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[WWW.HZMUD.COM/25](http://WWW.HZMUD.COM/25)

### Customer Information

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

**Geologist:** Holly Duncan  
Noble Energy Inc.

### Mud Logging Details

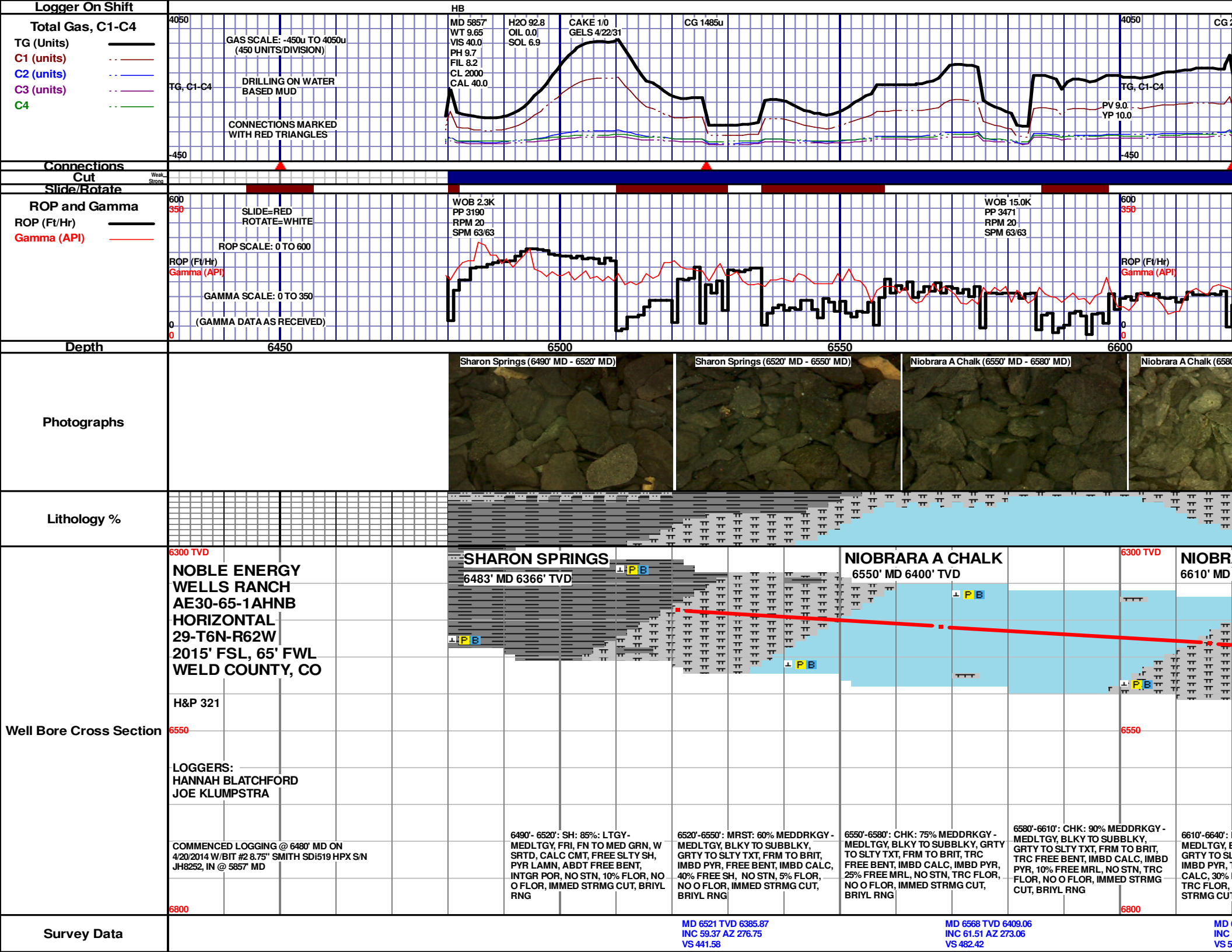
**Logger:** Hannah Blatchford &  
Joe Klumpstra  
**Log Interval:** 6480' MD to 11945' MD  
**Start Date:** April 20, 2014  
**Release Date:** April 23, 2014

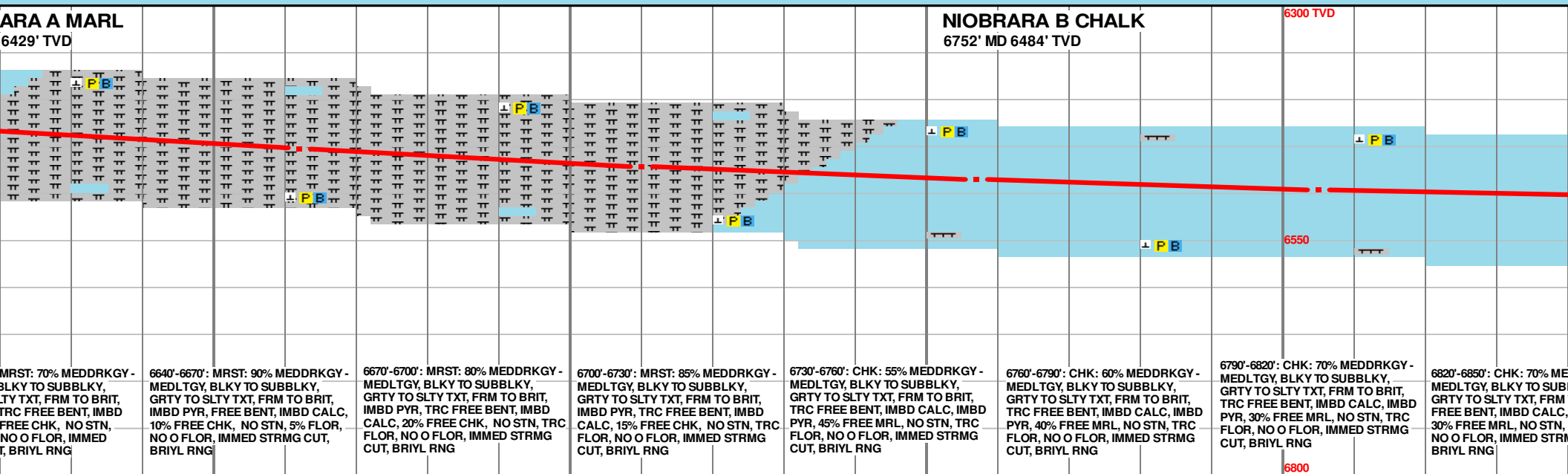
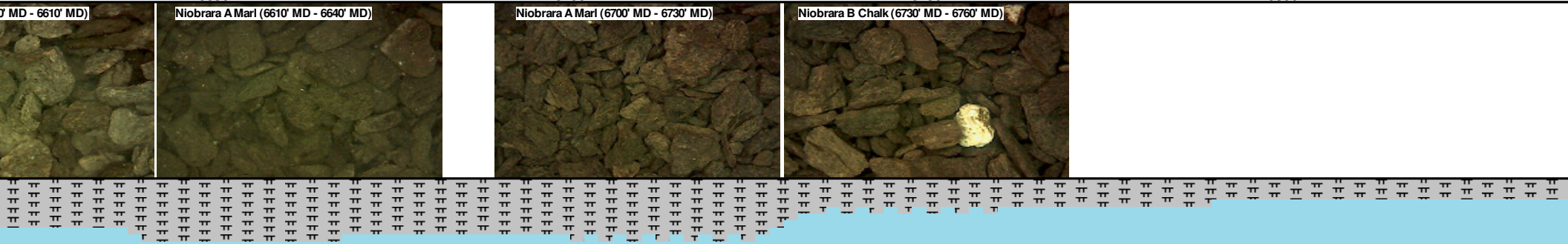
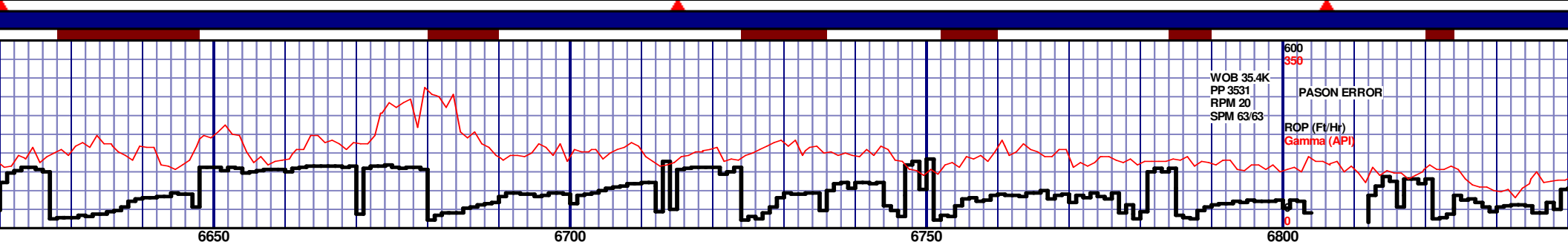
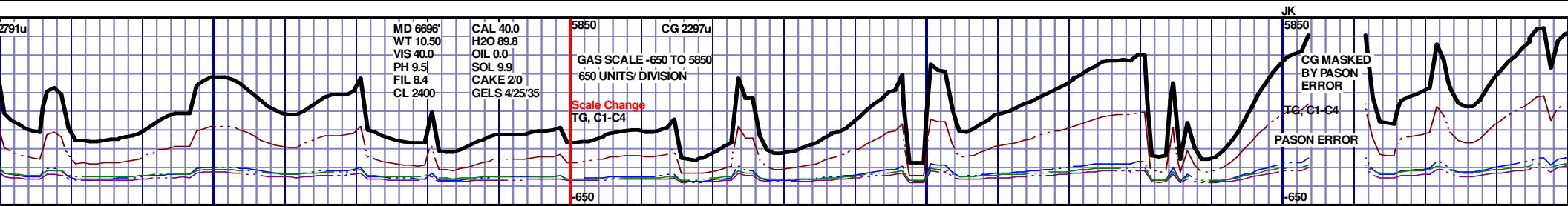
### Well Information

