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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

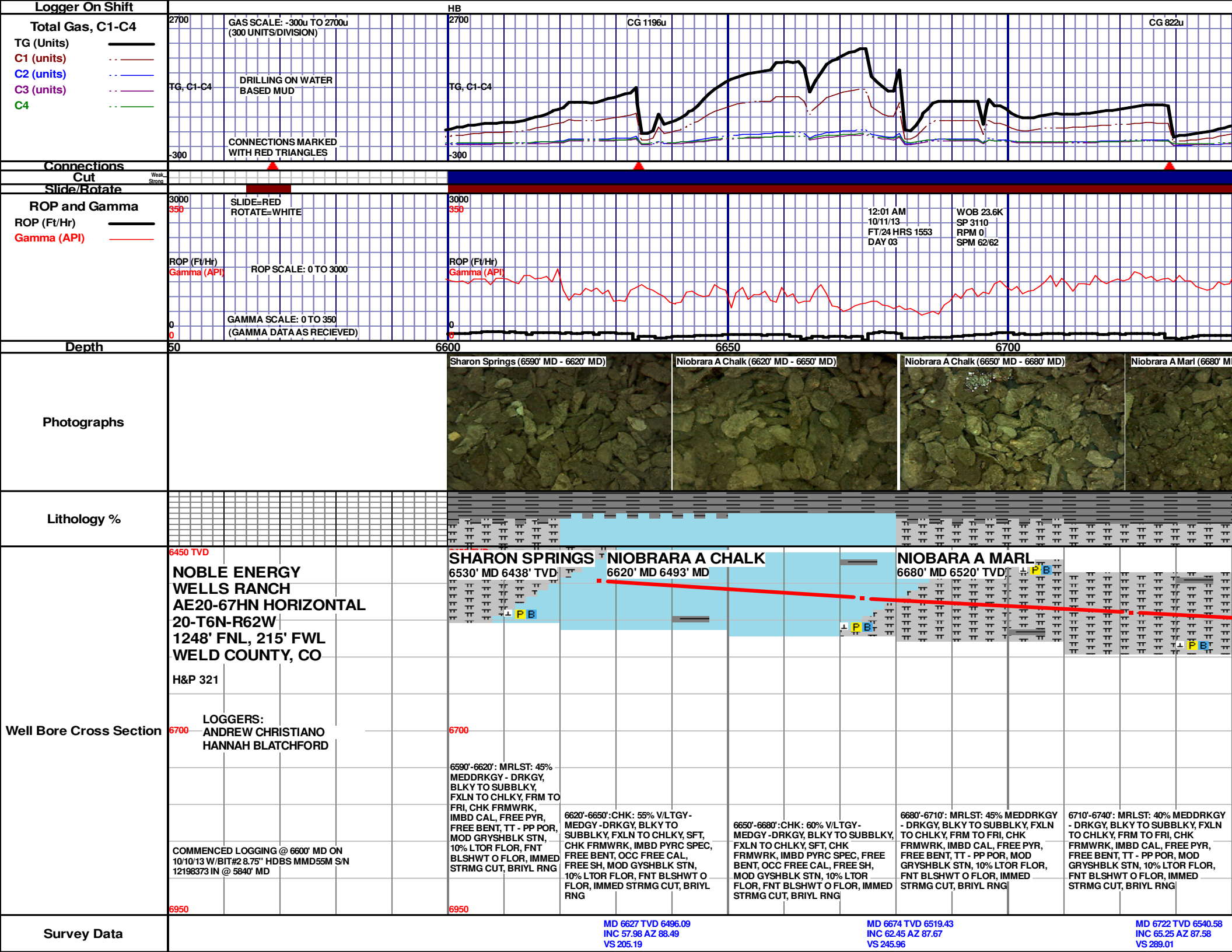
Logger: Andrew Christiano & Hannah Blatchford
Log Interval: 6600' MD to 10861' MD
Start Date: October 10, 2013
Release Date: October 14, 2013

