



Scale: 5" / 100'  
Measured Depth Log

Well Name 05123381830000\_Kerbs 32N-13HZ

Location SEC 13, T3N, R68W

State COLORADO

Country USA

API Number 05123381830000

Region DJ BASIN

Spud Date 2/20/2014

Surface Coordinates 1921' FNL & 283' FEL

Bottom Hole Coordinates RELATIVE TO WELLHEAD:  
1052.05' S & 4572.2' W

Ground Elevation 4873'

Logged Interval 6557' MD To 11732' MD

Formation NIOBRARA

Type of Drilling Fluid WBM

County WELD

Rig Number H&P 307

AFE # 2084981.DRL

Field WATTENBERG

Drilling Completed 2/28/2014

K.B. Elevation 4898'

Total Depth 11732' MD

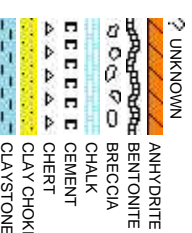
Company Anadarko

Address 1099 18th Street  
Denver, Co., 80202

Name Rhead Cannon

Company Anadarko Petro  
Address 1099 18th Street  
Room 15029  
Denver, Co., 80202

artin, Chris Johnson Columbine  
2385 S  
Denver



Operator

2022

Geologist

leum Co.

2022

Other

ine Logging Inc.

Lipan St.  
, CO

Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLOMITE	METAMORPHIC	SHALY SILTSTONE
DOLOMITIC LIMESTONE	NO SAMPLE	SILTY SHALE
GRANITE	SALT	SANDSTONE
GYPSUM	SALT-PEPPER SAND	TILL
IGNEOUS	SHALE	TUFF
SIDERITE or LIMONITE	SHALE COLORED	WELDED TUFF
LIMESTONE	SHALE GRAY	

Accessories

<b>Fossils</b>	GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL
INOCERAMUS	B BENTONITE	K KAOLIN	ANHYDRITE STRINGER
ALGAE	O OOLITE	BIT BITUMENOUS SUBSTANCE	B BENTONITE STRINGER
AMPHIPORA	O OSTRACOD	BRE BRECCIA FRAGMENTS	M MARLSTONE
BELEMNITE	P PELECYPOD	C CALCAREOUS	MIC MICACEOUS
BIOCLASTIC	P PELLET	CAR CARBONACEOUS FLAKES	MIN MINERAL CRYSTALS
BRACHIOPOD	P PISOLITE	CHT CHERT	N NODULES
BRYOZOA	PL PLANT REMAINS	COAL COAL - THIN BEDS	PH PHOSPHATE PELLETS
CEPHALOPOD	SP PLANT SPORES	DO DOLOMITIC	P PYRITE
CORAL	SC SCAPHOPOD	FE FELDSPAR	S SALT CAST
CRINOID	ST STROMATOPOROID	FER FERRUGINOUS PELLET	S SANDY
ECHINOID			SIL SILTY
<b>Minerals</b>	FISH	FER FERRUGINOUS	TU TUFACEOUS
FORAMINIFERA	AN ANHYDRITIC	GL GLAUCONITE	
F FOSSIL	AR ARGILLACEOUS	GP GYPSIFEROUS	<b>Stringer</b>

Other Symbols

<b>Oil Show</b>	P PINPOINT	DST DST INTERVAL	WIRELINE TESTED - LEFT	E EARTHY
V VUGGY	FAULT	WIRELINE TESTED - RT	FINELY XLN	
<b>Engineering</b>	D DEAD	FORMATION TOP	DRILL STEM TEST	GS GRAINSTONE
EVEN	GAS SHOW	MN DEPTH	L LITHOGRAPHIC	
Q QUESTIONABLE	BIT	OIL SHOW	MN DEPTH	MX MICROXLN
SP SPOTTED STAINING	CON CONNECTION (UP)			<b>Rounding</b>
	CON CONNECTION (DOWN)			A ANGULAR
<b>Porosity</b>	CON CONNECTION GAS	NORM NORMAL FAULT	R ROUNDED	PS PACKSTONE
E EARTHY	CON CONNECTION GAS (LEFT)	OVT OVERTURNED STRATA	B SUBANG	WS WACKESTONE
F FENESTRAL	TRIP TRIP GAS	REV REVERSE FAULT	R SUBRND	
F FRACTURE	TRIP TRIP GAS (LEFT)	CAS CASING		<b>Sorting</b>
INT INTERCRYSTALLINE	DTG DOWN TIME GAS	SCC SIDEWALL CORE (LEFT)	P POOR	M MODERATE
INT INTERCRYSTALLINE	DTG DOWN TIME GAS (LEFT)	SCC SIDEWALL CORE (RIGHT)	BS BOUNDSTONE	
M MOLDIC	CL CORE - LOST	SLIDE	C CHALKY	W WELL
O ORGANIC	CR CORE - RECOVERED	SURVEY	CX CRYPTOXLN	

Slide/Rotate

ROP  
ROF  
GAMMA

COLUMBINE LOGGING TWO MAN  
RIGGED UP ON 2/20/2014 @ 12:00HRS,  
BEGIN LOGGING  
@ 18:00 HRS 2/22/2014

KOP = 6557' MD

DRLG 8.75" HOLE W/ BIT  
#1, Smith SDI MPX,  
IN @ 1094' MD

GAS DETECTION  
PROVIDED BY  
TOTCO

Gamma + ROP  
Scale Change

GAS (units)  
C1-C3 (PPM)

