



# Empirica

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Windsor\_LV\_A\_14-H\_Horizontal

**Location** SEC.14-T6N-R67W

**State** Colorado

**Country** USA

**API Number** 051233905300

**Region** DJ Basin

**Spud Date** 12/22/2014

**County** Weld

**Rig Number** H&P 319

**AFE #** 14-752

**Field** Wattenberg

**Drilling Completed** 12/28/2014

**Ground Elevation** 4845'

**Logged Interval** 6450' To 11,642'

**Formation** Niobrara B

**Type of Drilling Fluid** WBM

**K.B. Elevation** 4895'

**Total Depth** 5192'

## Operator

**Company** Extraction Oil & Gas, LLC

**Address** 1888 Sherman St, Suite 200  
Denver, Colorado 80203

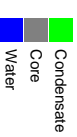
## Geologist

**Name** Justin Perry & Geoff Sterling

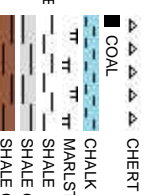
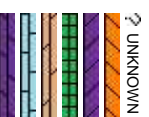
**Company** ALS Empirica

**Address** 6360 W Sam Houston Pkwy N  
Suite 100  
Houston, TX 77041

## Zone Color Coding



## Rock Types



## Accessories

# Fossils

[illegible]

## Minerals

## Other Symbols









## Oil Show

[illegible]

# Engineering

	QUESTIONABLE		ANGULAR		MUDSTONE
	SPOTTED STAINING		BIT		ROUNDED
	OIL SHOW		NORMAL FAULT		PACKSTONE

## Porosity






























































-  FENESTRAL
-  E EARTHLY
-  CONNECTION (LEFT)
-  CONNECTION (RIGHT)
-  REVERSE FAULT
-  SIDEWALL CORE (LEFT)
-  SIDEWALL CORE (RIGHT)
-  CONNECTION GAS

**Textures**

**Sorting**

M MODERATE

## Textures

	F FRACTURE		CG CORE - LOST		BS BOUNDSTONE		P POOR
	X INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		W WELL
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED		C CHALKY		
	INTERCRYSTALLINE		CORE - RECOVERED				

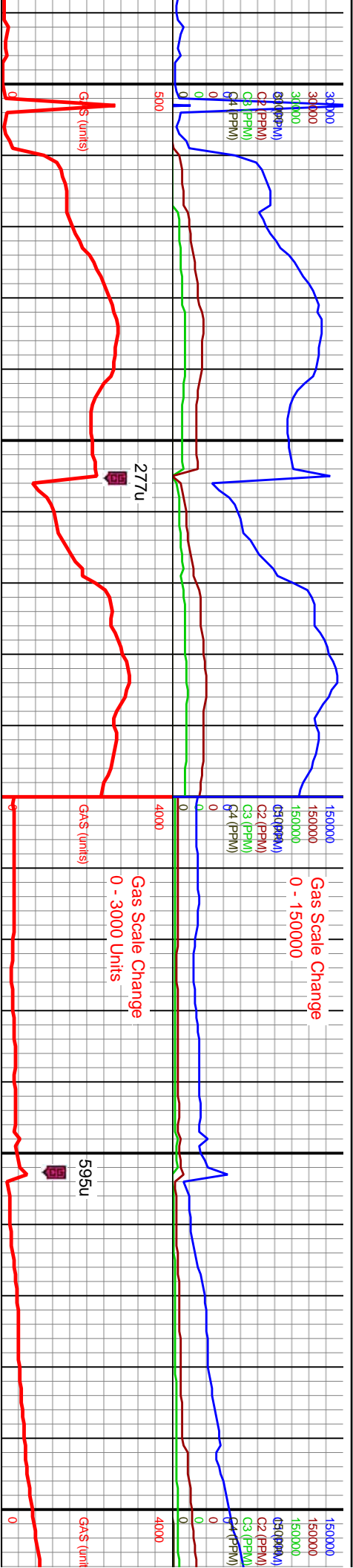
## Sorting

 INTERCRYSTALLINE  
  CORE - LOST  
  SURVEY  
  CHALKY  
  WELL

 MOLDIC
  DST INTERVAL
  WIRELINE TESTED - LEFT
  E EARTHY

IGNEOUS  
METAMORPHIC  
CEMENT  
SLTY SH  
SHY SS





SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.



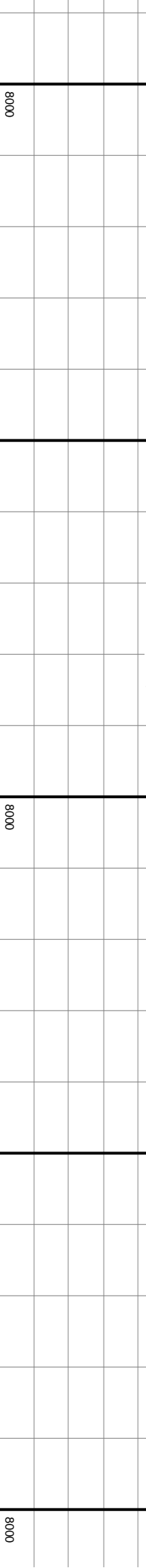
SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.



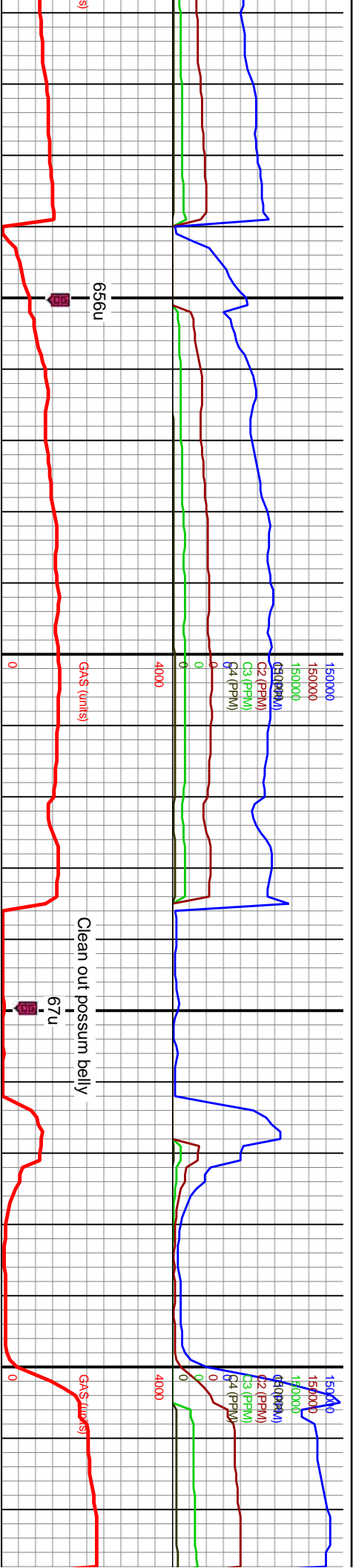
SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, SB  
PLTY-PLTY, PREDY FRM, OCCLY BRIT, WK  
FISS, V FY LAM, SLTY, SLTST: PREDY GY,  
SME LT GY, SB PLTY, RR BLKY, PREDY  
FRM, OCCLY BRIT, SL CALC, TR FY DISSM  
PYR, SD: LT GY, SB BLKY, FRM-SL HRD,  
BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.

SH: GY-DK GY, SME BRN GY, PLTY-SB  
PLTY, MOD FRM-FRM, OCCLY BRIT,  
MOD FISS, V FY LAM, V SLTY, SLTST:  
PREDY GY, SME LT GY, SB PLTY, RR  
BLKY, PREDY FRM, OCCLY BRIT, SL  
CALC, TR FY DISSM PYR.



GY, SME BRN GY, PLTY-SB PLTY, SH: GY, SME BRN GY, PLTY-SB PLTY, MOD FRM-FRM, OCCLY BRIT, MOD FISS, V FY LAM, V SLTY, SLTST: PREDY GY, SME BRN GY, SB PLTY-SB BLKY, PREDY FRM, OCCLY BRIT, SL CALC, TR FY DISSM PYR.

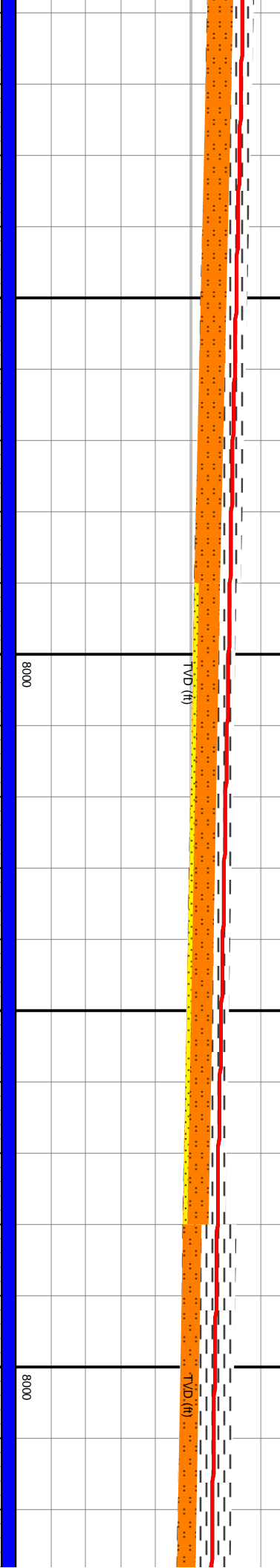
SH: GY-DK GY, SME BRN GY, SB PLTY-PLTY, MOD FRM-FRM, WK FISS, V FY LAM, V SLTY, SLTST: PREDY GY, SME LT GY, SB PLTY-PLTY, PREDY FRM, OCCLY BRIT, SL CALC, TR FY DISSM PYR, SD: LT GY-OFF WH, SB BLKY, FRM-SL HRD, BRIT, P SRT, SB ANG-ANG, SL CALC.

SH: GY-DK GY, SME BRN GY, SB PLTY-PLTY, MOD FRM-FRM, WK FISS, V FY LAM, V SLTY, SLTST: PREDY GY, SME LT GY, SB PLTY-PLTY, PREDY FRM, OCCLY BRIT, SL CALC, TR FY DISSM PYR, SD: LT GY-OFF WH, SB BLKY, FRM-SL HRD, BRIT, P SRT, SB ANG-ANG, SL CALC.



MD: 6.872'  
Inclination: 28.4°  
Azimuth: 302.9°  
TVD: 6.758.7'

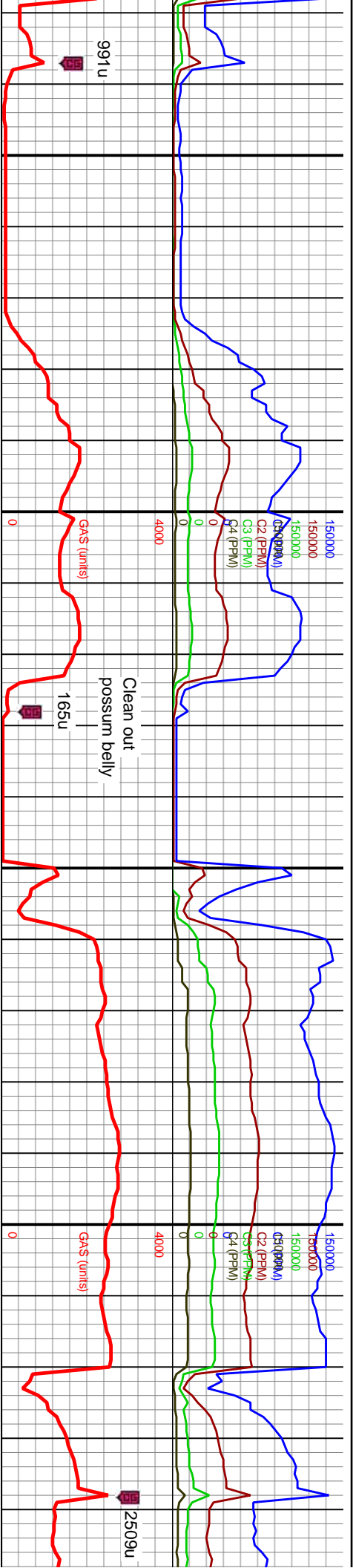
MD: 6.962'  
Inclination: 39.7°  
Azimuth: 295.5°  
TVD: 6.836.5'



WOB: 10.8  
RPM: 0  
PP: 4047  
SPM: 130

ROP (min/h)  
GAMMA (units)





PLTY-SB SH: DK GY-GY, RR TN, PLTY-SB SH: DK GY-GY, PLTY-SB PLTY, MOD SFT-FRM, WK FISS, V FY SFT-FRM, WK FISS, V FY  
PLTY, MOD SFT-FRM, WK FISS, V FY LAM, TR FY DISSM PYR. SLTST: DISSM PYR. MARL: GY-DK GY, SB PLTY, SME SB BLKY, MOD FRM-FRM, OCC SLT, V CALC. SLTST: GY-DK GY, SB PLTY-SB BLKY, PREDY FRM, OCCLY BRIT. WK CALC.

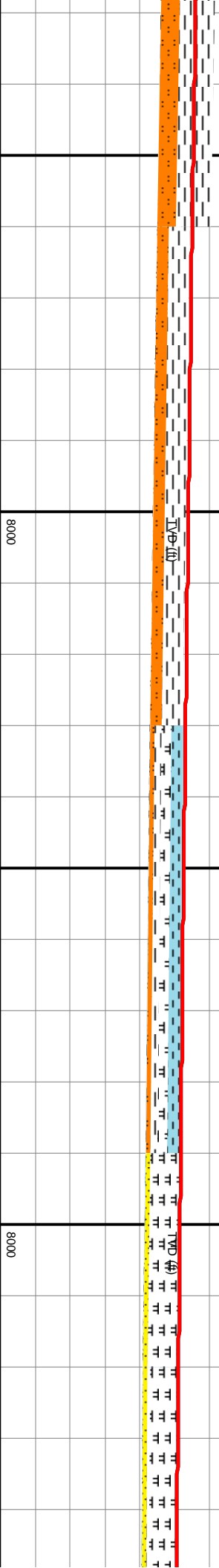
CHK: LT GY-DK GY, MOT, SB BLKY-SB PLTY, CHK: LT GY-DK GY, MOT, SB BLKY-SB SL HRD, BRIT, V CALC. SH: DK GY-GY, PLTY, SL HRD, OCC ELG CHK STRG, PLTY-SB PLTY, MOD SFT-FRM, WK FISS, V FY V CALC. MARL: GY-DK GY, SB PLTY, LAM, TR FY DISSM PYR. MARL: GY-DK GY, SB SME SB BLKY, MOD FRM-FRM, OCC PLTY, SME SB BLKY, MOD FRM-FRM, OCC SLT, V CALC. RR SLTST: GY-LT GY, SB PLTY-SB BLKY, PREDY FRM, OCCLY BRIT.



