

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Sekich State 39N-17HZ

Location SEC18 T3N R67W

State COLORADO

Country USA

API Number 05123390470000

Region DJ BASIN

Spud Date 3/29/2014

Surface Coordinates 2000' FSL & 380' FWL

Bottom Hole Coordinates RELATIVE TO WELLHEAD:
450.17' NORTH & 9930.94' EAST

Ground Elevation 4850' MD

Logged Interval 6,400' MD **To** 16,745

Formation NIOBRARA

Type of Drilling Fluid WBM TO CASING POINT/ OBM FOR LATERAL

K.B. Elevation 4875' MD

Total Depth 16,745

Drilling Completed 5/9/2014

Rig Number H&P 307

AFE # 2089136.DRL

Field WATTENBERG

Operator

Company Anadarko

Address 1099 18th Street
Denver, Co., 80202

Geologist

Name Christian Venturino, Chris Johnson, Jim Frank

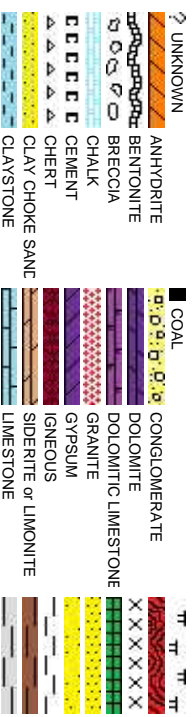
Company Columbine Logging, Inc.

Address 2385 S. Lipan Street
Denver, CO 80223

Zone Color Coding



Rock Types



Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	ANHYDRITE STRINGER
INOCERAMUS	B BENTONITE	K KAOLIN	BENTONITE STRINGER
ALGAE	BIT BITUMENOUS SUBSTANCE	M MARLSTONE	COAL STRINGER
AMPHIPORA	BRECCIA FRAGMENTS	MICACEOUS	DOLOMITE STRINGER
BELEMNITE	CALCAREOUS	MINERAL CRYSTALS	GYPSUM STRINGER
BIOCLASTIC	CARBONACEOUS FLAKES	NODULES	LIMESTONE STRINGER
BRACHIOPOD	CHERT	PHOSPHATE PELLETS	MARLSTONE (CALC) STRG
BRYOZOA	COAL - THIN BEDS	P PYRITE	MARLSTONE (DOL) STRG
CEPHALOPOD	DOLOMITIC	SALT CAST	SANDSTONE STRINGER
CORAL	FELDSPAR	SANDY	SHALE STRINGER
CRINOID	FERRUGINOUS PELLET	SILTY	SILTSTONE STRINGER
ECHINOID	FERRUGINOUS	TUFFACEOUS	
FISH	GLAUCONITE		
FORAMINIFERA	ARGILLACEOUS	Stringer	
F FOSSIL			

Other Symbols

Oil Show	P PINPOINT	DST INTERVAL	WIRELINE TESTED - LEFT	E EARTHY
	V VUGGY	FAULT	WIRELINE TESTED - RT	Fx FINELYXLN
Engineering	D DEAD	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
	EVEN	GAS SHOW	MN DEPTH	L LITHOGRAPHIC
	QUESTIONABLE	OIL SHOW		Mx MICROXLN
	BIT			
SPOTTED STAINING	CONNECTION (UP)	MN DEPTH UP	Rounding	MS MUDSTONE
Porosity	CONNECTION (DOWN)	MN DEPTH (DOWN)	A ANGULAR	PS PACKSTONE
	CONNECTION GAS	NORMAL FAULT	R ROUNDED	WS WACKESTONE
E EARTHY	CONNECTION GAS (LEFT)	OVERTURNED STRATA	B SUBANG	
F FENESTRAL	TRIP GAS	REVERSE FAULT	r SUBRND	
F FRACTURE	TRIP GAS (LEFT)	CASING		
INTERCRYSTALLINE	DOWN TIME GAS	SIDEWALL CORE (LEFT)	Textures	P POOR
INTEROOLITIC	DOWN TIME GAS (LEFT)	SIDEWALL CORE (RIGHT)	BS BOUNDSTONE	W WELL
MOLDIC	CORE - LOST	SLIDE	C CHALKY	
ORGANIC	CORE - RECOVERED	SURVEY	Cx CRYPTOXLN	



g

MARLSTONE		SHALY SANDSTONE
METAMORPHIC		SHALY SILTSTONE
NO SAMPLE		SILT SHALE
SALT		SILTSTONE
SANDSTONE		TILL
SALT-PEPPER SANIT		TUFF
SHALE		WELDED TUFF
SHALE COLORED		
SHALE GRAY		

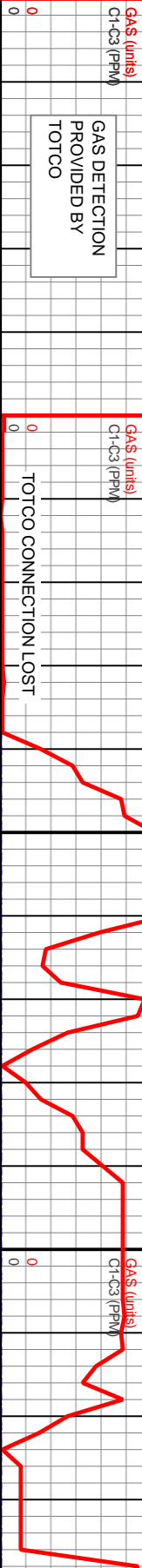
Slide/Rotate

ROP
ROF
GAMMA

COLUMBINE LOGGING TWO MAN
RIGGED UP ON 4/4/2014 @ 19:51 HRS
GAMMA BEGIN LOGGING @ 21:00 HRS 4/4/14

Total Gas & Chromatograph

GAS
C1
C3



Depth Labels

% Lith



Well Bore
TVD

DRILLING IN SUSSEX FM.

TVD (ft)

MD: 6,434
TVD: 6,397.6
Inclination: 1.75 -
Azimuth: 81.99 -
VS: -30.54

MD: 6,482
TVD: 6,445.49
Inclination: 5.57 -
Azimuth: 86.44 -
VS: -27.49

TVD (ft)

MD: 6,529
TVD: 6,492.06
Inclination: 9.91 -
Azimuth: 92.1 -
VS: -21.17

Oil Show

Oil Show

6400'-6500' MD: SLTY SH: med gry - dk gry,
frm-sft, sb plty rnd-sb blkly, gritty tex, v sl calc

6500'-6600' MD: SLTY SH: med gry - dk gry,
frm-sft, sb plty rnd-sb blkly, gritty tex, v sl calc

Images



4/4/14
6615' MD

MINDEPTH

108

ROP (mm/h)
GAMMA (api)

103

ROP (mm/h)
GAMMA (api)

113

0
150
15000

0
150
15000

GAS (units)
Cl-C3 (PPM)

GAS (units)
Cl-C3 (PPM)

25u

48u

49u

TOTCO CONNECTION LOST

TOTCO CONNECTION LOST

TOTCO CONNECTION LOST

6,540 6,550 6,560 6,570 6,580 6,590 6,600 6,610 6,620 6,630 6,640 6,650 6,660 6,670 6,680 6,690 6,700 6,710 6,720 6,730 6,740 6,750

6350

6350

MD: 6,576
TVD: 6,538.05
Inclination: 13.73 -
Azimuth: 92.25
VS: -11.55

MD: 6,623
TVD: 6,583.27
Inclination: 17.84 -
Azimuth: 92.24
VS: 1.23

MD: 6,670
TVD: 6,627.47
Inclination: 21.84 -
Azimuth: 91.92
VS: 17.16

MD: 6,717
TVD: 6,670.37
Inclination: 26.31 -
Azimuth: 90.71
VS: 36.33

D: SLTY SH: med gry - dk gry,
y rnd-sb blkly, gritty tex, v sl calc

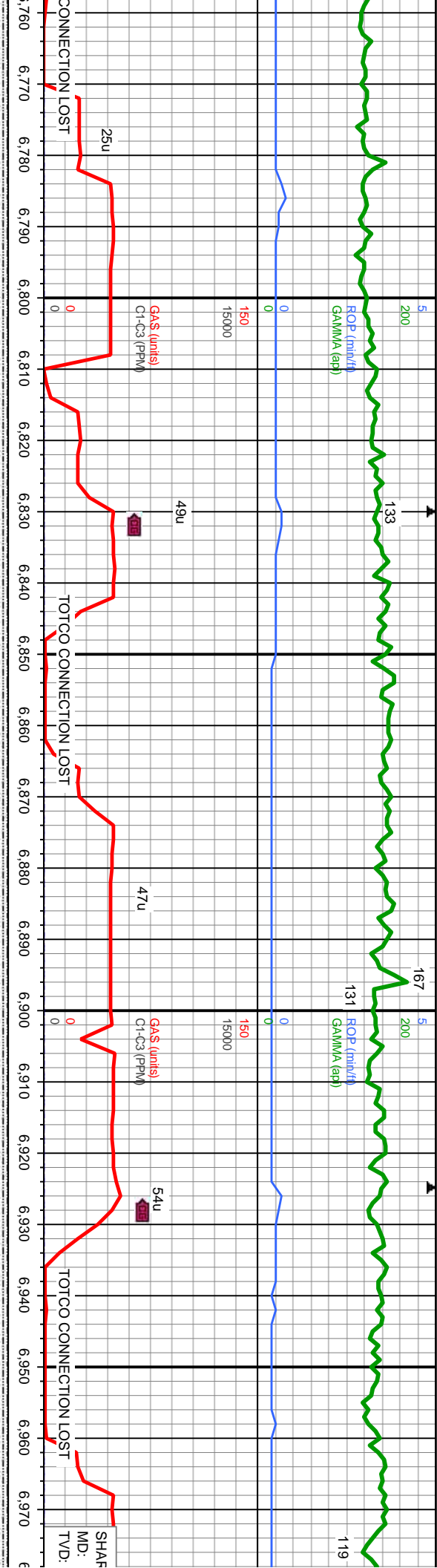
6600'-6700' MD: SLTY SH: med gry,
frm-sft, sb plty rnd-sb blkly, gritty tex, v sl calc

6700'-6800' MD: SLTY SH: med gry,
plty rnd-sb blkly, gritty tex, v sl calc

7450

7450





MD: 6,811
TVD: 6,751.48
Inclination: 34.5
Azimuth: 88.92
VS: 83.68

MD: 6,859
TVD: 6,789.81
Inclination: 39.48
Azimuth: 90.28
VS: 112.55

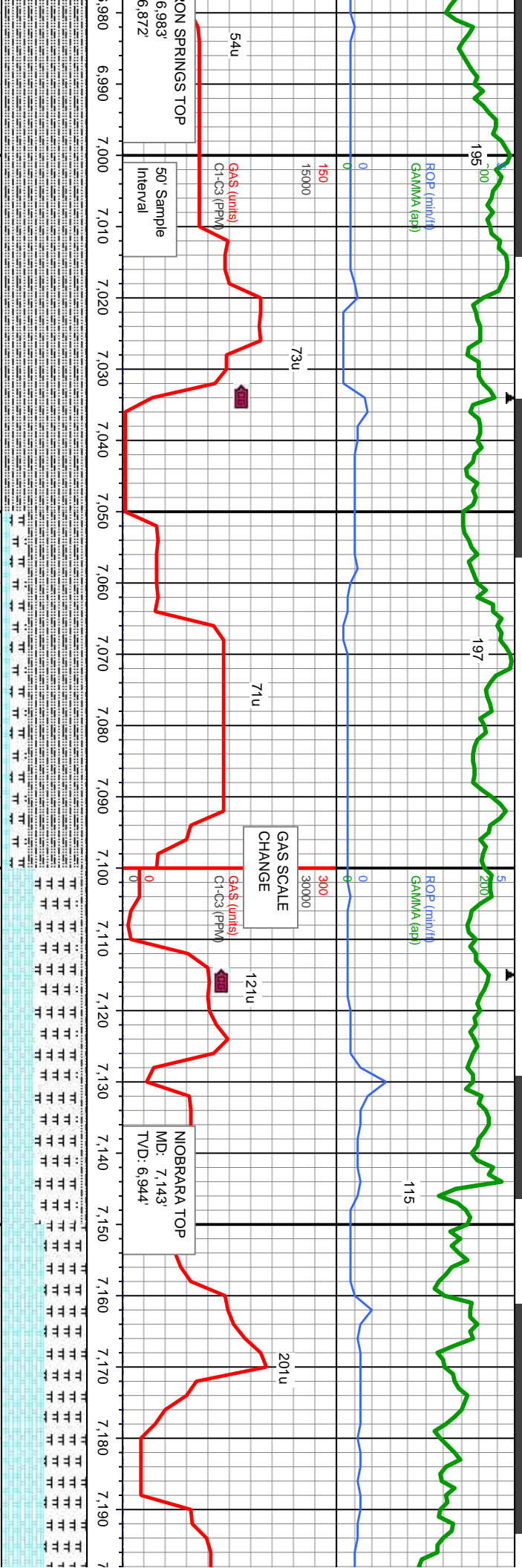
MD: 6,953
TVD: 6,854.91
Inclination: 52.61
Azimuth: 89.97
VS: 180.07

MD: 6,764
TVD: 6,711.77
Inclination: 30.15
Azimuth: 89.87
VS: 58.55

6800'-6900' MD: SLTY SH: med gry - dk gry, frm-sft, sb ply
rnd-sb blkly, gritty tex, v sl calc, tr shy ss

6900'-7000' MD: SLTY SH: med gry - dk gry, frm-sft, sb ply
rnd-sb blkly, gritty tex, v sl calc, tr shy ss, tr bent





MD: 7.000.
TVD: 6.881.
Inclination: 59.9 -
Azimuth: 89.64 -
VS: 219.12.

MD: 7.048.
TVD: 6.903.57.
Inclination: 63.99 -
Azimuth: 89.78 -
VS: 261.47.

MD: 7.095.
TVD: 6.924.03.
Inclination: 64.41 -
Azimuth: 89.8 -
VS: 303.79.

MD: 7.142.
TVD: 6.943.65.
Inclination: 66.23 -
Azimuth: 88.81 -
VS: 346.49.

MD: 7.189.
TVD: 6.960.9.
Inclination: 70.69 -
Azimuth: 87.88 -
VS: 390.18.

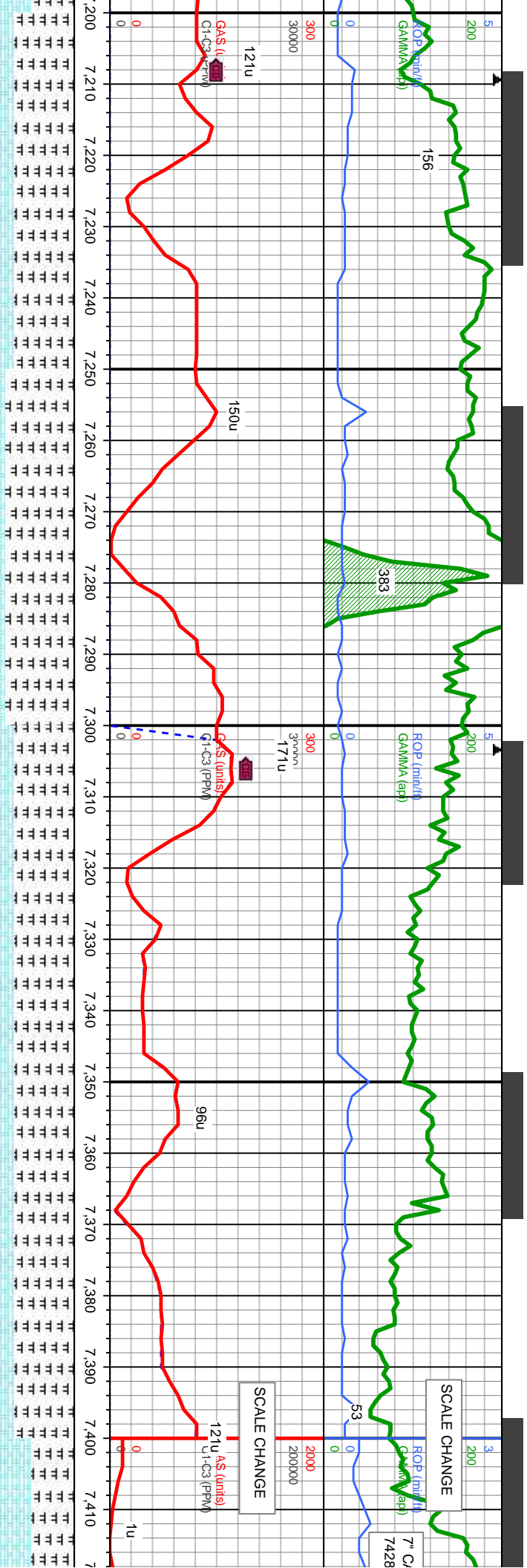
7000'-7050' MD: SLTY SH: med gry - dk gry,
frm-sft, sb pily rnd-sb blk, grtity tex, v sl calc,
tr bent

7050'-7100' MD: SLTY SH: med gry - dk gry, frm-sft,
sb pily rnd-sb blk, grtity tex, v sl calc; MRLST:
med-dk gy, sb pily-sb blk, mod sft-frm, sb arg-sily,
calc; CHK: lt gy-med gy, occ brn, sl mot, sb blk-sb
pily, mod sft-mod frm, wxy tex, v calc, tr bent, tr

7100'-7150' MD: MRLST: med-dk gy, sb pily-sb
bent, tr pily, slw streaming cut, sl tr lt bl flor

7150'-7200' MD: MRLST: med-dk gy, sb pily-sb
blk, mod sft-frm, sb arg-sily, calc; CHK: lt gy-me
gy, occ brn, sl mot, sb blk-sb pily, mod sft-mod
frm, wxy tex, v calc, tr bent, tr pily, mod
streaming cut, tr lt bl flor



