



Operator

BY INC.

Suite 2200  
202

Geologist

BY INC.

Suite 2200  
202

Other

Rock Types

CONGLOMERATE

DOLOMITE

GRANITE

GYPSUM

IGNEOUS

SIDERITE or LIMONITE

LIMESTONE

MARLSTONE

METAMORPHIC

NO SAMPLE

SALT

SANDSTONE

SALT-PEPPER SANC

SHALE

SHALE COLORED

LIMESTONE

SHALY SANDSTONE

SHALY SILTSTONE

SILTY SHALE

SILTSTONE

TUFF

WELDED TUFF

Accessories

F FOSSIL

ARGILLACEOUS

GLAUCONITE

TUFFACEOUS

GASTROPOD

ARGILLITE GRAIN

GYPSIFEROUS

ANHYDRITE STRINGER

ALGAE

OOLITE

HEAVY MINERAL

BENTONITE STRINGER

AMPHIPORA

OSTRACOD

INOCERAMUS

BENTONITE STRINGER

BELEMNITE

PELECYPOD

KAOLIN

COAL STRINGER

BIOCLASTIC

PELLET

MARLSTONE

DOLOMITE STRINGER

BRACHIOPOD

PISOLITE

MINERAL CRYSTALS

GYPSUM STRINGER

BRYOZOA

PLANT REMAINS

NODULES

LIMESTONE STRINGER

CEPHALOPOD

PLANT SPORES

COAL - THIN BEDS

MARLSTONE (CALC) STRG

CORAL

SCAPHOPOD

DOLOMITIC

MARLSTONE (DOL) STRG

CRINOID

STROMATOPOROID

FELDSPAR

SANDSTONE STRINGER

ECHINOID

FISH

FERRUGINOUS PELLET

SANDY

FORAMINIFERA

ANHYDRITIC

FERRUGINOUS

SILTY

SILTSTONE STRINGER

Other Symbols

MOLDIC

WIRELINE TESTED - LEFT

E EARTHY

ORGANIC

WIRELINE TESTED - RT

FX FINELYXLN

DEAD

GAS SHOW

GS GRAINSTONE

PINPOINT

MINDEPTH MN DEPTH

L LITHOGRAPHIC

EVEN

FAULT

A ANGULAR

QUESTIONABLE

FORMATION TOP

R ROUNDED

SPOTTED STAINING

OIL SHOW

MS MUDSTONE

BIT

OVERTURNED STRATA

PS PACKSTONE

E EARTHY

REVERSE FAULT

WS WACKESTONE

FENESTRAL

SIDEWALL CORE (LEFT)

SUBANG

FRACTURE

CORE - LOST

SLIDE

INTERCRYSTALLINE

CORE - RECOVERED

SURVEY

INTEROOLITIC

DST INTERVAL

TRIP GAS

BS BOUNDSTONE

C CHALKY

CX CRYPTOXLN

M MODERATE

P POOR

W WELL

Slide/Rotate

ROP

ROF

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

Gamma

GAMMA

Well Bore

TVD

Oil Show

Images

BEGAN DRILLING CURVE  
@ 03:41 PM 09/26/2013

COLUMBINE LOGGING INC.  
RIGGED UP ON 09/25/2013  
MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT #0298  
COLUMBINE BEGAN LOGGING  
ON 09/25/2013

50' Sample Interval

1485u

1571u

79

WT IN 9.65/O

Bit Data

Bit #: 2

Type: SEC MMD55

Size: 8.75

Depth In: 4.889 '

Depth Out: 6.118 '

Jets: 5x14

S/N: 1228572

MD: 4.872 '

TVD: 4.871.62 '

Inclination: 1.3 °

Azimuth: 304.5 °

VS: -8.91 '

MD: 4.967 '

TVD: 4.966.49 '

Inclination: 4.5 °

Azimuth: 291.1 °

VS: -4.61 '

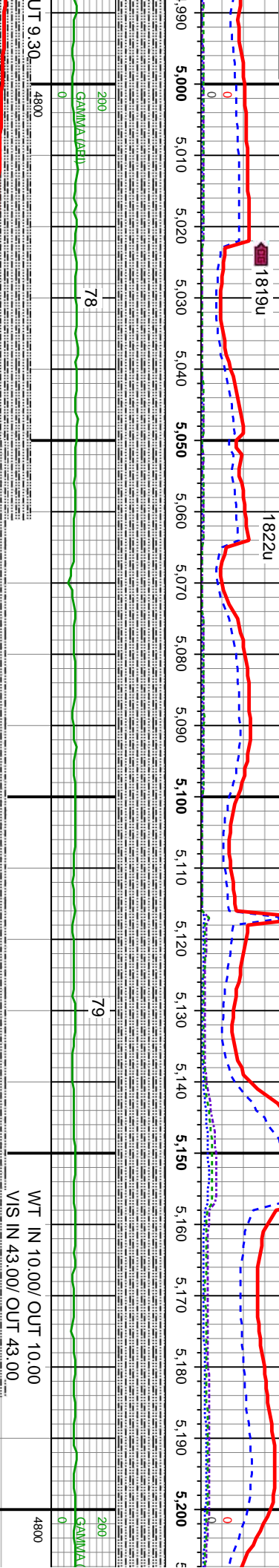
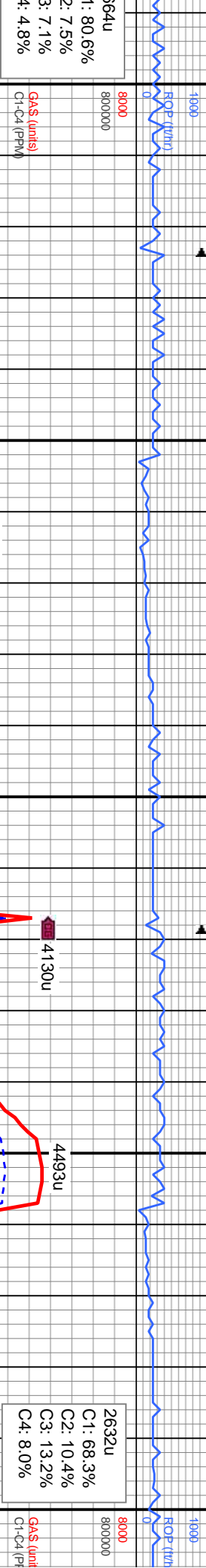
Acetone was used as the cutting  
agent with the dimple filled to the rim

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 judgment of brilliance, color and  
longevity of the cut.

SLTY SH: lt-med gy, occ drkg, sft - mod  
frm, sb blk, occ ply, arg-rthy mtx, non calc,  
lt shly ss

SLTY SH: lt-med gy, occ drkg, sft  
frm, sb blk, occ ply, arg-rthy mtx,  
lt shly ss





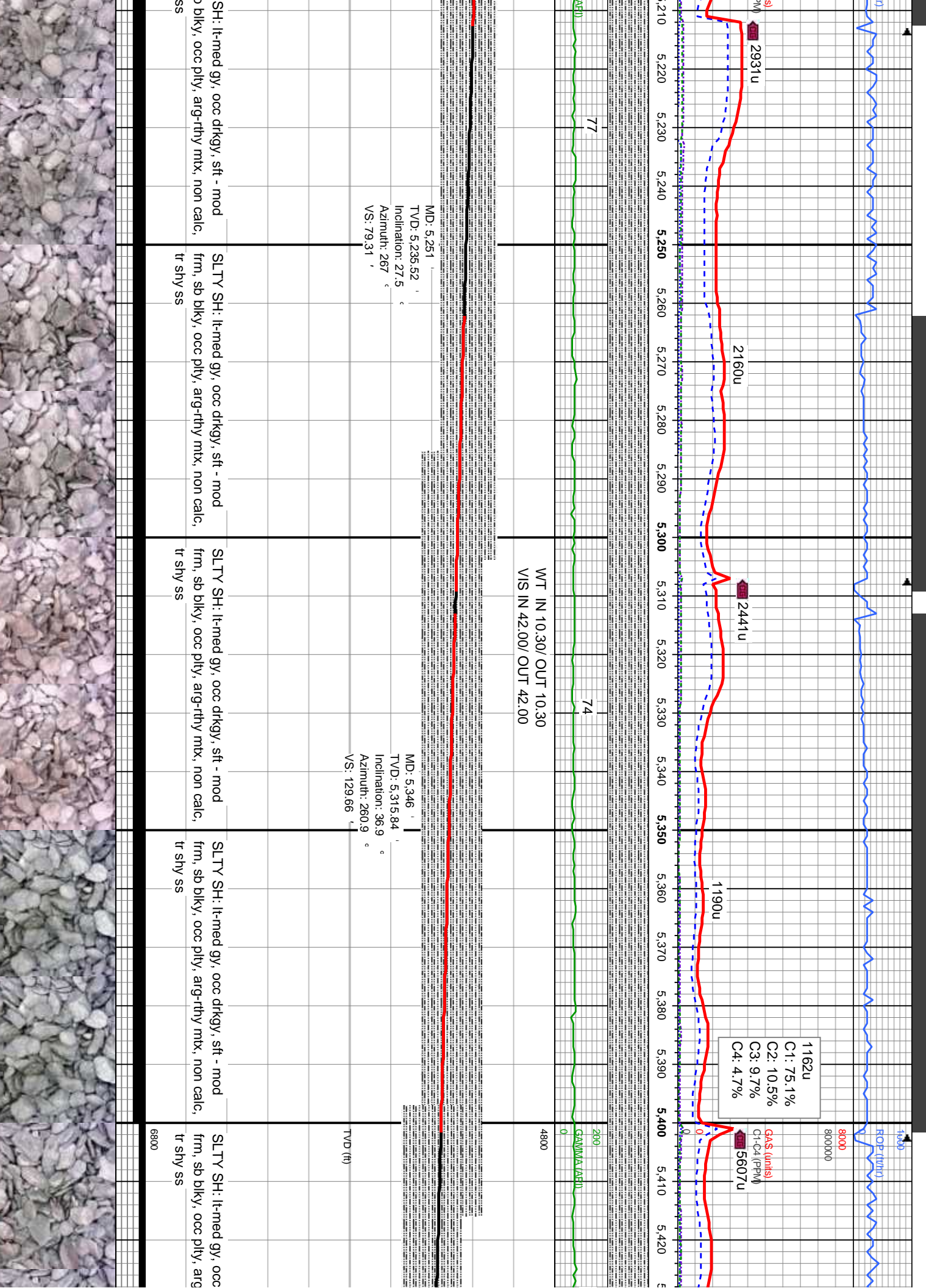
MD: 5.061  
TVD: 5.059.17  
Inclination: 14  
Azimuth: 276.3  
VS: 10.01