**Well Name:** Wells Ranch  
AE30-65-1AHNB Horizontal  
**Location:** 29-T6N-R62W  
2015' FSL, 65' FWL

**County:** Weld  
**State:** Colorado

**Drilling Rig:** H&P 321  
**Total Depth:** 11945' MD  
**TD Date:** April 23, 2014  
**Formation:** Niobrara B Chalk  
**KB Elevation:** 4788'  
**GR Elevation:** 4758'  
**API Number:** 05-123-38652-0000





MD 6616 TVD 6431.48  
INC 62.81 AZ 271.52  
VS 565.95

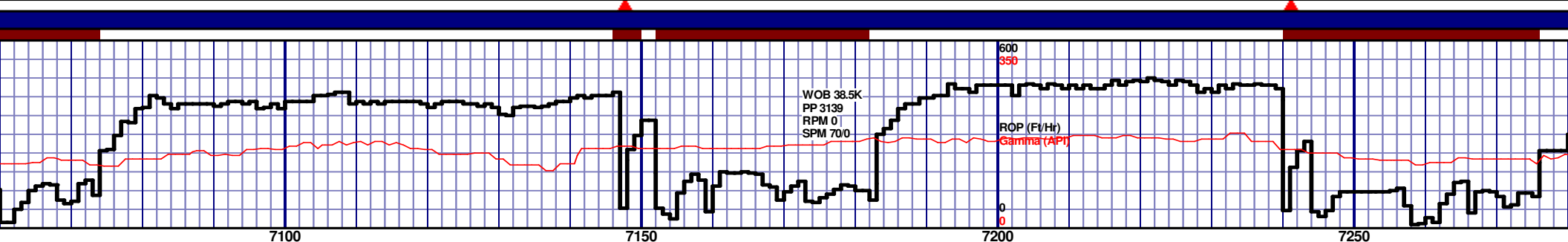
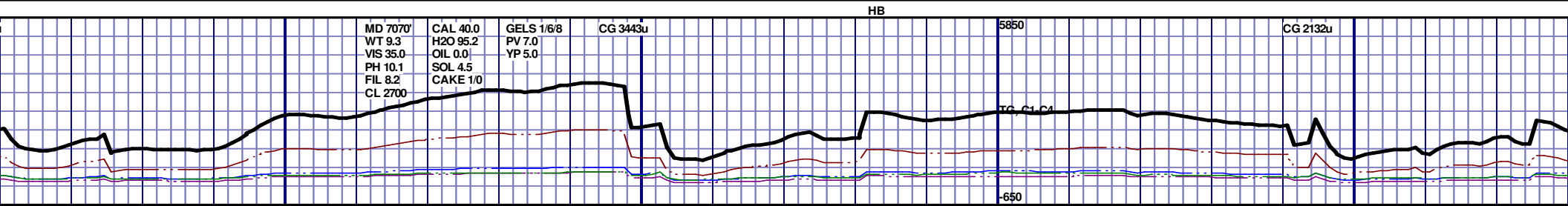
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INC 64.1 AZ 268.14  
VS 565.95

MD 6710 TVD 6471.04  
INC 69.27 AZ 266.7  
VS 609.81

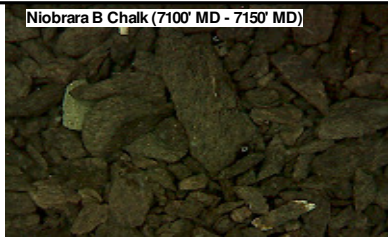
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INC 74.6 AZ 267.12  
VS 654.24

MD 6805 TVD 6496.38  
INC 79.44 AZ 268.21  
VS 700.81

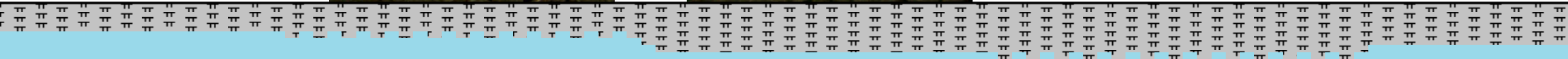




Niobrara B Chalk (7100' MD - 7150' MD)

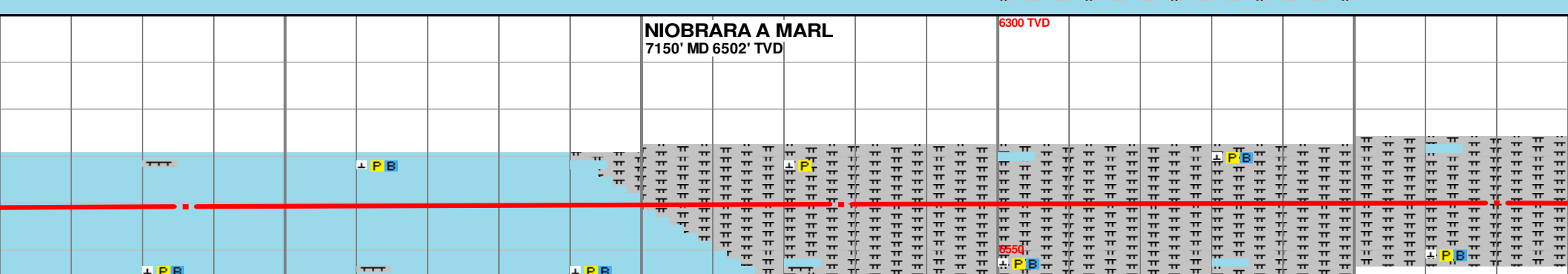


Niobrara A Marl (7150' MD - 7200' MD)



**NIOBRARA A MARL**  
7150' MD 6502' TVD

6300 TVD



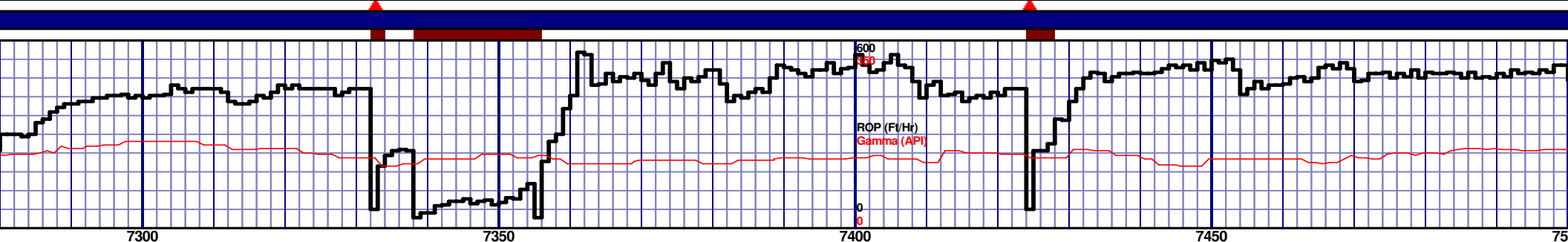
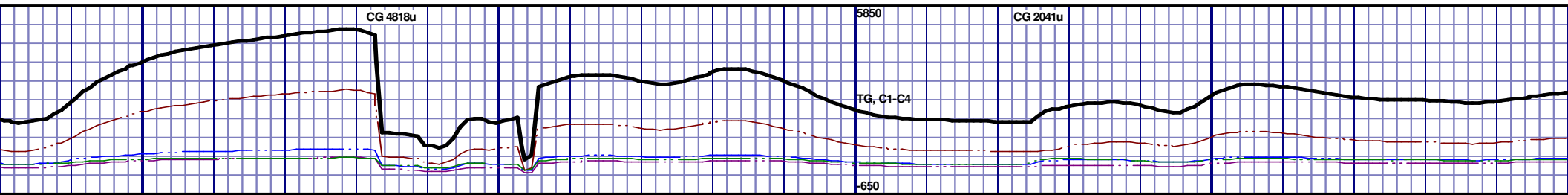
CHK: 60% MEDDRKGY - MEDLTGY, BLKYTO  
GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT,  
IMBD PYR, 40% FREE MRL, NO STN, 5% FLOR,  
IMMED STRMG CUT, BRIYL RNG

7100'-7150': CHK: 55% MEDDRKGY - MEDLTGY, BLKYTO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT,  
IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, 5% FLOR, NO  
O FLOR, IMMED STRMG CUT, BRIYL RNG

7150'-7200': MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC,  
IMBD PYR, 30% FREE CHK, NO STN, NO FLOR, NO O FLOR,  
IMMED STRMG CUT, BRIYL RNG

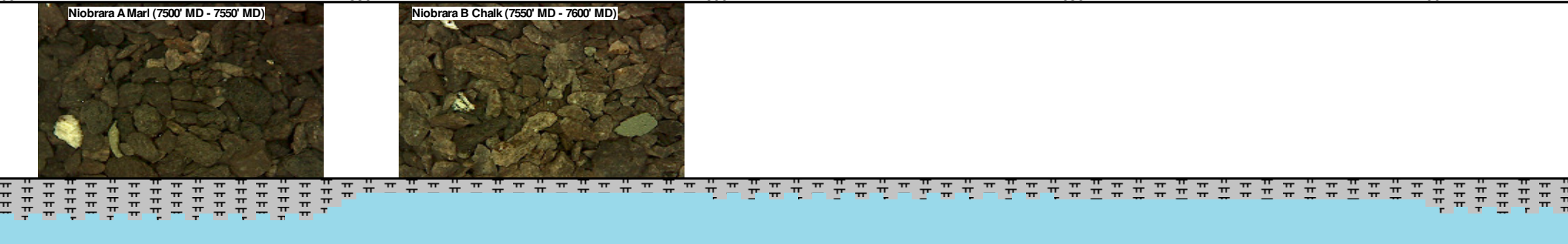
7200'-7250': MRST: 75% MEDDRKGY - MEDLTGY, BLKY TO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE BENT,  
IMBD CALC, FREE CALC, IMBD PYR, 25% FREE CHK, NO STN,  
TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