Depth Labels

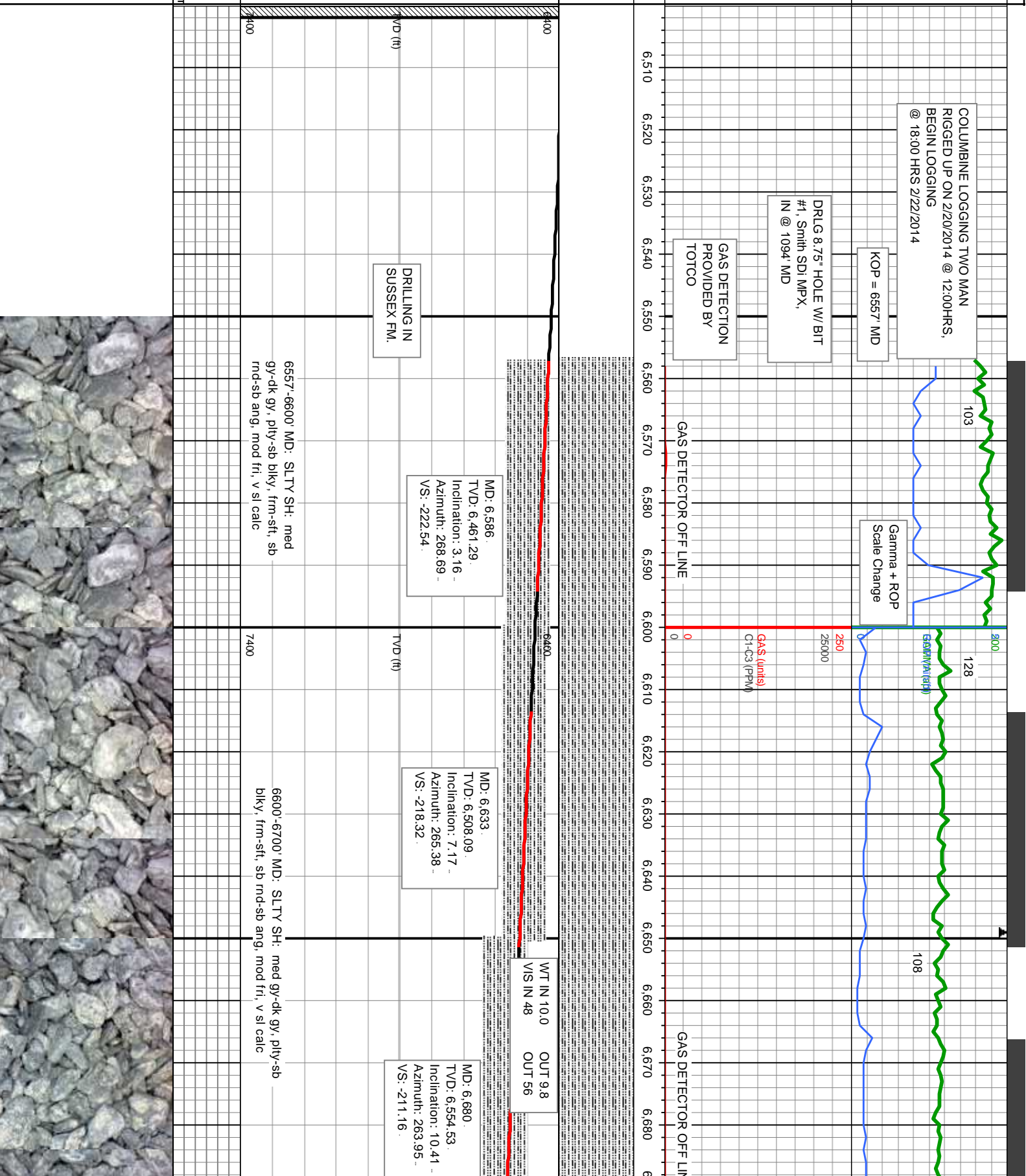
% Lith

Well Bore  
TVD

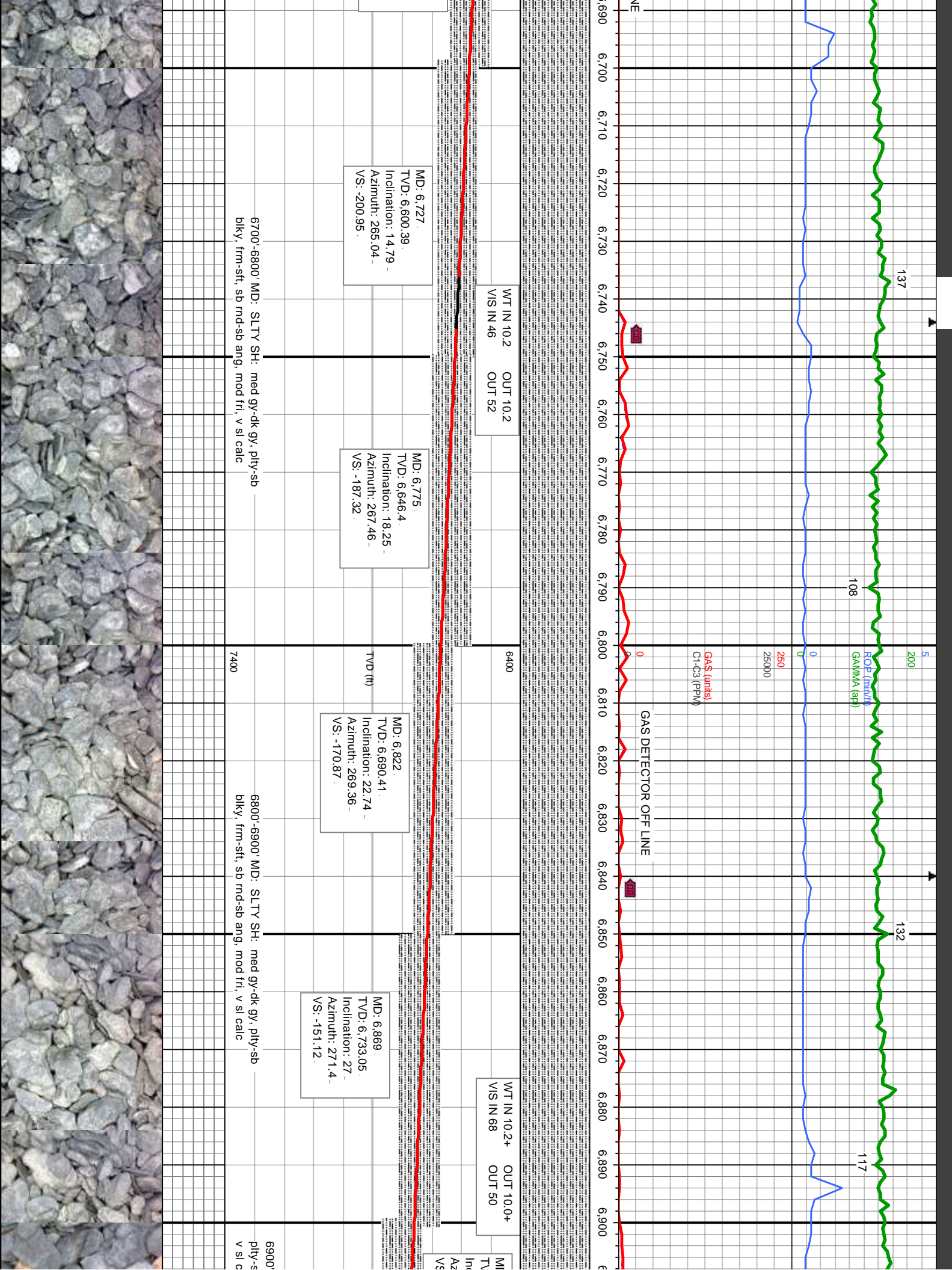
Oil Show

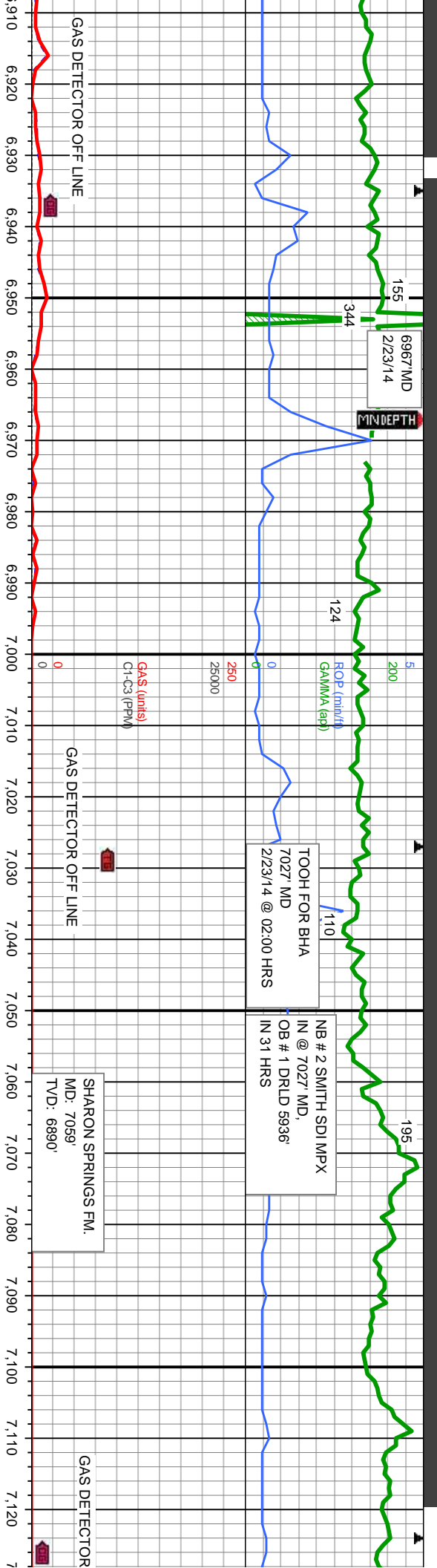
ESTIMATE

Images

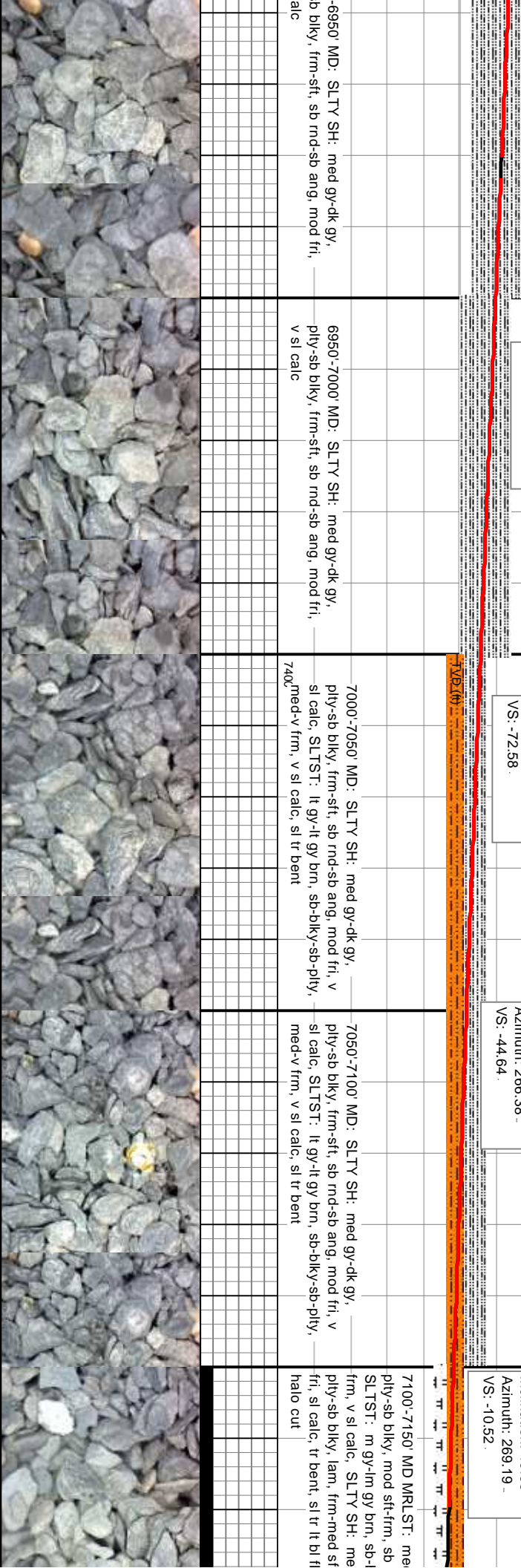








D: 6.916. D: 6.774.24 Inclination: 30.54 - Azimuth: 271.01 - VS: -128.51		WT IN 10.1 VIS IN 68	OUT 10.0+ OUT 46	MD: 6.964. TVD: 6.814.85. Inclination: 33.88 - Azimuth: 269.37 - VS: -102.94
6950'-7000' MD: SLTY SH: med gy-dk gy, b blkly, frm-sft, sb rnd-sb ang, mod fri, sl calc		6950'-7000' MD: SLTY SH: med gy-dk gy, ply-sb blkly, frm-sft, sb rnd-sb ang, mod fri, v sl calc		
7000'-7050' MD: SLTY SH: med gy-dk gy, ply-sb blkly, frm-sft, sb rnd-sb ang, mod fri, v sl calc, SLTST: lt gy-lt gy brn, sb-bkly-sb-pty, med-v frm, v sl calc, sl tr bent		7000'-7050' MD: SLTY SH: med gy-dk gy, ply-sb blkly, frm-sft, sb rnd-sb ang, mod fri, v sl calc, SLTST: lt gy-lt gy brn, sb-bkly-sb-pty, med-v frm, v sl calc, sl tr bent		
7050'-7100' MD: SLTY SH: med gy-dk gy, ply-sb blkly, frm-sft, sb rnd-sb ang, mod fri, v sl calc, SLTST: lt gy-lt gy brn, sb-bkly-sb-pty, med-v frm, v sl calc, sl tr bent		7050'-7100' MD: SLTY SH: med gy-dk gy, ply-sb blkly, frm-sft, sb rnd-sb ang, mod fri, v sl calc, SLTST: lt gy-lt gy brn, sb-bkly-sb-pty, med-v frm, v sl calc, sl tr bent		
7100'-7150' MD MRLST: me ply-sb blkly, mod sft-frm, sb SLTST: m gy-lm gy brn, sb-b frm, v sl calc, SLTY SH: me ply-sb blkly, lam, frm-med sft fri, sl calc, tr bent, sl tr lt bl fr halo cut		7100'-7150' MD MRLST: me ply-sb blkly, mod sft-frm, sb SLTST: m gy-lm gy brn, sb-b frm, v sl calc, SLTY SH: me ply-sb blkly, lam, frm-med sft fri, sl calc, tr bent, sl tr lt bl fr halo cut		







