



7136 South Yale Avenue, Suite 414
Tulsa, Oklahoma 74136-6378

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM/25

Customer Information

Operator: Noble Energy
1625 Broadway
Suite 2200
Denver, Colorado 80202

Geologist: Cassidy Miller
Noble Energy Inc.

Mud Logging Details

Logger: Andrew Christiano &
Hannah Blatchford
Log Interval: 6750' MD to 10897' MD
Start Date: November 13, 2013
Release Date: November 15, 2013

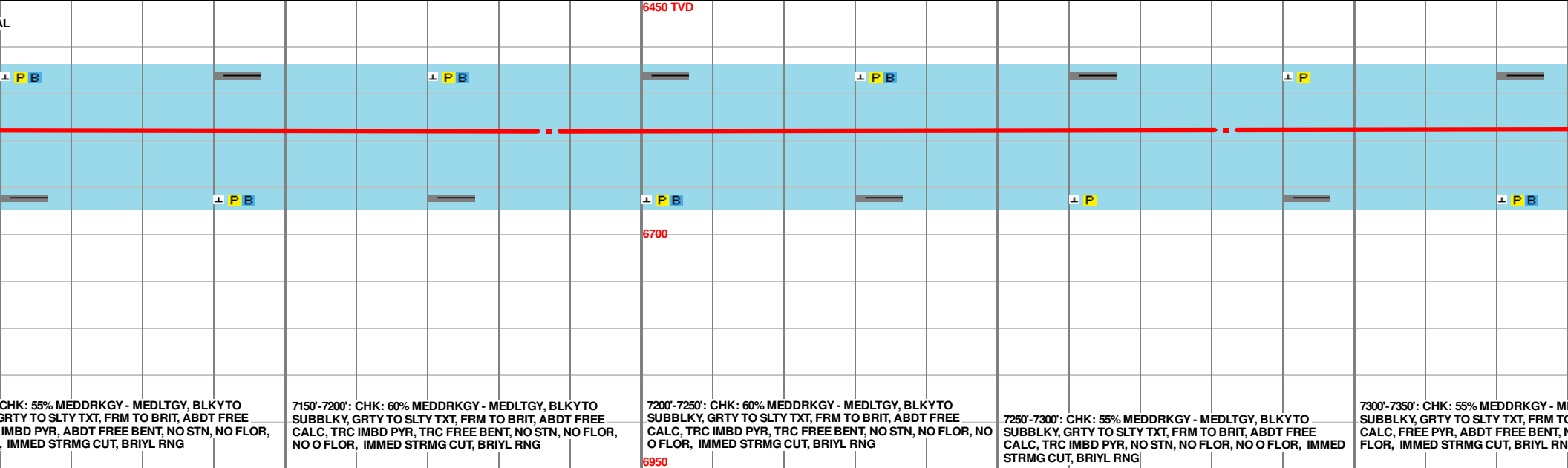
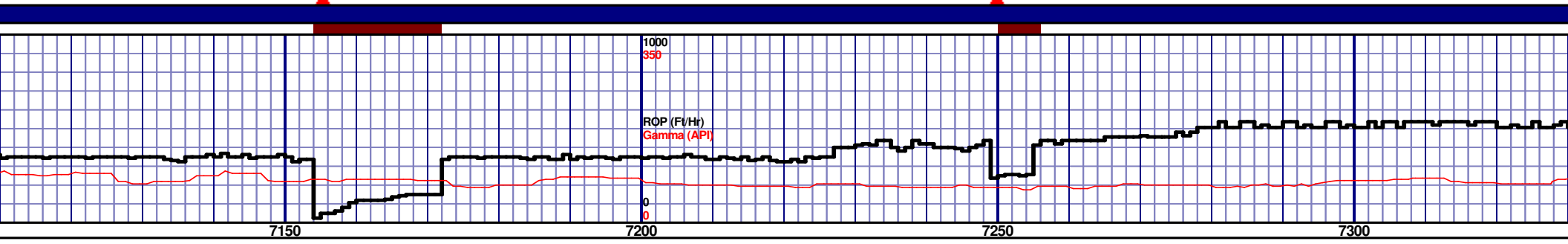
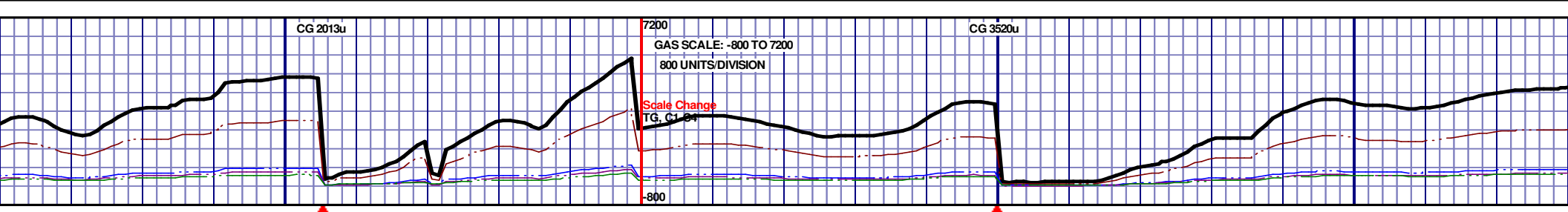
Well Information