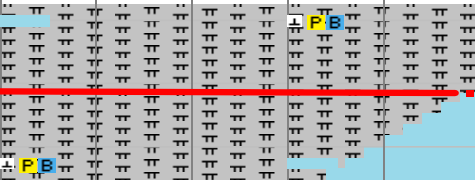
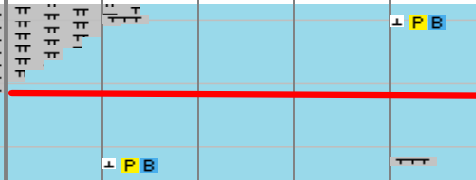
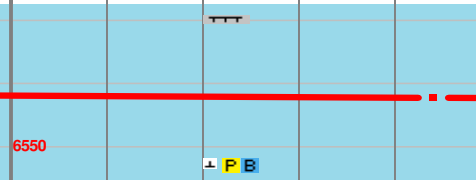
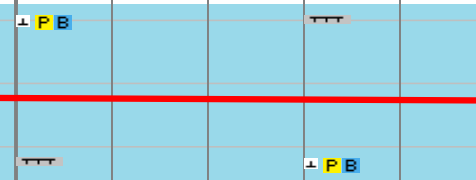
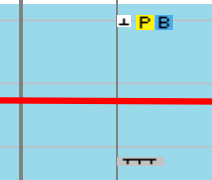
7250'-7300': MRST: 60% MEDDRKGY - M  
SUBBLKY, GRTY TO SLTY TXT, FRM TO  
IMBD CALC, FREE CALC, IMBD PYR, 4  
TRC FLOR, NO O FLOR, IMMED STRMG

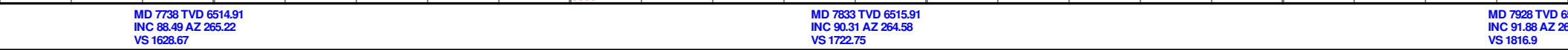
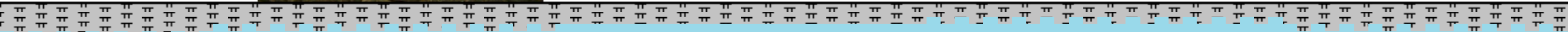
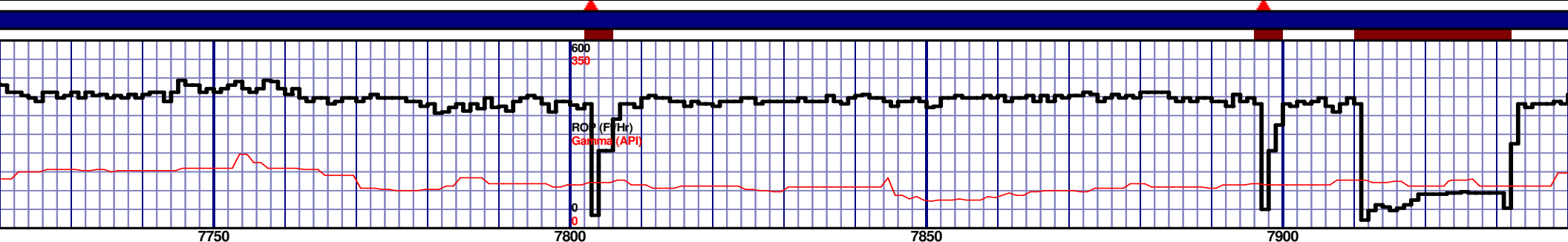


6300 TVD			6800		
7300'-7350': MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE BENT, IMBD CALC, IMBD PYR, 45% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG			7400'-7450': MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE BENT, IMBD CALC, IMBD PYR, 40% FREE CHK, NO STN, 20% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		
7350'-7400': MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE BENT, IMBD CALC, IMBD PYR, 45% FREE CHK, NO STN, 15% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG			7450'-7500': MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE BENT, IMBD CALC, IMBD PYR, 45% FREE CHK, NO STN, 20% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		

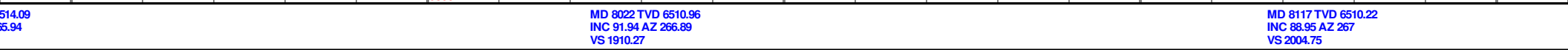
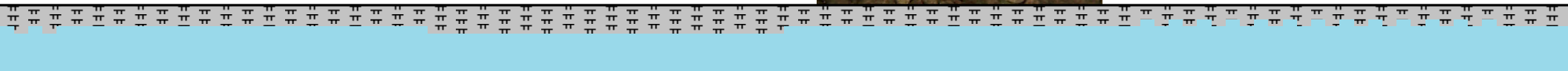
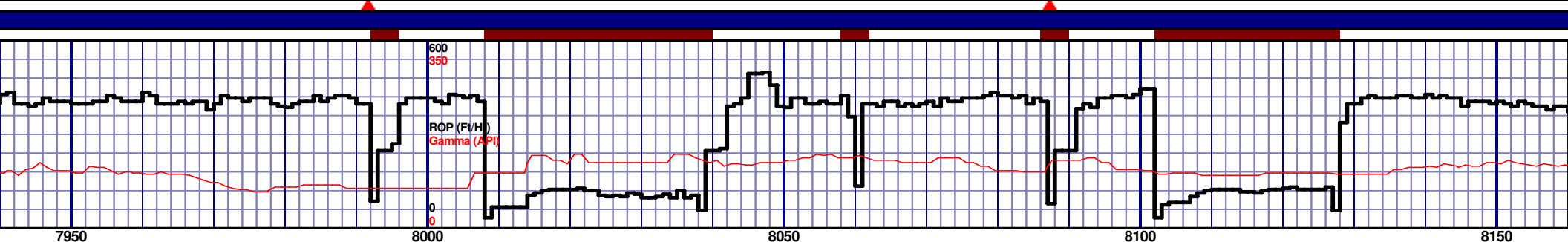


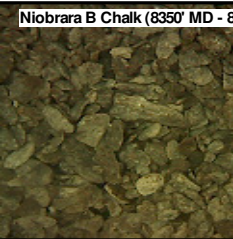
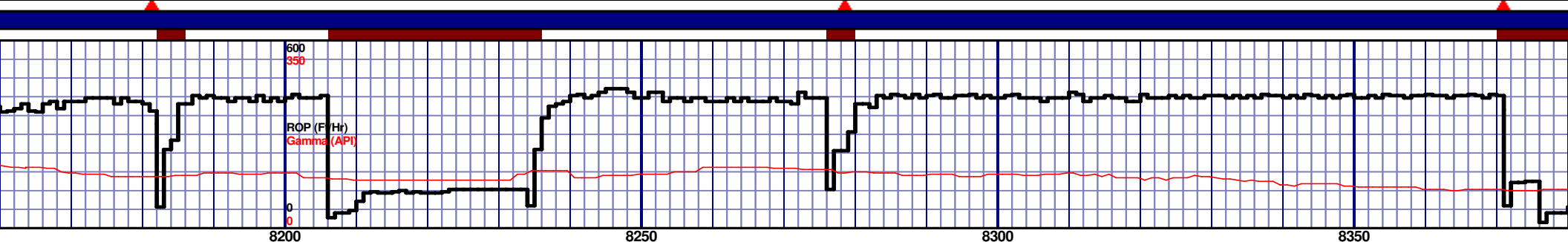
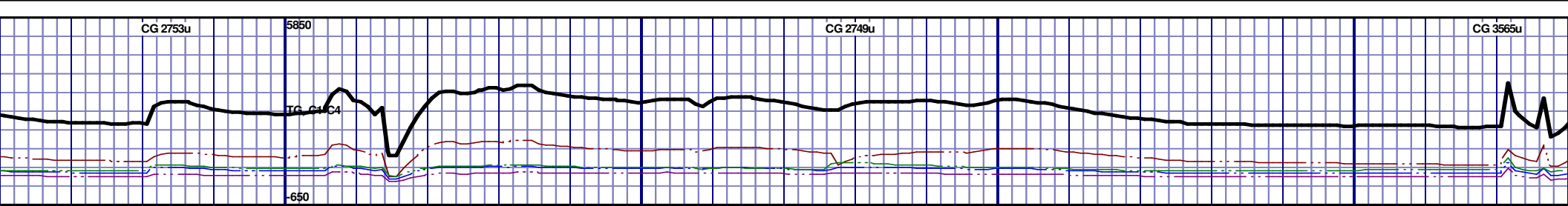


	NIOBRARA B CHALK 7550' MD 6507' TVD	6300 TVD		
 <p>7500'-7550': MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, ABDT FREE BENT, IMBD CALC, IMBD PYR, 45% FREE CHK, NO STN, 15% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	 <p>7550'-7600': CHK: 80% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 20% FREE MRL, NO STN, 10% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	 <p>7600'-7650': CHK: 75% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, FREE BENT, IMBD CALC, IMBD PYR, 25% FREE MRL, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	 <p>7650'-7700': CHK: 70% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE CALC, TRC, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	 <p>7700'-7750': CHK: 55% ME... SUBBLKY, GRTY TO SLTY... TRC FREE BENT, IMBD C... STN, TRC FLOR, NO O FLO...</p>
		6550		
		6800		





