

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells Ranch AA35-66-1AHNC(HORZ)

Location SEC 36;T6N;R63W

State COLORADO

Country USA

API Number 05-123-38660-0000

Region DJ BASIN

Spud Date 3/19/2014

Surface Coordinates PROJECTED:

LAT: 40.44455°N

LONG: 104.3941°W

2041' FNL

168' FWL

Bottom Hole Coordinates PROJECTED:

2145' FSL

535' FWL

Ground Elevation 4787'

Logged Interval 5989'

To 11190'

Formation NIOBRARA "C" CHALK

Type of Drilling Fluid MUD;WATER;POLY

K.B. Elevation 4811'

Total Depth 11190'

County WELD

Rig Number H&P 322

Field CROW CREEK

Drilling Completed 3/24/2014

Company NOBLE ENERGY

Address 1625 BROADWAY
DENVER, CO 80202
(303) 228-4000

Name MIKE GREENE,

Company COLUMBINE LOGGING

Address 2385 S. LIPAN STREET
DENVER, COLORADO 80222
(303) 289-7764

Oil
Note
Error

UNKNOWN
ANHYDRITE
BENTONITE
BRECCIA
CHALK
CEMENT
CHERT
CLAY CHOKE SAND
CLAYSTONE
COAL
GAS
GRANITE
GYP
LIMESTONE
MUDSTONE
SANDSTONE
SHALE
SLATE
TUFF
UNCONFORMITY
VEIN
VOLCANIC
WAX
WATER

Operator

Y INC.

AY

0202

Geologist

MATTHEW HOPKINS

DOGGING, INC.

ST

ORADO 80223

Zone Color Coding

Condensate

Water

Gas	Pressure	Seal
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Rock Types

[illegible]

Accessories

Fossils

[illegible]

Other Symbols

Oil Show
































✓ VUGGY

Engineering

Eng

SPOTTED STAINING CONNECTION (UP)

Porosity

Porosity	 CONNECTION (DOWN)	 MN DEPTH (DOWN)	 ANGULAR	P3 PACKSTONE
 CONNECTION GAS	 CONNECTION GAS (LEFT)	 NORMAL FAULT	 R ROUNDED	W3 WACKSTONE
E EARTHY	 CONNECTION GAS (LEFT)	 OVERTURNED STRATA	 S SUBANG	
 FENESTRAL	 TRIP GAS	 REVERSE FAULT	 S SUBRAND	
F FRACTURE	 TRIP GAS (LEFT)	 CASING		M MODERATE
 INTERCRYSTALLINE	 DOWN TIME GAS	 SIDEWALL CORE (LEFT)	Textures	P POOR
 INTERPOOLITIC	 DOWN TIME GAS (LEFT)	 SIDEWALL CORE (RIGHT)	 B3 BOUNDSTONE	W WELL
 MOLDIC	 CORE - LOST	 SLIDE	 C CHALKY	
 ORGANIC	 CORE - RECOVERED	 SURVEY	 C3 CRYPTOXAN	
				Sorting

Slide/Rotate

Began Build @ 5989' MD; 0151 hrs, 03/21/2014

ROP

ROF

GAMMA

LOG CONTINUED FROM:
WELLS RANCH
AA35-66-1AHNC(VERT).mplot

ROP (ft/hr)

GAMMA (api)

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

BEGIN 50' SAMPLE INTERVALS

COLUMBINE LOGGING INC. RIGGED UP ON
03/19/2014 MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS CHROMATOGRAPH
UNIT #0315

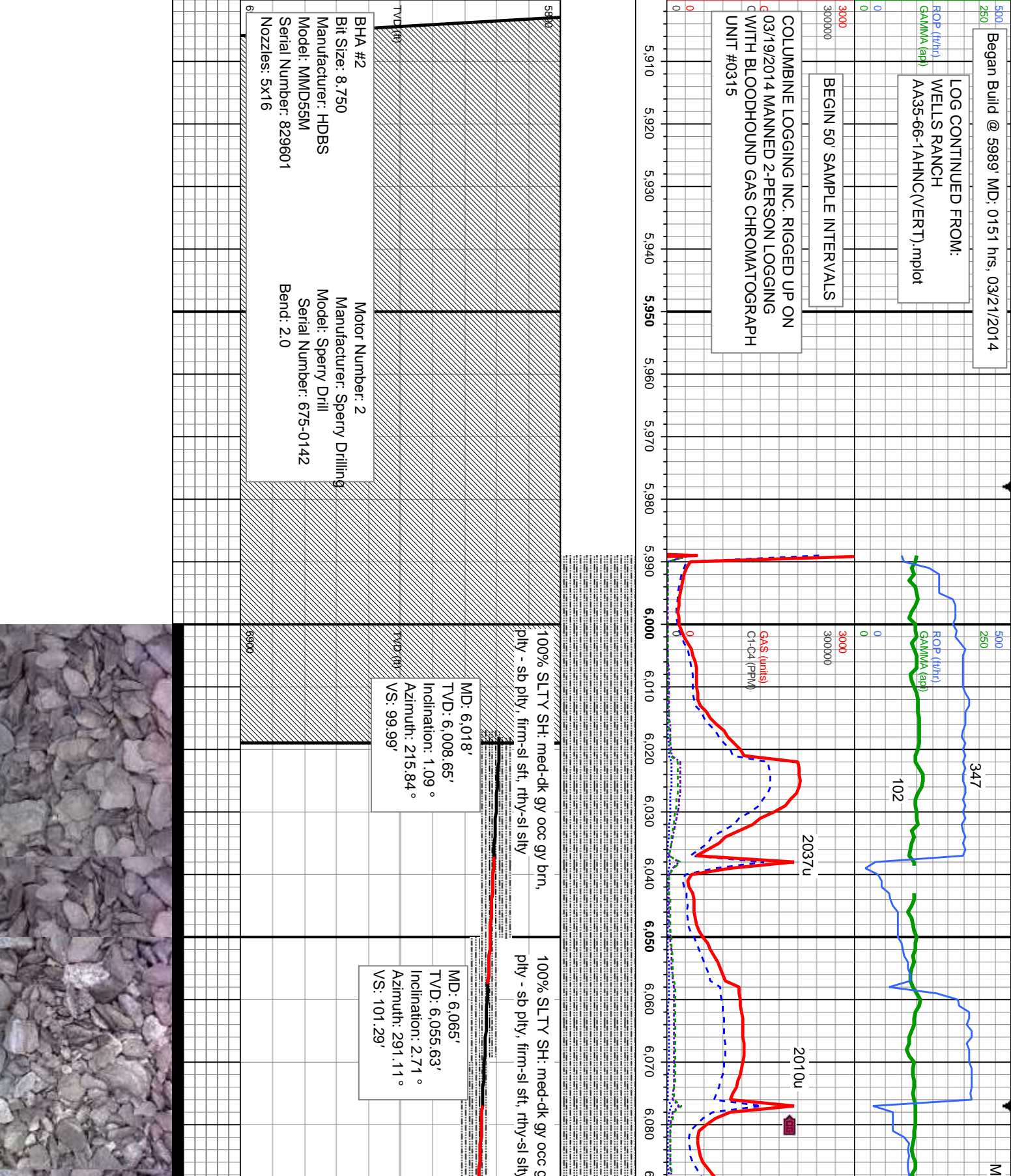
Depth Labels

% Lith

Well Bore
TVD

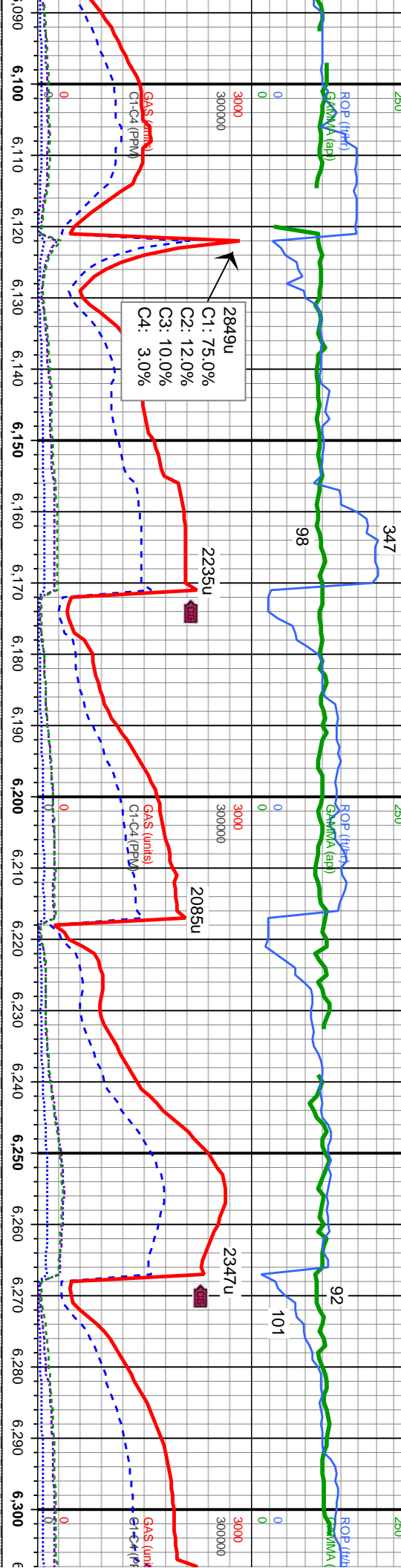
Oil Show

Images



UD WT 9.5 VIS 35

MUD WT 9.9+ VIS 38



5	100% SLTY SH: med-dk gy occ gy brn, pty - sb pty, firm-slt, rthy-slt	90% SLTY SH: m-dk gy occ gy brn, pty - sb pty, firm-slt, rthy-slt	5	85% SLTY SH: m-dk gy occ gy brn, pty - sb pty, firm-slt, rthy-slt	90% SLTY SH: m-dk gy occ gy brn, pty - sb pty, firm-slt, rthy-slt	95% S	5% SH
ply, brn,			ply, brn,			ply, fir	

MD: 6,113'
TVD: 6,103.48'
Inclination: 6.06 °
Azimuth: 295.76 °
VS: 104.59'

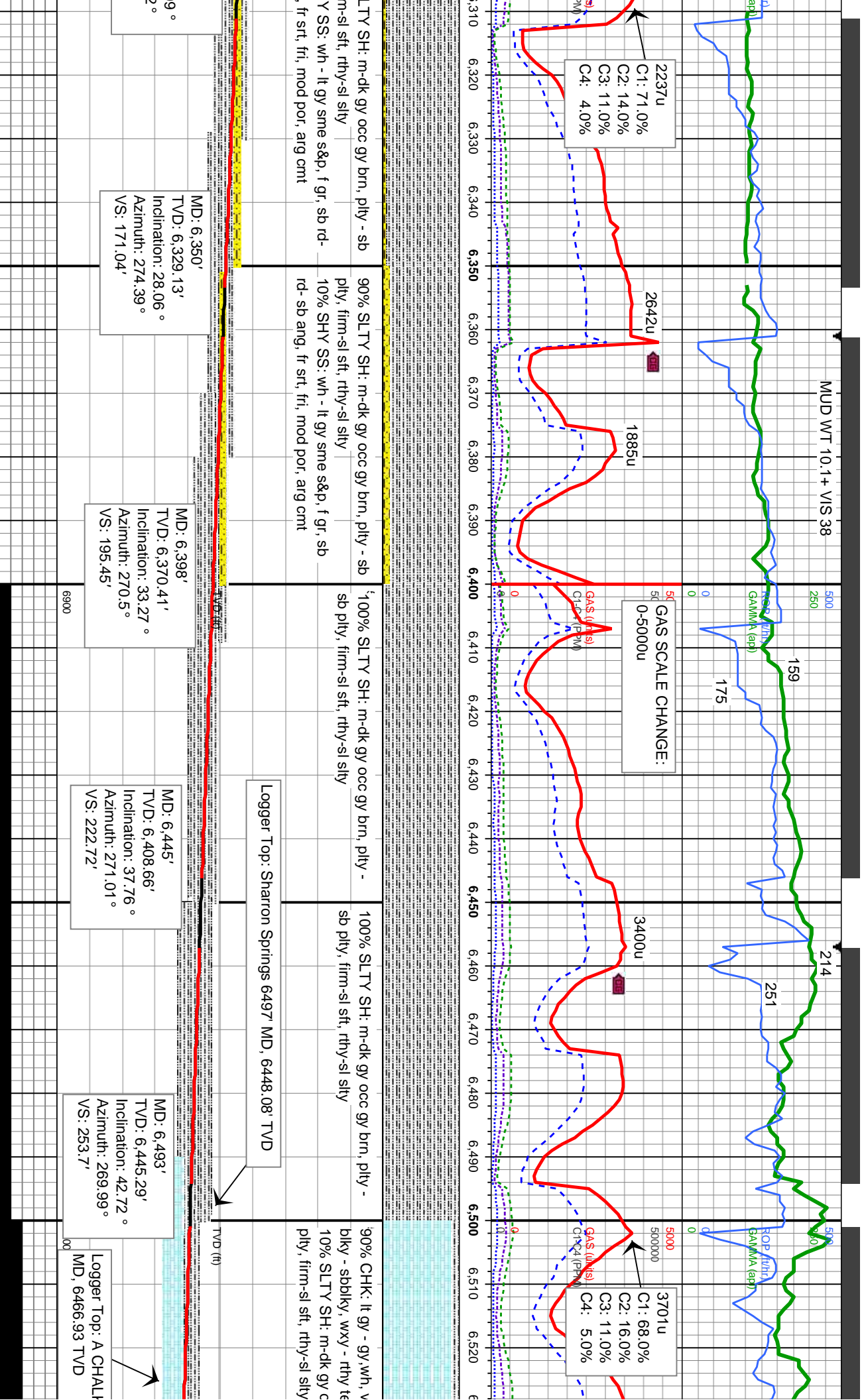
MD: 6,160'
TVD: 6,150.08'
Inclination: 8.97 °
Azimuth: 275.33 °
VS: 110.43'