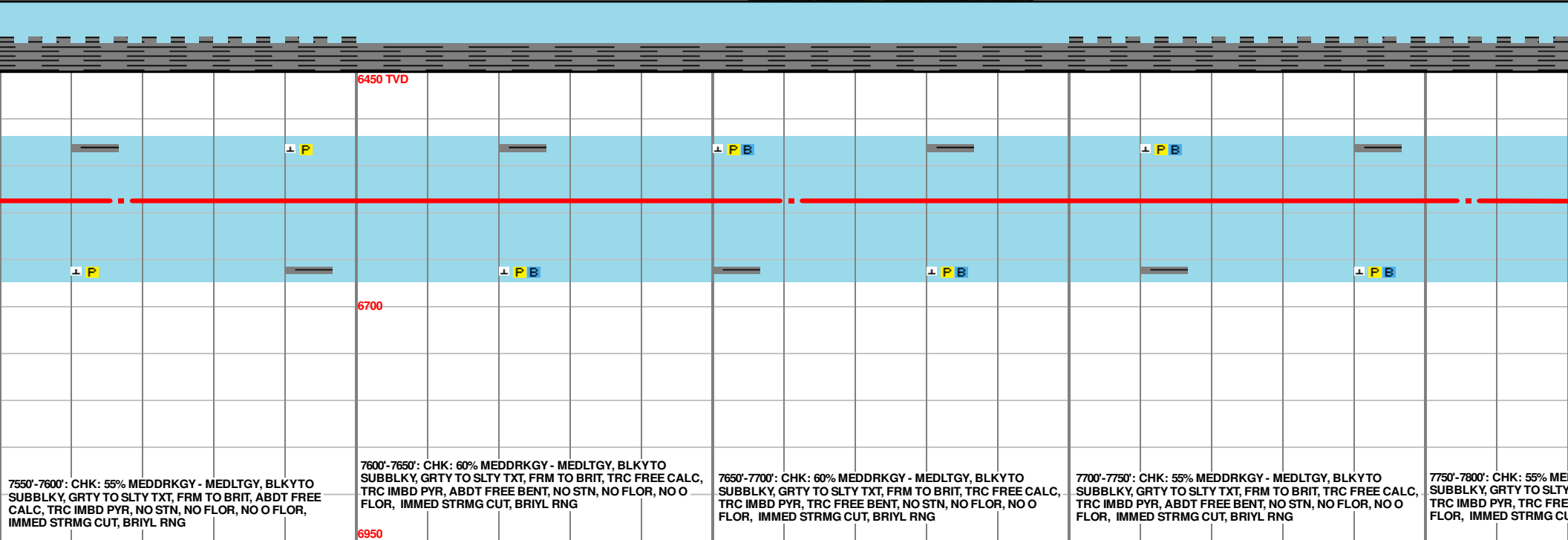
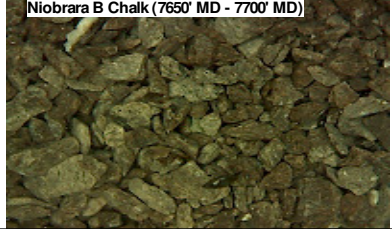
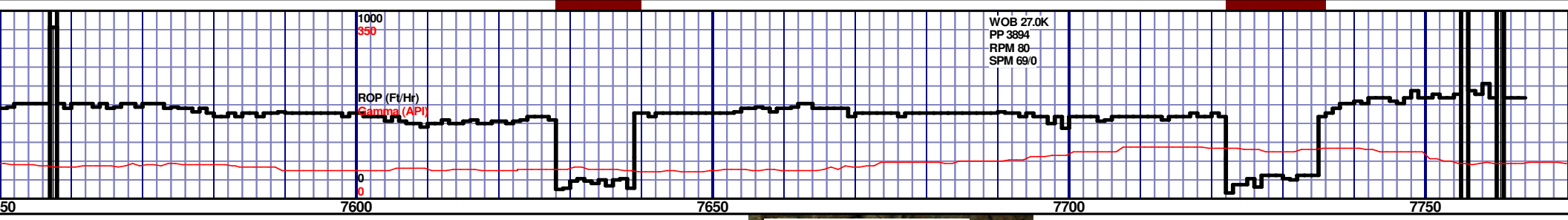
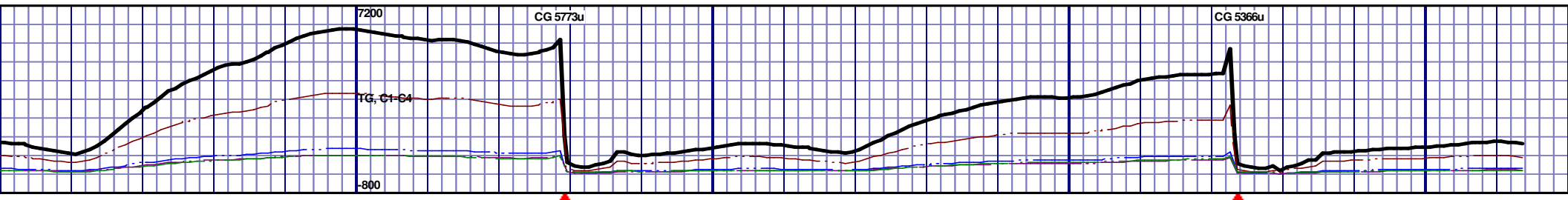
Well Name: Wells Ranch
AE20-69HN Horizontal

Location: 20-T6N-R62W
1136' FNL, 215' FWL

County: Weld Co.
State: Colorado

Drilling Rig: H&P 321
Total Depth: 10897' MD
TD Date: November 15, 2013
Formation: Niobrara B Chalk
KB Elevation: 4868'
GR Elevation: 4838'
API Number: 05-123-37223-0000

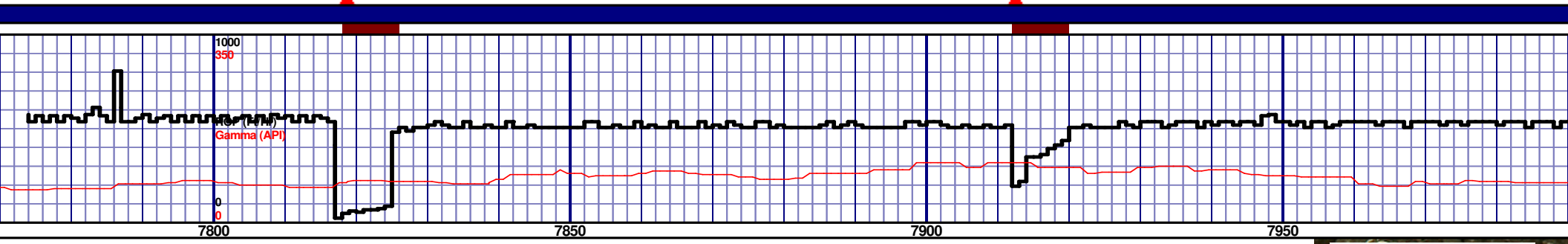
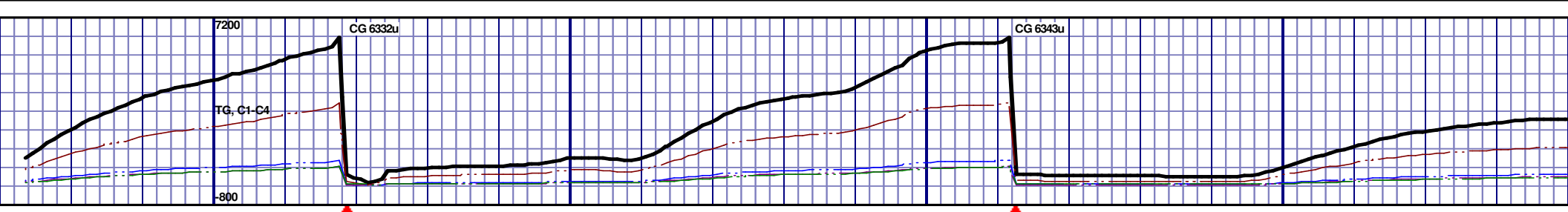