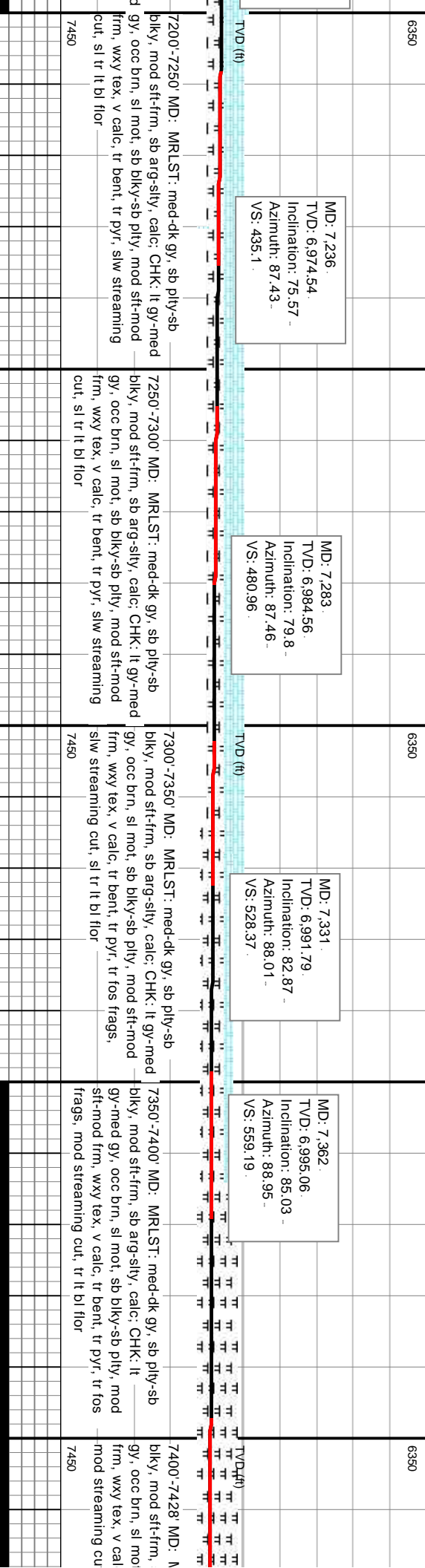


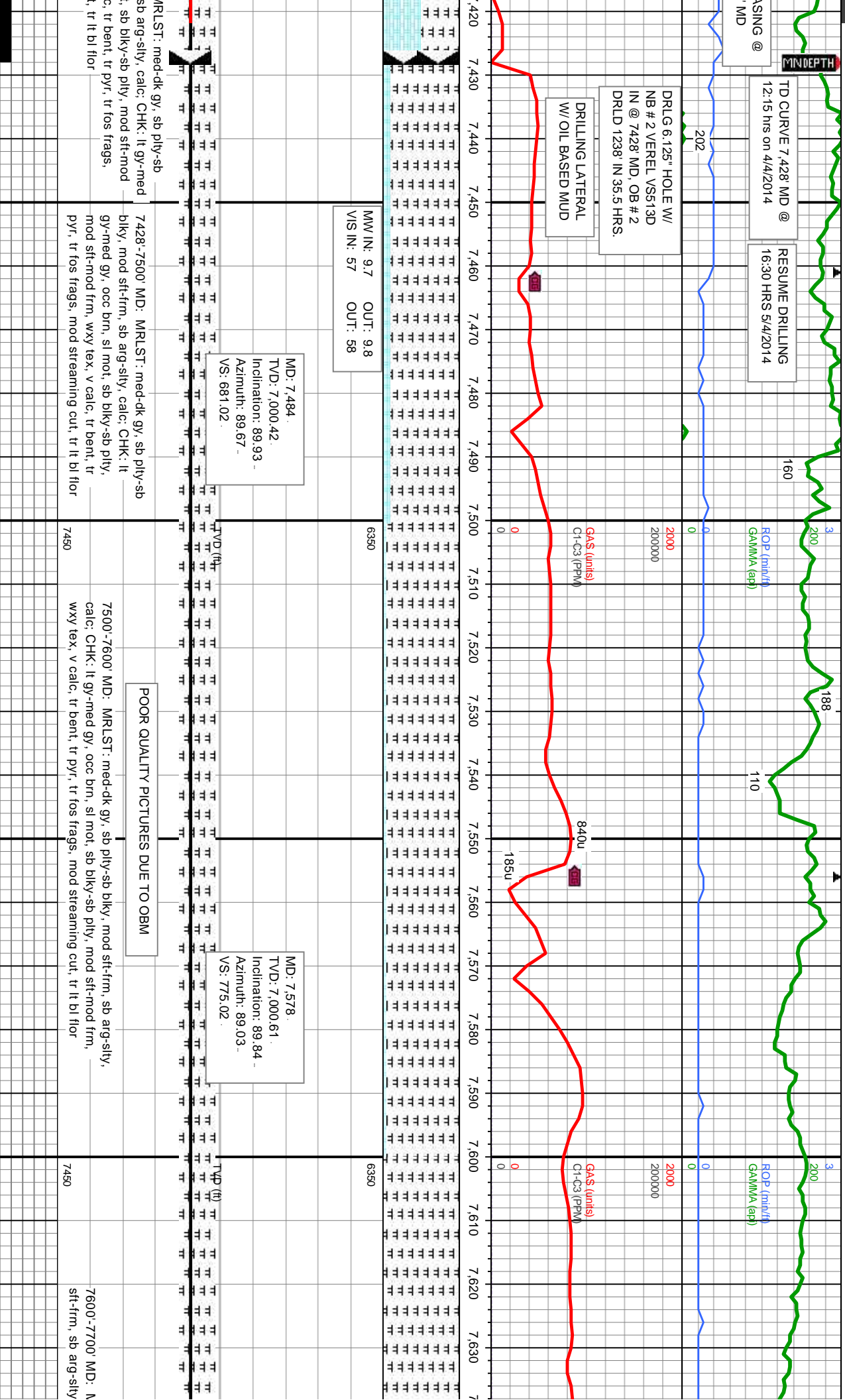
MD: 7.236
TVD: 6,974.54
Inclination: 75.57
Azimuth: 87.43
VS: 435.1

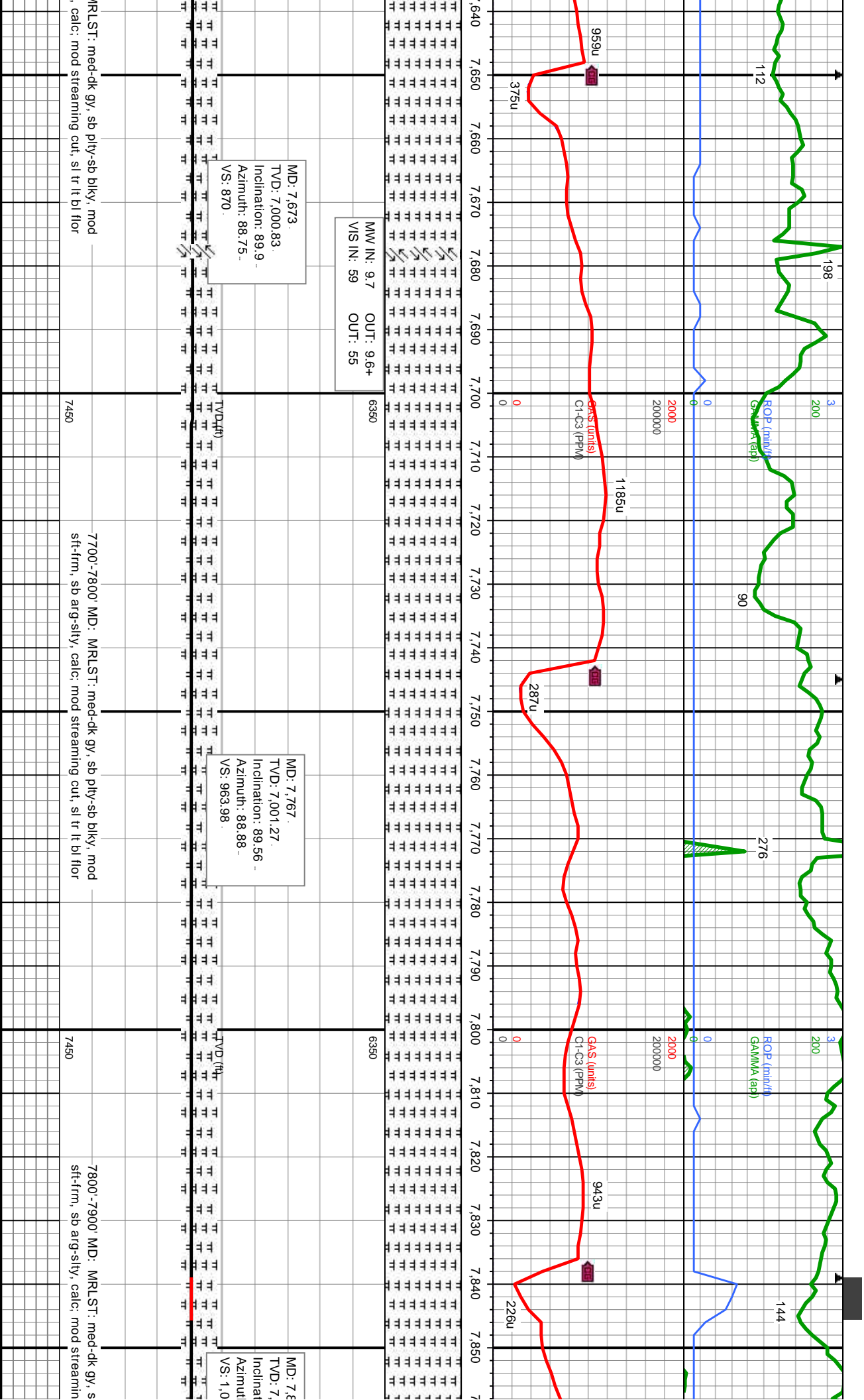
MD: 7.283
TVD: 6,984.56
Inclination: 79.8
Azimuth: 87.46
VS: 480.96

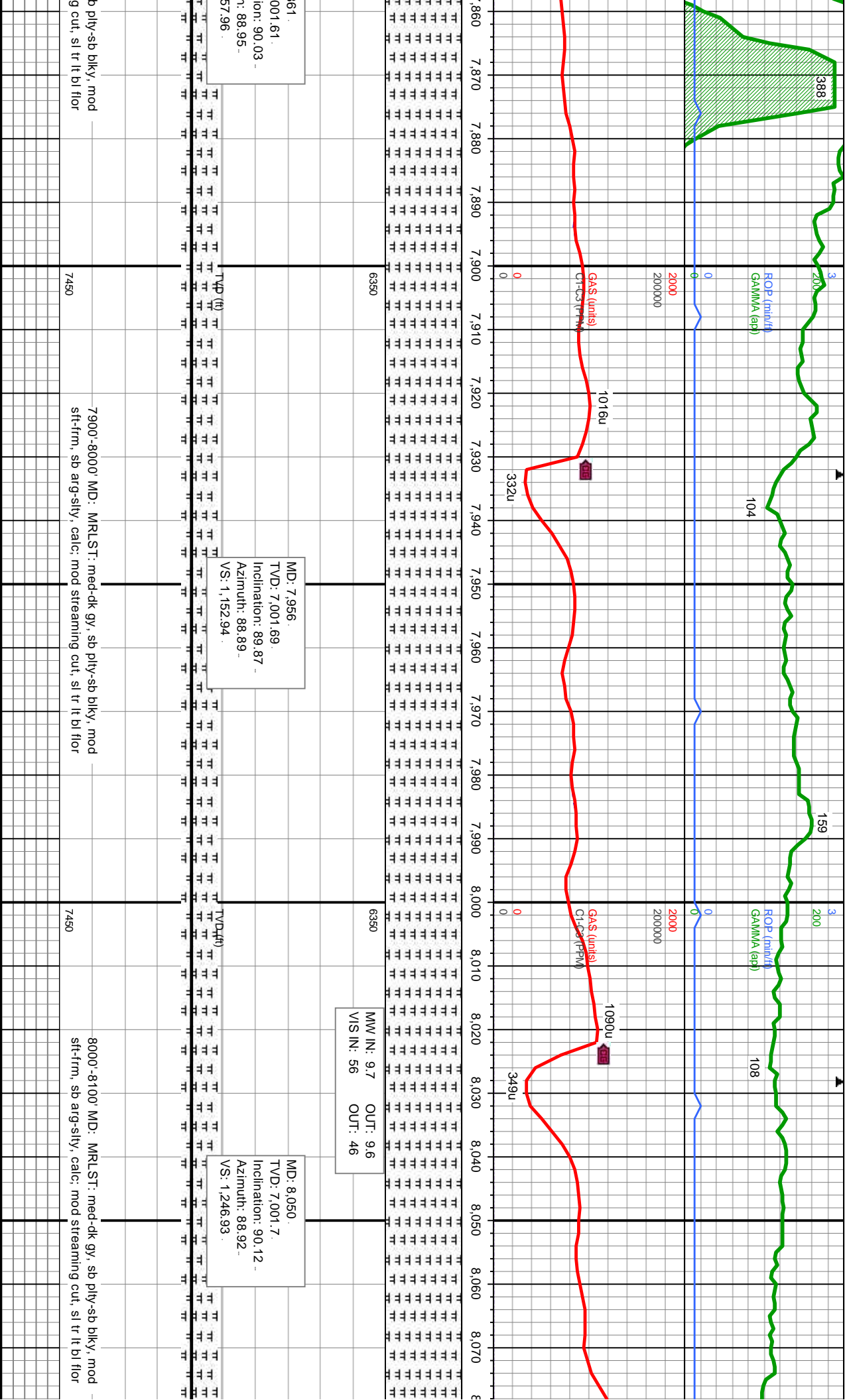
MD: 7.331
TVD: 6,991.79
Inclination: 82.87
Azimuth: 88.01
VS: 528.37

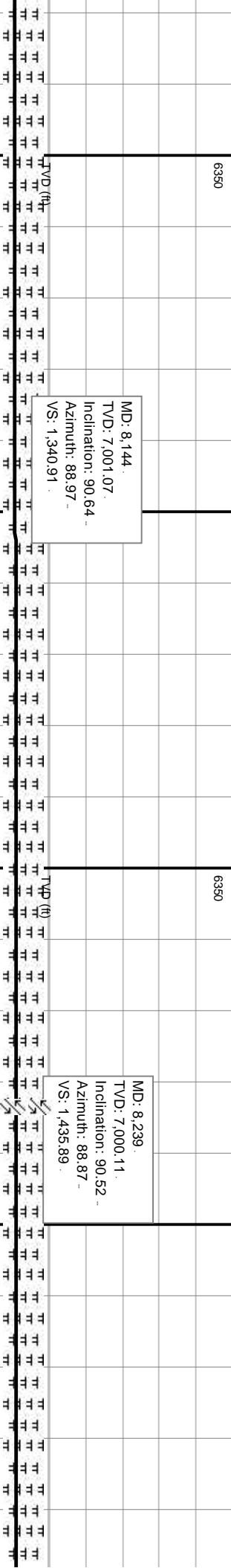
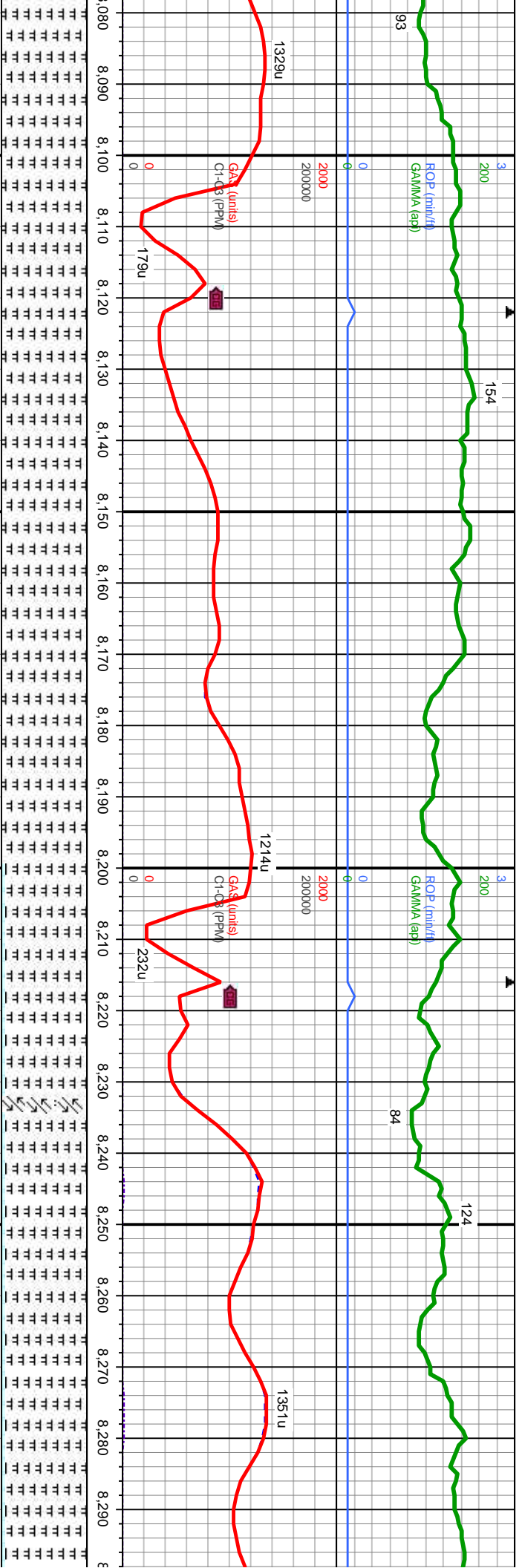
MD: 7.362
TVD: 6,995.06
Inclination: 85.03
Azimuth: 88.95
VS: 559.19