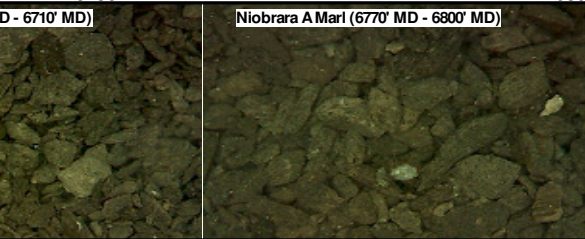
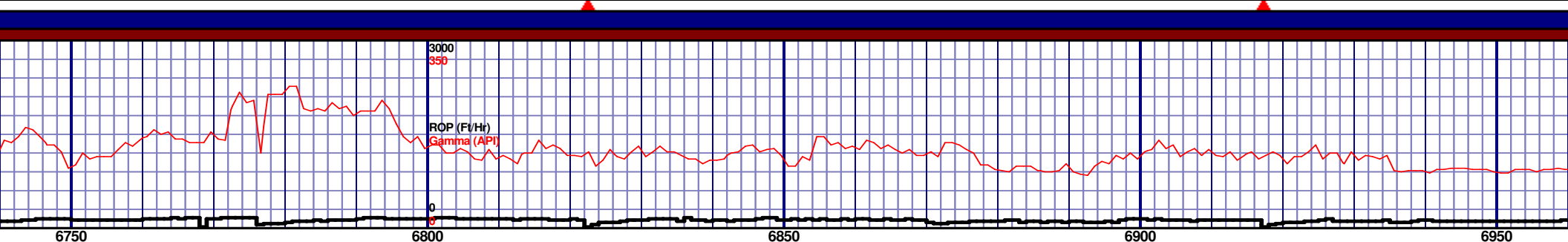
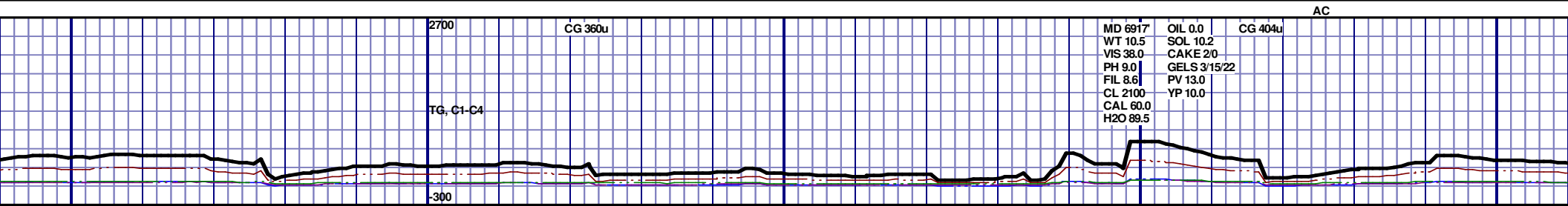
Well Information

Well Name: Wells Ranch
AE20-67-1HN Horizontal
Location: 20-T6N-R62W
1248' FNL, 215' FWL

County: Weld Co.
State: Colorado

Drilling Rig: H&P 321
Total Depth: 10861' MD
TD Date: October 13, 2013
Formation: Niobrara B Chalk
KB Elevation: 4871'
GR Elevation: 4841'
API Number: 05-123-37212-0000





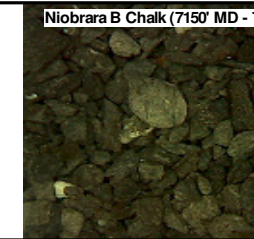
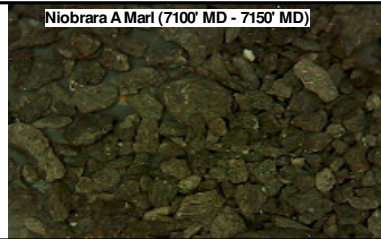
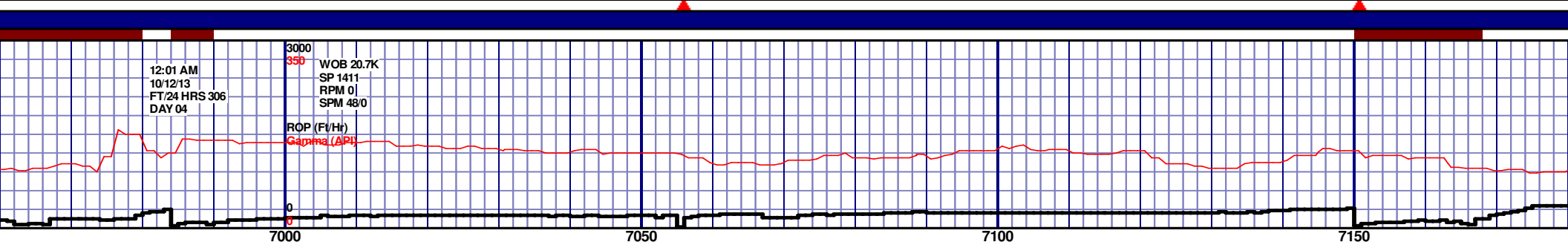
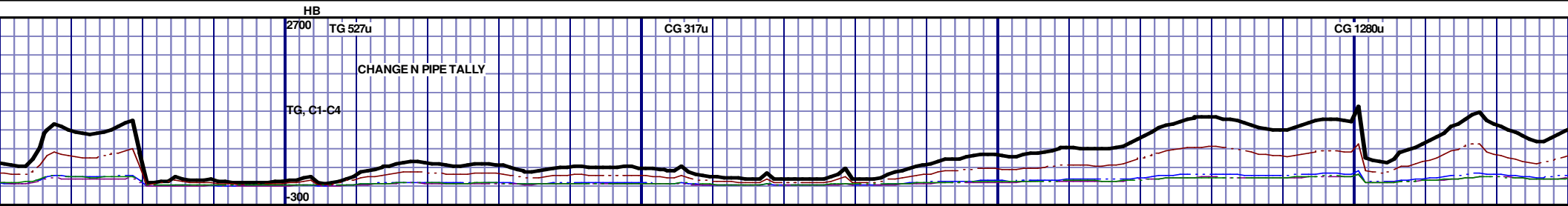
6450 TVD									
6700									
6950									
6740'-6770': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6770'-6800': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6800'-6830': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6830'-6860': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6860'-6890': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6890'-6920': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6920'-6950': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6950'-6980': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									

