





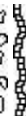















Scale: 5" / 100'  
Measured Depth Log

Well Name	Honey Badger J31-64-1HN(Horiz)		
Location	SEC 31, T5N, R66W		
State	COLORADO	County	WELD
Country	USA	Rig Number	H&P 326
API Number	05-123-35979		
Region	DJ BASIN	Field	WATTENBERG
Spud Date	1/20/2014	Drilling Completed	1/28/2014
Surface Coordinates	SEC 31, T5N, R66W 2164' FSL, 571' FWL		
Bottom Hole Coordinates	SEC31, T5N, R66W 1650' FSL, 535' FEL		
Ground Elevation	4863'	K.B. Elevation	4893'
Logged Interval	6530'	To	11733'
Formation	NIOBRARA, C CHALK		
Type of Drilling Fluid	LSND		

Company NOBLE ENERGY  
Address 1625 Broadway  
Denver, CO 80202

Name Evan Howell  
Company Noble Energy Inc  
Address 1625 Broadway  
Denver, CO 80202

COLUMBINE LOGGING

-  UNKNOWN
-  ANHYDRITE
-  BENTONITE
-  BRECCIA
-  CHALK
-  CEMENT
-  CHERT
-  CLAY CHOKE SAND
-  CLAYSTONE
-  COAL
-  CARBONATE
-  SANDSTONE
-  SHALE
-  SILTSTONE
-  LIMESTONE
-  GYPSUM
-  SALT
-  UNCONSOLIDATED

## Operator

BY INC.

Suite 2200

202

## Geologist

IC.

Suite 2200

202

## Other

MIKE KERSCHEN  
WESTON MARTIN

## Rock Types

CONGLOMERATE	MARLSTONE	SHALY SANDSTONE
DOLomite	METAMORPHIC	SHALY SILTSTONE
DOLomite	NO SAMPLE	SILTY SHALE
DOLomite	SALT	SILTSTONE
GRANITE	SANDSTONE	TILL
GYPsum	SALT-PEPPER SAND	TUFF
IGNEOUS	SHALE	WELDED TUFF
SIDERITE or LIMONITE	SHALE COLORED	
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	COAL STRINGER
BELEMNITE	P PELECYPOD	CAL CALCAREOUS	DOLOMITE STRINGER
BIOCLASTIC	P PELLET	CAR CARBONACEOUS FLAKES	GYP GYPSUM STRINGER
BRACHIOPOD	P PISOLITE	CHT CHERT	LIM LIMESTONE STRINGER
BRYOZOA	PL PLANT REMAINS	TH THIN BEDS	MARL MARLSTONE (CALC) STRG
CEPHALOPOD	SP PLANT SPORES	DOLOMITE	MARL MARLSTONE (DOL) STRG
CORAL	SC SCAPHOPOD	FEL FELDSPAR	SAND SANDSTONE STRINGER
CRINOID	ST STROMATOPOROID	FER FERRUGINOUS PELLET	SIL SILTY
ECHINOID			
FISH	<b>Minerals</b>	FER FERRUGINOUS	TU TUFACEOUS
FORAMINIFERA	ANH ANHYDRITIC	GLA GLAUCONITE	
F FOSSIL	ARG ARGILLACEOUS	GYP GYPSIFEROUS	<b>Stringer</b>

## Other Symbols

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

Slide/Rotate

ROP  
ROF

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Depth Labels

% Lith

Gamma  
GR

Well Bore  
TVD

Oil Show

Images

COLUMBINE LOGGING INC.  
RIGGED UP ON 01/20/2014  
MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT #0298

978u  
C1: 75.9%  
C2: 15.1%  
C3: 7.5%  
C4: 1.5%

Mud Wt: 9.50 / 29 Vis

2758u

SLTY SH: lt - med gy, mod frm, sft, sb blkly  
- sb plty, gritty arg cnt; SHY SS: lt gy-gy, off  
wh, vf-f gr, sub ang-sub rnd, mod w srd,  
frm, brt, sl calc

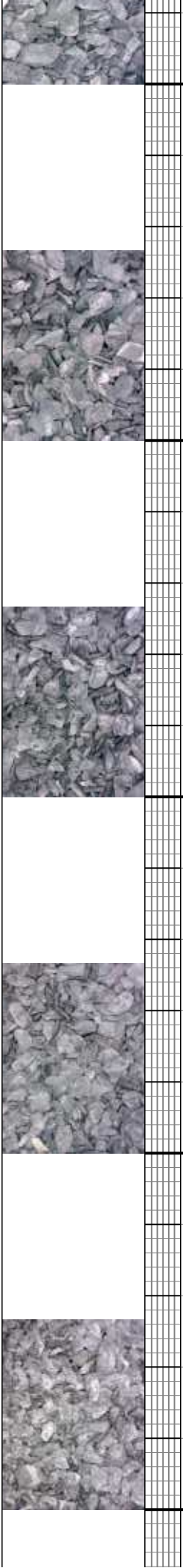
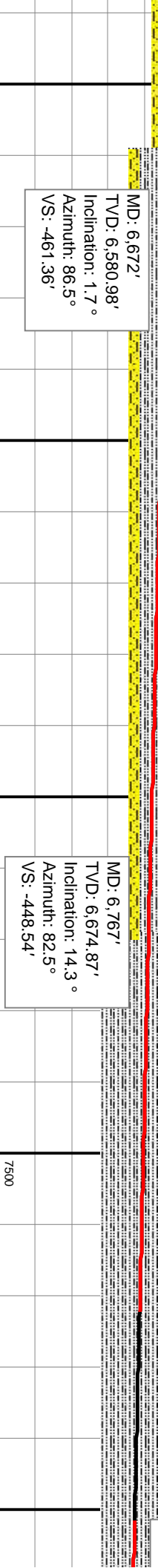
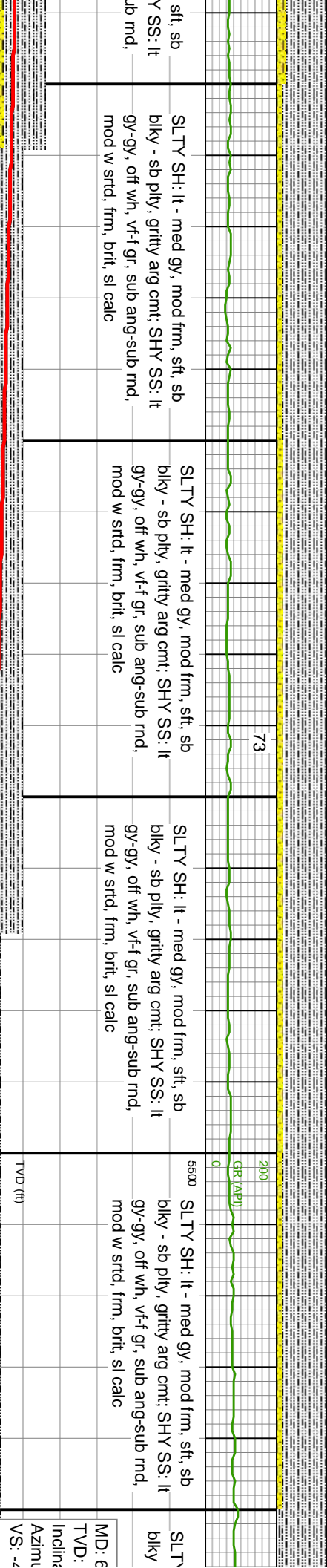
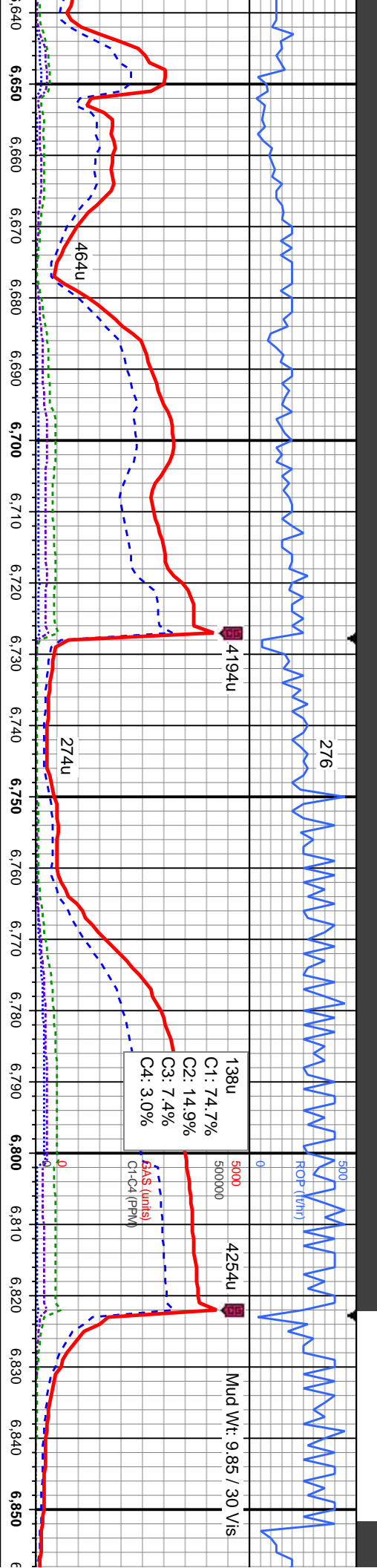
SLTY SH: lt - med gy, mod frm,  
blkly - sb plty, gritty arg cnt; SHY  
gy-gy, off wh, vf-f gr, sub ang-sub  
mod w srd, frm, brt, sl calc

Bit Data  
Bit #: 2  
Type: SMITH MD516  
Size: 8.75  
Jets: 5x11

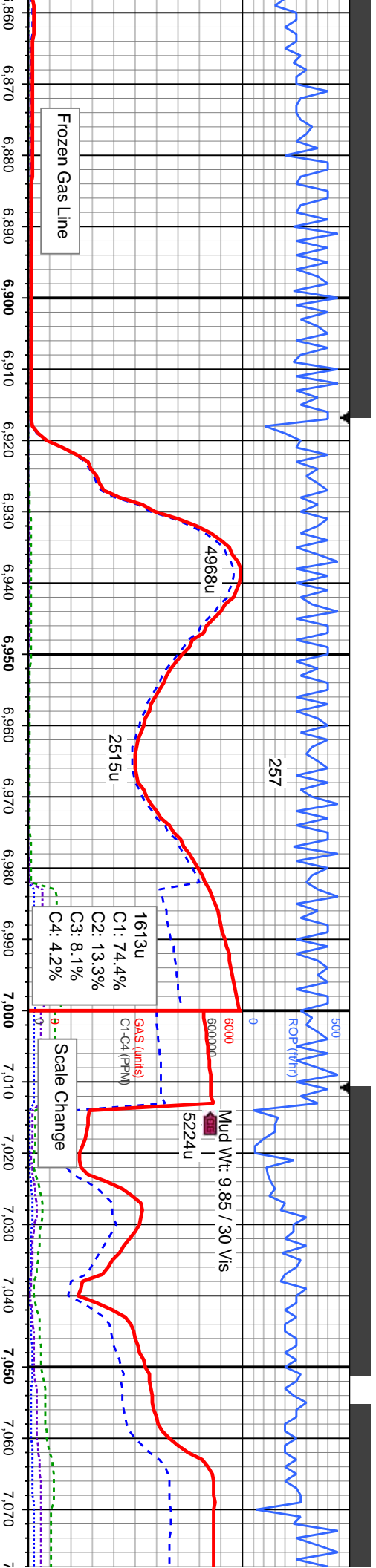
MD: 6,577'  
TVD: 6,486'  
Inclination: 0.8 °  
Azimuth: 166.1 °  
VS: -462.98'