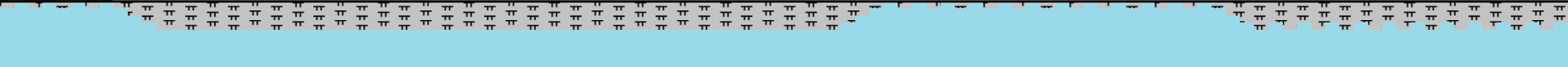
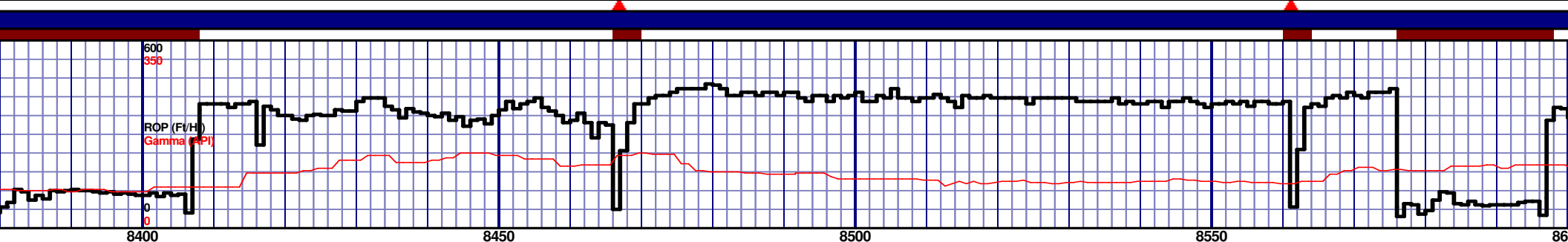
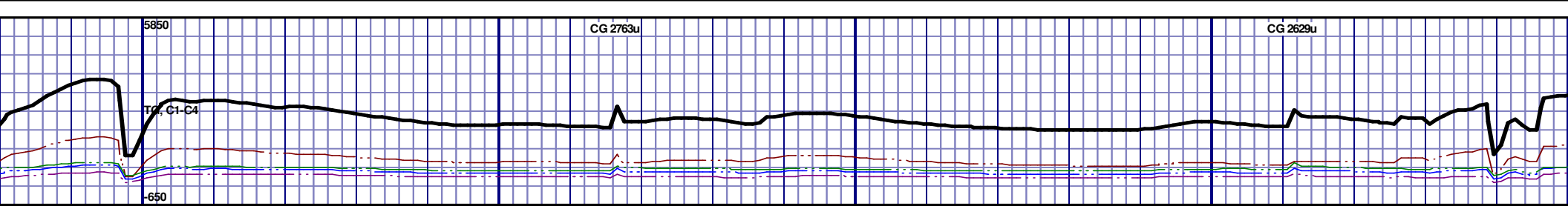




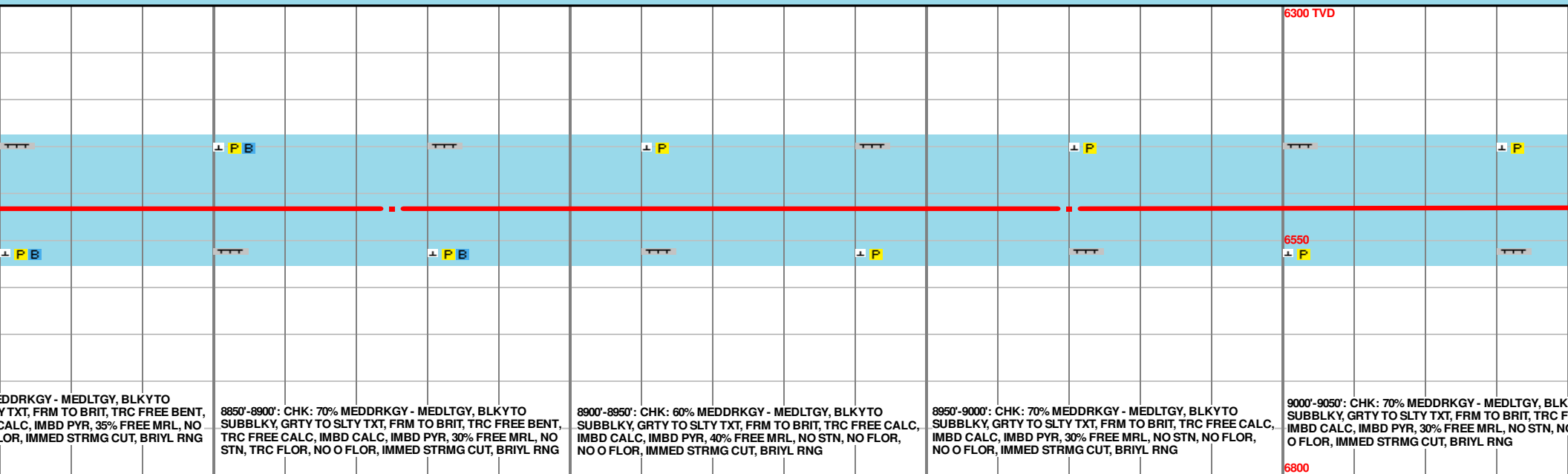
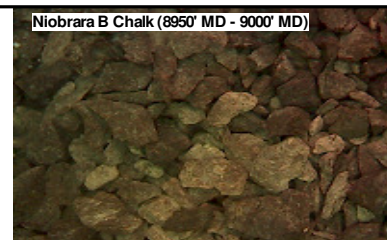
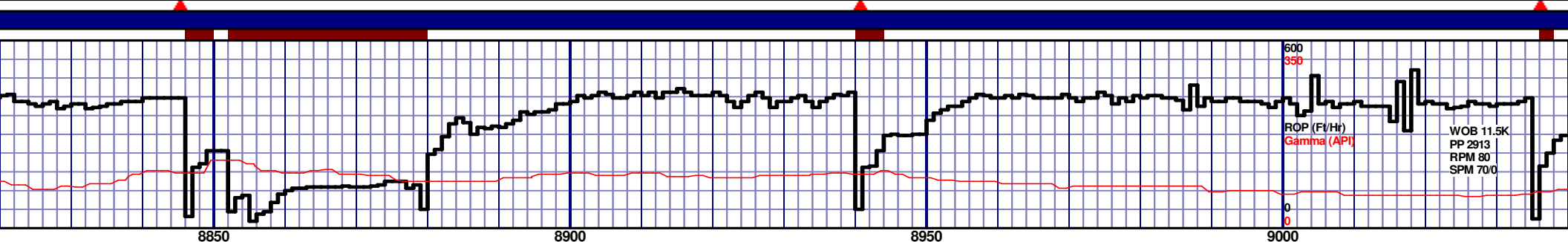
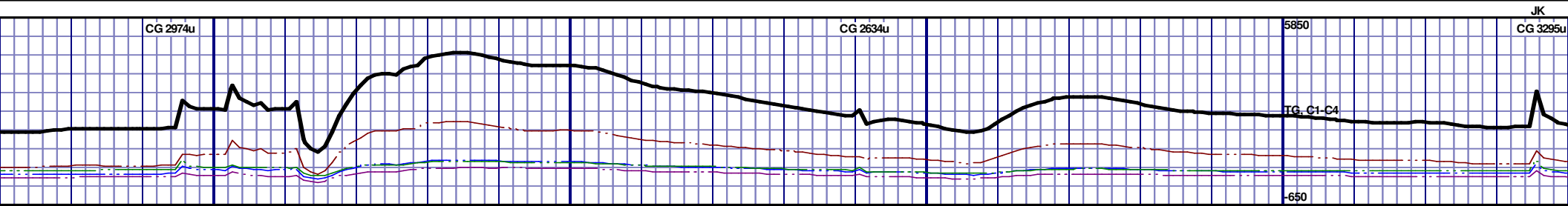
CHK: 70% MEDDRKGY - MEDLTGY, BLKYTO RTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, ENT, IMBD CALC, IMBD PYR, 30% FREE MRL, NO OR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG	8200'-8250': CHK: 85% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, IMBD PYR, 15% FREE MRL, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG	8250'-8300': CHK: 75% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, IMBD PYR, 25% FREE MRL, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG	8300'-8350': CHK: 90% MEDDRKGY - MEDLTGY, BLKYTO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, IMBD PYR, 10% FREE MRL, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG	8350'-8400': CHK: 95% MEDDRKGY - M SUBBLKY, GRTY TO SLTY TXT, FRM TO CALC, IMBD CALC, IMBD PYR, 5% FR FLOR, NO O FLOR, IMMED STRMG CUT
6300 TVD	6550			