2/25+26/14  
7488' MD

118

133

MINDEPTH

TRIP FOR 7"  
CASING @  
7478' MD

84

DRLG 6.125" HOLE W/  
NB # 3 SEC MMD54  
IN @ 7421' MD,  
OB # 2 DRLD 458'  
IN 10.5 HRS

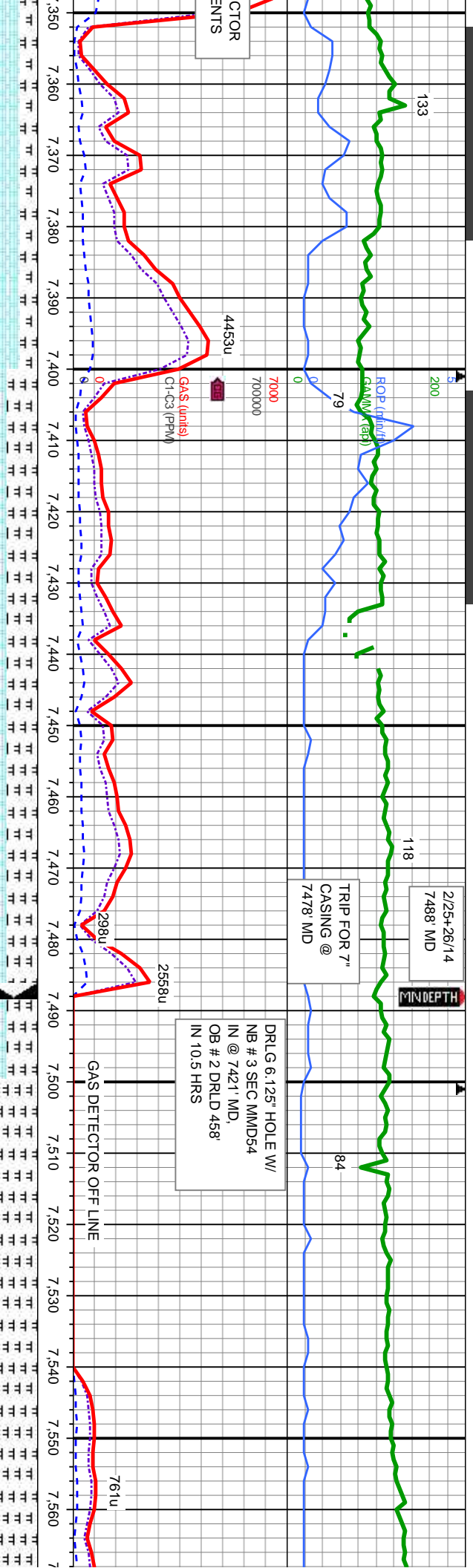
CTOR  
ENTS

4453u

2568u

GAS DETECTOR OFF LINE

761u



6400

WT IN 9.7  
VIS IN 48  
OUT 9.6  
OUT 45

MD: 7.390.  
TVD: 7.033.13.  
Inclination: 84.51 -  
Azimuth: 271.63 -  
VS: 244.87

MD: 7.428.  
TVD: 7.035.49.  
Inclination: 88.36 -  
Azimuth: 270.35 -  
VS: 282.77

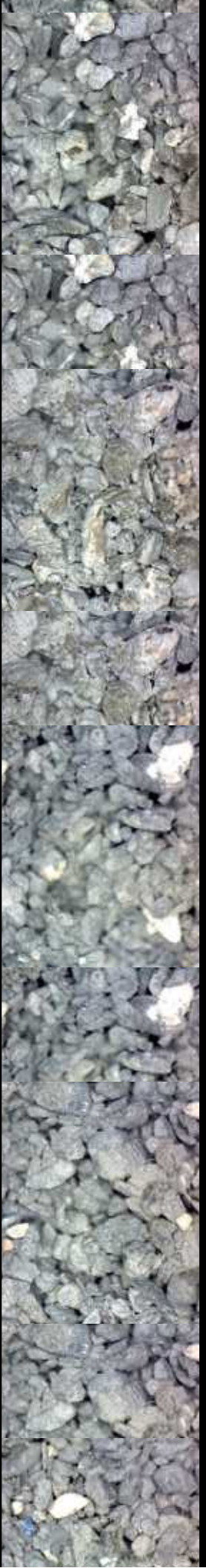
MD: 7.485.  
TVD: 7.036.51.  
Inclination: 89.59 -  
Azimuth: 268.79 -  
VS: 339.76

MD: 7.532.  
TVD: 7.037.06.  
Inclination: 89.07 -  
Azimuth: 268.71 -  
VS: 386.75

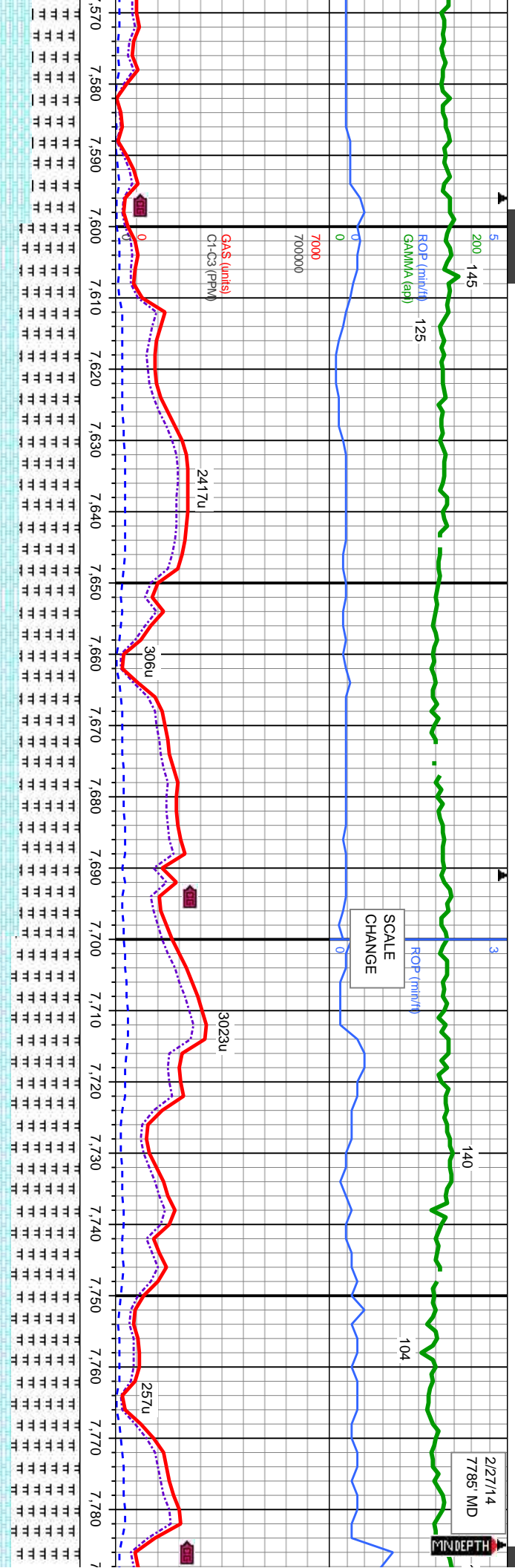
7350'-7400' MD: CHK: lt-med gy, mot, sb  
biky-sb pily, sft-sl frm, fri, chky-sb wxy, v calc,  
MRLST: med-dk gy-gy brn, sb pily-sb biky, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flor w/v  
slow-med halo cut

7400'-7488' MD: CHK: lt-med gy, mot, sb biky-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb biky, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flor w/v slow-med halo cut

7488'-7600' MD MRLST: med-dk gy-gy brn, sb pily-sb biky, r  
arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb biky-sb pily, r  
wxy, v calc, tr lt bl flor w/v slow-med halo cut