50' Sample Interval @ 6530'









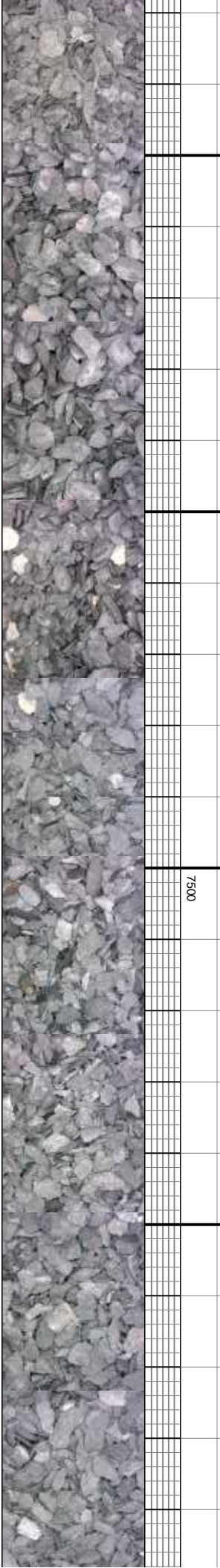
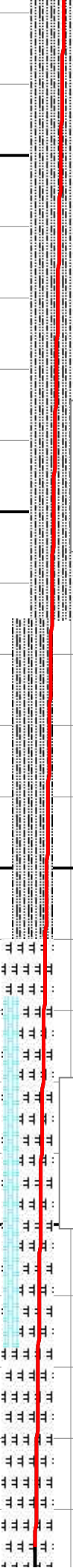
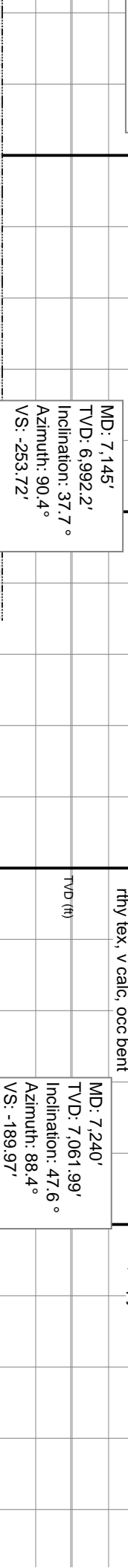
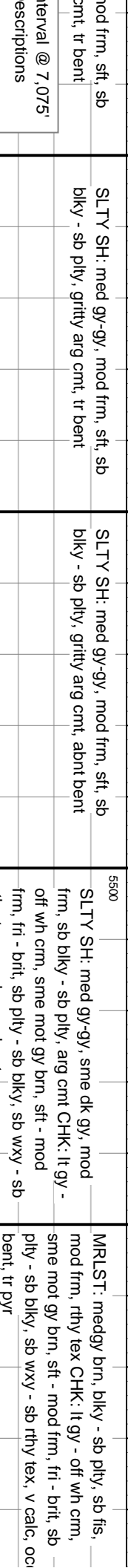
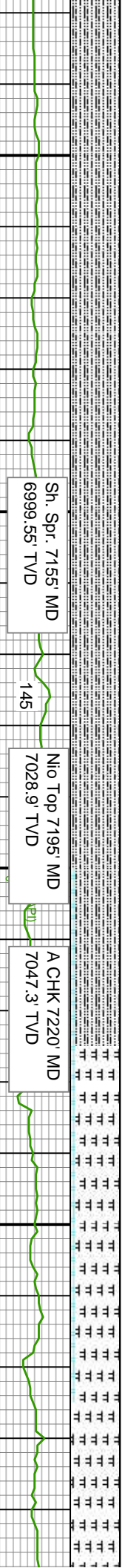
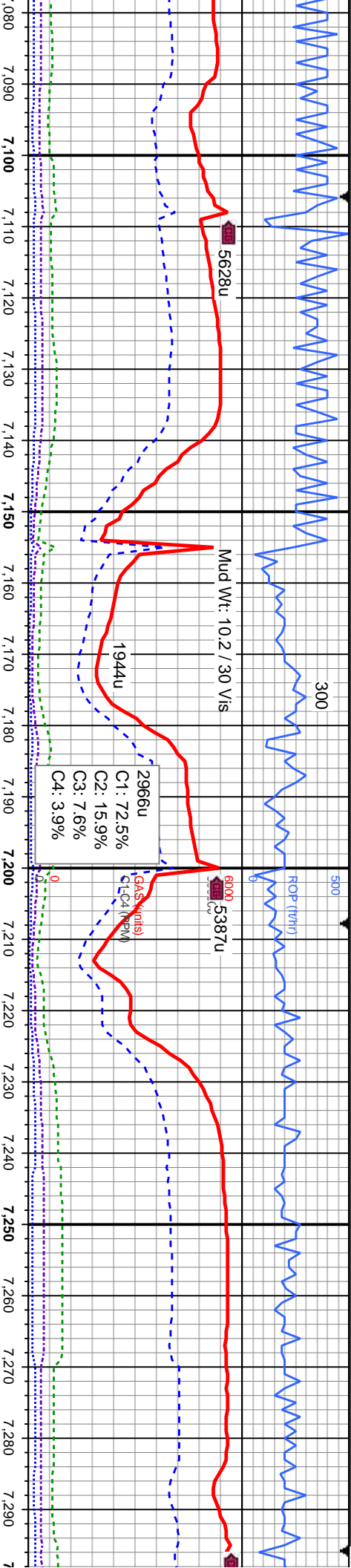
6,862'	SH: med gy-gy, mod frm, sft, sb sb pty, gritty arg cnt, tr bent	SLTY SH: med gy-gy, mod frm, sft, sb biky - sb pty, gritty arg cnt	SLTY SH: med gy-gy, mod frm, sft, sb biky - sb pty, gritty arg cnt, tr bent	SLTY SH: med gy-gy, mod frm, sft, sb biky - sb pty, gritty arg cnt	SLTY SH: med gy-gy, mod frm, sft, sb biky - sb pty, gritty arg
6,763.23'					
28.1°					
80.5°					
15.52'					

MD: 6,956'  
TVD: 6,842.43'  
Inclination: 36.9°  
Azimuth: 80.9°  
VS: -367'

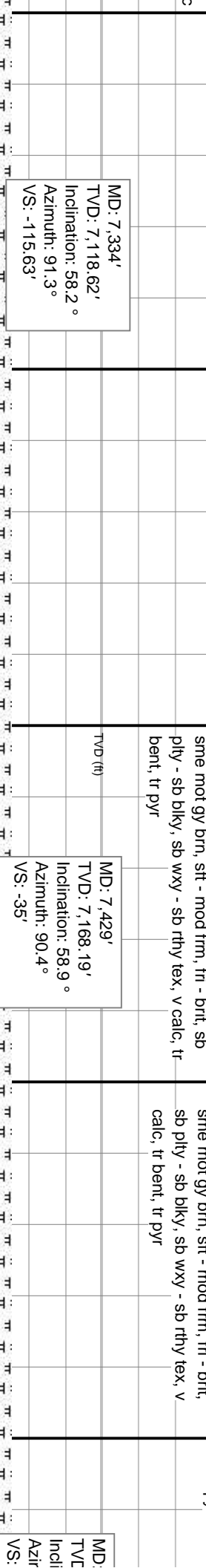
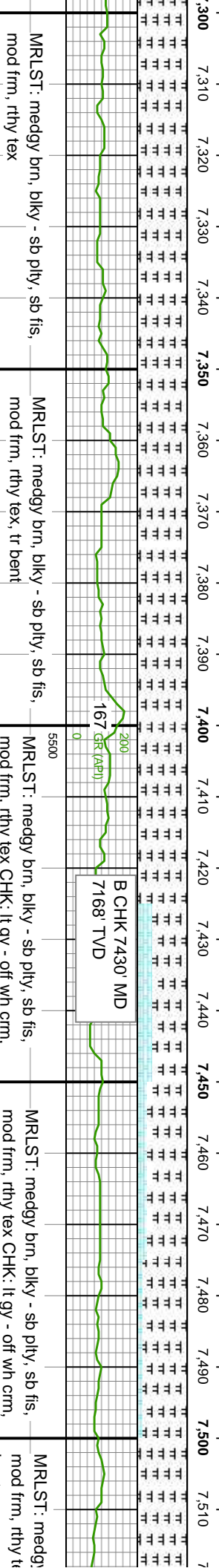
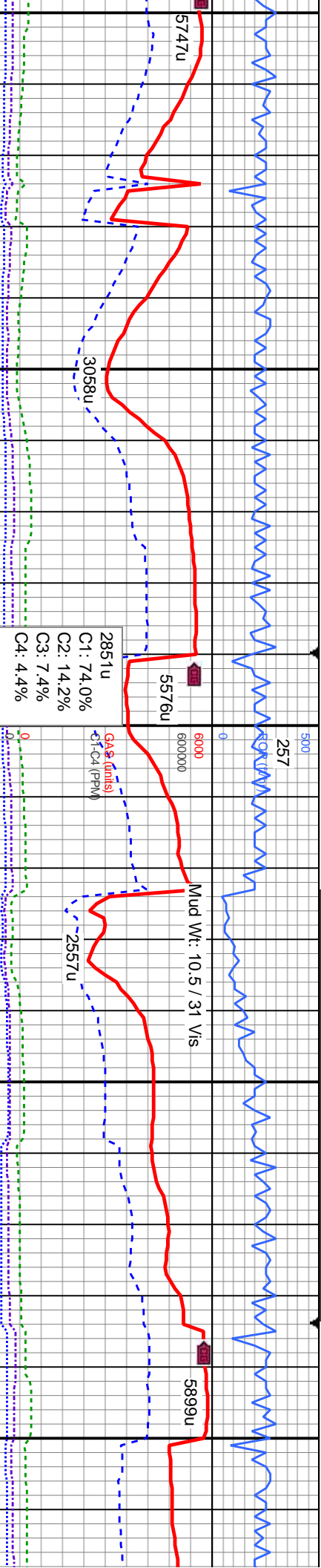
Mud Wt: 9.85 / 30 Vis  
5224u  
Scale Change