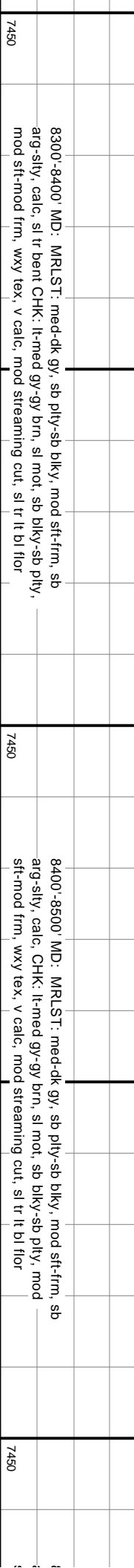
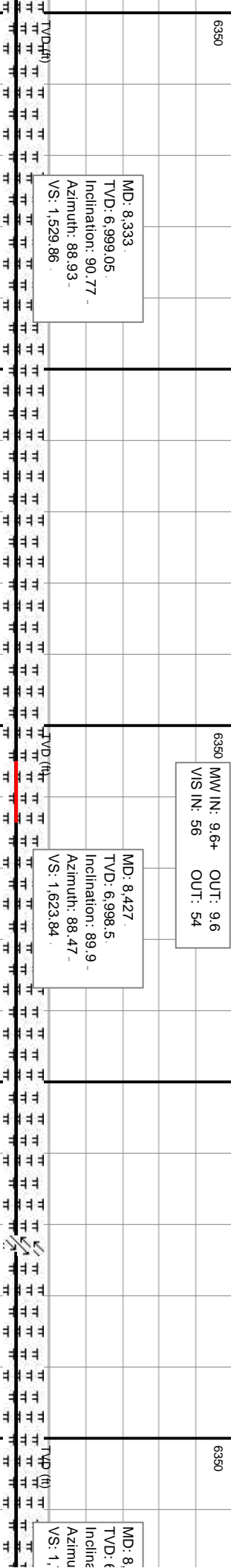
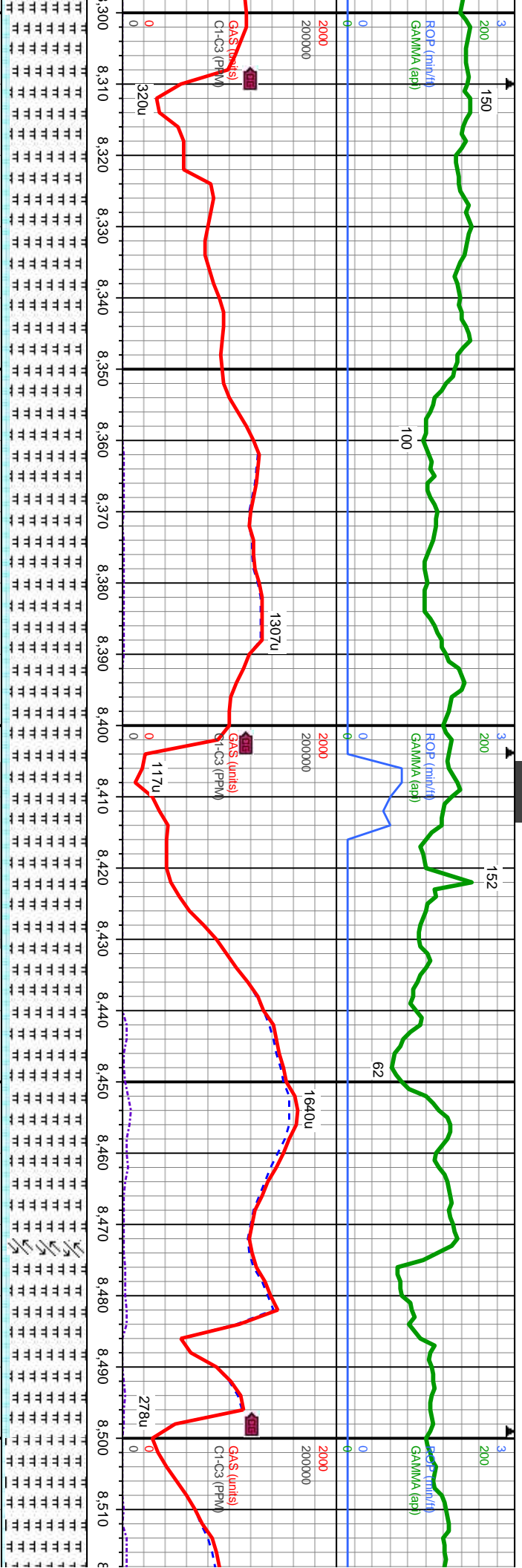


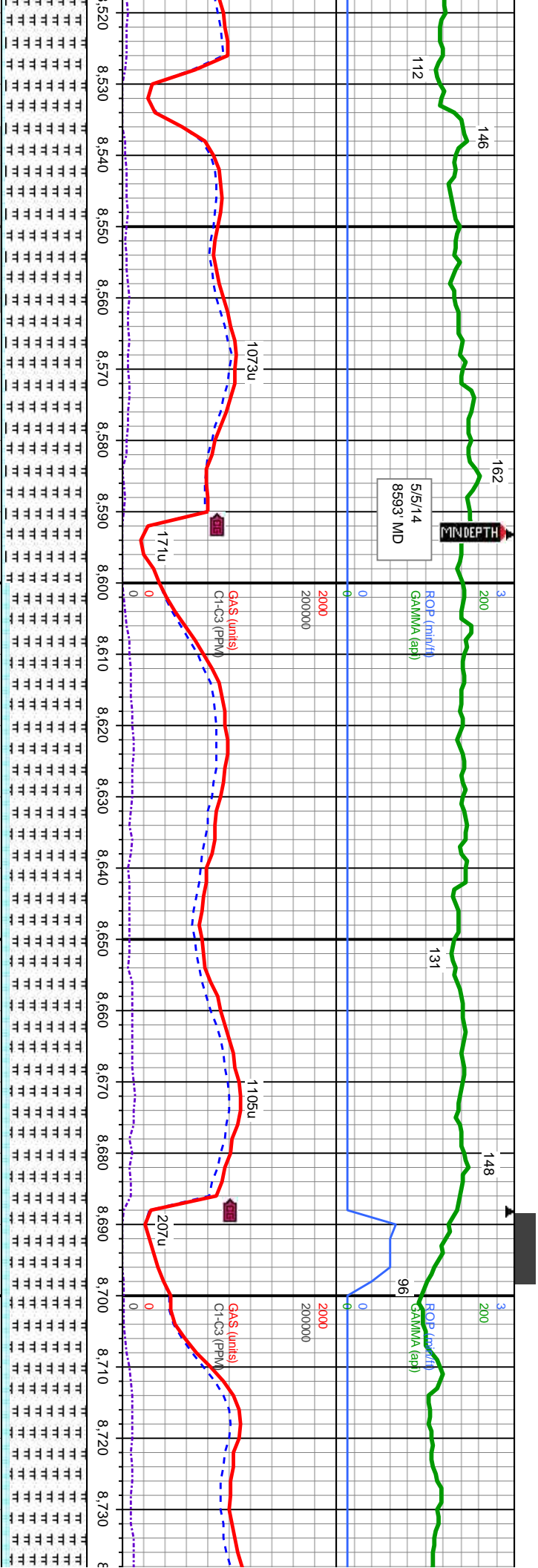




TVD (ft)		TVD (ft)	
6350		6350	
MD: 8.144 TVD: 7,001.07 Inclination: 90.64 Azimuth: 88.97 VS: 1,340.91		MD: 8.239 TVD: 7,000.11 Inclination: 90.52 Azimuth: 88.87 VS: 1,435.89	
8100'-8200' MD: MRLST: med-dk gy, sb ply-sb blk, mod sft-firm, sb arg-sily, calc, mod streaming cut, sl tr lt bl flr		8200'-8300' MD: MRLST: med-dk gy, sb ply-sb blk, mod sft-firm, sb arg-sily, calc, sl tr bent CHK: lt-med gy-gy brn, sl mot, sb blk-sb ply, mod sft-mod frm, wxy tex, v calc, mod streaming cut, sl tr lt bl flr	
7450		7450	







MW IN: 9.6+ OUT: 9.6
VIS IN: 57 OUT: 54

522.
998.36
ation: 90.27
th: 88.56
718.81

MD: 8.616
TVD: 6.997.62
Inclination: 90.64
Azimuth: 88.51
VS: 1.812.77

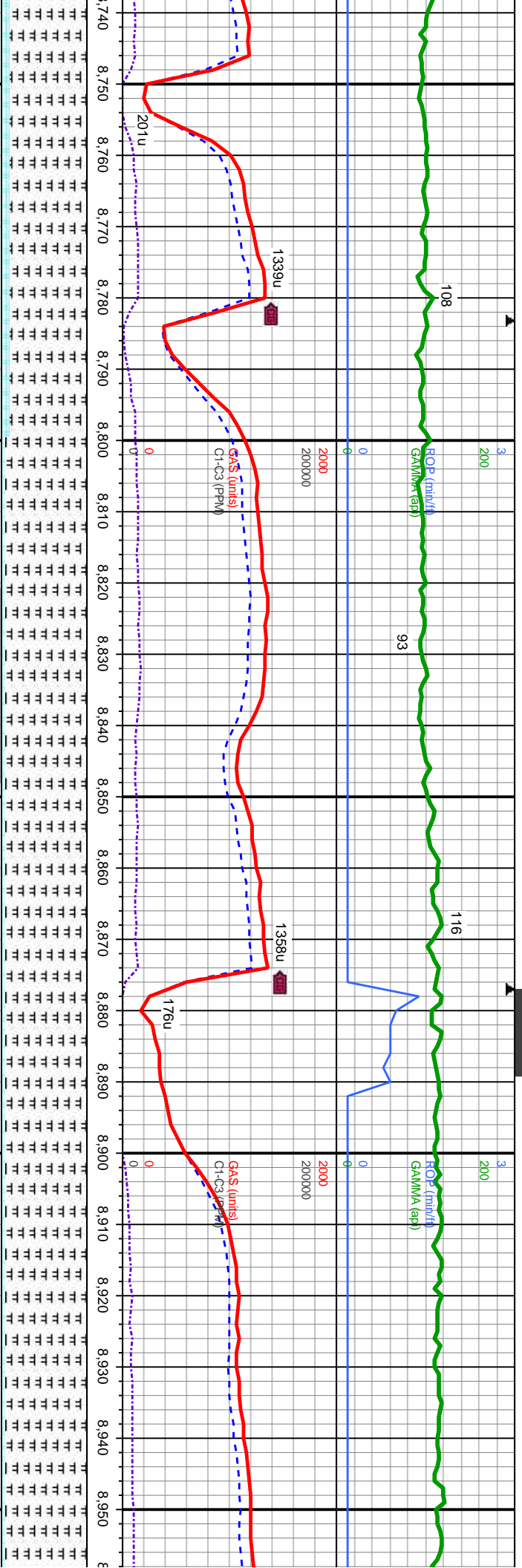
MD: 8.710
TVD: 6.997.02
Inclination: 90.09
Azimuth: 88.47
VS: 1.906.74

8500'-8600' MD: MRLST: med-dk gy, sb ply-sb blkly, mod sft-frn, sb
arg-sfly, calc, CHK: lt-med gy-gy brn, sl mot, sb blkly-sb ply, mod
sft-mod frn, wxy tex, v calc, mod streaming cut, sl tr lt bl flr

8600'-8700' MD: MRLST: med-dk gy, sb ply-sb blkly, mod sft-frn, sb
arg-sfly, calc, CHK: lt-med gy-gy brn, sl mot, sb blkly-sb ply, mod
sft-mod frn, wxy tex, v calc, mod streaming cut, sl tr lt bl flr

8700'-8800' MD: MRL
arg-sfly, calc, CHK: lt-
sft-mod frn, wxy tex, \





MD: 8,805
TVD: 6,995.77
Inclination: 91.41
Azimuth: 88.53
VS: 2,001.7

MW IN: 9.4 OUT: 9.4
VIS IN: 60 OUT: 58

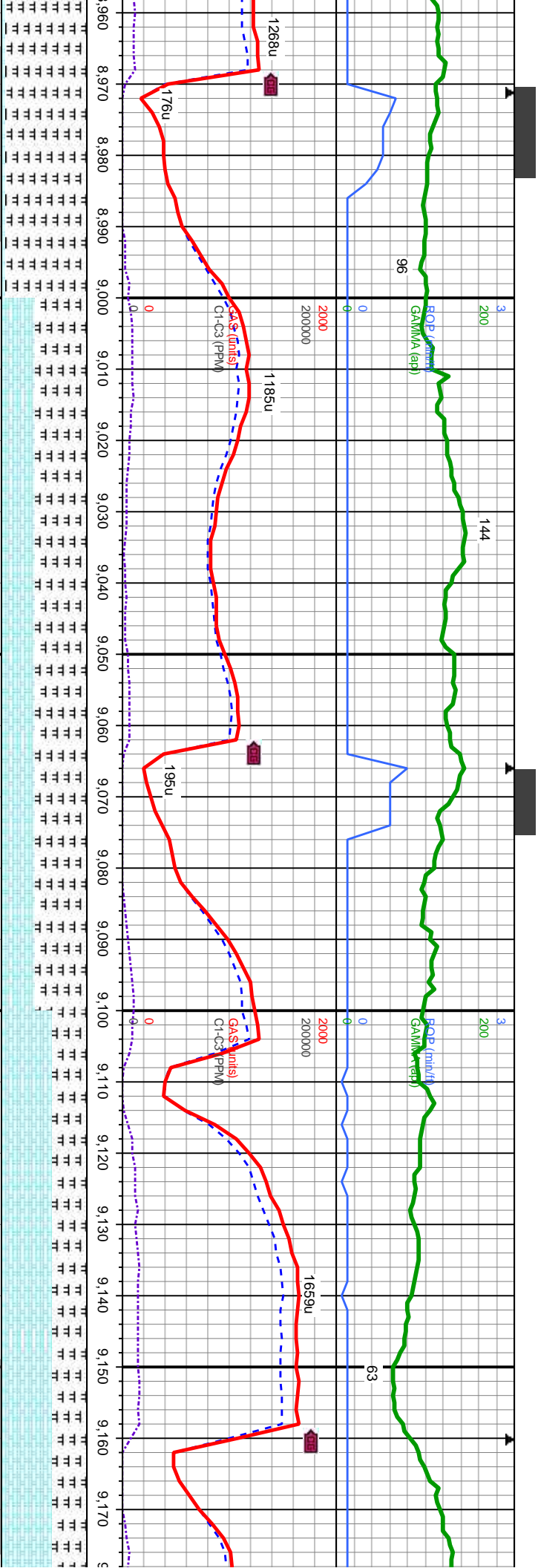
MD: 8,899
TVD: 6,993.94
Inclination: 90.83
Azimuth: 89.03
VS: 2,095.66

ST: med-dk gy, sb pily-sb blk, mod sft-fm, sb
med gy-gy brn, sl mot, sb blk-sb pily, mod
calc, tr bent, mod streaming cut, sl tr lt bl flr

8800'-8900' MD: MRLST: med-dk gy, sb pily-sb blk, mod sft-fm, sb
arg-sily, calc, CHK: lt-med gy-gy brn, sl mot, sb blk-sb pily, mod
sft-mod frm, wxy tex, v calc, tr bent, mod streaming cut, sl tr lt bl flr

8900'-9000' MD: MRLST: med-dk gy-dk gybrn,
sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl r
sft-mod frm, wxy tex, v calc, tr bent, sl tr lt bl flr





MW IN: 9.4+ OUT: 9.4+
VIS IN: 60 OUT: 55

MD: 8,994.
TVD: 6,993.36
Inclination: 89.87 -
Azimuth: 88.74 -
VS: 2,190.64

MD: 9,088.
TVD: 6,994.18
Inclination: 89.13 -
Azimuth: 89.19 -
VS: 2,284.62

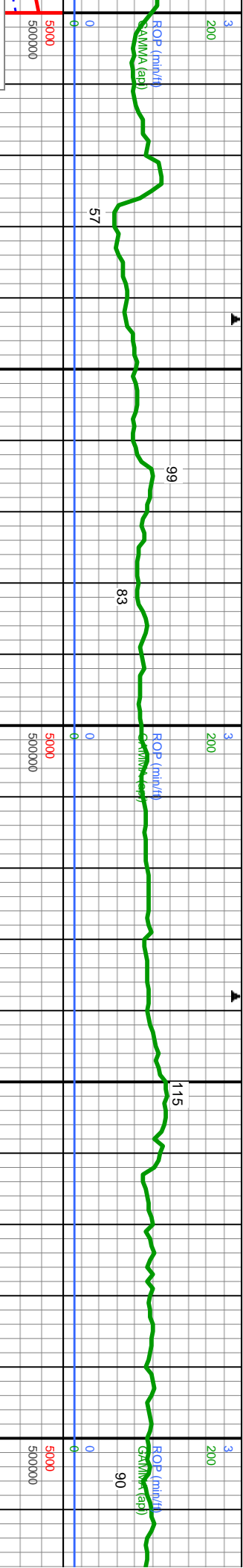
MW IN: 9.4 OUT: 9.3+
VIS IN: 58 OUT: 60

MD: 9,100.
TVD: 6,994.18
Inclination: 89.13 -
Azimuth: 89.19 -
VS: 2,284.62

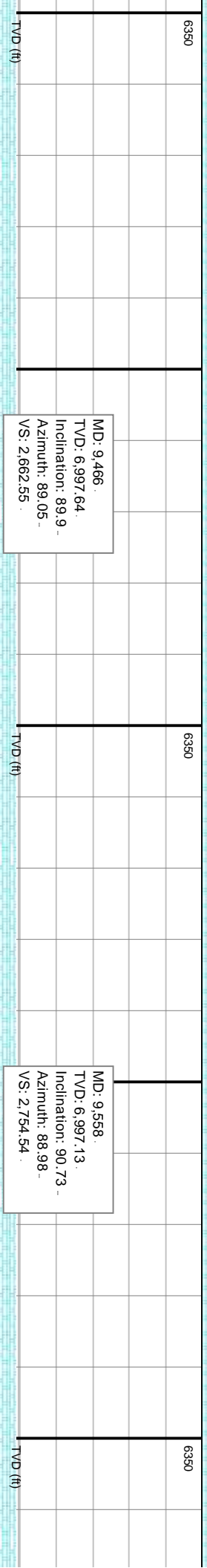
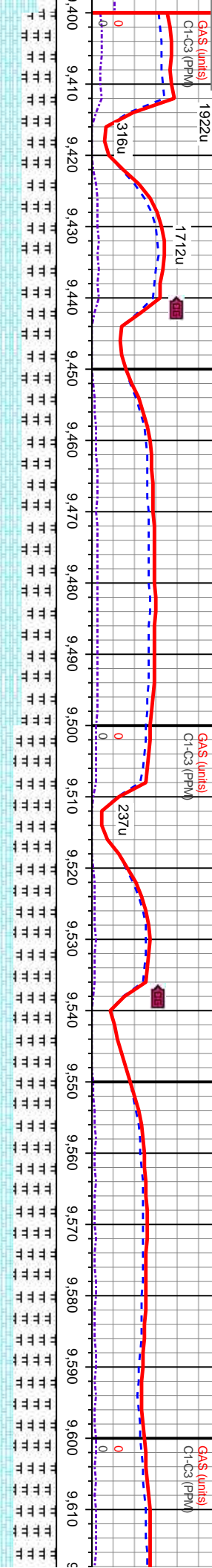
sb ply-sb blkly, mod sft-frn,
not, sb blkly-sb ply, mod
or w/ mod streaming cut

9000'-9100' MD: MRLST: med-dk gy-dk gybrn, sb ply-sb blkly, mod sft-frn,
sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb ply, mod
sft-mod frn, wxy tex, v calc, tr bent, tr lt bl flr w/ mod streaming cut

9100'-9200' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb ply, m
sft-mod frn, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, s
blkly, mod sft-frn, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut



E CHANGE

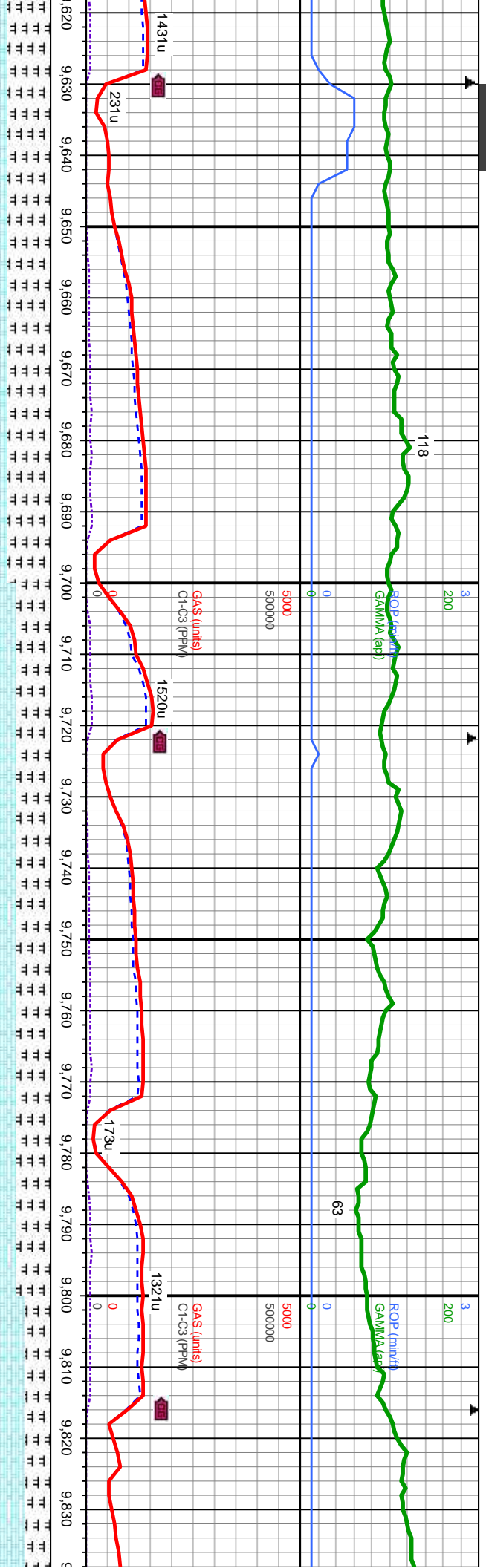


MD: 9.466.
TVD: 6.997.64.
Inclination: 89.9.
Azimuth: 89.05.
VS: 2.662.55.