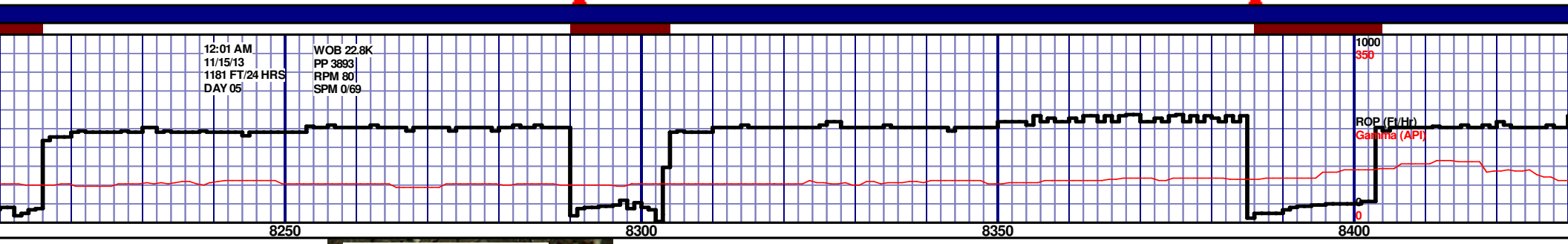
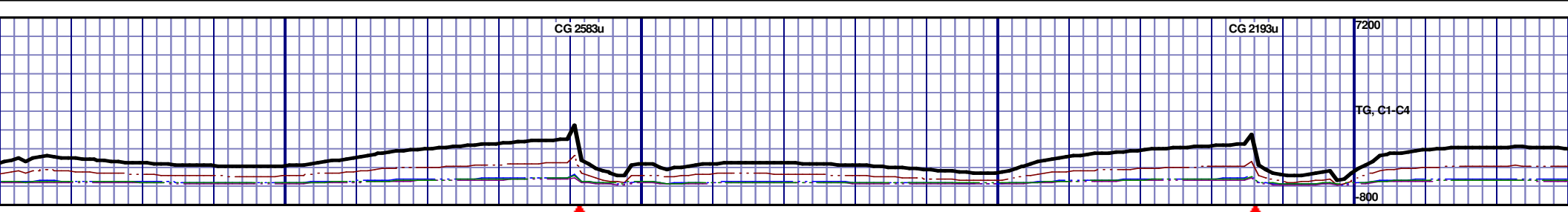
MD 7567 TVD 6587.32
INC 89.72 AZ 88.87
VS 1300.37

MD 7661 TVD 6587.5
INC 90.06 AZ 88.27
VS 1391.69

MD 7756 TVD 6588
INC 89.23 AZ 87.94
VS 1484.15

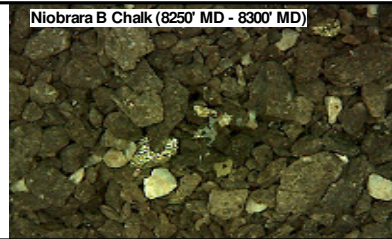


<p>6450 TVD</p> <p>⊥ P B</p>	<p>⊥ P B</p>	<p>⊥ P</p>	<p>⊥ P B</p>	<p>⊥ P B</p>
<p>⊥ P B</p> <p>6700</p> <p>7800'-7850': CHK: 55% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>⊥ P</p>	<p>7850'-7900': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC IMBD PYR, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>7900'-7950': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>7950'-8000': CHK: 55% MEDDRKGY - MEDLTGY, BLK SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT CALC, TRC IMBD PYR, ABDT FREE BENT, NO STN, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>



12:01 AM
11/15/13
1181 FT/24 HRS
DAY 05

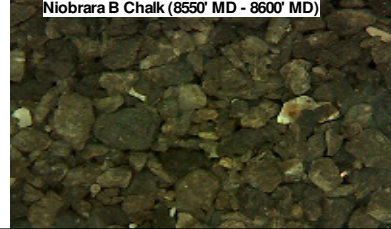
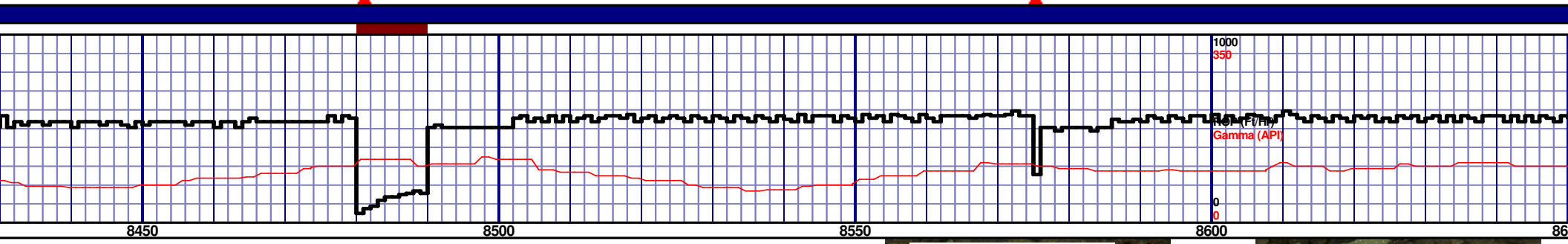
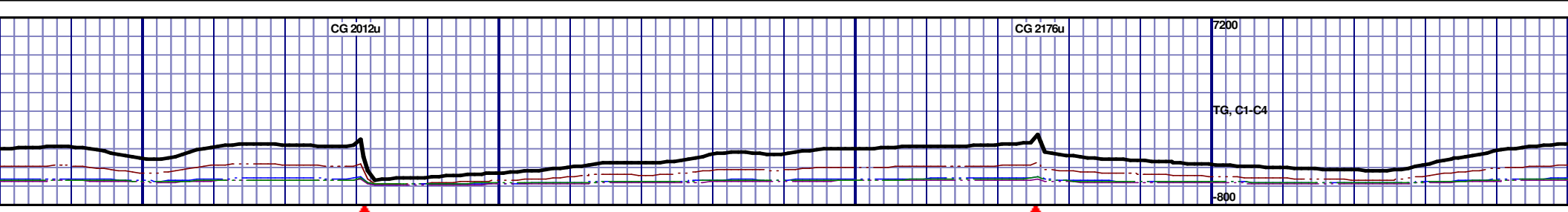
WOB 22.8K
PP 3893
RPM 80
SPM 0/69