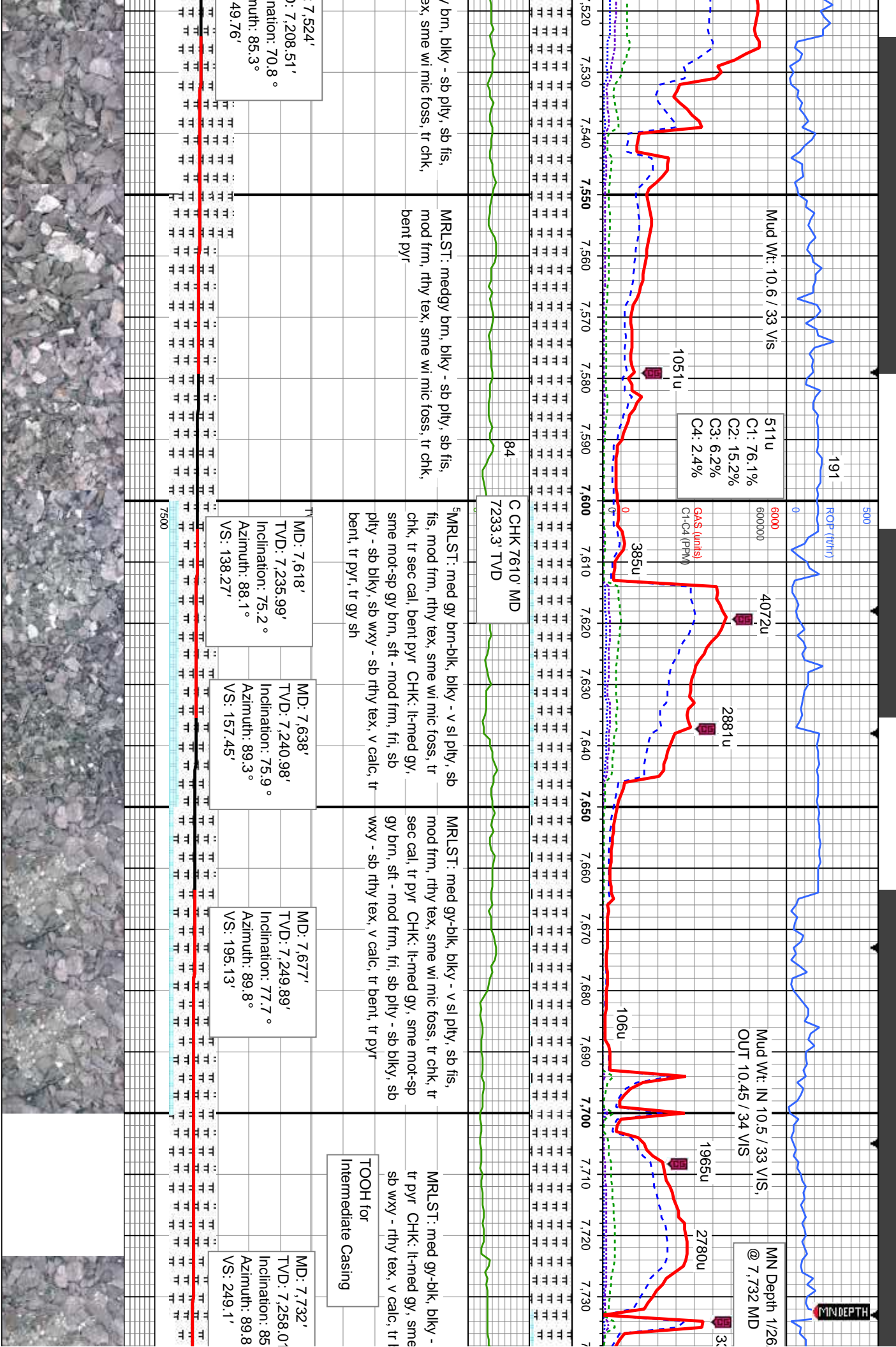
MD: 7,051'  
TVD: 6,917.92'  
Inclination: 37.9°  
Azimuth: 87°  
VS: -310.76'

25' Sample Ir  
50' Sample D

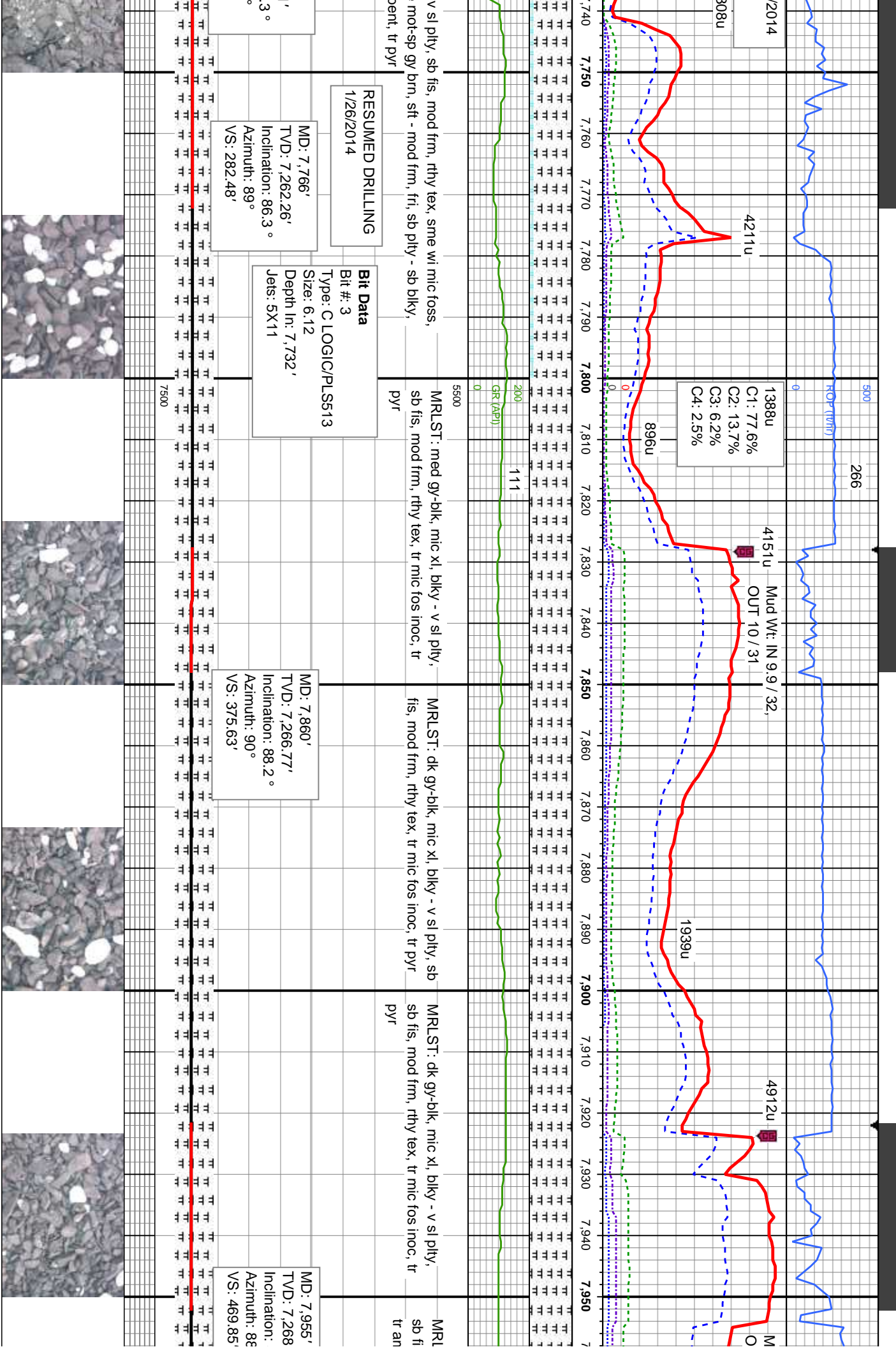












4211u

1388u  
C1: 77.6%  
C2: 13.7%  
C3: 6.2%  
C4: 2.5%

4151u  
Mud Wt: IN 9.9 / 32,  
OUT 10 / 31

1939u

4912u

RESUMED DRILLING  
1/26/2014

**Bit Data**  
Bit #: 3  
Type: C LOGIC/PLS513  
Size: 6.12  
Depth In: 7,732'  
Jets: 5X11

MD: 7,766'  
TVD: 7,262.26'  
Inclination: 86.3°  
Azimuth: 89°  
VS: 282.48'

MD: 7,860'  
TVD: 7,266.77'  
Inclination: 88.2°  
Azimuth: 90°  
VS: 375.63'

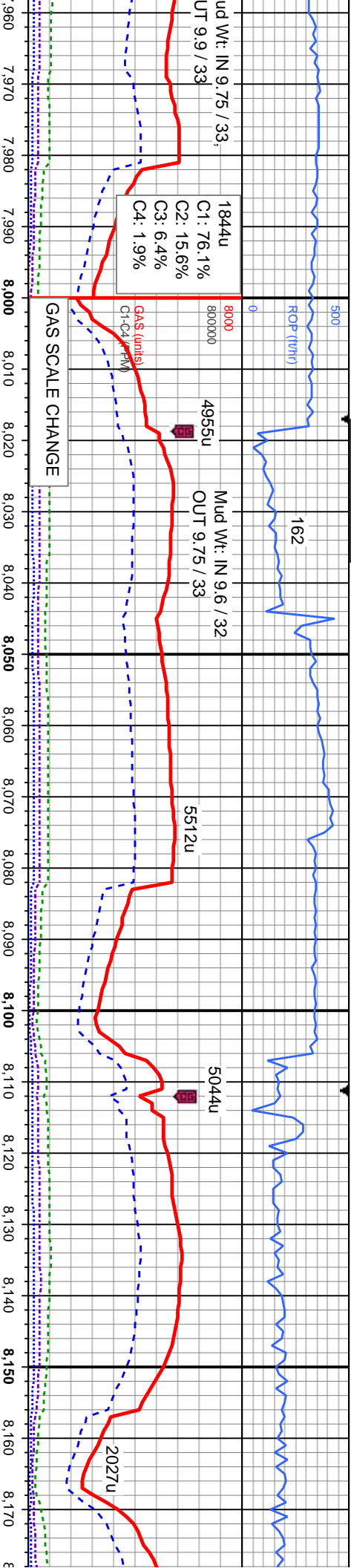
MD: 7,955'  
TVD: 7,268  
Inclination:  
Azimuth: 88°  
VS: 469.85'

vs sl pty, sb fis, mod frm, rthy tex, sme wi mic foss,  
mck-sp gy brn, sft - mod frm, fri, sb pty - sb blk, y  
ent, tr pyr