MD 8212 TVD 6511.07  
INC 90.03 AZ 269.16  
VS 2099.42

MD 8306 TVD 6510.53  
INC 90.62 AZ 270.66  
VS 2193.29

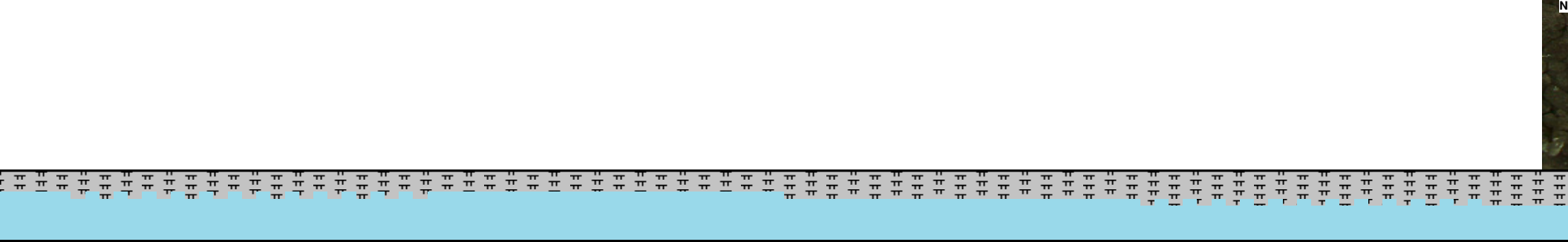
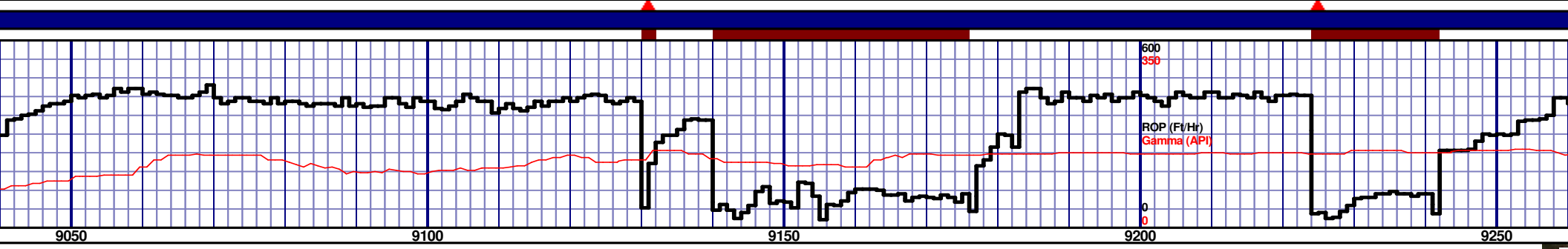
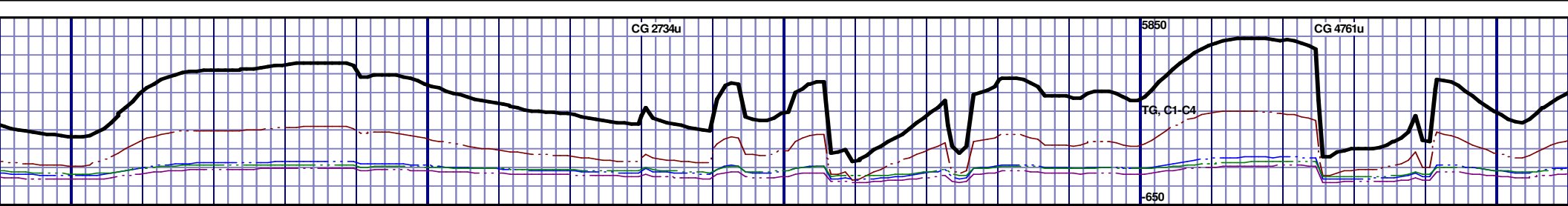




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INC 89.82 AZ 268.93  
VS 2761.67

MD 8970 TVD 6515.86  
INC 89.97 AZ 268.12  
VS 2856.41



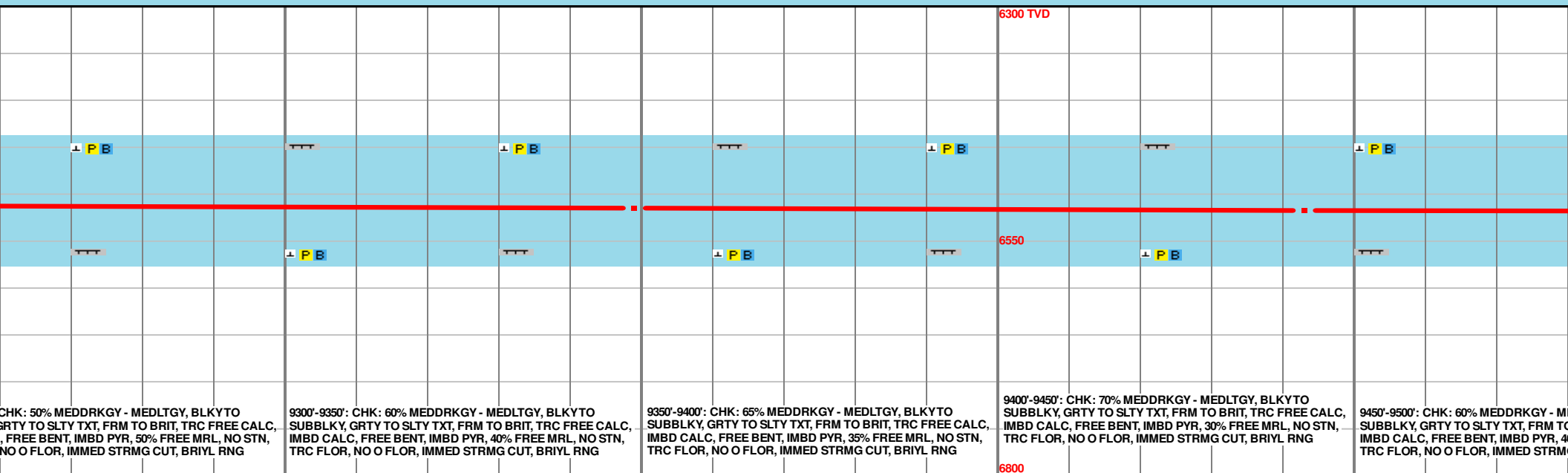
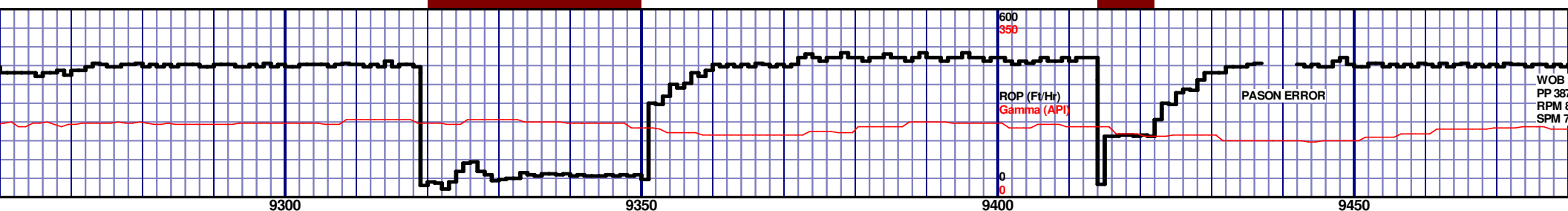
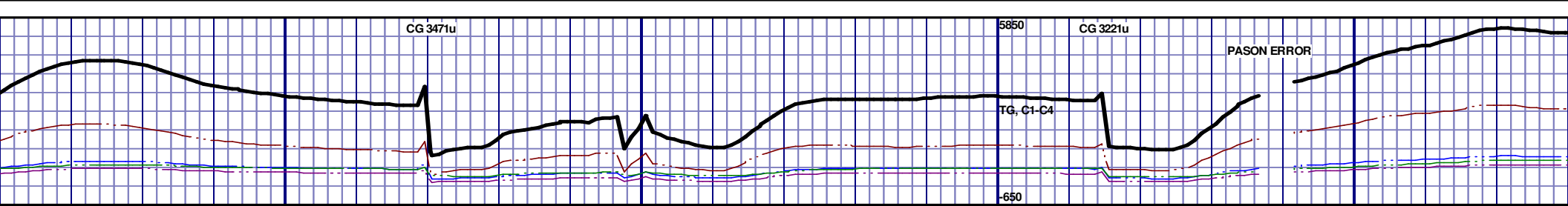
<p>9050'-9100': CHK: 65% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, TRC FREE BENT, IMBD PYR, 35% FREE MRL, NO STN,TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9100'-9150': CHK: 70% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, FREE BENT, IMBD PYR, 30% FREE MRL, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9150'-9200': CHK: 60% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, IMBD PYR, 40% FREE MRL, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9200'-9250': CHK: 55% MEDDRKGY - MEDLTGY, BLKYO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, FREE BENT, IMBD PYR, 45% FREE MRL, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>	<p>9250'-9300': SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC, IMBD CALC, FREE BENT, IMBD PYR, 45% FREE MRL, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG</p>
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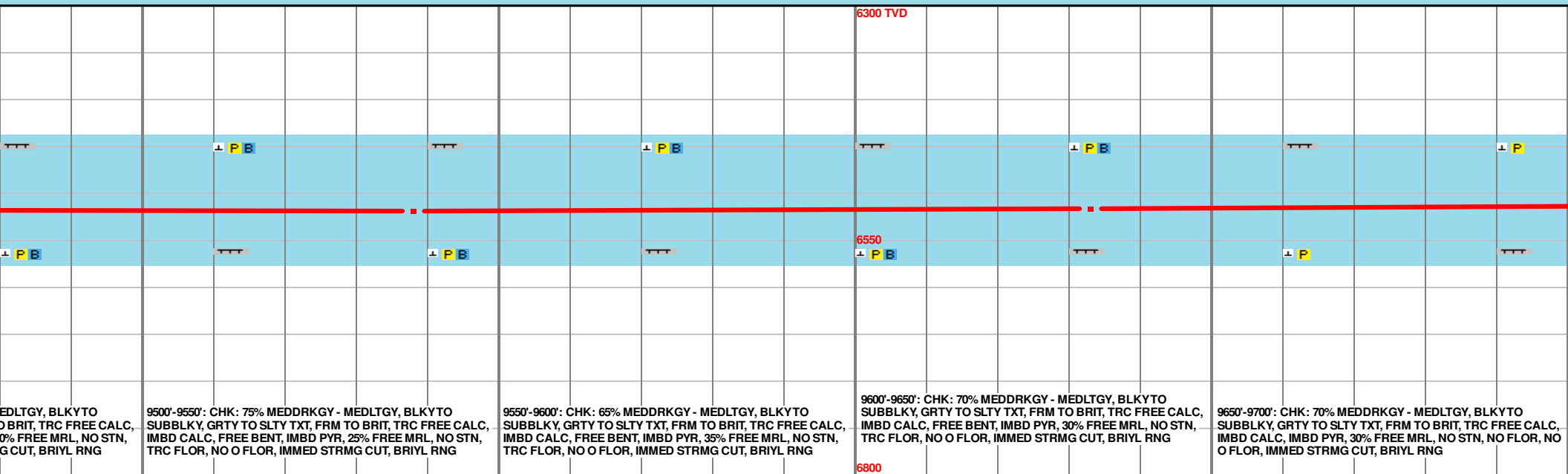
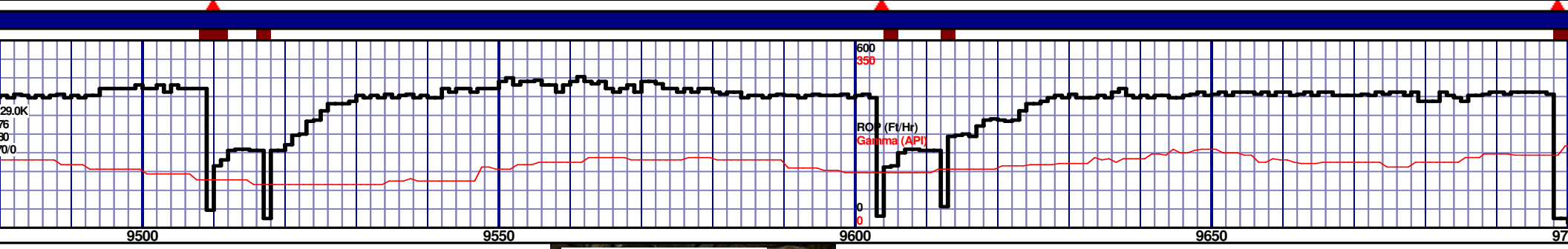
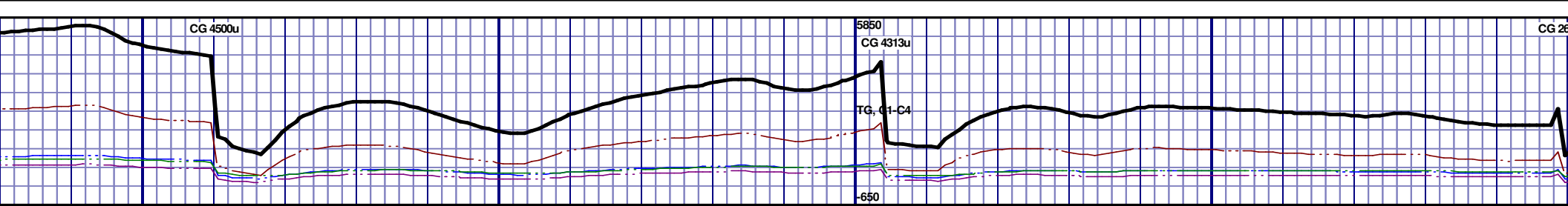
MD 9064 TVD 6514.77  
INC 91.36 AZ 267.75  
VS 2950.06

