

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name NAKAGAWA B13-64-1HN

Location SEC 13 T5N R64W

State COLORADO

Country USA

API Number 05-123-36378-0000

Region DJ BASIN

Spud Date 7/1/2013

Surface Coordinates 1060' FSL, 239' FWL

Bottom Hole Coordinates 1650' FSL, 535' FEL

County WELD

Rig Number H&P 330

AFE # 136877

Field WATTENBERG

Drilling Completed 7/9/2013

Ground Elevation 4570'

K.B. Elevation 4600'

Logged Interval 2500' To 11025

Total Depth 11025

Formation NIOBRARA C CHALK

Type of Drilling Fluid LSND

Company Noble Energy, Inc.

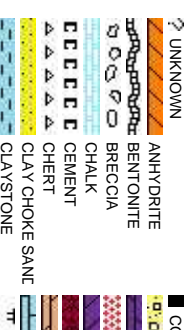
Address 1625 Broadway
Denver, CO 80202

Name Teresa Malesan

Company Noble Energy, Inc.

Address 1625 Broadway
Denver, CO 80202

Wellsite Geologists



Operator

nc.

Suite 2200

202

Geologist

vi

nc.

Suite 2200
202

Other

Elizabeth Storey
Eric Bernardo
Ryan Shilling

Rock Types

DAL	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
DOLomite	X X X X X	NO SAMPLE	SILT SHALE
GRANITE			SILTSTONE
GYPsum			TILL
IGNEOUS			TUFF
SIDERITE or LIMONITE			WELDED TUFF
SHALE COLORED			
MARLSTONE			

Accessories

Fossils

[illegible]

Other Symbols

Oil Show

- MOLDIC
- ORGANIC
- DEAD
- EVEN
- VUGGY
- FAULT
- FORMATION TOP
- GAS SHOW
- MIN DEPTH
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT
- E EARTHLY
- FINELYXLN
- GRAINSTONE
- L LITHOGRAPHIC

Engineering

	QUESTIONABLE	
	SPOTTED STAINING	
Engineering		
	NORMAL FAULT	
	OIL SHOW	
	OVERTURNED STRATA	
	REVERSE FAULT	
	SIDEWALL CORE (LEFT)	
	SIDEWALL CORE (RIGHT)	
Textures		
	BOUNDSTONE	
	CHALKY	
	CRYPTOXLN	
Sorting		
	MODERATE	
	POOR	
	WELL	

Textures

Sorting

Springer

	ANHYDRITE STRINGER
	BENTONITE STRINGER
	COAL STRINGER
	DOLOMITE STRINGER
	GYPSUM STRINGER
	LIMESTONE STRINGER
	MARLSTONE (CALC) STRG
	MARLSTONE (DOL) STRG
	SANDSTONE STRINGER

Slide/Rotate

ROP
ROF
GAMMA

COLUMBINE LOGGING INC
RIGGED UP ON 07/02/2013
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #0314
BEGAN ON 07/03/2013

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

Depth Labels

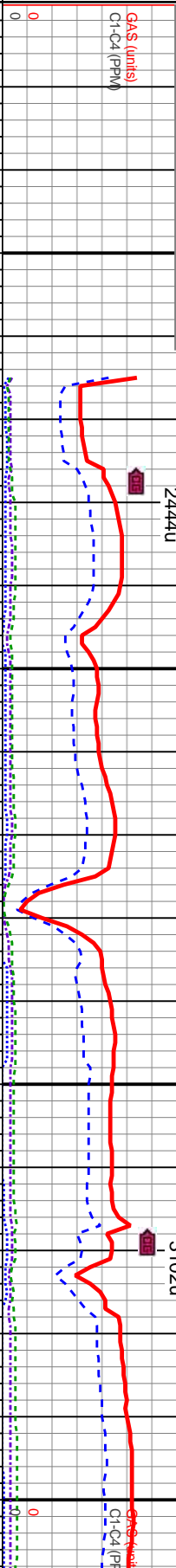
% Lith

Well Bore
TVD

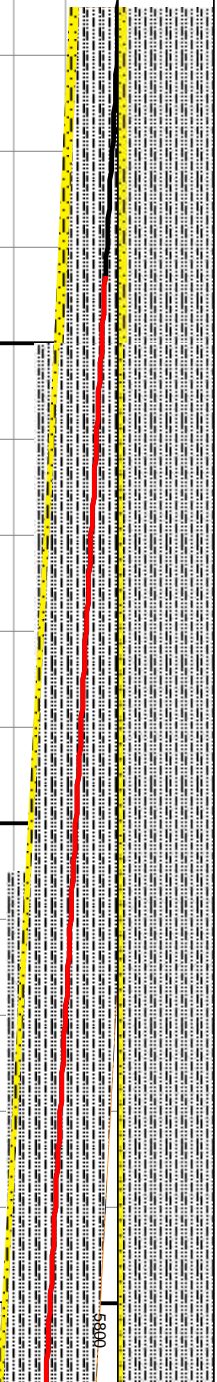
Oil Show

Images

LOG CONTINUES FROM MPLOT
NAKAGAWA B13-64-11N VERTICAL



50' SAMPLES
OIL SHOWS BEGIN



Bit Data
Bit #: 3
Type: HDBS / FXD56M
Size: 8.75
Depth In: 5,865 '
Jets: 5x16

07/04/2013
14:00
MW: 9.9
FV: 37
PV: 9
VP: 10
PH: 9.0
GELS: 2/11/18

90% SLTY SH: MED - DK GY, OCC TAN, V F GR,
FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD
TO
10% SHY SS: LT-MED GY, F-MED F GR, SUB RD
- SB ANG, MOD-P SRT, ARG CMT, SL CALC, TR
SH

96% SLTY SH: MED - DK GY, OCC TAN, V F
GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL
CALC, GRD TO
5% SHY SS: LT-MED GY, F-MED F GR, SUB
RD - SB ANG, MOD-P SRT, ARG CMT, SL
CALC, TR SH

96% SLTY SH: MED - DK GY, OCC TAN, V F GR,
FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC,
GRD TO
55% SHY SS: LT-MED GY, F-MED F GR, SUB RD
- SB ANG, MOD-P SRT, ARG CMT, SL CALC, TR
SH

95% SL
FRI- BR
TO
5% SHY
SB ANG
SH
6800

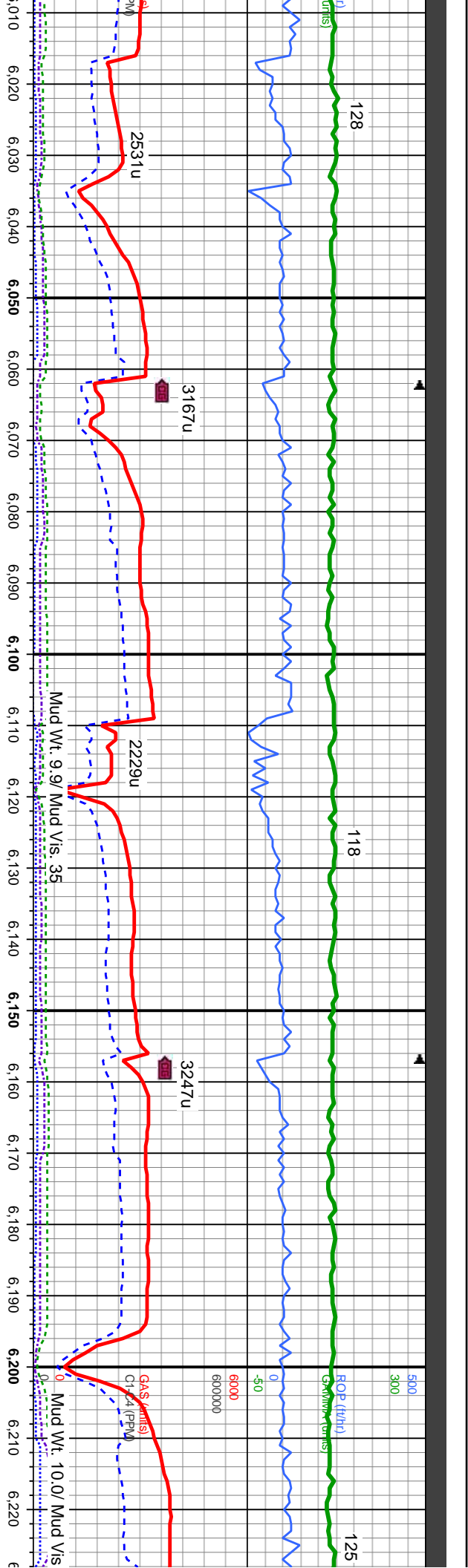
MD: 5,909 '
TVD: 5,841.09 '
Inclination: 2.6 °
Azimuth: 103.6 °
VS: -75.78 '