MRLST: med gy-blk, mic xl, blk y - v sl pty,  
sb fis, mod frm, rthy tex, tr mic fos inoc, tr  
pyr

MRLST: dk gy-blk, mic xl, blk y - v sl pty, sb  
fis, mod frm, rthy tex, tr mic fos inoc, tr pyr

MRLST: dk gy-blk, mic xl, blk y - v sl pty,  
sb fis, mod frm, rthy tex, tr mic fos inoc, tr  
pyr



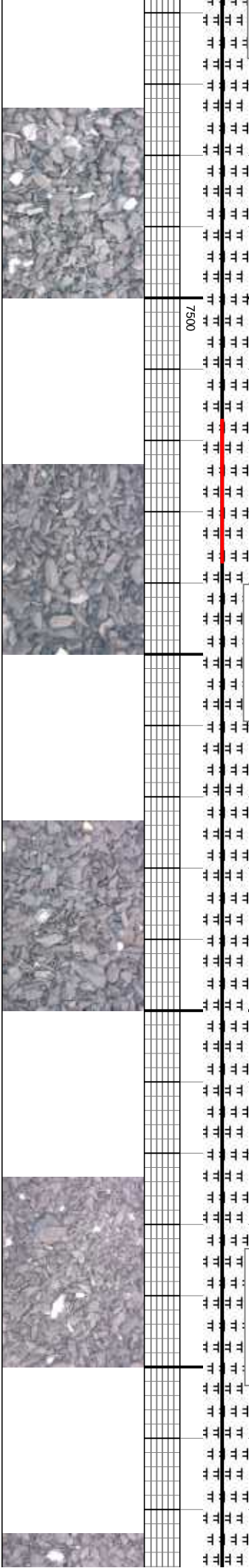
ST: dk gy-blk, mic xl, blk y - v sl pty, sb fis, mod frm, rthy tex, tr pyr, tr sec cal, tr wh-amb ss

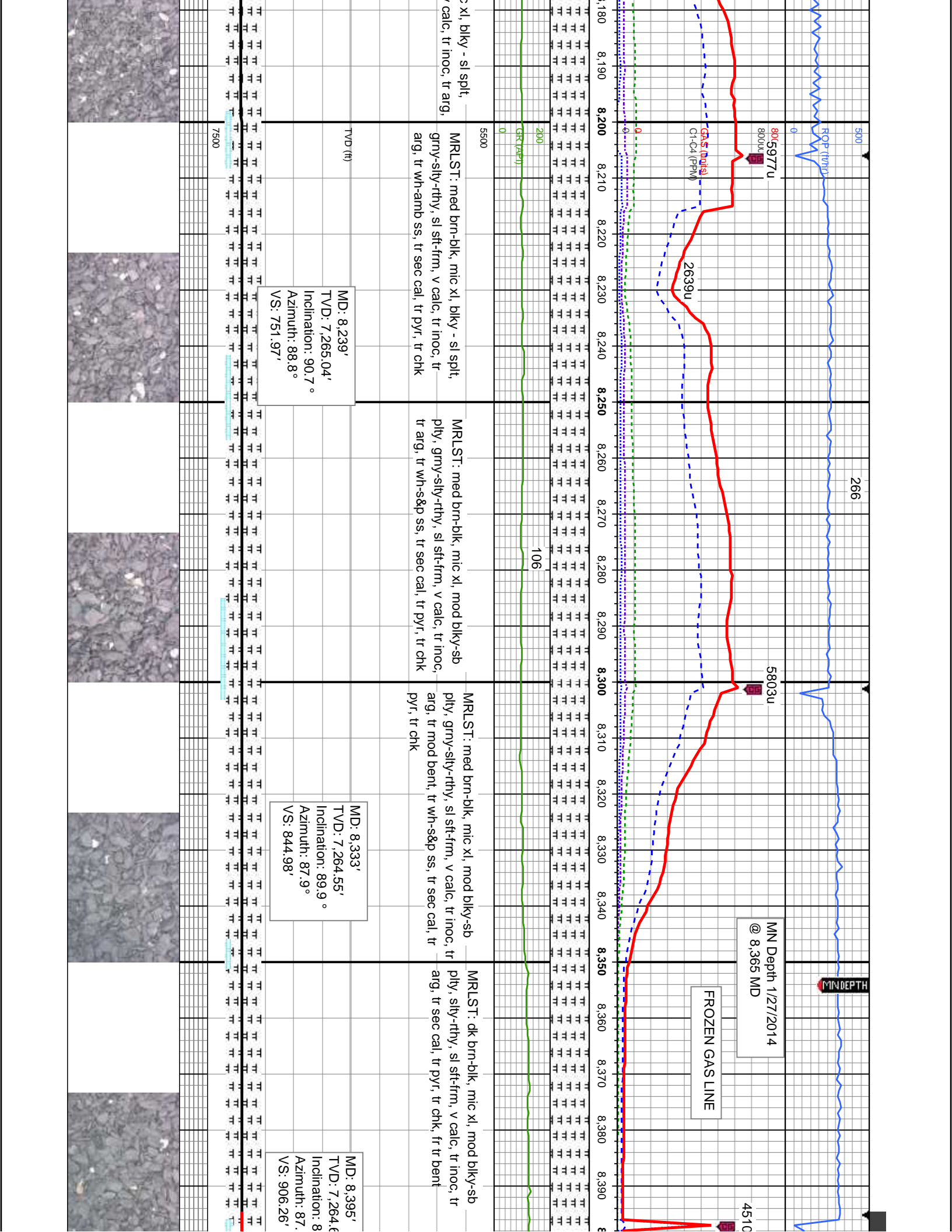
MRLST: dk gy-blk, mic xl, blk y - v sl pty, sb fis, mod frm, rthy tex, tr pyr, tr sec cal, tr wh-amb ss

MRLST: med brn-blk, mic xl, blk y - sl split, grny-sily-rthy, sl sft-frm, v calc, tr inoc, tr arg, tr wh-amb ss

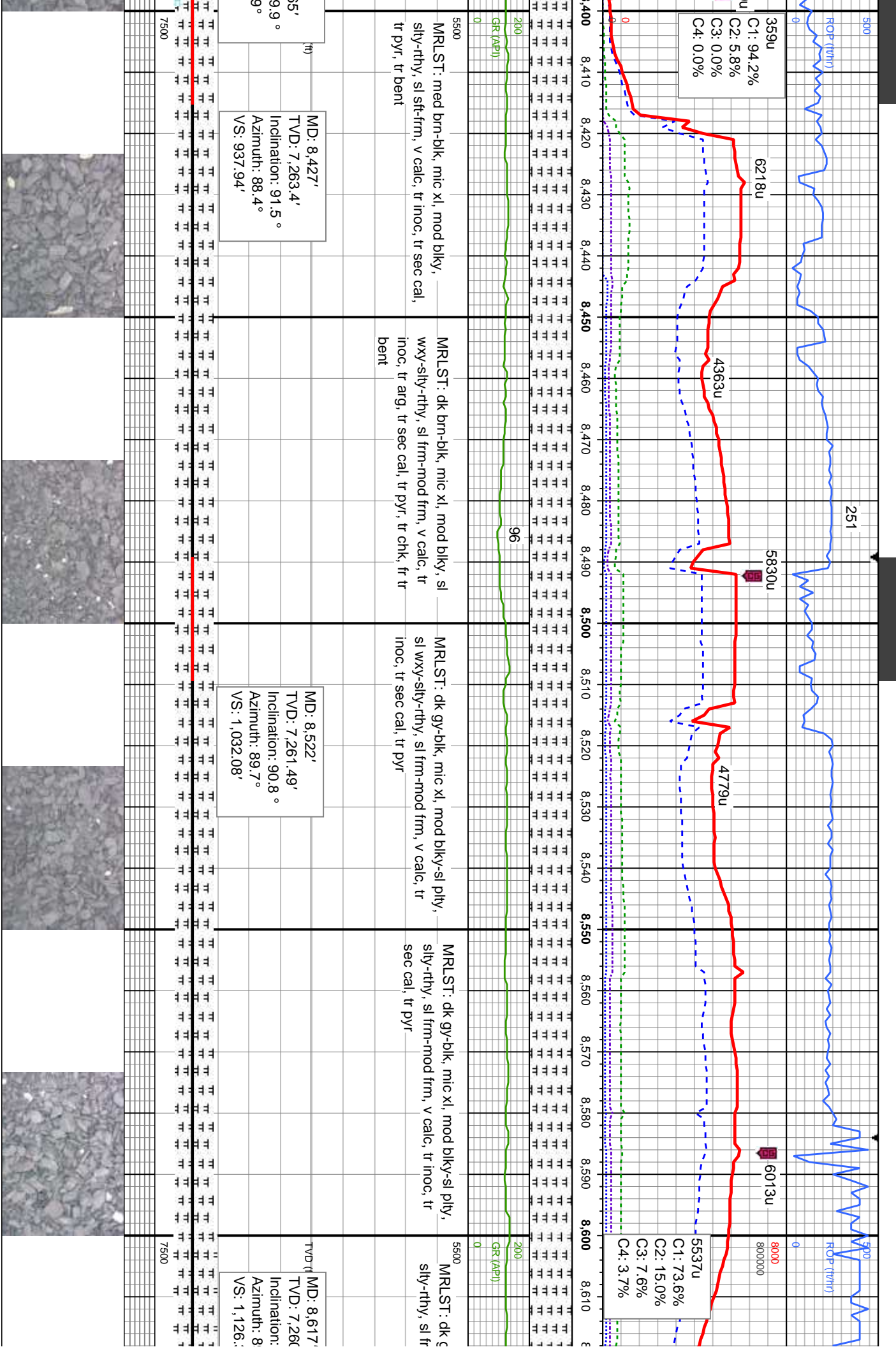
MD: 8,049'  
TVD: 7,268.11'  
Inclination: 91 °  
Azimuth: 90.9°  
VS: 563.18'