MD: 9.558.
TVD: 6.997.13.
Inclination: 90.73.
Azimuth: 88.98.
VS: 2.754.54.

9400'-9500' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-frm, sb arg-slt-y, calc, tr lt bl flwr w/ mod streaming cut	7450
9500'-9600' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-frm, sb arg-slt-y, calc, tr lt bl flwr w/ mod streaming cut	7450
9600' sft-m blk-y,	7450





MW IN: 9.4 OUT: 9.3
VIS IN: 56 OUT: 55

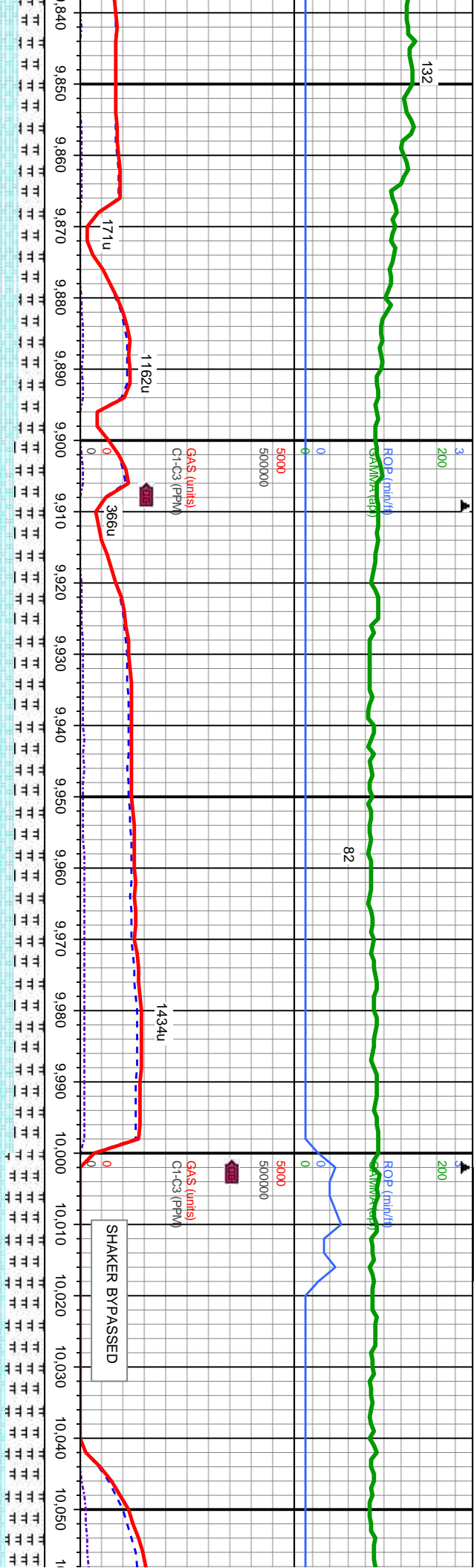
MD: 9.651
TVD: 6.997.01.
Inclination: 89.38 -
Azimuth: 89.35
VS: 2.847.52

MD: 9.744.
TVD: 6.997.69
Inclination: 89.78 -
Azimuth: 89.39 -
VS: 2.940.52

MD: 9.838
TVD: 6.997
Inclination
Azimuth: 8
VS: 3.034.

-9700' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut		7450
9700'-9800' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut		7450
9800'-9900' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut		7450

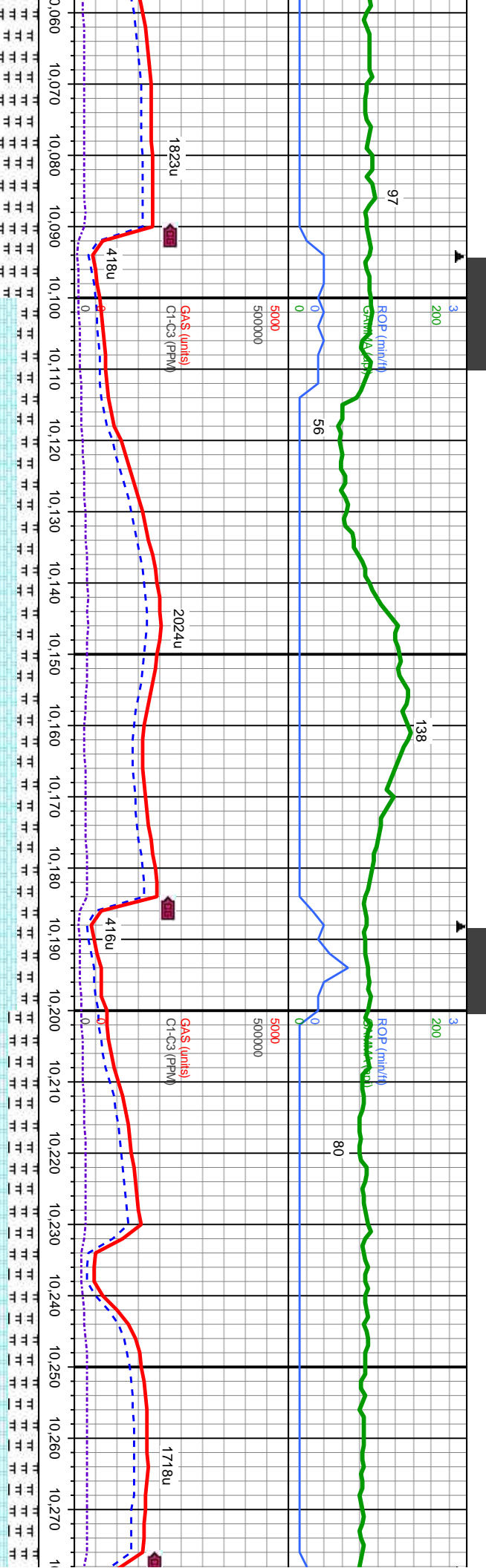




6350	MD: 9.930 TVD: 6.997.03 Inclination: 90.86 Azimuth: 89.27 VS: 3.126.5	6350
TVD (ft)		

med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod g, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-firm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut	9,900'-10,000' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y, mod sft-firm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut	7450
TVD (ft)		

10,000'-10,100' MD: CHK: lt-med gy-lt gy brn, s sft-mod frm, wxy tex, v calc, tr bent, MRLST: m blk-y, mod sft-firm, sb arg-sily, calc, tr lt bl flr w	10,000'-10,100' MD: CHK: lt-med gy-lt gy brn, s sft-mod frm, wxy tex, v calc, tr bent, MRLST: m blk-y, mod sft-firm, sb arg-sily, calc, tr lt bl flr w	7450
TVD (ft)		



MD: 10.116
TVD: 6.995.52
Inclination: 90.15
Azimuth: 91.93
VS: 3.312.47

MD: 10.209
TVD: 6.995.22
Inclination: 90.21
Azimuth: 93.22
VS: 3.405.38

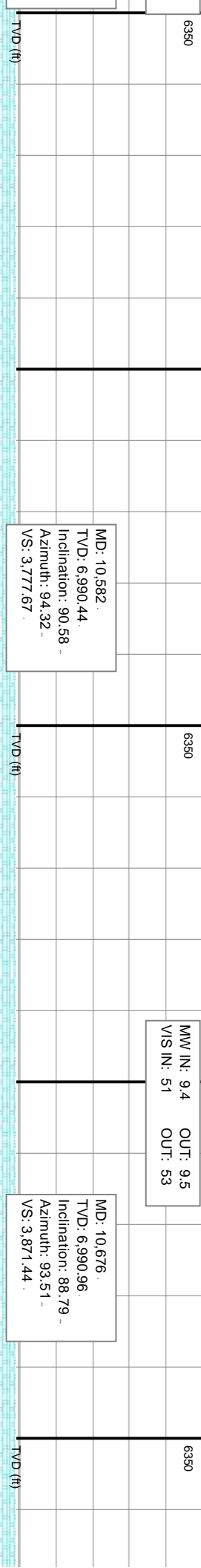
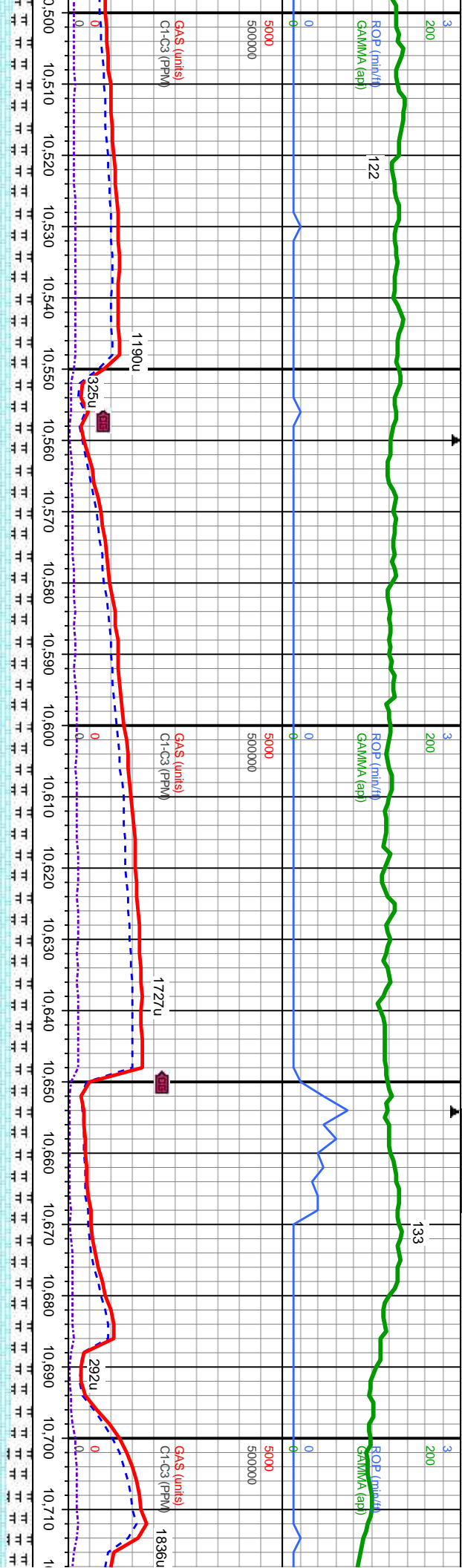
MW IN: 9
VIS IN: 54

mod, sb blk-y-sb pily, mod
mod-dk gy-dk gybrn, sb pily-sb
mod streaming cut

10.100'-10.200' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod
sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb pily-sb
blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut

10.200'-10.300' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily,
sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gybrn, sb
blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut





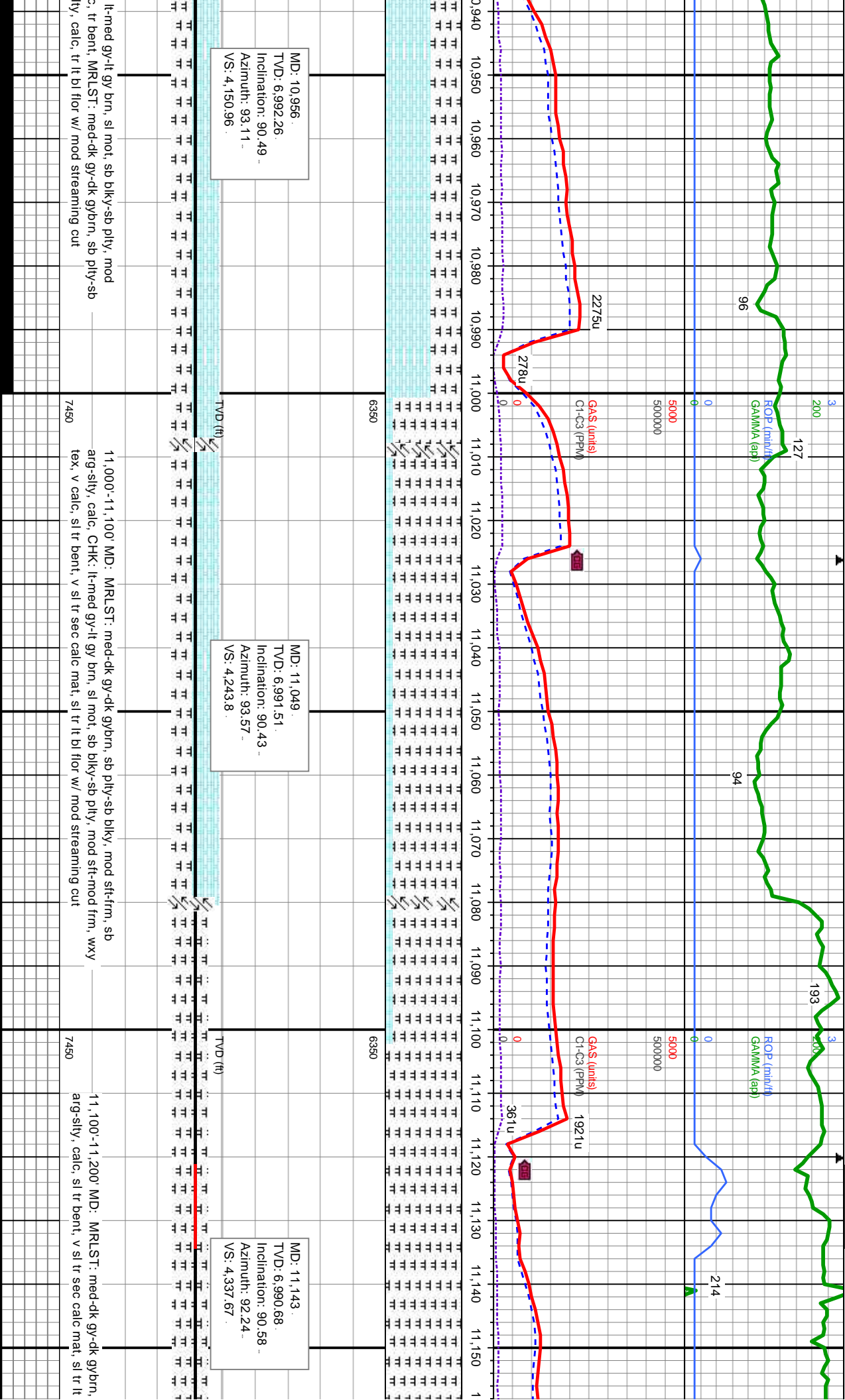
MD: 10.582
TVD: 6,990.44
Inclination: 90.58
Azimuth: 94.32
VS: 3.777 67