MD: 7.062'  
Inclination: 53.4°  
Azimuth: 288.6°  
TVD: 6,901.0'

MD: 7.156'  
Inclination: 63.3°  
Azimuth: 281.9°  
TVD: 6,960.2'

MD: 7.240'  
Inclination: 63.3°  
Azimuth: 281.9°  
TVD: 6,960.2'



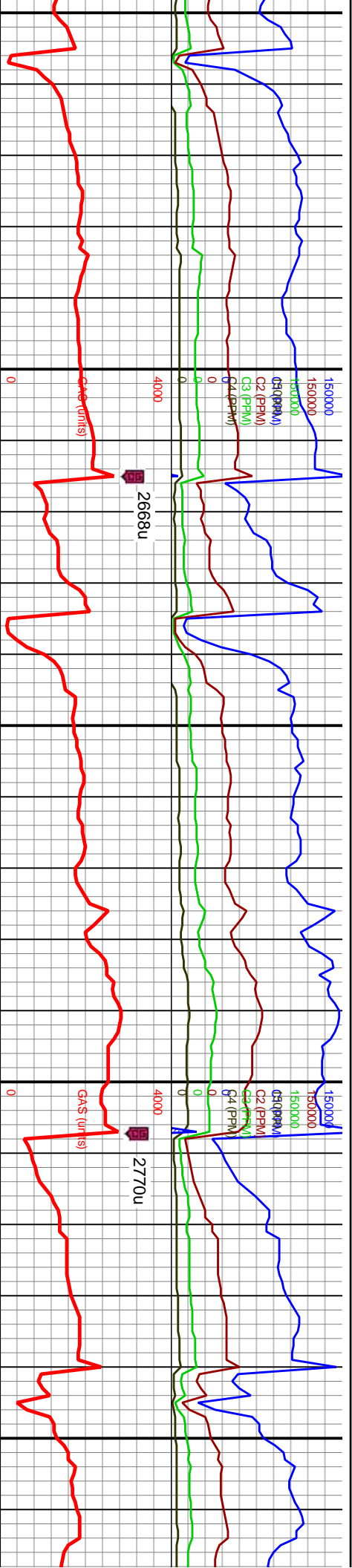
MUD IN: WT: 10.3

WOB: 24.8 RPM: 31 PP: 4090 SPM: 130

MUD IN: WT: 10.4 VIS: 37

ROP (mbl/ft) GAMMA (units)

ROP (mbl/ft) GAMMA (units)



CHK: LT GY-DK GY, MOT, SB BLKY-SB  
PLTY, MOD FRM-SL HRD, OCC ELG CHK  
STRG. MARL: GY-DK GY, SB PLTY, SME SB  
BLKY, MOD FRM-FRM, OCC SLT, V CALC.  
V CALC. RR SD: LT GY-OFF WH, SB BLKY,  
PRE DY FRM, OCCLY BRIT.

CHK: LT GY-BRN GY, MOT, SB BLKY-SB  
PLTY, MOD FRM-SL HRD, OCC ELG CHK  
STRG. V F LAM. MARL: GY-DK GY, SB  
PLTY-SB BLKY, MOD FRM-FRM, RR SL  
HRD, OCC SLT, V CALC, RAPID HCL RXN.  
RR SD: LT GY-OFF WH, SB BLKY, PRE DY  
FRM, OCCLY BRIT.

CHK: GY-BRN GY, MOT, SB PLTY-SB  
BLKY, FRM-SL HRD, RR ELG CHK  
STRG. MARL: GY-DK GY, SB PLTY, SME  
SB BLKY, FRM-SL HRD, OCC SLT, V  
CALC. SH: DK GY-GY, PLTY-SB PLTY,  
MOD SFT-FRM, WK FISS, V FY LAM. TR  
FY DISSM PYR.

CHK: GY-BRN GY, MOT, SB PLTY-SB  
BLKY, FRM-SL HRD, RR ELG CHK  
STRG. MARL: GY-DK GY, SB PLTY, SME  
SB BLKY, FRM-SL HRD, OCC SLT, V  
CALC. SH: DK GY-GY, PLTY-SB PLTY,  
MOD SFT-FRM, WK FISS, V FY LAM. TR  
FY DISSM PYR.

CHK: GY-BRN GY, MOT, SB PLTY-SB  
BLKY, FRM-SL HRD, RR ELG CHK  
STRG AND CTG, SME SB  
PLTY, SME SB  
OCCLY SL HRD  
SLTST: LT GY-GY  
MOD FRM, SLTY



250' Ion: 66.4°  
h: 277.7°  
990.1'

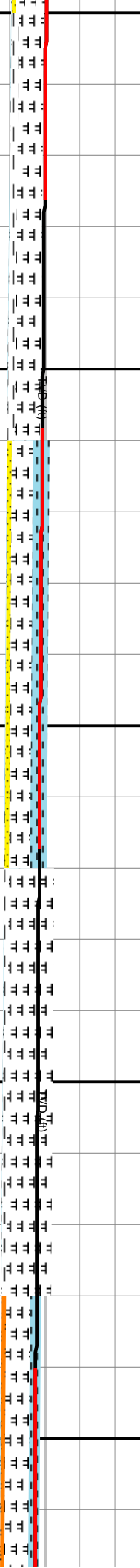
MD: 7.34'  
Inclination: 71.5°  
Azimuth: 270.3°  
TVD: 7.023.8'

MD: 7.37'  
Inclination: 74.4°  
Azimuth: 268.6°  
TVD: 7.033.2'

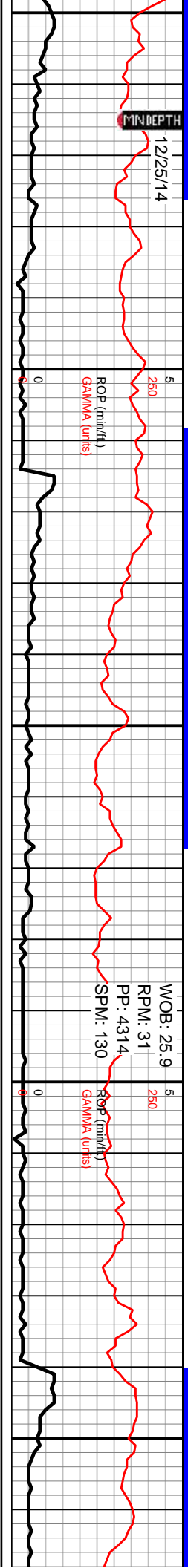
MD: 7.40'  
Inclination: 75.0°  
Azimuth: 267.4°  
TVD: 7.041.3'

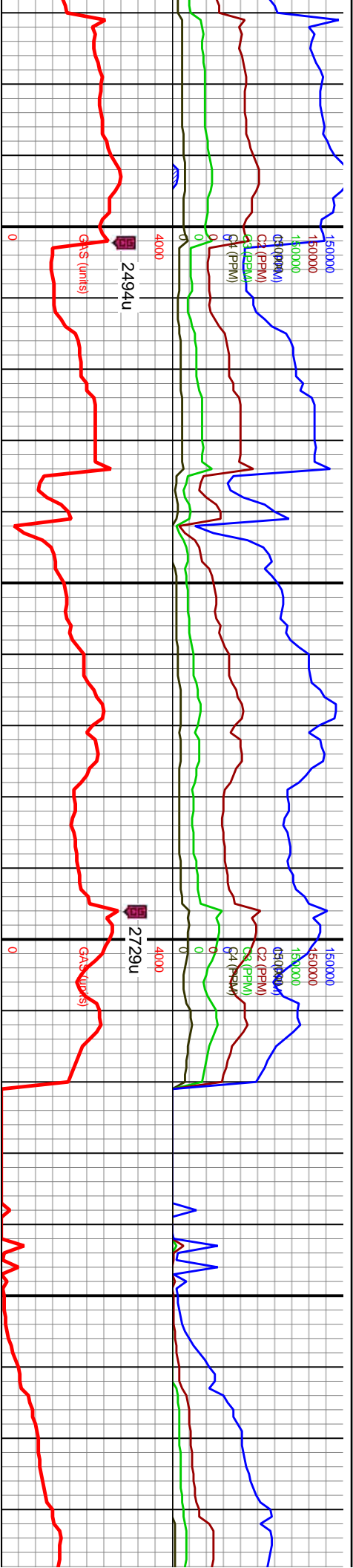
MD: 7.43'  
Inclination: 76.5°  
Azimuth: 267.4°  
TVD: 7.049.0'

MD: 7.46'  
Inclination: 76.5°  
Azimuth: 267.4°  
TVD: 7.049.0'



WOB: 25.9  
RPM: 31  
PP: 4314  
SPM: 130





CHK: GY-BRN GY, MOT, SB PLTY-SB  
BLKY, FRM-SL HRD, RR ELG CHK  
STRG AND CTGS, RAPID HCL RXN.  
MARL: DK GY, SB PLTY-SB BLKY,  
PREDY SL HRD, OCCLY FRM, RAPID  
HCL RXN. TR DISS F PYR.

CHK: GY-BRN GY, PREDY SB PLTY,  
OCCLY SB BLKY, FRM-SL HRD, SME  
ELG CHK STRG AND CTGS, RAPID  
HCL RXN. MARL: DK GY, SB PLTY-SB  
BLKY, PREDY SL HRD, OCCLY FRM,  
VF LAM, RAPID HCL RXN. TR DISS F  
PYR.

CHK: GY-BRN GY, PREDY SB PLTY,  
OCCLY SB BLKY, PREDY FRM, OCCLY  
SL HRD, RAPID HCL RXN. MARL: DK  
GY, SB PLTY-SB BLKY, PREDY SL  
HRD, OCCLY FRM, VF LAM, RAPID  
HCL RXN. TR DISS F PYR.

CHK: GY BRN, OCCLY LT GY, FRI  
HRD, PREDY SB PLTY, SME SB B  
SME WH ELG STRGS OF CHK, SL  
RAPID HCL RXN, VF LAM. MARL:  
MOD FRM - SL HRD, BRIT, SB PLTY  
BLKY, RAPID HCL RXN, FY LAM.  
VF PYR.

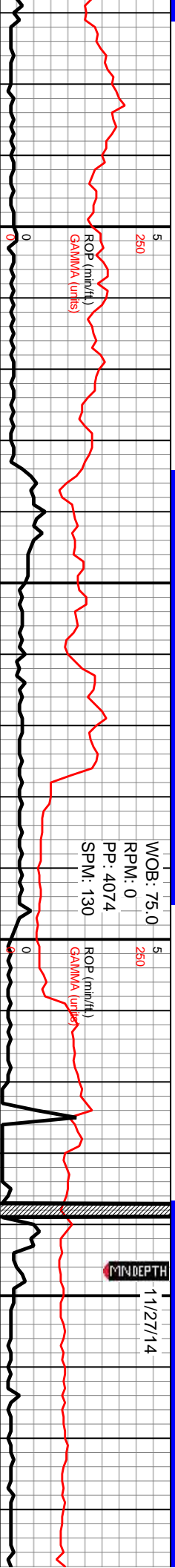
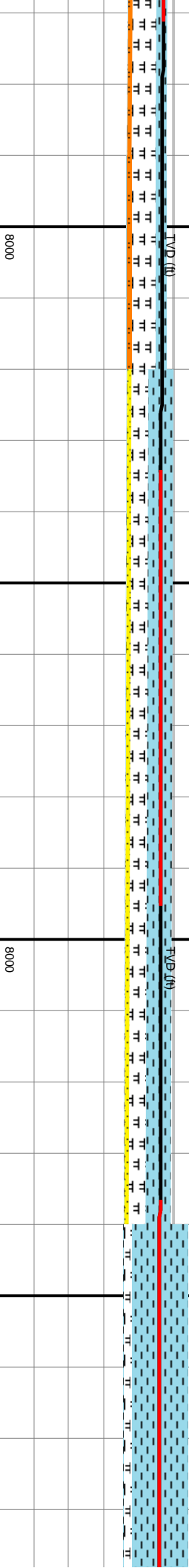


MD: 7.53°  
Inclination: 80.6°  
Azimuth: 266.9°  
TVD: 7.066.1'

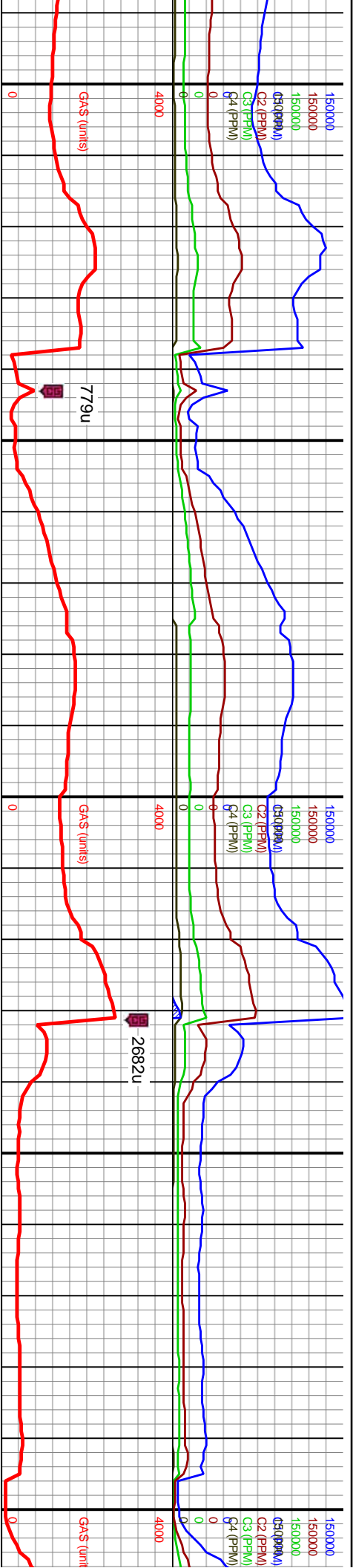
MD: 7.57°  
Inclination: 85.9°  
Azimuth: 266.6°  
TVD: 7.071.1'

MD: 7.67°  
Inclination: 90.0°  
Azimuth: 268.5°  
TVD: 7.074.6'

TOOH For Intermediate  
Casing @ 04:35 on  
12/25/14. Drilling  
Resumed at 19:50 on  
12/26/14.