MD: 5.156  
TVD: 5.149.37  
Inclination: 22.3  
Azimuth: 271.9  
VS: 39.36

UT 9.30	4800	200	GA/MMA (AED)	78	0	WT IN 10.00/ OUT 10.00 VIS IN 43.00/ OUT 43.00	4800	200	GA/MMA (AED)	79	0
TVD (ft)							TVD (ft)				
- mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod
non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,	frm, sb blkly, occ plty, arg-rthy mtz, non calc,
tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss	tr shy ss
6800							6800				







MD: 5,251  
TVD: 5,235.52  
Inclination: 27.5  
Azimuth: 267  
VS: 79.31

MD: 5,346  
TVD: 5,315.84  
Inclination: 36.9  
Azimuth: 260.9  
VS: 129.66

1162u  
C1: 75.1%  
C2: 10.5%  
C3: 9.7%  
C4: 4.7%

Gas (units)  
C1-C4 (PPM)  
5607u

WT IN 10.30/ OUT 10.30  
VIS IN 42.00/ OUT 42.00

1118u

C1: 66.8%

C2: 12.1%

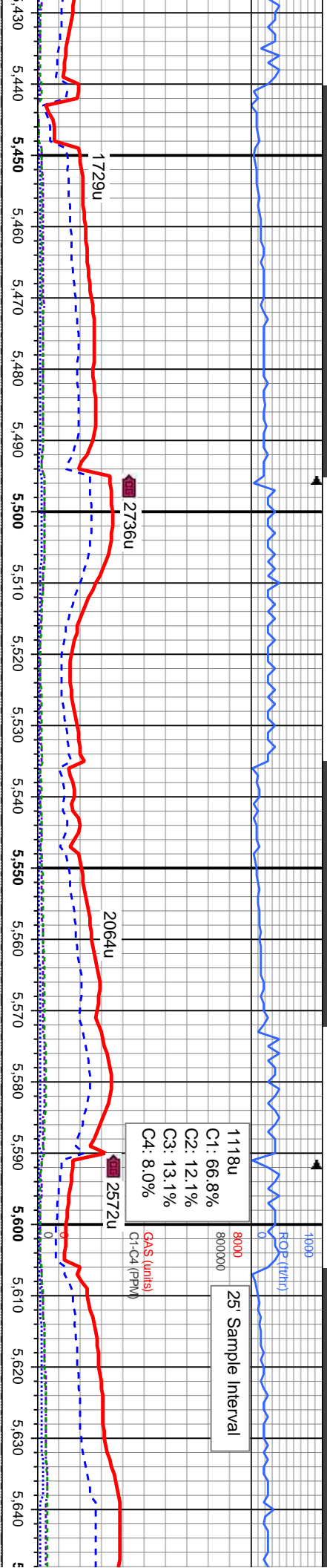
C3: 13.1%

C4: 8.0%

25' Sample Interval

GAS (units)

C1-C4 (PPM)



WT IN 10.35/ OUT 10.35  
VIS IN 40.00/ OUT 40.00

WT IN 10.80/ OUT 10.80  
VIS IN 40.00/ OUT 40.00

MD: 5,629 '  
TVD: 5,508.81 '  
Inclination: 55.8 °  
Azimuth: 263.7 °  
VS: 332.16 '

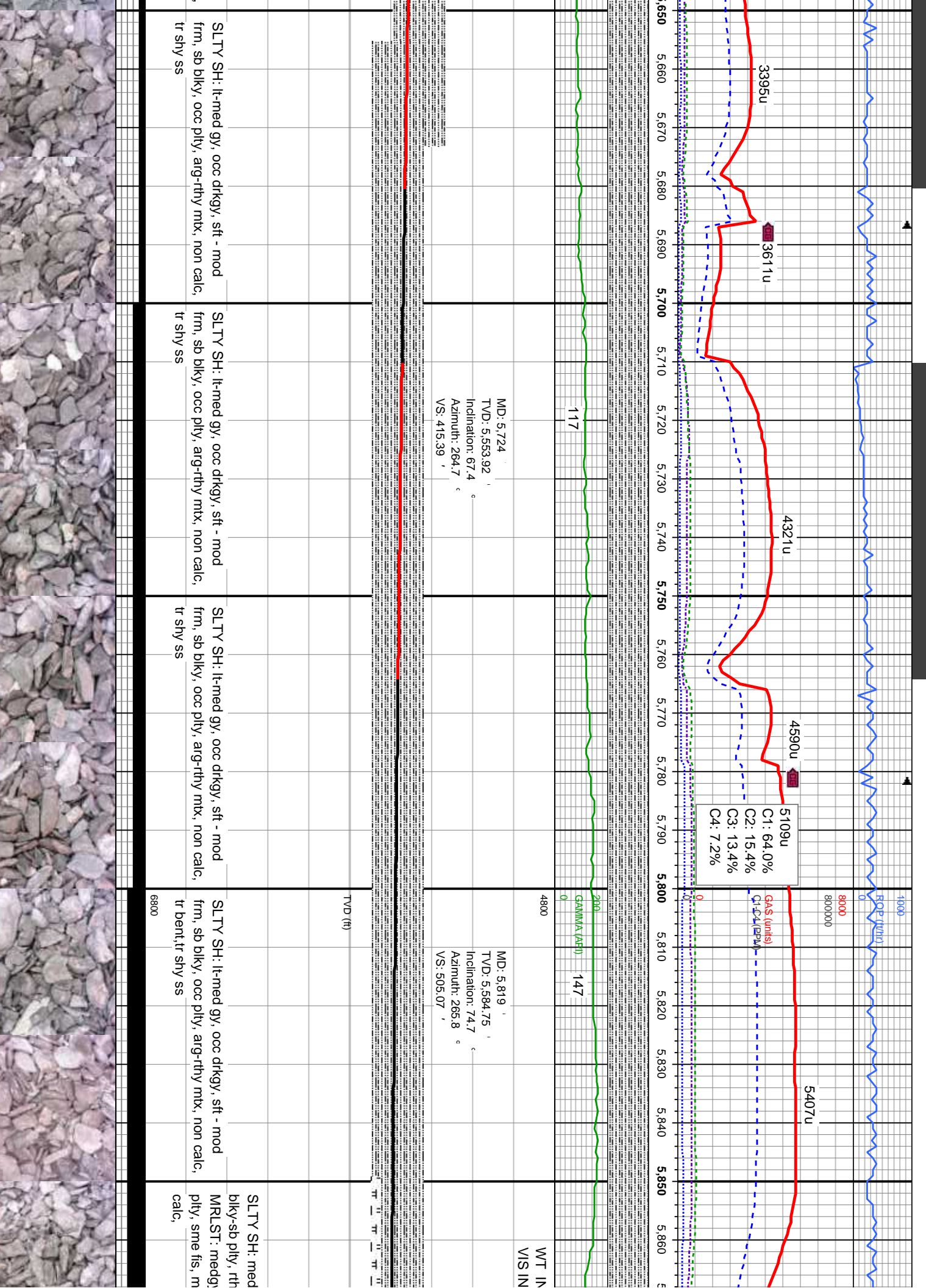
MD: 5,440 '  
TVD: 5,387.34 '  
Inclination: 44 °  
Azimuth: 256.5 °  
VS: 189.72 '