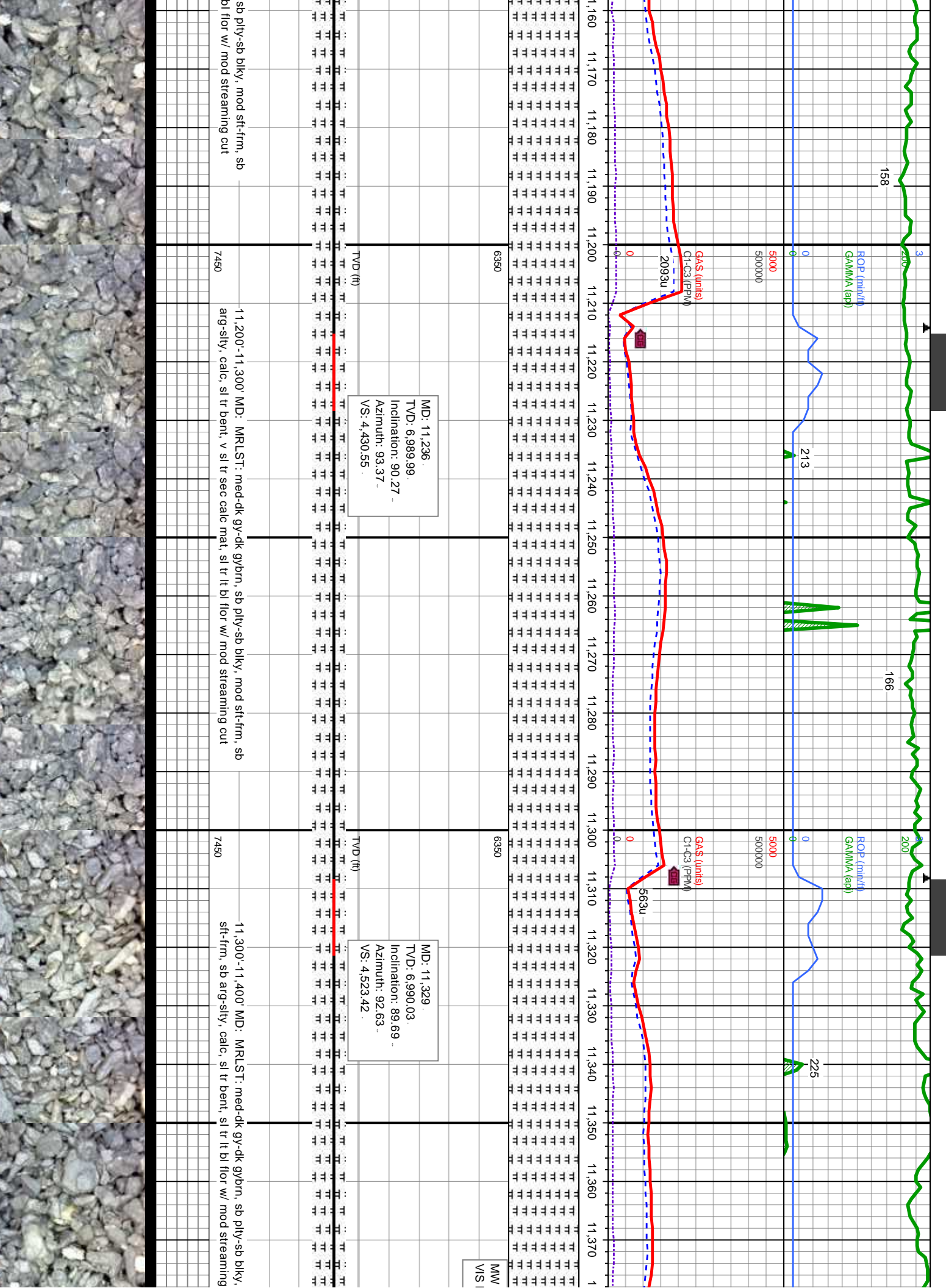
MW IN: 9.4 OUT: 9.5
VIS IN: 51 OUT: 53

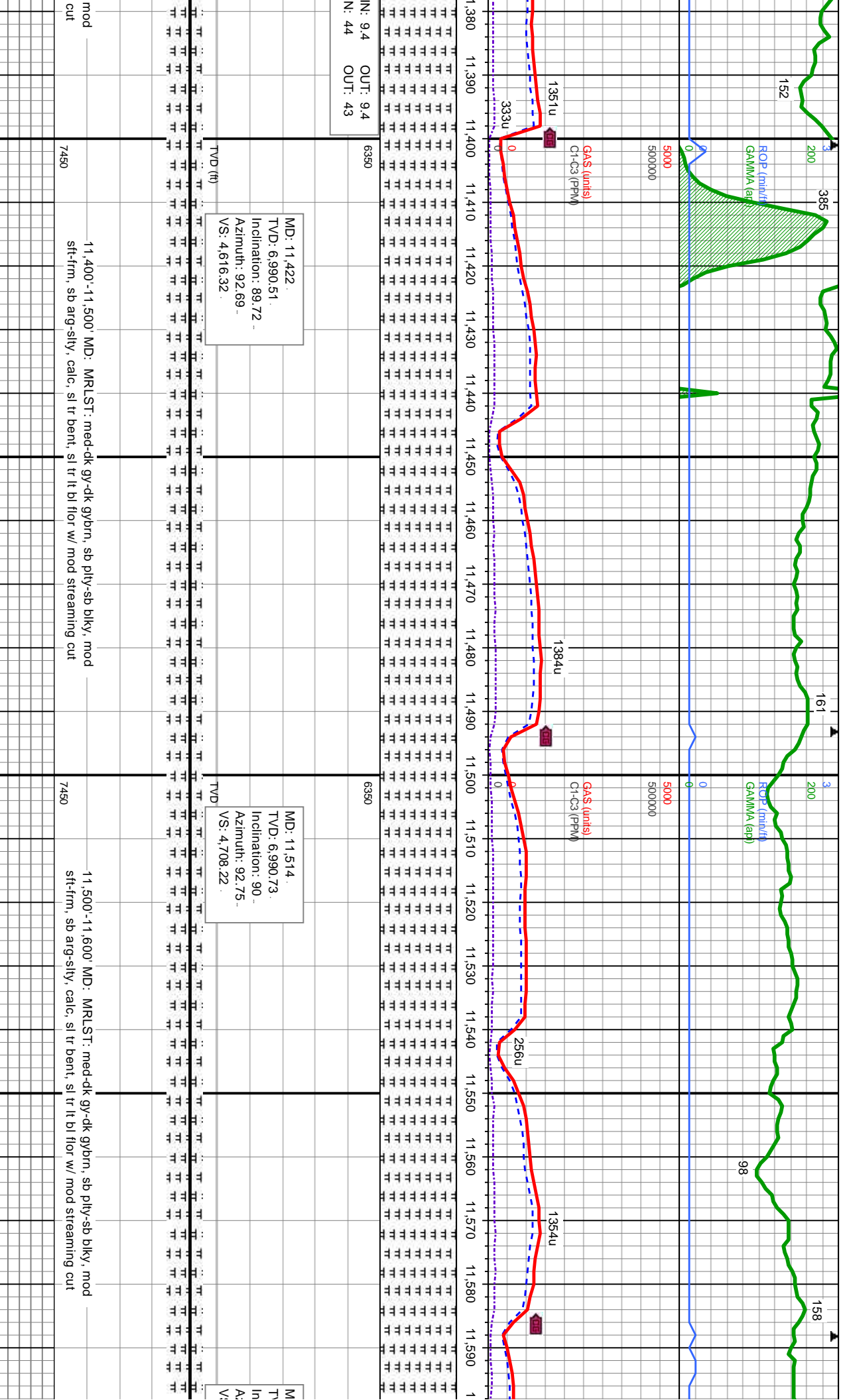
MD: 10.676
TVD: 6,990.96
Inclination: 88.79
Azimuth: 93.51
VS: 3.871 44

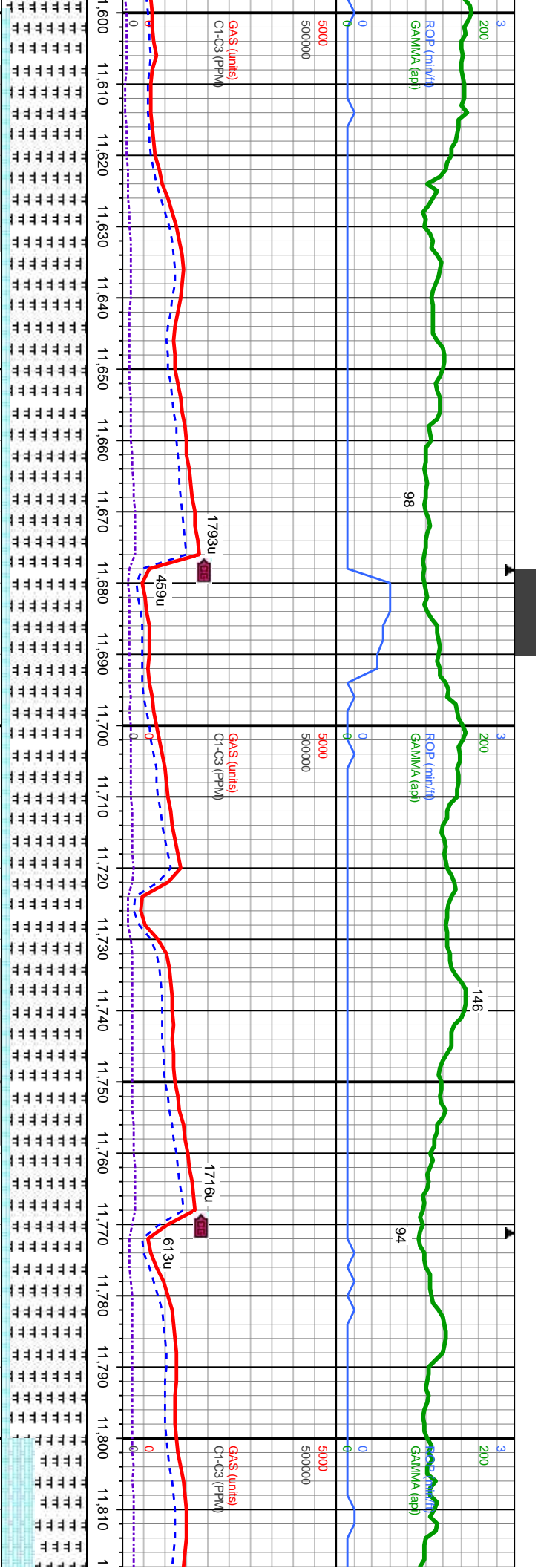
10,500'-10,600' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gy/brn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut	7450
10,600'-10,700' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gy/brn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut	7450
10,700'-10,710' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, tr bent, MRLST: med-dk gy-dk gy/brn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr lt bl flr w/ mod streaming cut	7450











MW IN: 9.4 OUT: 9.4
VIS IN: 45 OUT: 43

D: 11,606.
/D: 6,990.71.
clination: 90.03 -
azimuth: 93.09 -
S: 4,800.1.

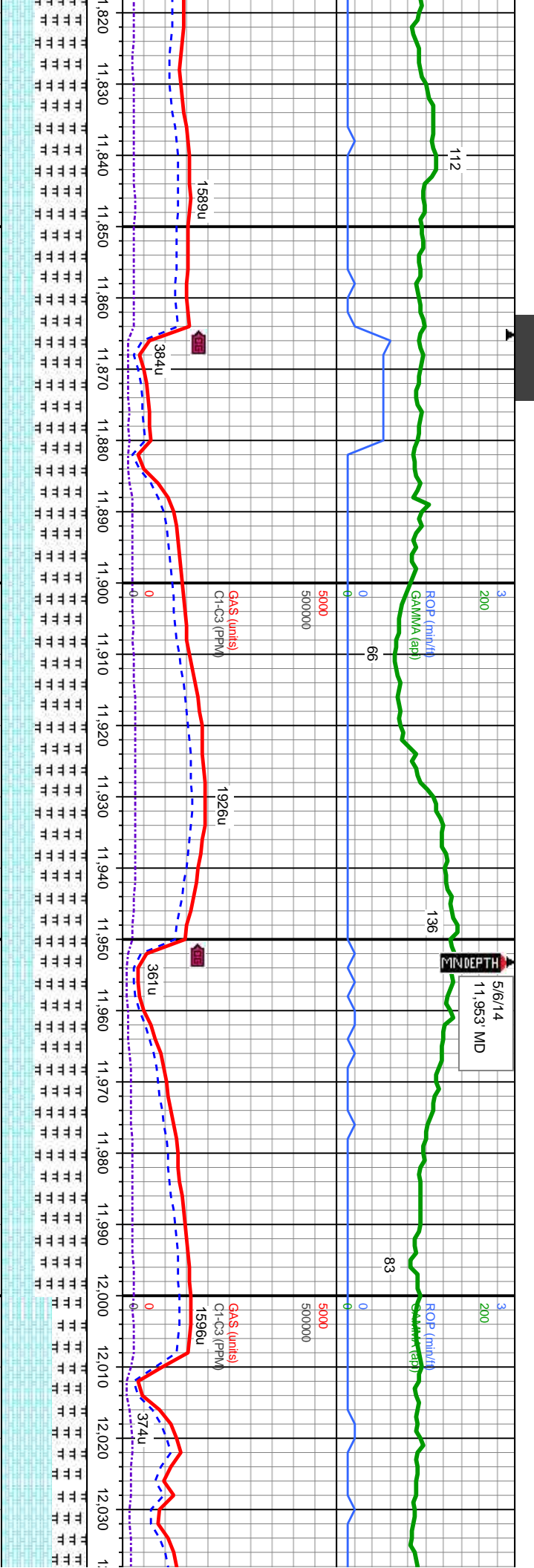
MD: 11,698
TVD: 6,990.83.
Inclination: 89.81 -
Azimuth: 92.07 -
VS: 4,892.

MW IN: 9.4 OUT: 9.4
VIS IN: 48 OUT: 45

MD: 11,790.
TVD: 6,990.77.
Inclination: 90.27 -
Azimuth: 92.27 -
VS: 4,983.93.

11,600'-11,700' MD: MRLST: med-dk gy-dk gybrn, sb plty-sb blk, mod sft-firm, sb arg-slt, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-ly-sb plty, mod sft-mod frm, wxy tex, v calc, sl tr lt bl flr w/ mod streaming cut	7450
11,700'-11,800' MD: MRLST: med-dk gy-dk gybrn, sb plty-sb blk, mod sft-firm, sb arg-slt, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-ly-sb plty, mod sft-mod frm, wxy tex, v calc, sl tr lt bl flr w/ mod streaming cut	7450
11,800' sb arg-frm, wxy	7450





MD: 11,882
TVD: 6,991.12
Inclination: 89.29
Azimuth: 91.99
VS: 5,075.87

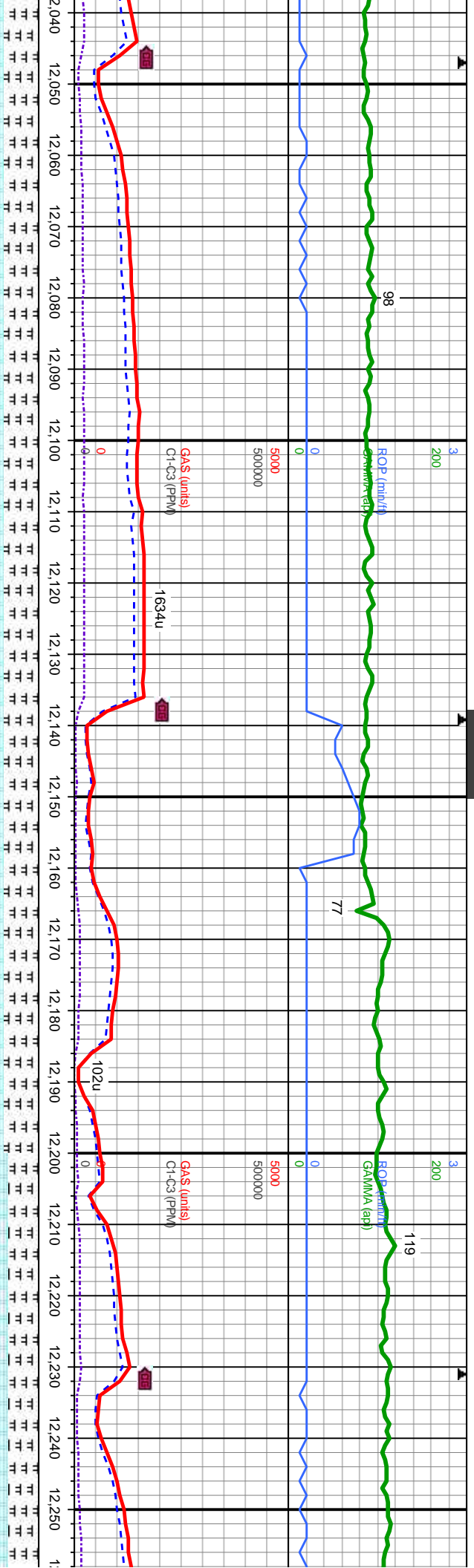
MD: 11,974
TVD: 6,991.77
Inclination: 89.9
Azimuth: 92.41
VS: 5,167.8

-11,900' MD: MRLST: med-dk gy-dk gy/brn, sb ply-sb blkly, mod sft-frn, sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb ply, mod sft-mod tex, v calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

11,900'-12,000' MD: MRLST: med-dk gy-dk gy/brn, sb ply-sb blkly, mod sft-frn, sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb ply, mod sft-mod frn, wxy tex, v calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

12,000'-12,100' MD: CHK: sft-mod frn, wxy tex, v calc, mod sft-frn, sb arg-sily, ca





MD: 12,066.
TVD: 6,991.39.
Inclination: 90.58 -
Azimuth: 92.65 -
VS: 5,259.7.

MW IN: 9.4 OUT: 9.4
VIS IN: 46 OUT: 44

MD: 12,157.
TVD: 6,991.25.
Inclination: 89.59 -
Azimuth: 92.67 -
VS: 5,350.6.