MD: 5,957 '
TVD: 5,888.94 '
Inclination: 6.2 °
Azimuth: 85 °
VS: -72.18 '

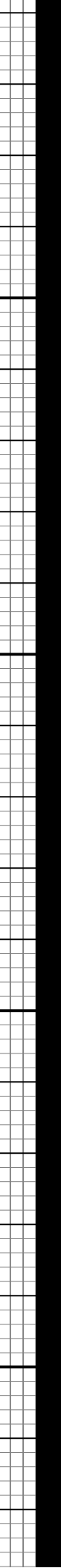
MD: 6,003 '
TVD: 5,934.4 '
Inclination: 9.5 °
Azimuth: 80 °
VS: -65.98 '

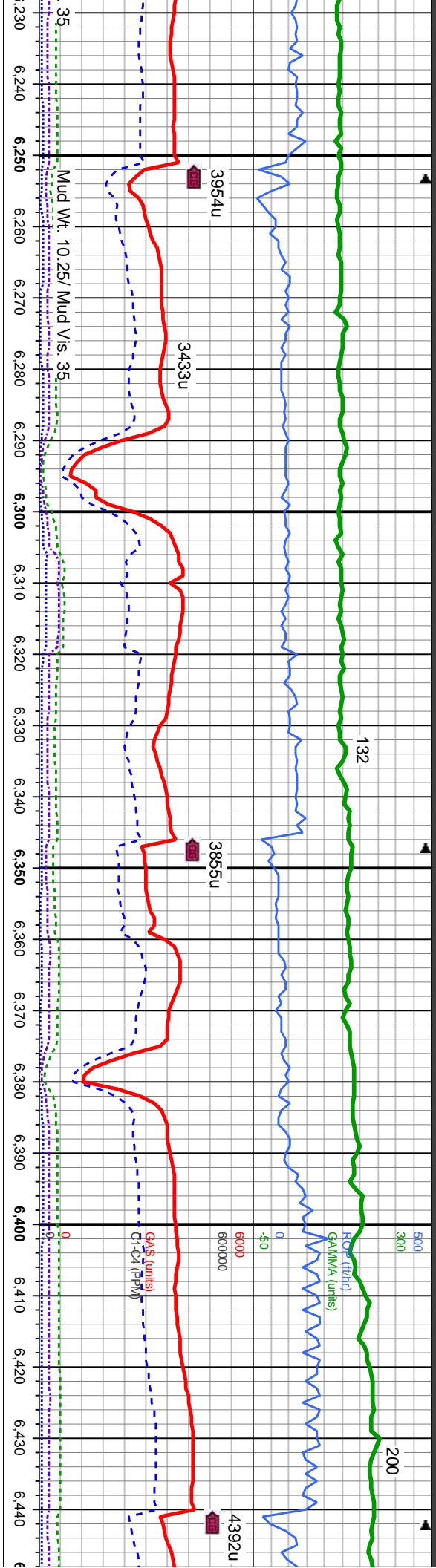
TR
FR
M
G
E



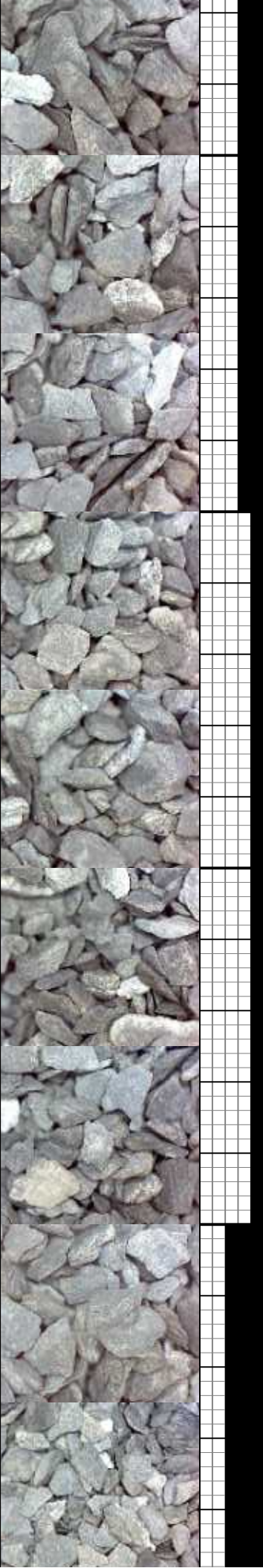


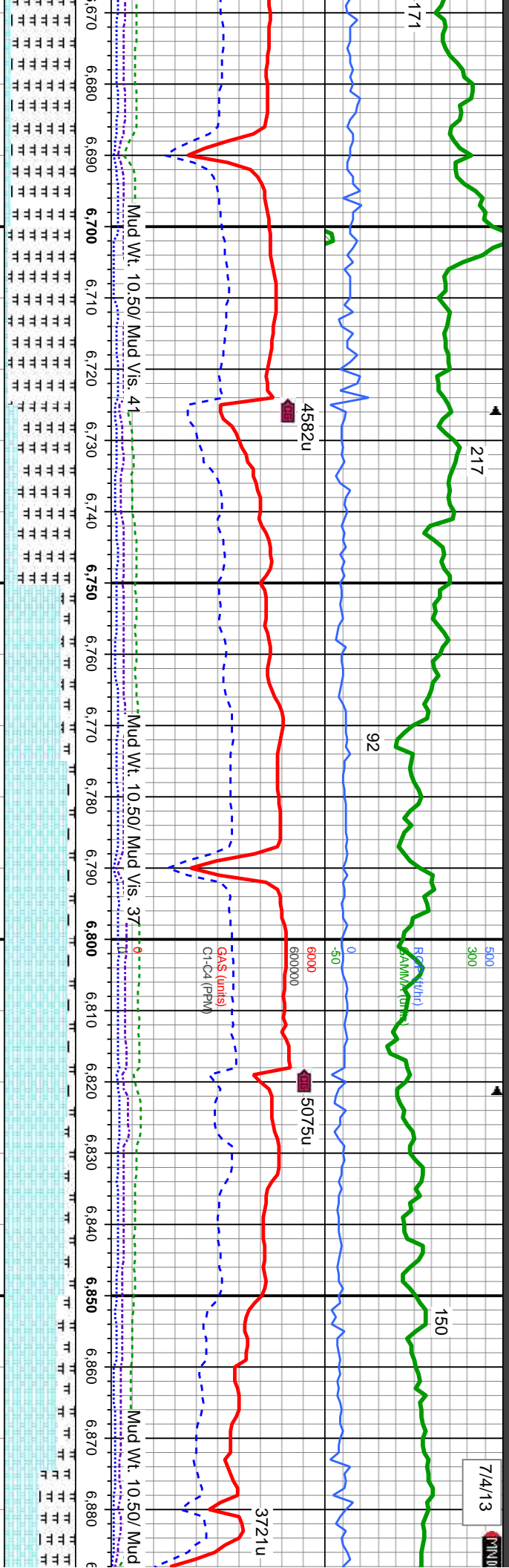
MD: 6,050 TVD: 5,980.69 Inclination: 12.2 ° Azimuth: 80.8 ° VS: -57.22'			MD: 6,098 TVD: 6,027.33 Inclination: 15.1 ° Azimuth: 83.4 ° VS: -45.9'			MD: 6,193 TVD: 6,117.47 Inclination: 21.5 ° Azimuth: 86.3 ° VS: -16.1'		
SS: LT-MED GY, F-MED F GR, SUB RD - MOD-P SRT, ARG CMT, SL CALC, TR			SS: LT-MED GY, F-MED F GR, SUB RD - MOD-P SRT, ARG CMT, SL CALC, TR			SS: LT-MED GY, F-MED F GR, SUB RD - MOD-P SRT, ARG CMT, SL CALC, TR		
90% SLTY SH: MED - DK GY, OCC TAN, V F GR, GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO			90% SLTY SH: MED - DK GY, OCC TAN, V F GR, GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO			90% SLTY SH: MED - DK GY, OCC TAN, V F GR, GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO		
10% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC, TR SH			10% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC, TR SH			10% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC, TR SH		
6800			6800			6800		



