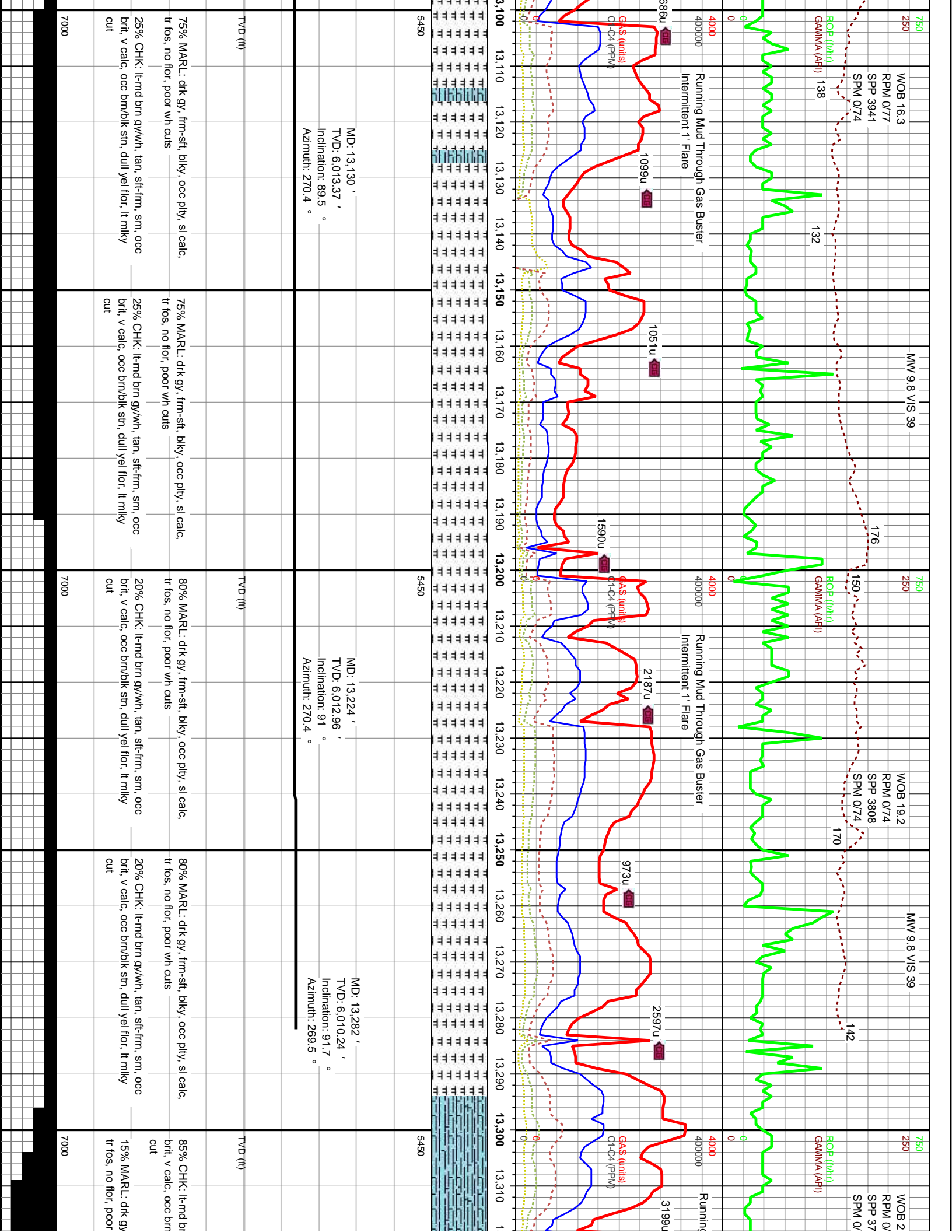




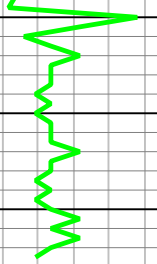


[illegible]



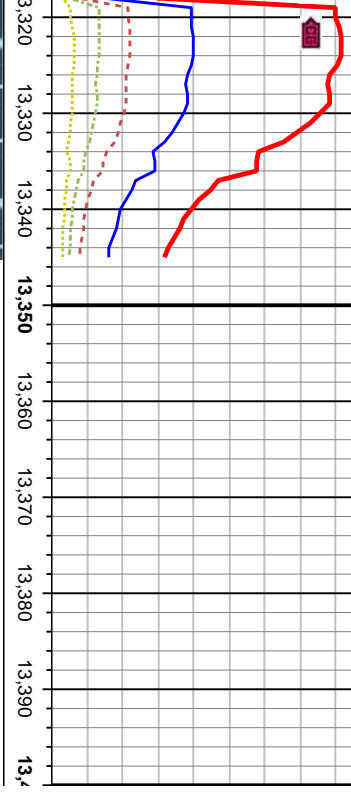


1.4  
83  
42  
74



Reached TD at 13,345' on  
12/1/2014 at 1048 hours.

Mud Through Gas Buster



THANK YOU FOR CHOOSING  
DECOLLEMENT CONSULTING!

n gy/w/h, tan, sft-frm, sm, occ  
/blk stn, dull yel flr, lt mlky  
frm-sft, blk y, occ ply, sl calc,  
wh cuts

