



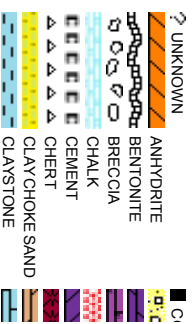
Scale: 5" / 100'  
Measured Depth Log

Well Name	Dreiling 27N-32HZ		
Location	SESE SEC 32, T2N, R65W		
State	COLORADO	County	WELD
Country	USA		
API Number	05-123-38405	Rig Number	ENSIGN 132
Region	DJ BASIN	AFE #	2075516
Spud Date	1/13/2014	Field	WATTENBERG
		Drilling Completed	1/18/2014
Surface Coordinates	687' FSL & 310' FEL 40.089634 -104.67939		
Bottom Hole Coordinates	460' FNL & 1420' FEL 40.100971 -104.6834		
Ground Elevation	4924'	K.B. Elevation	4937'
Logged Interval	6757'	To	11817'
Formation	NIOBRARA C		
Total Depth	5060'		
Type of Drilling Fluid	FSNL		

Company ANADARKO PE  
Address 1099 18th St, S  
Denver, CO 80

Name JAKE STUART  
Company ANADARKO PE  
Address 1099 18th St, S  
Denver, CO 80

SHANA SW



## Operator

ETROLEUM INC

uite 1800  
202

## Geologist

ETROLEUM INC.

uite 1800  
202

## Other

IRIN, MOHAMMED ALMUBARAK

## Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLomite	METAMORPHIC	SHALY SLTSTONE
DOLomite Limestone	NOSAMPLE	SILTSTONE
GRANITE	SALT	TUFF
Gypsum	SANDSTONE	WELDED TUFF
IGNEOUS	SALT-PEPPER SAND	
SIDERITE or LIMONITE	SHALE	
LIMESTONE	SHALE COLORED	
	SHALE GRAY	

## Accessories

<b>Fossils</b>	GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL
INOCERAMUS	B BENTONITE	K KAOLIN	ANHYDRITE STRINGER
ALGAE	O OOLITE	BITUMINOUS SUBSTANCE	BENTONITE STRINGER
AMPHIPORA	O OSTRACOD	BRECCIA FRAGMENTS	COAL STRINGER
BELEMNITE	P PELECYPOD	MICACEOUS	DOLOMITE STRINGER
BIOCLASTIC	P PELLET	CALCAREOUS	GYPSUM STRINGER
BRACHIOPOD	P PISOLITE	CARBONACEOUS FLAKES	LIMESTONE STRINGER
BRYOZOA	P PLANT REMAINS	CHERT	PHOSPHATE PELLETS
CEPHALOPOD	P PLANT SPORES	CHERT	P PYRITE
CORAL	S SCAPHOPOD	COAL - THIN BEDS	S SALT CAST
CRINOID	S STROMATOPOROD	DOLOMITIC	S SANDY
ECHINOID	F FERRUGINOUS PELLET	F FELDSPAR	S SILTY
<b>Minerals</b>	F FISH	F FERRUGINOUS	T TUFACEOUS
FORAMINIFERA	A ANHYDRITIC	G GLAUCONITE	
F FOSSIL	A ARGILLACEOUS	G GYPSIFEROUS	<b>Stringer</b>

## Other Symbols

<b>Oil Show</b>	P PINPOINT	W WIRELINE TESTED - LEFT	E EARTHY
V VUGGY	F FAULT	W WIRELINE TESTED - RT	FM FINELXLN
<b>Engineering</b>	F FORMATION TOP	D DRILL STEM TEST	GS GRAINSTONE
D DEAD	G GAS SHOW	MN DEPTH	L LITHOGRAPHIC
E EVEN	O OIL SHOW		MX MICROXLN
Q QUESTIONABLE	B BIT		
S SPOTTED STAINING	C CONNECTION (UP)	<b>Rounding</b>	MS MUDSTONE
		A ANGULAR	PS PACKSTONE
<b>Porosity</b>	C CONNECTION (DOWN)		
E EARTHY	C CONNECTION GAS (LEFT)	N NORMAL FAULT	R ROUNDED
F FENESTRAL	T TRIP GAS	O OVERTURNED STRATA	B SUBANG
F FRACTURE	T TRIP GAS (LEFT)	R REVERSE FAULT	P SUBRND
I INTERCRYSTALLINE	D DOWN TIME GAS	C CASING	<b>Textures</b>
I INTERCRYSTALLINE	D DOWN TIME GAS (LEFT)	S SIDEWALL CORE (LEFT)	M MODERATE
M MOLDIC	C CORE - LOST	S SIDEWALL CORE (RIGHT)	P POOR
O ORGANIC	C CORE - RECOVERED	S SLIDE	W WELL
		S SURVEY	BS BOUNDSTONE
			C CHALKY
			CX CRYPTOXLN

Slide/Rotate

Columbine Logging Two Person  
Rigged Up 0400hrs 01/14/2014  
With Bloodhound Unit # 0313

ROP  
ROF  
GAMMA

Logging Started @  
2114hrs 01/14/2014  
at 6757' MD

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Bit Data  
Bit #: 02  
Type: SMITH SD1611  
Size: 8.75  
Depth In: 1,056'  
Depth Out: 7,655'  
Jets: 6x16  
S/N: JH4933

Depth Labels

% Lith

Begin in Sussex Formation

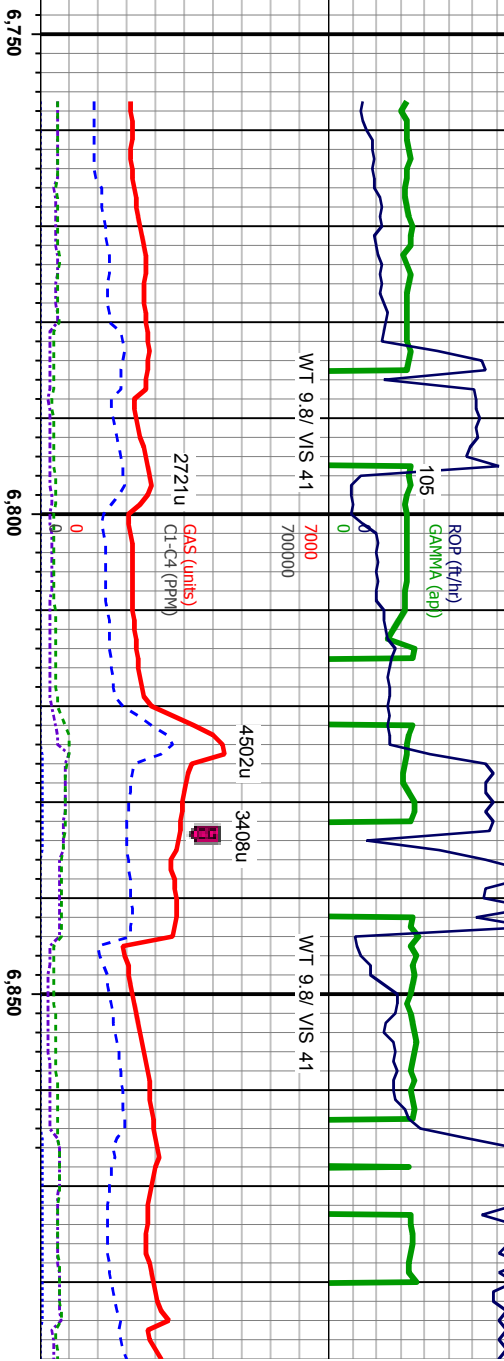
Well Bore  
TVD

Acetone was used as the cutting agent with the dimple filled to the rim  
The ratings are based on 7 descriptors:  
None, Slight trace, Trace, Fair, Moderate, Good, and Excellent. The descriptor used is based on the loggers observations and best judgement of brilliance, color and longevity of the cut.