MD: 7.626  
TVD: 7.038.11  
Inclination: 89.66  
Azimuth: 269.08  
VS: 480.75

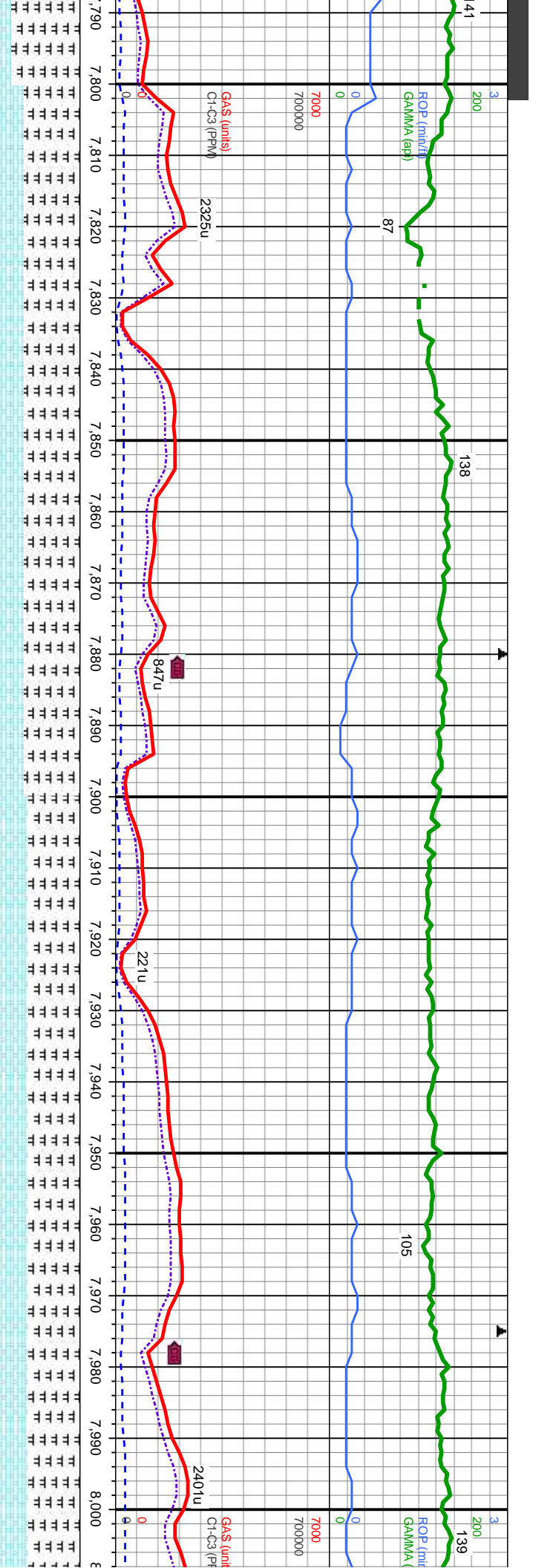
MD: 7.721  
TVD: 7.038.88  
Inclination: 89.41  
Azimuth: 268.59  
VS: 575.74

7600'-7700' MD MRLST: med-dk gy-gy brn, sb ply-sb blk, mod sft-fm, sb arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb blk-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, sl tr lt bl flr w/v slow-med halo cut

7700'-7800' MD MRLST: med-dk gy-gy brn, sb ply-sb blk, mod sft-fm, sb arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb blk-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, sl tr lt bl flr w/v slow-med halo cut



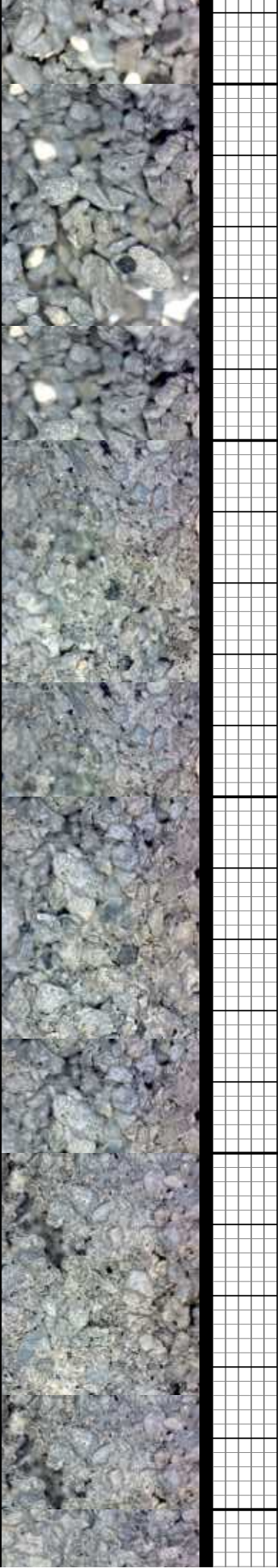




UT 9.5+ UT 44	6400	WT IN 9.3 VIS IN 58	OUT 9.3 OUT 62	WT IN 9.3 VIS IN 52	OUT 9.2 OUT 50	6400
MD: 7.815. TVD: 7,039.11. Inclination: 90.3 - Azimuth: 269.27 - VS: 669.74.						
TVD						
MD: 7.910. TVD: 7,038.48. Inclination: 90.46 - Azimuth: 268.69 - VS: 764.73.						
MD: 8.004. TVD: 7,038.74. Inclination: 89. Azimuth: 267.3 - VS: 858.7.						

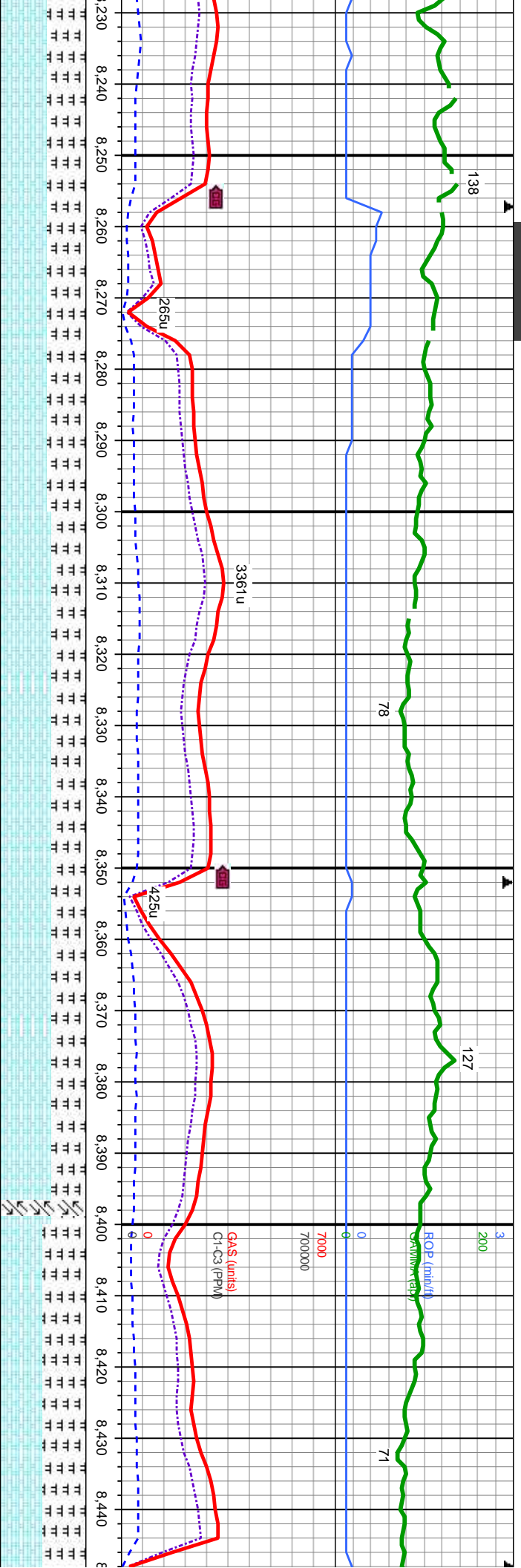
7800'-7900' MD: MRLST: med-dk gy-gy brn, sb pily-sb blk, mod sft-fm, sb arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri, chky-sb wxy, v calc, sl tr lt bl flr w/v slow-med halo cut

7900'-8000' MD: MRLST: med-dk gy-gy brn, sb pily-sb blk, mod sft-fm, sb arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri, chky-sb wxy, v calc, sl tr lt bl flr w/v slow-med halo cut







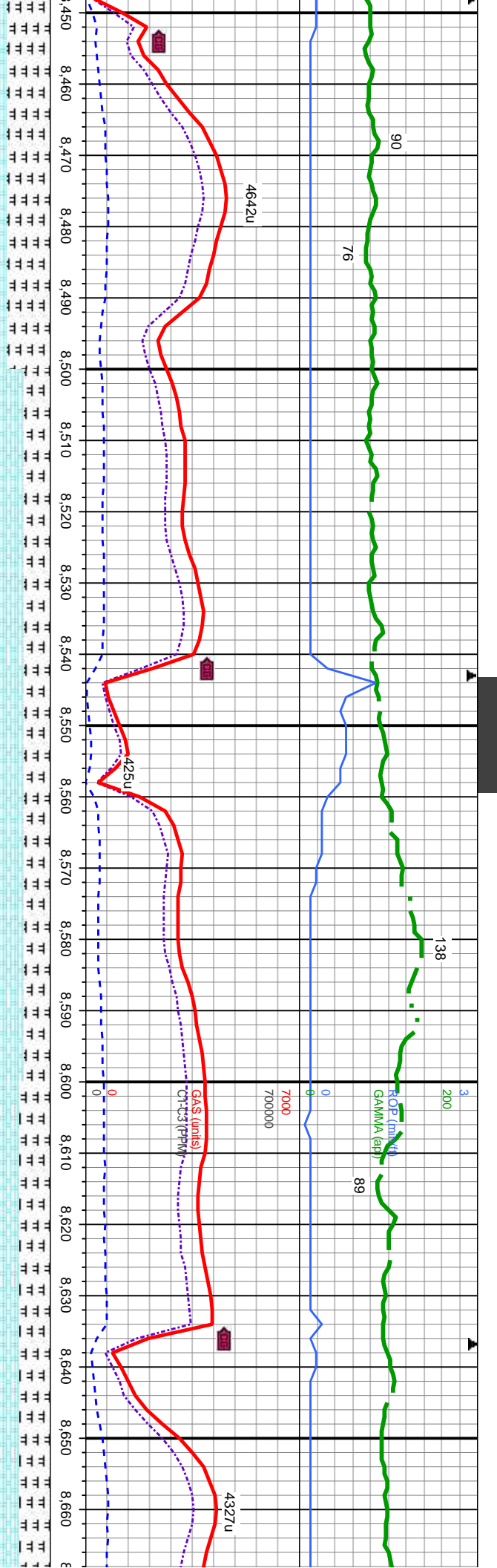


MD: 8,288.  
TVD: 7,041.3  
Inclination: 90.58  
Azimuth: 269.95  
VS: 1,142.63

MD: 8,382.  
TVD: 7,040.43  
Inclination: 90.49  
Azimuth: 269.12  
VS: 1,236.63

ID: CHK: lt-med gy, mot, sb blk-y-sb pty, sft-sl frm, fri, v calc, MRLST: med-dk gy-gy brn, sb pty-sb blk-y, mod  
8300'-8400' MD: CHK: lt-med gy, mot, sb blk-y-sb pty, sft-sl frm, fri, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pty-sb blk-y, mod  
8400'-8500' MD: CHK: lt-med gy, r chky-sb wxy, v calc, MRLST: med-sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut