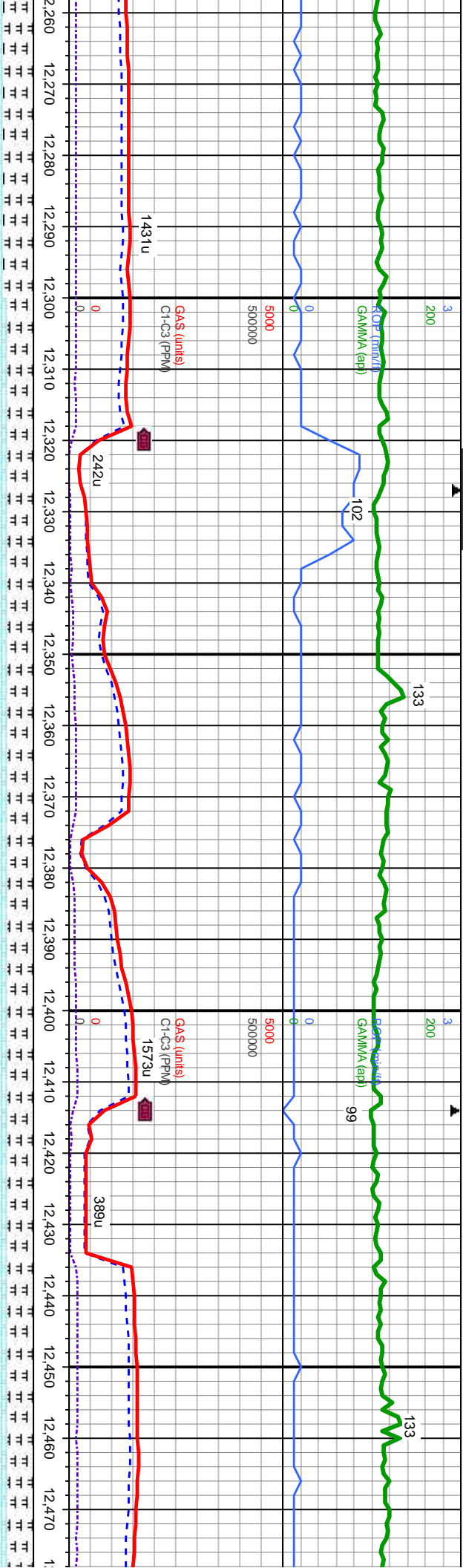
MW IN: 9.4 OUT: 9.3+
VIS IN: 50 OUT: 45

MD: 12,249.
TVD: 6,991.39.
Inclination: 90.24 -
Azimuth: 92.91 -
VS: 5,442.49.

lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y,
mod sft-frm, sb arg-slty, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

12,100'-12,200' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb ply, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb ply-sb blk-y,
mod sft-frm, sb arg-slty, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

12,200'-12,300' MD: CHK: lt-med gy-lt gy brn, sl
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-
mod sft-frm, sb arg-slty, calc, tr sec cal, sl tr lt bl



6350																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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mot, sb biky-sb pily, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb biky,
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

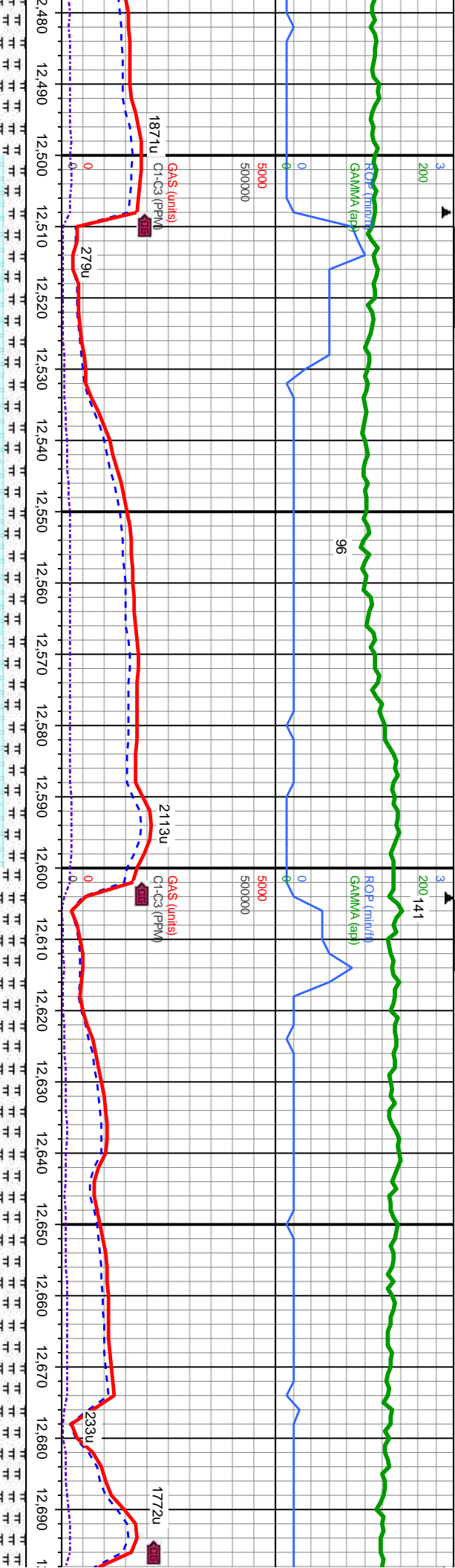
12,300'-12,400' MD: CHK: lt-med gy-lt gy brn, sl mot, sb biky-sb pily, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb biky,
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

7450

12,400'-12,500' MD: CHK: lt-med gy-lt gy brn, sl mot, sb biky-sb pily,
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streamin

7450

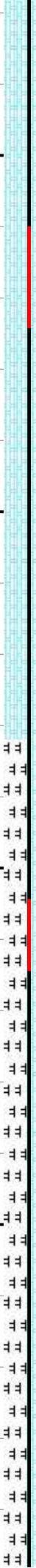




6350 MW IN: 9.1+ OUT: 9.2
VIS IN: 47 OUT: 44

MD: 12.532
TVD: 6.993.17
Inclination: 89.01
Azimuth: 93.17
VS: 5.725.08

TVD (ft)



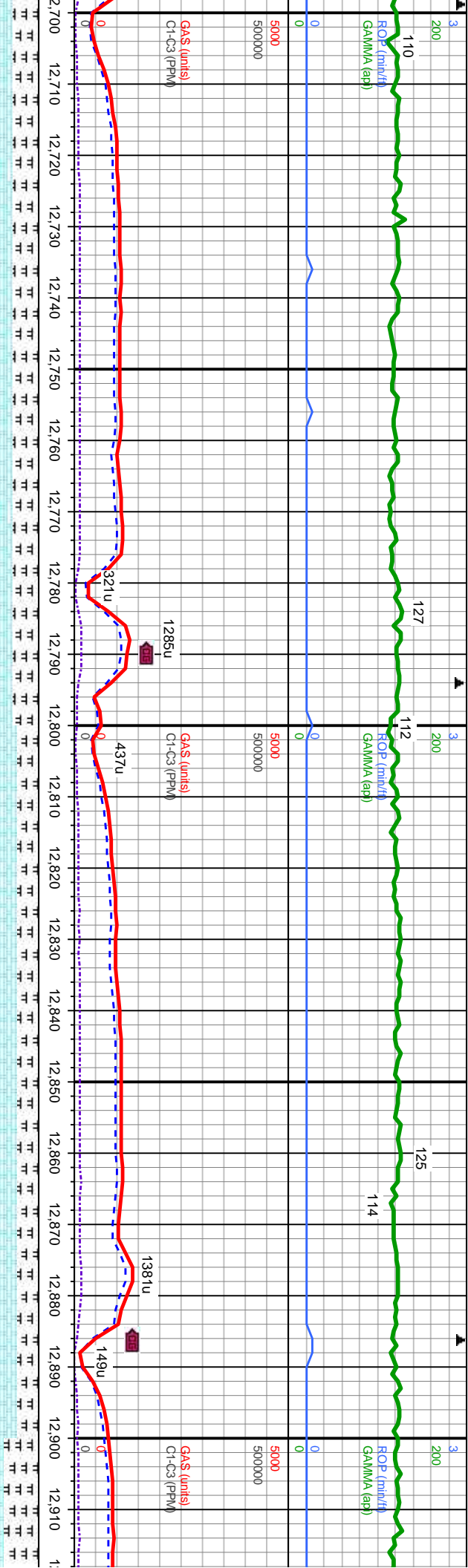
6350 MW IN: 9.1+ OUT: 9.2
VIS IN: 47 OUT: 44

MD: 12.627
TVD: 6.994.69
Inclination: 89.16
Azimuth: 92.65
VS: 5.819.95

TVD (ft)

mod sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb bily, mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flwr w/ mod streaming cut





6350 MW IN: 9.1 OUT: 9.1
VIS IN: 44 OUT: 44

MD: 12,721
TVD: 6,995.59
Inclination: 89.75
Azimuth: 92.63
VS: 5,913.84
TVD (ft)

12,700'-12,800' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

6350

MD: 12,816
TVD: 6,995.85
Inclination: 89.93
Azimuth: 92.35
VS: 6,008.75
TVD (ft)

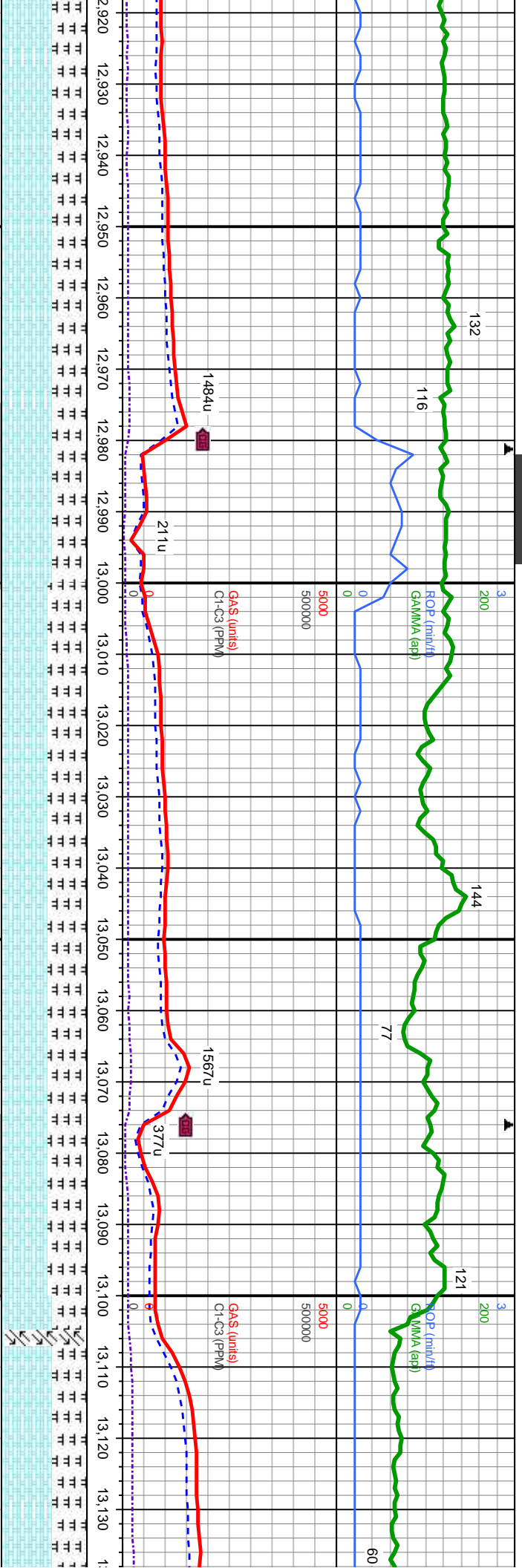
12,800'-12,900' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

6350

MD: 12,910
TVD: 6,994.8
Inclination: 91.35
Azimuth: 93.23
VS: 6,102.63
TVD (ft)

12,900'-12,910' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut





MW IN: 9.1 OUT: 9.1
VIS IN: 44 OUT: 43

MD: 13,004
TVD: 6,994.3
Inclination: 89.26
Azimuth: 92.73
VS: 6,196.5

MW IN: 9.2 OUT: 9.2
VIS IN: 43 OUT: 43

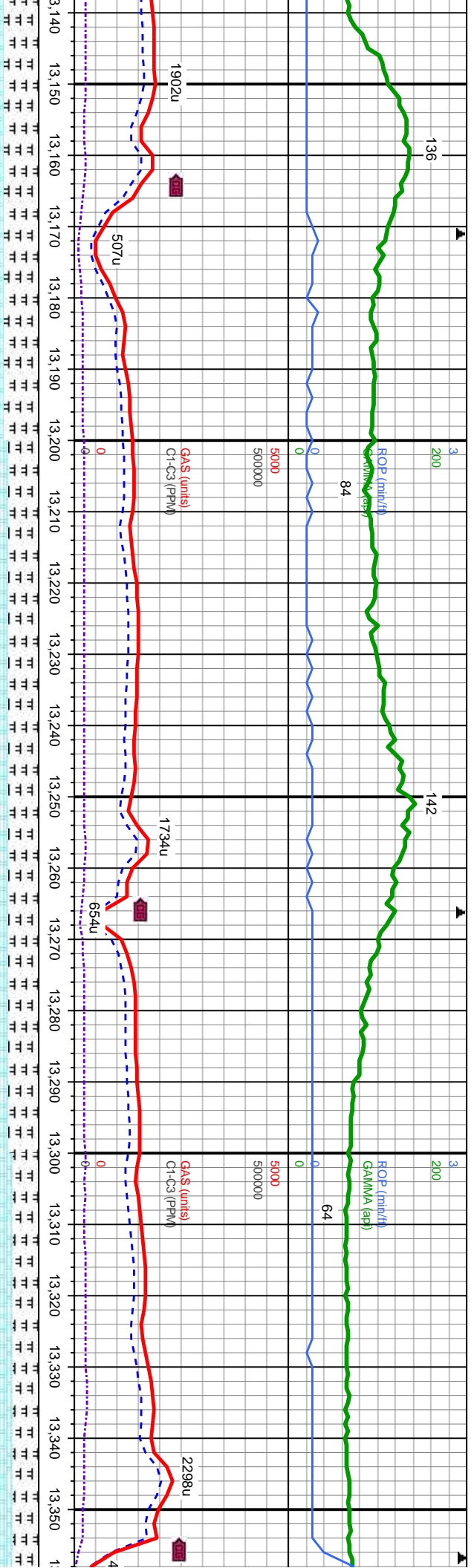
MD: 13,099
TVD: 6,995.56
Inclination: 89.22
Azimuth: 92.99
VS: 6,291.37

0'-13,000' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod
mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blk-y,
sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flwr w/ mod streaming cut

13,000'-13,100' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pily, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blk-y,
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flwr w/ mod streaming cut

13,100'-13,200' MD: CHK:
sft-mod frm, wxy tex, v ca
mod sft-frm, sb arg-sily, c





MD: 13,193
TVD: 6,996.26
Inclination: 89.93
Azimuth: 93.13
VS: 6,385.23

MW IN: 9.2 OUT: 9.2
VIS IN: 44 OUT: 43

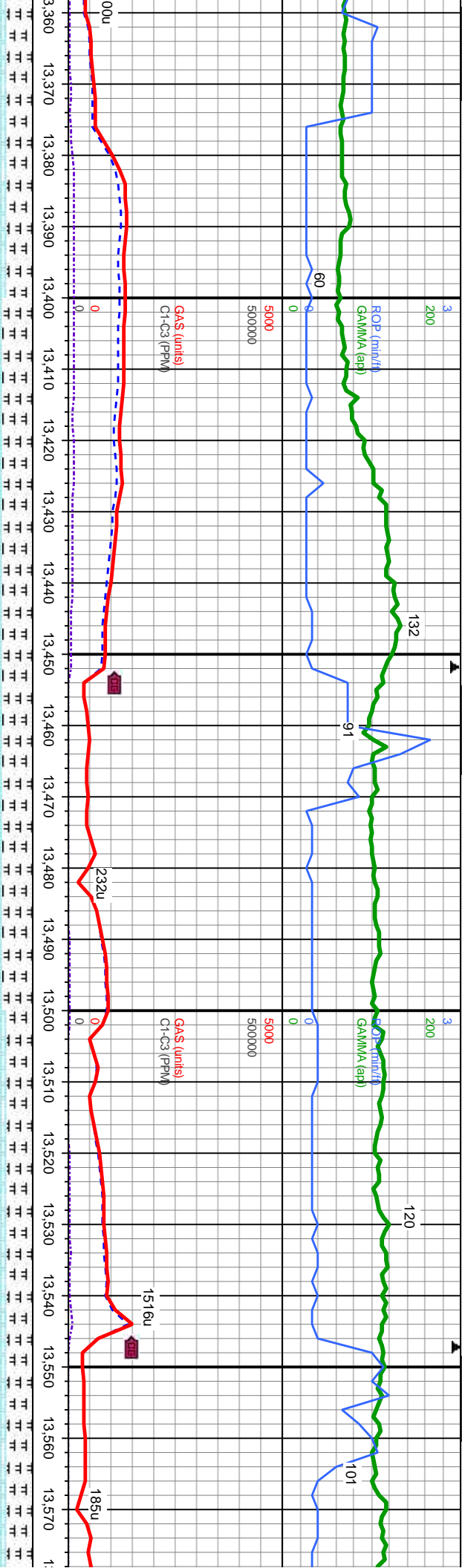
MD: 13,287
TVD: 6,995.86
Inclination: 90.55
Azimuth: 93.69
VS: 6,479.06

lt-med gy-lt gy brn, sl mot, sb blk-y-sb pty, mod
ic, MRLST: med-dk gy-dk gybrn, sb pty-sb blk-y,
alc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

13,200'-13,300' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blk-y-sb pty, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pty-sb blk-y,
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

13,300'-13,400' MD: CHK: lt-med gy-lt gy brn, sl
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl





MW IN: 9.1 OUT: 9.1
VS IN: 44 OUT: 44

MD: 13,382.
TVD: 6,995.26.
Inclination: 90.18 -
Azimuth: 93.06 -
VS: 6,573.89.

TVD (ft)

MD: 13,476.
TVD: 6,994.82.
Inclination: 90.36 -
Azimuth: 91.96 -
VS: 6,667.8.