Oil Show

Images

500 Problems with Gamma  
300



MD: 6,739'  
TVD: 6,541.67'  
Inclination: 1.78°  
Azimuth: 330.68°  
VS: 631.85'

MD: 6,786'  
TVD: 6,588.5'  
Inclination: 7.41°  
Azimuth: 351.59°  
VS: 628.21'

MD: 6,834'  
TVD: 6,635.82'  
Inclination: 11.78°  
Azimuth: 355.97°  
VS: 620.27'

MD: 6,881'  
TVD: 6,681.51'  
Inclination: 15.27°  
Azimuth: 357.41°  
VS: 609.3'

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-fm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-fm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-fm, w  
srt, sb md-sb ang, mod f  
stmg bl cut, dull yel ring

ST  
FM  
CE





3264u

Problems with Gamma

1/15/2014

4096u

C1: 66%

C1: 73%

C2: 17%

C2: 15%

C3: 15%

C3: 11%

C4: 2%

C4: 0%

120

ROP (ft/hr)  
GAMMA (cp)

135

WT 10.0 VIS 41

WT 10.0

3820u

3178u

3790u

3426u

4025u

3178u

GAS (units)  
CI (cp/ft/hr)

6,900

6,950

7,000

7,050

7,100

MD: 7.025'  
TVD: 816.87'  
Inclination: 25.8°  
Azimuth: 359.2°  
VS: 560.72'

MD: 7.072'  
TVD: 858.26'  
Inclination: 30.7°  
Azimuth: 358.5°  
VS: 538.46'

MD: 6.929'  
TVD: 727.5'  
Inclination: 18.0°  
Azimuth: 358.6°  
VS: 595.56'

MD: 6.977'  
TVD: 772.78'  
Inclination: 20.6°  
Azimuth: 0.21°  
VS: 579.66'

TVD (ft)

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-frm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-frm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-frm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: lt-med gy, sb  
ply-sb blkly, mod sft-frm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

7400





MD: 7,120'  
TVD: 6,898.43'  
Inclination: 35  
Azimuth: 0.37  
VS: 512.24'

MD: 7,167'  
TVD: 6,935.48'  
Inclination: 40.28°  
Azimuth: 358.94°  
VS: 483.35'

MD:7,215'  
TVD:6,970.53'  
Inclination: 45.88  
Azimuth: 359.03  
VS:-450.58'

SLTY SH: lt-med gy, sb  
ply-sb blk, mod sft-firm, w  
sft, sb rnd-sb ang, mod fri,  
tr bent, slimg bl cut, dull yel  
ring

CHK: med-dk g  
biky-sb pily, moi  
rd-sb ang, mod  
med-dk gy-brn,  
sft-frm, sb rd-st  
fri, tr silty sh, str  
dull yel ring

TY SH: It-med gy, sb  
y-sb bkly, mod sft-firm, w  
sb md-sb ang, mod fri,  
ng bl cut, dull yel ring

SLTY SH: It-med gy, sb  
ply-sb blkly, mod sft-firm, w  
srt, sb md-sb ang, mod fri,  
stmg bl cut, dull yel ring

SLTY SH: It-med gy, sb  
ply-sb blkly, mod sft-frm, w  
sft, sb md-sb ang, mod fri,  
abt bent, stmg bl cut, dull  
yel ring

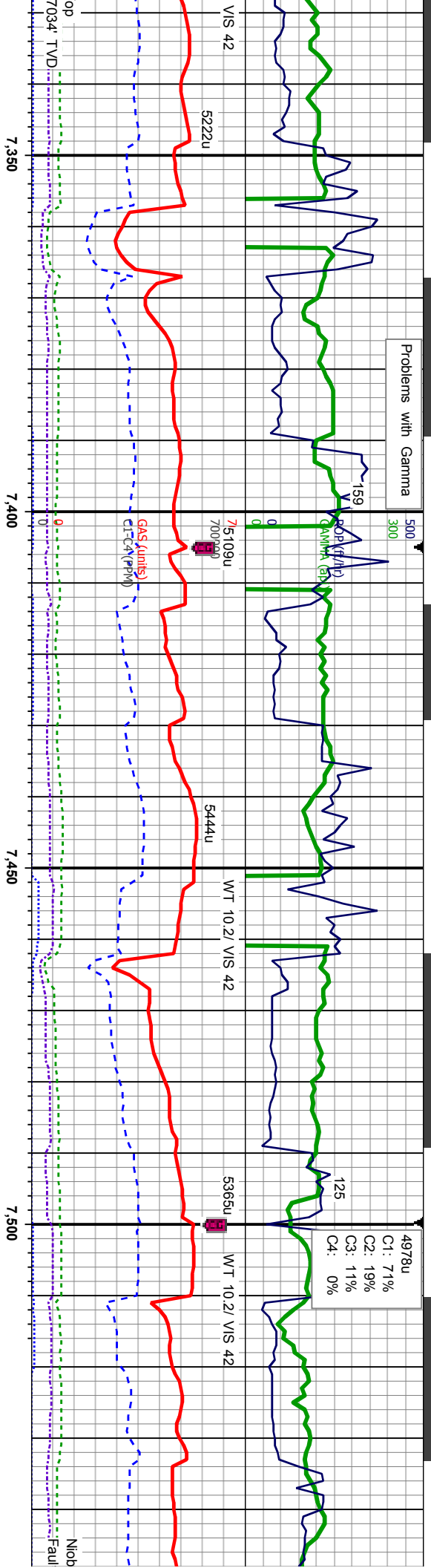
MD: 7,262'  
TVD: 7,001.44'  
Inclination: 51.84  
Azimuth: 0.46°  
VS: -415.2'

MD: 7,310'  
TVD: 7,029.97'  
Inclination: 55.24°  
Azimuth: 0.35°  
VS: -376.61'





Problems with Gamma



5222u	5444u	5365u
MD: 7.357' TVD: 7.054.57' Inclination: 61.62° Azimuth: 0.55° VS: -338.6'	MD: 7.405' TVD: 7.075.71' Inclination: 66.18° Azimuth: 0.3° VS: -293.51'	MD: 7.452' TVD: 7.093.62' Inclination: 69.07° Azimuth: 0.63° VS: -250.07'
CHK: med-dk gy-brn, blk-y-sb pily, mot, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb pily, sft-frm, sb rd-sb ang, mod fri, sting bl cut, bri bl ring	CHK: lt-dk gy-brn, blk-y-sb pily, mot, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb pily, sft-frm, sb rd-sb ang, mod fri, sting bl cut, bri bl ring	CHK: lt-dk gy-brn, blk-y-sb pily, mot, sft-frm, sb rd-sb ang, mod fri, MRLST: med-dk gy-brn, blk-y-sb pily, sft-frm, sb rd-sb ang, mod fri, sting bl cut, bri bl ring
MD: 7.500' TVD: 7.108.68' Inclination: 74.4° Azimuth: 0.47° VS: -204.51'	MD: 7.500' TVD: 7.108.68' Inclination: 74.4° Azimuth: 0.47° VS: -204.51'	MD: 7.500' TVD: 7.108.68' Inclination: 74.4° Azimuth: 0.47° VS: -204.51'