MD: 8.477.  
TVD: 7,040.15  
Inclination: 89.84  
Azimuth: 268.73  
VS: 1,331.62

WT IN 9.5  
VIS IN 50  
OUT 9.5  
OUT 42

MD: 8.571.  
TVD: 7,038.95  
Inclination: 91.63  
Azimuth: 269.82  
VS: 1,425.61

TVD (ft)

not, sb blk-y-sb ply, sft-sl frm, fri,  
dk gy-gy brn, sb ply-sb blk-y, mod  
lt bl flr w/v slow-med halo cut

8500'-8600' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod  
sft-frm, sb arg-sily, calc, abnt bent, tr lt bl flr w/v slow-med halo cut

7400

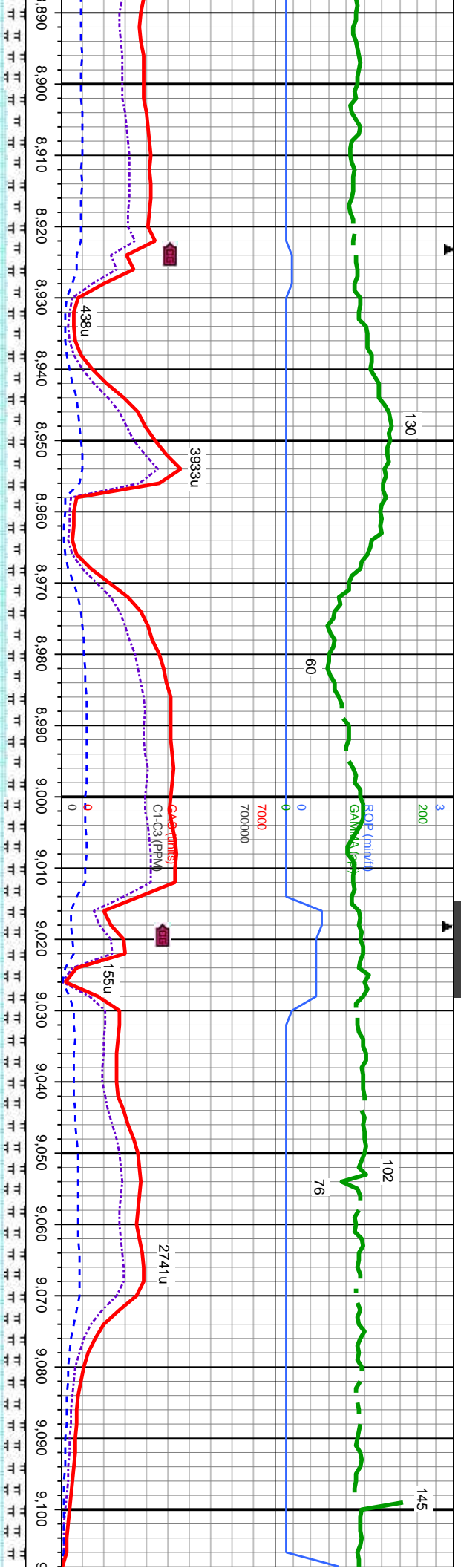
8600'-8700' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod  
sft-frm, sb arg-sily, calc, abnt bent, tr lt bl flr w/v slow-med halo cut

MD: 8.665.  
TVD: 7,036.2  
Inclination: 9  
Azimuth: 269  
VS: 1,519.57









MD: 8,949  
TVD: 7,029.1  
Inclination: 90.98  
Azimuth: 270.26  
VS: 1,803.45

6400  
TVD (ft)

MD: 9,043  
TVD: 7,029.01  
Inclination: 89.13  
Azimuth: 269.75  
VS: 1,897.44

WT IN 9.5  
VIS IN 55  
OUT 9.5  
OUT 40

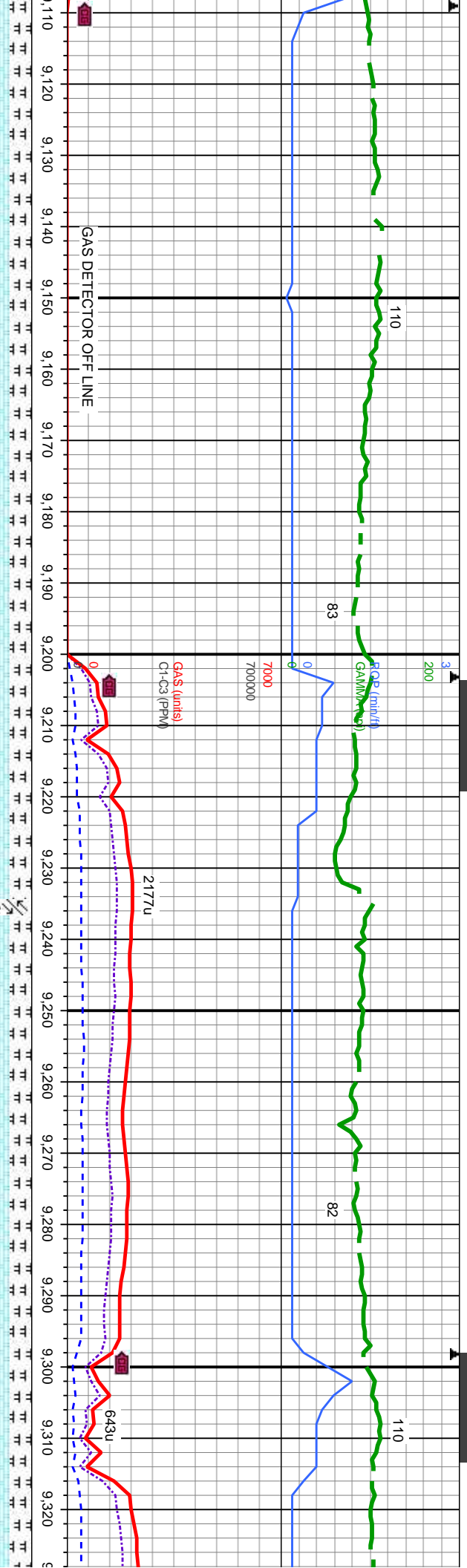
8900'-9000' MD: CHK: lt-med gy, mot, sb blk-y-sb pty, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pty-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

9000'-9100' MD: CHK: lt-med gy, mot, sb blk-y-sb pty, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pty-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

7400







MD: 9,138.  
TVD: 7,031.24.  
Inclination: 88.18 -  
Azimuth: 269.61 -  
VS: 1,992.41 -

WT IN 9.5 OUT 9.5  
VIS IN 47 OUT 45

TVD (ft)

MD: 9,232.  
TVD: 7,034.07.  
Inclination: 88.36 -  
Azimuth: 270.08 -  
VS: 2,086.36 -