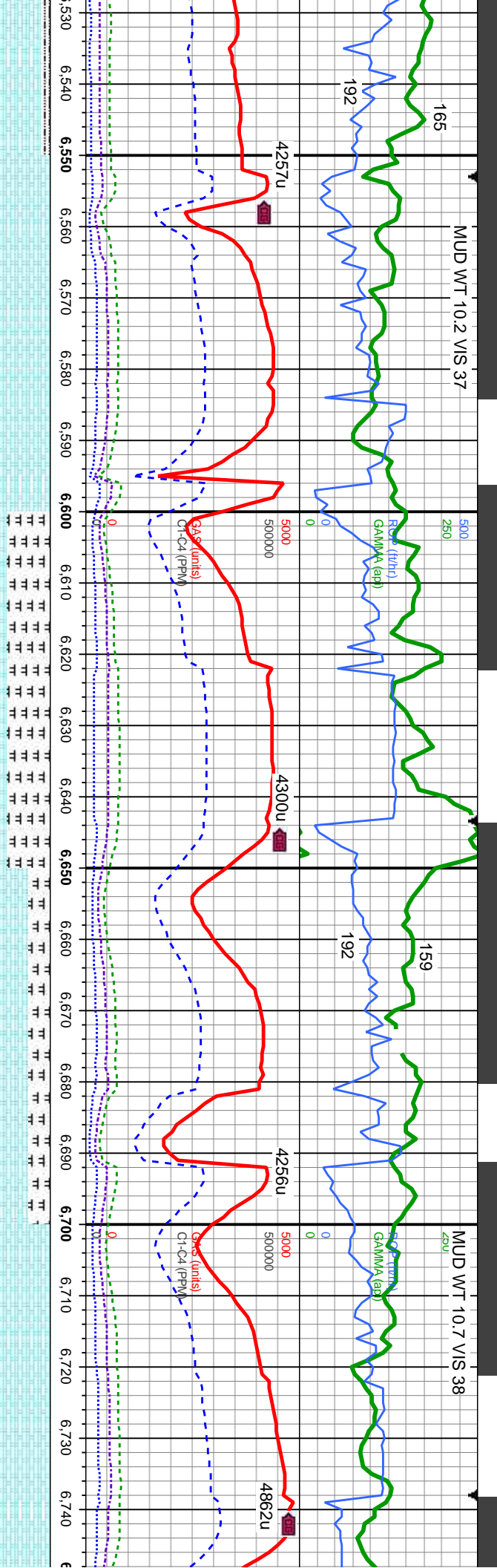
MD: 6,208'
TVD: 6,197.14'
Inclination: 13.7 °
Azimuth: 264.4 °
VS: 119.82'

MD: 6,255'
TVD: 6,242.24'
Inclination: 18.87 °
Azimuth: 267.61 °
VS: 132.98'

MD: 6,303'
TVD: 6,286.91'
Inclination: 23.9 °
Azimuth: 271.8 °
VS: 150.5'







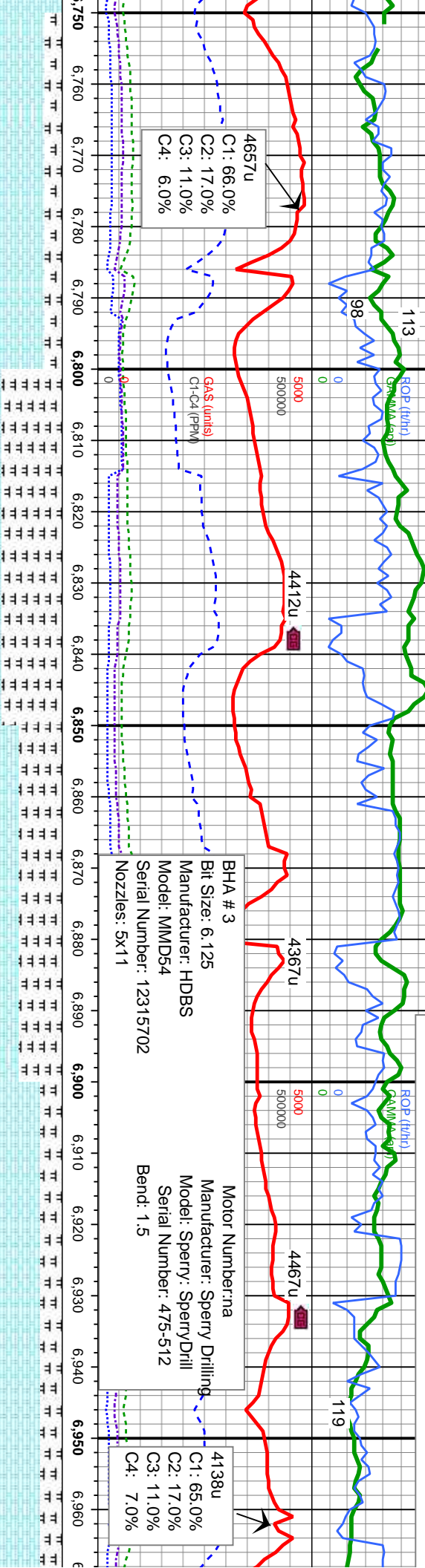
st - sft, occ firm,	100% CHK: lt gy - gy, wh, v sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex	50% CHK: lt gy - gy, wh, v sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex 50% MRL: med -gy, mod sft-sl firm, sbbkly-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc	75% CHK: lt gy - gy, wh, v sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex 25% MRL: med -gy, mod sft-sl firm, sbbkly-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc	100% CHK: lt gy - dk gy, occ lt brn, mod sft - sft, occ firm, blkly - sbbkly, wxy - rthy tex, v calc
occ gy brn, ply - sb				
MD: 6,540' TVD: 6,478.1' Inclination: 48.68 ° Azimuth: 269.12 ° VS: 287.31'	MD: 6,588' TVD: 6,508.17' Inclination: 53.69 ° Azimuth: 268.62 ° VS: 324.7'	MD: 6,635' TVD: 6,535.24' Inclination: 55.99 ° Azimuth: 271.77 ° VS: 363.1'	MD: 6,683' TVD: 6,560.54' Inclination: 60.38 ° Azimuth: 272.13 ° VS: 403.8'	MD: 6,730' TVD: 6,582.22' Inclination: 64.67 ° Azimuth: 271.67 ° VS: 445.41'
Logger Top: A MARL 6608' MD, 6519.69 TVD	Logger Top: B CHALK 6670' MD, 6553.68' TVD	Logger Top: B MARL 6756'		



500 MUD WT 10.7 VIS 38

500
250

TOOH for 7" Casing @ 6981' 1024 hrs 03/21/14. Resumed Drilling 1921



4657u
C1: 66.0%
C2: 17.0%
C3: 11.0%
C4: 6.0%

BHA # 3
Bit Size: 6.125
Manufacturer: HDBS
Model: MMD54
Serial Number: 12315702
Nozzles: 5x11

Motor Number: na
Manufacturer: Sperry Drilling
Model: Sperry SperryDrill
Serial Number: 475-512
Bend: 1.5

4138u
C1: 65.0%
C2: 17.0%
C3: 11.0%
C4: 7.0%

MD: 6.777'
TVD: 6.601.05'
Inclination: 68.1 °
Azimuth: 270.76 °
VS: 488.42'

MD: 6.824'
TVD: 6.617.34'
Inclination: 71.33 °
Azimuth: 270.6 °
VS: 532.46'

MD: 6.872'
TVD: 6.630.99'
Inclination: 75.61 °
Azimuth: 269.64 °
VS: 578.46'

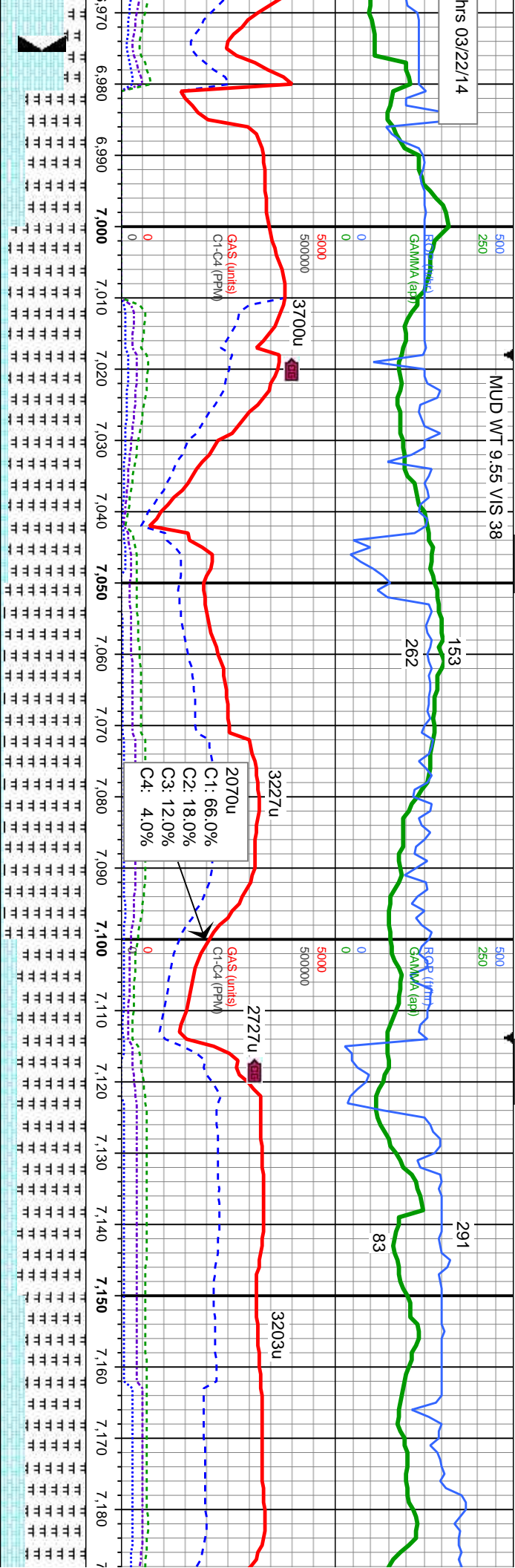
MD: 6.925'
TVD: 6.641.31'
Inclination: 81.93 °
Azimuth: 268.82 °
VS: 630.41'

80% CHK: lt gy - gy,wh, v sft - sft, occ firm, biky - sbbiky, wxy - rthy tex 20% MRL: med -gy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc	70% MRL: med -gy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 30% CHK: lt gy - gy,wh, v sft - sft, occ firm, biky - sbbiky, wxy - rthy tex	50% CHK: lt gy - gy,wh, v sft - sft, occ firm, biky - sbbiky, wxy - rthy tex 50% MRL: med -gy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, abnt calc frag	75% CHK: lt gy - gy,wh, v sft - sft, occ firm, biky - sbbiky, wxy - rthy tex 25% MRL: med -gy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, abnt calc frag	75% CHK: lt gy - gy,wh, v sft - sft, occ firm, biky - sbbiky, wxy - rthy tex 25% MRL: med -gy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc, abnt calc frag
MD: 6.777' TVD: 6.601.05' Inclination: 68.1 ° Azimuth: 270.76 ° VS: 488.42'	MD: 6.824' TVD: 6.617.34' Inclination: 71.33 ° Azimuth: 270.6 ° VS: 532.46'	MD: 6.872' TVD: 6.630.99' Inclination: 75.61 ° Azimuth: 269.64 ° VS: 578.46'	MD: 6.925' TVD: 6.641.31' Inclination: 81.93 ° Azimuth: 268.82 ° VS: 630.41'	
MD, 6594.99 TVD	6900	Logger Top: C CHALK 6880 MD, 6632.35 TVD	300	



hts 03/22/14

MUD WT 9.55 VIS 38



- gy, wh, v sft - sft, occ firm,
xy - rthy tex
-gy, mod sft-sl firm,
rthy-sly tex, sl mot, occ sl
bnt calc frag