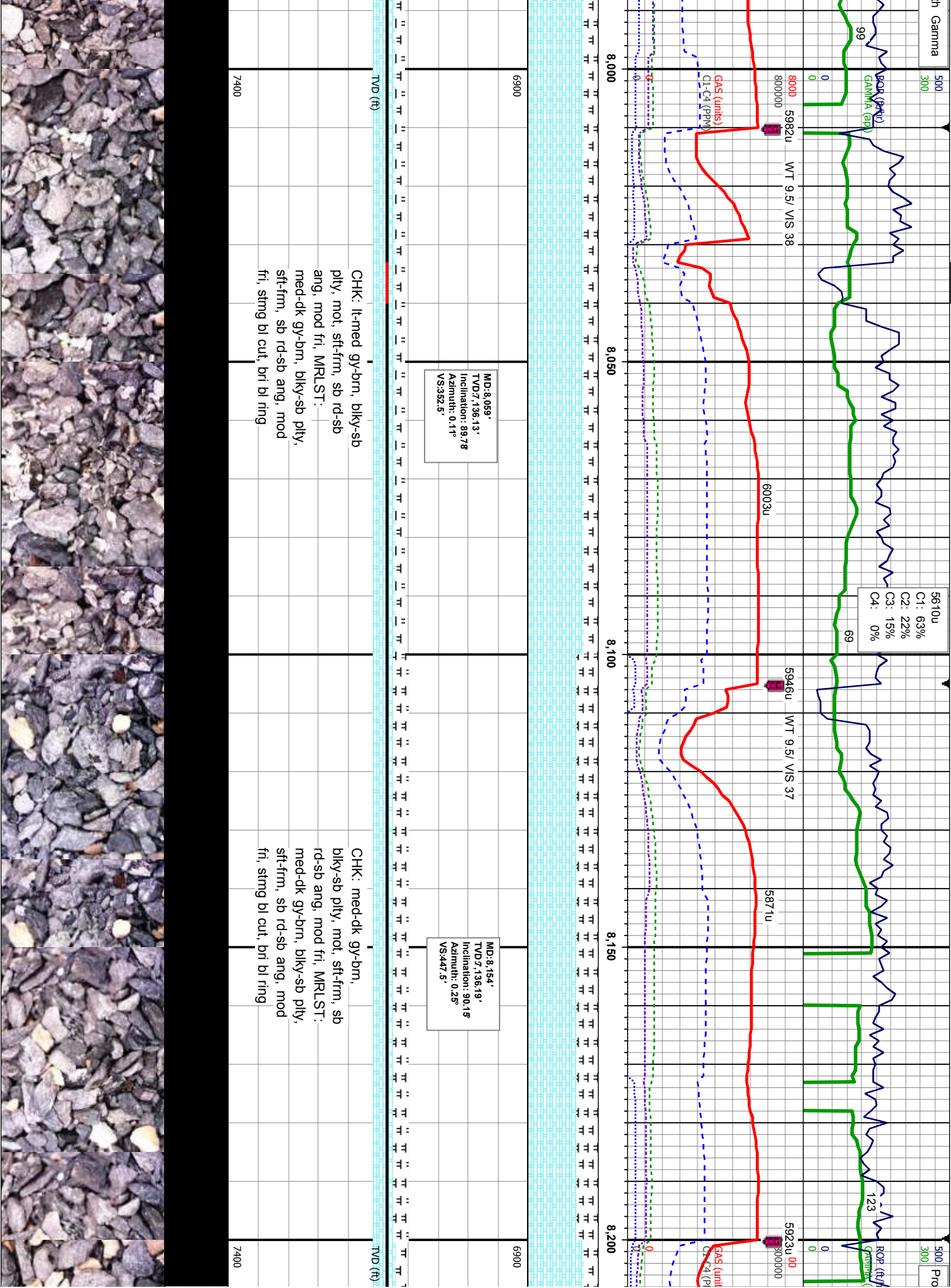


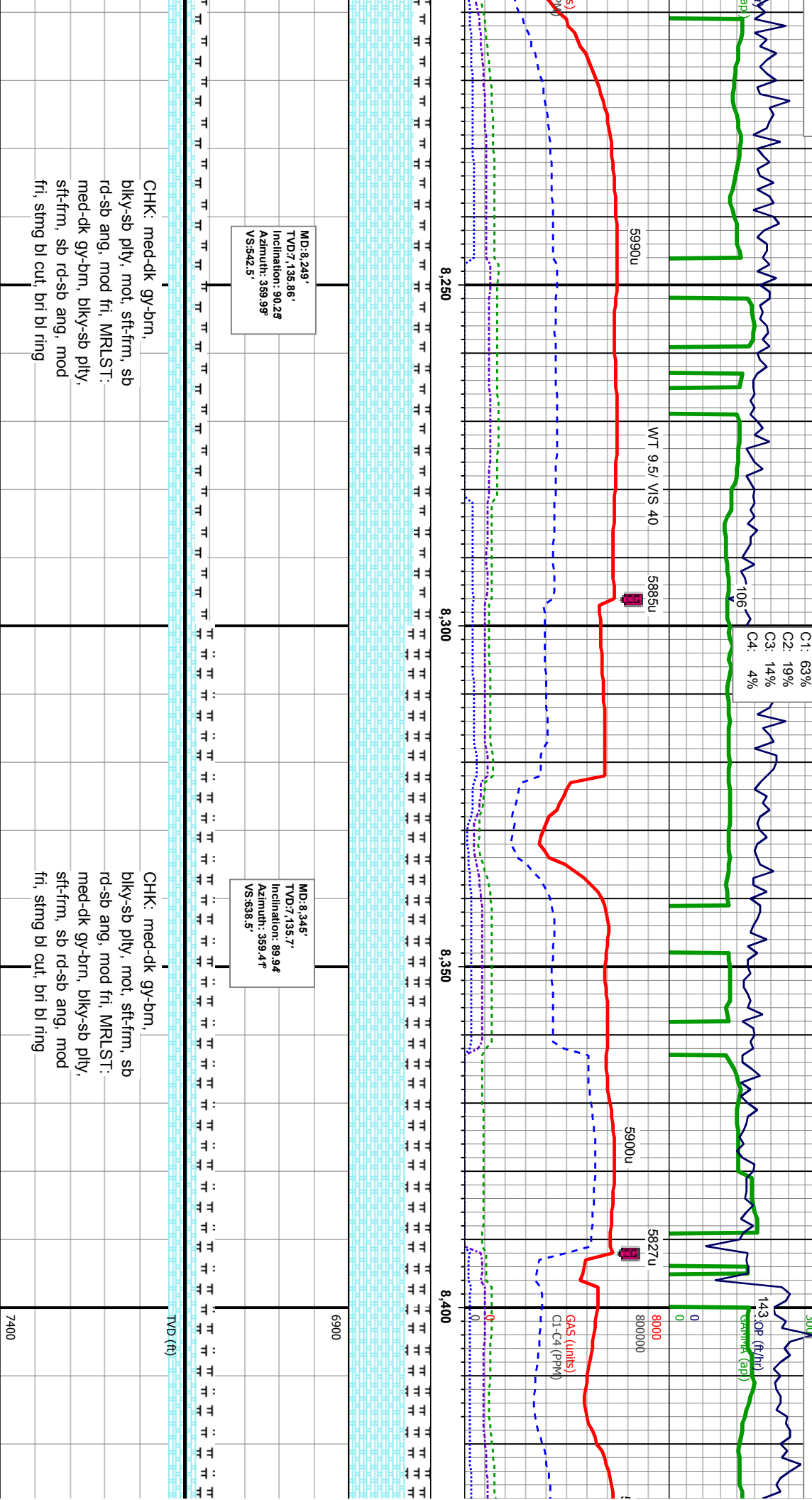




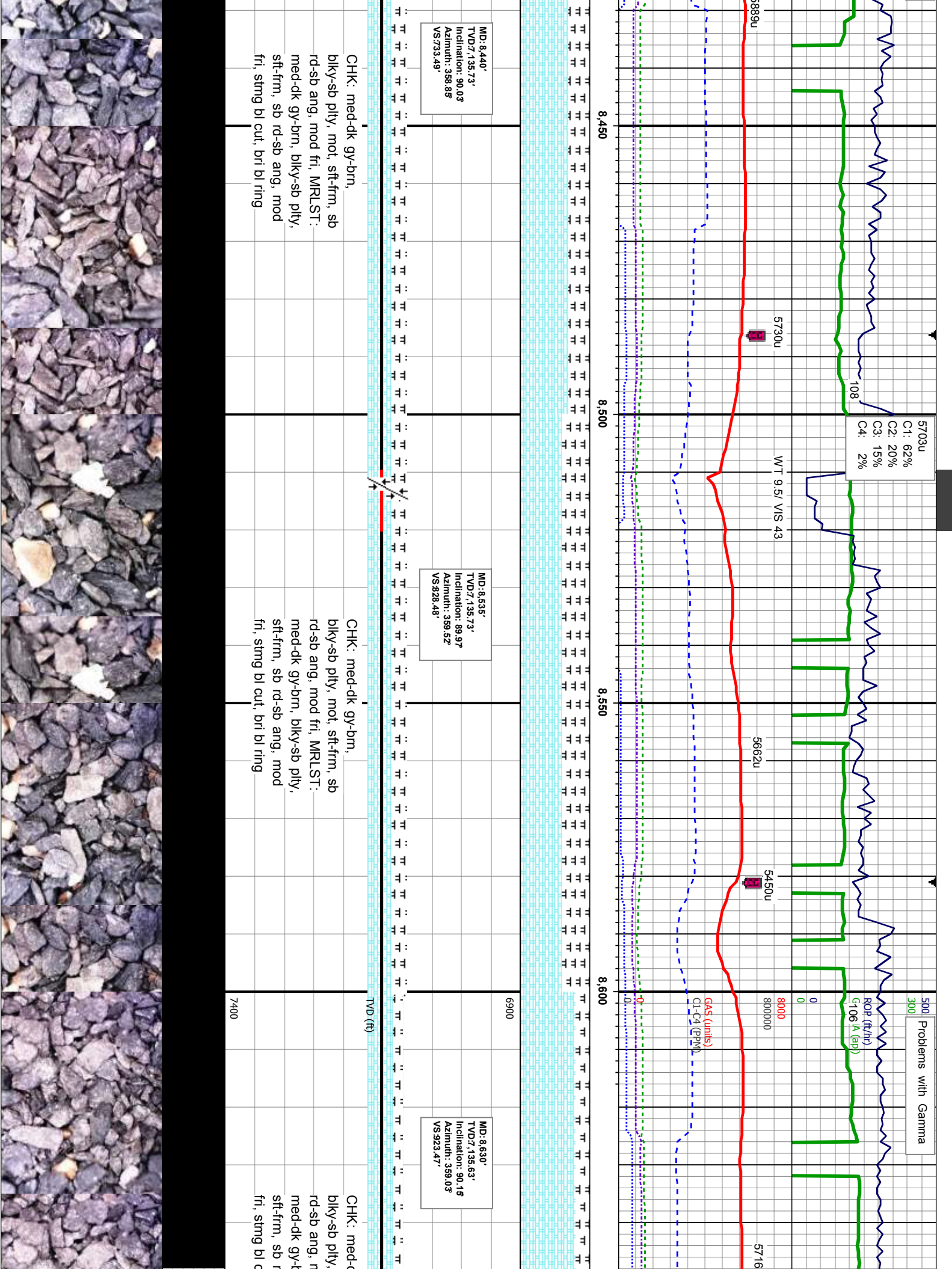


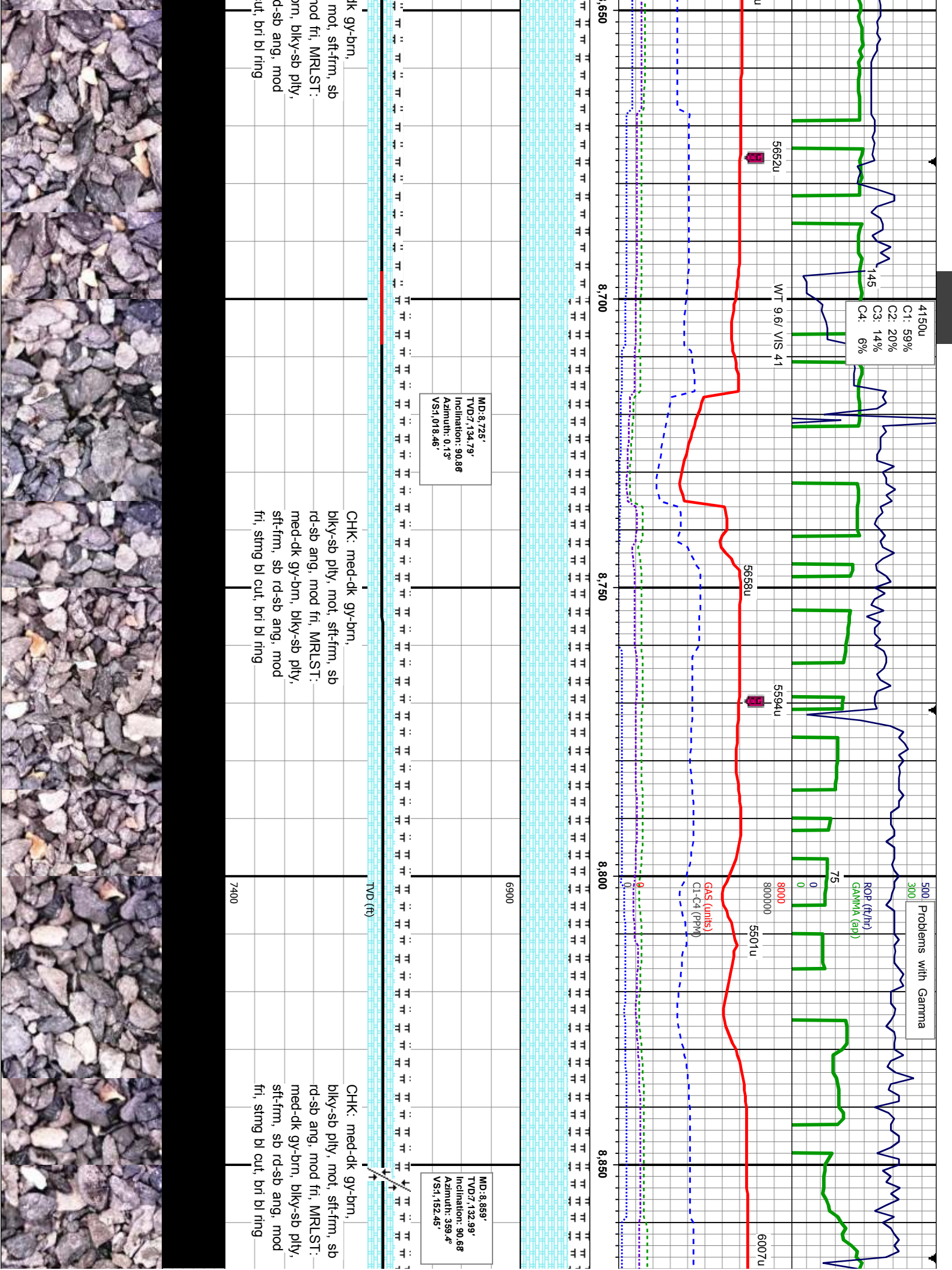














C1: 68%  
C2: 18%  
C3: 14%  
C4: 0%

Problems with Gamma

134

161

WT 9.5+ / VS 41

WT 9.5/ VS 40

5985u

8000

5792u

5814u

GAS (units)  
CIC (ppm)

8,900

8,950

9,000

9,050

MD:8,915'  
TVD:7,132.58'  
Inclination: 90.15°  
Azimuth: 0.22°  
VS:1,208.45'

MD:9,010'  
TVD:7,131.99'  
Inclination: 90.56°  
Azimuth: 0.71°  
VS:1,303.44'