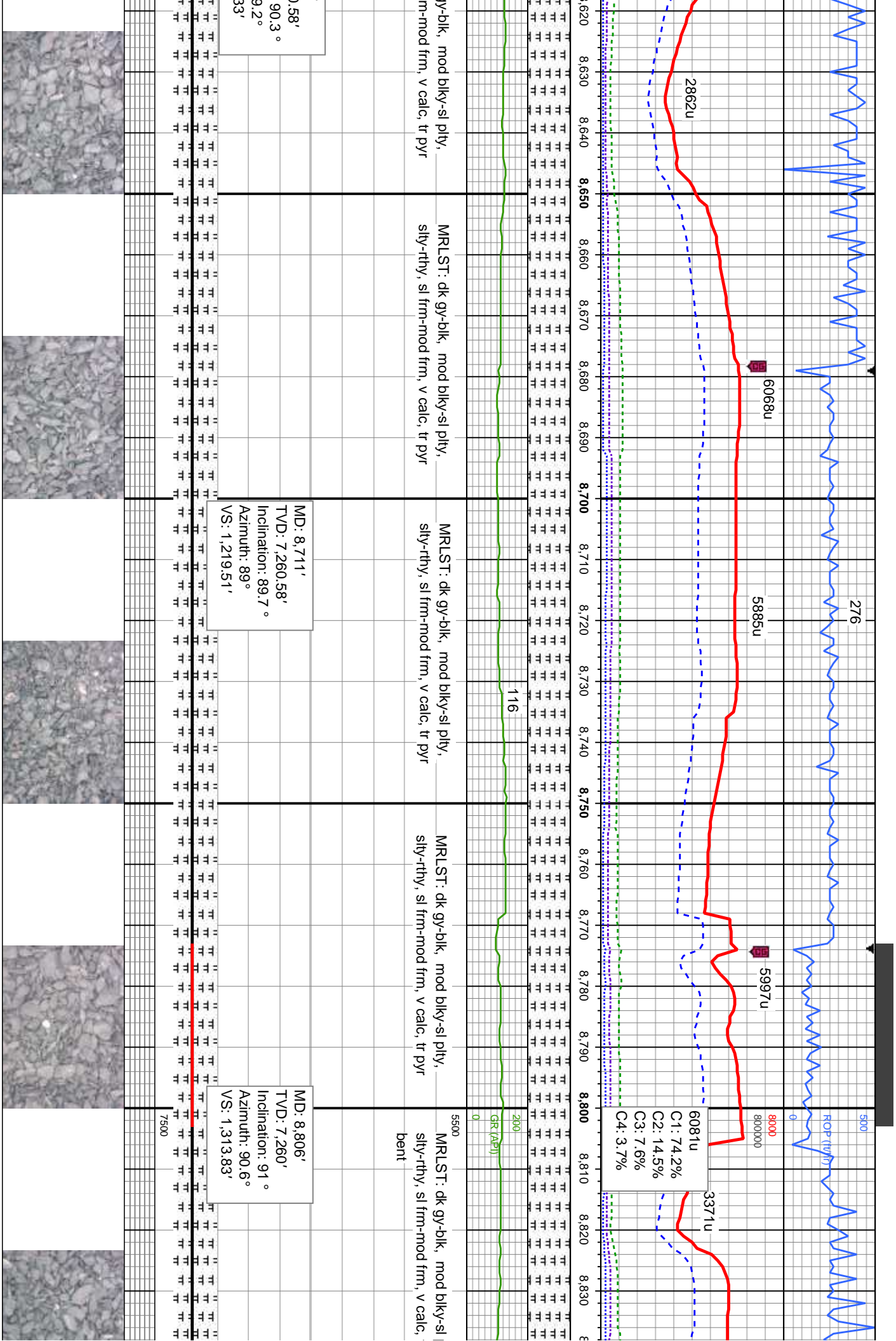
MD: 8,144'  
TVD: 7,266.45'  
Inclination: 91 °  
Azimuth: 90.7°  
VS: 657.67'