CHK: GY BRN-GY, FRM-SL HRD, OCCLY  
BRIT, SB BLKY-SB PLTY, RR WH ELG  
STGRS OF CHK, SLTY, RAPID HCL RXN, VF  
LAM. SH: PREDY DK GY, SME LT GY, MOD  
SFT-FRM, OCCLY BRIT, SB PLTY-SB BLKY,  
WK CALC, FY LAM. TR DISS VF PYR. SME  
CMT. BL-WH SOLVENT CUT FLOR.

CHK: GY BRN-GY, FRM-SL HRD, OCCLY  
BRIT, SB BLKY-SB PLTY, RR WH ELG  
STGRS OF CHK, SLTY, RAPID HCL RXN, VF  
LAM. SH: PREDY DK GY, MOD SFT-FRM, REAC, VF LAM. MARL: PREDY DK GY,  
OCCLY BRIT, SB PLTY-SB BLKY, WK  
CALC, FY LAM. TR DISS VF PYR. SME CMT. RAPID HCL REAC. TR DISS VF PYR.  
BL-WH SOLVENT CUT FLOR.

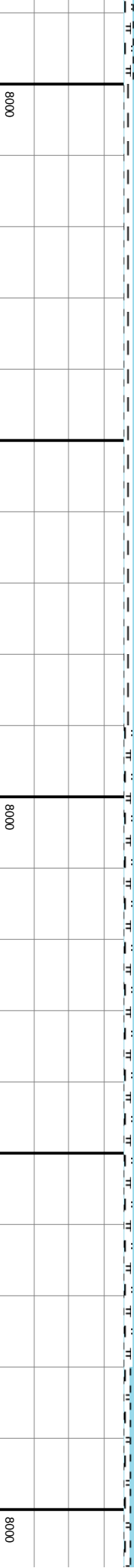
CHK: GY BRN-GY, FRM-SL HRD,  
OCCLY BRIT, SB BLKY-SB PLTY, RR  
WH ELG STGRS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. MARL: PREDY DK  
GY, FRM-SL HRD, BRIT, PREDY SB  
BLKY, RAPID HCL REAC. TR DISS VF  
PYR. BL-WH SOLVENT CUT FLOR.



MD: 7.76c'  
Inclination: 89.2°  
Azimuth: 267.5°  
TVD: 7.075.2'

MD: 7.86c'  
Inclination: 89.2°  
Azimuth: 267.5°  
TVD: 7.076.4'

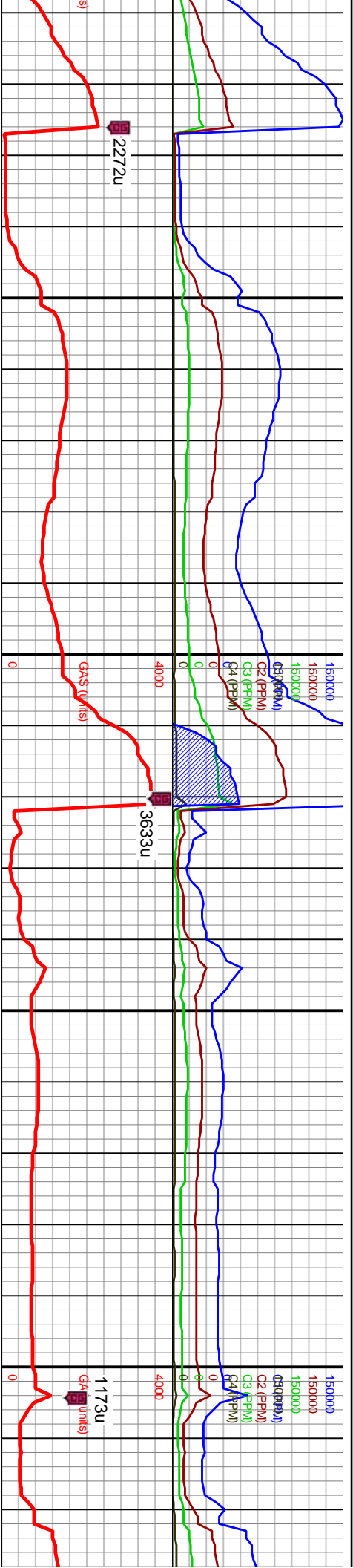
TVD (ft)



ROP (min/ft)  
GAMMA (units)

WOB: 16.2  
RPM: 31  
PP: 3981  
SPM: 82





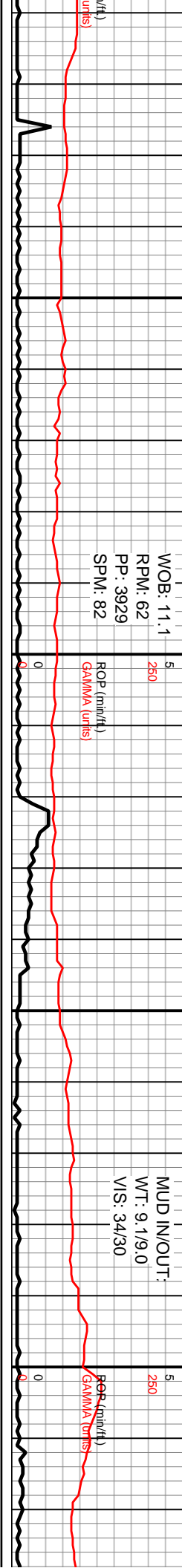
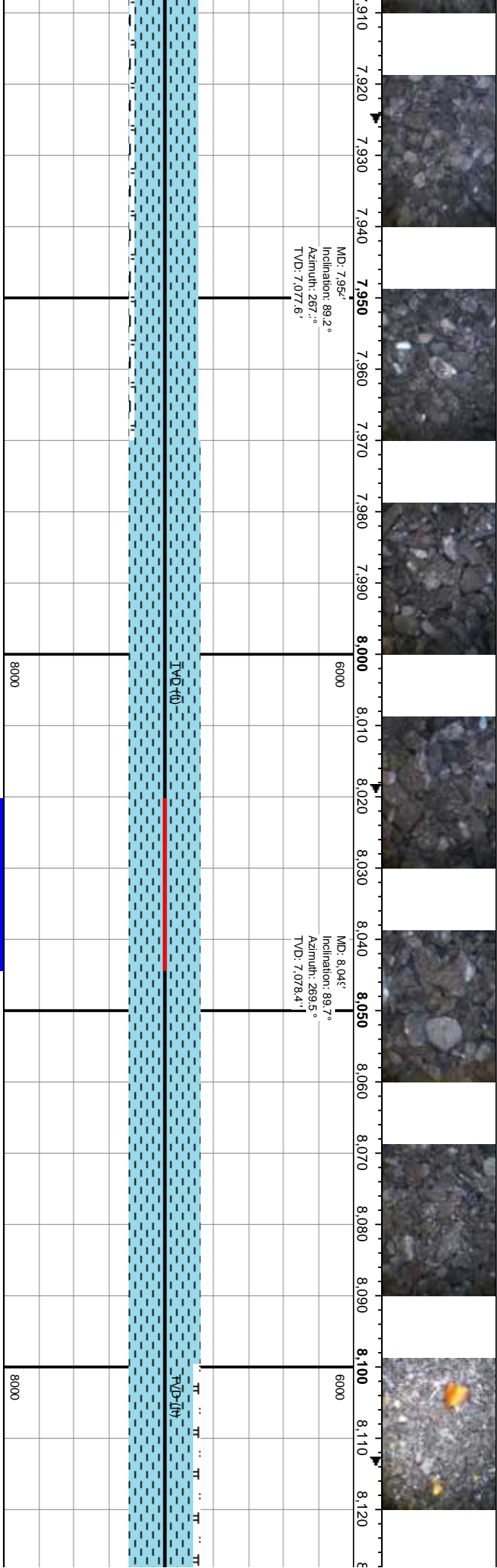
Y BRN-GY, MOT, FRM-SL HRD, BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, VF LAM. MARL: PREDY DK GY, HRD, BRIT, PREDY SB PLTY, HCL REAC. TR DISS VF PYR. SOLVENT CUT FLOR.

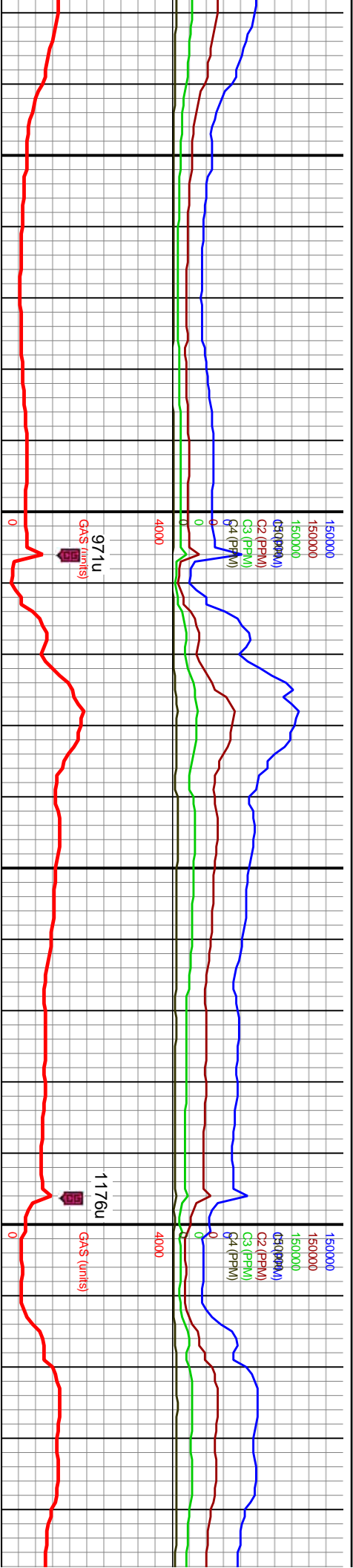
CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, VF LAM. MARL: PREDY DK GY, FRM-SL HRD, BRIT, PREDY SB PLTY, RAPID HCL REAC. TR DISS VF PYR. BL-WH SOLVENT CUT FLOR.

CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN, OCCLY LT PREDY SB PLTY, SME SE ELG STRGS OF CHK, SLTY, VF LAM. MARL: DK HRD, BRIT, SB PLTY-SB BLKY, RXN, FY LAM. TR DISS VF PYR.



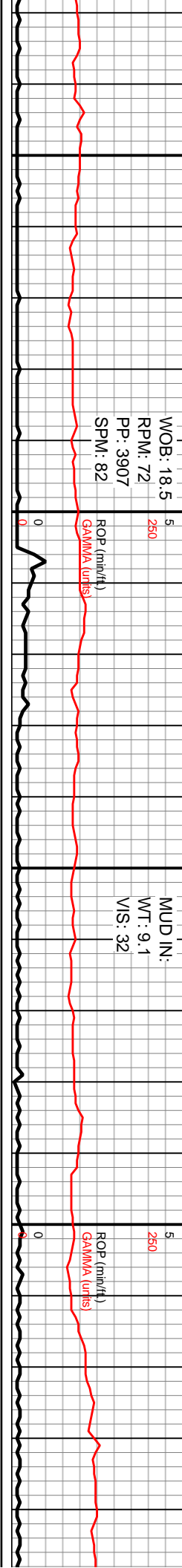
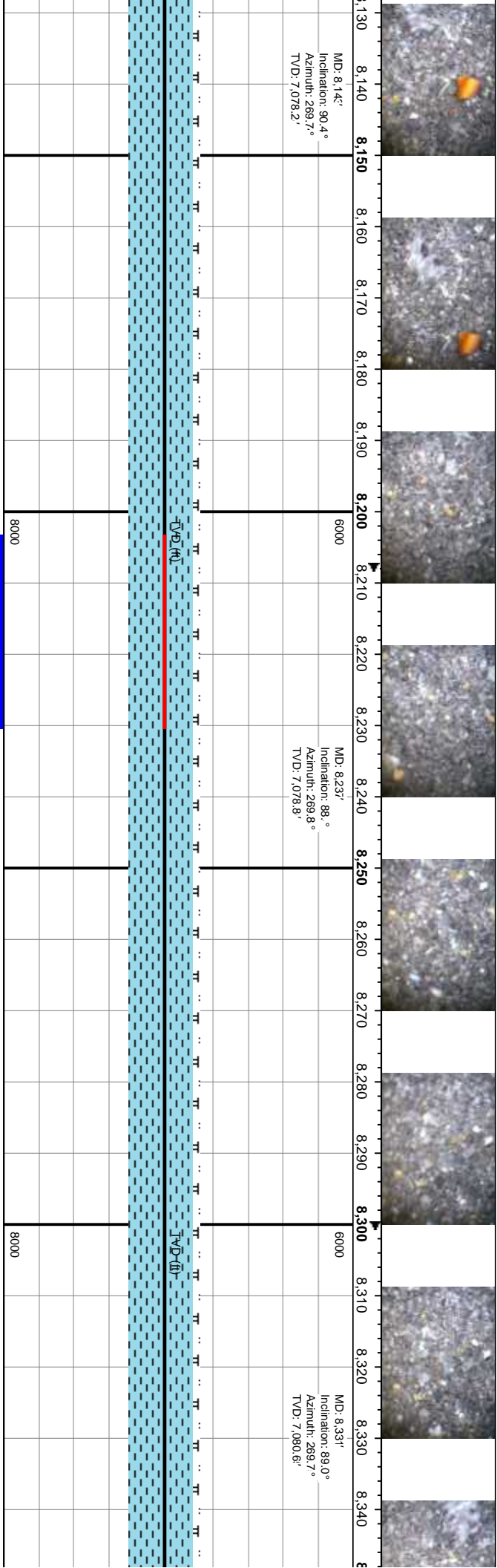


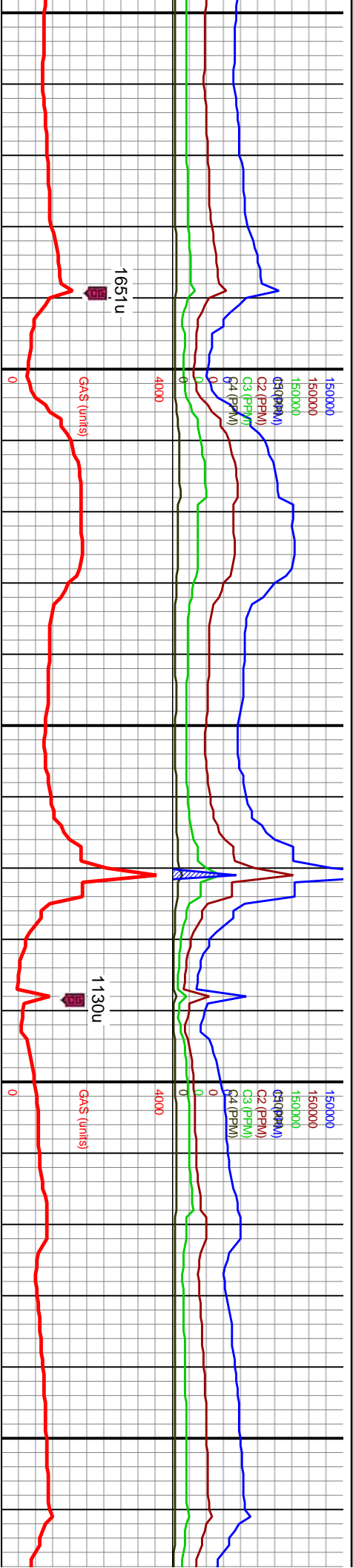
GY, FRM-SL HRD,  
3 BLKY, SME WH  
TY, RAPID HCL  
GY, MOD FRM - SL  
BLKY, RAPID HCL  
F PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
PREDY SB PLTY, SME SB BLKY, SME WH  
ELG STRGS OF CHK, SLTY, RAPID HCL  
RXN, VF LAM, MARL: DK GY, MOD FRM - SL  
HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL  
RXN, FY LAM, TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
PREDY SB PLTY, SME SB BLKY, SME WH  
ELG STRGS OF CHK, SLTY, RAPID HCL  
RXN, VF LAM, MARL: DK GY, MOD FRM - SL  
HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL  
RXN, FY LAM, TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
SB PLTY, SME SB BLKY, SME WH ELG STR  
CHK, SLTY, RAPID HCL RXN, VF LAM, MAR  
MOD FRM - SL HRD, BRIT, SB PLTY-SB BLK  
RAPID HCL RXN, FY LAM, TR DISS VF PYR.