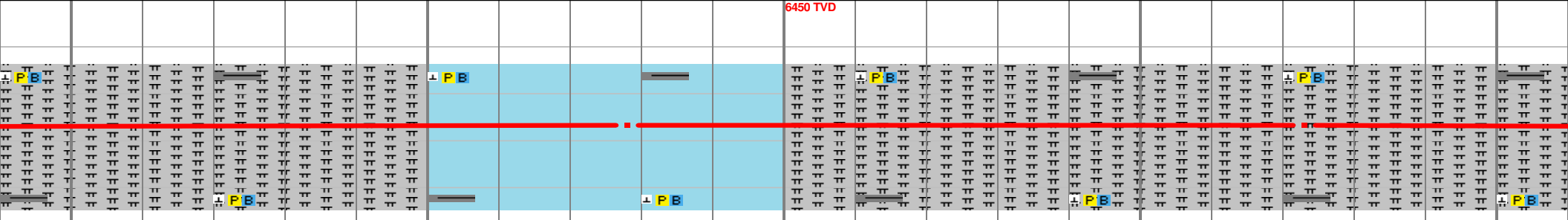
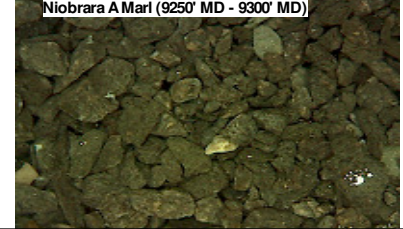
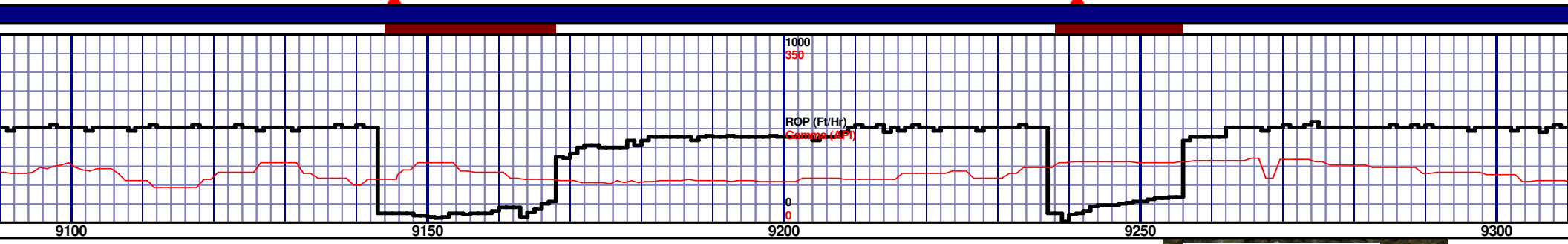
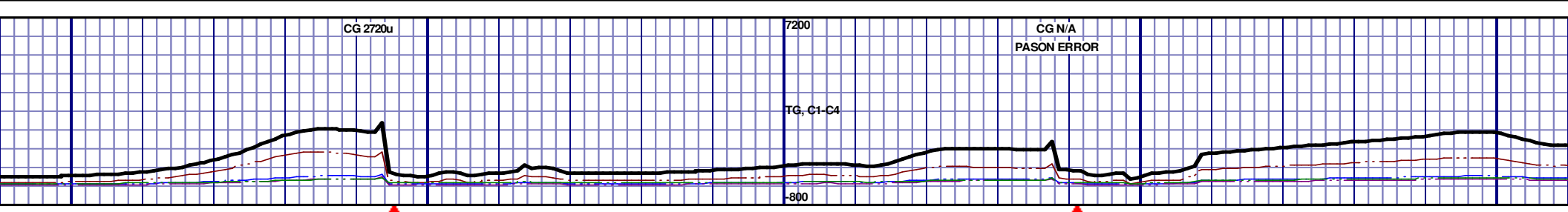
Niobrara B Chalk (8250' MD - 8300' MD)