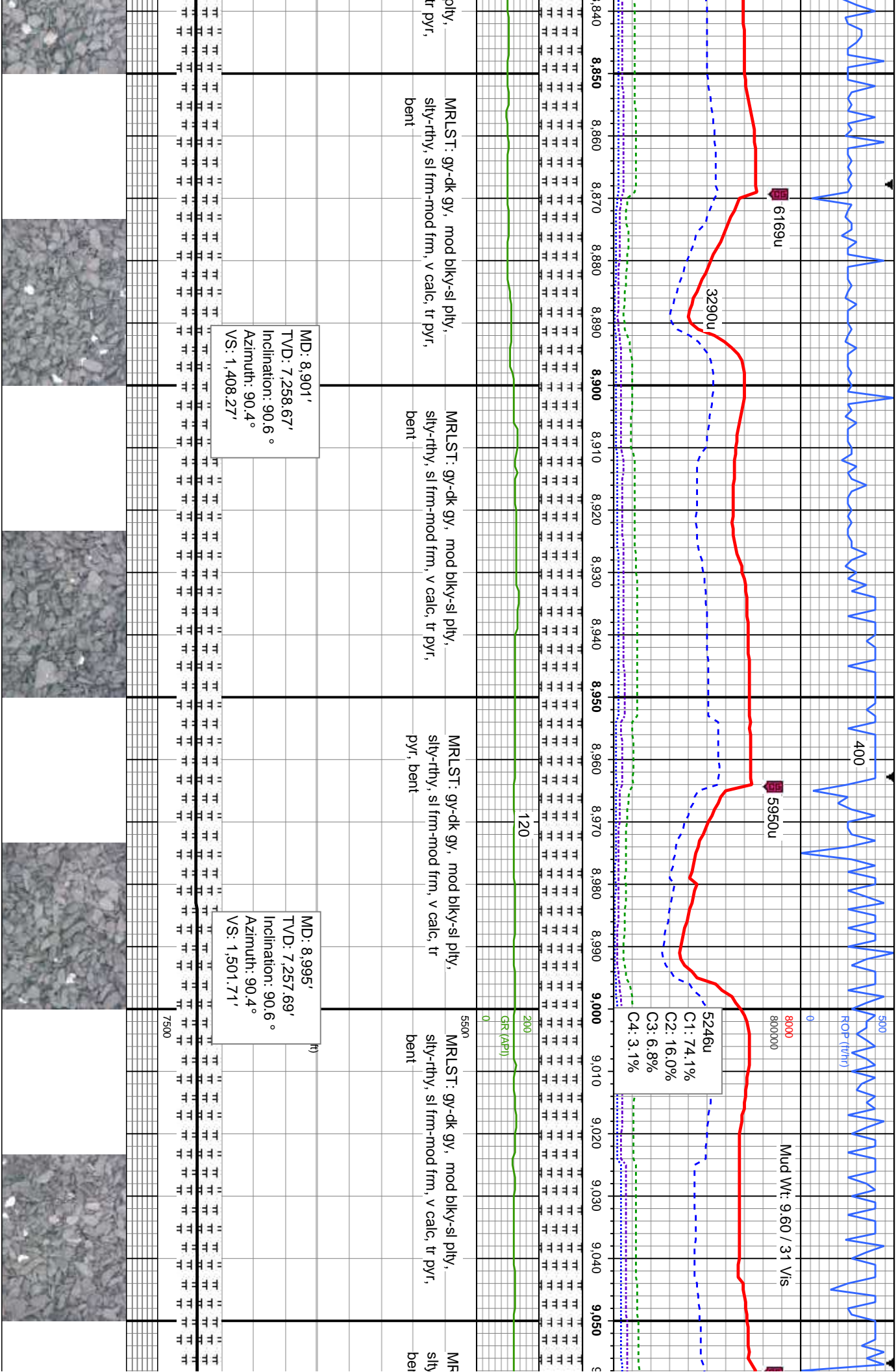










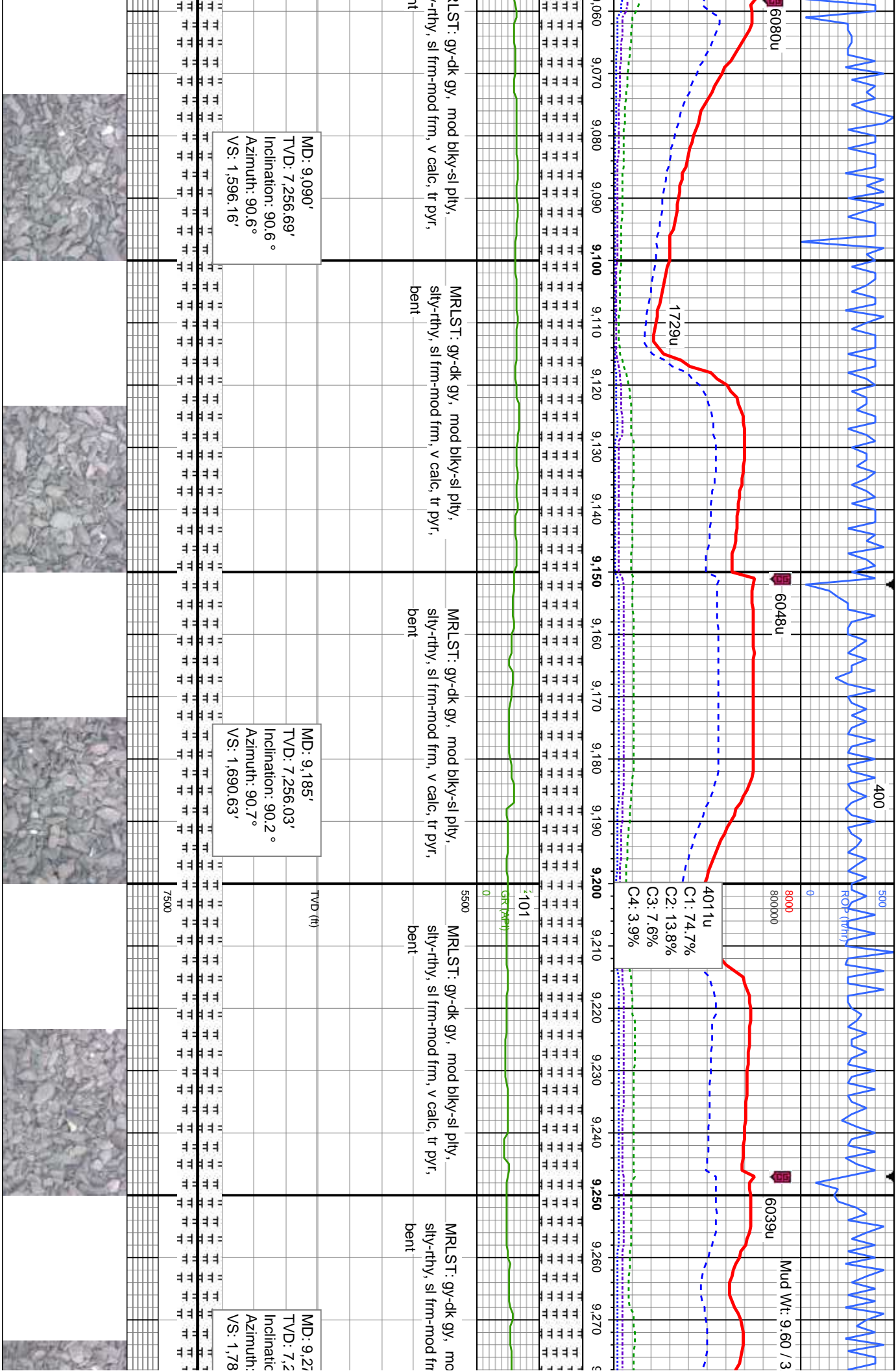


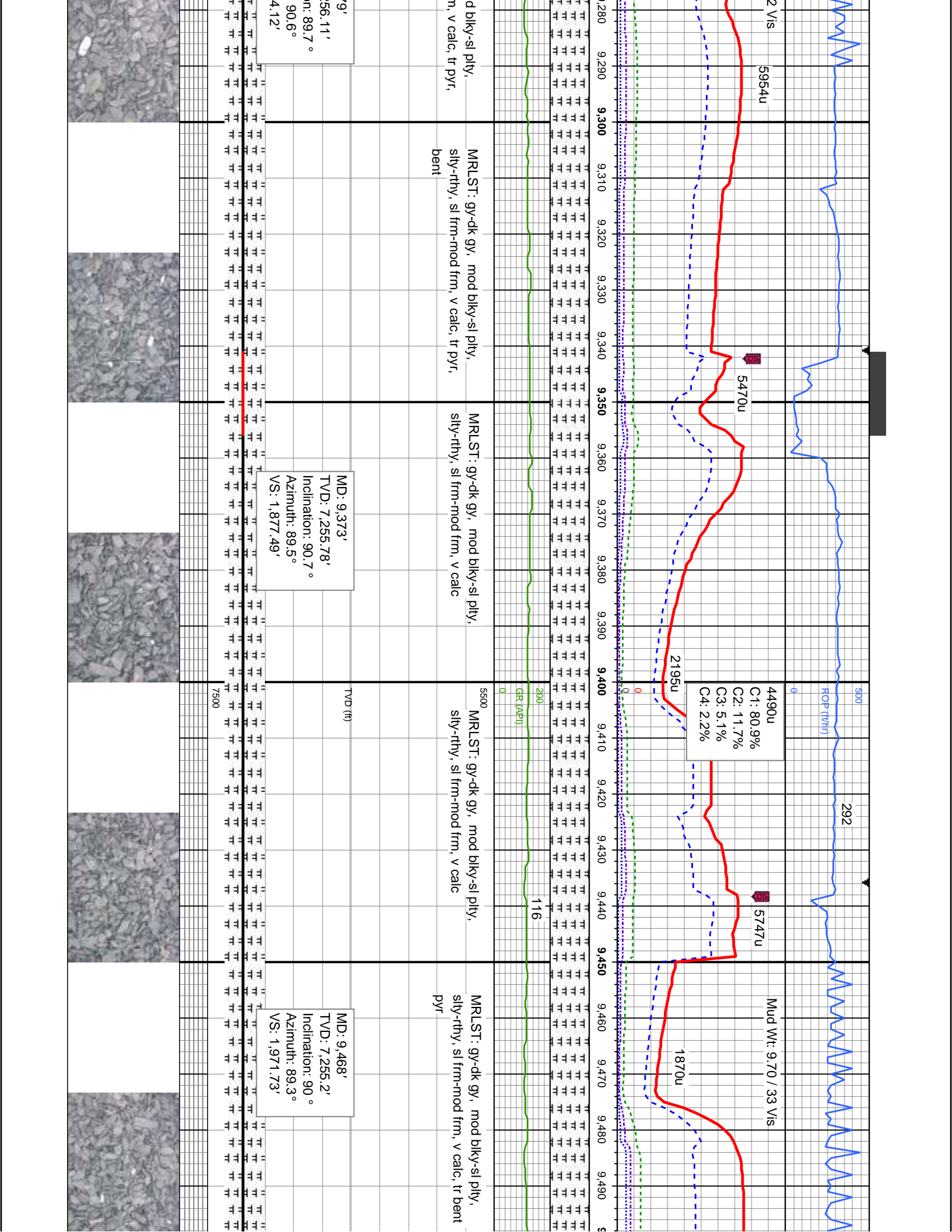
C1: 74.1%  
C2: 16.0%  
C3: 6.8%  
C4: 3.1%

MD: 8,901'  
TVD: 7,258.67'  
Inclination: 90.6°  
Azimuth: 90.4°  
VS: 1,408.27'

MD: 8,995'  
TVD: 7,257.69'  
Inclination: 90.6°  
Azimuth: 90.4°  
VS: 1,501.71'