5800 90% MRL: med -gy, mod sft-sl firm, sb
bly-sb pily, rthy-sly tex, sl mot, occ sl
vit lstr, v calc, abnt calc frag
10% CHK: lt gy - gy,wh, v sft - sft, occ
firm, bly - sb bly, wxy - rthy tex

95% MRL: med -gy, mod sft-sl firm, sb
bly-sb pily, rthy-sly tex, sl mot, occ sl vit
lstr, v calc, abnt calc frag
5% CHK: lt gy - gy,wh, v sft - sft, occ firm,
bly - sb bly, wxy - rthy tex

5800 80% MRL: med -gy, mod sft-sl firm, sb
bly-sb pily, rthy-sly tex, sl mot, occ sl vit
lstr, v calc, abnt calc frag
20% CHK: lt gy - gy,wh, v sft - sft, occ firm,
bly - sb bly, wxy - rthy tex

70% MRL: med -gy, mod sft-sl firm
bly-sb pily, rthy-sly tex, sl mot, c
lstr, v calc, abnt calc frag
30% CHK: lt gy - gy,wh, v sft - sft,
bly - sb bly, wxy - rthy tex

TVD (ft)

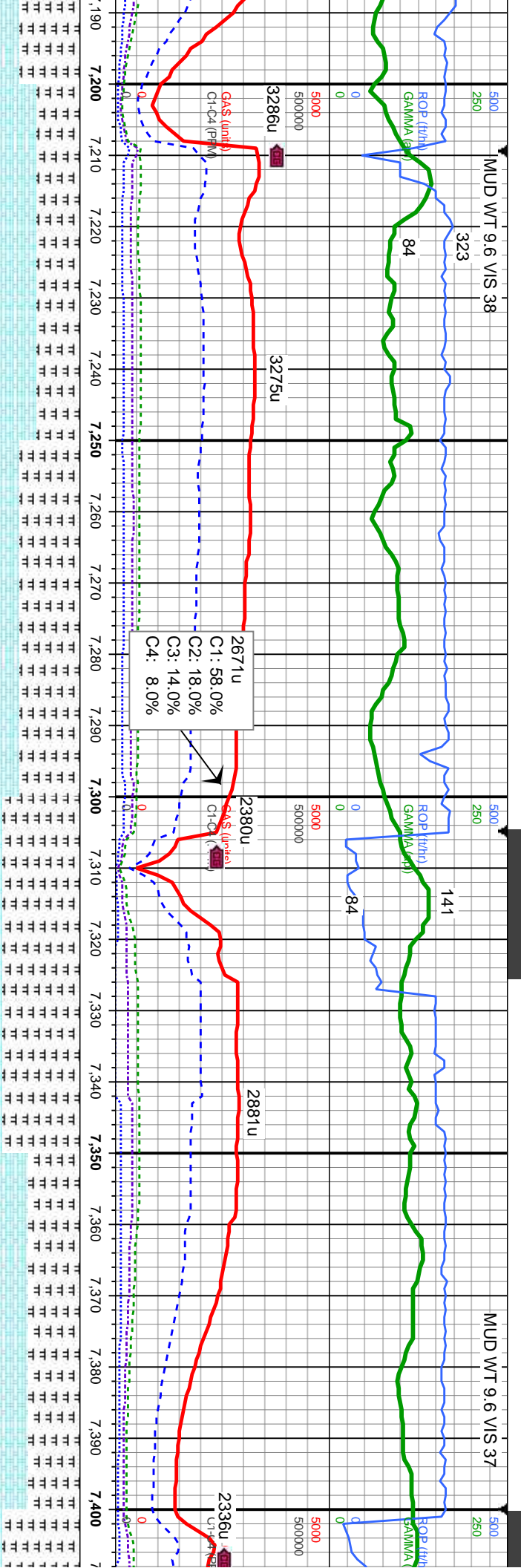
TVD (ft)

MD: 7,144'
TVD: 6,663.81'
Inclination: 86.27 °
Azimuth: 269.83 °
VS: 848.17'

6900

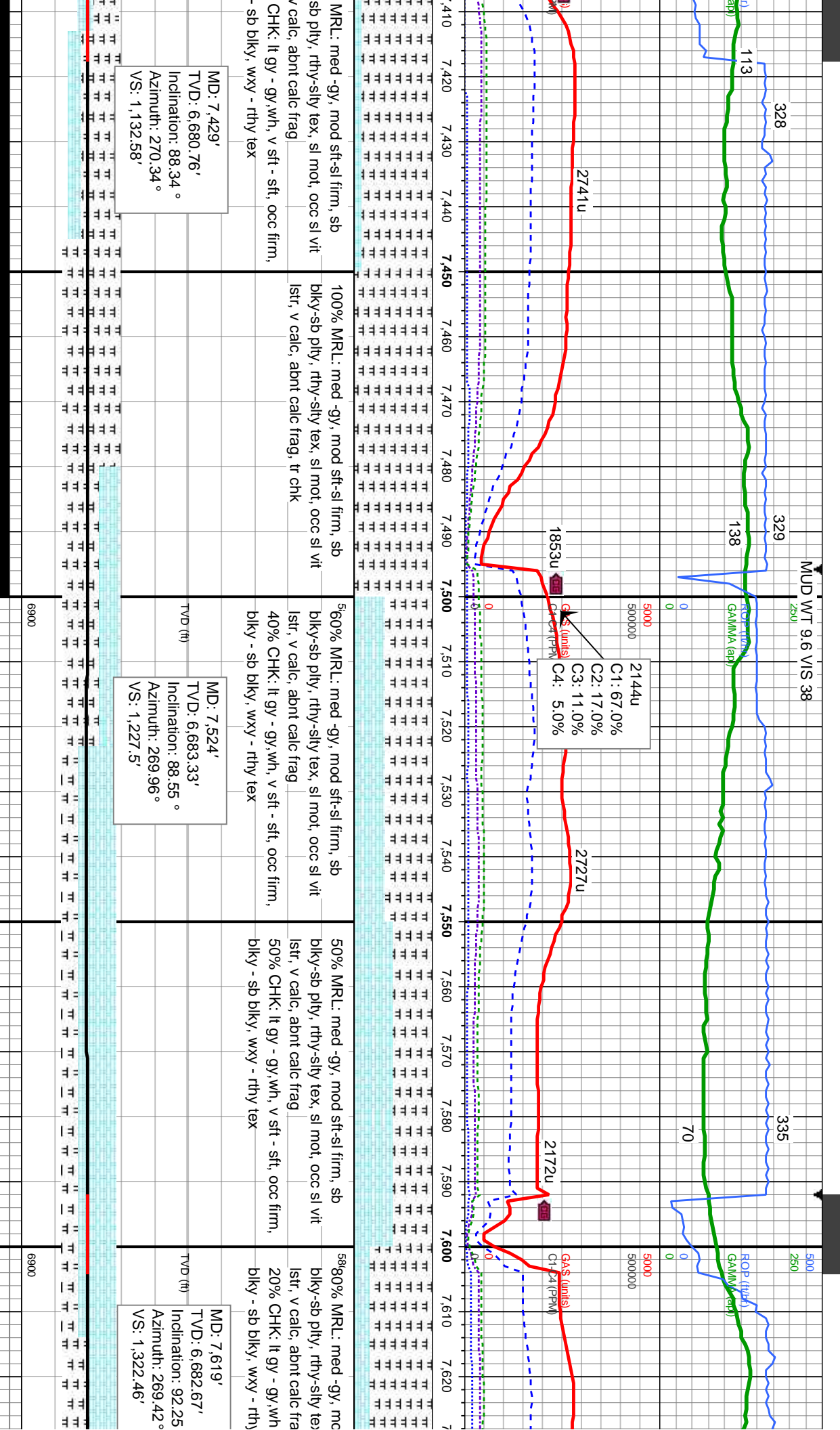
6900





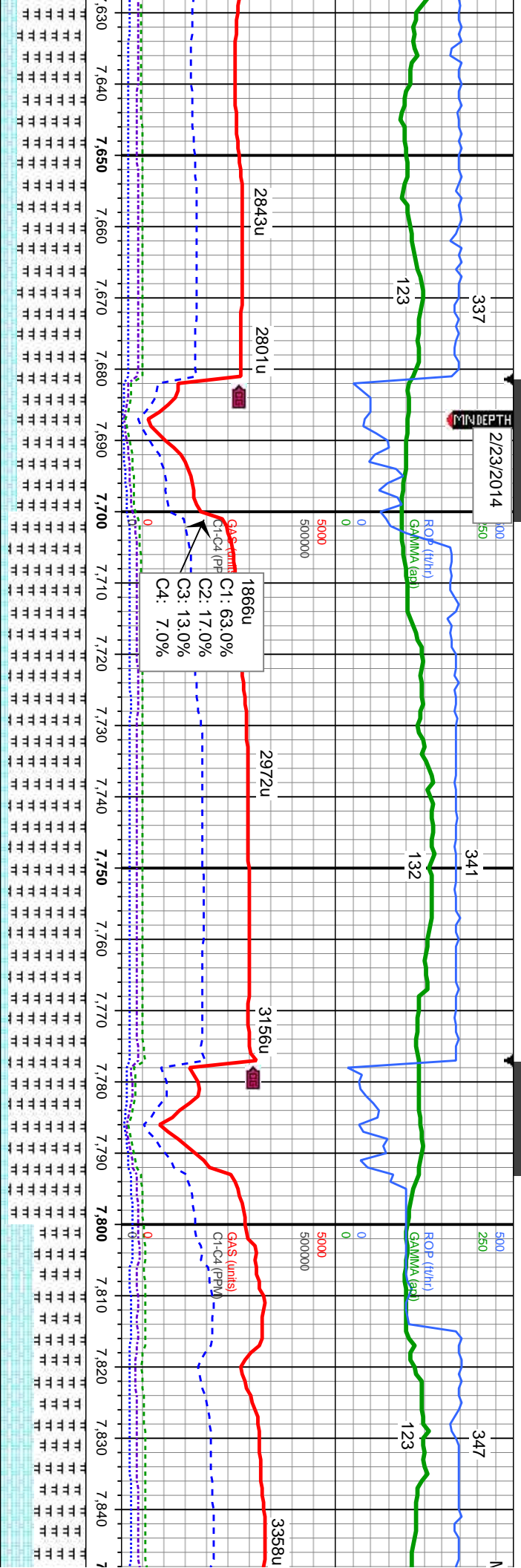
n, sb occ sl vit occ firm,	58% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsit, v calc, abnt calc frag 50% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	70% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsit, v calc, abnt calc frag 30% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	58% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsit, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	60% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsit, v calc, abnt calc frag 40% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	58% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsit, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex
	TVD (ft) MD: 7,239' TVD: 6,670.67' Inclination: 85.46 ° Azimuth: 268.97° VS: 942.91'	TVD (ft) MD: 7,334' TVD: 6,676.9' Inclination: 87.01 ° Azimuth: 269.52° VS: 1,037.69'	TVD (ft)	TVD (ft)	TVD (ft)





2/23/2014

MINDEPTH

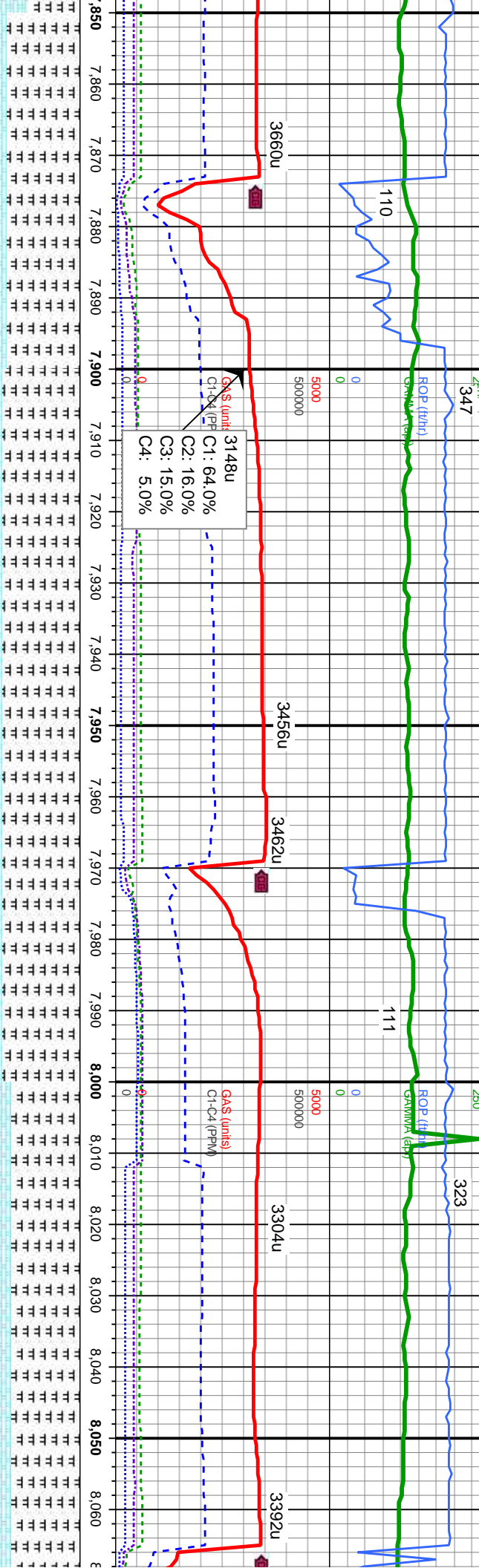


80% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsr, v calc, abnt calc frag 20% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	580% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsr, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	90% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsr, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	5860% MRL: med -gy, mod sft-sl firm, sb blky-sb pily, rthy-sily tex, sl mot, occ sl vit lsr, v calc, abnt calc frag 40% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex
MD: 7,713' TVD: 6,679.92' Inclination: 91.11 ° Azimuth: 269.78 ° VS: 1,416.4'			MD: 7,808' TVD: 6,681.19' Inclination: 87.35 ° Azimuth: 267.6 ° VS: 1,511.36'