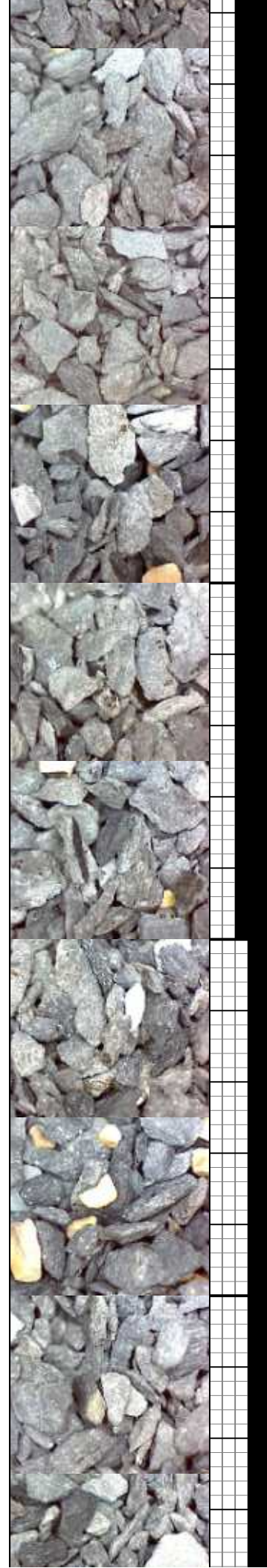


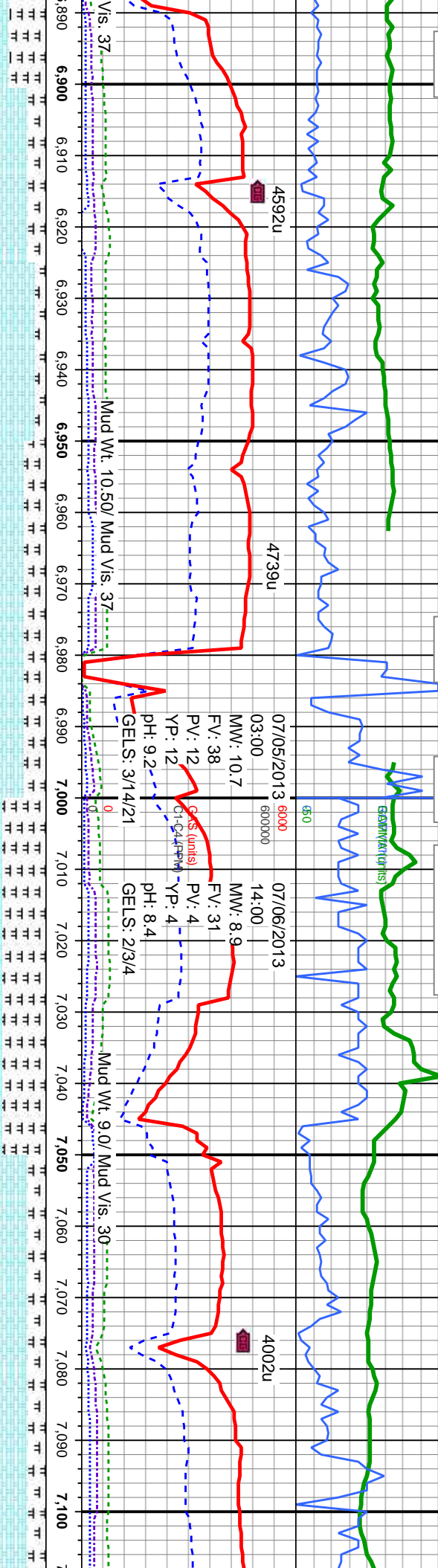
OCC TAN, V F GR, LKY, SL CALC, GRD	95% SLTY SH: MED - DK GY, OCC TAN, V F GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO	95% SLTY SH: MED - DK GY, OCC TAN, V F GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO	95% SLTY SH: MED - DK GY, OCC TAN, V F GR, FRI- BRIT, SUB PLTY- SUB BLKY, SL CALC, GRD TO	MD: 6,287' TVD: 6,203.11' Inclination: 27.1° Azimuth: 87° VS: 22.45'	5800
MED F GR, SUB RD CMT, SL CALC	5% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC	5% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC	5% SHY SS: LT-MED GY, F-MED F GR, SUB RD - SB ANG, MOD-P SRT, ARG CMT, SL CALC	MD: 6,382' TVD: 6,284.61' Inclination: 34.6° Azimuth: 84.7° VS: 71.03'	6800





GRY BLK, SB PLTY- SB BLKY, OCC SFT, MOT, CALC, OCC WH GY- CRM, SFT- SL	MRSLT: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC,	CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC,	CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC,	CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, MOD FOS
BLKY, MOT- RTHY, V CALC, TR	MRSLT: MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, TR BENT, TR PYR	MRSLT: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	MRSLT: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, MOD FOS	MRSLT: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, MOD BENT, TR PYR, MOD FOS





SFT - SL	CHK: LT-MED GY, OCC WH GY-CRM, SFT-SL	CHK: LT-MED GY, OCC WH GY-CRM, SFT-SL	6400 50 SAMPLES	
Y, V	FRM, SUB PLTY-SUB BLKY, MOT-RTHY, V	FRM, SUB PLTY-SUB BLKY, MOT-RTHY, V		
4-SUB	CALC, GRD TO	CALC, GRD TO		
	MRSLT: MED GRY-GRY BLK, SUB PLTY-SUB	MRSLT: MED GRY-GRY BLK, SUB PLTY-SUB		
	BLKY, SOME FIS, SL FRM-OCC SFT, MOT,	BLKY, SOME FIS, SL FRM-OCC SFT, MOT,		
	CALC, TR BENT, TR PYR, TR FOS	CALC, TR BENT, TR PYR, TR FOS		

MD: 6.926
TVD: 6,576.82
Inclination: 80.3 °
Azimuth: 87.5 °
VS: 512.27'

Bit Data
Bit #: 4
Type: HDBS / FXD54
Size: 6.12
Depth In: 6.985'
Jets: 5x11

Curve landed at 6985' MD
@ 02:09hrs on 07/05/13
Resume drilling @ 17:05hrs on 07/07/13

MD: 7.010
TVD: 6,587.2
Inclination: 85.5 °
Azimuth: 88.4 °
VS: 595.17'