TVD (ft)

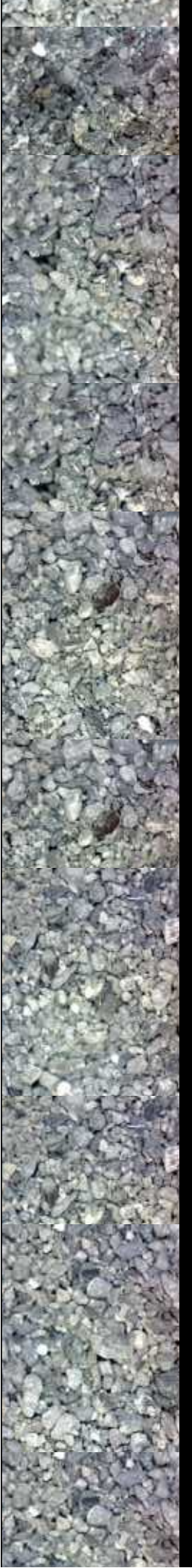
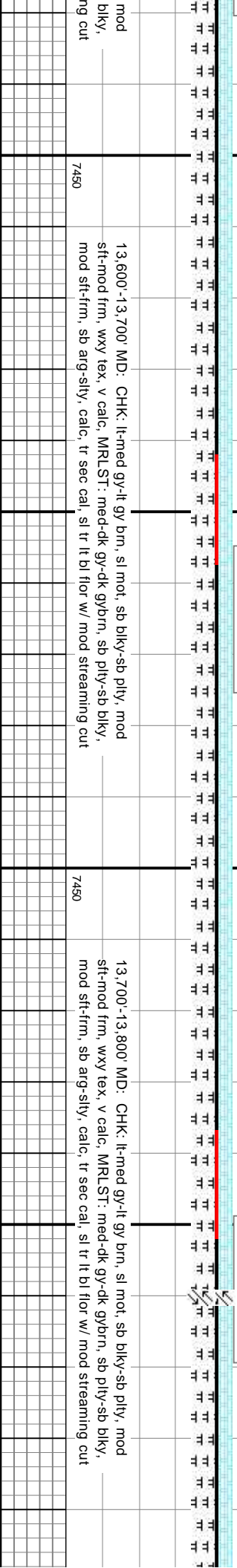
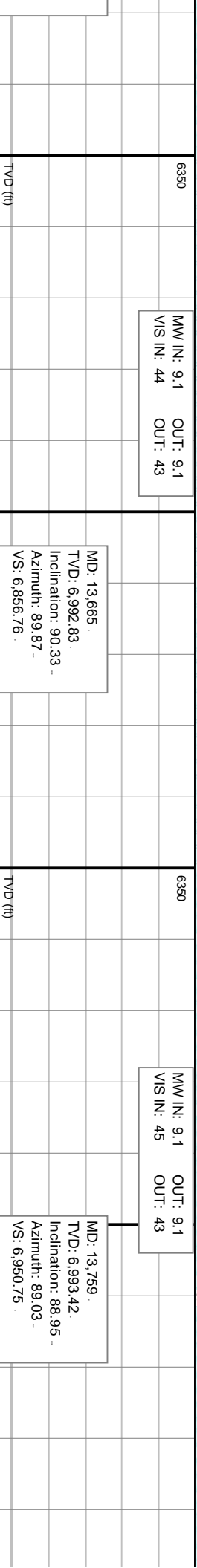
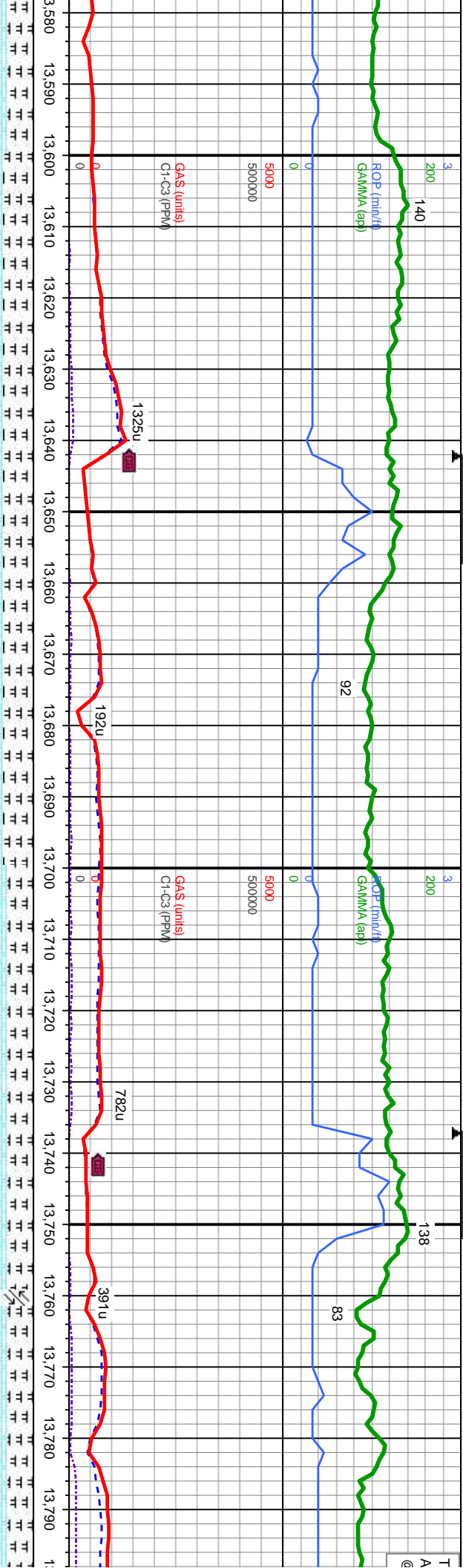
MD: 13,570.
TVD: 6,993.81.
Inclination: 90.86 -
Azimuth: 90.63 -
VS: 6,761.77.

mot. sb blkly-sb pily, mod
dk gybrn, sb pily-sb blkly,
flor w/ mod streaming cut

13,400'-13,500' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb blkly,
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flor w/ mod streaming cut

13,500'-13,600' MD: CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily,
sft-mod frm, wxy tex, v calc, MRLST: med-dk gy-dk gybrn, sb pily-sb
mod sft-frm, sb arg-sily, calc, tr sec cal, sl tr lt bl flor w/ mod streami





RIP FOR BIT
AND MUDMOTOR
13,831' MD

5/7/14

13,831' MD

MINDEPTH

NB #3 VEREL VSS13D
IN @ 13831' MD, OB #2
DRLD 6403' IN 44.5 HRS

99

138

3

200

ROP (min/h)

GAMMA (api)

5000

500000

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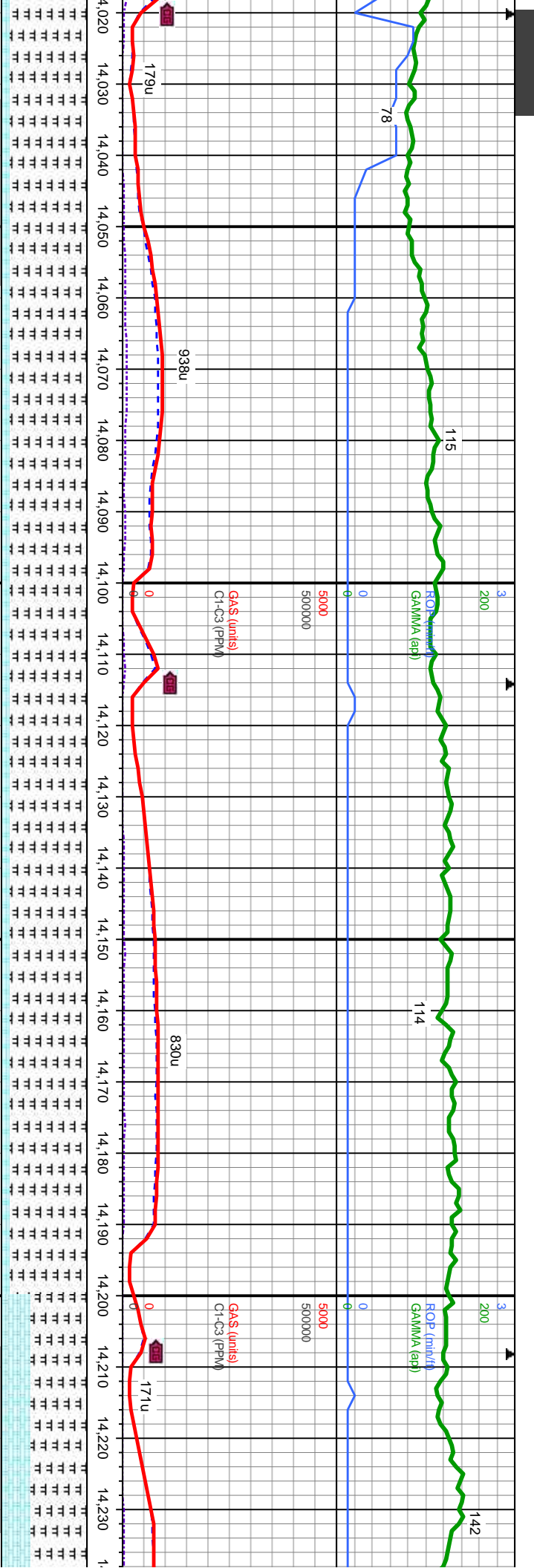
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MW IN: 9.2 OUT: 9.2
VIS IN: 48 OUT: 45

MD: 14,042.
TVD: 6,998.94
Inclination: 88.92
Azimuth: 85.74
VS: 7,233.37

TVD (ft)

MD: 14,137.
TVD: 7,000.51
Inclination: 89.19
Azimuth: 85.68
VS: 7,328.75

TVD (ft)

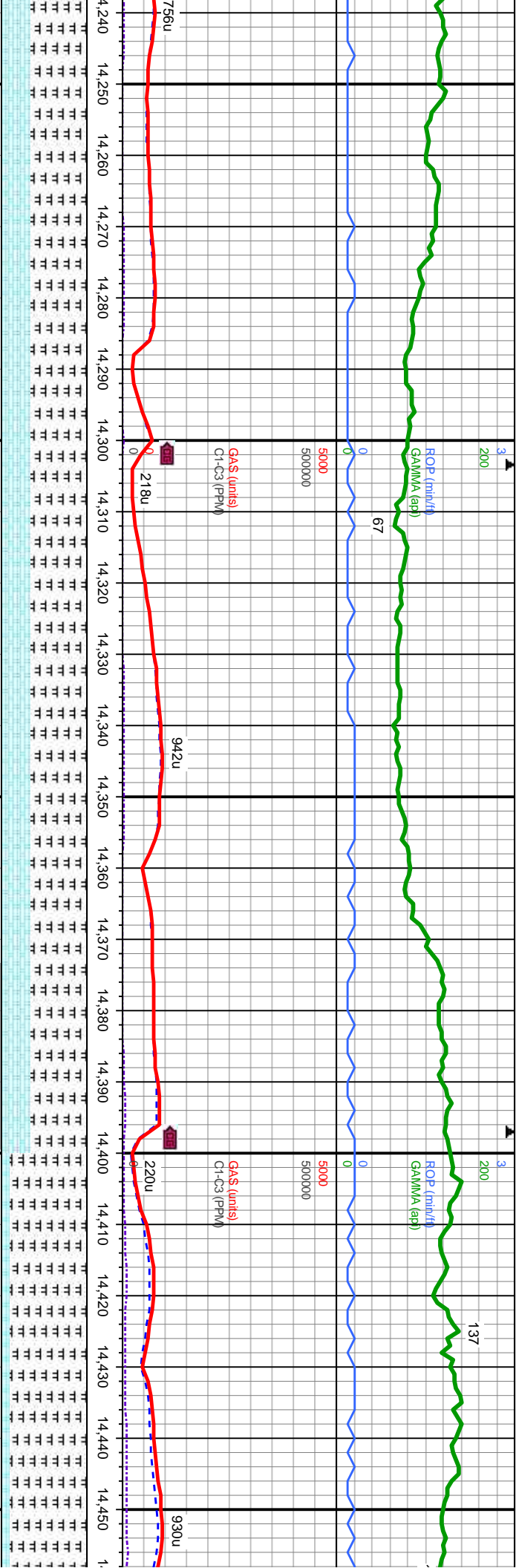
MW IN: 9.2 OUT: 9.2
VIS IN: 49 OUT: 45

MD: 14,231.
TVD: 7,001.71
Inclination: 89.35
Azimuth: 84.95
VS: 7,422.42

0'-14,100' MD: MRLST: med-dk gy-dk gybrn, sb pty-sb bky, mod sft-frm, arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb bky-sb pty, mod sft-mod frn, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

14,100'-14,200' MD: MRLST: med-dk gy-dk gybrn, sb pty-sb bky, mod sft-frm, arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb bky-sb pty, mod sft-mod frn, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

14,200'-14,300' MD: MRLS: med-dk gy-dk gybrn, sb pty-sb bky, mod sft-frm, arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb bky-sb pty, mod sft-mod frn, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut



6350	MD: 14.325 TVD: 7,001.91 Inclination: 90.4 Azimuth: 86.04 VS: 7.516.12	6350	MD: 14.420 TVD: 7,000.51 Inclination: 91.29 Azimuth: 86.38 VS: 7.610.89
TVD (ft)		TVD (ft)	

14,300'-14,400' MD: MRLST: med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-fm, sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut	7450	14,400'-14,500' MD: MRLST: med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-fm, sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut	7450
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5/8/14
14,492' MD



3
200
ROP (min/h)
GAMMA (api)

5000
500000

GAS (units)
Cl-C3 (PPM)

0

165u

6350

MW IN: 9.2 OUT: 9.2
VIS IN: 51 OUT: 50

MD: 14,514.
TVD: 6,999.18
Inclination: 90.33 -
Azimuth: 86.24 -
VS: 7,704.68

1, sb ply-sb blk, mod sft-frm,
sb blk-sb ply, mod sft-mod
or w/ mod streaming cut

7450

14,500'-14,600' MD: MRLST: med-dk gy-dk gybrn, sb ply-sb blk, mod sft-frm,
sb arg-slt, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-sb ply, mod sft-mod
frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

7450

MD: 14,608
TVD: 6,998.84
Inclination: 90.09 -
Azimuth: 86.7 -
VS: 7,797.87

MW IN: 9.2 OUT: 9.3
VIS IN: 50 OUT: 48

14,600'-14,700' MD: MRLST: med-dk gy-dk gybrn, sb ply-sb blk, mo
sb arg-slt, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-sb ply, moc
frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming

7450



3
200
ROP (min/h)
GAMMA (api)

5000
500000

GAS (units)
Cl-C3 (PPM)

0

166u

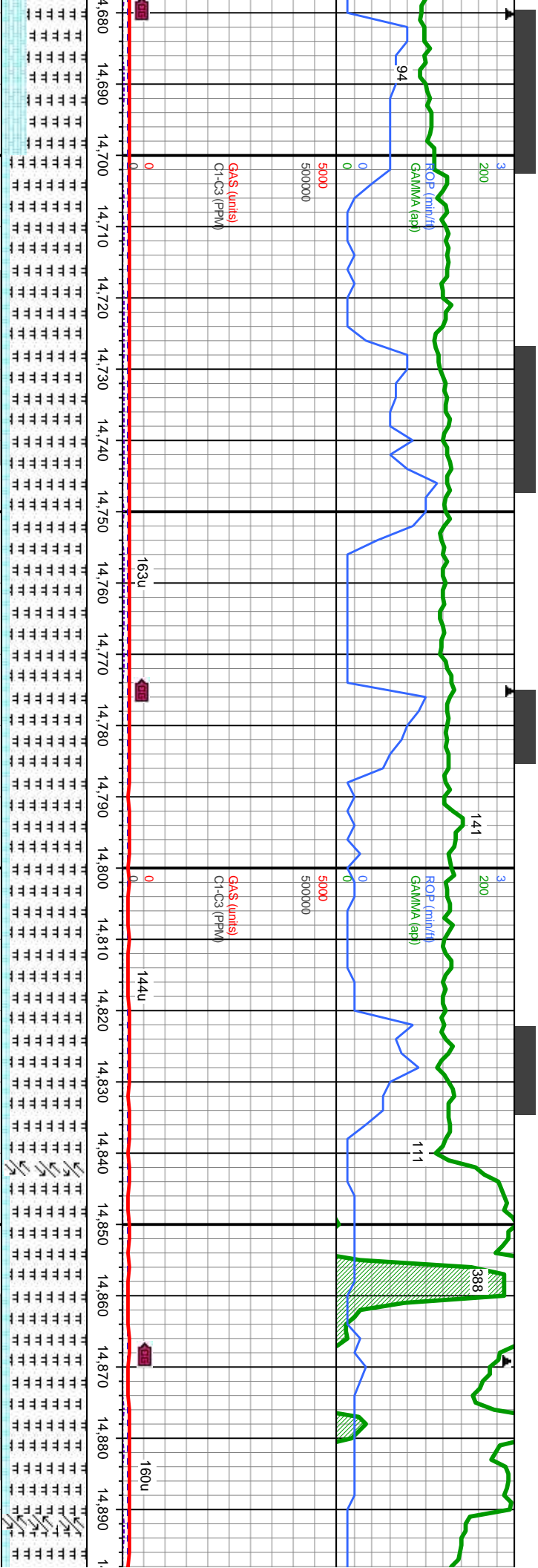
6350

145u

142

81





MD: 14,703
TVD: 6,998.31
Inclination: 90.55
Azimuth: 85.19
VS: 7,892.64

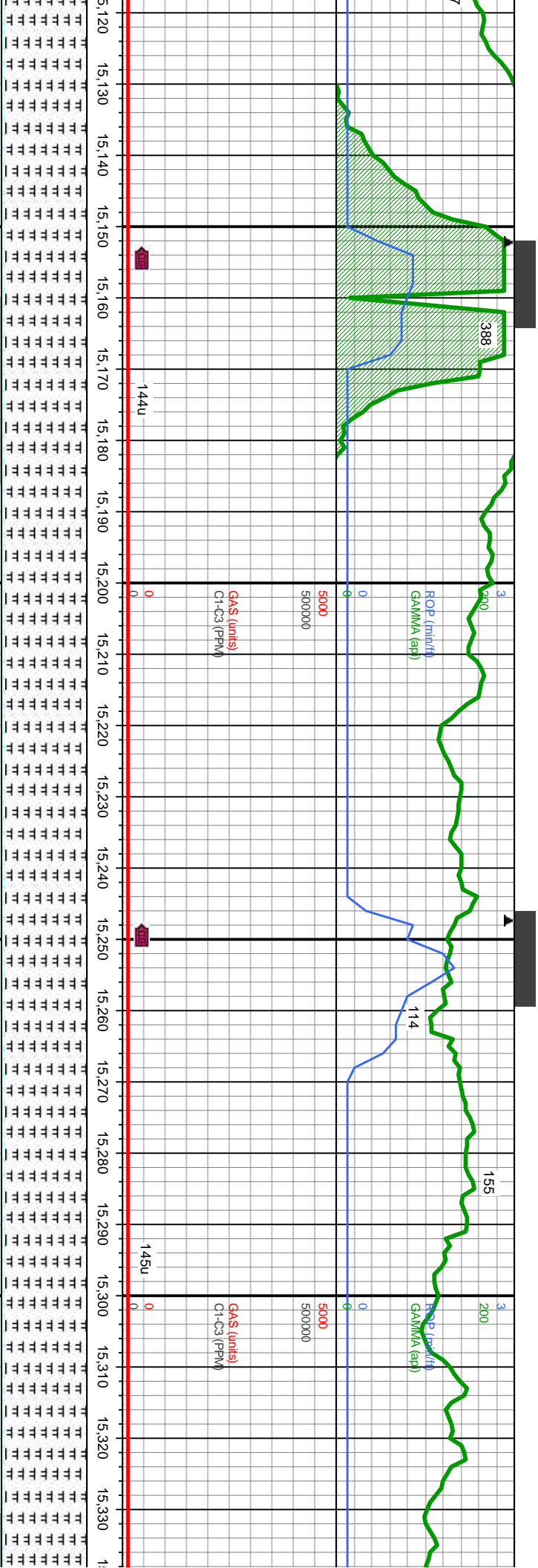
MD: 14,797
TVD: 6,998.29
Inclination: 89.47
Azimuth: 83.94
VS: 7,986.21

MD: 14,844
TVD: 6,998.74
Inclination: 89.44
Azimuth: 83.48
VS: 8,032.93

MD: 14,892
TVD: 6,998.92
Inclination: 90.12
Azimuth: 83.61
VS: 8,080.62

d sft-frm,	14,700'-14,800' MD: MRLST: med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-frm,	14,800'-14,900' MD: MRLST: med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-frm, v
sft-mod	sb arg-sily, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod sft-mod	arg, sl sily ip, calc, tr bent, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod
cut	frm, wxy tex, v calc, tr bent, sl tr lt bl flr w/ mod streaming cut	sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut
	7450	7450





MW IN: 9.1 OUT: 9.2
VIS IN: 46 OUT: 47

MD: 15,174.
TVD: 7,001.22
Inclination: 89.26
Azimuth: 84.64
VS: 8,360.73

TVD (ft)