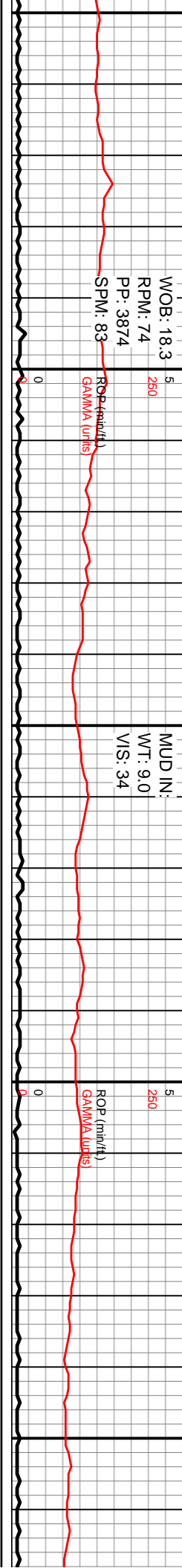
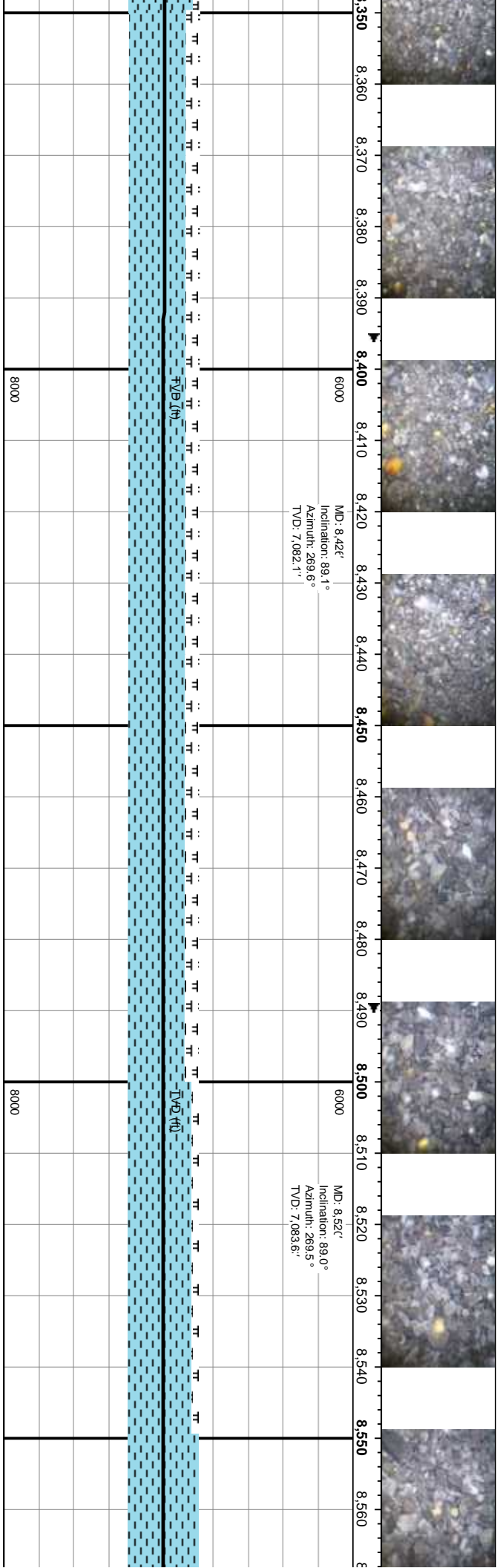


PREDY  
OF  
... DK GY,  
Y,

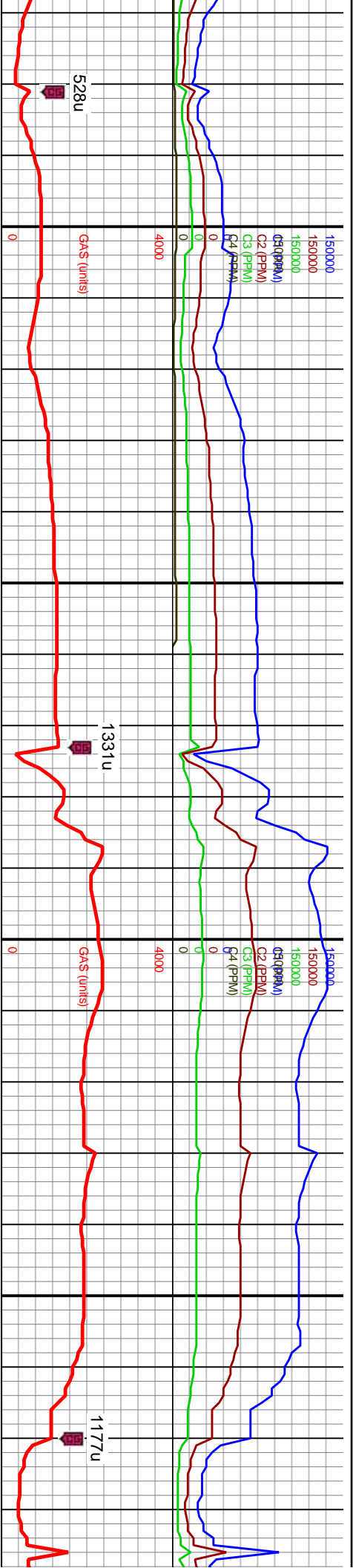
CHK: GY BRN, OCCLY LT GY, FRM-SL HRD, PREDY  
SB PLTY, SME SB BLKY, SME WH ELG STRGS OF  
CHK, SLTY, RAPID HCL RXN, VF LAM. MARL: DK GY,  
MOD FRM - SL HRD, BRIT, SB PLTY-SB BLKY,  
RAPID HCL RXN, FY LAM. TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
PREDY SB PLTY, SME SB BLKY, SME WH  
ELG STRGS OF CHK, SLTY, RAPID HCL  
RXN, VF LAM. MARL: DK GY, MOD FRM - SL  
HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL  
RXN, FY LAM. TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
PREDY SB PLTY, SME SB BLKY, SME WH  
ELG STRGS OF CHK, SLTY, RAPID HCL  
RXN, VF LAM. MARL: DK GY, MOD FRM - SL  
HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL  
RXN, FY LAM. TR DISS VF PYR.





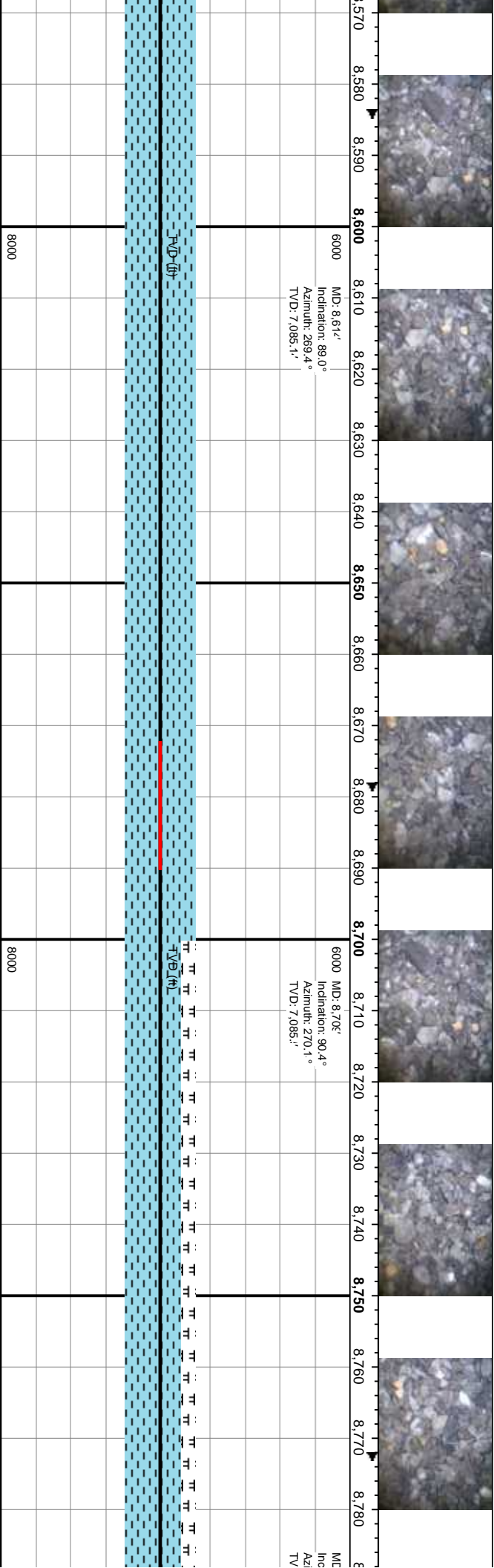


CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF  
CHK, SLTY, RAPID HCL REAC,  
VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF  
CHK, SLTY, RAPID HCL REAC,  
VF LAM. TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD,  
PREDY SB PLTY, SME SB BLKY, SME WH  
ELG STRGS OF CHK, SLTY, RAPID HCL  
RXN, VF LAM. MARL: DK GY, MOD FRM - SL  
HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL  
RXN, FY LAM. TR DISS VF PYR.

CHK: GY BRN, C  
PREDY SB PLTY  
ELG STRGS OF  
RXN, VF LAM. M  
HRD, BRIT, SB F  
RXN, FY LAM. T



MD: 8.61°  
Inclination: 89.0°  
Azimuth: 269.4°  
TVD: 7.085.1'

MD: 8.70°  
Inclination: 90.4°  
Azimuth: 270.1°  
TVD: 7.085.1'

MD: 8.70°  
Inclination: 90.4°  
Azimuth: 270.1°  
TVD: 7.085.1'

WOB: 16.7  
RPM: 61  
PP: 3936  
SPM: 83

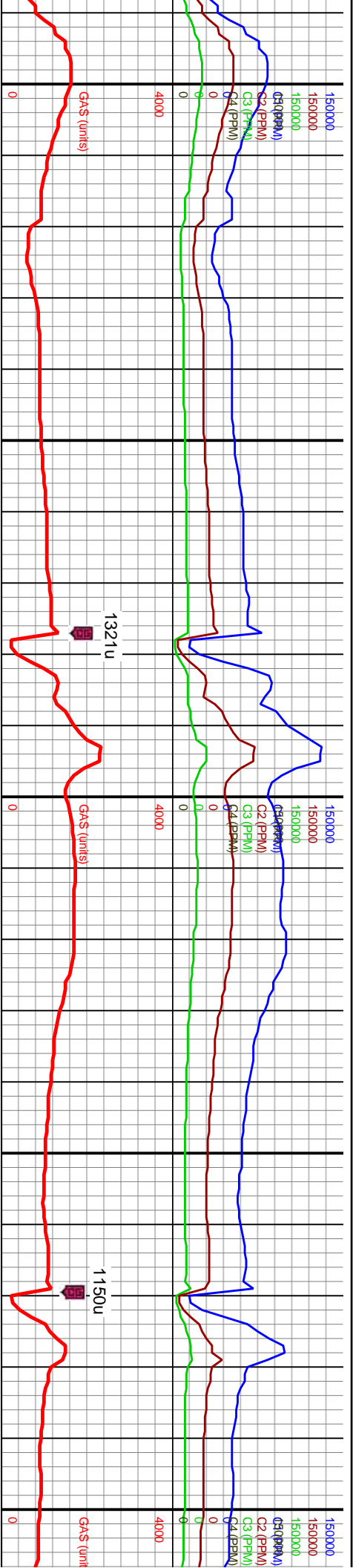
ROP (min/ft)  
GAMMA (units)

ROP (min/ft)  
GAMMA (units)