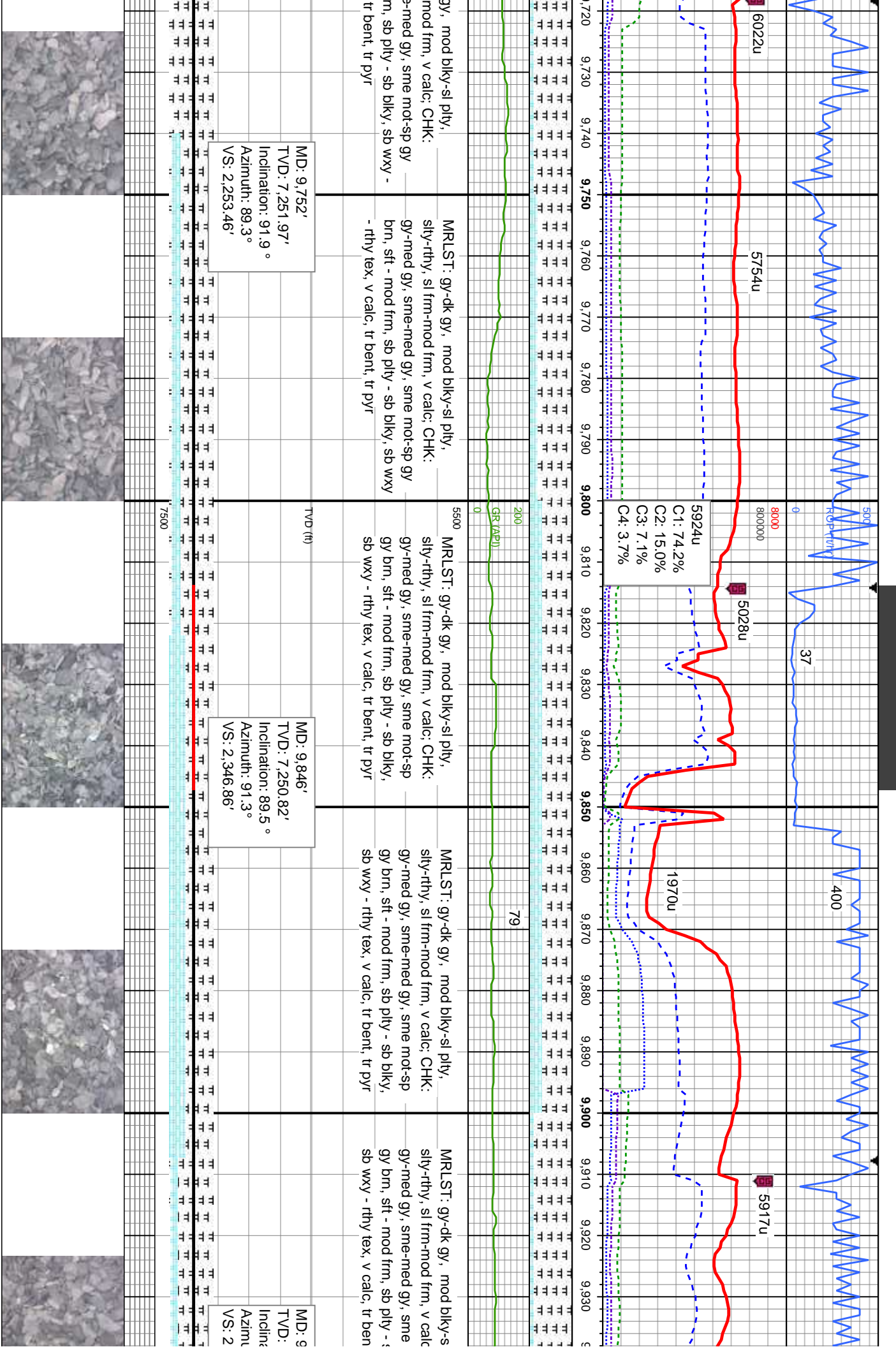


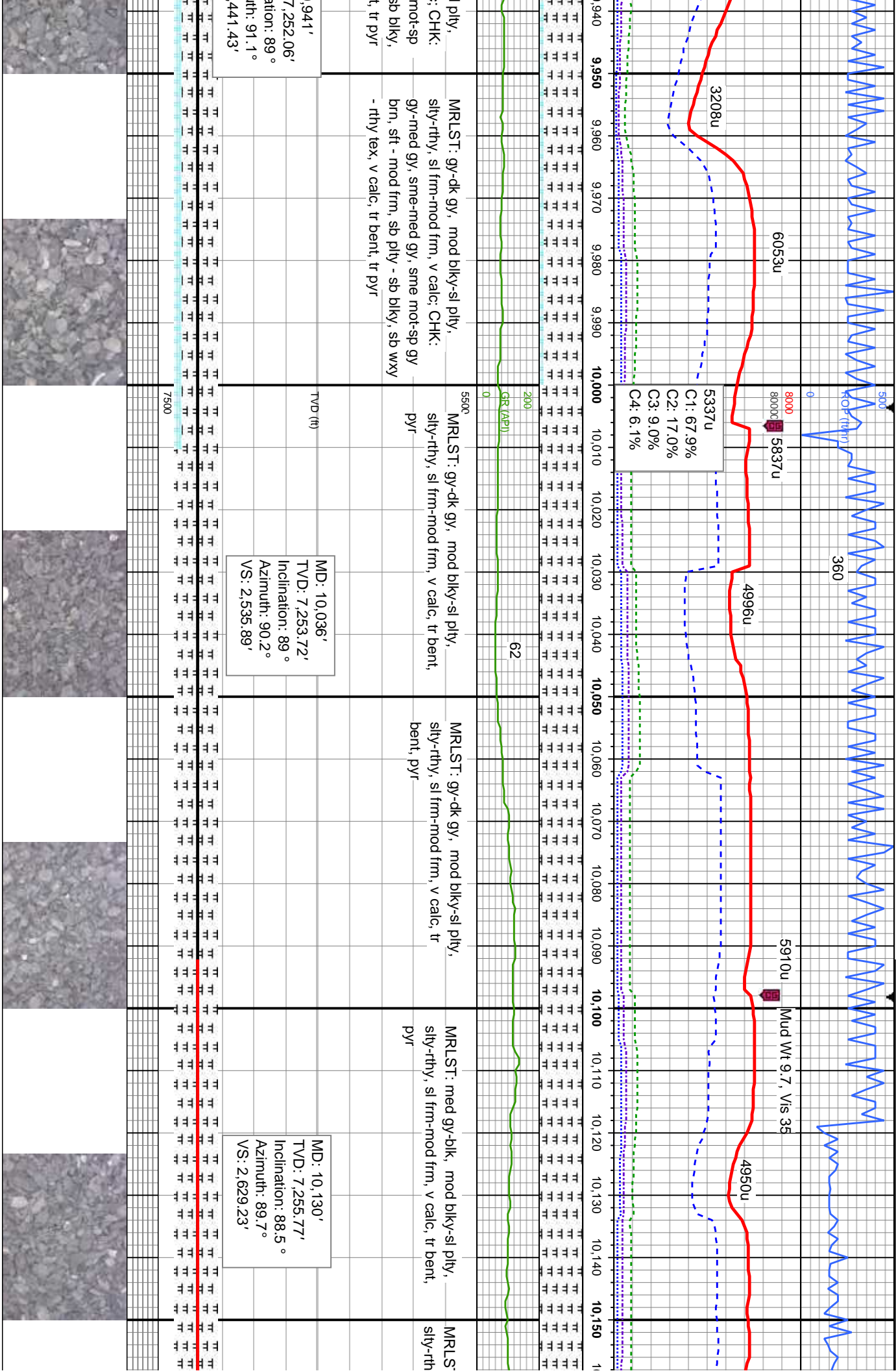


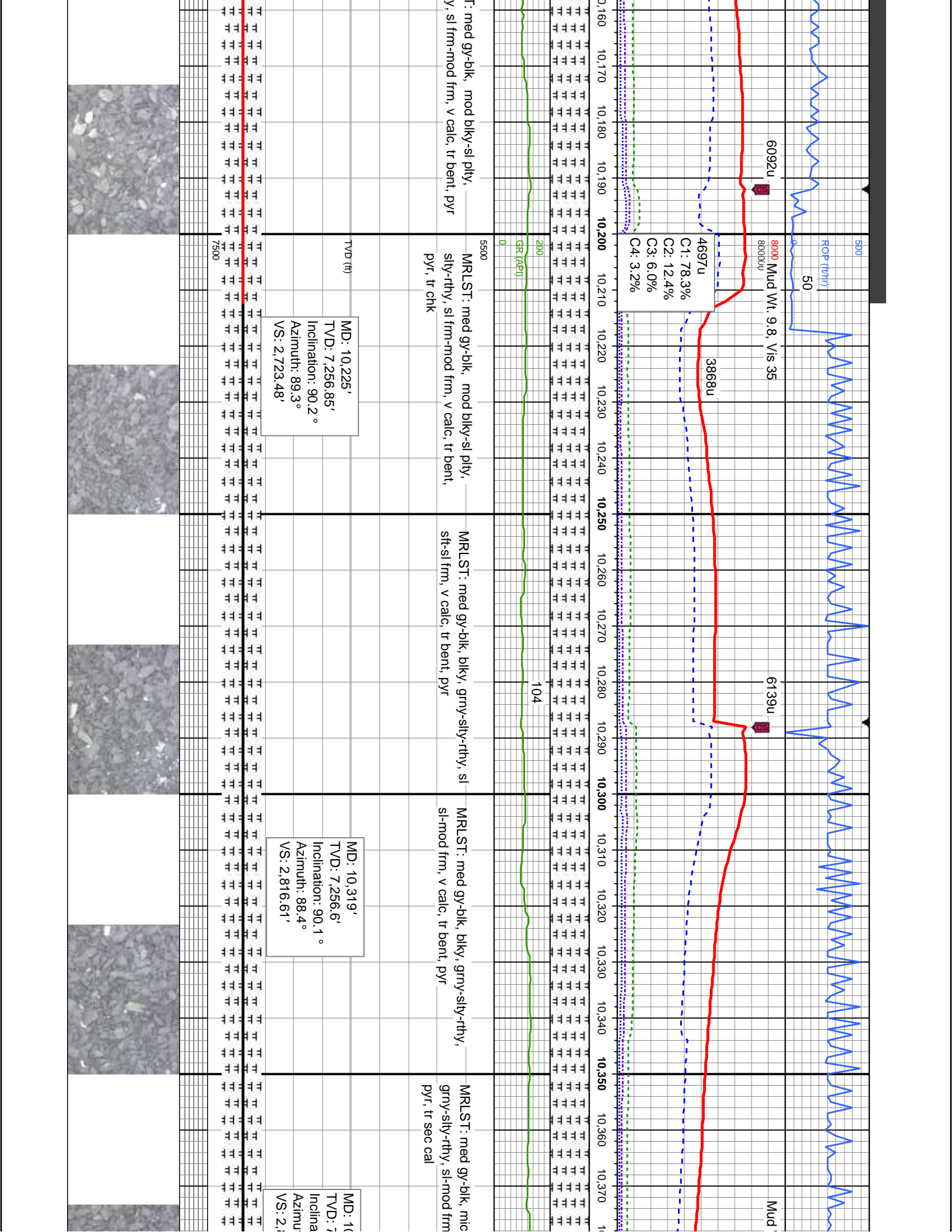




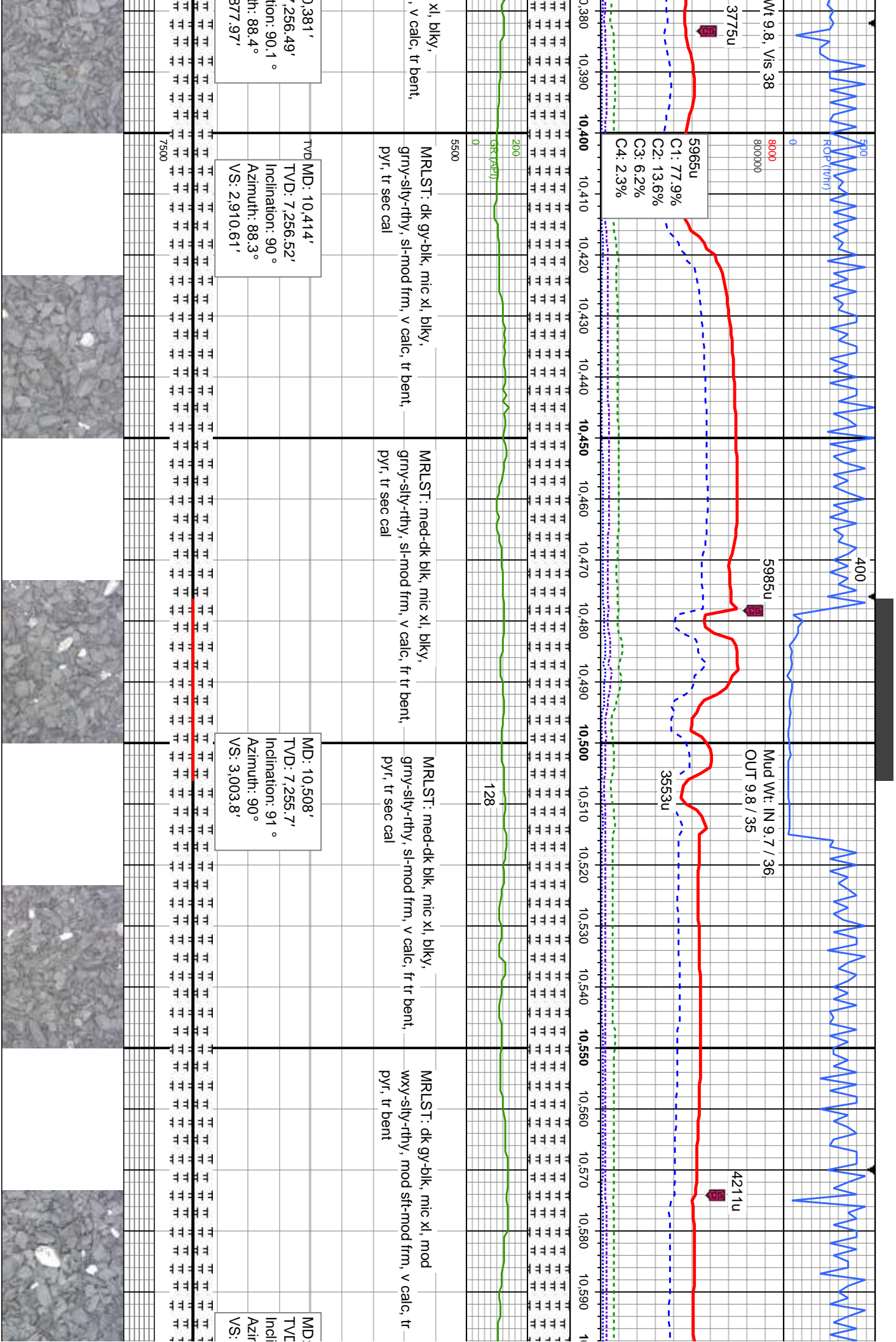


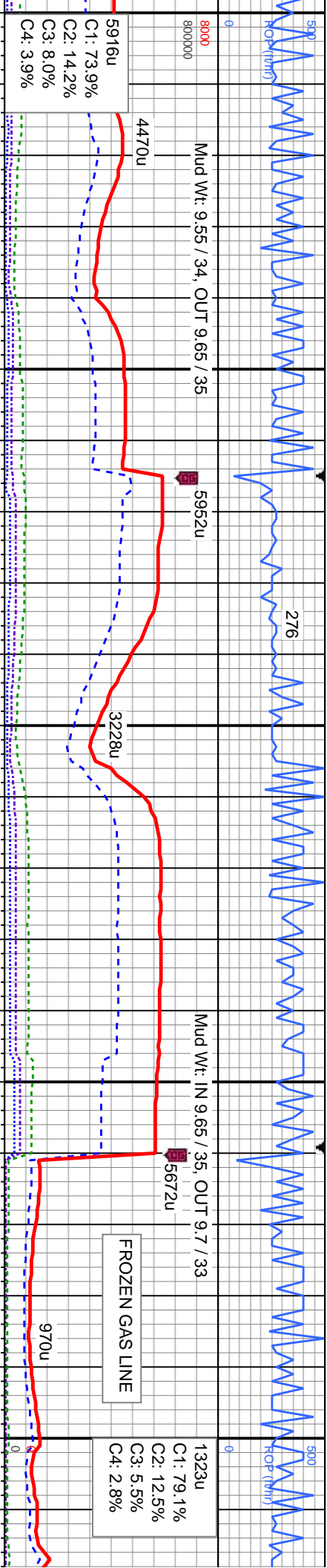












MRLST: dk gy-blk, mic xl, mod  
wxy-slty-rthy, mod sft-mod frm, v calc, tr  
pyr, tr bent, tr sec cal