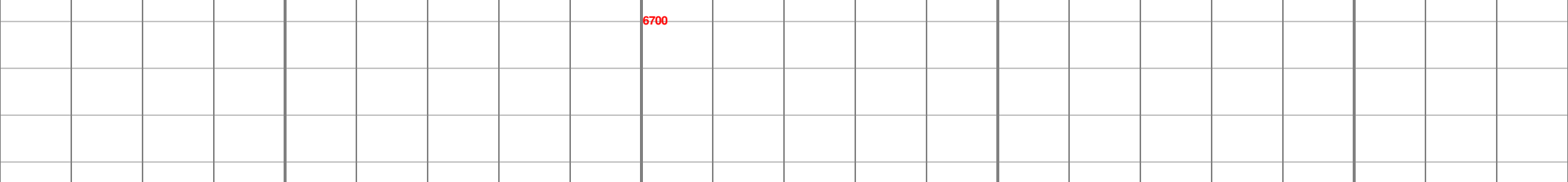
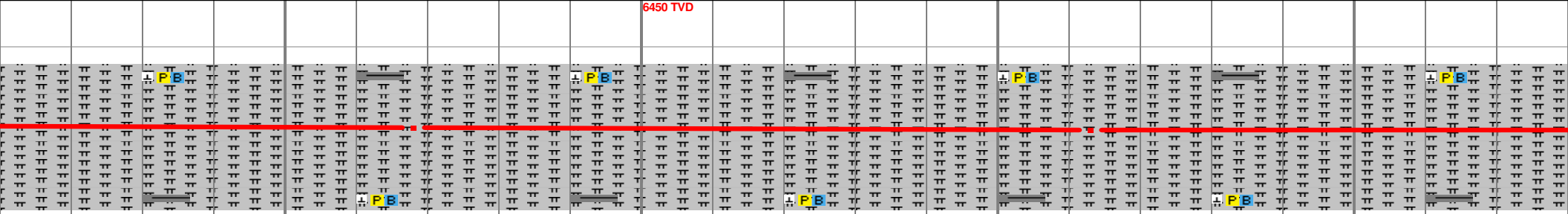
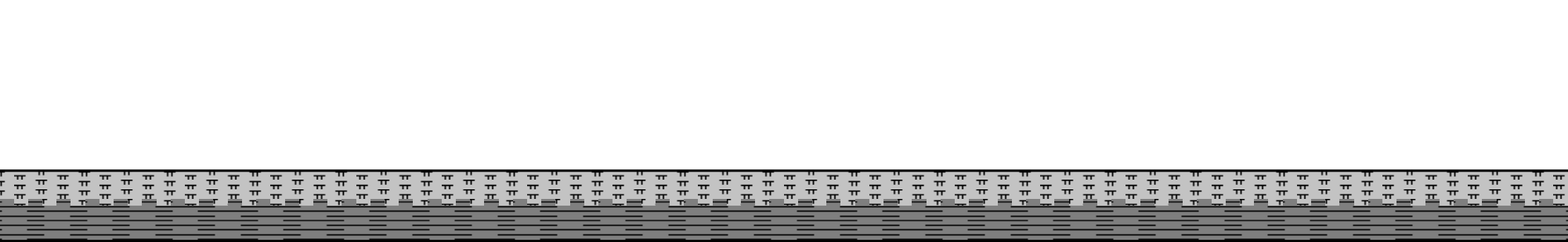
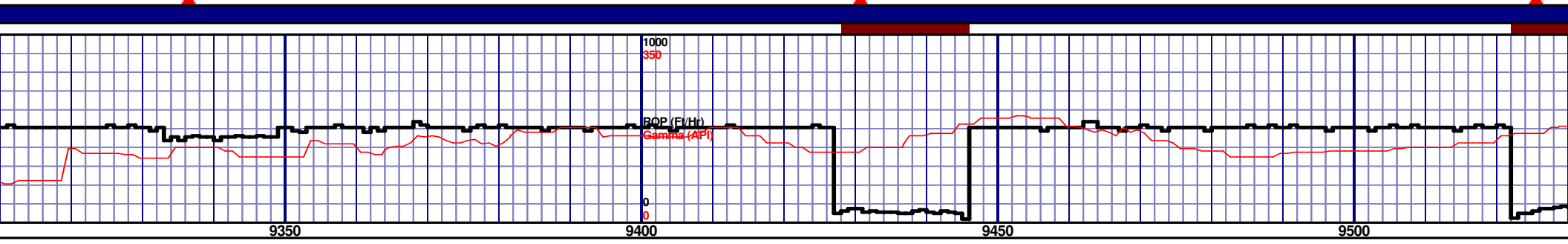
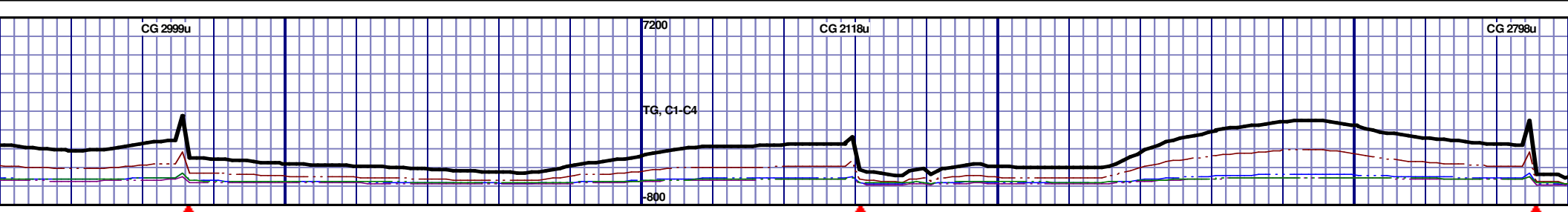
<p>CHK: 55% MEDDRKGY - MEDLTGY, BLKYO RTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD PYR, ABDT FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8250'-8300': CHK: 50% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE PYR, TRC FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8300'-8350': CHK: 55% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, ABDT FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8350'-8400': CHK: 50% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, ABDTFREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>8400'-8450': MRST: 45% MEDDRKGY - M SUBBLKY, GRTY TO SLTY TXT, FRM TO IMBD PYR, ABDT FREE BENT, NO STN, IMMED STRMG CUT, BRIYL RNG</p>
---	---	--	---	---



<p>EDLTGY, BLKY TO BRIT, FREE CALC, TRC 5% FLOR, NO O FLOR,</p>	<p>8450'-8500': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, ABDT FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYLRNG</p>	<p>8450'-8500': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, ABDT FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYLRNG</p>	<p>8550'-8600': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYLRNG</p>	<p>8600'-8650': CHK: 50% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYLRNG</p>
---	---	---	---	---



<p>9050'-9100': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, ABDT FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9150'-9200': CHK: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9200'-9250': MRST: 50% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9250'-9300': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9300'-9350': SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>
--	---	---	---	---



MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO
 GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
 IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
 ED STRMG CUT, BRIYL RNG

9350'-9400': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO
 SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
 CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
 FLOR, IMMED STRMG CUT, BRIYL RNG