WT IN 9.5 OUT 9.5  
VIS IN 54 OUT 47

MD: 9,327.  
TVD: 7,035.  
Inclination:  
Azimuth: 27  
VS: 2,181.3

9100'-9200' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

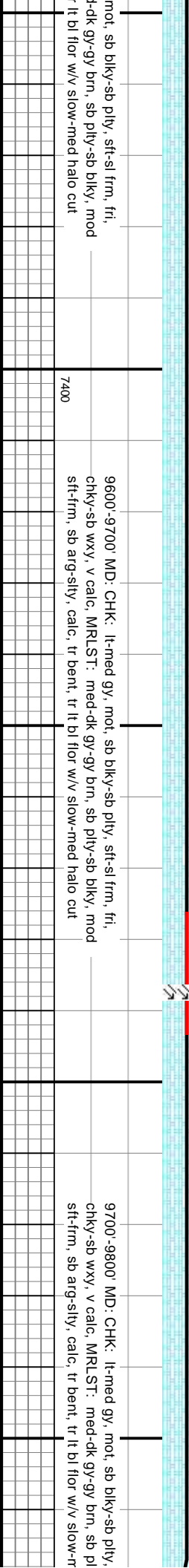
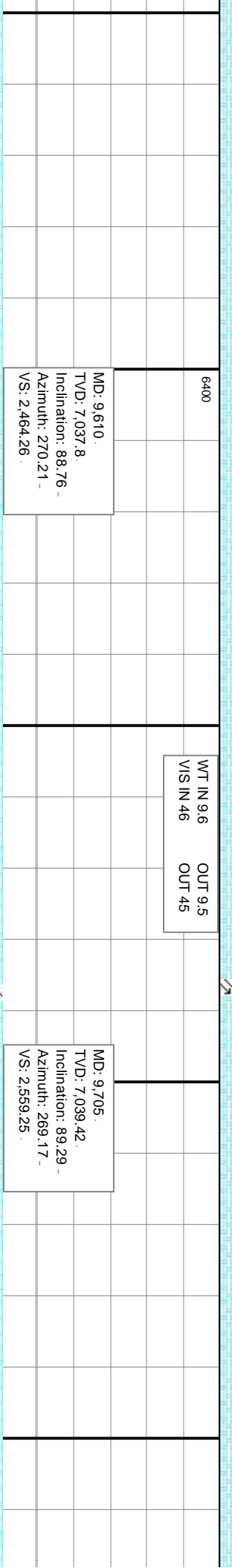
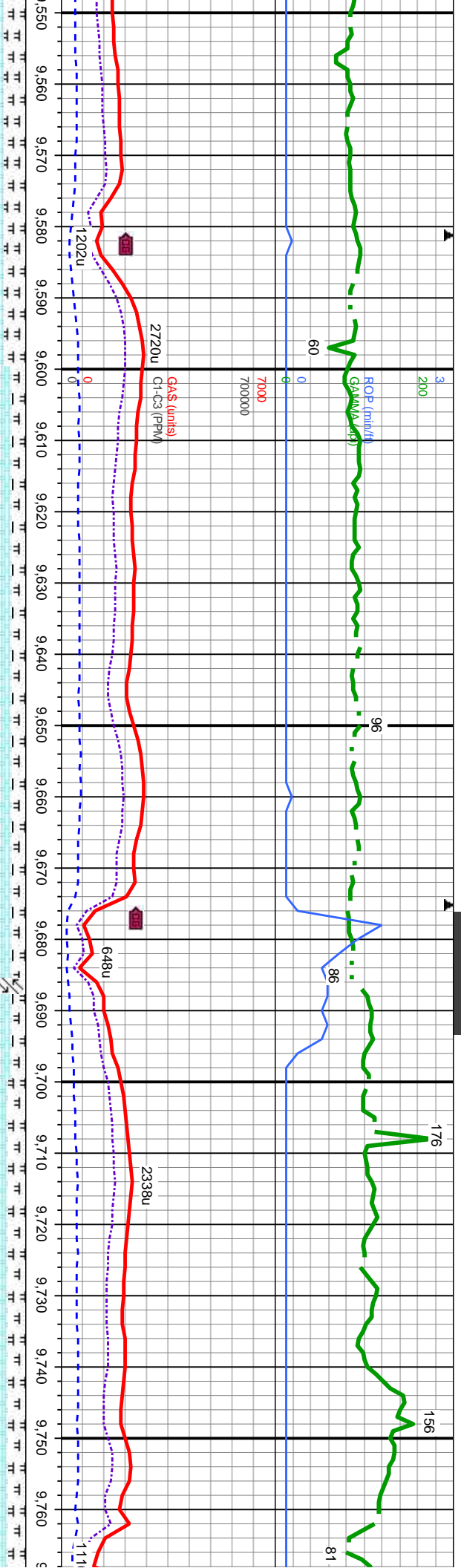
9200'-9300' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

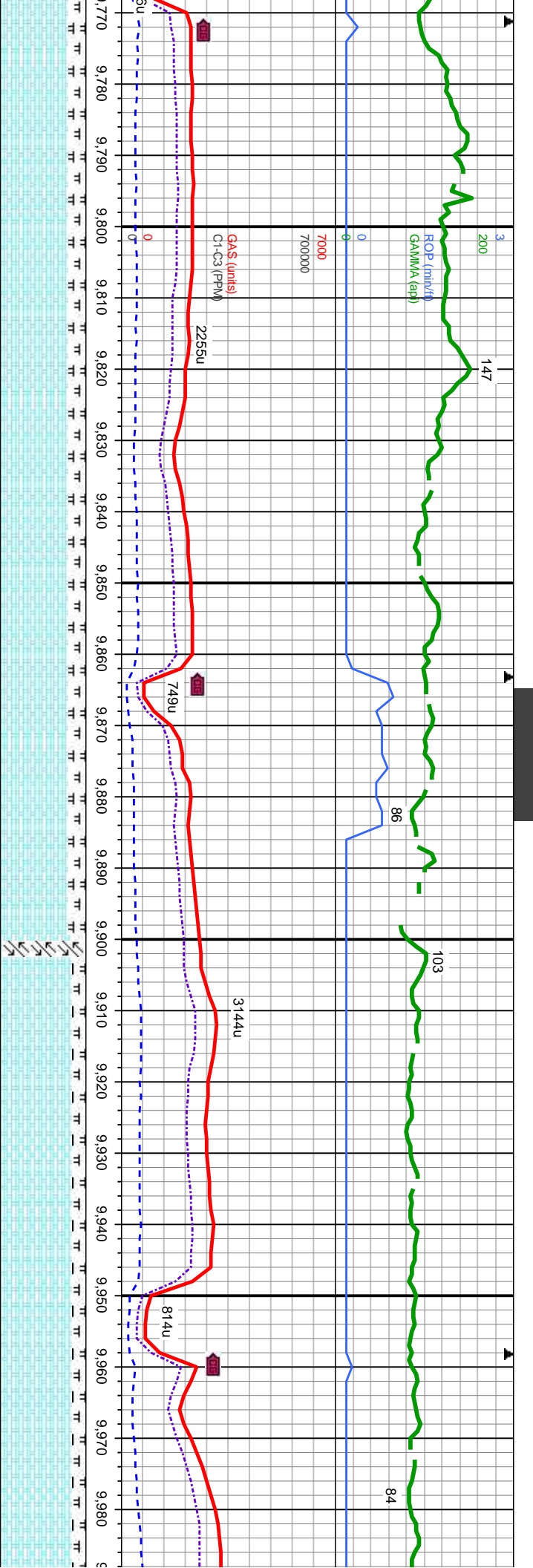
9300'-9400'  
chky-sb wxy  
sft-frm, sb a











MD: 9,799.  
TVD: 7,041.22  
Inclination: 88.52  
Azimuth: 269.76  
VS: 2,653.23

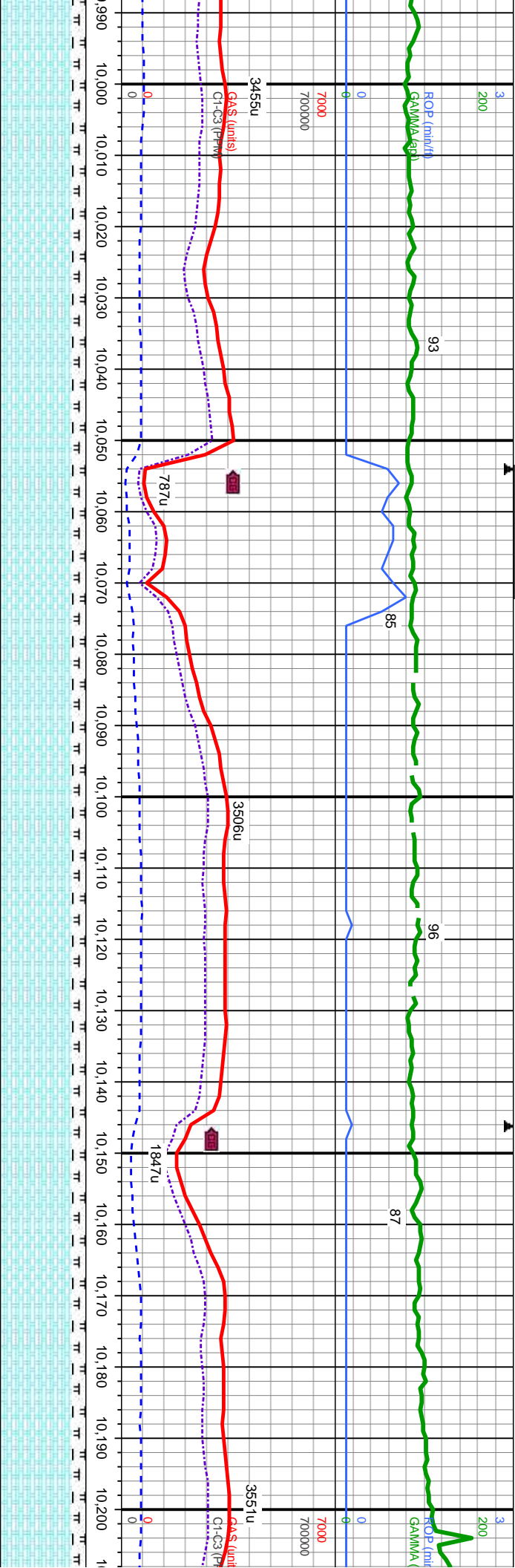
MD: 9,893.  
TVD: 7,042.96  
Inclination: 89.35  
Azimuth: 270.19  
VS: 2,747.2

MD: 9,988  
TVD: 7,044  
Inclination  
Azimuth: 2  
VS: 2,842.

sft-sl frm, fri, ly-sb blkly, mod hed halo cut	9800'-9900' MD: CHK: lt-med gy, mot, sb blkly-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blkly, mod sft-frm, sb arg-slty, calc, tr bent, tr lt bl flr w/v slow-med halo cut	9900'-10,000' MD: CHK: lt-med gy, mot, sb blkly-sb ply, sft-sl frm, fri, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blkly, mod sft-frm, sb arg-slty, calc, tr bent, tr lt bl flr w/v slow-med halo cut
7400		