MD 9159 TVD 6512.98  
INC 90.8 AZ 266.68  
VS 3044.58

MD 9259 TVD 6512.98  
INC 89.8 AZ 266.68  
VS 3133.58







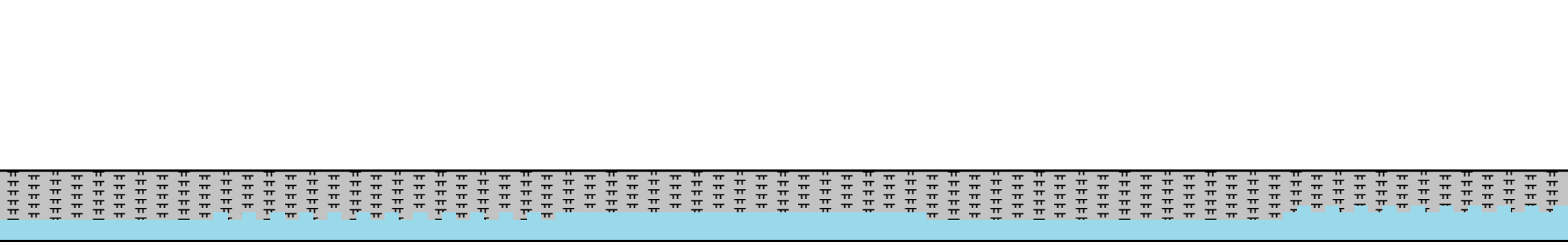
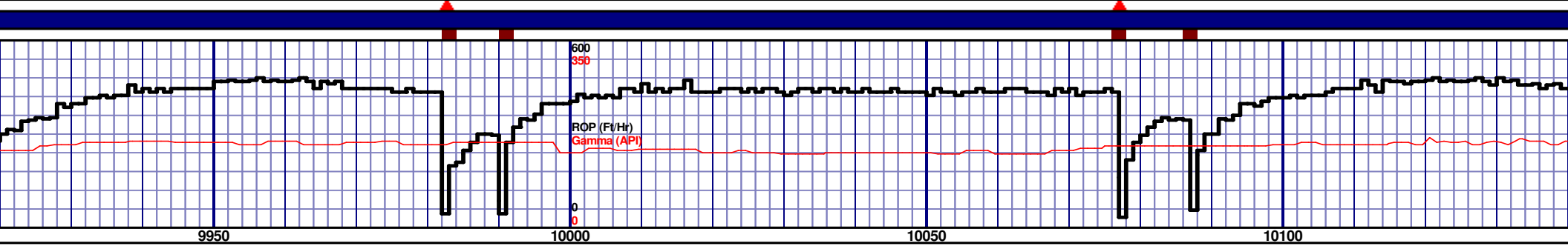
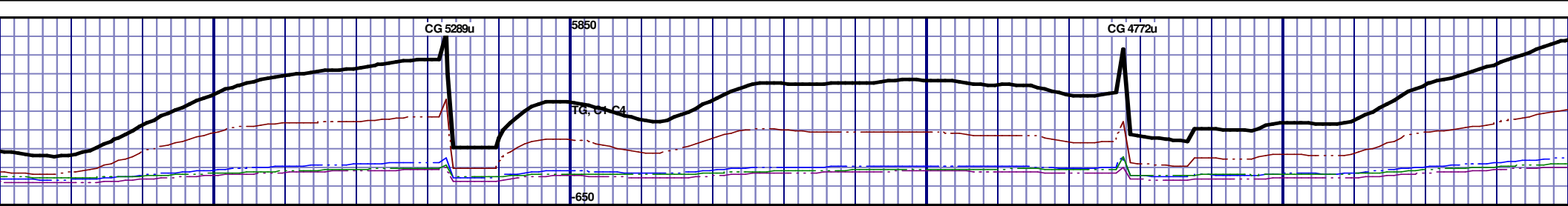
9500'-9550': CHK: 75% MEDDRKGY - MEDLTGY, BLKGYTO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC,  
IMBD CALC, FREE BENT, IMBD PYR, 25% FREE MRL, NO STN,  
TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

9550'-9600': CHK: 65% MEDDRKGY - MEDLTGY, BLKGYTO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC,  
IMBD CALC, FREE BENT, IMBD PYR, 35% FREE MRL, NO STN,  
TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

9600'-9650': CHK: 70% MEDDRKGY - MEDLTGY, BLKGYTO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC,  
IMBD CALC, FREE BENT, IMBD PYR, 30% FREE MRL, NO STN,  
TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

9650'-9700': CHK: 70% MEDDRKGY - MEDLTGY, BLKGYTO  
SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE CALC,  
IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, NO FLOR, NO  
O FLOR, IMMED STRMG CUT, BRIYL RNG



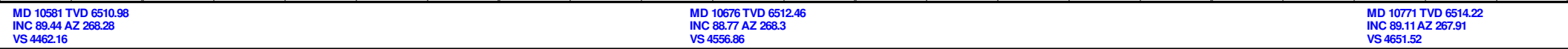
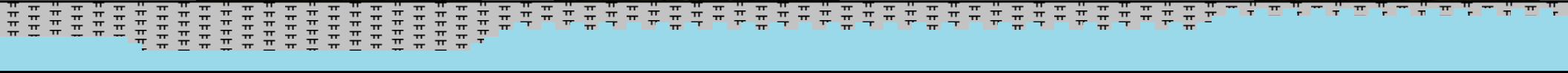
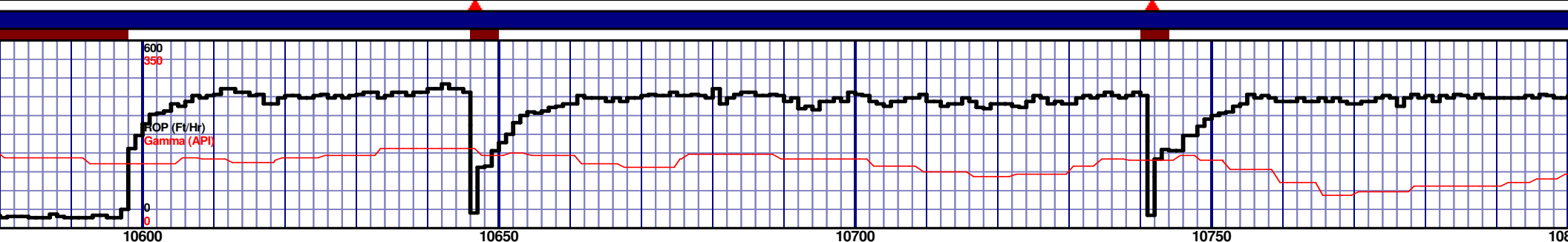