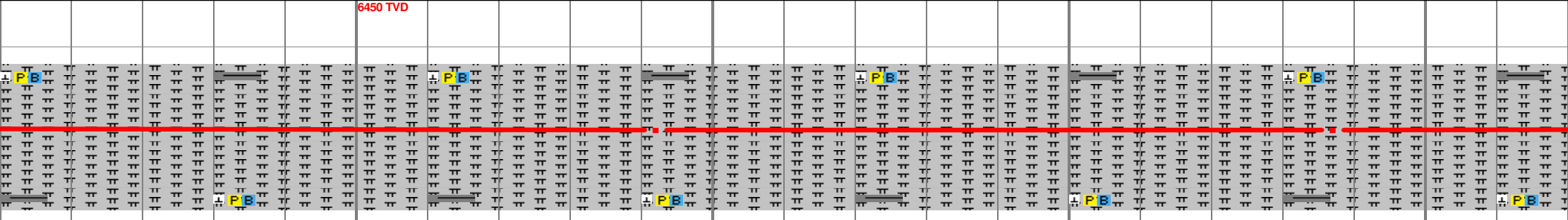
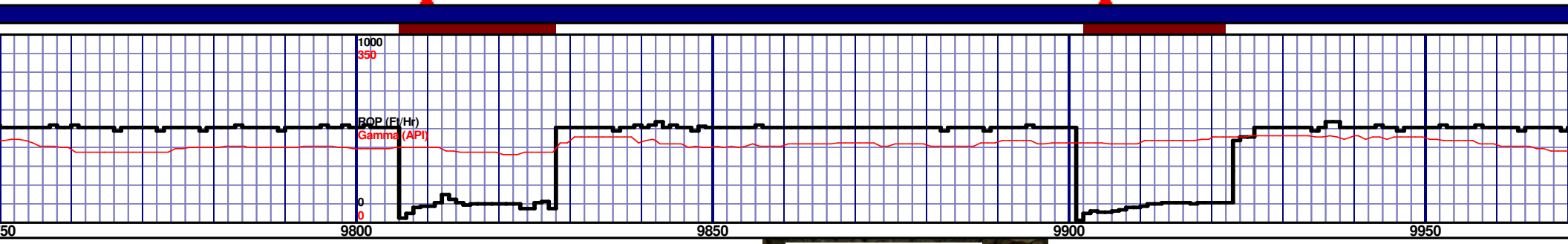
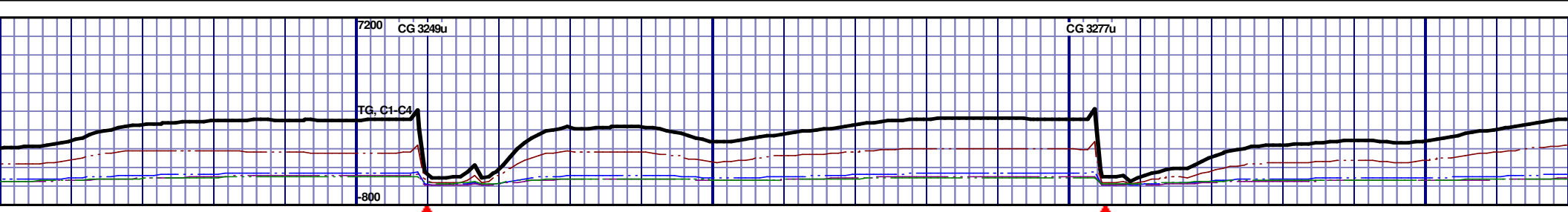
9400'-9450': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO
 SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
 CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
 FLOR, IMMED STRMG CUT, BRIYL RNG

9450'-9500': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO
 SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
 CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
 FLOR, IMMED STRMG CUT, BRIYL RNG

9500'-9550': MRST: 45% MEDDRKGY - M
 SUBBLKY, GRTY TO SLTY TXT, FRM TO
 CALC, TRC IMBD PYR, FREE BENT, NO
 FLOR, IMMED STRMG CUT, BRIYL RNG

MD 9368 TVD 6585.95
 INC 87.93 AZ 88.72
 VS 3053.32

MD 9463 TVD 6588.54
 INC 88.95 AZ 88.88
 VS 3145.48



6450 TVD

6700

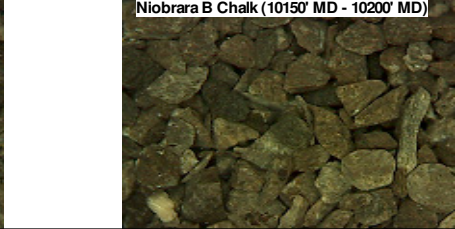
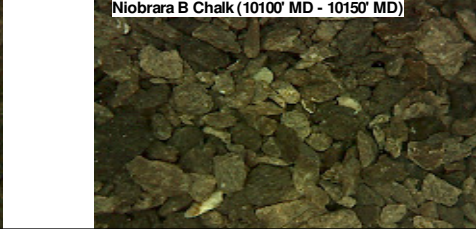
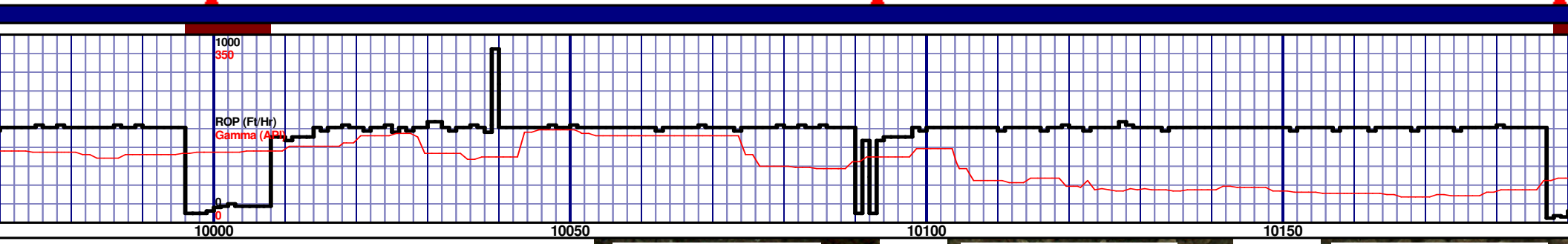
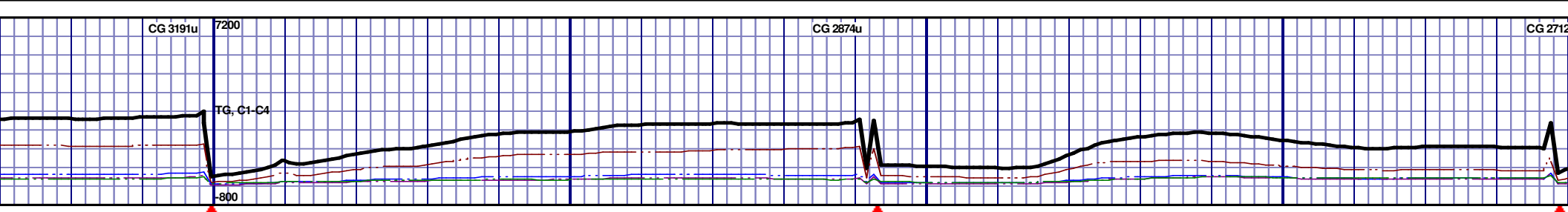
9750'-9800': MRST: 40% MEDDRKGY - MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG

9800'-9880': MRST: 40% MEDDRKGY - MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG

9850'-9900': MRST: 40% MEDDRKGY - MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG

9900'-9950': MRST: 40% MEDDRKGY - MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG

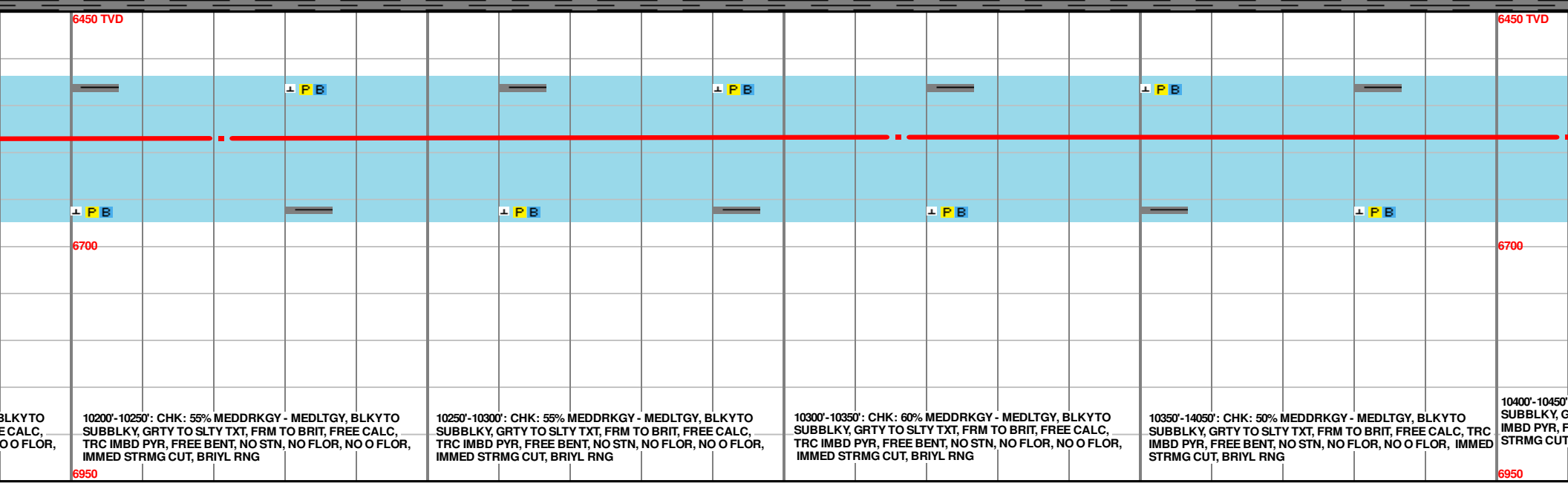
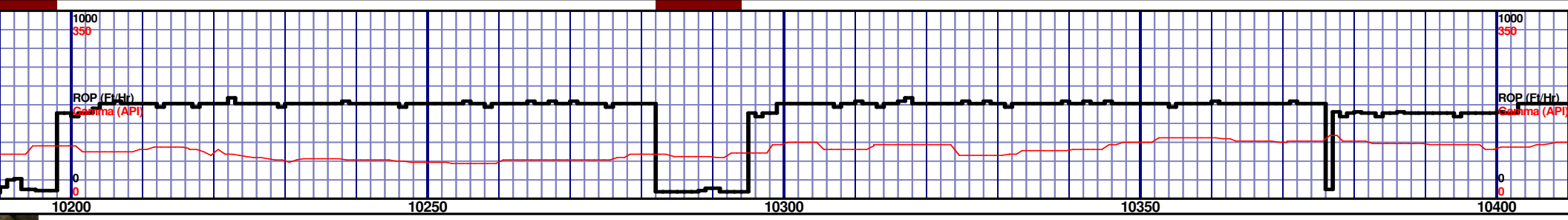
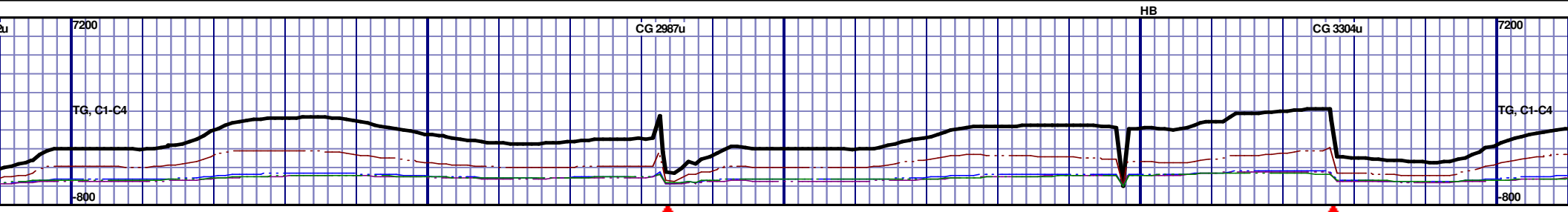
9950'-10000': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE
CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG



<p>6450 TVD</p>	<p>10000'-10050': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>10050'-10100': MRST: 45% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>NIOBRARA B CHALK 10100' MD 6587' TVD</p>	<p>10150'-10200': CHK: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>
<p>6700</p>	<p>6950</p>			