MRLST: dk gy-blk, mic xl, mod  
wxy-slty-rthy, mod sft-mod frm, v calc, tr  
pyr, tr bent, tr sec cal

MRLST: med gy-blk, mic xl, grny-slty-rthy,  
mod frm, v calc, tr pyr, tr bent, tr sec cal

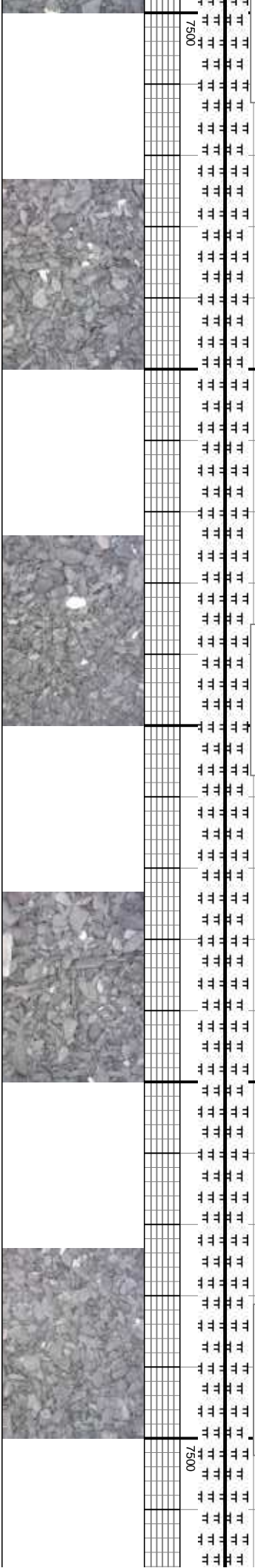
MRLST: blk, mic xl, grny-slty-rthy, mod  
frm, v calc, tr pyr, tr bent

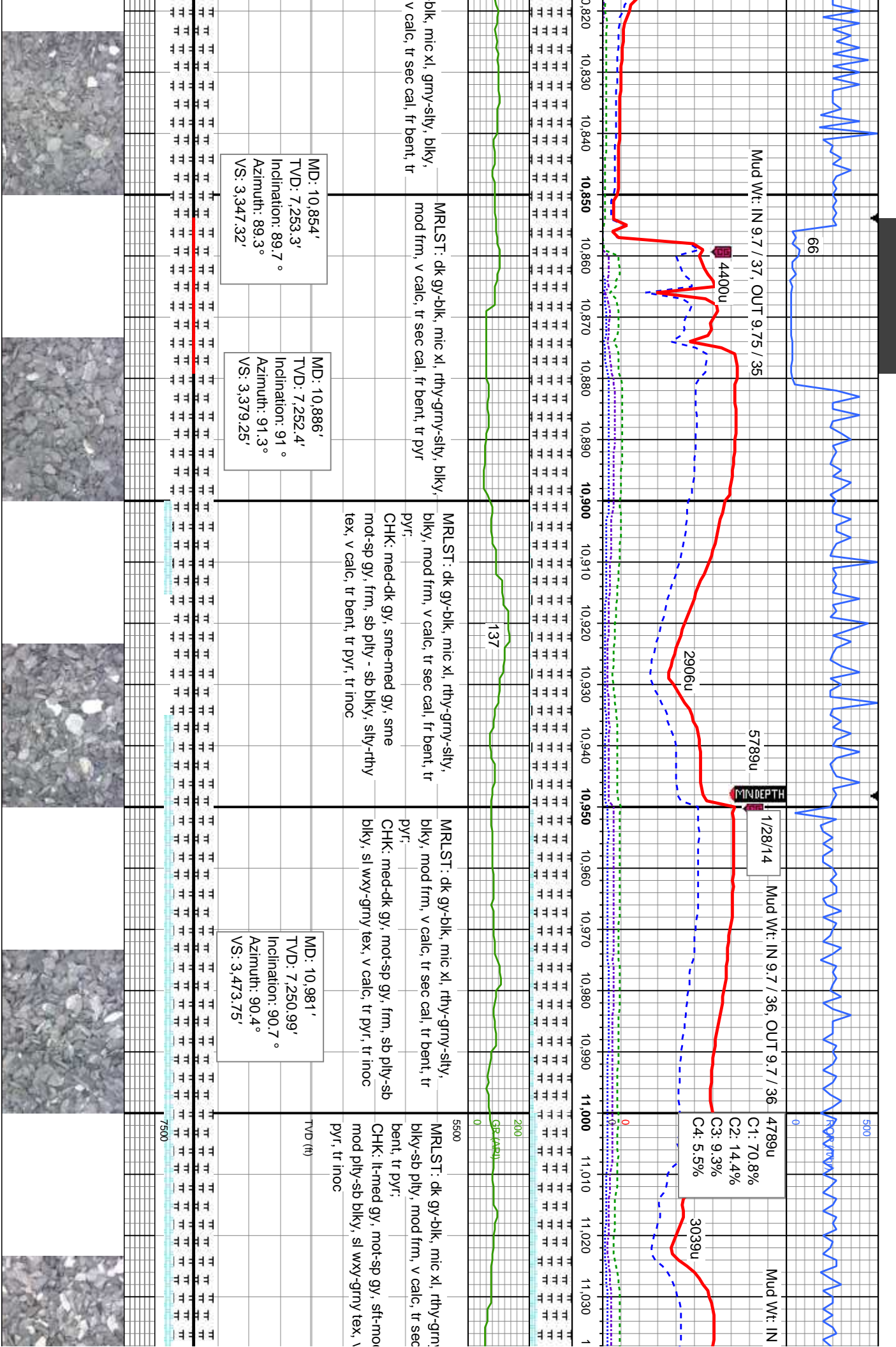
MRLST: dk gy-  
mod frm, grny,  
pyr

10,603'  
): 7.254.04'  
nation: 91 °  
nuth: 90.4 °  
3.098.18'

MD: 10,697'  
TVD: 7,252.97'  
Inclination: 90.3 °  
Azimuth: 89.8 °  
VS: 3,191.56'

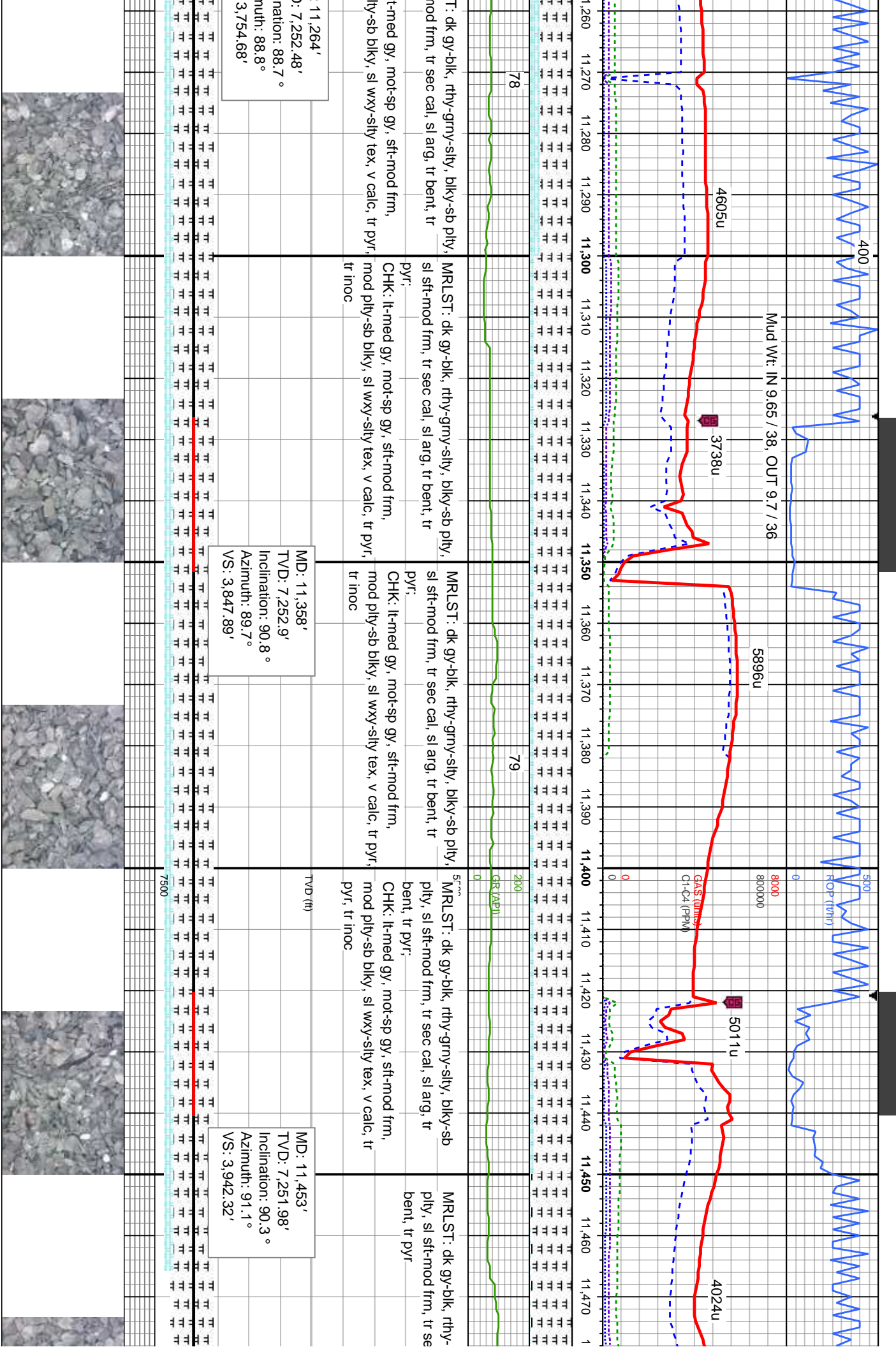
MD: 10,792'  
TVD: 7,252.97'  
Inclination: 89.7 °  
Azimuth: 89.3 °  
VS: 3,285.83'











11,264'  
MD: 7,252.48'  
TVD: 7,252.48'  
Inclination: 88.7°  
Azimuth: 88.8°  
VS: 3,754.68'

MD: 11,358'  
TVD: 7,252.9'  
Inclination: 90.8°  
Azimuth: 89.7°  
VS: 3,847.89'

MD: 11,453'  
TVD: 7,251.98'  
Inclination: 90.3°  
Azimuth: 91.1°  
VS: 3,942.32'