MUD IN:  
WT: 9.05  
VIS: 45

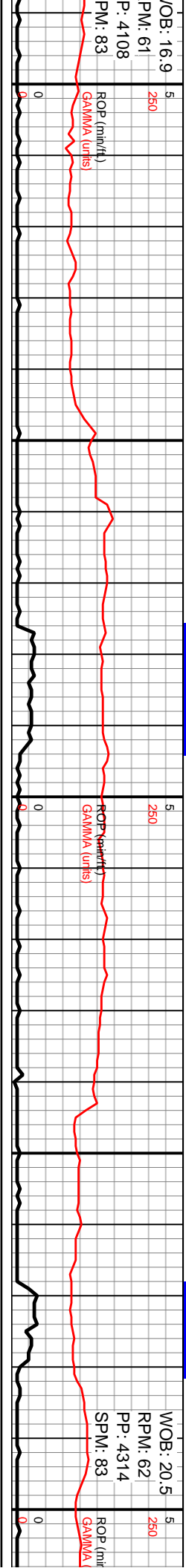
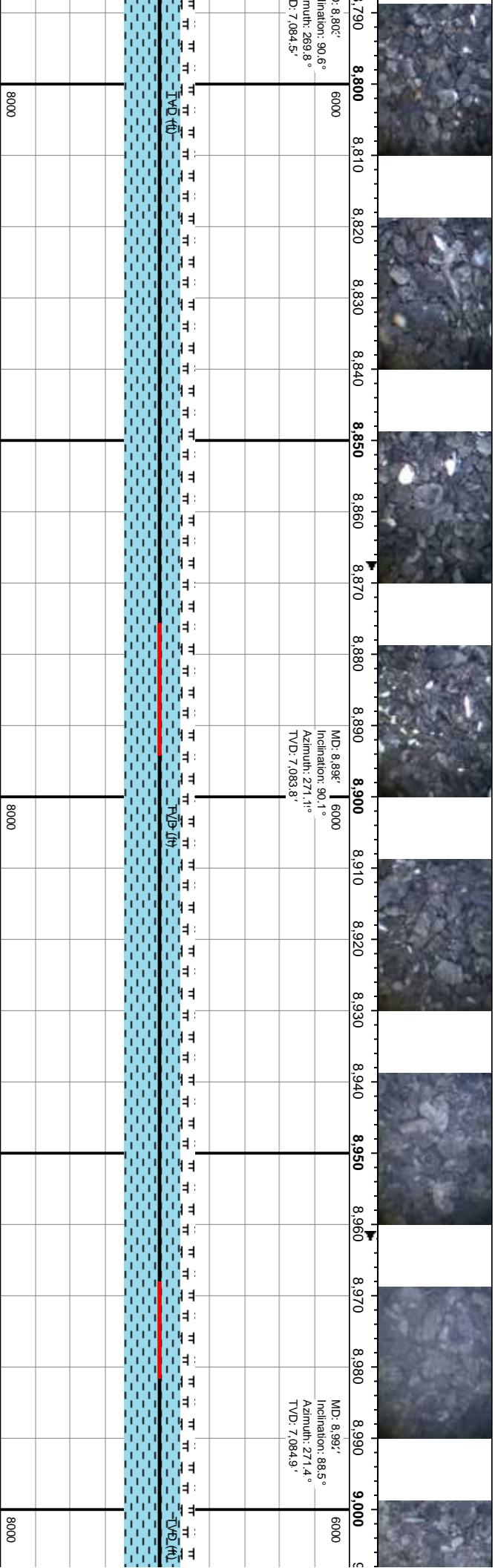
WOB: 16.7  
RPM: 61  
PP: 3936  
SPM: 83

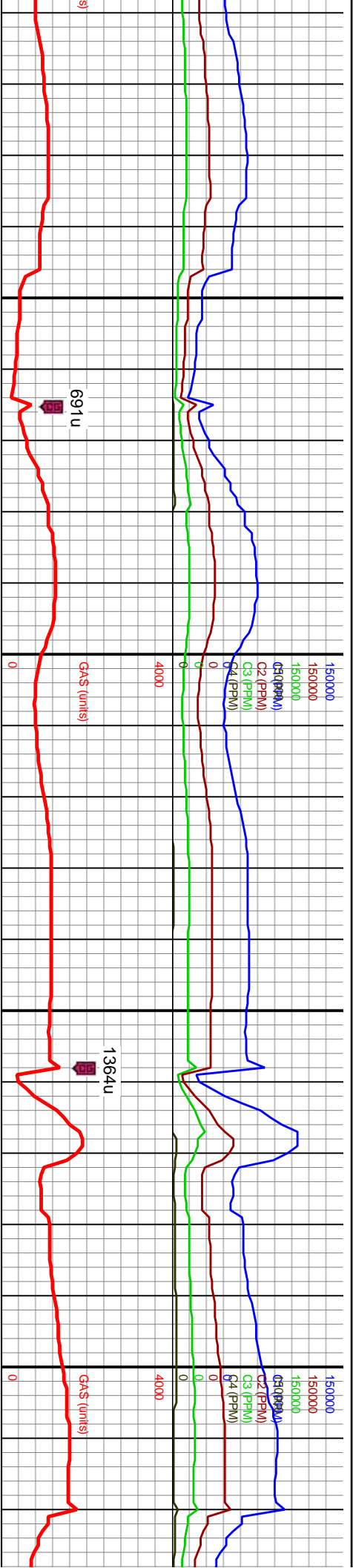




CHK: GY BRN, OCCLY LT GY, FRM-SL HRD, PREDY SB PLTY, SME SB BLKY, SME WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN, VF LAM. MARL: DK GY, MOD FRM - SL HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL RXN, FY LAM. TR DISS VF PYR.

CHK: GY BRN, OCCLY LT GY, FRM-SL HRD, PREDY SB PLTY, SME WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN, VF LAM. MARL: DK GY, MOD FRM - SL HRD, BRIT, SB PLTY-SB BLKY, RAPID HCL RXN, FY LAM. TR DISS VF PYR.



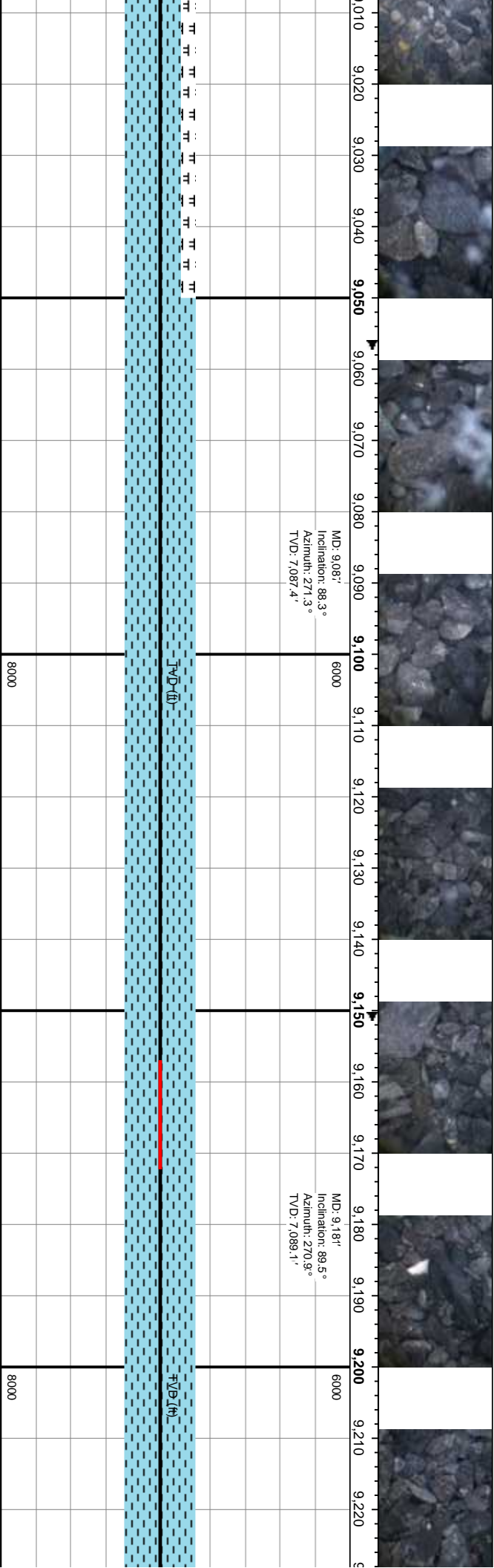


CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

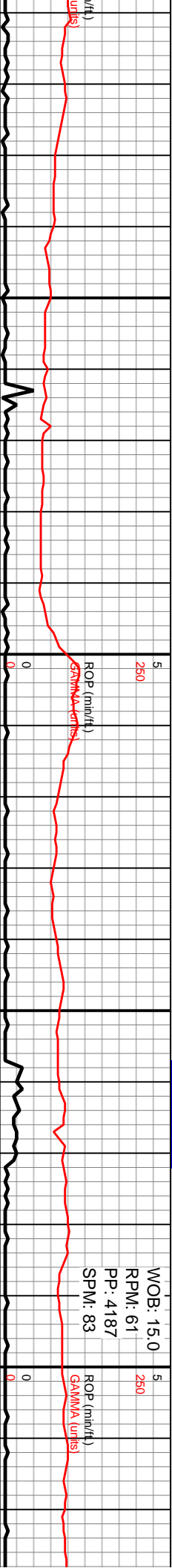
CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

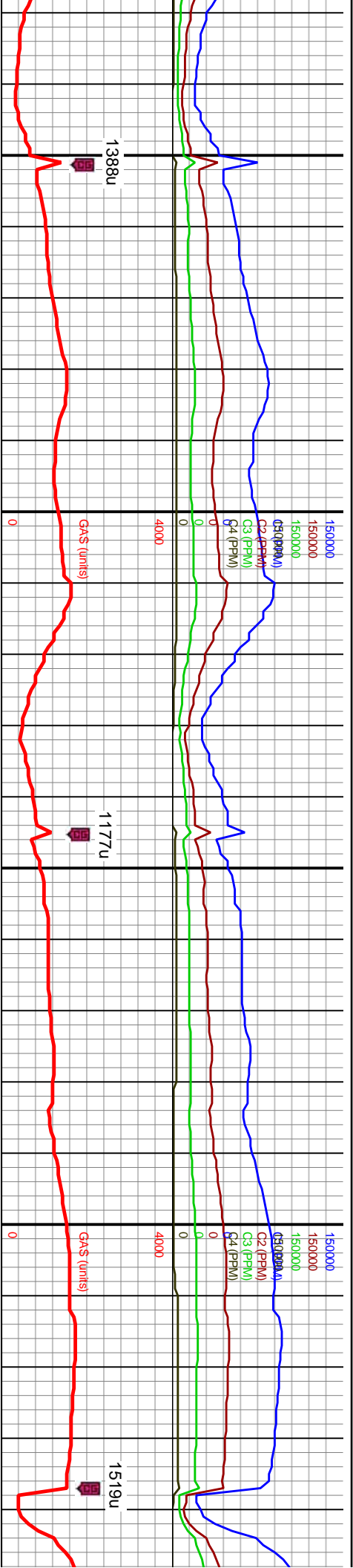


MD: 9.08°  
Inclination: 88.3°  
Azimuth: 271.3°  
TVD: 7.087.4'

MD: 9.18°  
Inclination: 89.5°  
Azimuth: 270.9°  
TVD: 7.088.1'



WOB: 15.0  
RPM: 61  
PP: 4187  
SPM: 83

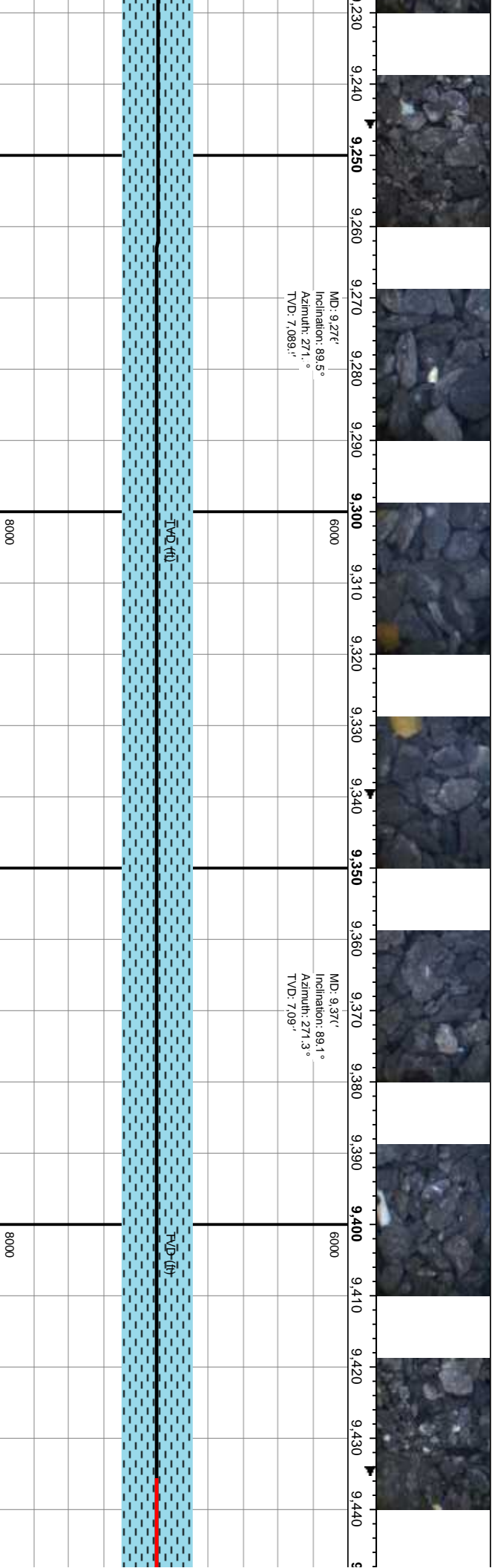


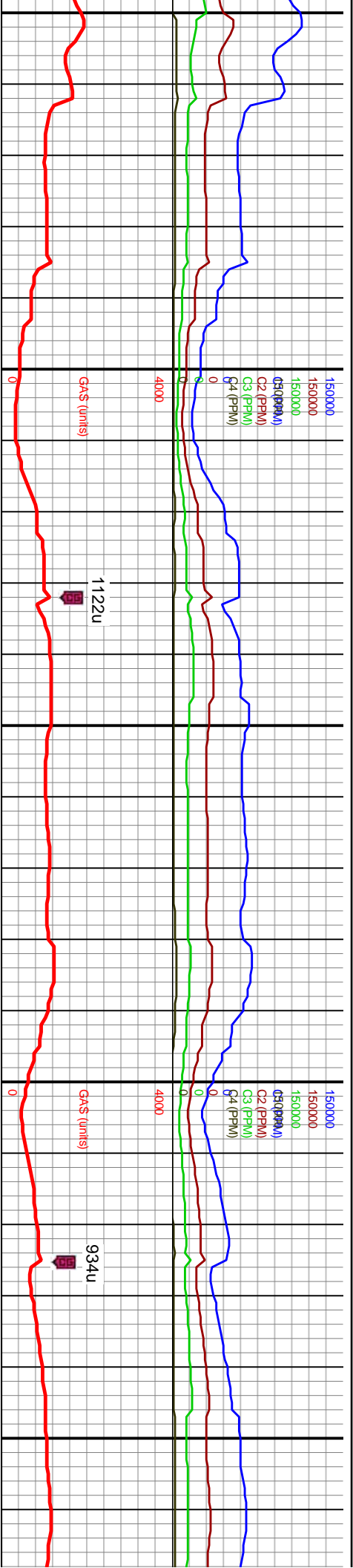
CHK: GY BRN-GY, MOT, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, RR  
WH ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

CHK: GY BRN-GY, MOT,  
FRM-SL HRD, OCCLY BRIT,  
SB PLTY-SB BLKY, RR WH  
ELG STRGS OF CHK, SLTY,  
RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.