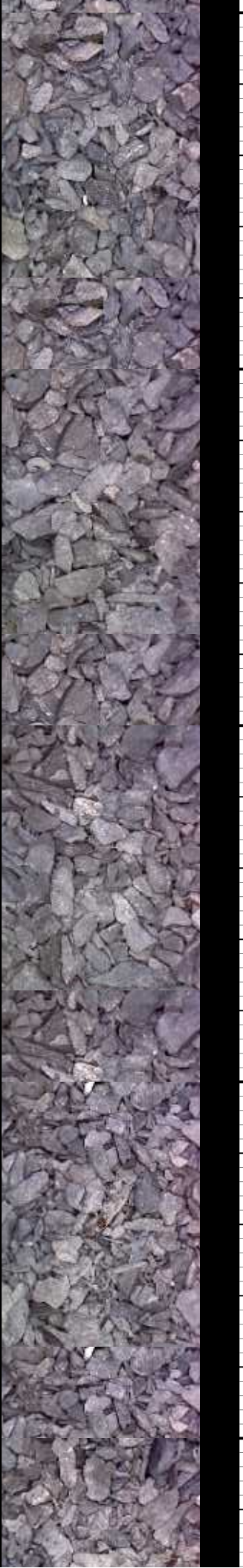
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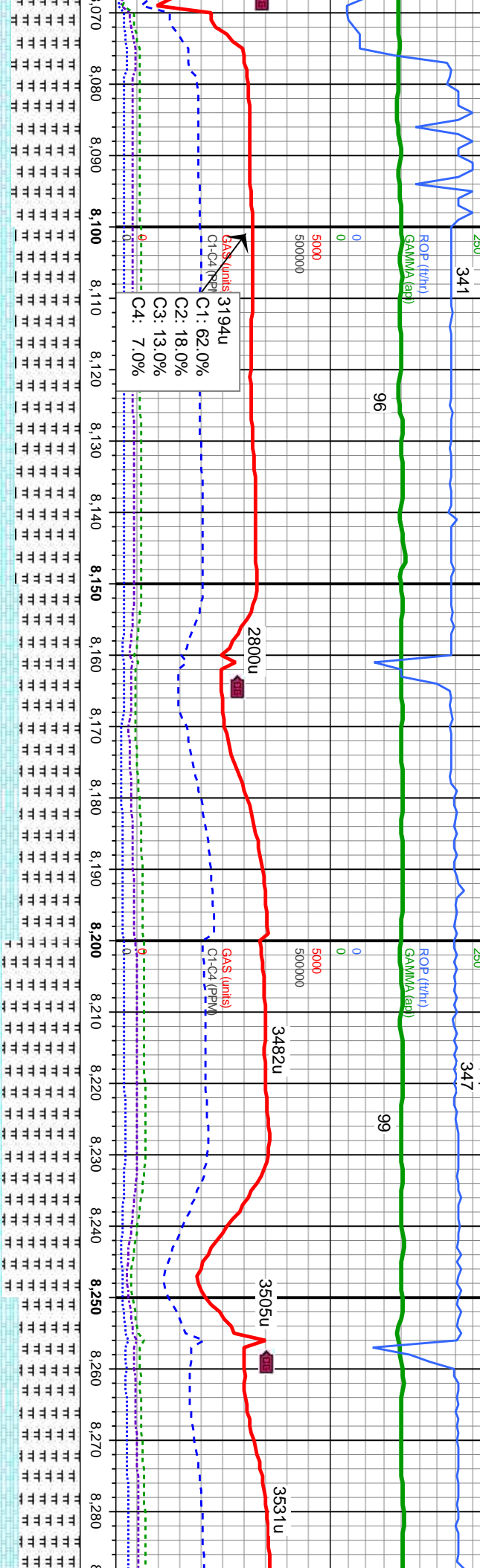
6900





85% MRL: med -gy, mod sft-sl firm, sb blky-sb ply, rthy-slty tex, sl mot, occ sl vit lsfr, v calc, abnt calc frag 15% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	58% 90% MRL: med -gy, mod sft-sl firm, sb blky-sb ply, rthy-slty tex, sl mot, occ sl vit lsfr, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	90% MRL: med -gy, mod sft-sl firm, sb blky-sb ply, rthy-slty tex, sl mot, occ sl vit lsfr, v calc, abnt calc frag 10% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	58% 80% MRL: med -gy, mod sft-sl firm, sb blky-sb ply, rthy-slty tex, sl mot, occ sl vit lsfr, v calc, abnt calc frag 20% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex	80% MRL: med -gy, mod sft-sl firm, sb blky-sb ply, rthy-slty tex, sl mot, occ sl vit lsfr, v calc, abnt calc frag 20% CHK: lt gy - gy,wh, v sft - sft, occ firm, blky - sb blky, wxy - rthy tex
MD: 7,903' TVD: 6,682.98' Inclination: 90.49° Azimuth: 267.65° VS: 1,606.33'		MD: 7,998' TVD: 6,682.53' Inclination: 90.06° Azimuth: 267.73° VS: 1,701.32'		
6900	6900	6900	6900	6900



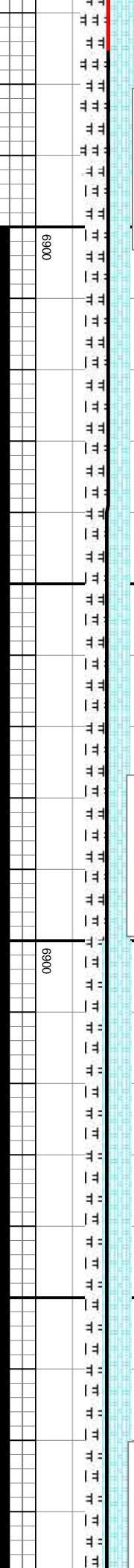


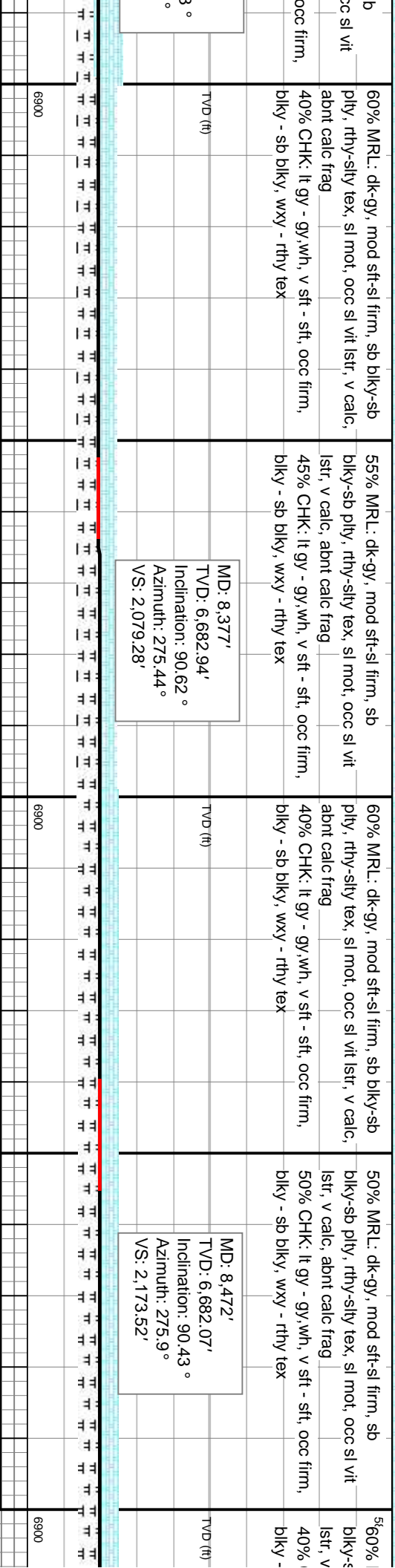
d - gy, mod sft-si firm, sb	75% MRL: dk gy, mod sft-si firm, sb blk-y-sb	70% MRL: dk-gy, mod sft-si firm, sb blk-y-sb	90% MRL: dk-gy, mod sft-si firm, sb blk-y-sb	70% MRL: dk-gy, mod sft-si firm, s
ply, rthy-sily tex, sl mot, occ si vit	ply, rthy-sily tex, sl mot, occ si vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ si vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ si vit lstr, v calc,	blk-y-sb ply, rthy-sily tex, sl mot, occ
abt calc frag	abt calc frag	abt calc frag	abt calc frag	lstr, v calc, abnt calc frag
- gy, wh, v sft - sft, occ firm,	25% CHK: lt gy - gy, wh, v sft - sft, occ firm,	30% CHK: lt gy - gy, wh, v sft - sft, occ firm,	10% CHK: lt gy - gy, wh, v sft - sft, occ firm,	30% CHK: lt gy - gy, wh, v sft - sft,
wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex

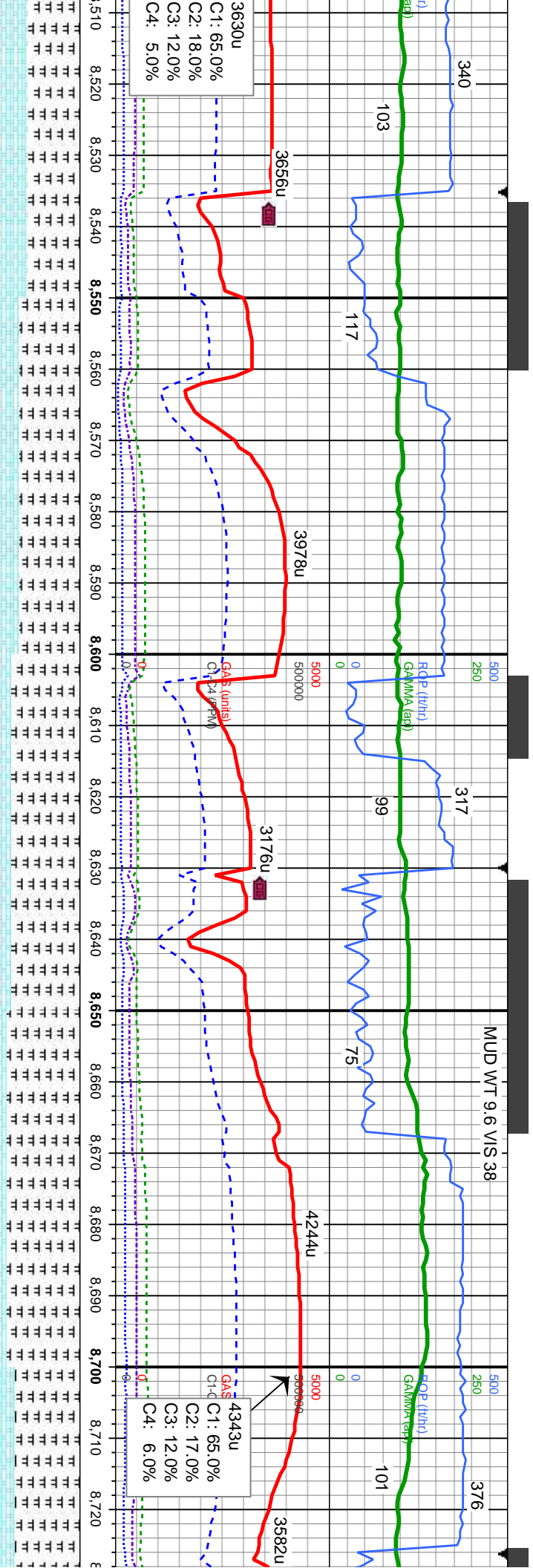
MD: 8,093'
TVD: 6,682.76'
Inclination: 89.66°
Azimuth: 268.83°
VS: 1,796.31'