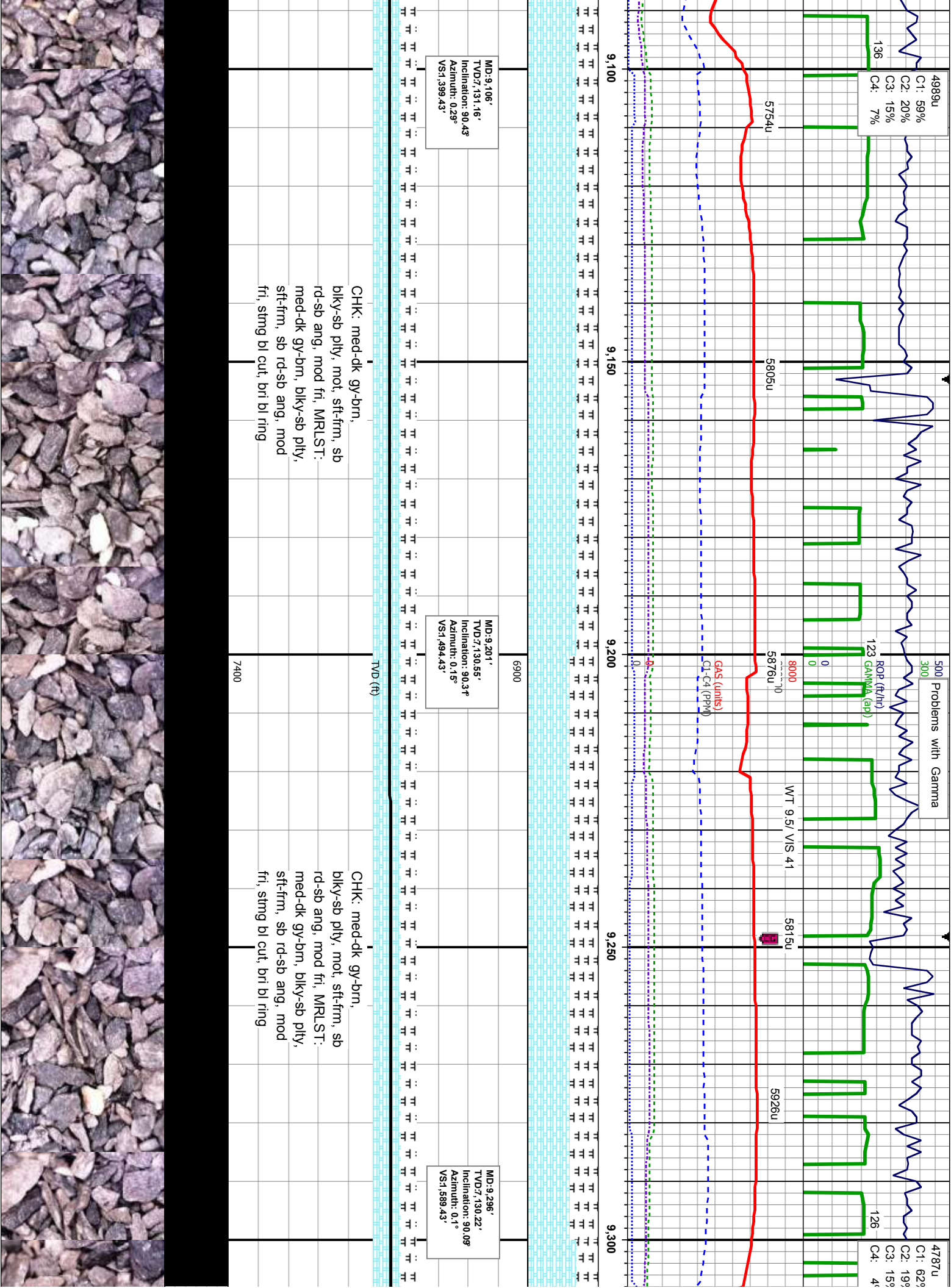
CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, stng bl cut, bri bl ring

CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, stng bl cut, bri bl ring

TVD (ft)

7400

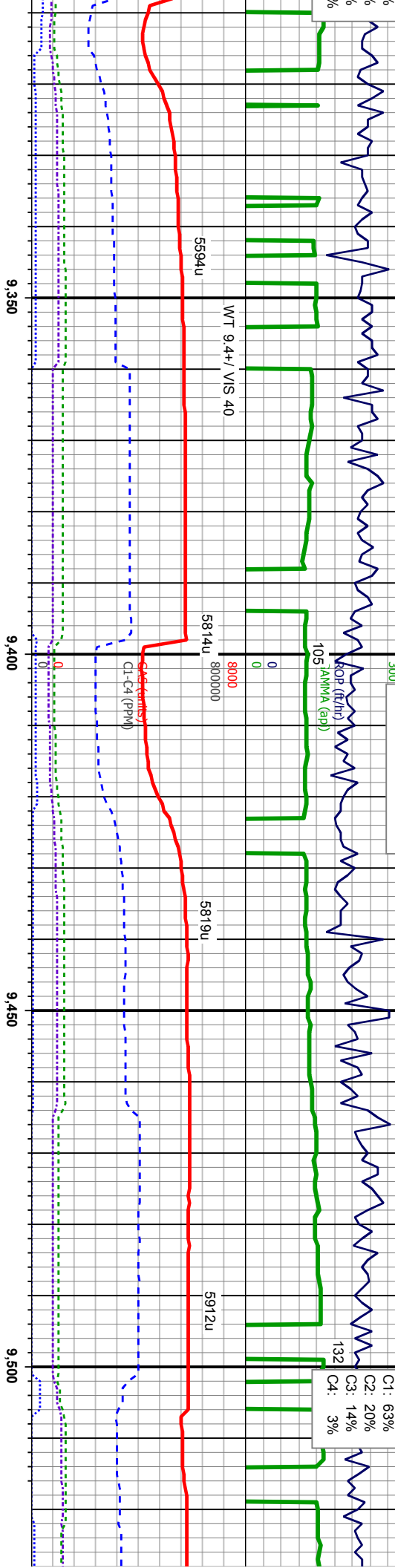
6900





Problems with Gamma

5467u  
C1: 63%  
C2: 20%  
C3: 14%  
C4: 3%



MD: 9,391'  
TVD: 7,130.22'  
Inclination: 89.9°  
Azimuth: 359.7°  
VS: 1,684.43

MD: 9,486'  
TVD: 7,129.99'  
Inclination: 90.3°  
Azimuth: 359.7°  
VS: 1,779.43

CHK: med-dk gy-bm,  
bkly-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-bm, bkly-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, stmg bl cut, bri bl ring

CHK: med-dk gy-bm,  
bkly-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-bm, bkly-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, stmg bl cut, bri bl ring



Problems with Gamma

01/18/2014

5182u

C1: 59%  
C2: 19%  
C3: 16%  
C4: 6%

WT 9.5/ VIS 42

80000

5637u

5668u

9,550

9,600

9,650

9,700

GAS (units)  
CL-C4 (PPM)

5694u

5561u

5167u

MD: 9.581'  
TVD: 7,129.45'  
Inclination: 90.28°  
Azimuth: 359.76°  
VS: 1,874.43'

MD: 9.676'  
TVD: 7,128.88'  
Inclination: 90.6°  
Azimuth: 359.73°  
VS: 1,969.42'

CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, sting bl cut, bri bl ring

CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-fm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-fm, sb rd-sb ang, mod  
fri, sting bl cut, bri bl ring

CHK: med-d  
biky-sb pty,  
rd-sb ang, m  
med-dk gy-b  
sft-fm, sb rd  
fri, sting bl c

TVD (ft)

6900

7400







Problems with Gamma

500

300

5817u

C1: 61%

C2: 18%

C3: 15%

C4: 5%

134 (ft/hr)

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MD:10,057'  
TVD:127.53'  
Inclination: 90.28°  
Azimuth: 359.6°  
VS2,350.38'

MD:10,153'  
TVD:126.96'  
Inclination: 90.43°  
Azimuth: 359.18°  
VS2,446.37'

TVD (ft)

6900

10,000

10,050

10,100

10,150

7400

CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-firm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-firm, sb rd-sb ang, mod  
fri, occ fcs frag, sting bl cut,  
bri bl ring

CHK: med-dk gy-brn,  
biky-sb pty, mot, sft-firm, sb  
rd-sb ang, mod fri, MRLST:  
med-dk gy-brn, biky-sb pty,  
sft-firm, sb rd-sb ang, mod  
fri, sting bl cut, bri bl ring