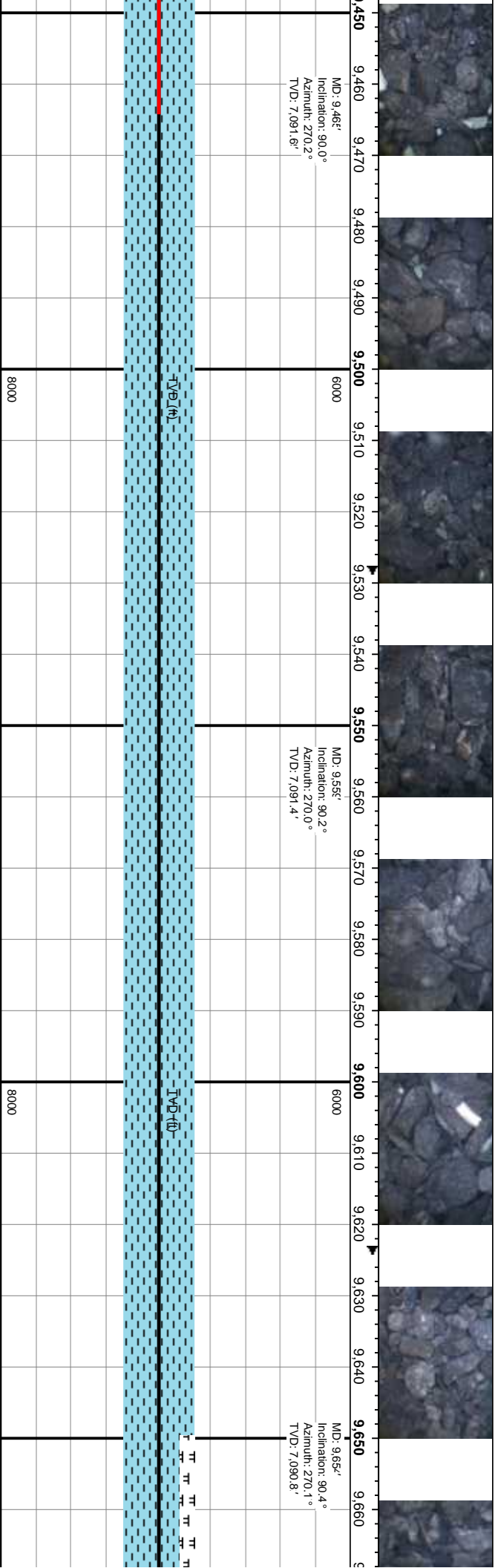


CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM.  
TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY  
BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS  
OF CHK, SLTY, RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY  
BRIT, SB PLTY-SB BUKY, RR WH ELG STRGS  
OF CHK, SLTY, RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.

CHK: GY  
SB P LTY  
CHK, SLT  
MOD FRM  
HCL RXN



MD: 9,46€  
Inclination: 90.0°  
Azimuth: 270.2°  
TVD: 7,091.6'

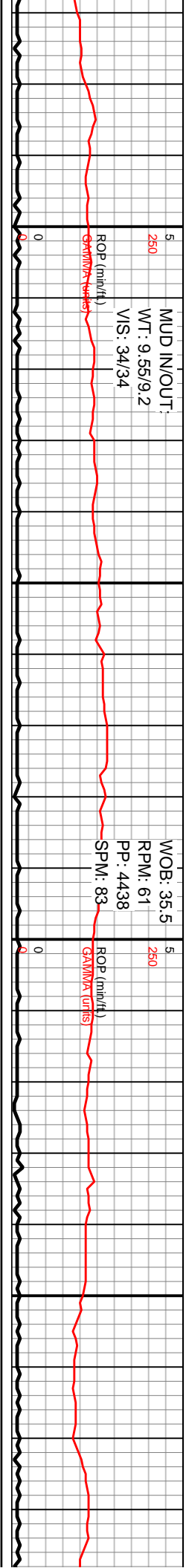
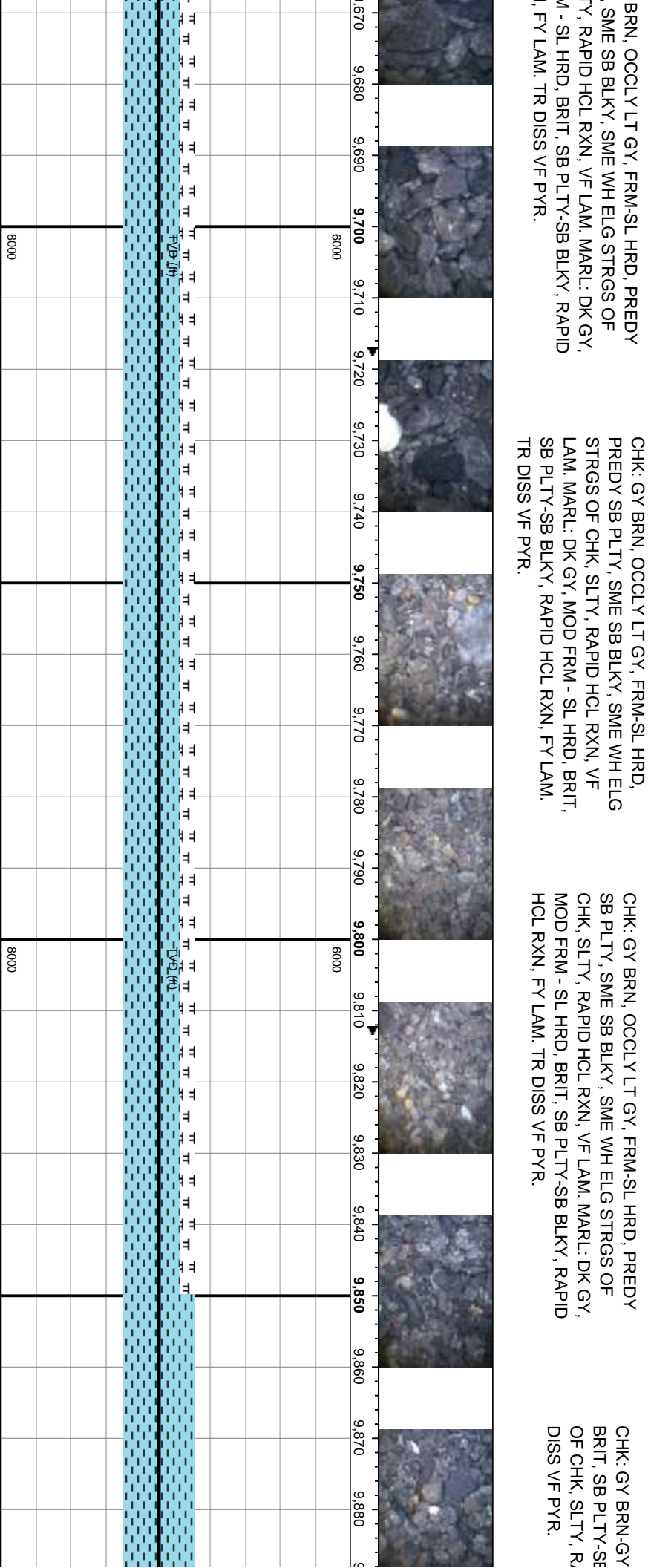
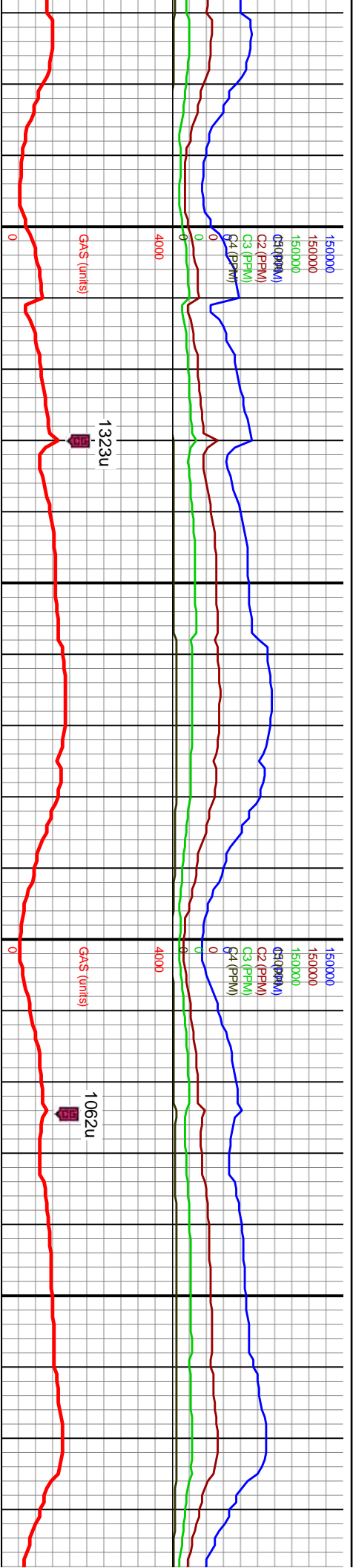
MD: 9,55c'  
Inclination: 90.2°  
Azimuth: 270.0°  
TVD: 7,091.4'

MD: 9,654'  
Inclination: 90.4°  
Azimuth: 270.1°  
TVD: 7,090.8'

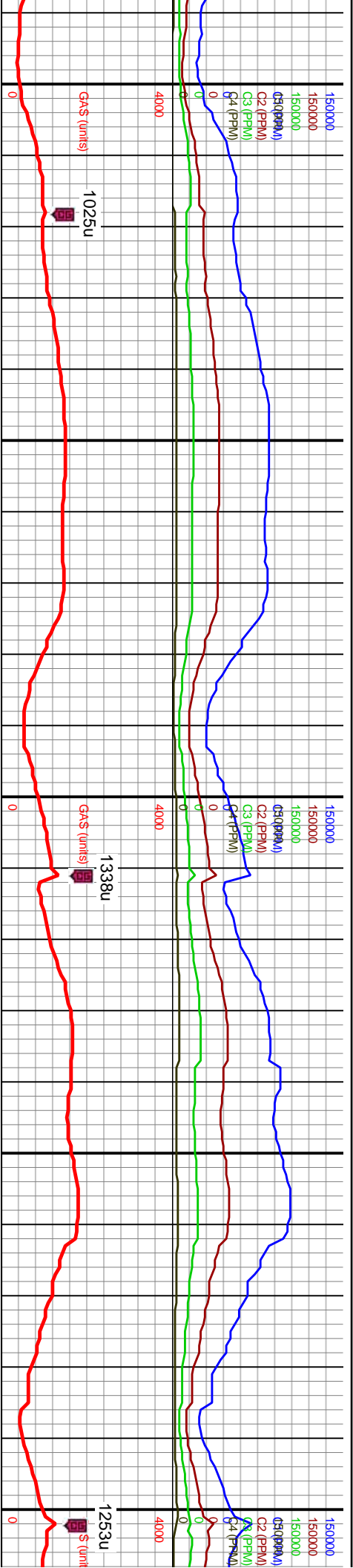
MUD IN:	
WT: 9.1	
VIS: 34	

WOB: 21  
RPM: 61  
PP: 4453  
SPM: 83

ROP (min/ft)  
GAMMA (units)





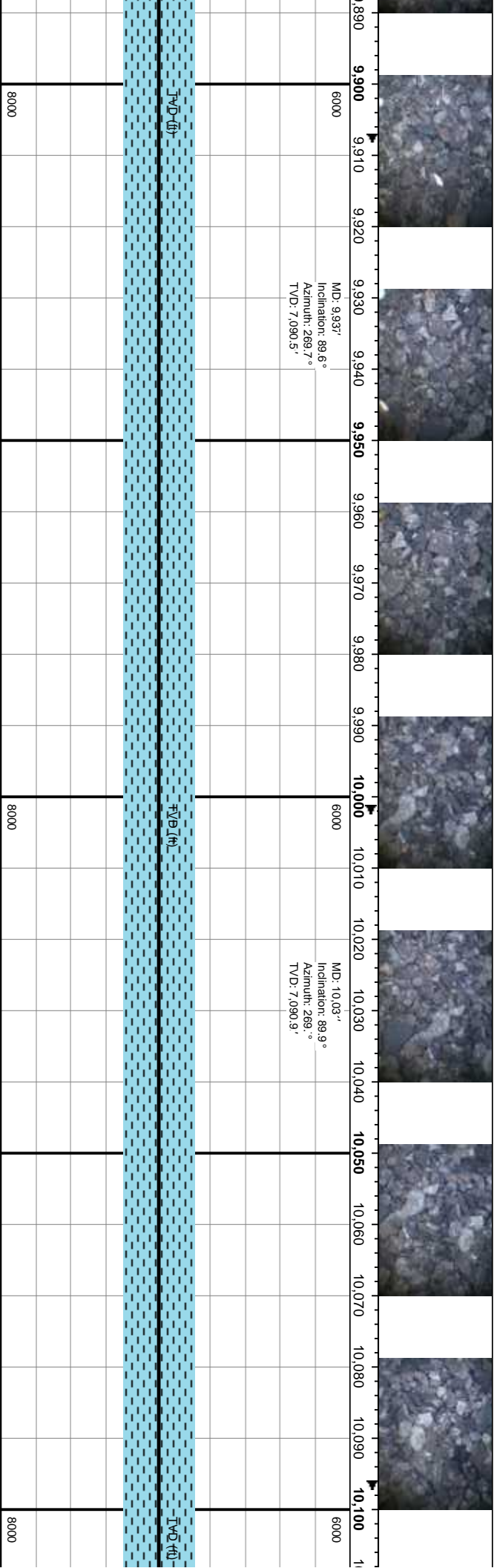


, MOT, FRM-SL HRD, OCCLY  
3 BLKY, RR WH ELG STRGS  
RAPID HCL REAC, VF LAM. TR

CHK: GY BRN-GY, MOT, FRM-SL HRD, OCCLY  
BRIT, SB PLTY-SB BLKY, RR WH ELG STRGS  
OF CHK, SLTY, RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.