MD: 8,188'
TVD: 6,683.27'
Inclination: 89.72°
Azimuth: 271.45°
VS: 1,891.26'

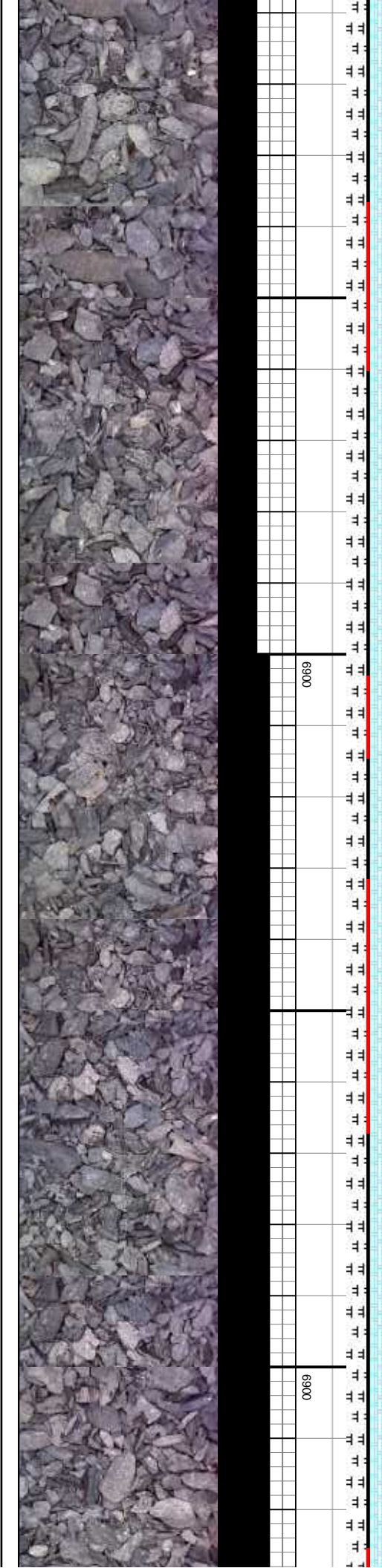
MD: 8,282'
TVD: 6,683.48'
Inclination: 90.0°
Azimuth: 274.86°
VS: 1,984.93'

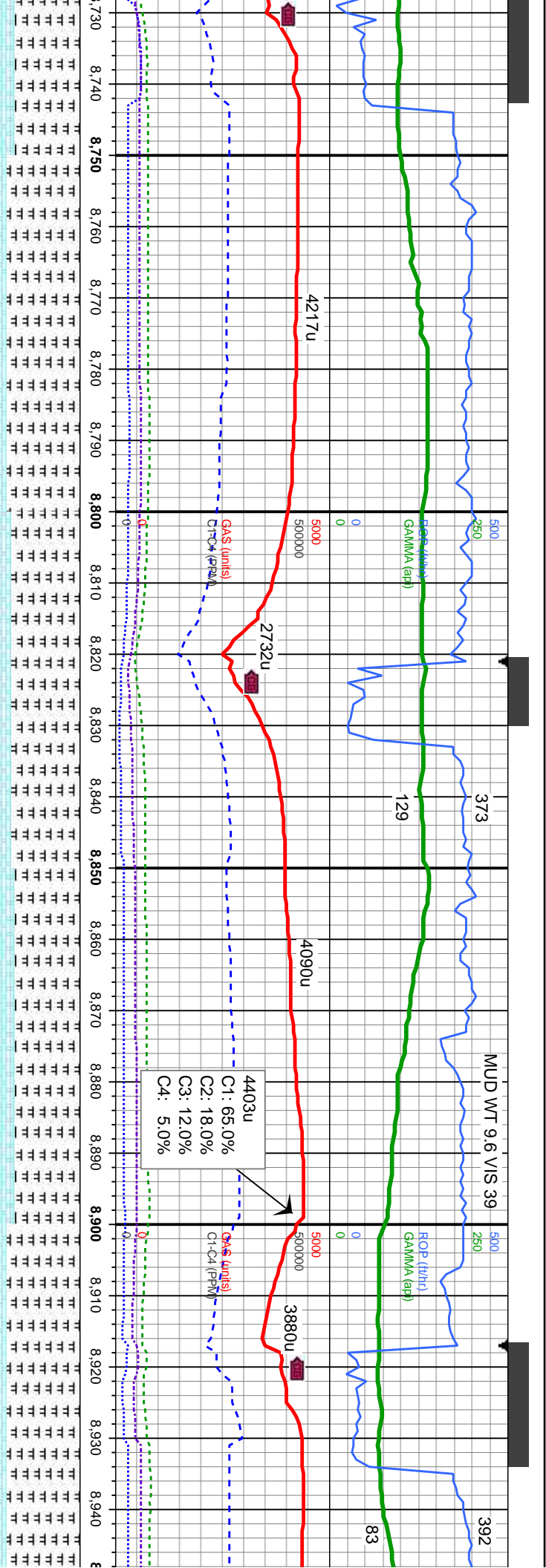






MRL: dk-gy, mod sft-sl firm, sb pty, rthy-sily tex, sl mot, occ sl vit calc, abnt calc frag	70% MRL: dk-gy, mod sft-sl firm, sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag	580% MRL: dk-gy, mod sft-sl firm, sb blkly-sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag	85% MRL: dk-gy, mod sft-sl firm, sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag	75% MRL: dk-gy, mod sft pty, rthy-sily tex, sl mot, c abnt calc frag
CHK: lt gy - gy,wh, v sft - sft, occ firm, sb blkly, wxy - rthy tex	30% CHK: lt gy - gy,wh, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	20% CHK: lt gy - gy,wh, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	15% CHK: lt gy - gy,wh, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	25% CHK: lt gy - gy,wh, v blkly - sb blkly, wxy - rthy
MD: 8.567' TVD: 6,681.51' Inclination: 90.25 ° Azimuth: 274.13 ° VS: 2,267.89'				
TVD (ft)				
6900				
6900				



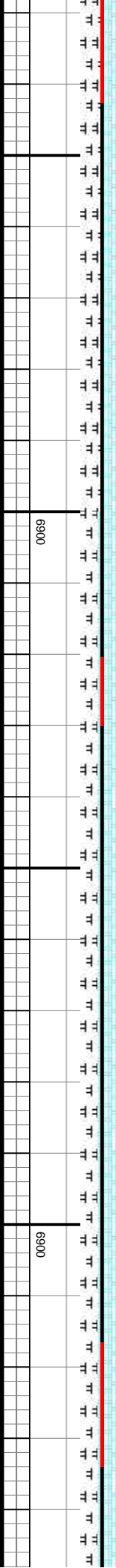


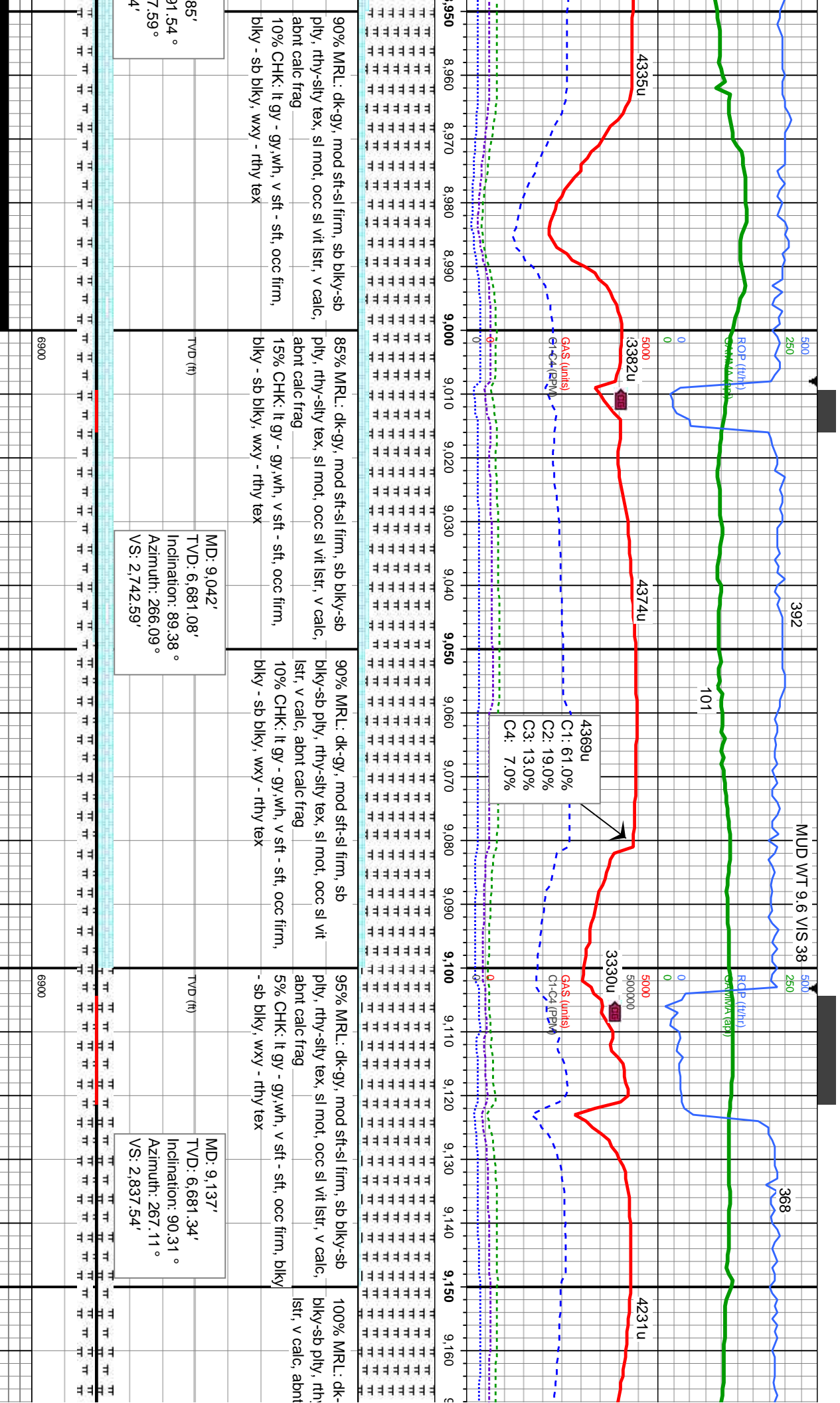
sl firm, sb blk-y-sb	85% MRL: dk-gy, mod sft-sl firm, sb	80% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb	75% MRL: dk-gy, mod sft-sl firm, sb	85% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb
occ sl vit lstr, v calc,	blk-y-sb pty, rthy-sily tex, sl mot, occ sl vit	pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	blk-y-sb pty, rthy-sily tex, sl mot, occ sl vit	pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc,
sft - sft, occ firm,	15% CHK: lt gy - gy,wh, v sft - sft, occ firm,	20% CHK: lt gy - gy,wh, v sft - sft, occ firm,	25% CHK: lt gy - gy,wh, v sft - sft, occ firm,	15% CHK: lt gy - gy,wh, v sft - sft, occ firm,
tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex	blk-y - sb blk-y, wxy - rthy tex

MD: 8,757'
TVD: 6,682.03'
Inclination: 91.02 °
Azimuth: 268.74 °
VS: 2,457.69'

MD: 8,852'
TVD: 6,682.15'
Inclination: 88.83 °
Azimuth: 266.77 °
VS: 2,552.67'

MD: 8,947'
TVD: 6,681.
Inclination: 8
Azimuth: 26
VS: 2,647.6





90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb
ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,
abt calc frag
10% CHK: lt gy - gy,wh, v sft - sft, occ firm,
blkly - sb blkly, wxy - rthy tex

85% MRL: dk-gy, mod sft-sl firm, sb blkly-sb
ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,
abt calc frag
15% CHK: lt gy - gy,wh, v sft - sft, occ firm,
blkly - sb blkly, wxy - rthy tex

90% MRL: dk-gy, mod sft-sl firm, sb
blkly-sb ply, rthy-slty tex, sl mot, occ sl vit
lstr, v calc, abt calc frag
10% CHK: lt gy - gy,wh, v sft - sft, occ firm,
blkly - sb blkly, wxy - rthy tex

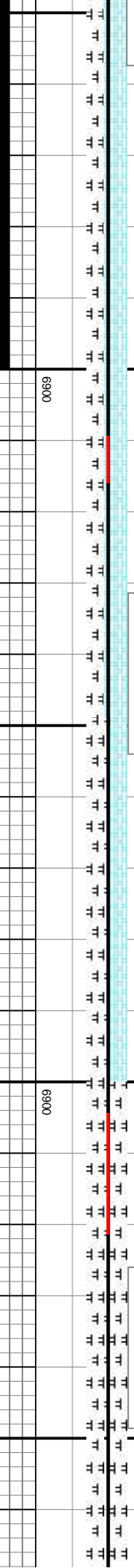
95% MRL: dk-gy, mod sft-sl firm, sb blkly-sb
ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,
abt calc frag
5% CHK: lt gy - gy,wh, v sft - sft, occ firm, blkly
- sb blkly, wxy - rthy tex