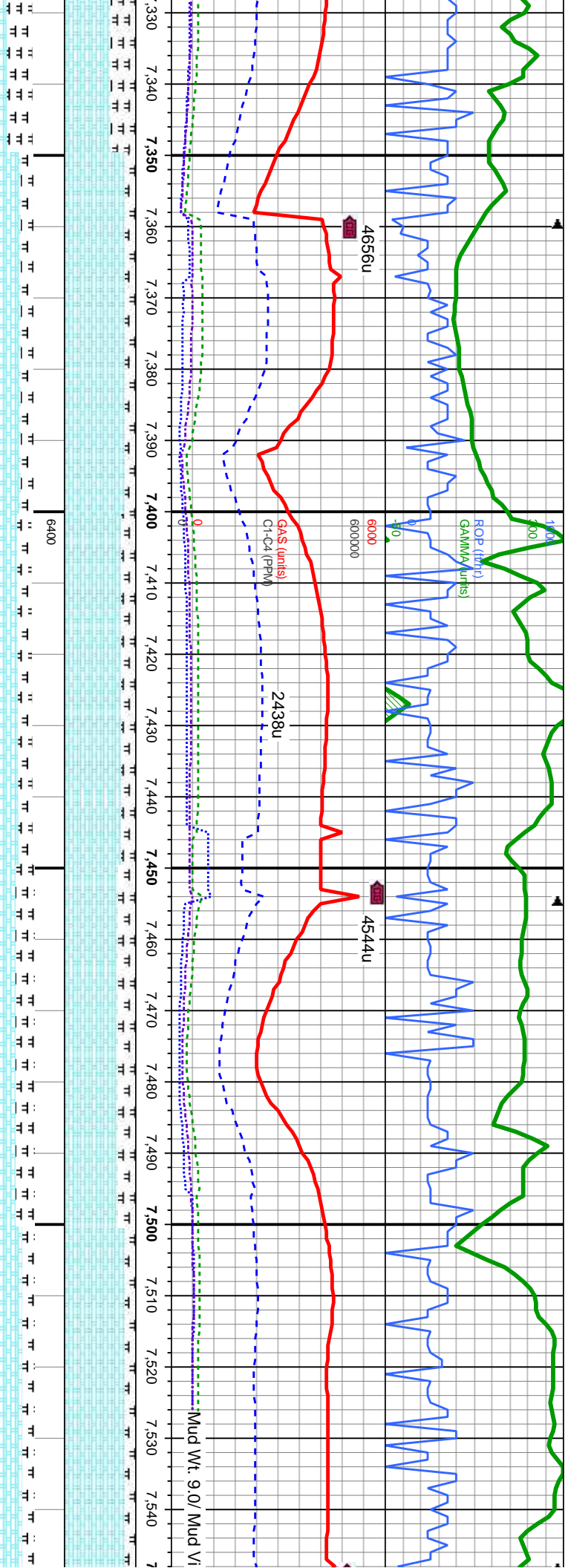
60% MRSLT: MED GRY-GRY BLK, SUB PLTY-SUB BLKY, SOME FIS, SL FRM-OCC SFT, MOT, CALC, GRD TO
40% CHK: LT-MED GY, OCC WH GY-CRM, SFT-SL FRM, SUB PLTY-SUB BLKY, MOT-RTHY, V CALC, TR BENT, TR PYR, TR FOS

75% CHK: LT-MED GY, OCC WH GY-CRM, SFT-SL FRM, SUB PLTY-SUB BLKY, MOT-RTHY, V CALC, GRD TO
25% MRSLT: MED GRY-GRY BLK, SUB PLTY-SUB BLKY, SOME FIS, SL FRM-OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS

SCALE CHANGE

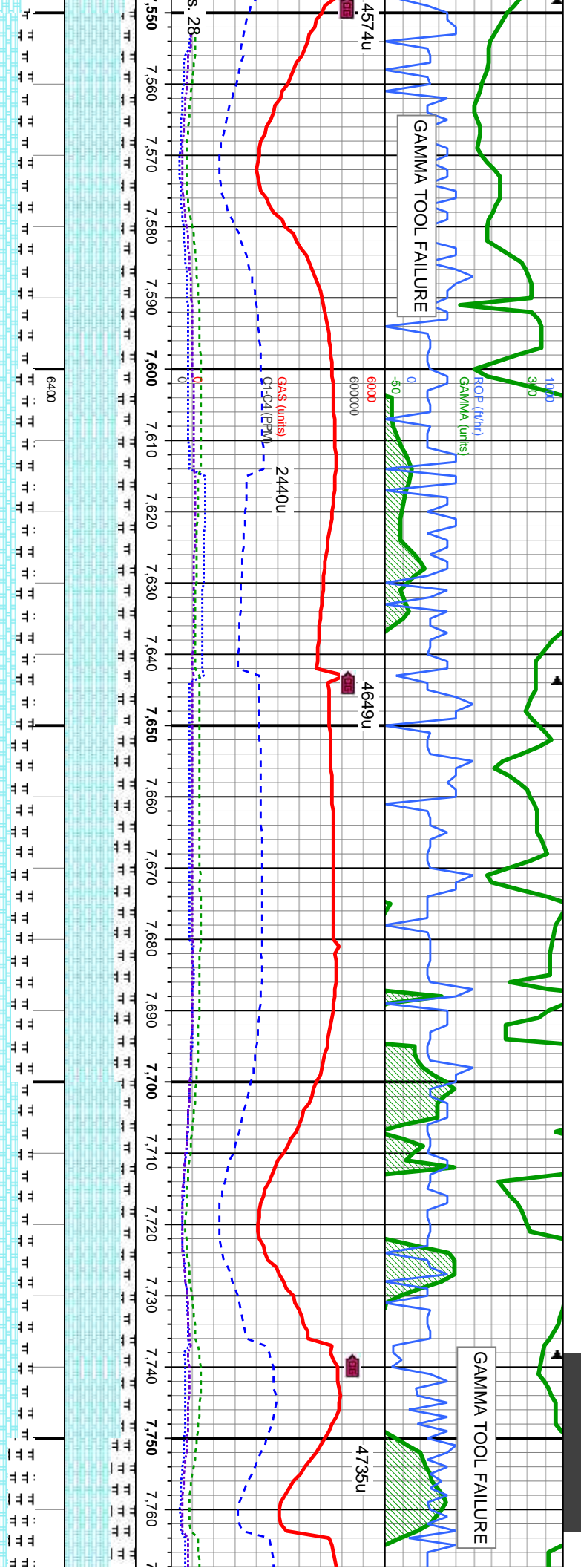
7400





WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V	85% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 15% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	MD: 7,389' TVD: 6,578.7' Inclination: 91.1° Azimuth: 92.1° VS: 969.99'	TVD (ft)	7400	80% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 20% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	7400	75% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 25% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	85% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 15% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS





MD: 7,579' TVD: 6,576.13' Inclination: 89.9° Azimuth: 90° VS: 1,157.56'		MD: 7,674' TVD: 6,576.38' Inclination: 89.8° Azimuth: 89.7° VS: 1,251.7'		MD: 7,760' TVD: 6,576.38' Inclination: 89.8° Azimuth: 89.7° VS: 1,251.7'	
80% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 20% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	75% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 25% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	70% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 30% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	80% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 20% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	65% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 35% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS	65% CHK: LT- MED GY, OCC WH GY- CRM, SFT- SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V CALC, GRD TO 35% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT, CALC, TR BENT, TR PYR, TR FOS



1 7/6/1

ROP (ft/hr)
GAMMA (units)

GAMMA TOOL FAILURE

TOOH for gamma tool change at
8211' MD @ 02:00hrs on 7/7/13

Resumed drilling
@ 12:41 hrs on 7/7/13

GAS (units)
C-C4 (PPM)

600000
60000

600000
60000

4728u

4996u

8.000 8.010 8.020 8.030 8.040 8.050 8.060 8.070 8.080 8.090 8.100 8.110 8.120 8.130 8.140 8.150 8.160 8.170 8.180 8.190 8.200

Mud Wt. 9.2 / Mud Vis. 29

6400

6400

TVD (ft)

MD: 8,063'
TVD: 6,564.97'
Inclination: 91.8°
Azimuth: 91.1°
VS: 1,625.2'

MD: 8,148'
TVD: 6,563.15'
Inclination: 90.4°
Azimuth: 92.6°
VS: 1,718.82'

TVD (ft)