MD: 15,269.
TVD: 7,002.48
Inclination: 89.22
Azimuth: 86.1
VS: 8,455.41

TVD (ft)

15,200 MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blkly, mod sft-frm, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pty, mod sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

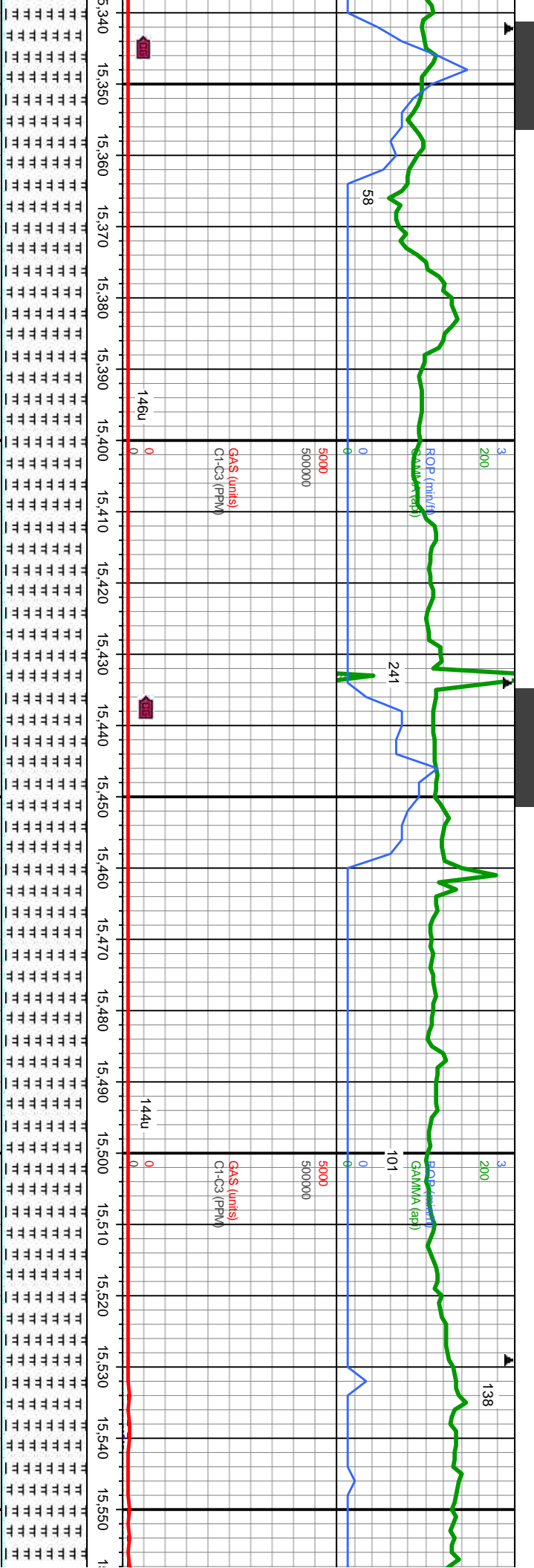
7450

15,200-15,300 MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blkly, mod sft-frm, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pty, mod sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

7450

15,300-15,400 MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blkly, mod sft-frm, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pty, mod sft-mod frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flr w/ mod streaming cut

7450



MD: 15,363
TVD: 7,003.5
Inclination: 89.53
Azimuth: 87.3
VS: 8,549.25

MD: 15,457
TVD: 7,004.14
Inclination: 89.69
Azimuth: 88.68
VS: 8,643.19

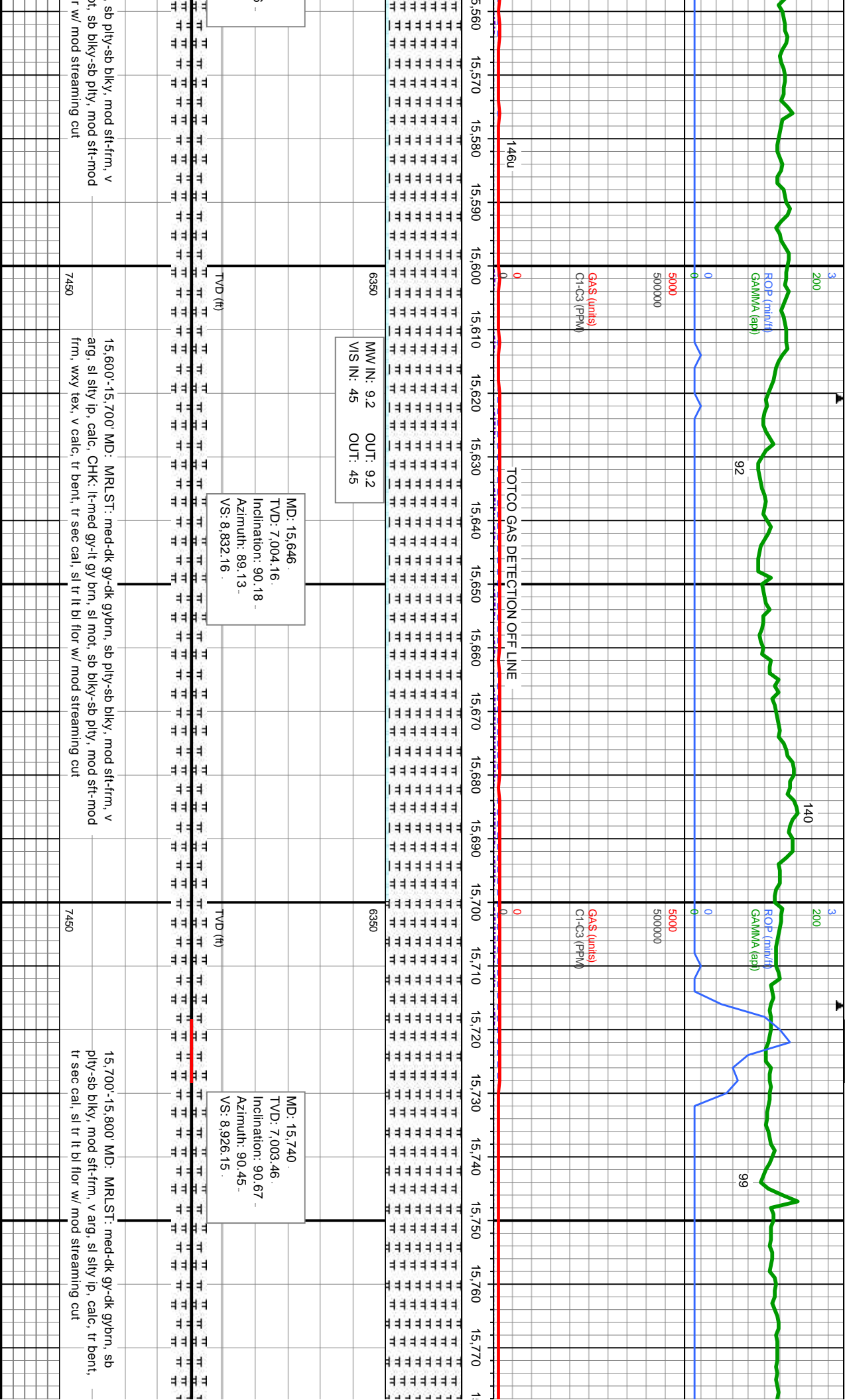
MD: 15,552
TVD: 7,004.35
Inclination: 90.06
Azimuth: 89.09
VS: 8,738.17

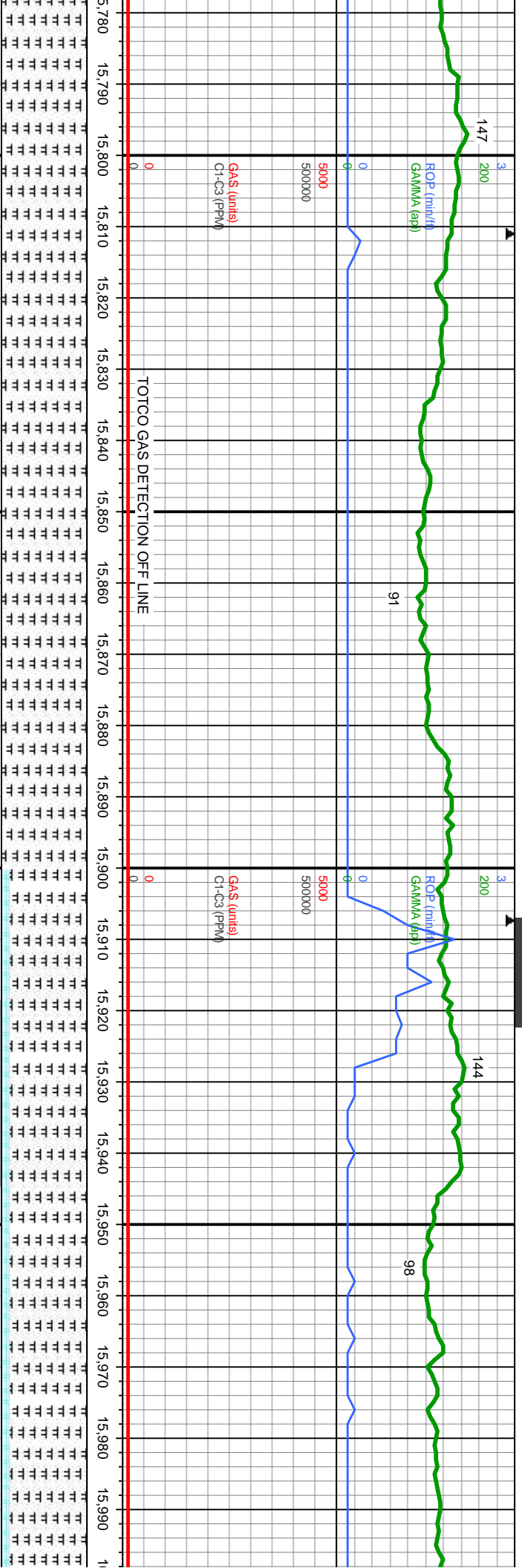
med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-frm, v
ed gy-lt gy brn, sl mot, sb blkly-sb pily, mod sft-mod
r sec cal, sl tr lt bl flwr w/ mod streaming cut

15,400'-15,500' MD: MRLST: med-dk gy-dk gybrn, sb pily-sb blkly, mod sft-frm, v
arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blkly-sb pily, mod sft-mod
frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flwr w/ mod streaming cut

15,500'-15,600' MD: MRLST: med-dk gy-dk gybrn
arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot
frm, wxy tex, v calc, tr bent, tr sec cal, sl tr lt bl flwr







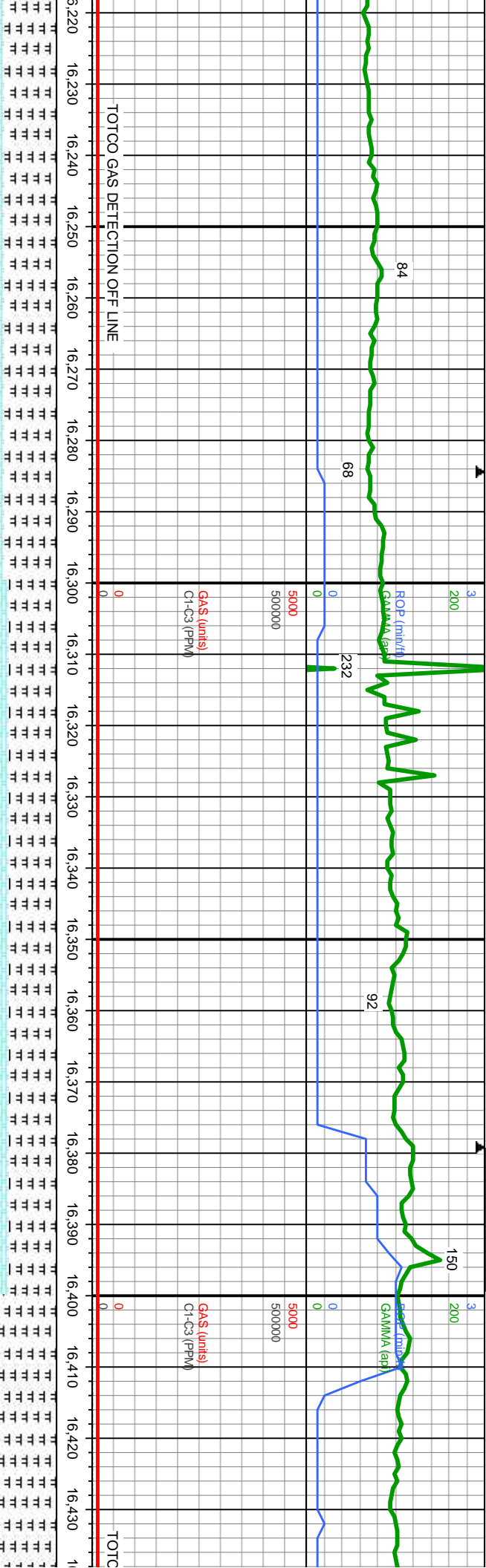
MD: 15,835.
TVD: 7,001.71.
Inclination: 91.44 -
Azimuth: 90.86 -
VS: 9,021.13.

15,800'-15,900' MD: MRLST: med-dk gy-dk gybrn, sb
ply-sb blkly, mod sft-firm, v arg, sl silty ip, calc, tr bent,
tr sec cal, sl tr lt bl flr w/ mod streaming cut

MW IN: 9.1 OUT: 9.2
VIS IN: 44 OUT: 46

MD: 15,929.
TVD: 7,000.03.
Inclination: 90.61 -
Azimuth: 90.99 -
VS: 9,115.1.

15,900'-16,000' MD: MRLST: med-dk gy-dk gybrn, sb
ply-sb blkly, mod sft-firm, v arg, sl silty ip, calc, tr bent,
tr sec cal, sl tr lt bl flr w/ mod streaming cut



NW IN: 9.2 OUT: 9.2
VIS IN: 48 OUT: 44

MD: 16,307
TVD: 6,996.26
Inclination: 91.63
Azimuth: 91.82
VS: 9,492.98

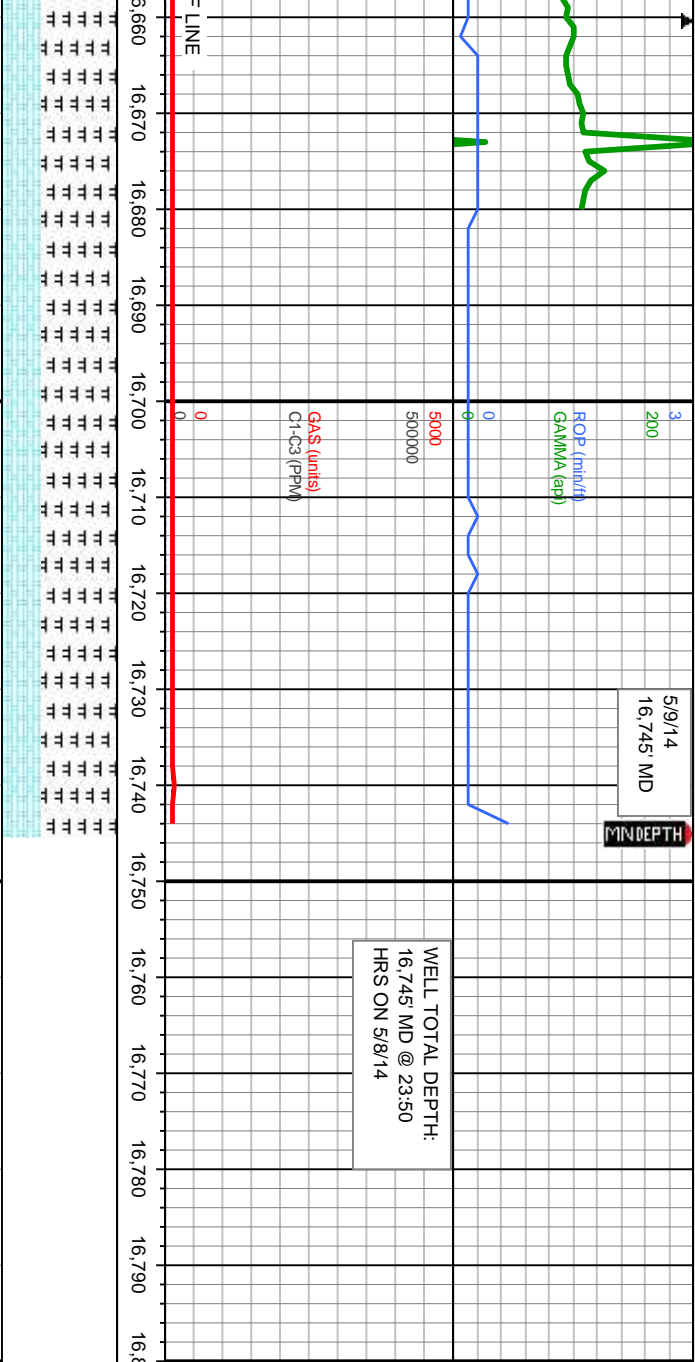
MD: 16,401
TVD: 6,994.24
Inclination: 90.83
Azimuth: 91.07
VS: 9,586.93

16,300' MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blk, mod sft-frn, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-ty-sb pty, mod sft-mod sft-frn, wxy tex, v calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

16,300'-16,400' MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blk, mod sft-frn, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-ty-sb pty, mod sft-mod frn, wxy tex, v calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut

16,400'-16,500' MD: MRLST: med-dk gy-dk gybrn, sb pty-sb blk, mod sft-frn, v arg, sl sily ip, calc, CHK: lt-med gy-lt gy brn, sl mot, sb blk-ty-sb pty, mod sft-mod frn, wxy tex, v calc, tr sec cal, sl tr lt bl flr w/ mod streaming cut





MD: 16,673.
TVD: 6,991.02.
Inclination: 91.6 -
Azimuth: 90.49 -
VS: 9,868.89 .

TVD (ft)

PROJ TO BIT
MD: 16,745.
TVD: 6,989.01.
Inclination: 91.6 -
Azimuth: 90.49 -
VS: 9,930.86 .

THANK YOU FOR USING
COLUMBINE LOGGING INC.

h, sb pty-sb blkly, mod sft-frm,
mot, sb blkly-sb pty, mod
or w/ mod streaming cut

7450

16,700'-16,745' MD: MRLST: med-dk gy-dk
gybrn, sb pty-sb blkly, mod sft-frm, v arg, sl sily
lp, calc, CHK: lt-med gy-lt gy brn, sl mot, sb
blkly-sb pty, mod sft-mod frm, wxy tex, v calc, tr
sec cal, sl tr lt bl flr w/ mod streaming cut