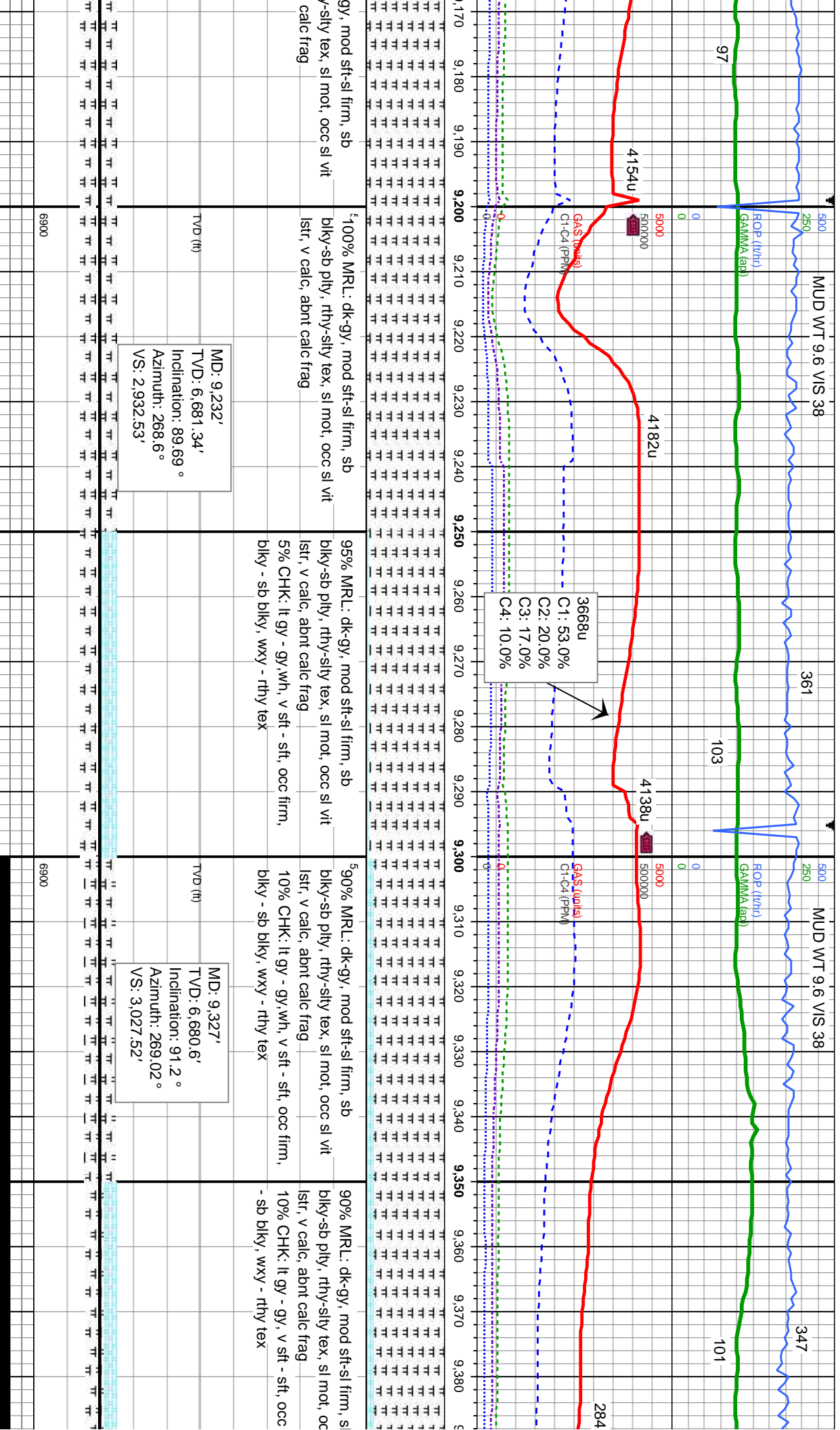
100% MRL: dk-
blkly-sb ply, rthy,
lstr, v calc, abt

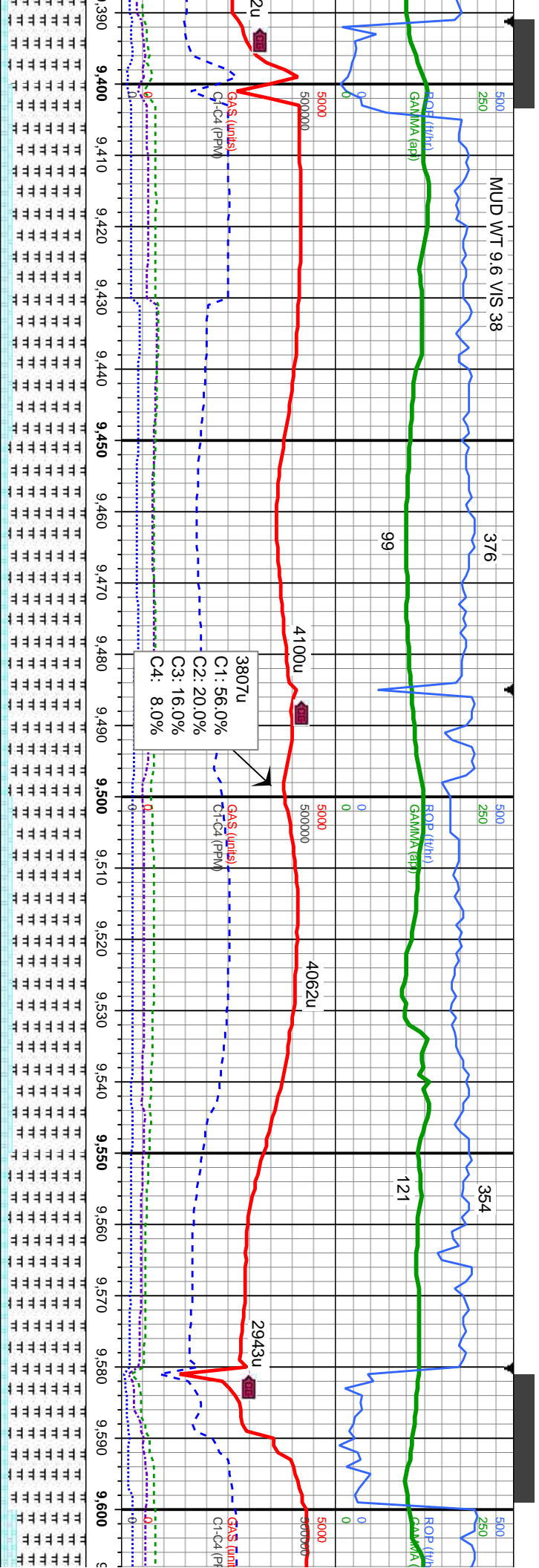
85'
81.54°
7.59°
4'

MD: 9.042'
TVD: 6.681.08'
Inclination: 89.38°
Azimuth: 266.09°
VS: 2.742.59'

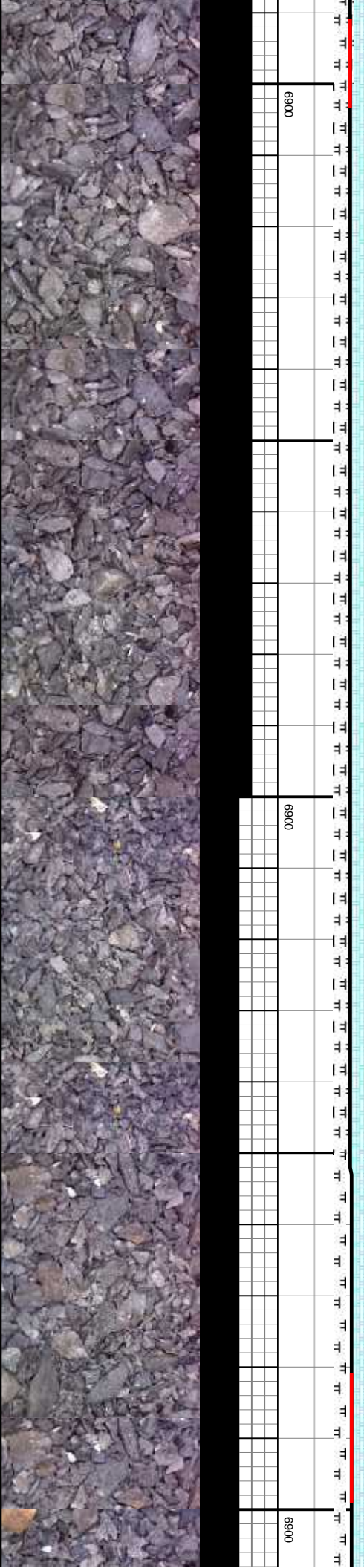
MD: 9.137'
TVD: 6.681.34'
Inclination: 90.31°
Azimuth: 267.11°
VS: 2.837.54'