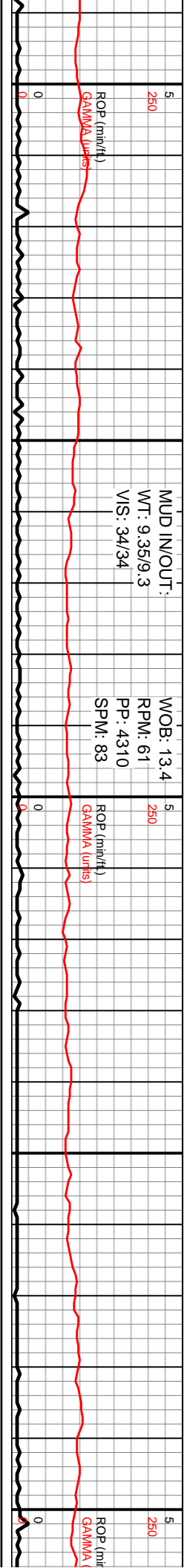
CHK: GY BRN-GY, MOT, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, RR  
WH ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL HRD  
OCCLY BRIT, SB PLTY-SB BLKY, RR  
WH ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. TR DISS VF PYR.



MD: 9.937'  
Inclination: 89.6°  
Azimuth: 268.7°  
TVD: 7,090.5'

MD: 10.037'  
Inclination: 89.9°  
Azimuth: 269.°  
TVD: 7,090.9'



5  
250

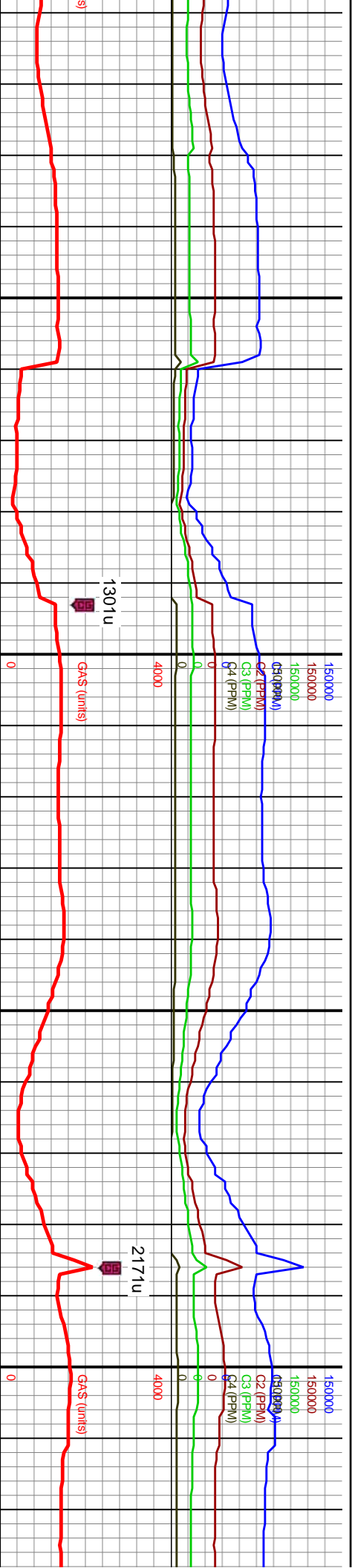
ROP (min/ft)  
GAMMA (units)

WOB: 13.4  
RPM: 61  
PP: 4310  
SPM: 83

ROP (min/ft)  
GAMMA (units)

5  
250

ROP (min/ft)  
GAMMA (units)

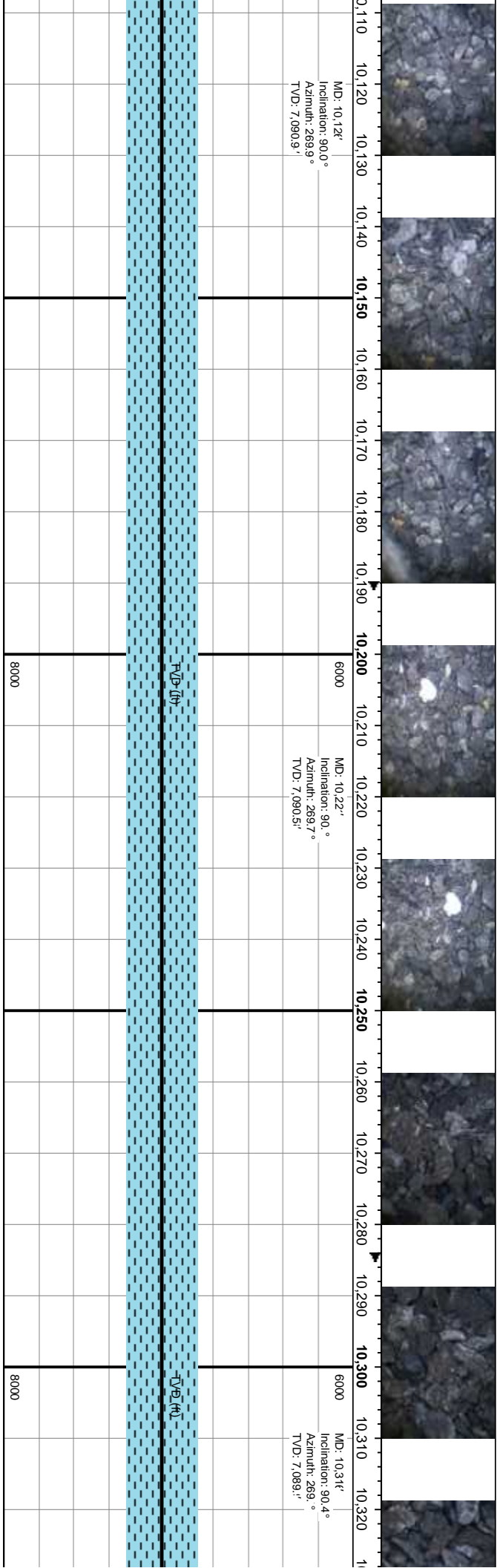


CHK: GY BRN-GY, MOT, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, RR  
WH ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, RR  
WH ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC, VF LAM. TR DISS VF PYR.

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB PLTY-SB  
BLKY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.

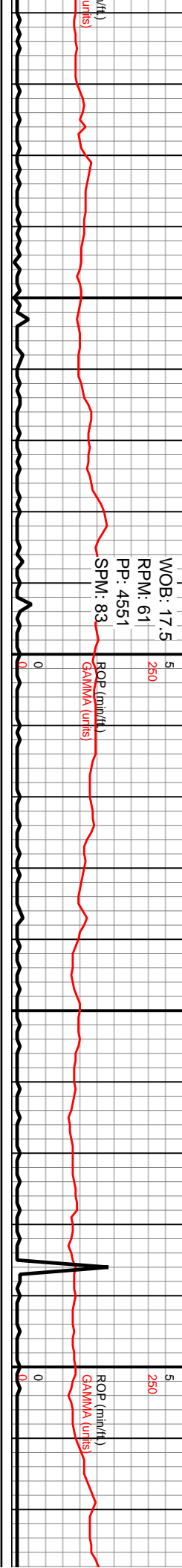
CHK: GY BRN-GY,  
HRD, OCCLY BRIT  
BLKY, RR WH ELG  
SLTY, RAPID HCL  
DISS VF PYR.



MD: 10.12k'  
Inclination: 90.0°  
Azimuth: 269.9°  
TVD: 7,090.9'

MD: 10.22"  
Inclination: 90.°  
Azimuth: 269.7°  
TVD: 7,090.5'

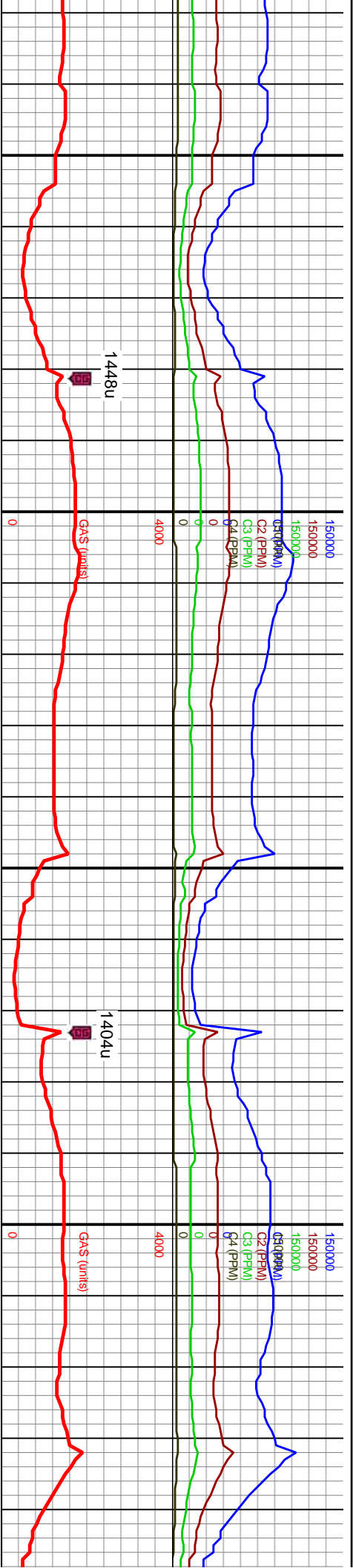
MD: 10.31k'  
Inclination: 90.4°  
Azimuth: 269.°  
TVD: 7,089.1'



WOB: 17.5  
RPM: 61  
PP: 4551  
SPM: 83

ROP (min/ft)  
GAMMA (units)

ROP (min/ft)  
GAMMA (units)



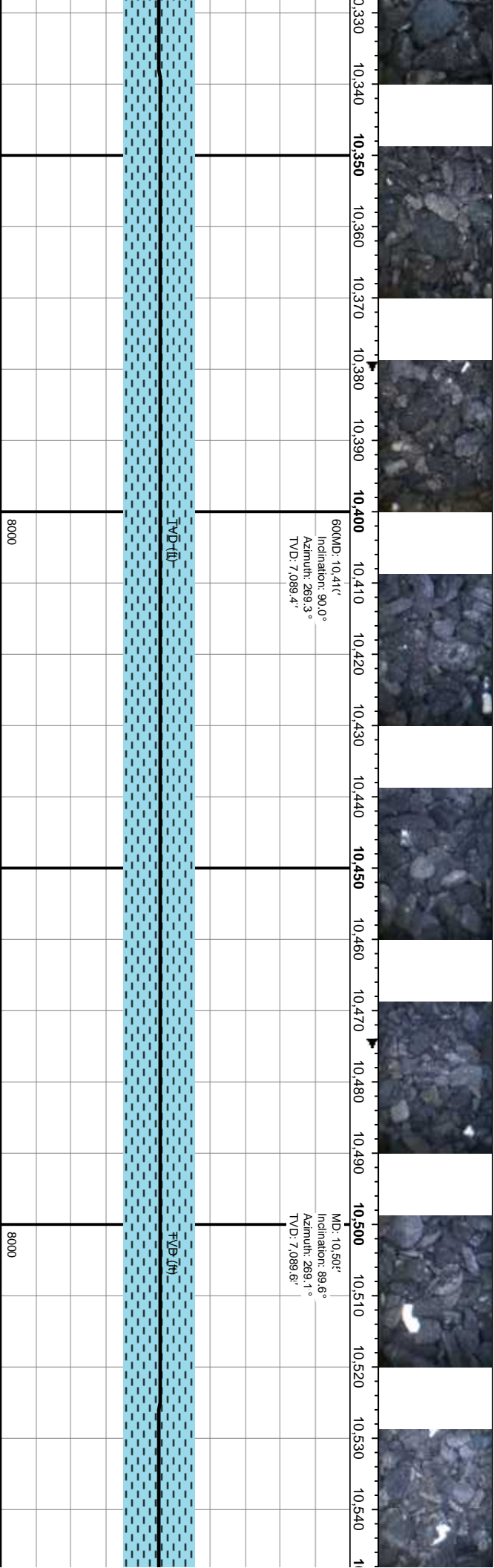
MOT, FRM-SL  
SB PLTY-SB  
STRGS OF CHK,  
REAC, VF LAM. TR

CHK: GY BRN-GY, MOT, FRM-SL  
HRD, OCCLY BRIT, SB BLKY-SB  
PLTY, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC, VF LAM. TR  
DISS VF PYR.

CHK: GY BRN-GY, MOT APPNC,  
FRM-SL HRD, OCCLY BRIT, SB  
BLKY-SB PLTY, VF LAM, RR WH  
ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC. TR DISS VF PYR.

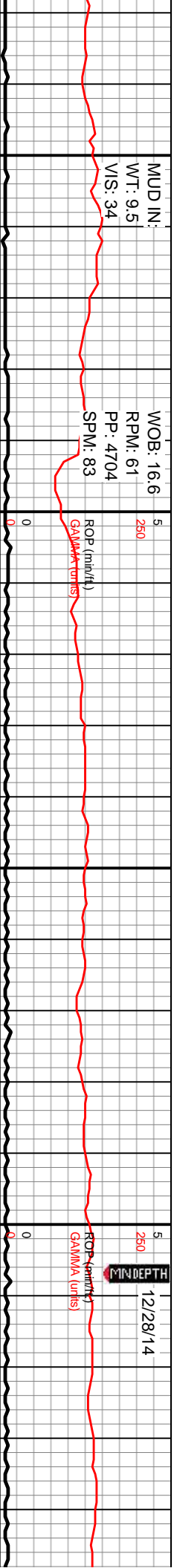
CHK: GY BRN-GY, MOT APPNC,  
FRM-SL HRD, OCCLY BRIT, SB  
BLKY-SB PLTY, VF LAM, RR WH  
ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC. TR DISS VF PYR.

CHK: GY BRN-GY, MOT APPNC,  
FRM-SL HRD, OCCLY BRIT, SB  
BLKY-SB PLTY, VF LAM, RR WH  
ELG STRGS OF CHK, SLTY, RAPID  
HCL REAC. TR DISS VF PYR.