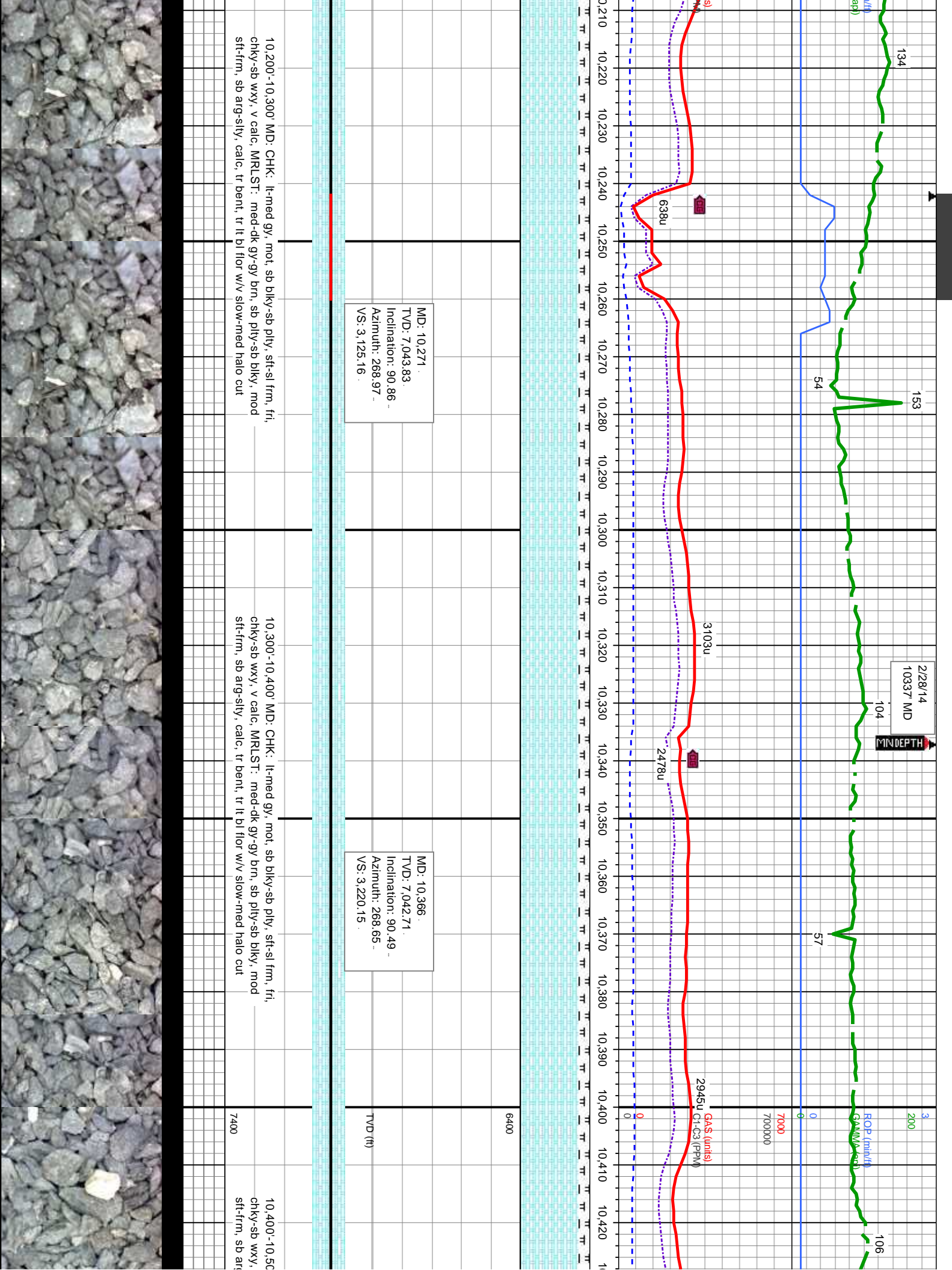




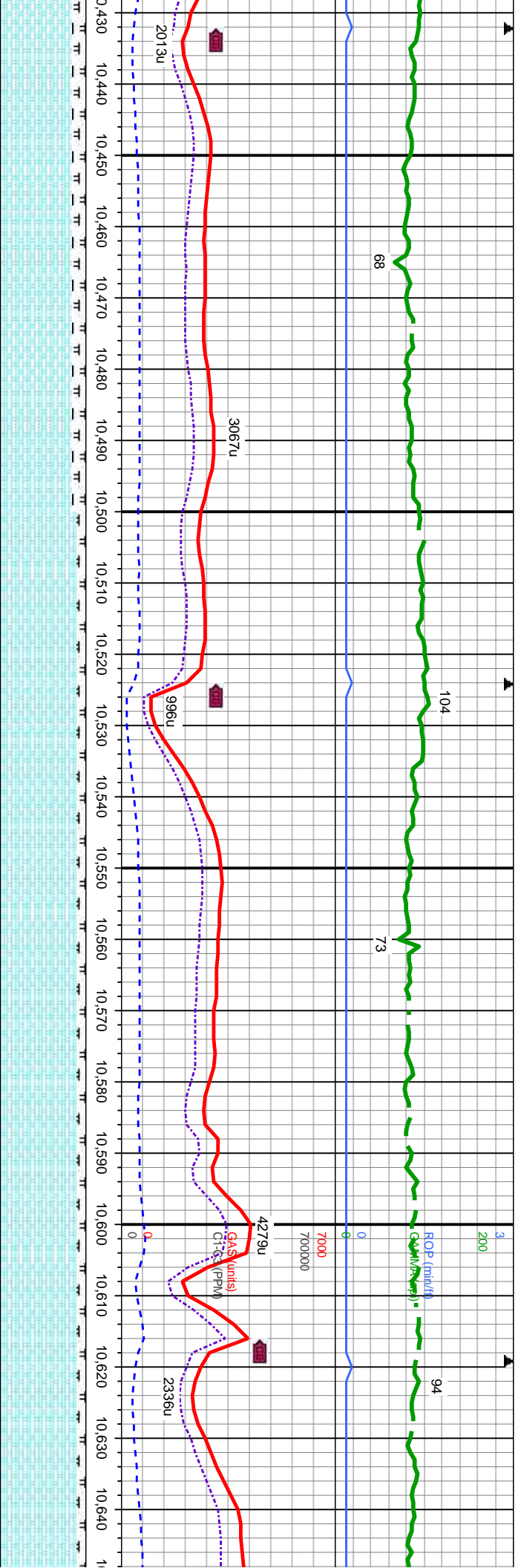
6400	WT IN 9.6+ VIS IN 50	OUT 9.5 OUT 47	MD: 10.082. TVD: 7,044.74. Inclination: 90.06 Azimuth: 269.54 VS: 2.936.17.	TVD (ft)
70.38 - 18.				

10,000'-10,100' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fti, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut	7400
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MD: 10,460.  
TVD: 7,042.28.  
Inclination: 90.03 -  
Azimuth: 268.06 -  
VS: 3,314.14.

MD: 10,554.  
TVD: 7,042.29  
Inclination: 89.96 -  
Azimuth: 268.08 -  
VS: 3,408.12.

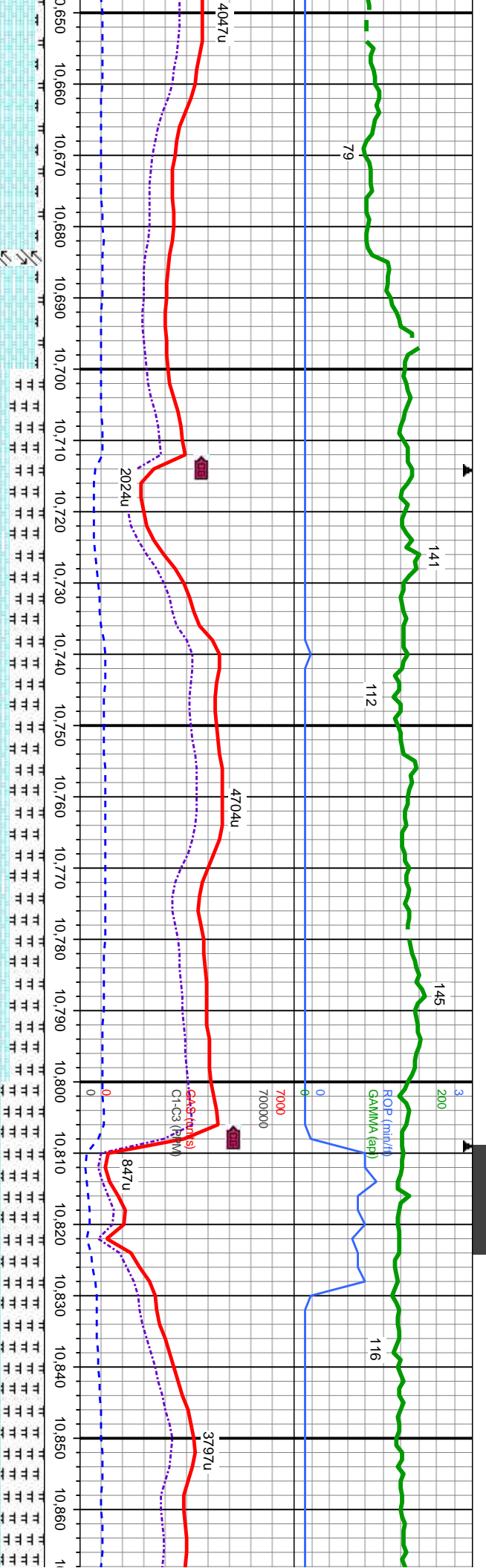
MD: 10,640.  
TVD: 7,042.29  
Inclination: 89.96 -  
Azimuth: 268.08 -  
VS: 3,503.