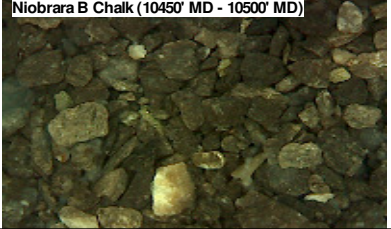
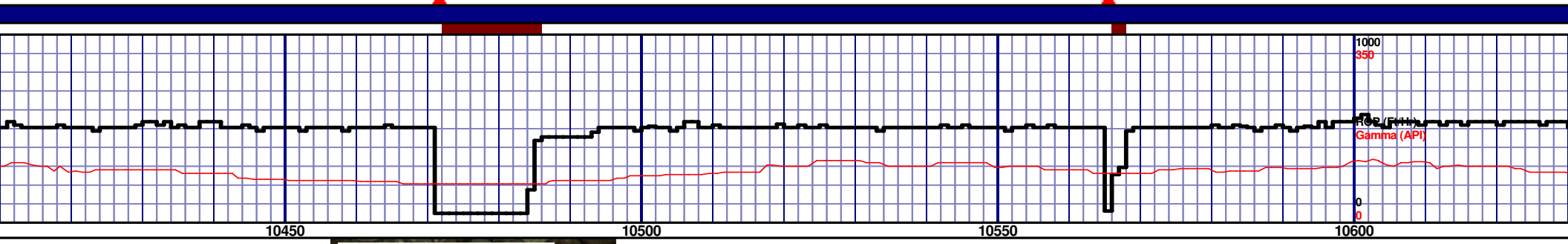
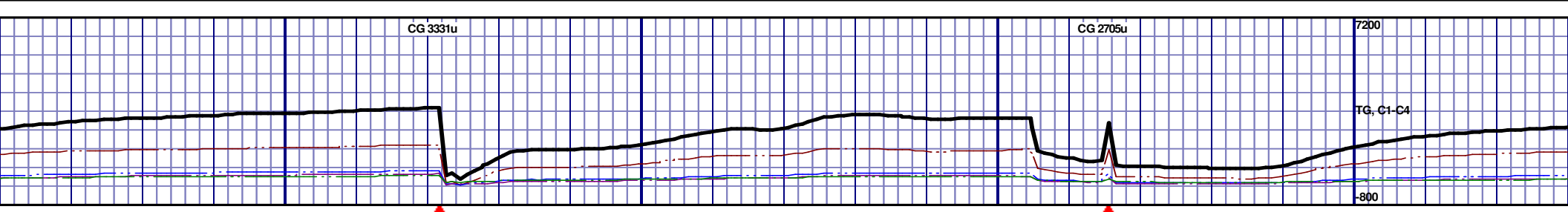
MD 10031 TVD 6587.85
INC 90.55 AZ 89.33
VS 3698.66

MD 10126 TVD 6586.55
INC 91.02 AZ 88.55
VS 3790.8

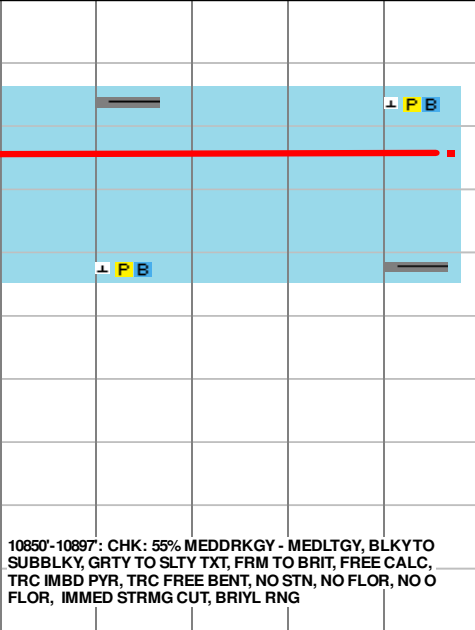
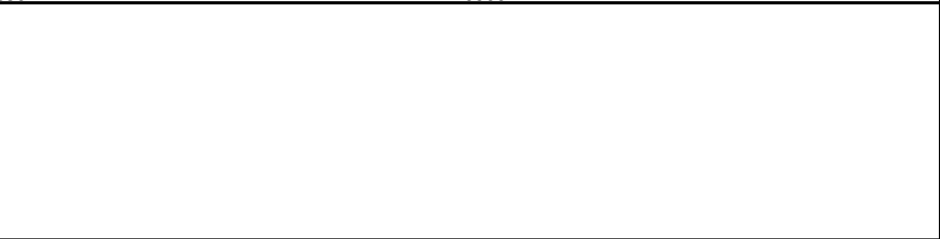
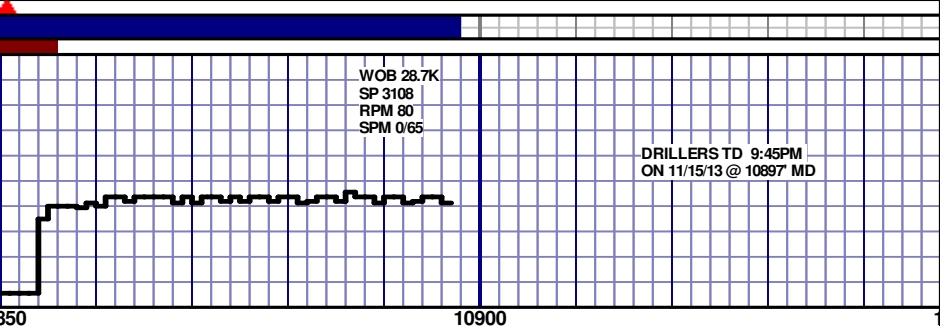
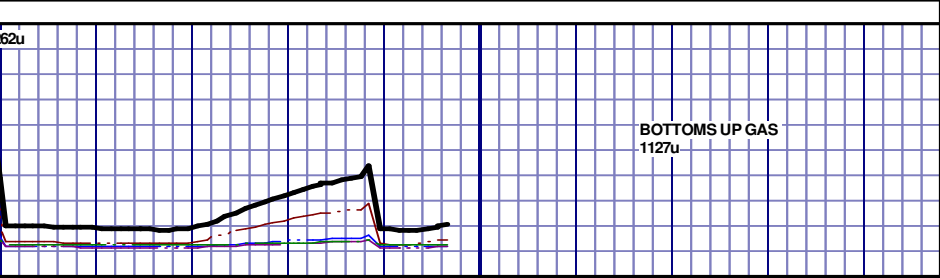


MD 10221 TVD 6584.78
 INC 91.11 AZ 89.46
 VS 3882.89

MD 10316 TVD 6583.77
 INC 90.12 AZ 89.38
 VS 3974.83



										6450 TVD
⊥ P B		⊥ P B		⊥ P B		⊥ P B		⊥ P B		
—										
										6700
CHK: 50% MEDDRKGY - MEDLTGY, BLKYO GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		10450'-10500': CHK: 55% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		10500'-10550': CHK: 55% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		10550'-10600': CHK: 50% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC IMBD PYR, FREE BENT, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		10600'-10650': CHK: 55% MEDDRKGY - SUBBLKY, GRTY TO SLTY TXT, FRM TO IMBD PYR, FREE BENT, NO STN, NO FLOR, STRMG CUT, BRIYL RNG		6950



TD @ 10897' MD

RELEASED ON 11/15/13

THANK YOU FROM
ANDREW CHRISTIANO,
HANNAH BLATCHFORD,
AND HORIZON WELL
LOGGING, LLC

10850'-10897': CHK: 55% MEDDRKGY - MEDLTGY, BLKYTO
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC,
TRC IMBD PYR, TRC FREE BENT, NO STN, NO FLOR, NO O
FLOR, IMMED STRMG CUT, BRIYL RNG