60CMD: 10.41°  
Inclination: 90.0°  
Azimuth: 269.3°  
TV/D: 7.098.4°

MD: 10.50°  
Inclination: 89.6°  
Azimuth: 269.1°  
TV/D: 7.098.6°



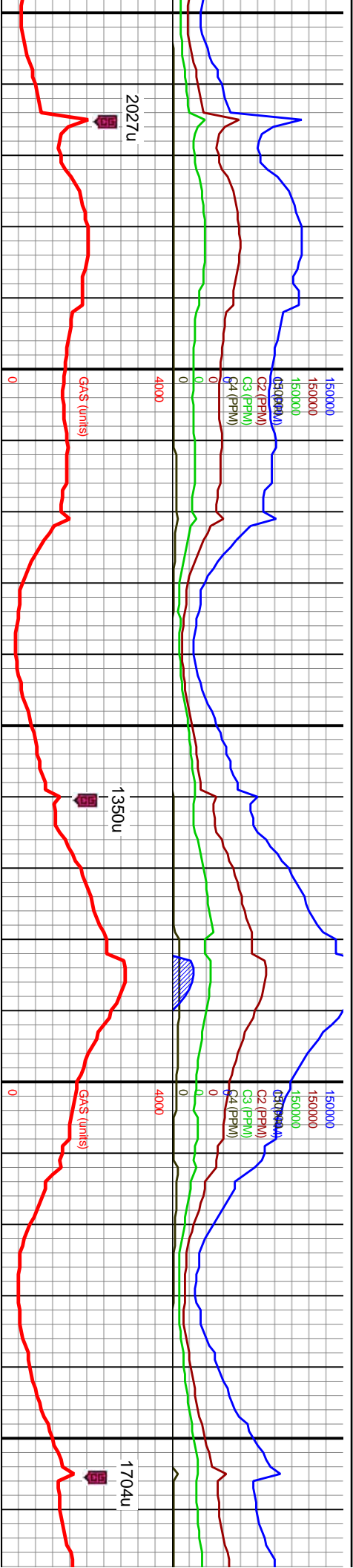
MUD IN:  
WT: 9.5  
VIS: 34

WOB: 16.6  
RPM: 61  
PP: 4704  
SPM: 83

ROP (min/ft)  
GAMMA (units)

ROP (min/ft)  
GAMMA (units)

12/28/14



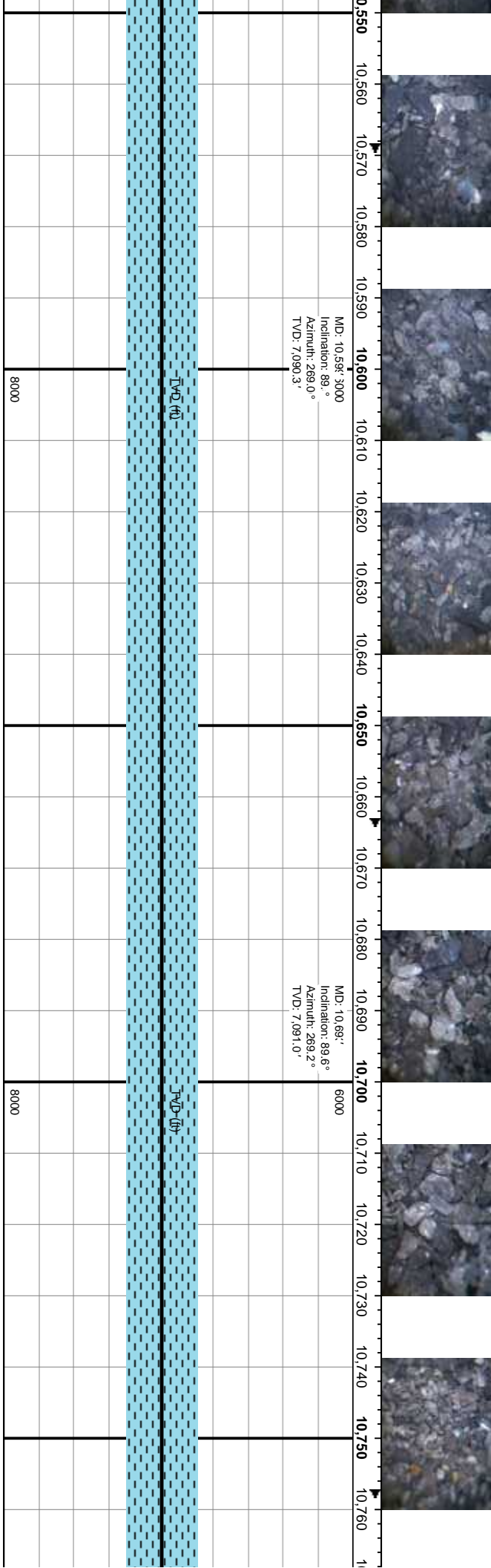
CHK: PREDY GY BRN-GY, SME DK  
GY, MOT APPNC, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, VF  
LAM, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC. TR DISS  
VF PYR.

CHK: PREDY GY BRN-GY, SME DK  
GY, MOT APPNC, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY, VF  
LAM, RR WH ELG STRGS OF CHK,  
SLTY, RAPID HCL REAC. TR DISS  
VF PYR.

CHK: PREDY GY BRN-GY, SME LT  
GY, MOT APPNC, PREDY SL HRD,  
SME FRM, OCCLY BRIT, SB PLTY-SB  
BLKY, VF LAM, RR WH ELG STRGS  
OF CHK, SLTY, RAPID HCL REAC.  
TR DISS VF PYR.

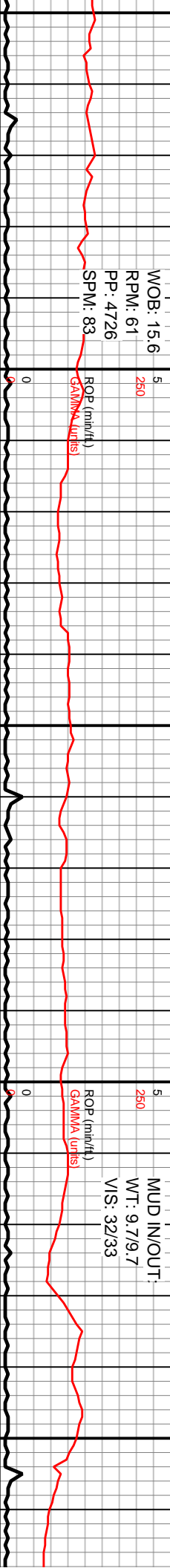
CHK: PREDY GY BRN-GY, SME LT  
GY, MOT APPNC, PREDY SL HRD,  
SME FRM, OCCLY BRIT, SB PLTY-SB  
BLKY, VF LAM, RR WH ELG STRGS  
OF CHK, SLTY, RAPID HCL REAC.  
TR DISS VF PYR.

CHK: PREDY  
MOT APPNC,  
FRM, OCCLY  
VF LAM, RR W  
SLTY, RAPID I  
PYR.



MD: 10.59°  
Inclination: 89.0°  
Azimuth: 269.0°  
TVD: 7.090.3'

MD: 10.69°  
Inclination: 89.6°  
Azimuth: 269.2°  
TVD: 7.091.0'



WOB: 15.6  
RPM: 61  
PP: 4726  
SPM: 83

MUD IN/OUT:  
WT: 9.7/9.7  
VIS: 32/33

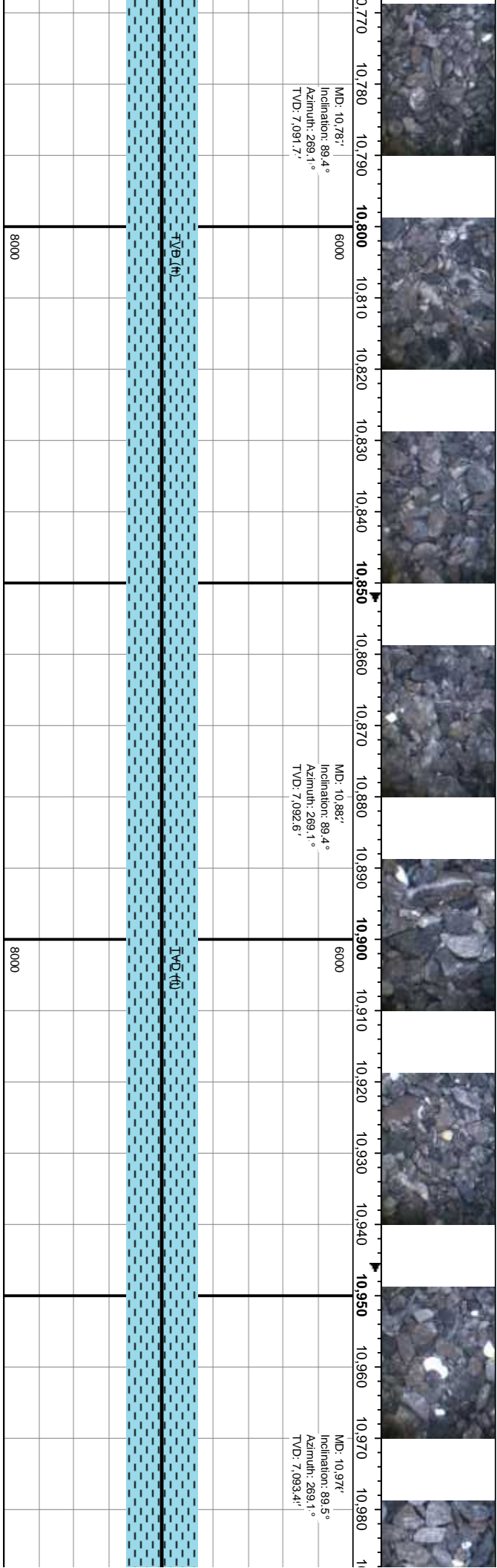




CHK: PREDY GY BRN-GY, SME LT GY, MOT APPNC, PREDY SL HRD, SME FRM, OCCLY BRIT, SB PLTY-SB BLKY, VF LAM, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, TR DISS VF PYR.

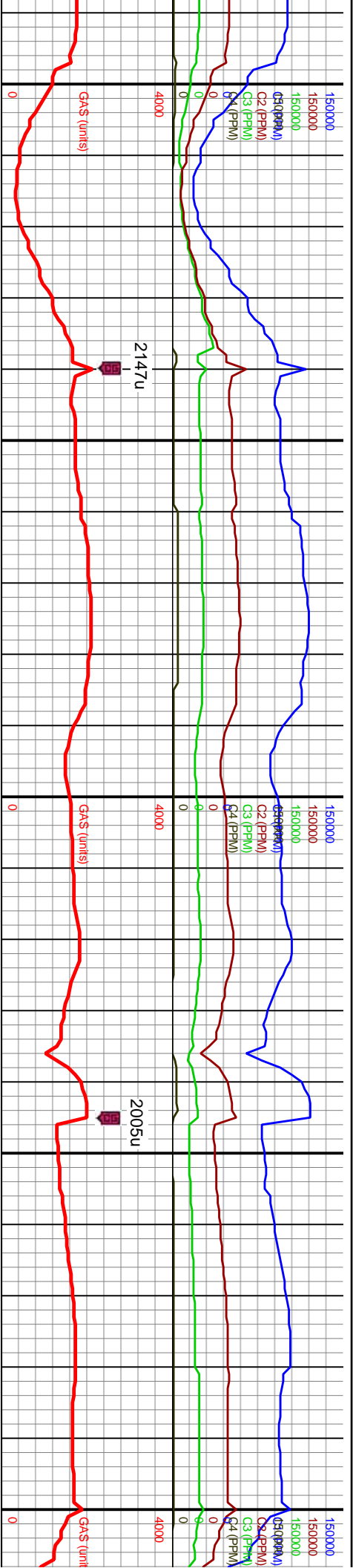
CHK: PREDY GY BRN-GY, SME LT GY, MOT APPNC, PREDY SL HRD, SME FRM, OCCLY BRIT, SB PLTY-SB BLKY, VF LAM, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, TR DISS VF PYR.

CHK: PREDY GY BRN-GY, SME LT GY, MOT APPNC, PREDY SL HRD, SME FRM, OCCLY BRIT, SB PLTY-SB BLKY, VF LAM, RR WH ELG STRGS OF CHK, SLTY, RAPID HCL REAC, TR DISS VF PYR.



WOB: 15.5	ROP (m/h)	W
RPM: 61	GAMMA (units)	R
PP: 4678		P
SPM: 82		S





CHK: PREDY GY BRN-GY, SME LT GY,  
MOT APPNC, PREDY SL HRD, SME FRM,  
OCCLY BRIT, SB PLTY-SB BLKY, VF LAM,  
RR WH ELG STRGS OF CHK, SLTY,  
RAPID HCL REAC, TR DISS VF PYR.

CHK: PREDY GY BRN-GY, SME LT GY,  
MOT APPNC, PREDY SL HRD, SME FRM,  
OCCLY BRIT, SB PLTY-SB BLKY, VF LAM,  
RR WH ELG STRGS OF CHK, SLTY,  
RAPID HCL REAC, TR DISS VF PYR.

CHK: PREDY GY BRN-GY, SME LT GY,  
MOT APPNC, PREDY SL HRD, SME FRM,  
OCCLY BRIT, SB PLTY-SB BLKY, VF LAM,  
RR WH ELG STRGS OF CHK, SLTY,  
RAPID HCL REAC, TR DISS VF PYR.

CHK: PREDY GY BRN-GY, OCCLY LT  
GY, MOT APPNC, FRM-SL HRD,  
OCCLY BRIT, SB PLTY-SB BLKY,  
SLTY, VF LAM, RR WH ELG STRGS  
OF CHK, RAPID HCL REAC, TR DISS  
VF PYR.

CH  
GY  
OC  
SL  
OF  
VF



11,000 11,010 11,020 11,030 11,040 11,050 11,060 11,070 11,080 11,090 11,100 11,110 11,120 11,130 11,140 11,150 11,160 11,170 11,180 11,190 11,200

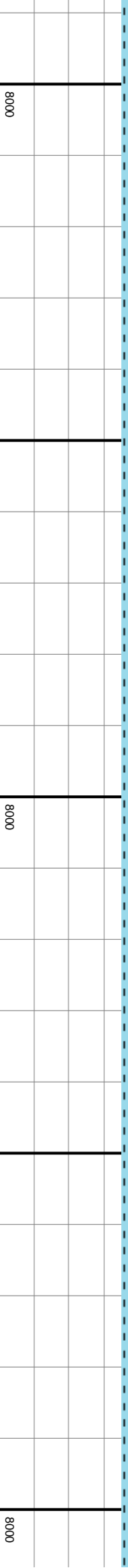
MD: 11.07"  
Inclination: 89.4°  
Azimuth: 269.0°  
TVD: 7.094.2"

MD: 11.16"  
Inclination: 90.1°  
Azimuth: 269.1°  
TVD: 7.094.6"

TVD (ft)

TVD (ft)

TVD (ft)



TVD (ft)

TVD (ft)

TVD (ft)

OB: 17.5 5 250

PM: 71 5 250

PM: 82 5 250

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)

ROP (min/ft) GAMMA (units)





THANK YOU FOR USING

# ALS EMPIRICA

REACHED TD  
OF 11,642 MD  
@ 01:15 ON  
12/28/2014

1,650	11,660	11,670	11,680	11,690	11,700
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A blank 10x10 grid for drawing a picture. The grid consists of 10 columns and 10 rows of squares, outlined by thin grey lines. The entire grid is enclosed within a thicker black border.[illegible]