75% CHK: LT- MED GY, OCC WH GY- CRM, SFT-
SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V
CALC, GRD TO
25% MRLST: MED GRY- GRY BLK, SUB PLTY-
SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT,
CALC, TR BENT, TR PYR, TR FOS

70% CHK: LT- MED GY, OCC WH GY- CRM, SFT-
SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V
CALC, GRD TO
30% MRLST: MED GRY- GRY BLK, SUB PLTY-
SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT,
CALC, TR BENT, TR PYR, TR FOS

70% CHK: LT- MED GY, OCC WH GY- CRM, SFT-
SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V
CALC, GRD TO
30% MRLST: MED GRY- GRY BLK, SUB PLTY-
SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT,
CALC, TR BENT, TR PYR, TR FOS

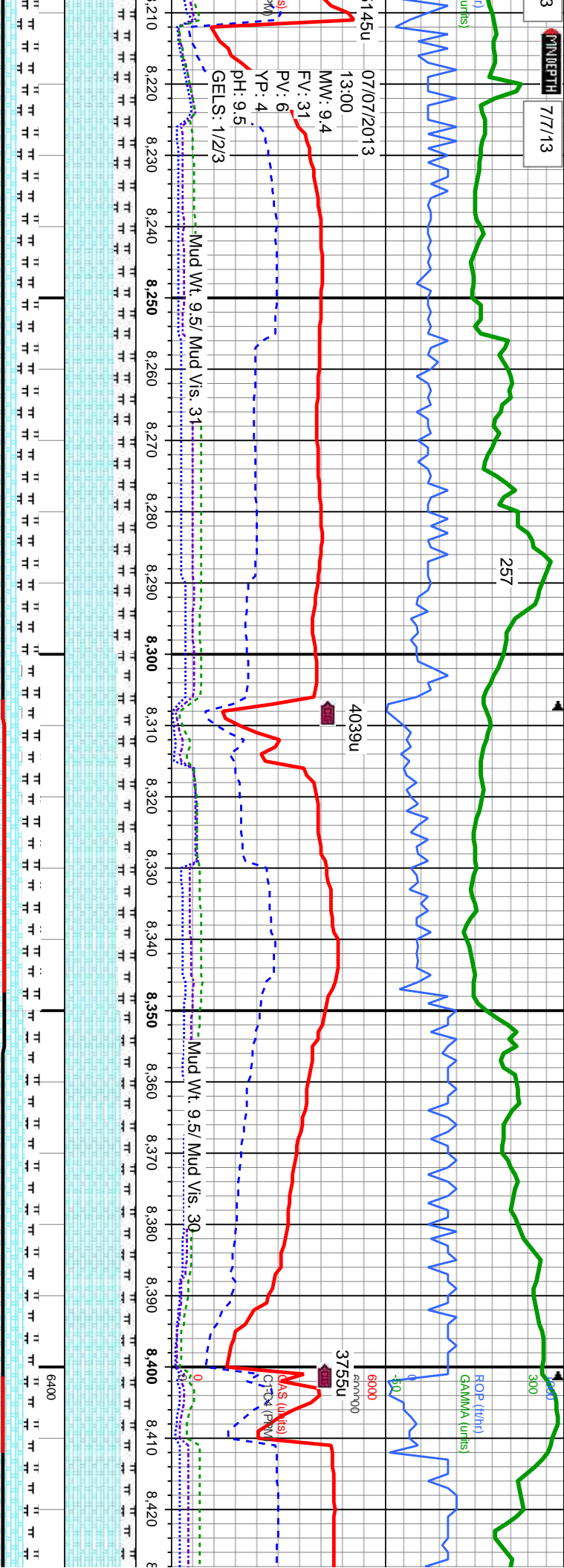
70% CHK: LT- MED GY, OCC WH GY- CRM, SFT-
SL FRM, SUB PLTY- SUB BLKY, MOT- RTHY, V
CALC, GRD TO
30% MRLST: MED GRY- GRY BLK, SUB PLTY-
SUB BLKY, SOME FIS, SL FRM- OCC SFT, MOT,
CALC, TR BENT, TR PYR, TR FOS

70% CH
SUB PL
GRD TC
30% M
SUB BL
CALC,

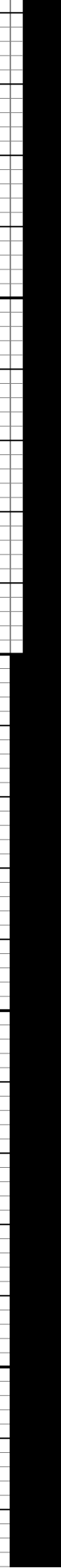
7400

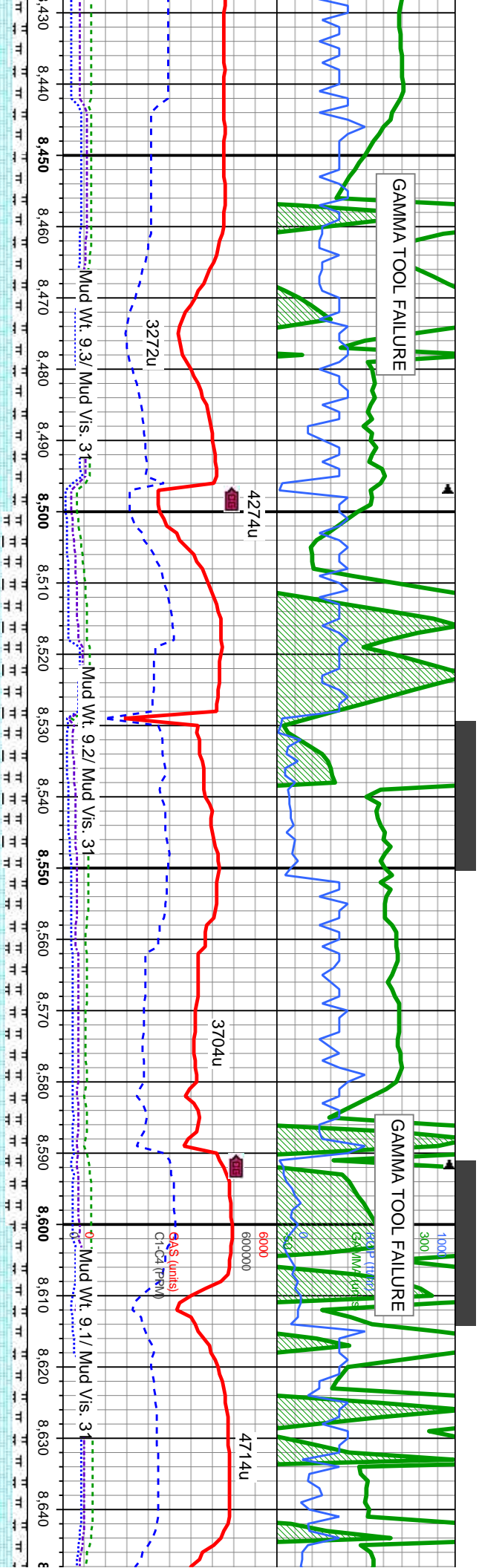
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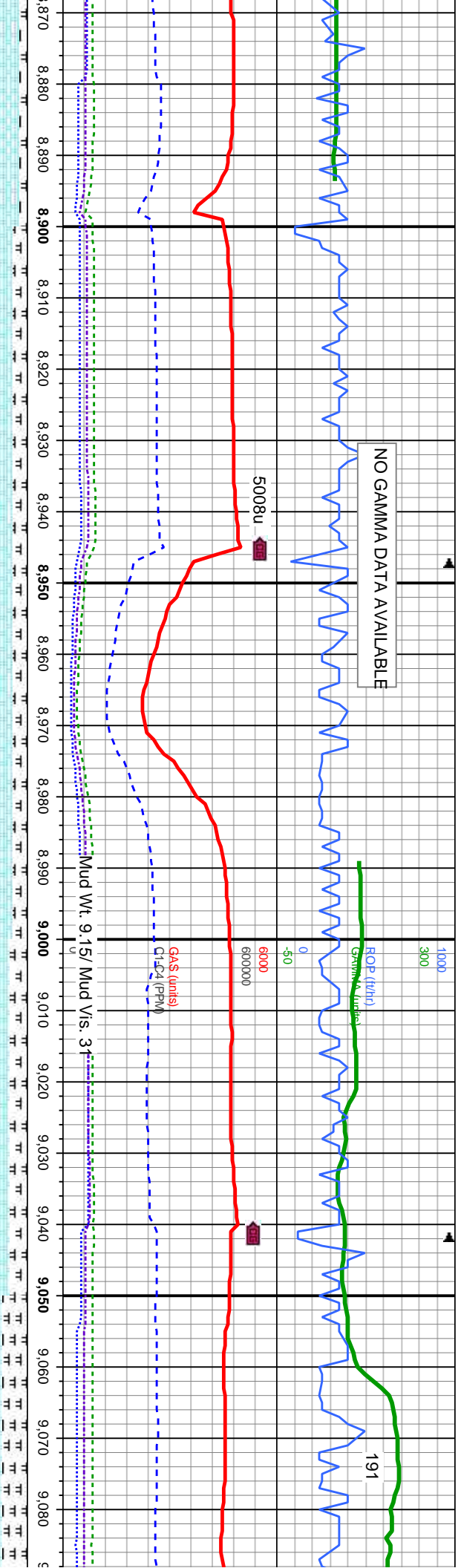
MD: 8,242 TVD: 6,560.61' Inclination: 92.7° Azimuth: 92.3° VS: 1,811.27'		70% CHK: LT - MED GY, LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, MOT - RTHY, V CALC, GRD TO	75% CHK: MED-LT GY, LT - DK BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO	80% CHK: MED-LT GY, LT - DK BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO	80% CHK: MED GY - DK BRN, SL FRM, SUB PLTY - SUB BLKY, WXY, V CALC, GRD TO
MD: 8,337 TVD: 6,558.7' Inclination: 89.6° Azimuth: 91.2° VS: 1,904.91'		30% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SOME FIS, SL FRM - OCC SFT, MOT, CALC, TR PYR, TR FOS	25% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS	20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS	20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS





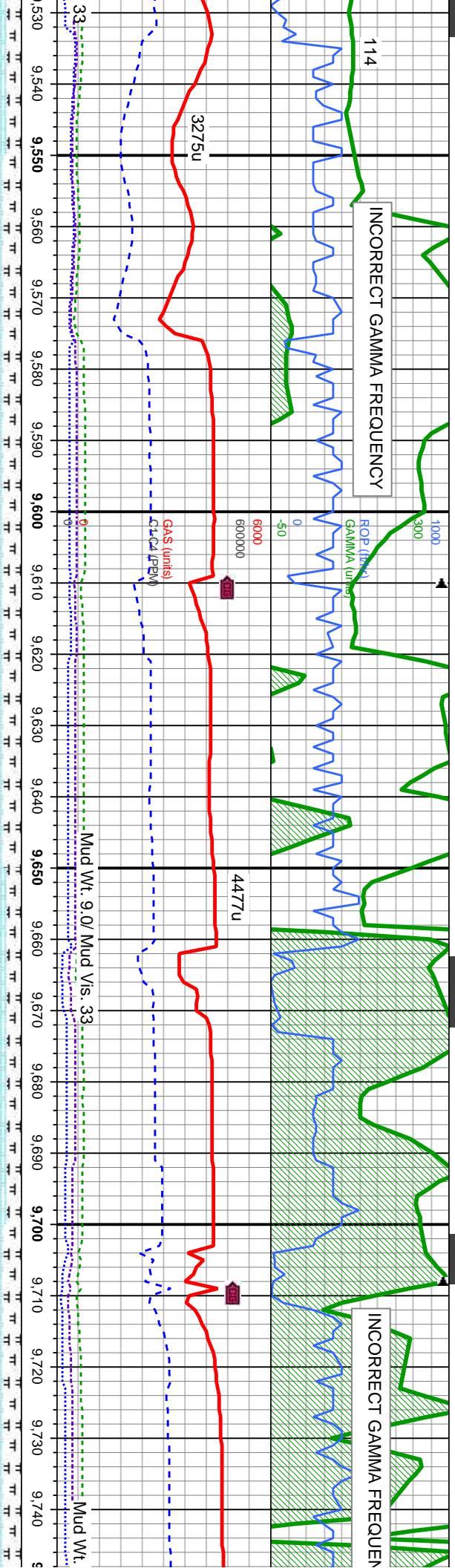
431'		MD: 8,526'		MD: 8,621'	
3,561.57'		TVD: 6,566.13'		TVD: 6,565.88'	
Inclination: 86.9°		Inclination: 87.6°		Inclination: 92.7°	
Th: 91°		Azimuth: 90.3°		Azimuth: 93°	
997.71'		VS: 2,091.56'		VS: 2,185.22'	
1, SME LT GY, SFT- SL FRM, SUB PLTY, SB		65% CHK: MED GY - DK BRN, SME LT GY, SFT- SL FRM, SUB PLTY, SUB BLKY, SL MOT, SB		80% CHK: MED GY - DK BRN, SME LT GY, SFT- SL FRM, SUB PLTY, SUB BLKY, SL MOT, SB	
BLK, SUB PLTY, MOT, CALC, TR		35% MRLST: MED GRY - GRY BLK, SUB PLTY, SUB BLKY, SL FRM, SFT, SL MOT, CALC, TR		20% MRLST: MED GRY - GRY BLK, SUB PLTY, SUB BLKY, SL FRM, SFT, SL MOT, CALC, TR	
PYR, TR FOS		PYR, TR FOS		PYR, TR FOS	