10,430-10,500' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fr, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod g-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

10,500'-10,600' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fr, chly-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

10,600'-10,640' MD: CHK: lt-med gy, mot, sb blk-y-sb ply, sft-sl frm, fr, chly-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb ply-sb blk-y, mod sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut





WT IN 9.6+  
VIS IN 55

OUT 9.5+  
OUT 47

MD: 10,743.  
TVD: 7,039.53  
Inclination: 91.5  
Azimuth: 268.12  
VS: 3,597.05

TVD (ft)

MD: 10,837.  
TVD: 7,038.5  
Inclination: 89.75  
Azimuth: 267.9  
VS: 3,691.01

WT IN 9.6+  
VIS IN 61

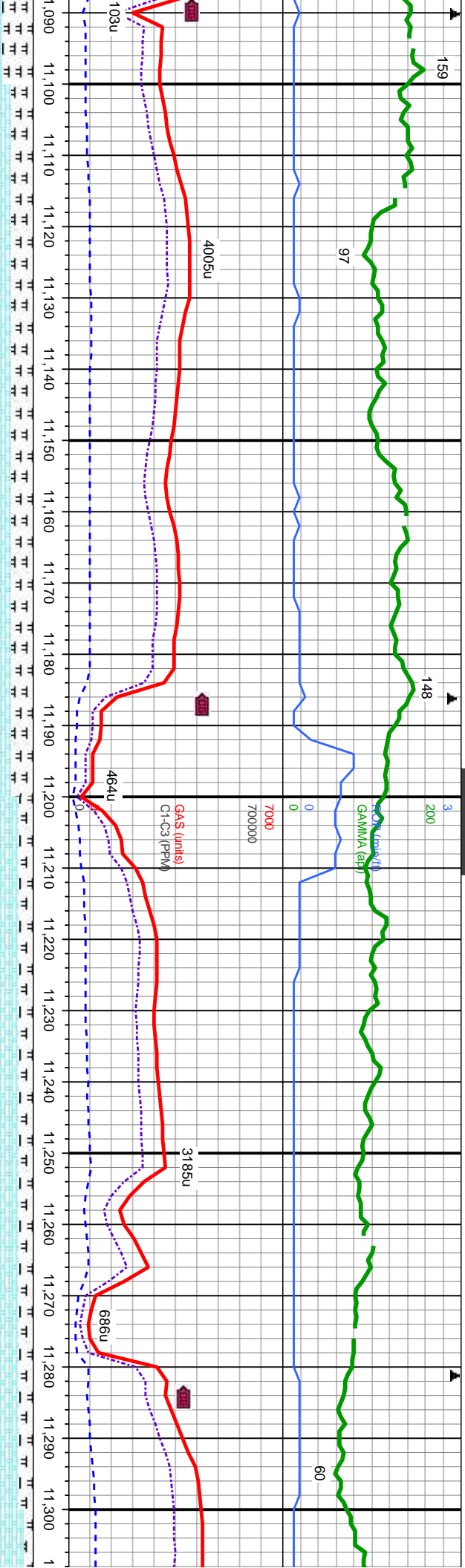
10,700'-10,800' MD: CHK: lt-med gy, mot, sb blk-y-sb pty, sft-sl frm, fri, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pty-sb blk-y, mod sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

10,800'-10,900' MD: CHK: lt-med gy, mot, sb blk-y-sb pty, chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pty sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-me









MD: 11,120.  
TVD: 7,043.44.  
Inclination: 88.45 -  
Azimuth: 268.44 -  
VS: 3.973.89.

MD: 11,215.  
TVD: 7,045.6  
Inclination: 88.95 -  
Azimuth: 269.07 -  
TVD  
VS: 4,068.86.

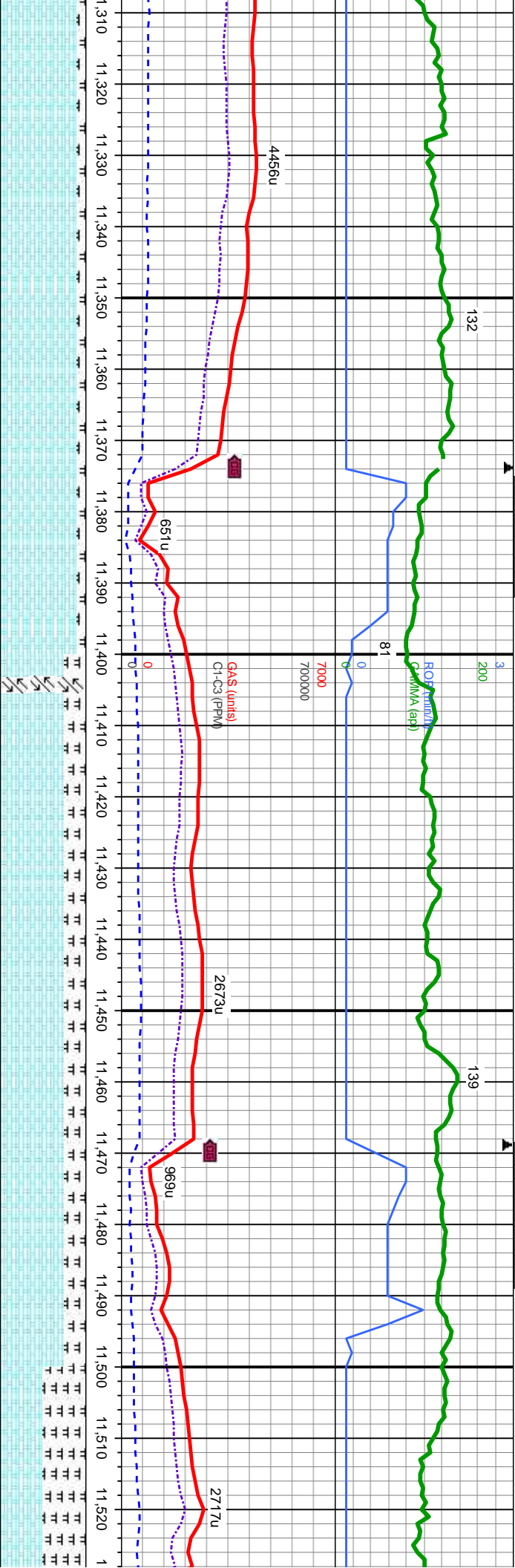
MD: 11,300.  
TVD: 7,046  
Inclination: 88.95 -  
Azimuth: 269.07 -  
TVD  
VS: 4,162

11,100'-11,200' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

11,200'-11,300' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut







MD: 11,403  
TVD: 7,050.34  
Inclination: 87.99  
Azimuth: 270.89  
VS: 4,256.77

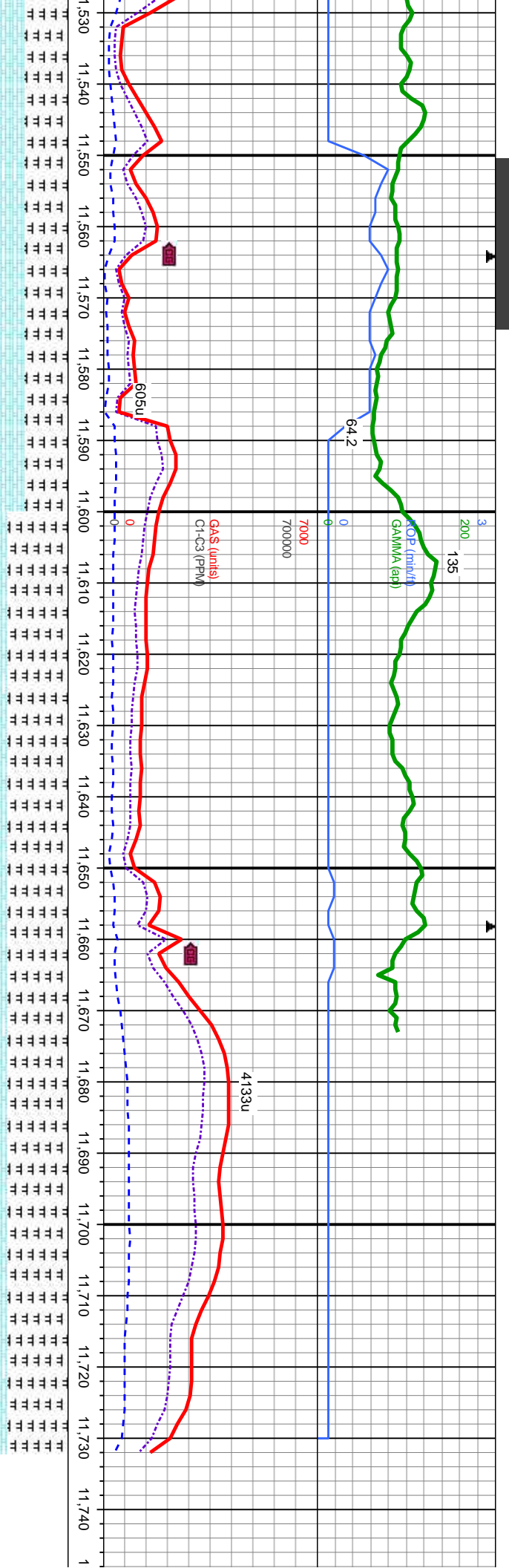
MD: 11,498  
TVD: 7,053.46  
Inclination: 88.24  
Azimuth: 271.89  
VS: 4,351.66

11,300'-11,400' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

11,400'-11,500' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut

11,500'-11,600' MD: CHK: lt-med gy, mot, sb blk-y-sb pily, sft-sl frm, fri,  
chky-sb wxy, v calc, MRLST: med-dk gy-gy brn, sb pily-sb blk-y, mod  
sft-frm, sb arg-sily, calc, tr bent, tr lt bl flr w/v slow-med halo cut





MD: 11,593  
TVD: 7,056.54  
Inclination: 89.26  
Azimuth: 273.5  
VS: 4,446.46

MD: 11,666  
TVD: 7,056.93  
Inclination: 88.55  
Azimuth: 273.45  
VS: 4,519.25

MD: 11,732  
TVD: 7,058.6  
Inclination: 88.55  
Azimuth: 273.45  
VS: 0

PROJ TO BIT

0' MD: CHK: lt-med gy, mot, sb blk-y-sb plty, sft-sl frm, fri, v calc, MRLST: med-dk gy-gy brn, sb plty-sb blk-y, mod -sily, calc, tr bent, tr lt bl fior w/v slow-med halo cut

11,600-11,732' MD: MRLST: med-dk gy-gy brn, sb plty-sb blk-y, mod sft-frm, sb arg-sily, calc, tr bent, CHK: lt-med gy, mot, sb blk-y-sb plty, sft-sl frm, fri, chky-sb wxy, v calc, sl tr lt bl fior w/v slow-med halo cut