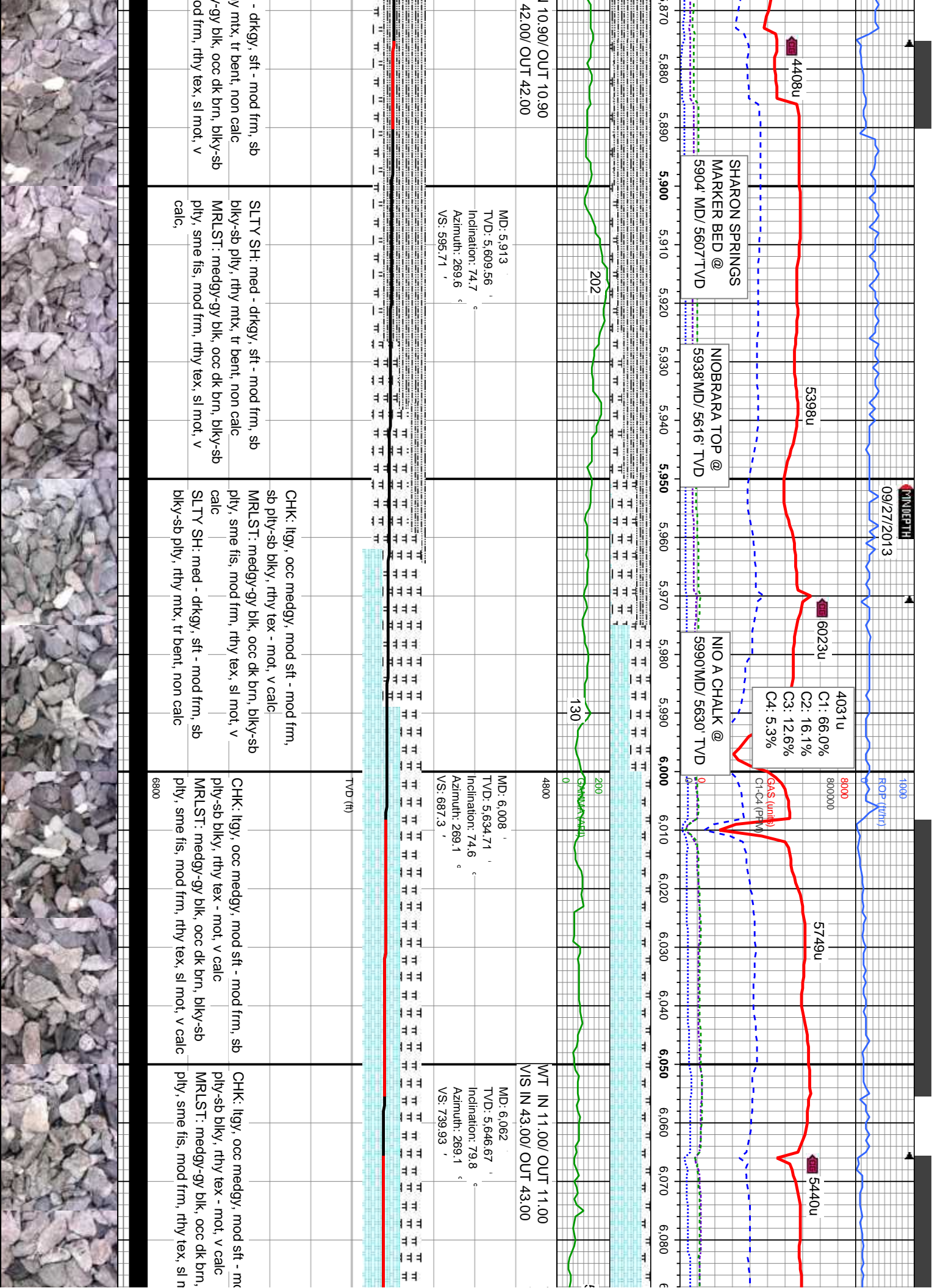
MD: 5,535 '  
TVD: 5,452.1 '  
Inclination: 50 °  
Azimuth: 257.7 °  
VS: 257.89 '

drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod	SLTY SH: lt-med gy, occ drkgy, sft - mod
-rthy mtx, non calc,	frm, sb blkly, occ plty, arg-rthy mtx, non calc,	frm, sb blkly, occ plty, arg-rthy mtx, non calc,	frm, sb blkly, occ plty, arg-rthy mtx, non calc,
tr shy ss	tr shy ss	tr shy ss	tr shy ss