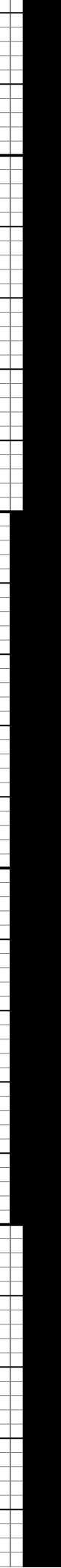


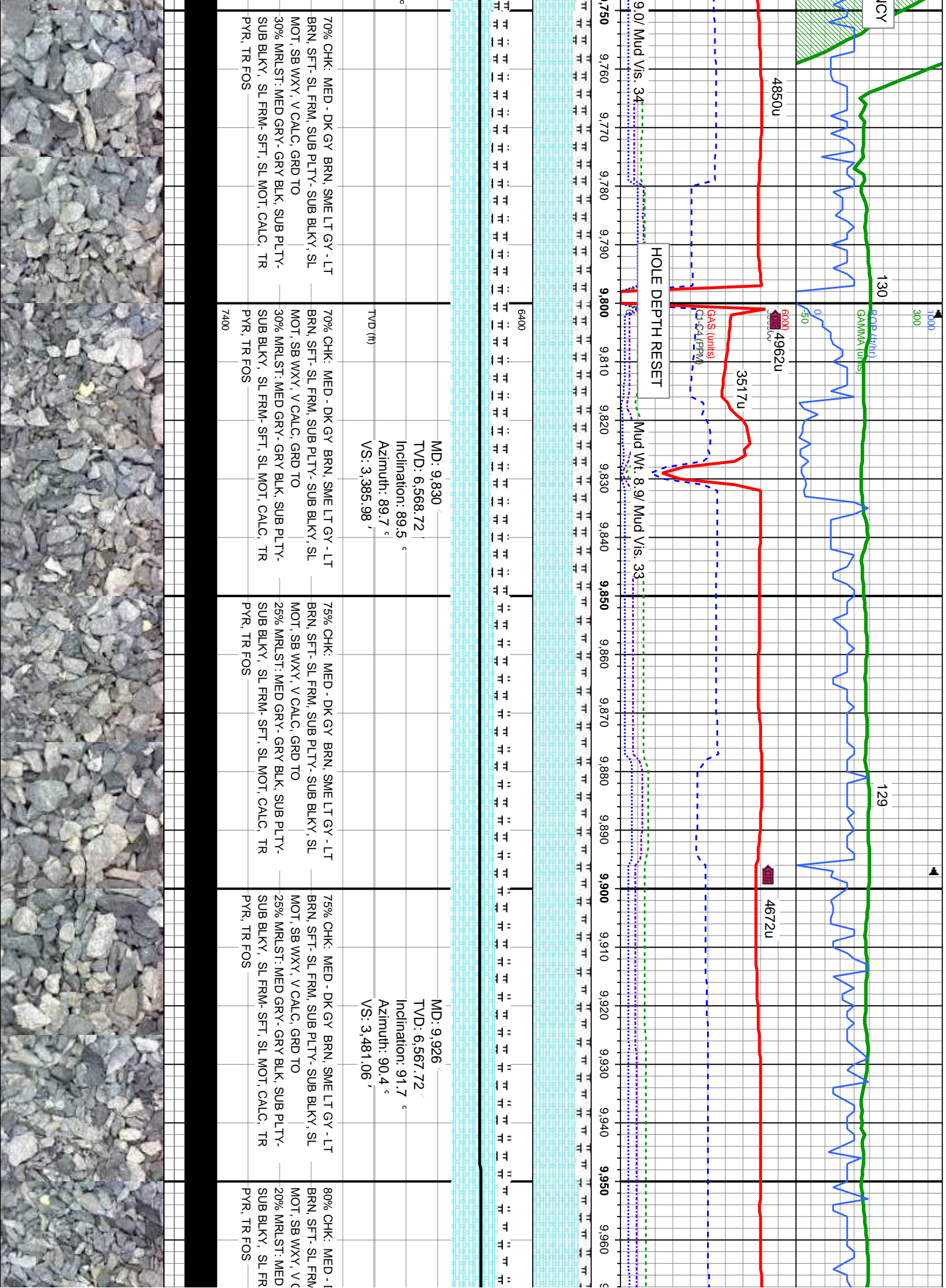
MD: 8.883' TVD: 6,561.45' Inclination: 89.5° Azimuth: 88.1° VS: 2,444.22'	80% CHK: BRN - GY BRN, SME LT GY, SFT-SL FRM, SUB PLTY- SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 20% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SL FRM- SFT, SL MOT, CALC, TR PYR, TR FOS	MD: 8.978' TVD: 6,561.61' Inclination: 90.3° Azimuth: 88.3° VS: 2,538.69'	75% CHK: MED GY - GY BRN, SME LT GY - LT BRN, SFT-SL FRM, SUB PLTY- SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 25% MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SL FRM- SFT, SL MOT, CALC, TR PYR, TR FOS, TR SEC CALCITE	MD: 9.072' TVD: 6,558.99' Inclination: 92.9° Azimuth: 87.4° VS: 2,632.18'
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MD: 9,546 TVD: 6,564.51 Inclination: 88 ° Azimuth: 88.9 ° VS: 3,104.02 '		MD: 9,641 TVD: 6,566.5 Inclination: 89.6 ° Azimuth: 88.3 ° VS: 3,198.4 '		MD: 9,736 TVD: 6,567.58 Inclination: 89.1 ° Azimuth: 89.3 ° VS: 3,292.76 '	
N, SME LT GY - LT Y - SUB BLKY, SL TO BLK, SUB PLTY - MOT, CALC, TR		75% CHK: MED - DK GY BRN, SME LT GY - LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 25% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS		80% CHK: MED - DK GY BRN, SME LT GY - LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS	
7400		7400		7400	





7/8/13 7/9/13

INDEPTH

110

ROP (ft/hr)
Gamma (units)

4868u

60000

6485 (units)
G1-C4 (PPM)

Mud Wt. 9.0 Mud Vis. 33

3575u

136

4802u

TOOH for gamma tool calibration at 10143' MD @ 00:50hrs on 07/09/13

Resumed drilling @ 11:22hrs

9.970 9.980 9.990 10.000 10.010 10.020 10.030 10.040 10.050 10.060 10.070 10.080 10.090 10.100 10.110 10.120 10.130 10.140 10.150 10.160 10.170 10.180 10.190

6400

MD: 10,020'

TVD: 6,563.13'

Inclination: 93.9 °

Azimuth: 91.6 °

TVD (ft) VS: 3,573.82'

75% CHK: MED - DK GY BRN, SME LT GY - LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 25% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS

80% CHK: MED - DK GY BRN, SME LT GY - LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS

85% CHK: MED - DK GY BRN, SME LT GY - LT BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO 15% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS

MD: 10,137'

TVD: 6,556.37'

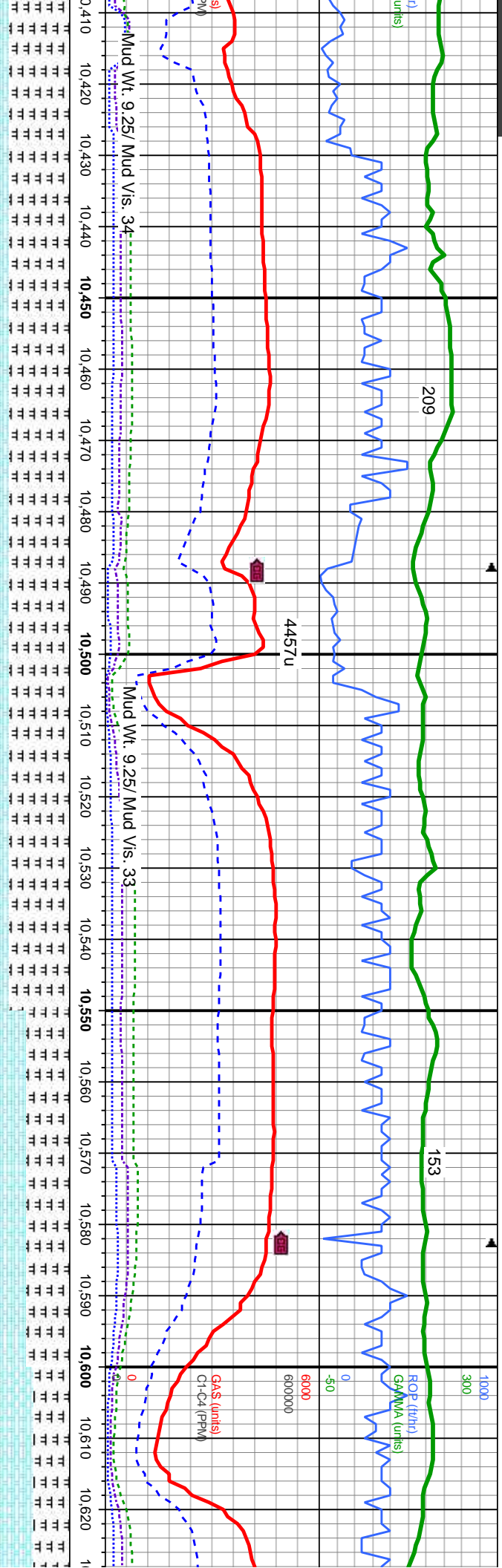
Inclination: 93.7 °

Azimuth: 91 °

VS: 3,689.08'