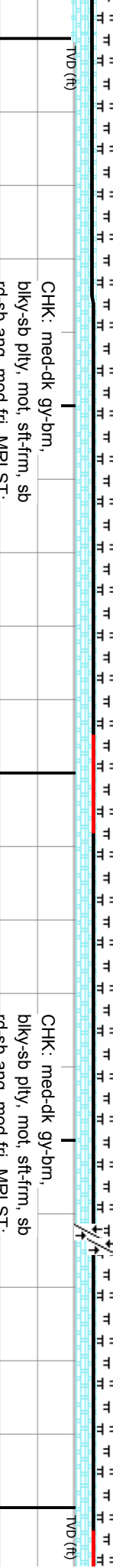
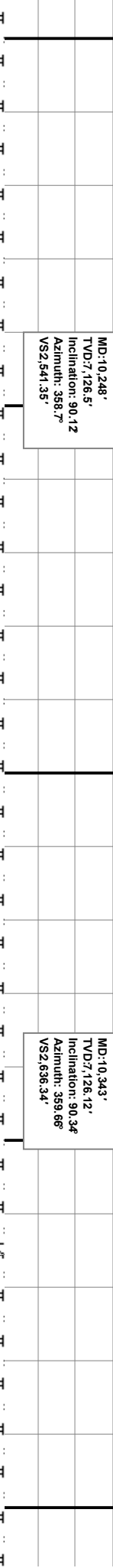
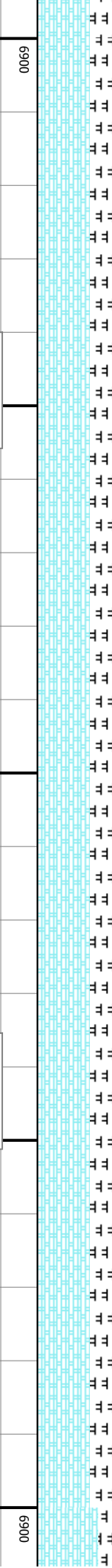
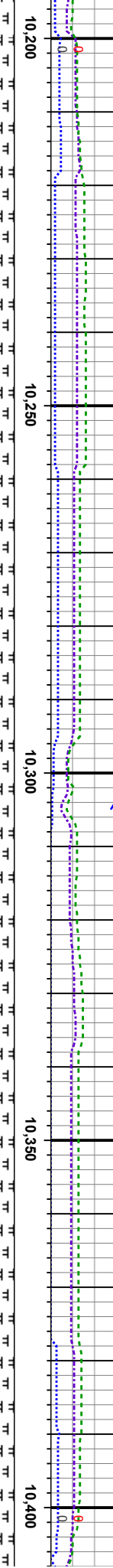
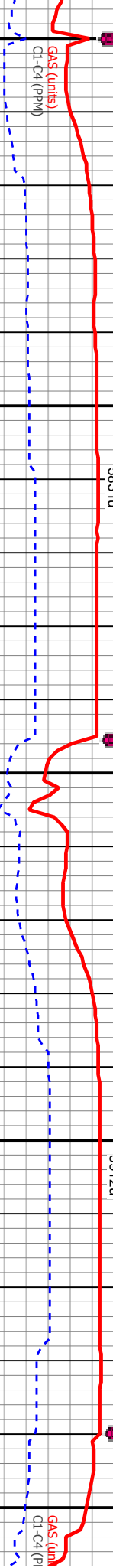
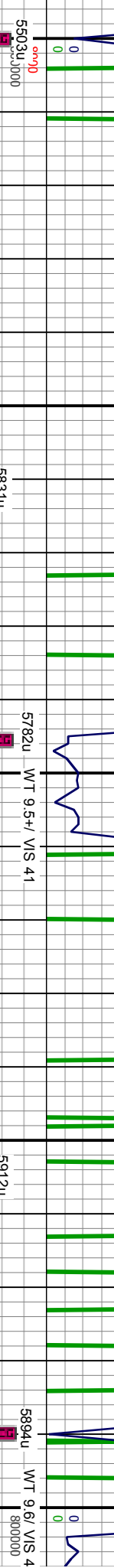
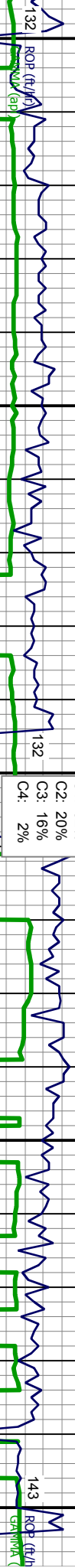


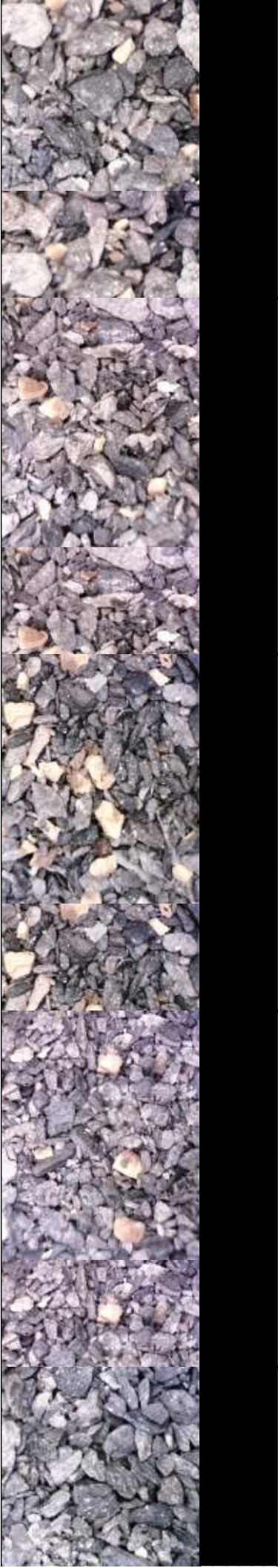
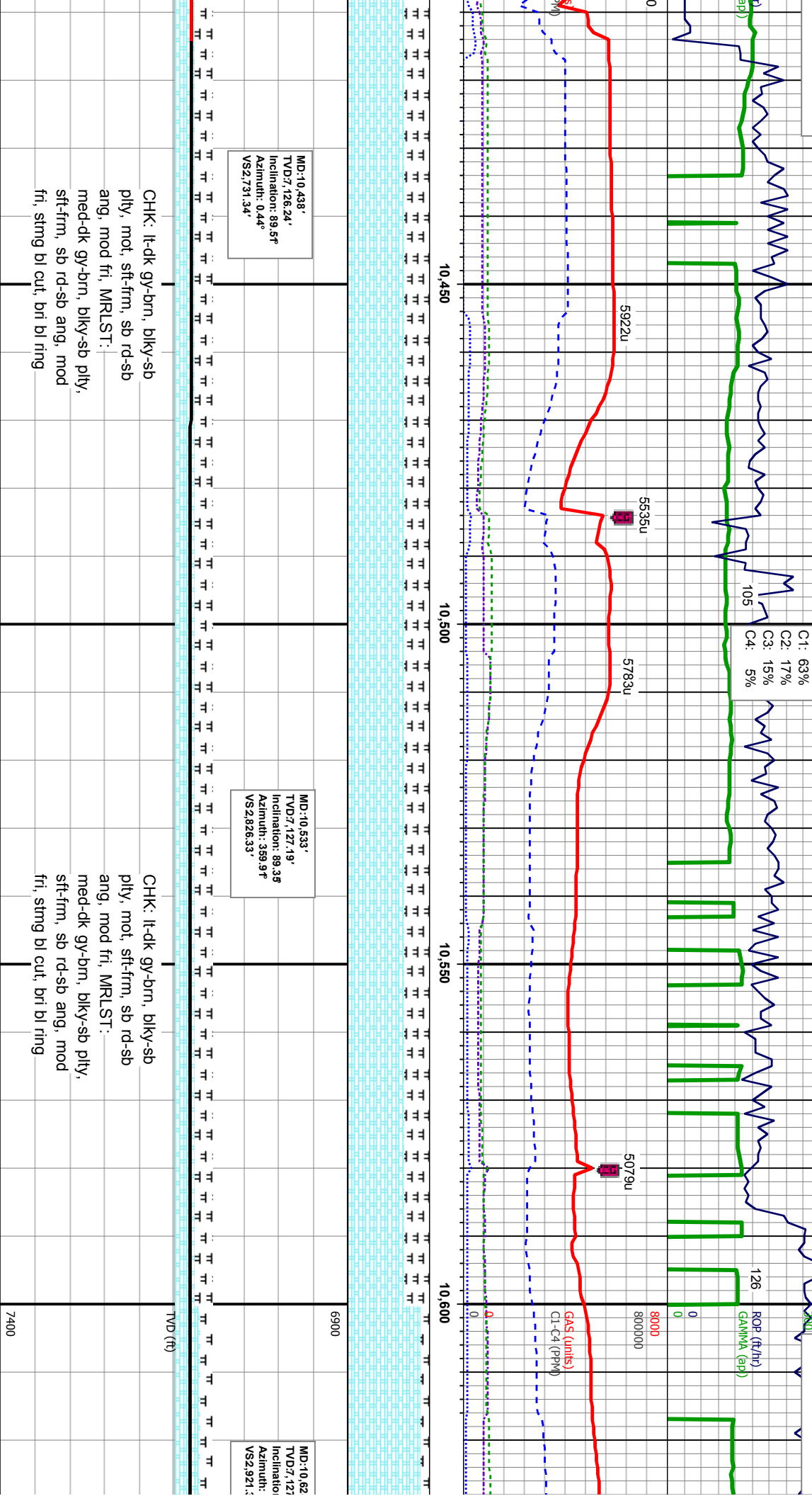