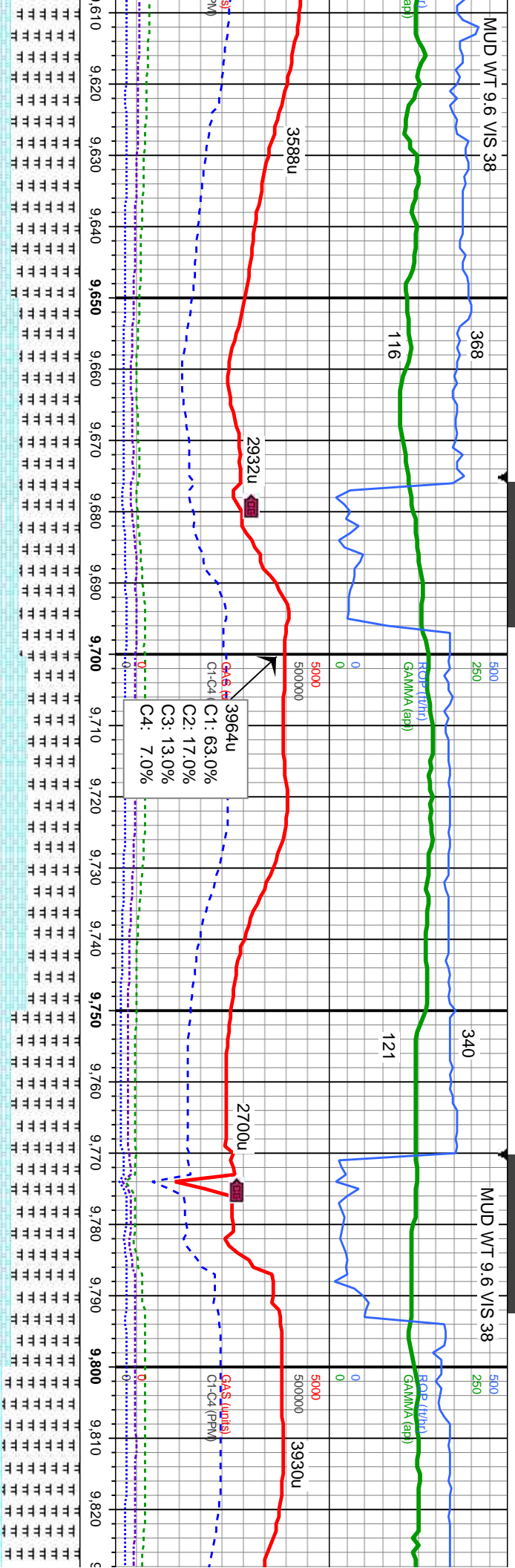






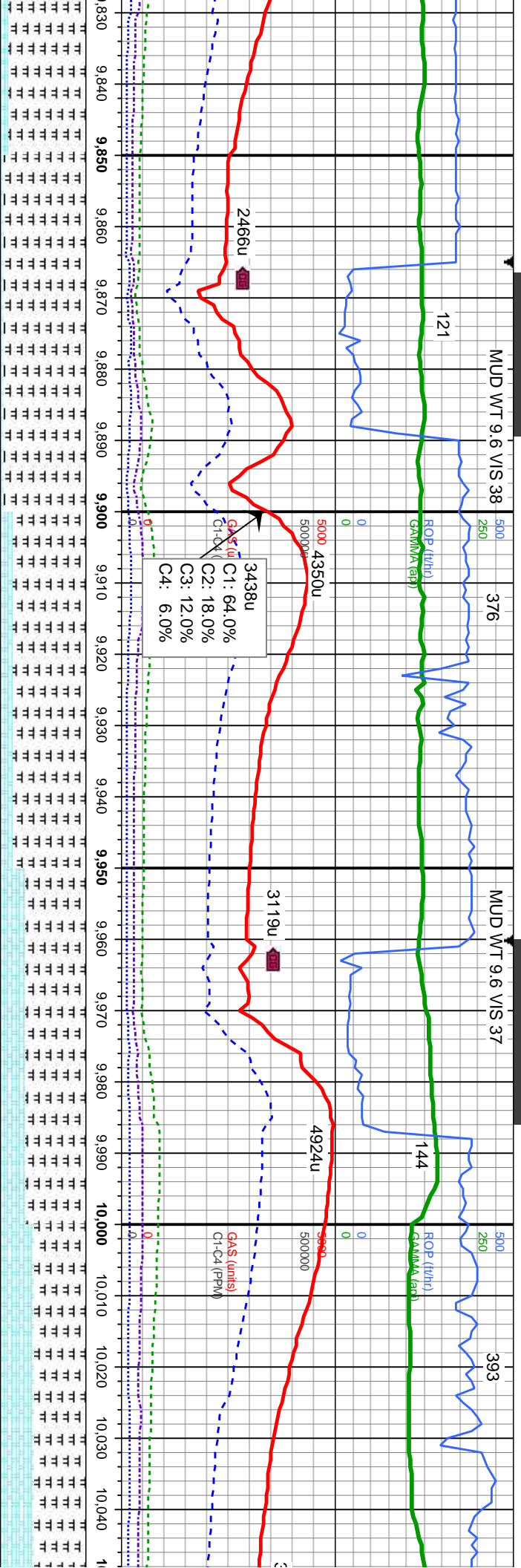
firm, blkly	85% MRL: dk-gy, mod sft-sl firm, sb blkly-sb plty, rthy-slty tex, sl mot, occ sl vit lstr, v calc, about calc frag	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb plty, rthy-slty tex, sl mot, occ sl vit lstr, v calc, about calc frag	85% MRL: dk-gy, mod sft-sl firm, sb blkly-sb plty, rthy-slty tex, sl mot, occ sl vit lstr, v calc, about calc frag	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb plty, rthy-slty tex, sl mot, occ sl vit lstr, v calc, about calc frag
	15% CHK: lt gy - gy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	10% CHK: lt gy - gy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	15% CHK: lt gy - gy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	10% CHK: lt gy - gy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex
	MD: 9,421' TVD: 6,679.74' Inclination: 89.85 ° Azimuth: 267.4° VS: 3,121.51'			
	TVD (ft)			
	6900			





MRL: dk-gy, mod sft-sl firm, sb blk-y-sb rthy-sltv tex, sl mot, occ sl vit lstr, v calc, calc frag	70% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sltv tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 30% CHK: lt gy - gy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sltv tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 40% CHK: lt gy - gy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	80% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sltv tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 20% CHK: lt gy - gy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	90% MRL: dk-gy, mod sft ply, rthy-sltv tex, sl mot, c abnt calc frag 10% CHK: lt gy - gy, v sft
611' 6,777.79' ion: 91.08 ° h: 266.1° 311.37'		MD: 9,706' TVD: 6,677.23' Inclination: 89.6 ° Azimuth: 266.47 ° VS: 3,406.3'		MD: 9,801' TVD: 6,677.56' Inclination: 90 ° Azimuth: 267.39 ° VS: 3,501.26'

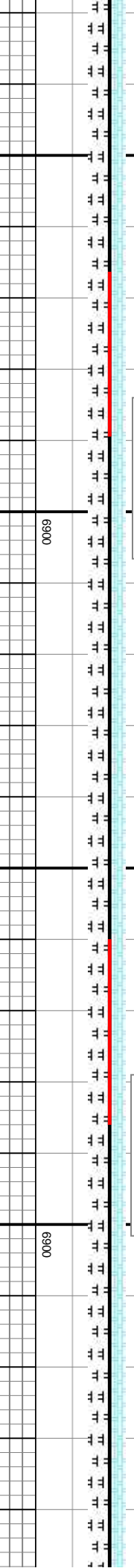


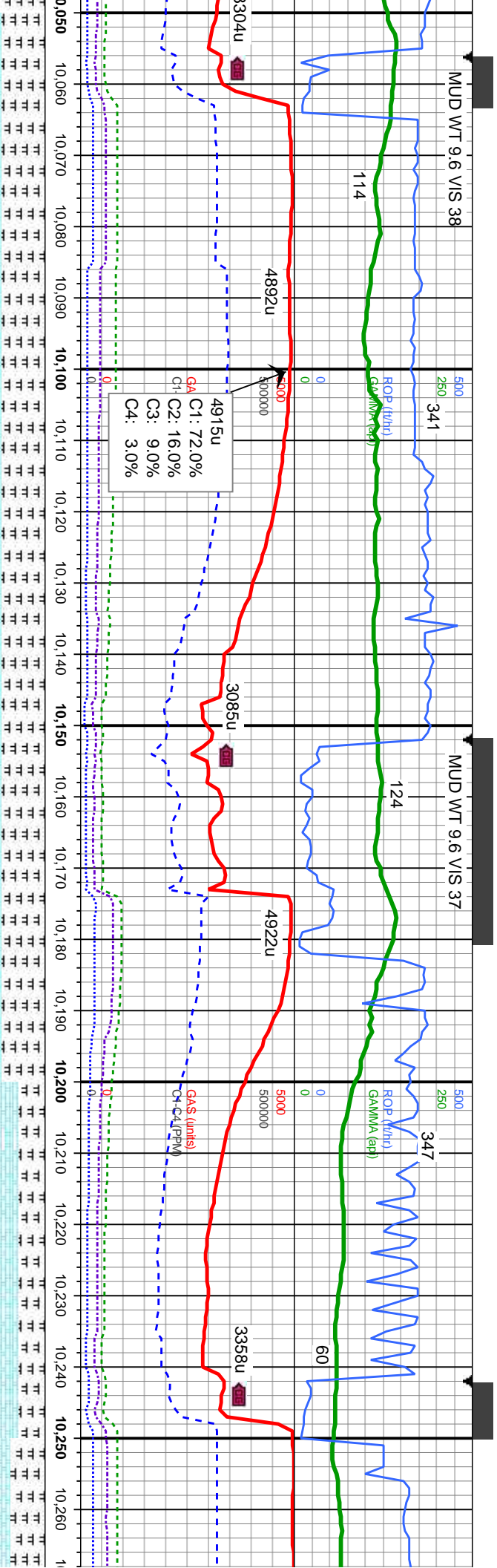


9,830	9,840	9,850	9,860	9,870	9,880	9,890	9,900	9,910	9,920	9,930	9,940	9,950	9,960	9,970	9,980	9,990	10,000	10,010	10,020	10,030	10,040
firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk	firm, sb blk
occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,	occ sl vit lstr, v calc,
- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk	- sft, occ firm, blk

MD: 9,895'
TVD: 6,677.79'
Inclination: 89.72°
Azimuth: 268.22°
VS: 3,595.25'

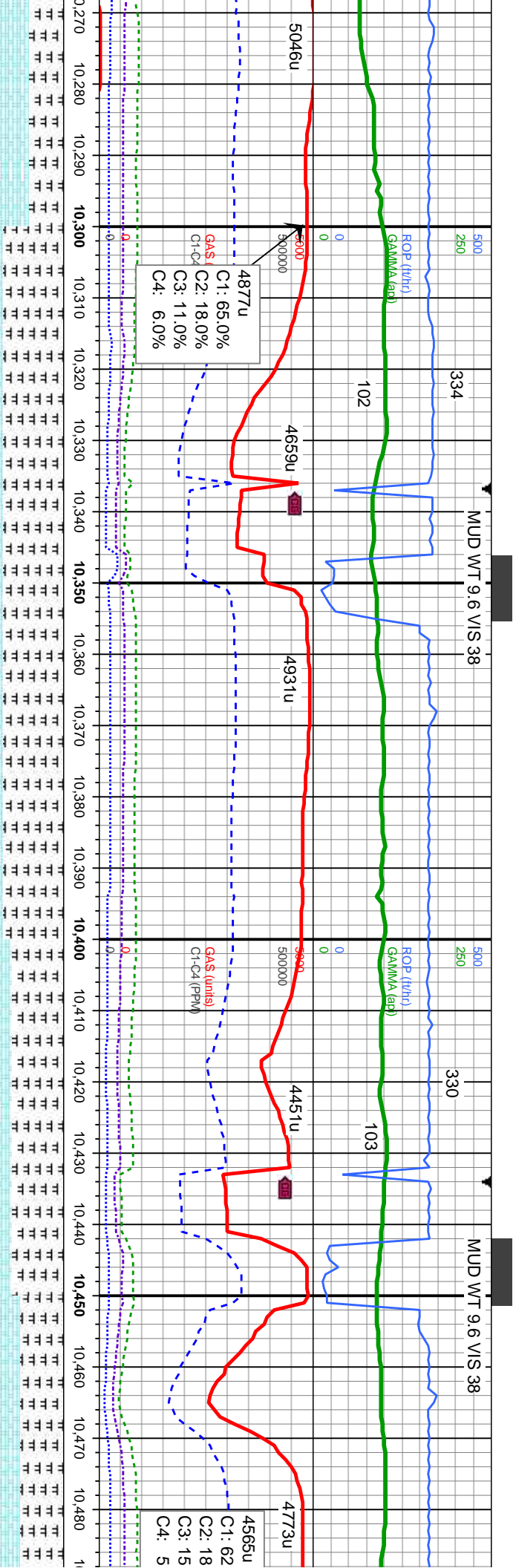
MD: 9,990'
TVD: 6,677.25'
Inclination: 90.93°
Azimuth: 269.93°
VS: 3,690.24'





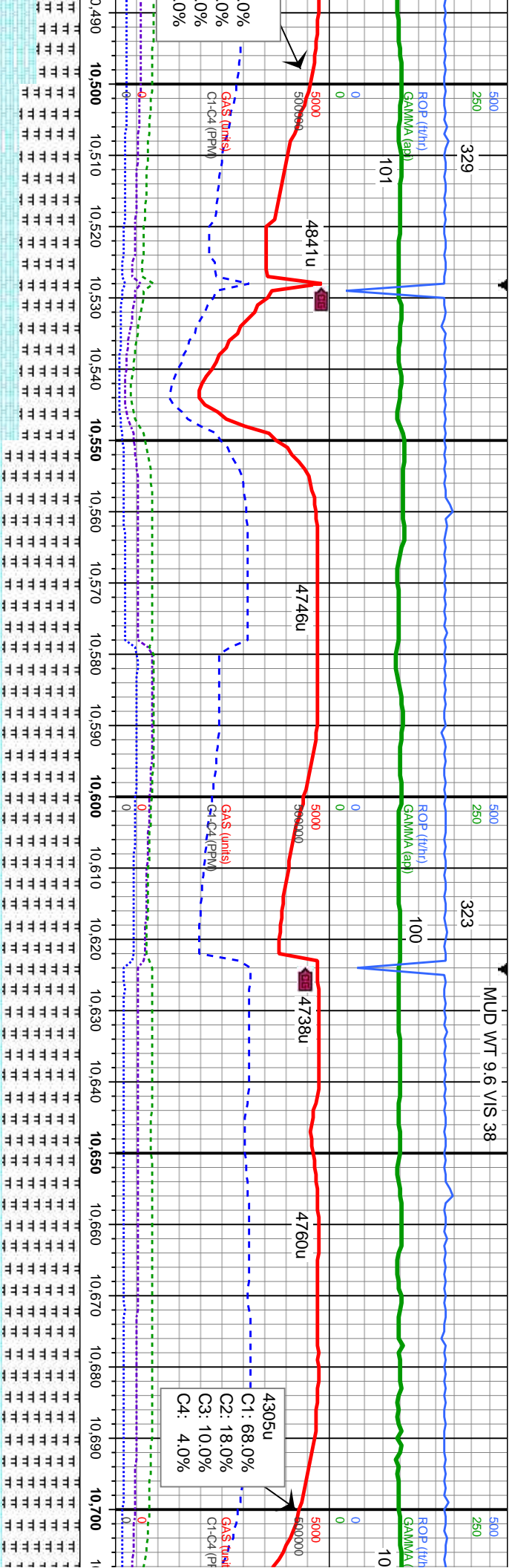
50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lsir, v calc, abnt calc frag	50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lsir, v calc, abnt calc frag	50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lsir, v calc, abnt calc frag	70% CHK: lt- v ltyg, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	60% CHK: lt- v ltyg, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex
50% CHK: lt gy - gy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	50% CHK: lt- v ltyg, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	50% CHK: lt- v ltyg, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	30% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lsir, v calc, abnt calc frag	40% MRL: dk-gy, ply, rthy-sily tex
MD: 10,085' TVD: 6,677.73' Inclination: 88.49 ° Azimuth: 267.87 ° VS: 3,765.23'	MD: 10,180' TVD: 6,677.33' Inclination: 92 ° Azimuth: 270.51 ° VS: 3,880.19'	MD: 10,180' TVD: 6,677.33' Inclination: 92 ° Azimuth: 270.51 ° VS: 3,880.19'	MD: 10,180' TVD: 6,677.33' Inclination: 92 ° Azimuth: 270.51 ° VS: 3,880.19'	MD: 10,180' TVD: 6,677.33' Inclination: 92 ° Azimuth: 270.51 ° VS: 3,880.19'
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)





70% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 30% CHK: lt-v lgy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	70% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 30% CHK: lt-v lgy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	60% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 40% CHK: lt-v lgy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex	50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc, abnt calc frag 50% CHK: lt-v lgy, v sft - sft, occ firm, blk-y - sb blk-y, wxy - rthy tex
MD: 10,275' TVD: 6,674.85' Inclination: 90.99 ° Azimuth: 270.59 ° VS: 3,975.09'	MD: 10,370' TVD: 6,675.46' Inclination: 88.27 ° Azimuth: 269.55 ° VS: 4,070.04'	MD: 10,465' TVD: 6,677.87' Inclination: 88.83 ° Azimuth: 270.51 ° VS: 4,164.98'	
6900	6900	6900	





sb blkly-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	70% MRL: dk-gy, mod sft-sl firm, sb blkly-sb abnt calc frag	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb abnt calc frag	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb abnt calc frag	90% MRL: dk-gy, mod sft-sl firm, sb blkly-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,
abnt calc frag	30% CHK: lt-v ltgy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	abnt calc frag	10% CHK: lt-v ltgy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	abnt calc frag	10% CHK: lt-v ltgy, v sft - sft, occ firm, blkly - sb blkly, wxy - rthy tex	abnt calc frag
MD: 10,560' TVD: 6,679.55' Inclination: 89.14 ° Azimuth: 269.85 ° VS: 4,259.92'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'	MD: 10,655' TVD: 6,680.69' Inclination: 89.48 ° Azimuth: 266 ° VS: 4,354.89'

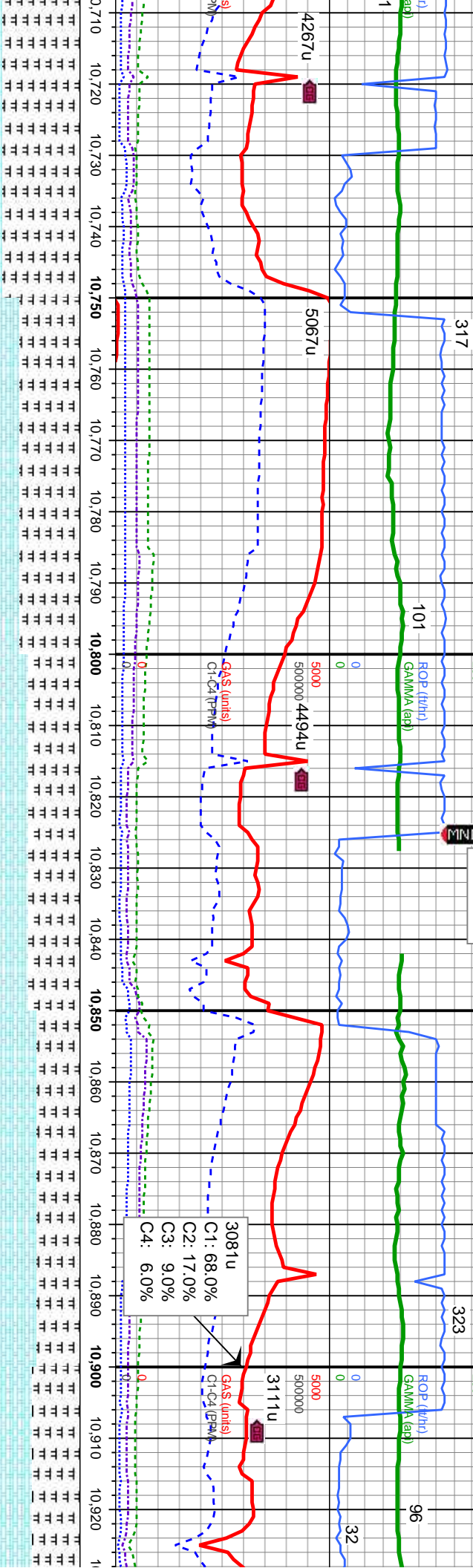


MUD WT 9.6 VIS 37

3/24/2014

MUD WT 9.6 VIS 38

MUD WT 9.6 VIS 3



dk-gy, mod sft-sl firm, sb blk-y-sb	70% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb	dk-gy, mod sft-sl firm, sb blk-y-sb	50% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb	55% MRL: dk-gy, mod sft-sl firm, sb blk-y-sb
ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc,
alc frag	abnt calc frag	abnt calc frag	abnt calc frag	abnt calc frag
lt-v ltgy, v sft - sft, occ firm, blk-y -	40% CHK: lt-v ltgy, v sft - sft, occ firm, blk-y -	40% CHK: lt-v ltgy, v sft - sft, occ firm, blk-y -	50% CHK: lt-v ltgy, v sft - sft, occ firm, blk-y -	45% CHK: lt-v ltgy, v sft - sft, occ firm, blk-y -
, wxy - rthy tex	sb blk-y, wxy - rthy tex	sb blk-y, wxy - rthy tex	sb blk-y, wxy - rthy tex	sb blk-y, wxy - rthy tex

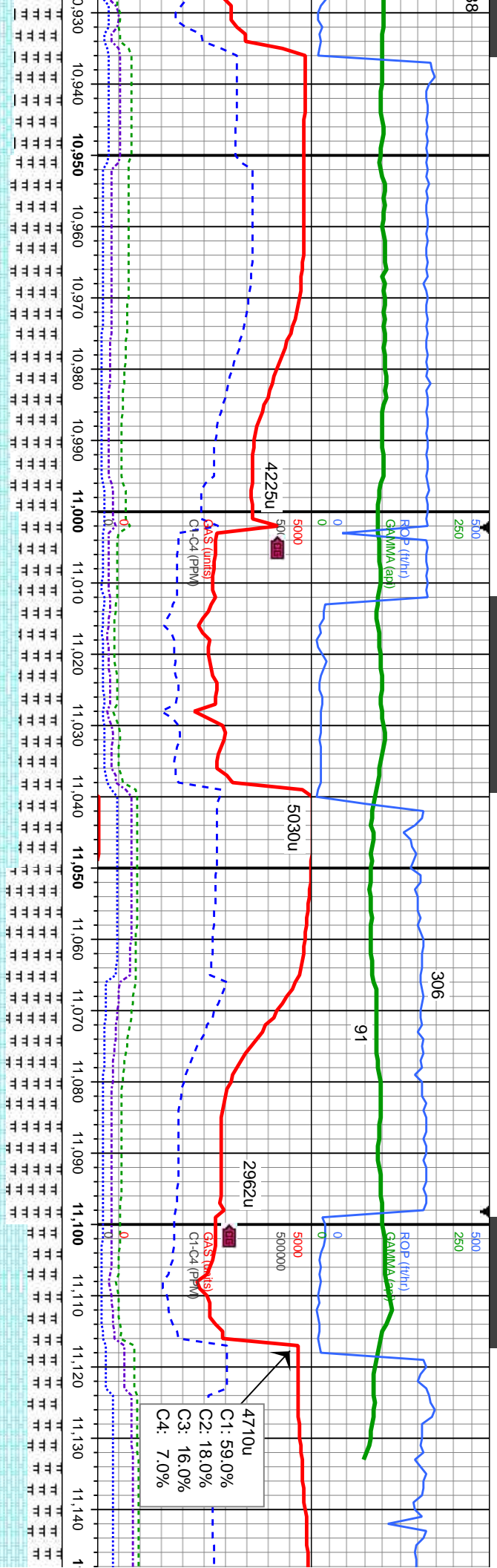
MD: 10,749'
TVD: 6,680.74'
Inclination: 90.46°
Azimuth: 263.81°
VS: 4,448.7'

MD: 10,844'
TVD: 6,679.8'
Inclination: 90.68°
Azimuth: 266.08°
VS: 4,543.51'

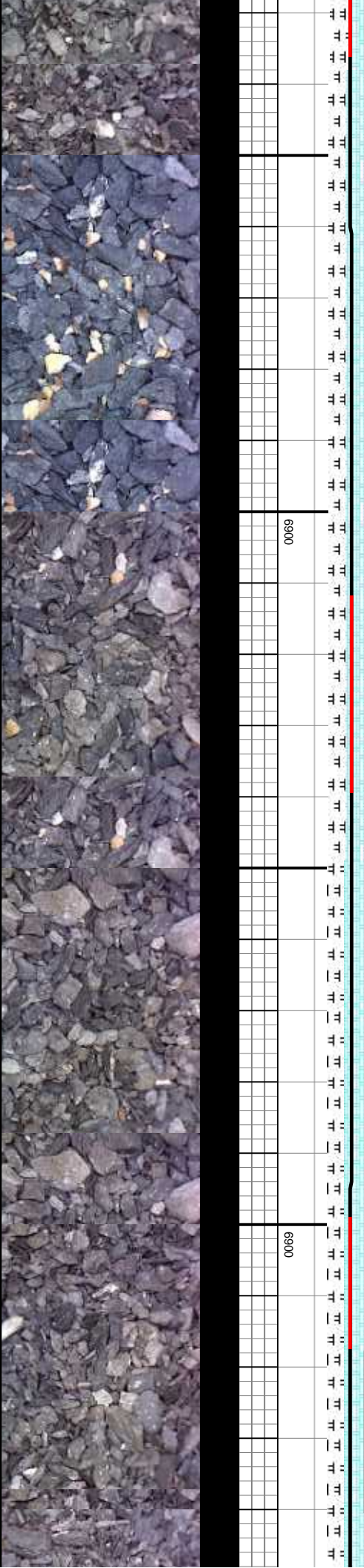
6900

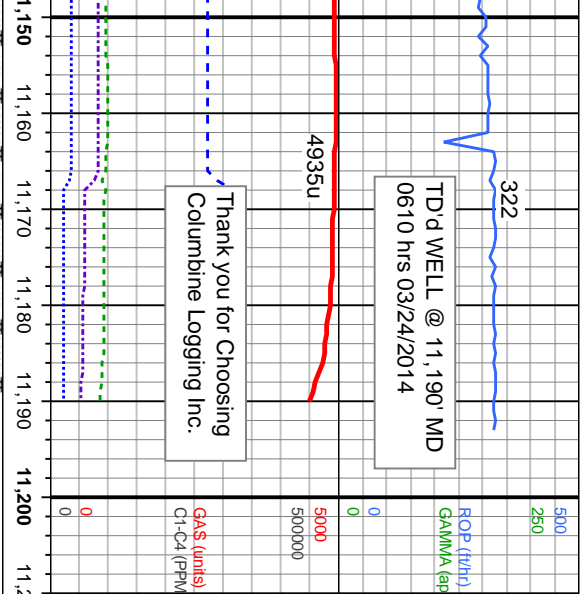
6900





t-sl firm, sb	60% MRL: dk-gy, mod sft-sl firm, sb blkly-sb	50% MRL: dk-gy, mod sft-sl firm, sb blkly-sb	65% MRL: dk-gy, mod sft-sl firm, sb blkly-sb	50% CHK: lt-v ltgy, v sft - sft, occ firm, blkly -
sl mot, occ sl vit	ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,	ply, rthy-slty tex, sl mot, occ sl vit lstr, v calc,	sb blkly, wxy - rthy tex
sft, occ firm, blkly -	40% CHK: lt-v ltgy, v sft - sft, occ firm, blkly -	50% CHK: lt-v ltgy, v sft - sft, occ firm, blkly -	35% CHK: lt-v ltgy, v sft - sft, occ firm, blkly -	blkly-sb ply, rthy-slty tex, sl mot, occ sl vit
	sb blkly, wxy - rthy tex	sb blkly, wxy - rthy tex	sb blkly, wxy - rthy tex	lstr, v calc, abnt calc frag
<div>MD: 10,939' TVD: 6,678.9' Inclination: 90.4° Azimuth: 267.34° VS: 4,638.46'</div>				
<div>MD: 11,034' TVD: 6,678.08' Inclination: 90.59° Azimuth: 267.86° VS: 4,733.45'</div>				
<div>MD: 11,128' TVD: 6,679.06' Inclination: 88.21° Azimuth: 268.23° VS: 4,827.44'</div>				





65% CHK: lt-v lty, v sft - sft, occ firm, blk	5800
- sb blk, wxy - rthy tex	
35% MRL: dk-gy, mod sft-sl firm, sb	
blk-sb pty, rthy-sly tex, sl mot, occ sl vit	
lstr, v calc, abnt calc frag	
PROJECTED:	
MD: 11,190'	
TVD: 6,681'	TVD (ft)
Inclination: 88.21 °	
Azimuth: 268.23 °	
VS: 4,889.41'	
	6900