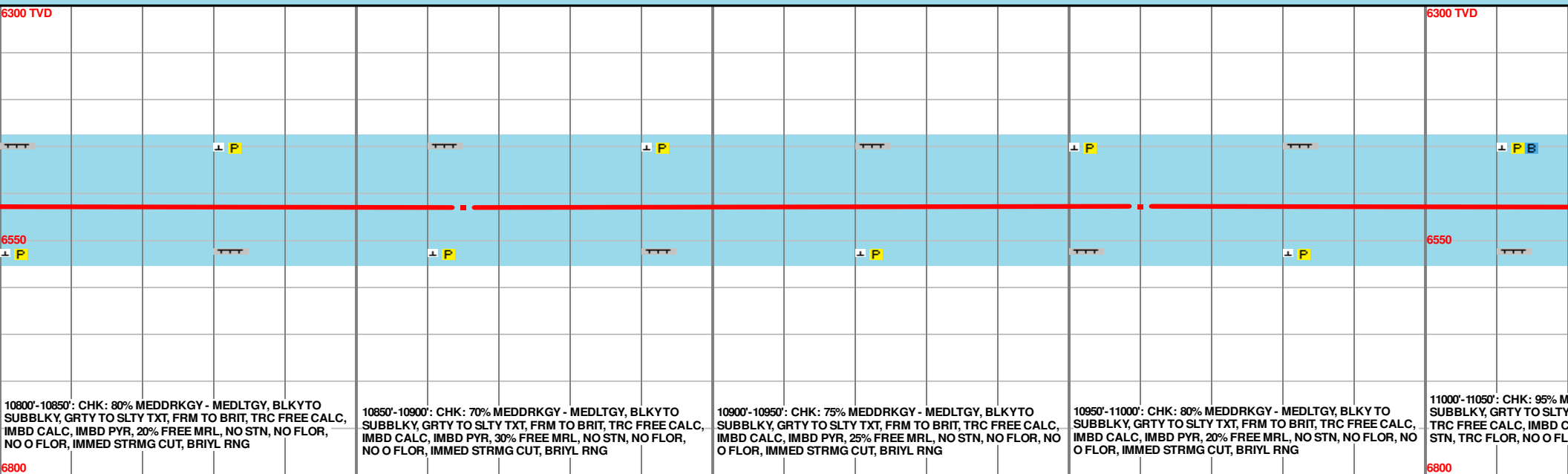
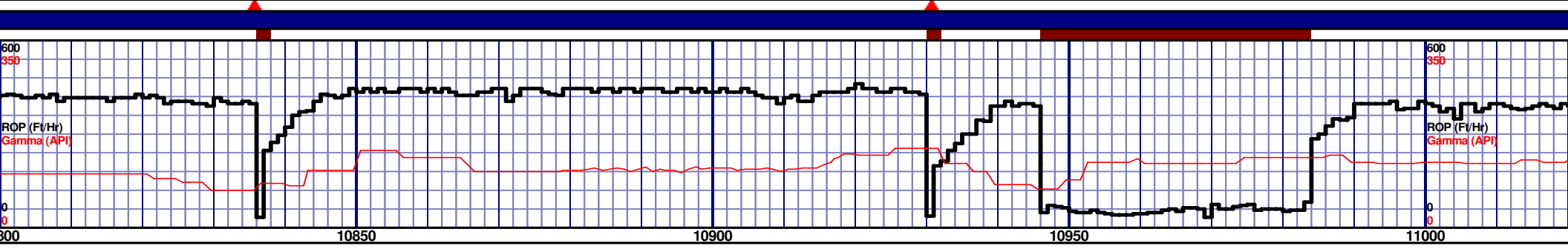
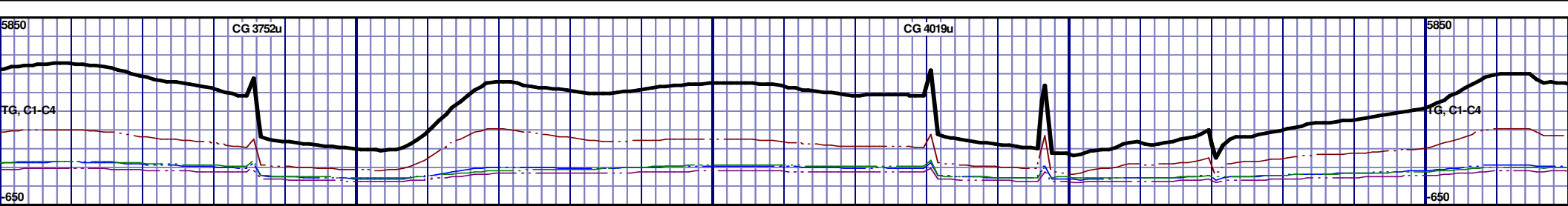
6300 TVD									
6330									
6800									
9950'-10000': MRST: 65% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 35% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG									
10000'-10050': MRST: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD PYR, 40% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG									
10050'-10100': MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG									
10100'-10150': MRST: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 45% FREE CHK, NO STN, 5% FLOR, IMMED STRMG CUT, BRIYL RNG									







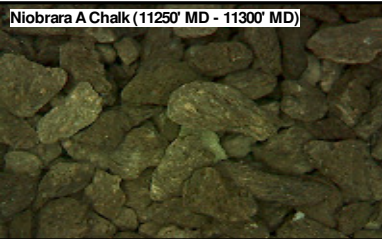
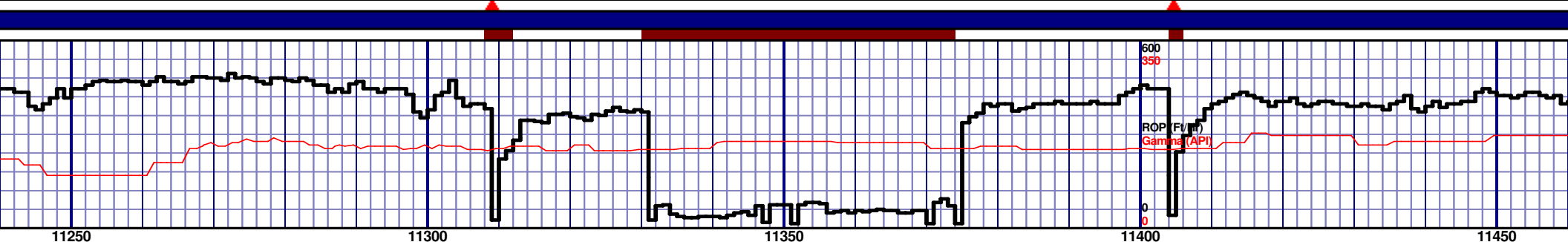
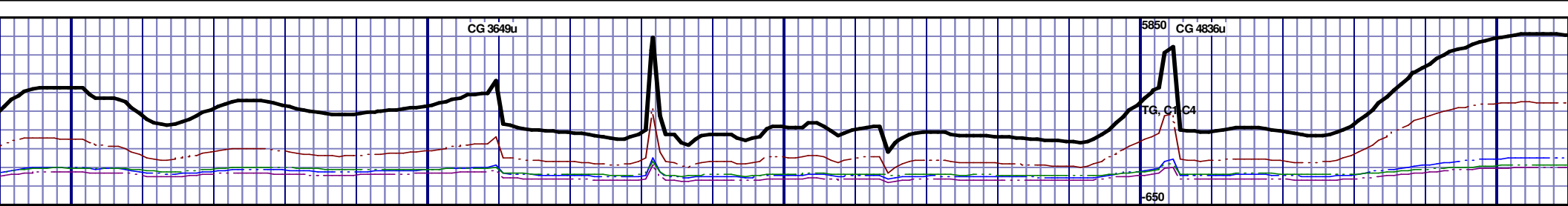




MD 10865 TVD 6514.65  
INC 90.37 AZ 267.43  
VS 4745.14

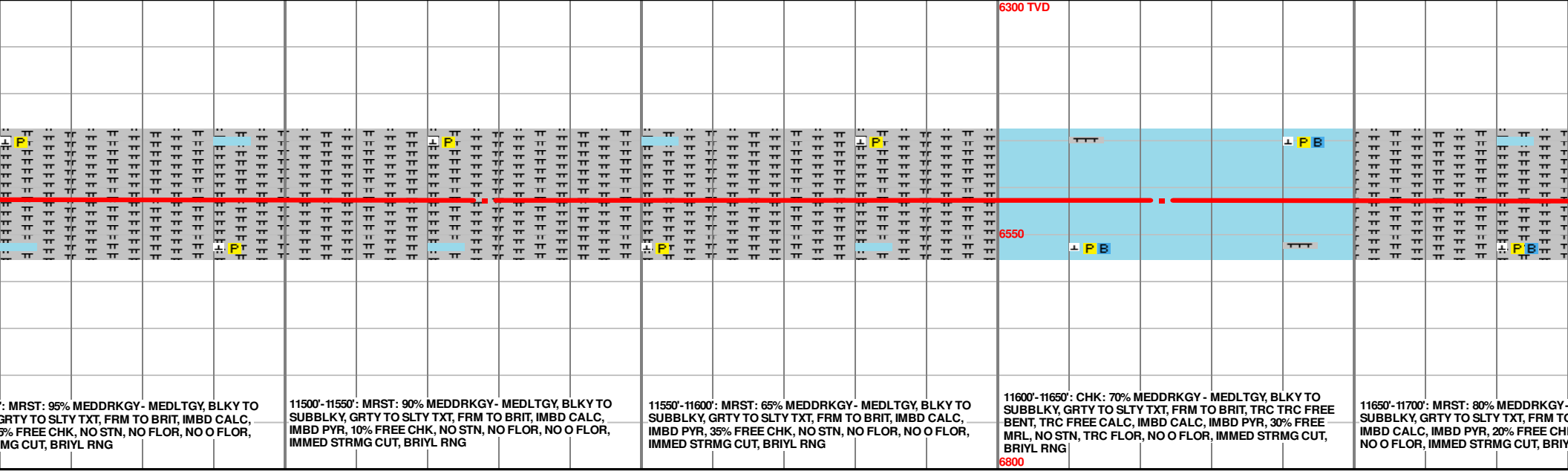
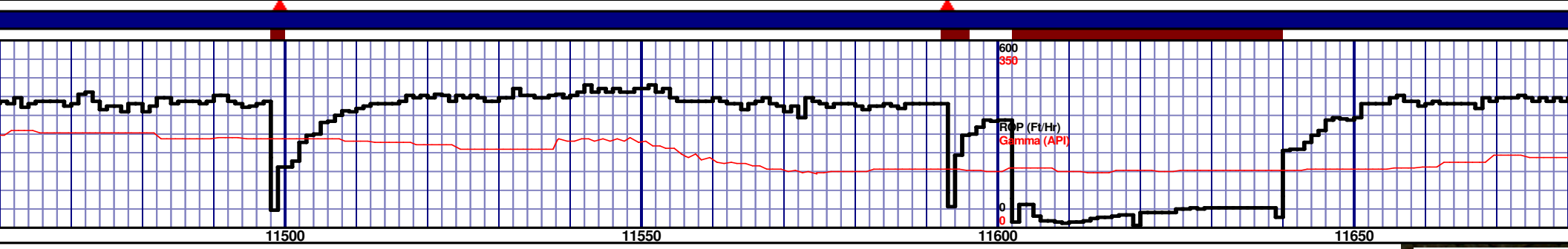
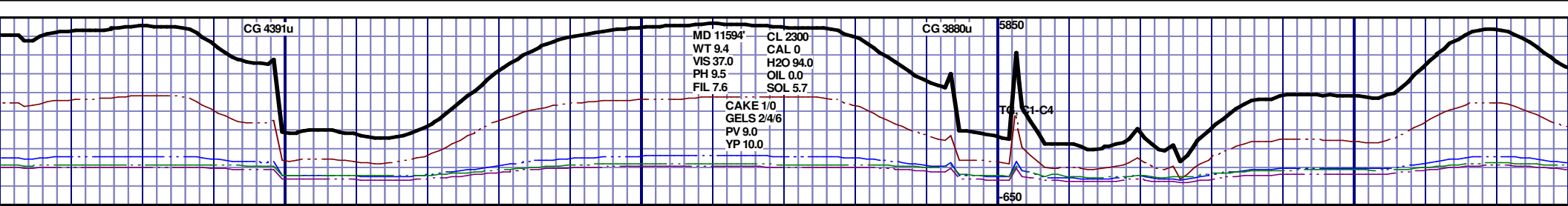
MD 10960 TVD 6514.24  
INC 90.12 AZ 268.82  
VS 4839.81