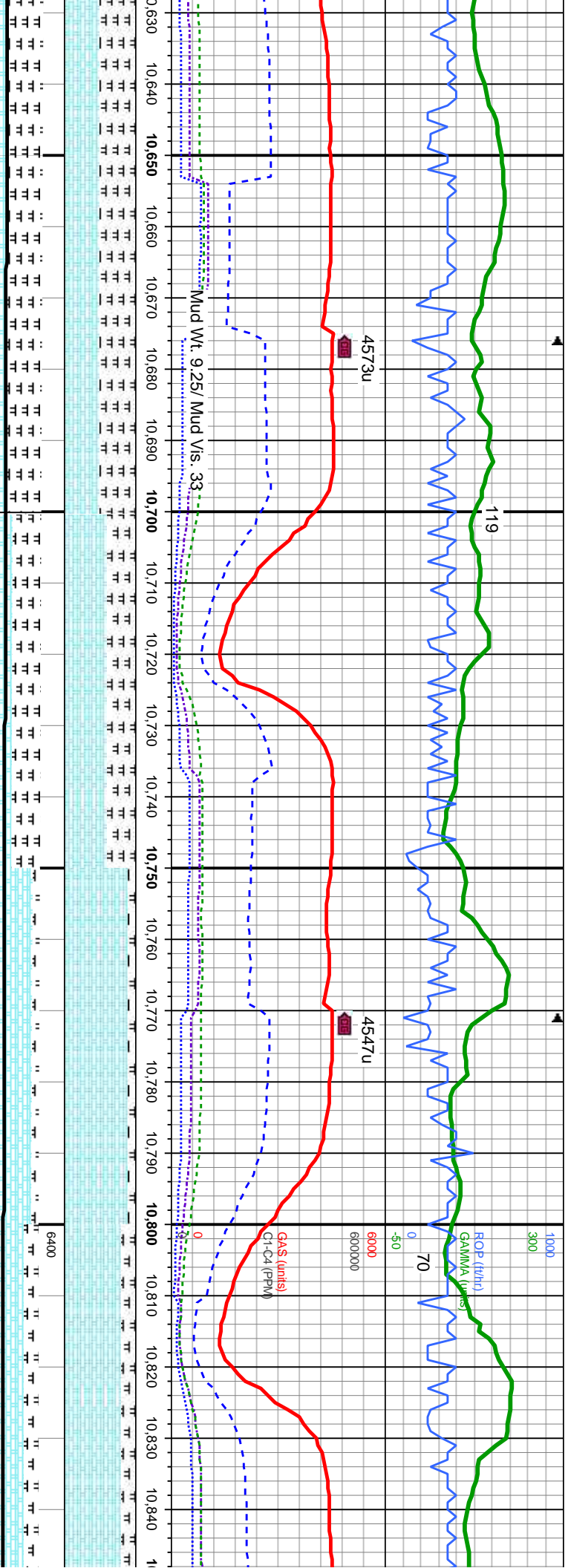
30% CHK: MED - DK GY BRN, SFT - SL SUB PLTY - SUB BLKY, SL MOT, SB WXY CALC, GRD TO 70% MRLST: MED GRY - GRY BLK, SUB SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR FOS, TR SEC CALCITE





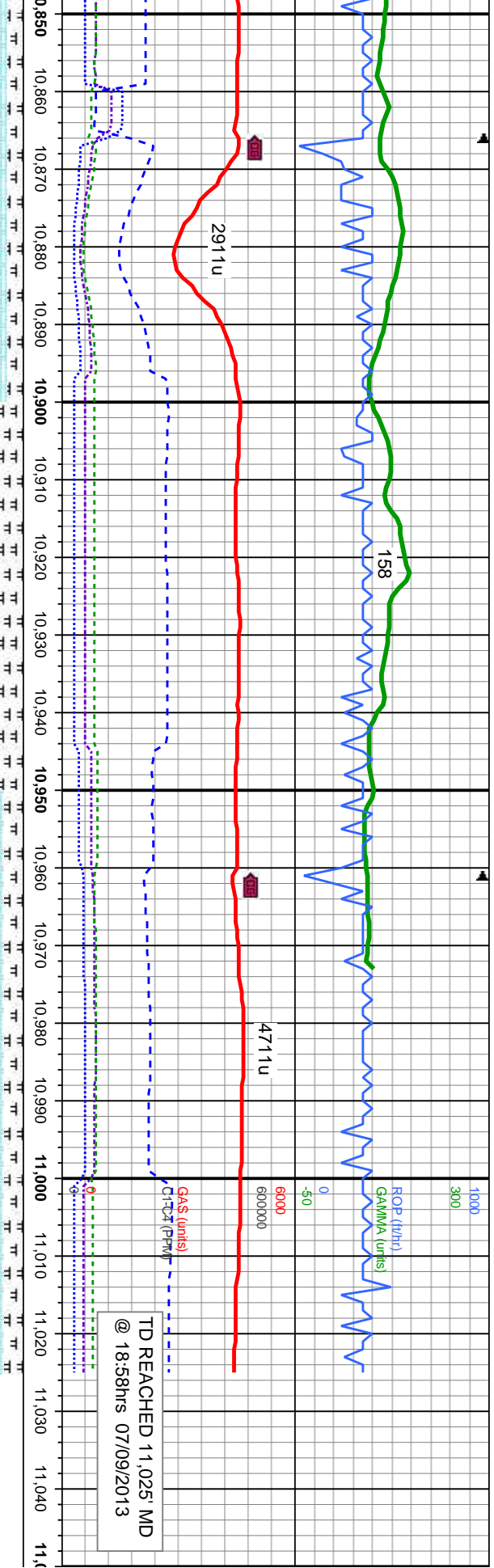
MD: 10,422 TVD: 6,539.47 Inclination: 89.1 ° Azimuth: 92.4 ° VS: 3,969.29	MD: 10,516 TVD: 6,542.91 Inclination: 86.7 ° Azimuth: 91.4 ° VS: 4,061.86	MD: 10,621 TVD: 6,549.12 Inclination: 86 Azimuth: 91.3 VS: 4,165.33
CHK: MED - DK GY BRN, SFT- SL FRM, SUB BLKY - SUB BLKY, SL MOT, SB WXY, V GRD TO MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SL FRM- SFT, SL MOT, CALC, TR PYR, TR BENT	CHK: MED - DK GY BRN, SFT- SL FRM, SUB PLTY- SUB BLKY, SL MOT, SB WXY, V GRD TO MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SL FRM- SFT, SL MOT, CALC, TR PYR, TR BENT	CHK: MED - DK GY BRN, SFT- SL FRM, SUB PLTY- SUB BLKY, SL MOT, SB WXY, V GRD TO MRLST: MED GRY- GRY BLK, SUB PLTY- SUB BLKY, SL FRM- SFT, SL MOT, CALC, TR PYR, TR BENT





MD: 10,706 TVD: 6,554.33' Inclination: 86.5° Azimuth: 91.5° VS: 4,249.07'		MD: 10,800 TVD: 6,559.33' Inclination: 87.4° Azimuth: 89.9° VS: 4,341.89'	
N. SFT - SL FRM, DT, SB WXY, V	50% CHK: MED - DK GY BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V	SUB PLTY - SUB BLKY, SL MOT, SB WXY, V	80% CHK: MED - DK GY BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V
BLK, SUB PLTY - MOT, CALC, TR	CALC, GRD TO 50% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR	CALC, GRD TO 40% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR	CALC, GRD TO 20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR
	PYR, TR BENT, TR FOS	PYR, TR BENT, TR FOS	PYR, TR BENT, TR FOS





MD: 10,895'	MD: 10,960'	PTB Survey
TV D: 6,564.39'	TV D: 6,565'	MD: 11,025'
Inclination: 87.4 °	Inclination: 88.1 °	TV D: 6,566.5'
Azimuth: 89.9 °	Azimuth: 88.6 °	Inclination: 88.7 °
VS: 4,435.7'	VS: 4,500.5'	Azimuth: 88.6 °
		TV D (ft)
		VS: 4,565.07'
80% CHK: MED - DK GY BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO	75% CHK: MED - DK GY BRN, SFT - SL FRM, SUB PLTY - SUB BLKY, SL MOT, SB WXY, V CALC, GRD TO	
20% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR BENT, TR FOS	25% MRLST: MED GRY - GRY BLK, SUB PLTY - SUB BLKY, SL FRM - SFT, SL MOT, CALC, TR PYR, TR BENT, TR FOS	

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