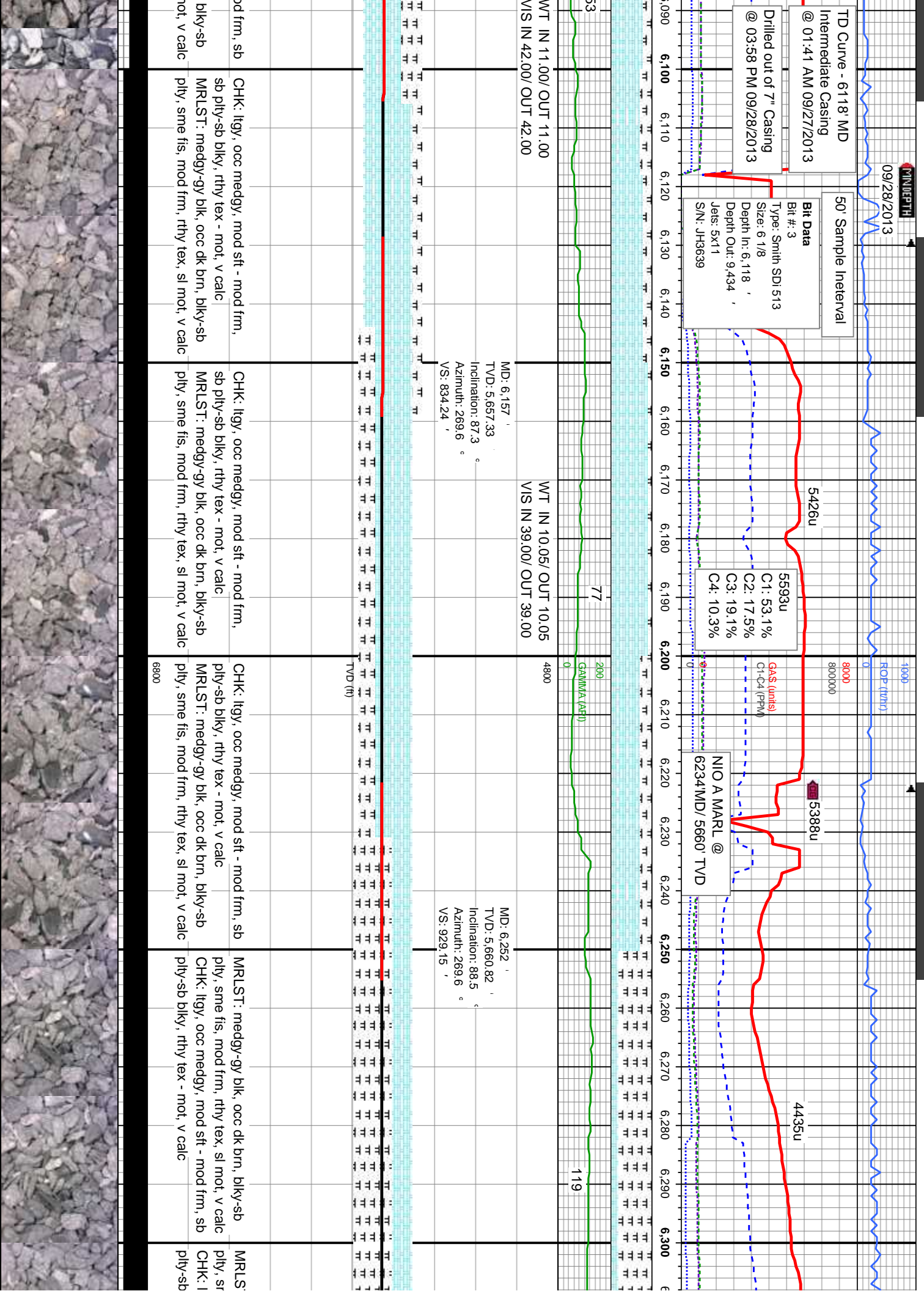


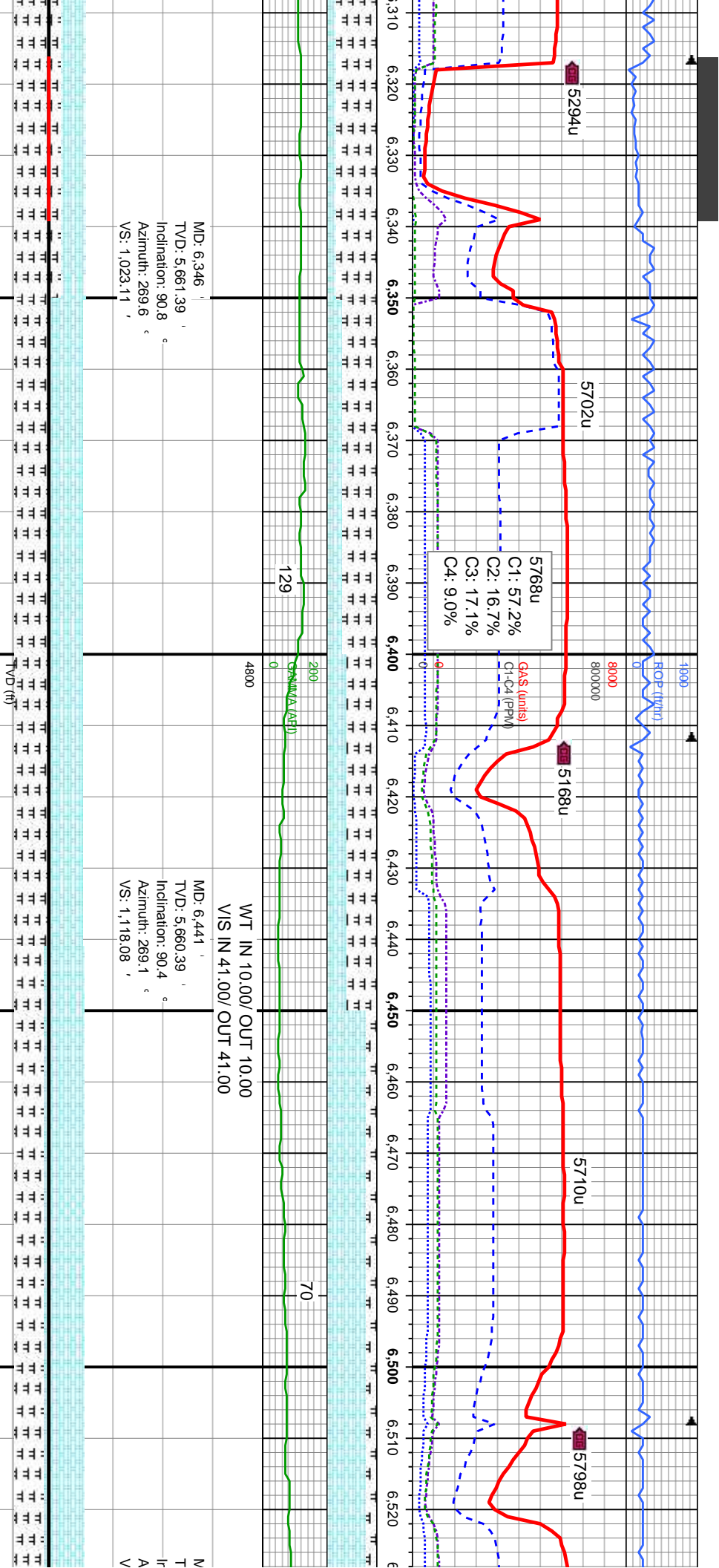








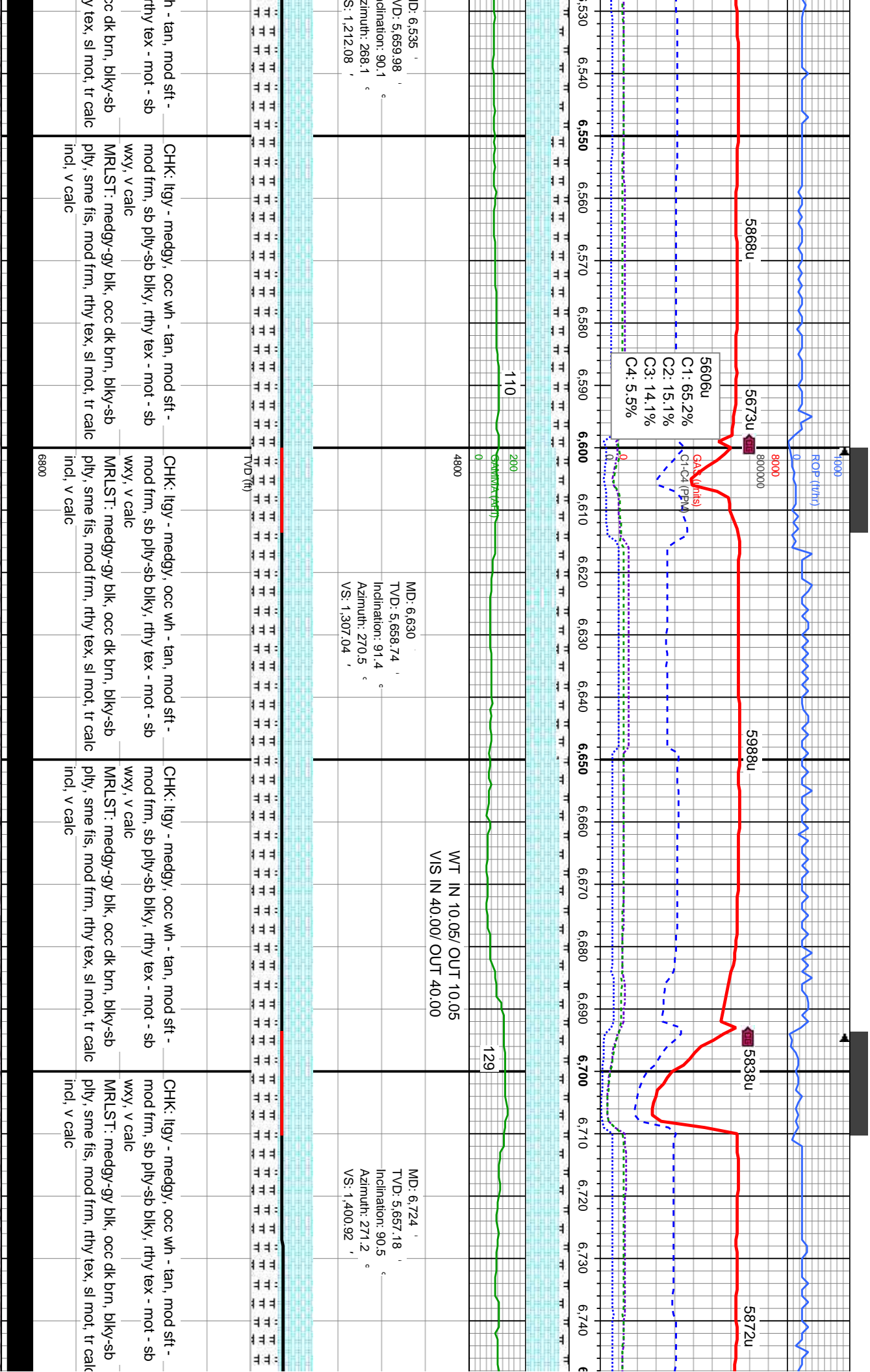


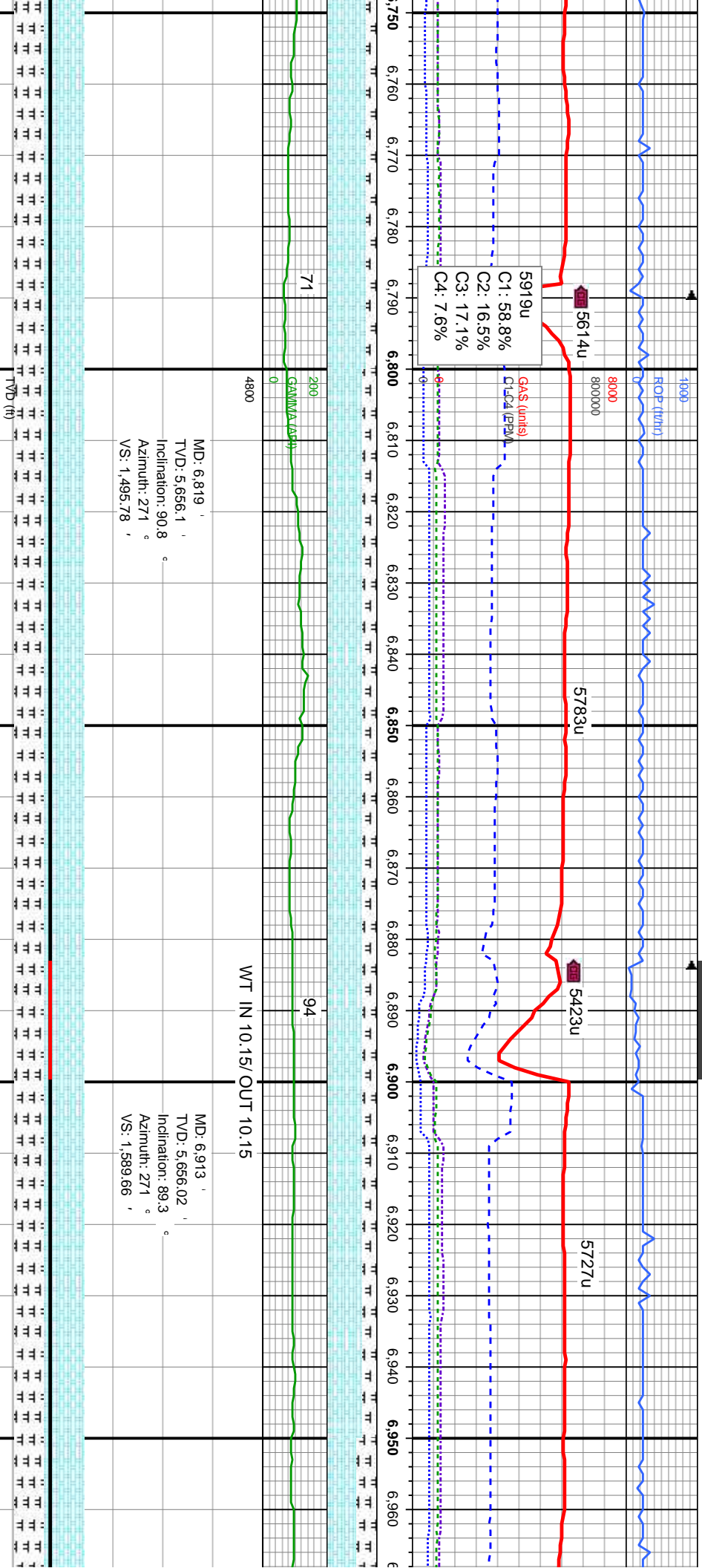


T: medgy-gy blk, occ dk brn, bly-sb sme fis, mod frm, rthy tex, sl mot, v calc lgy, occ medgy, mod sft - mod frm, sb bly, rthy tex - mot, v calc	MRLST: medgy-gy blk, occ dk brn, bly-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc CHK: lgy, occ medgy, mod sft - mod frm, sb ply-sb bly, rthy tex - mot, v calc	MRLST: medgy-gy blk, occ dk brn, bly-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc CHK: lgy, occ medgy, mod sft - mod frm, sb ply-sb bly, rthy tex - mot, v calc	CHK: lgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb bly, rthy tex - mot - sb wxy, v calc	MRLST: medgy-gy blk, occ dk brn, bly-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	CHK: lgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb bly, rthy tex - mot - sb wxy, v calc	MRLST: medgy-gy blk, occ dk brn, bly-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc
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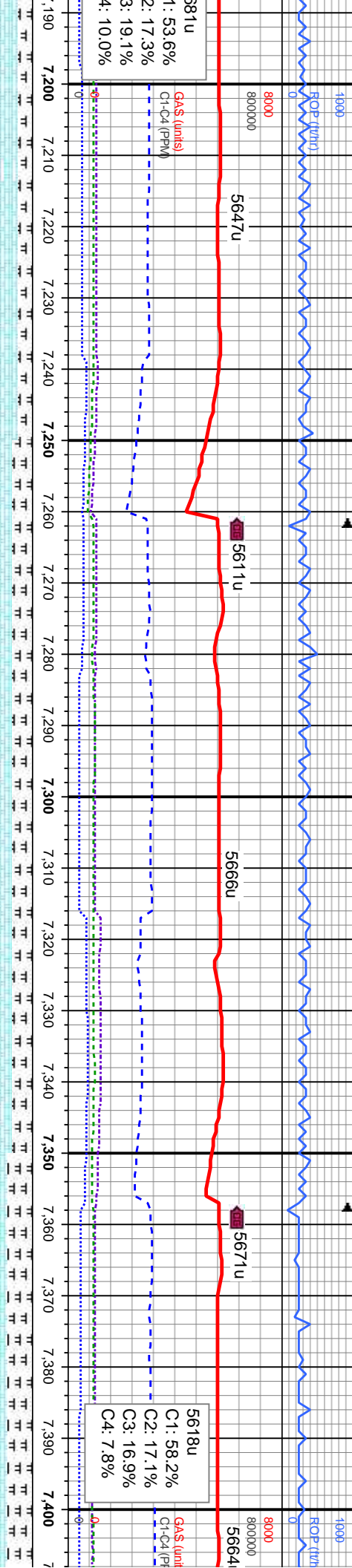


CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc
MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, tr calc incl, v calc
6800			







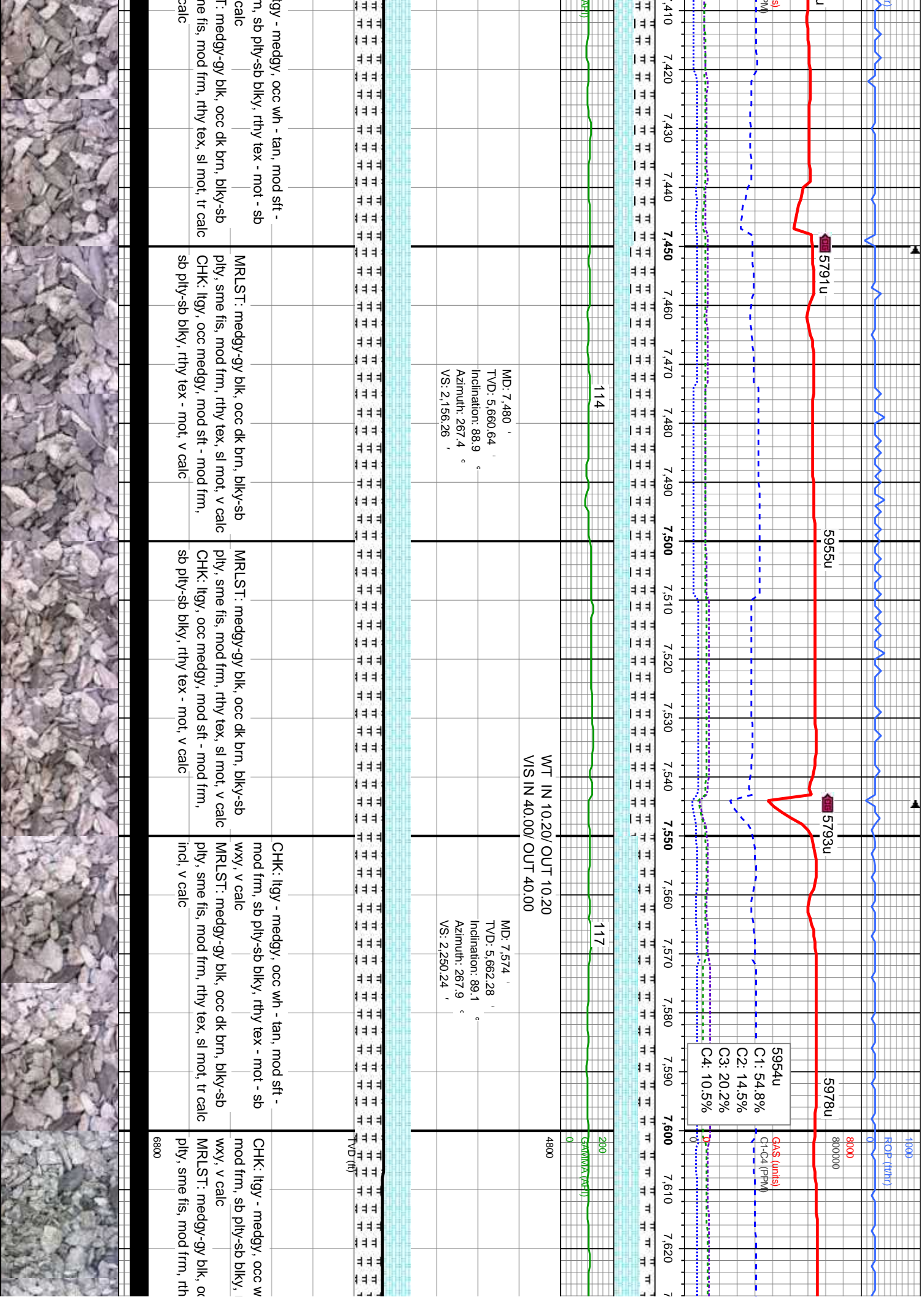


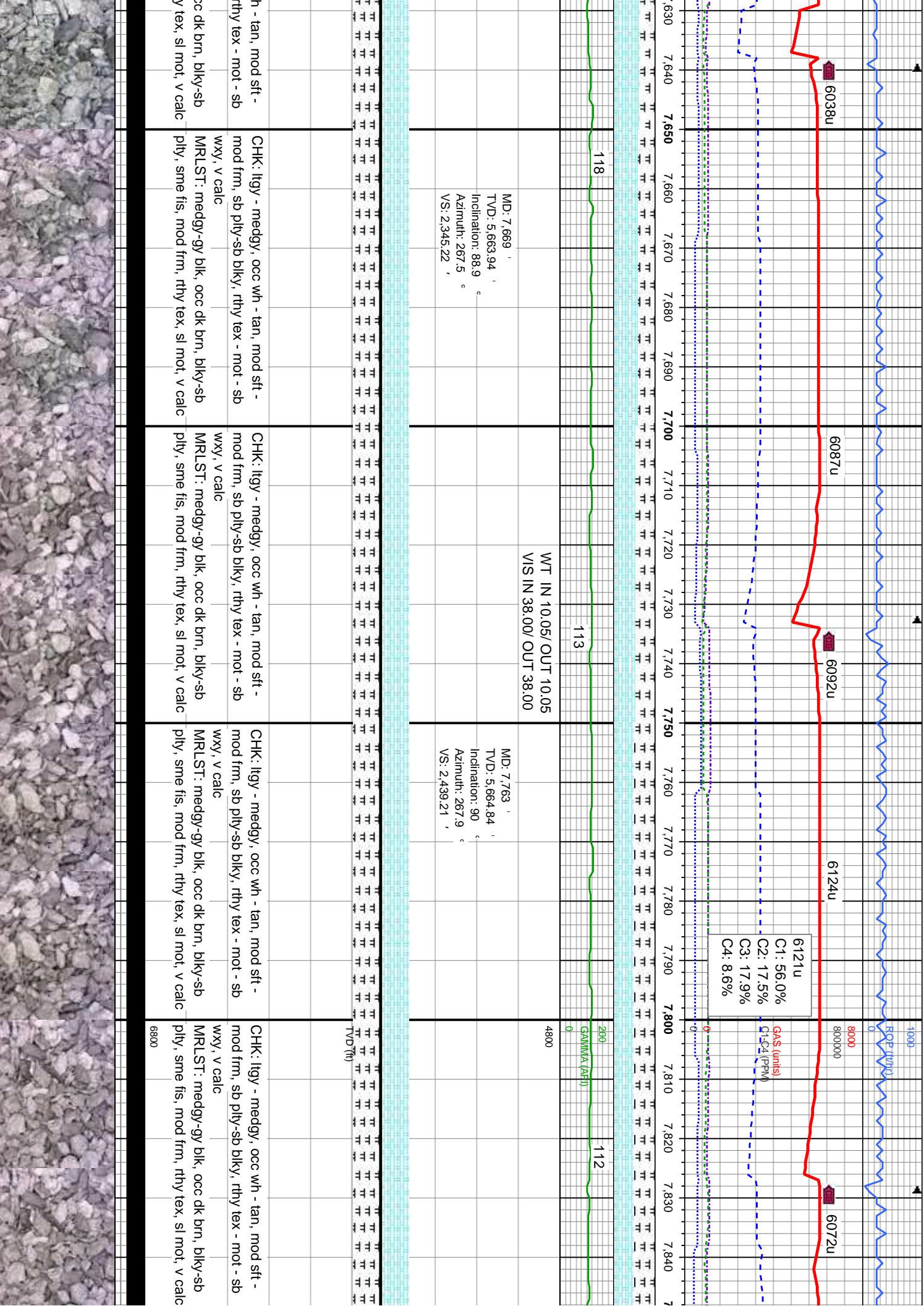
12	200	GA/MMA (API)	111	200	GA/MMA (API)
0	4800		0	4800	
MD: 7.197 ' , TVD: 5.657.76 ' , Inclination: 89.6 ° , Azimuth: 270.4 ° , VS: 1.873.32 ' ,			MD: 7.291 ' , TVD: 5.658.74 ' , Inclination: 89.2 ° , Azimuth: 268.6 ° , VS: 1.967.28 ' ,		
WT IN 10.15/ OUT 10.15 VIS IN 41.00/ OUT 41.00			MD: 7.386 ' , TVD: 5.659.57 ' , Inclination: 89.8 ° , Azimuth: 269.1 ° , VS: 2.062.27 ' ,		