**NIOBRARA A MARL**  
11300' MD 6514' TVD

11250'-11300': CHK: 85% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE BENT, TRC FREE CALC, IMBD CALC, IMBD PYR, 15% FREE MRL, NO STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		11300'-11350': MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 30% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		11350'-11400': MRST: 95% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC FREE BENT, IMBD CALC, IMBD PYR, 5% FREE CHK, NO STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		11400'-11450': MRST: 95% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, IMBD PYR, 5% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG		11450'-11500': MRST: 95% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, IMBD PYR, 5% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG	
P B		P B		P B		P B		P B	



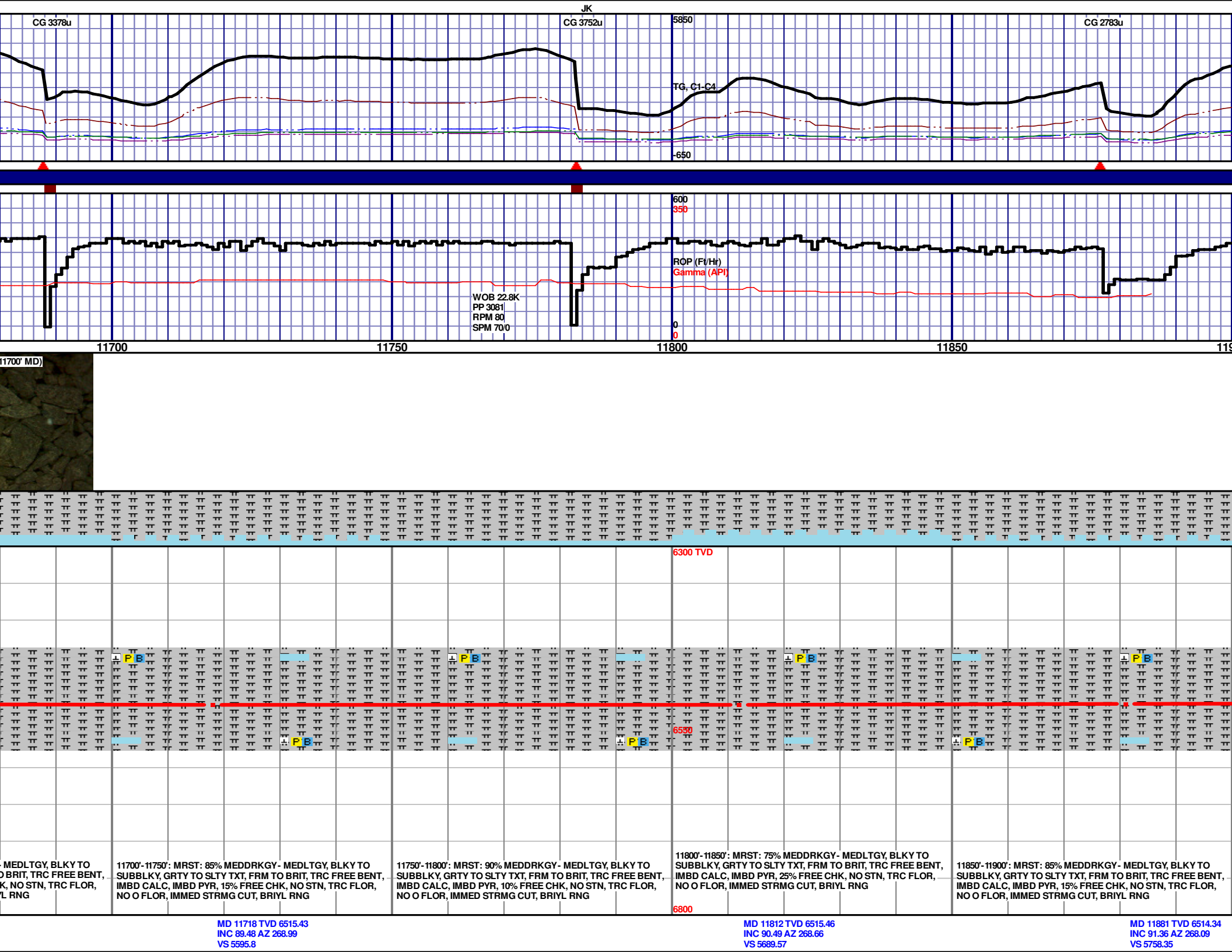
0' - 11500': MRST: 95% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, 10% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

11500' - 11550': MRST: 90% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, IMBD PYR, 10% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

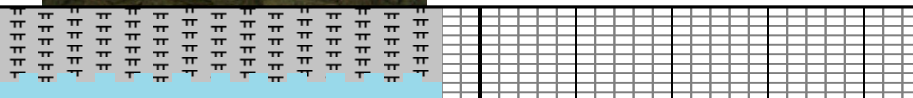
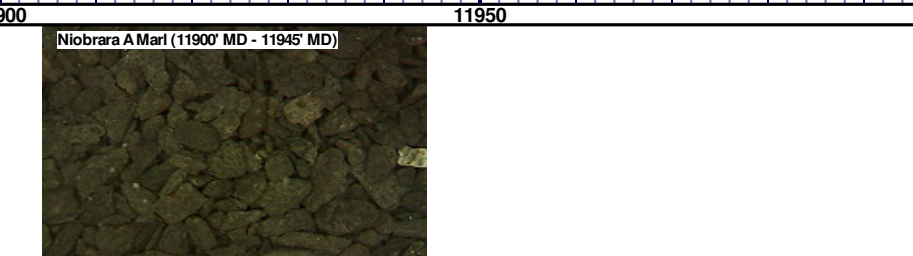
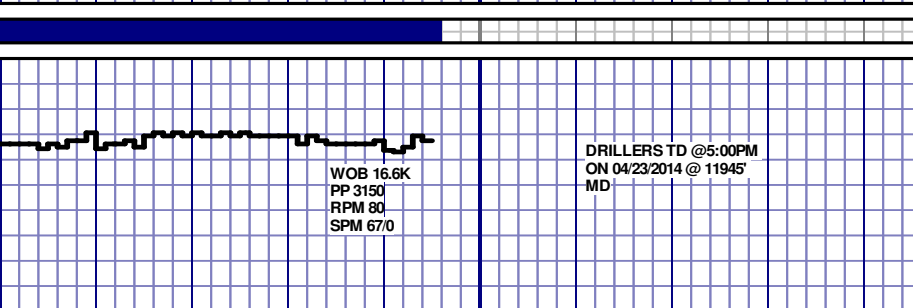
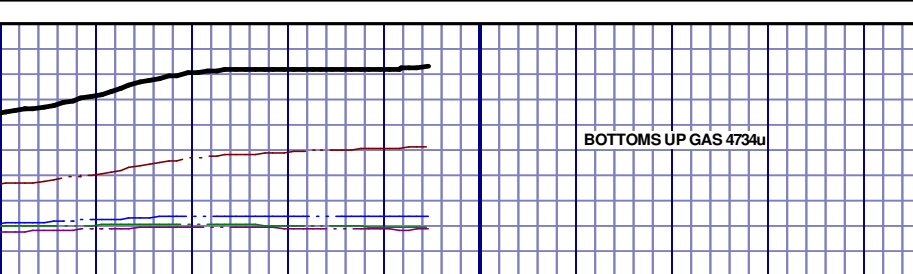
11550' - 11600': MRST: 65% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, IMBD PYR, 35% FREE CHK, NO STN, NO FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

11600' - 11650': CHK: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC TRC FREE BENT, TRC FREE CALC, IMBD CALC, IMBD PYR, 30% FREE MRL, NO STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

11650' - 11700': MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, IMBD CALC, IMBD PYR, 20% FREE CHK, NO STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG







TD @ 11945' MD

RELEASED ON 4/23/14

THANK YOU FROM  
HANNAH BLATCHFORD,  
JOE KLUMPSTRA,  
AND HORIZON WELL  
LOGGING, LLC

11900'-11945': MRST: 75% MEDDRKGY- MEDLTGY, BLKY  
TO SUBBLKY, GRTY TO SLTY TXT, FRM TO BRIT, TRC  
FREE BENT, IMBD CALC, IMBD PYR, 25% FREE CHK, NO  
STN, TRC FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL  
RNG