500 Problems with Gamma  
300

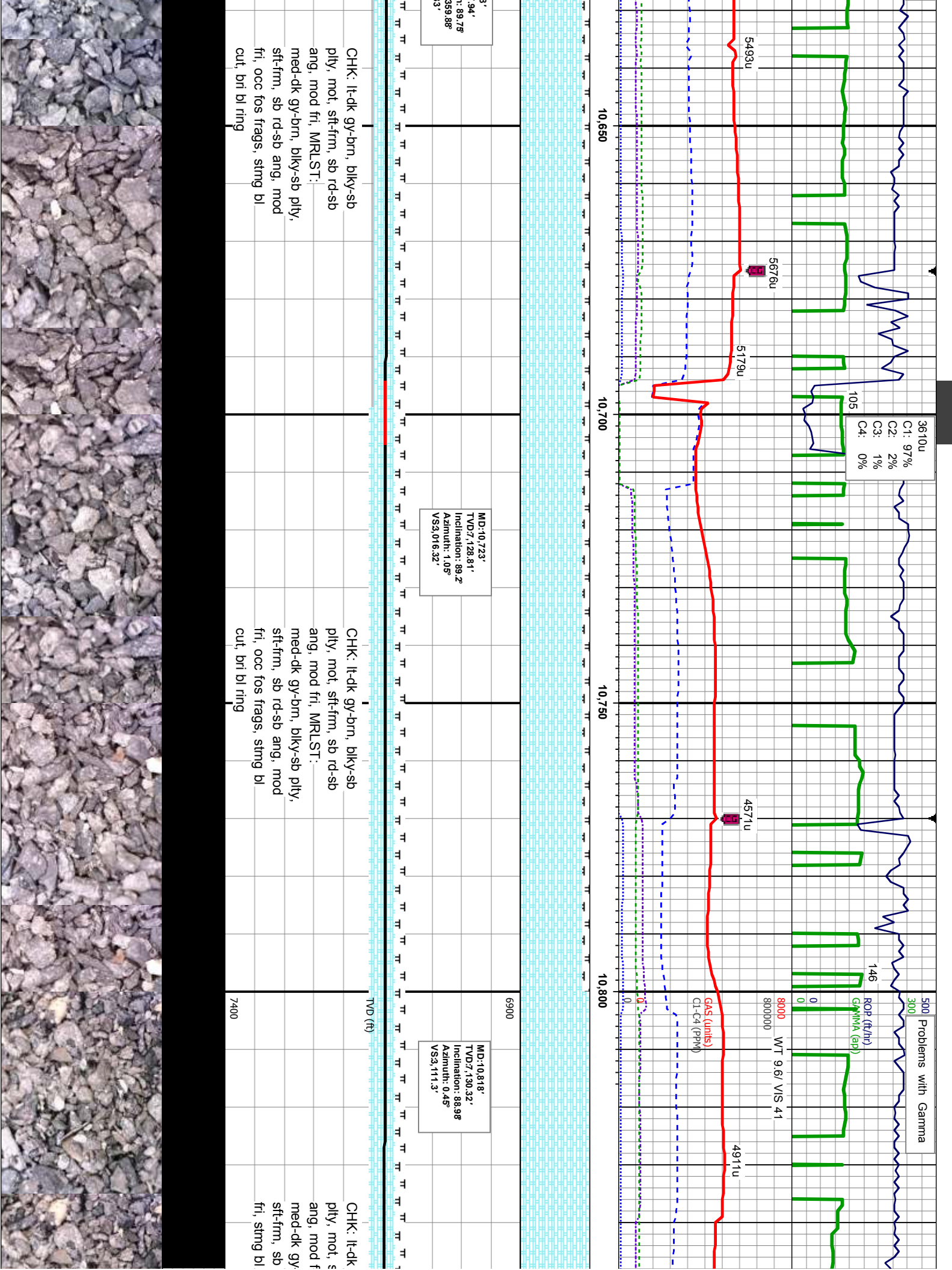
4049u  
C1: 62%  
C2: 20%  
C3: 16%  
C4: 2%