mod sft -	CHK: llyg - medgy, occ wh - tan, mod sft -	CHK: llyg - medgy, occ wh - tan, mod sft -	CHK: llyg - medgy, occ wh - tan, mod sft -
mod - sb	mod frm, sb pily-sb blk, rthy tex - mot - sb	mod frm, sb pily-sb blk, rthy tex - mot - sb	mod frm, sb pily-sb blk, rthy tex - mot - sb
mod - sb	wxy, v calc	wxy, v calc	wxy, v calc
mod - sb	MRLST: medgy-gy blk, occ dk brn, blk-sb	MRLST: medgy-gy blk, occ dk brn, blk-sb	MRLST: medgy-gy blk, occ dk brn, blk-sb
mod - sb	pily, sme fis, mod frm, rthy tex, sl mot, tr calc	pily, sme fis, mod frm, rthy tex, sl mot, tr calc	pily, sme fis, mod frm, rthy tex, sl mot, tr calc
mod - sb	incl, v calc	incl, v calc	incl, v calc
mod - sb	6800		6800

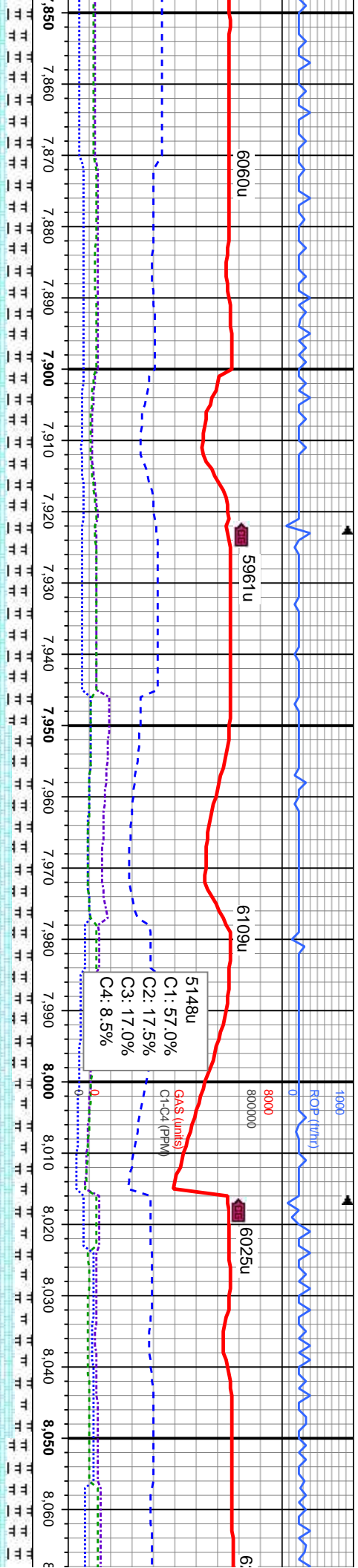








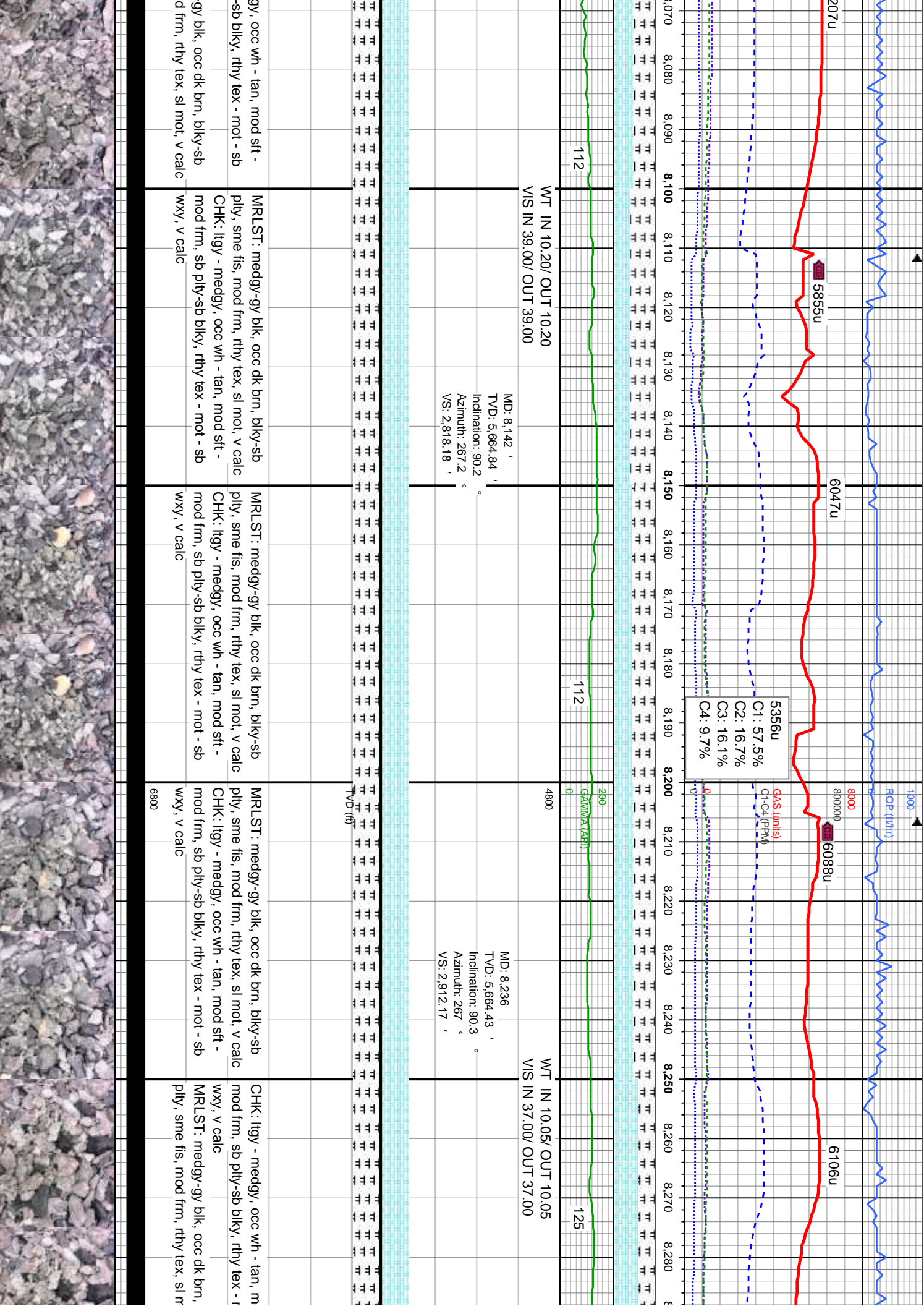




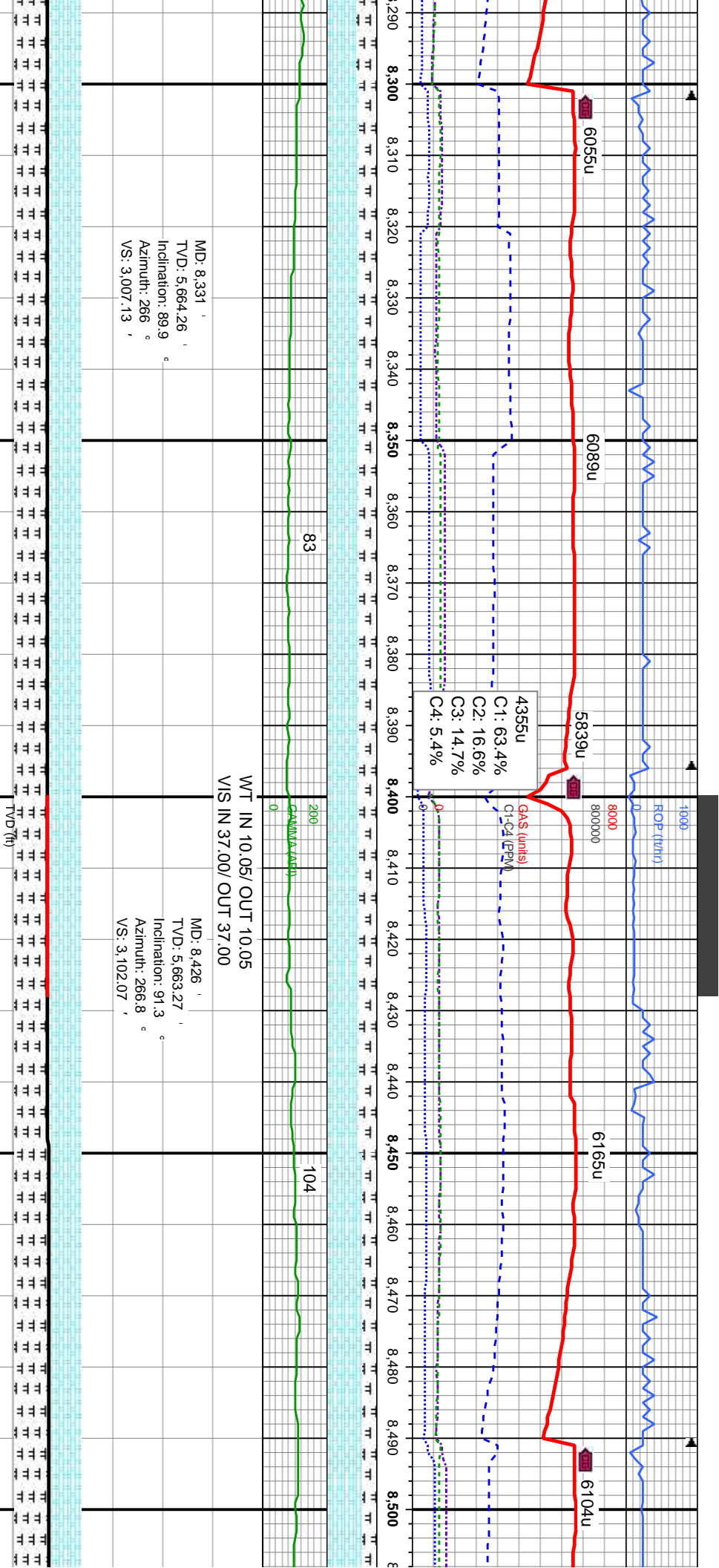
MD: 7.858 TVD: 5.664.76 Inclination: 90.1 Azimuth: 267.5 VS: 2.534.21	WT IN 10.15/ OUT 10.15 VIS IN 38.00/ OUT 38.00	MD: 7.952 TVD: 5.664.84 Inclination: 89.8 Azimuth: 267.2 VS: 2.628.2	MD: 8.047 TVD: 5.665 Inclination: 90 Azimuth: 267.4 VS: 2.723.19
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CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc
MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc



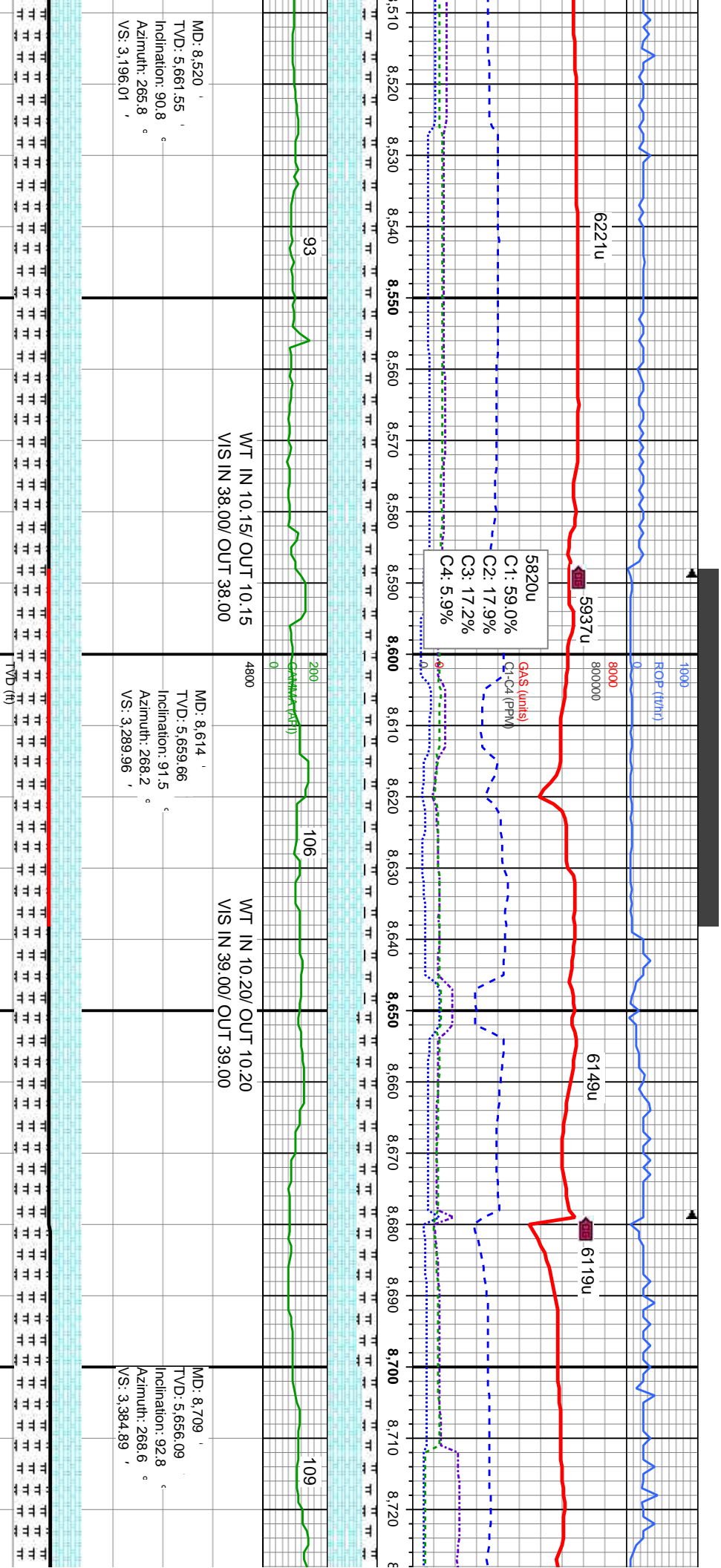






mod sft - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb	CHK: ltgy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
blk-y-sb mot, v calc	wxy, v calc MRLST: medgy-gy blk, occ dk brn, blk-y-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	wxy, v calc MRLST: medgy-gy blk, occ dk brn, blk-y-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	wxy, v calc MRLST: medgy-gy blk, occ dk brn, blk-y-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	wxy, v calc MRLST: medgy-gy blk, occ dk brn, blk-y-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc





MD: 8.520  
TVD: 5.661.55  
Inclination: 90.8  
Azimuth: 265.8  
VS: 3.196.01

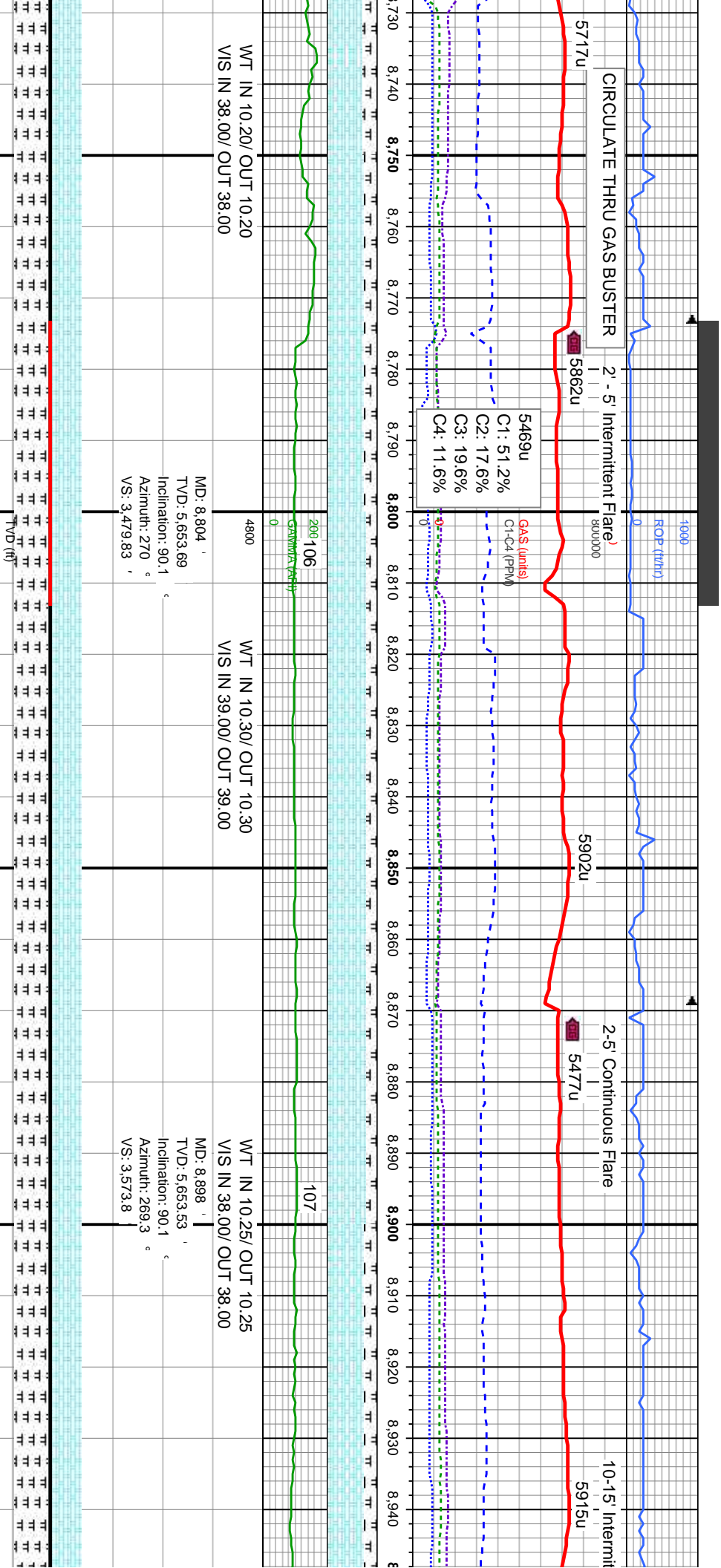
MD: 8.614  
TVD: 5.659.66  
Inclination: 91.5  
Azimuth: 268.2  
VS: 3.289.96

MD: 8.709  
TVD: 5.656.09  
Inclination: 92.8  
Azimuth: 268.6  
VS: 3.384.89

Interval	Description
8,510 - 8,550	gy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
8,550 - 8,600	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
8,600 - 8,650	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
8,650 - 8,700	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
8,700 - 8,720	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb

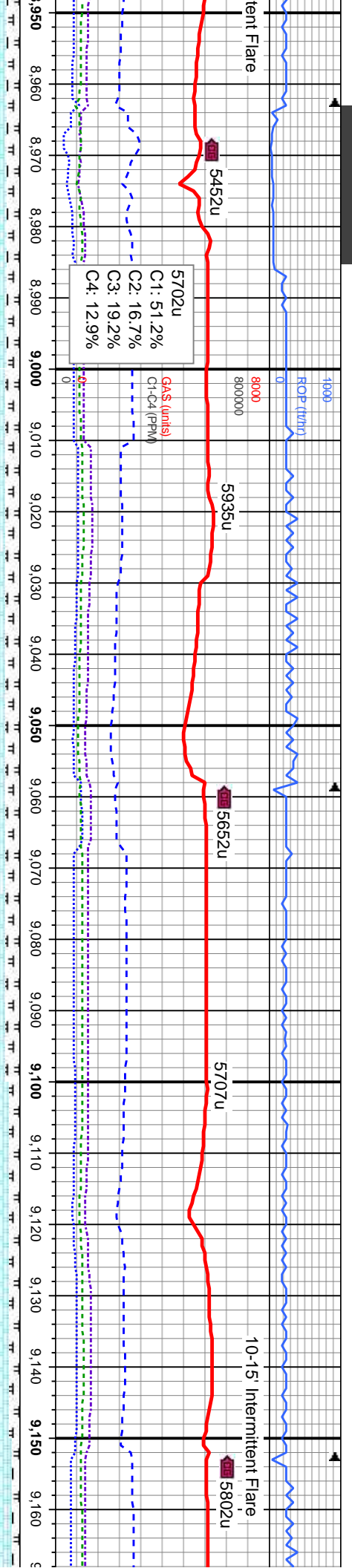






tan, mod sft - thy tex - mot - sb	CHK: lly - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb	CHK: lly - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb	CHK: lly - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb
ck dk brn, blk-sb v tex, sl mot, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRSLT: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc



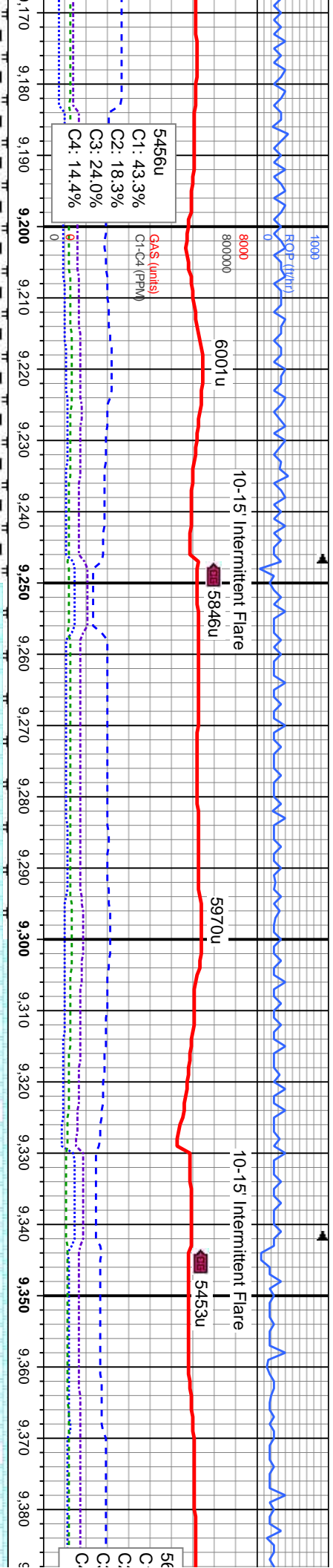


	113	200	104
	MD: 8.992 ' , TVD: 5.654.35 Inclination: 88.9 ° Azimuth: 270.4 ° VS: 3.667.75 ' ,	MD: 9.087 ' , TVD: 5.656.25 Inclination: 88.8 ° Azimuth: 269.6 ° VS: 3.762.68 ' ,	
	4800	WT IN 10.25/ OUT 10.25 VIS IN 37.00/ OUT 37.00	

CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyy - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc
MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk-sb ply, sme fis, mod frm, rthy tex, sl mot, v calc



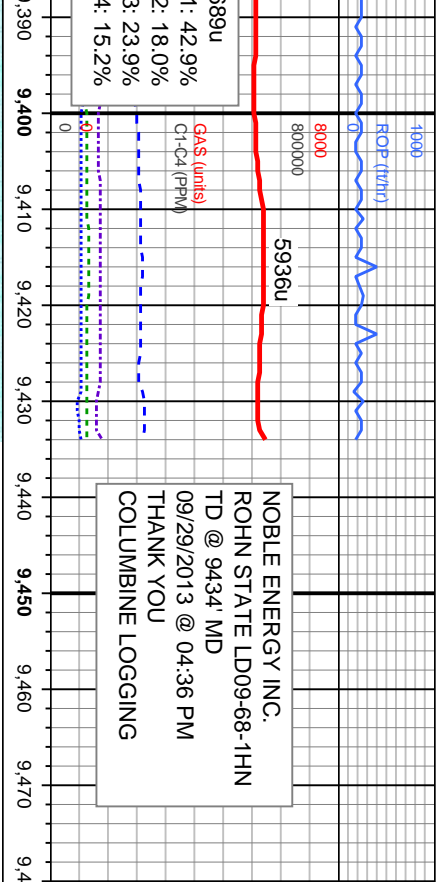




MD: 9.182 TVD: 5.657.83 Inclination: 89.3 Azimuth: 270.2 VS: 3.857.62	200 GA\$ (units)	96	MD: 9.276 TVD: 5.658.73 Inclination: 89.6 Azimuth: 270 VS: 3.951.56	89	WT IN 10.40/ OUT 10.40 V/S IN 40.00/ OUT 40.00	MD: 9.371 TVD: 5.659.56 Inclination: 89.4 Azimuth: 269.3 VS: 4.046.52
4800						

gy, occ wh - tan, mod sft - sb blk, rthy tex - mot - sb	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc	CHK: llyg - medgy, occ wh - tan, mod sft - mod frm, sb ply-sb blk, rthy tex - mot - sb wxy, v calc
d frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb ply, sme fis, mod frm, rthy tex, sl mot, v calc	MRLST: medgy-gy blk, occ dk brn, blk, sb ply, sme fis, mod frm, rthy tex, sl mot, v calc
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