500 Pro  
300



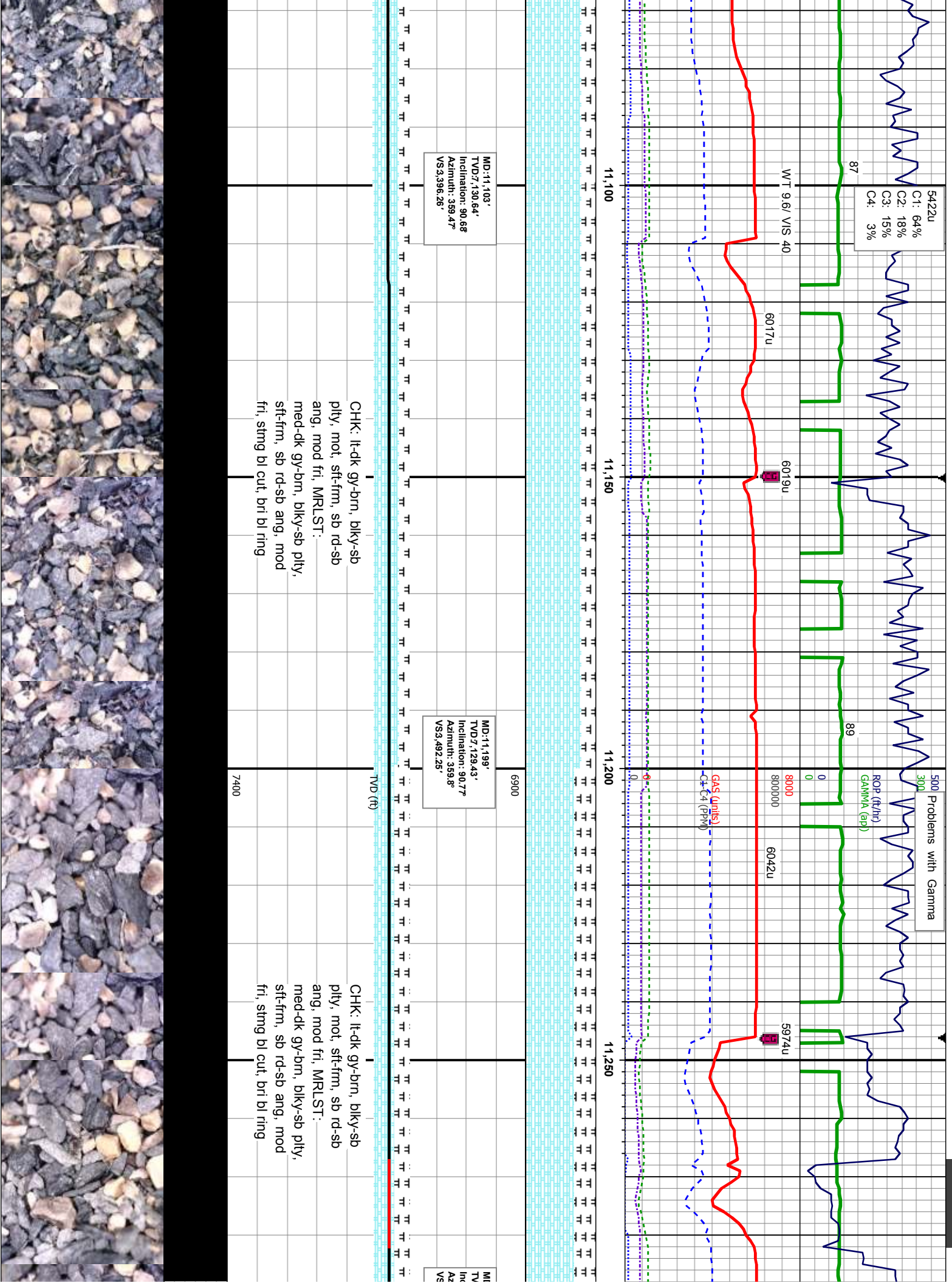


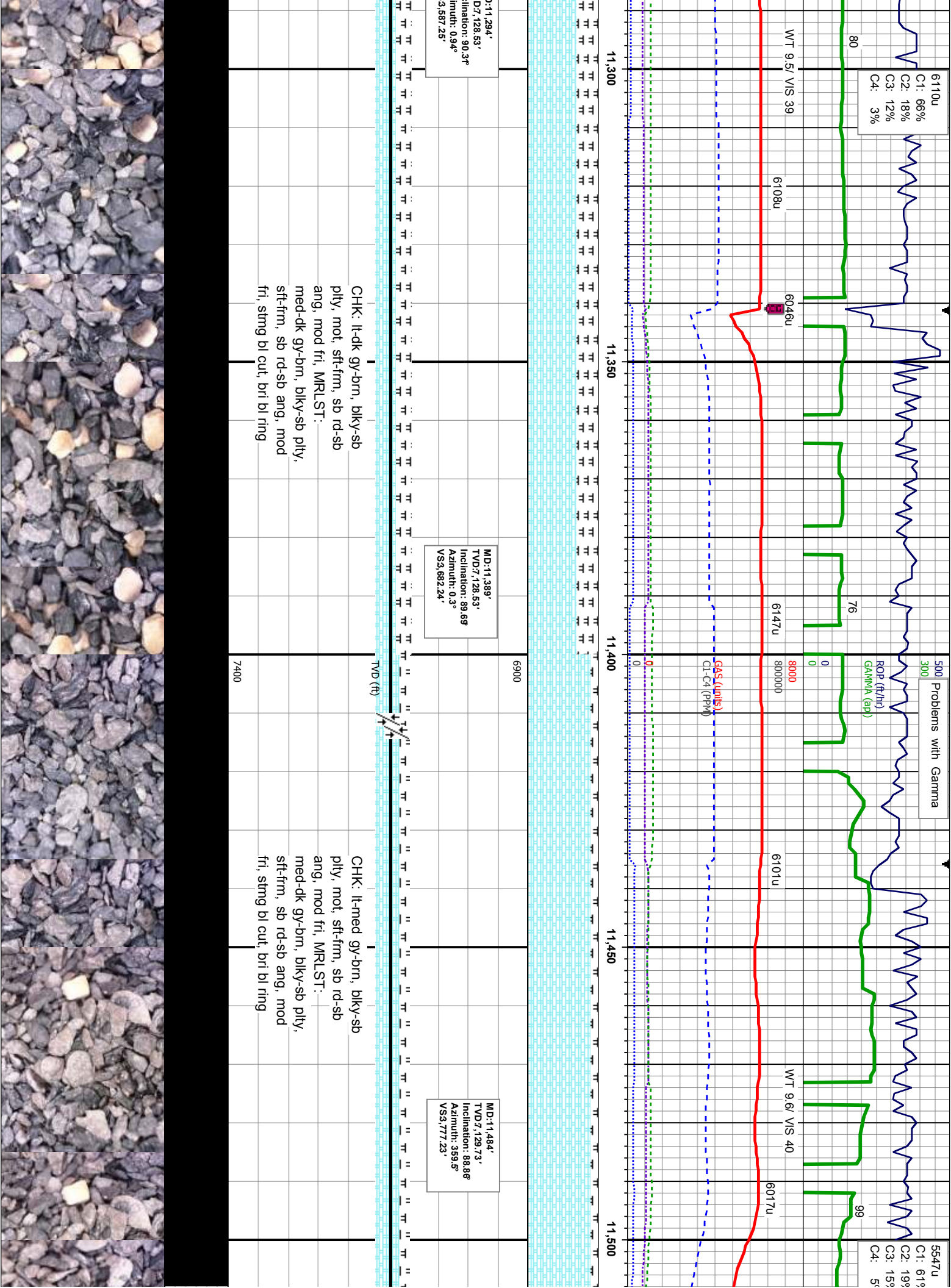




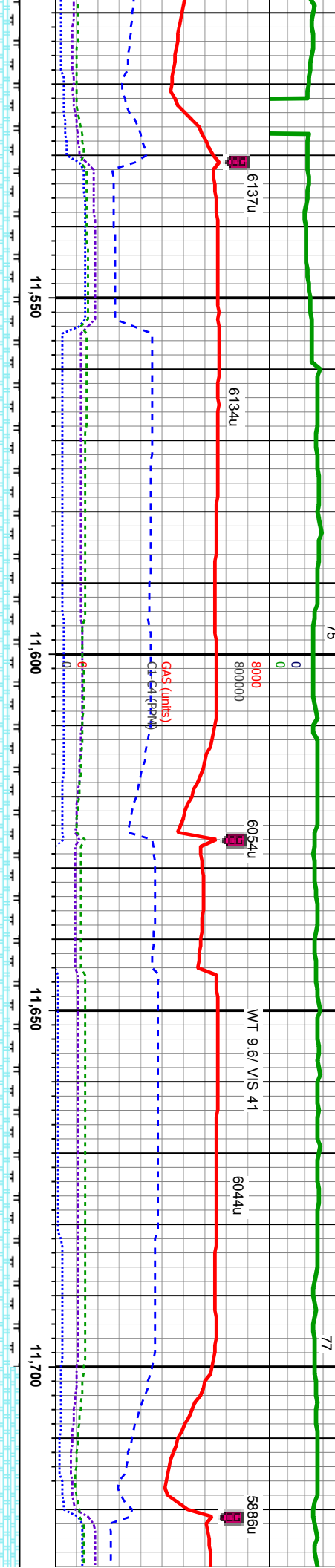
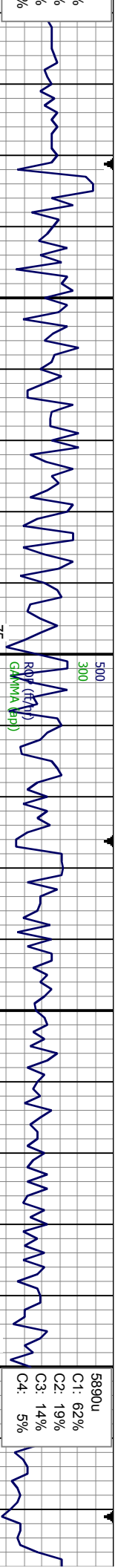




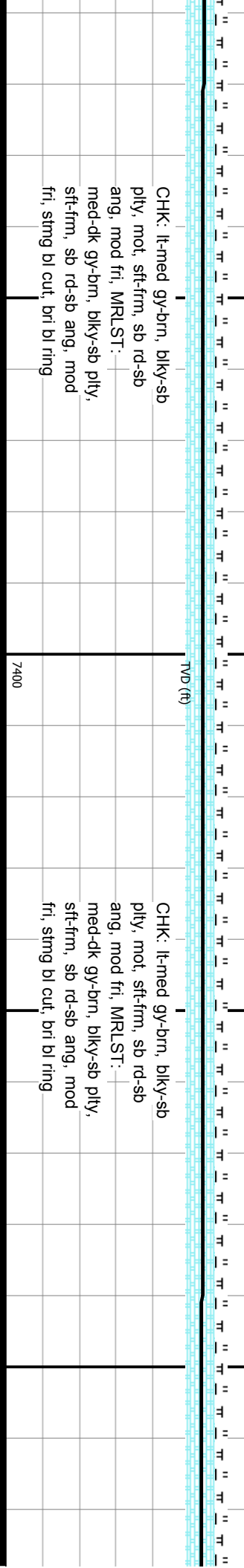








MD:11,579'  
TVD:7,131.64'  
Inclination: 88.83°  
Azimuth: 359.16°  
VS:3.872.2°



CHK: lt-med gy-brn, blk-y-sb  
pily, mot, sft-fm, sb rd-sb  
ang, mod fri, MRLST:  
med-dk gy-brn, blk-y-sb pily,  
sft-fm, sb rd-sb ang, mod  
fri, sting bl cut, bri bl ring

CHK: lt-med gy-brn, blk-y-sb  
pily, mot, sft-fm, sb rd-sb  
ang, mod fri, MRLST:  
med-dk gy-brn, blk-y-sb pily,  
sft-fm, sb rd-sb ang, mod  
fri, sting bl cut, bri bl ring