MD 6768 TVD 6557.68
INC 71.09 AZ 88.42
VS 331.67

MD 6816 TVD 6572.18
INC 73.74 AZ 89.82
VS 377.42

MD 6863 TVD 6583.97
INC 77.2 AZ 89.58
VS 422.91

MD 6926 TVD 6594.34
INC 83.85 AZ 88.55
VS 485

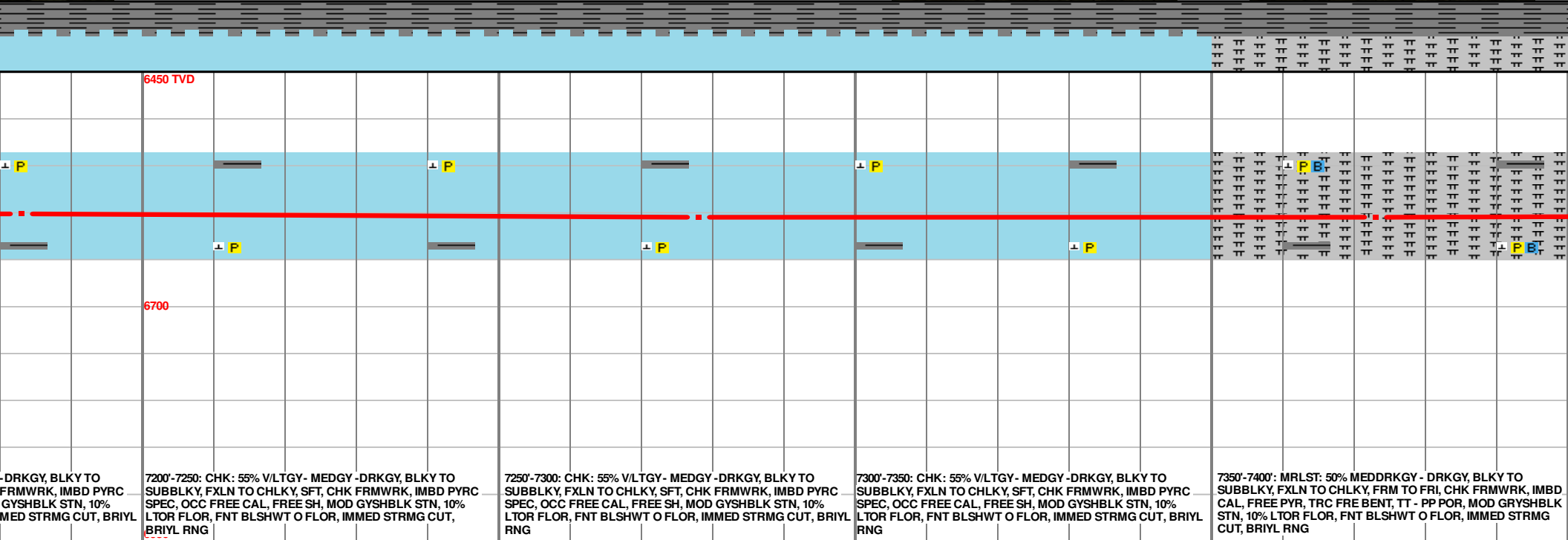
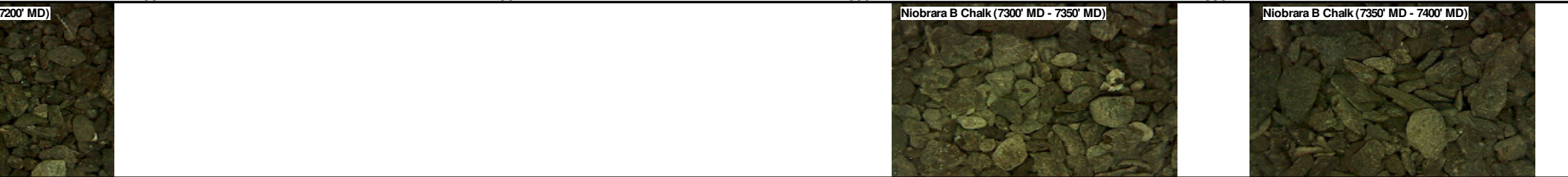
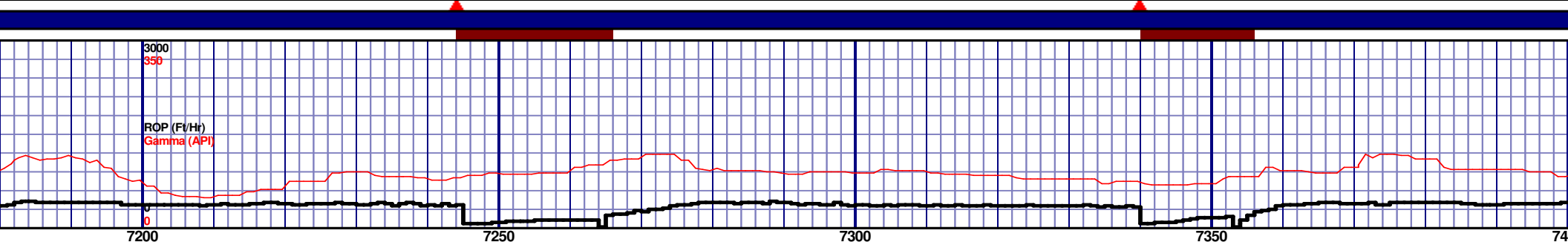
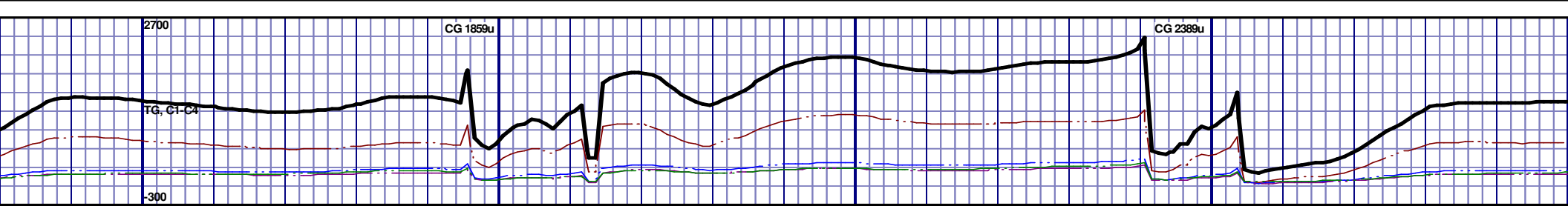


TOOH @ 7:00AM ON 10/11/13 @ 6980' MD FOR INTERMEDIATE CASING OPERATIONS. TIH @ 12:45PM ON 10/12/13. RESUMED DRILLING @ 5:30PM ON 10/12/13 W/ BIT #3 6.125" OTHER PLS 51325U S/N S08668 IN @ 6990' MD.									
SWITCHED TO 50' SAMPLE INTERVAL.									
MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
6980'-7050': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
7050'-7100': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
7100'-7150': MRLST: 50% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, IMBD CAL, FREE PYR, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
7150'-7200': CHK: 55% VLTGY - MEDGY SUBBLKY, FXLN TO CHLKY, SFT, CHK SPEC, OCC FREE CAL, FREE SH, MOD LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									

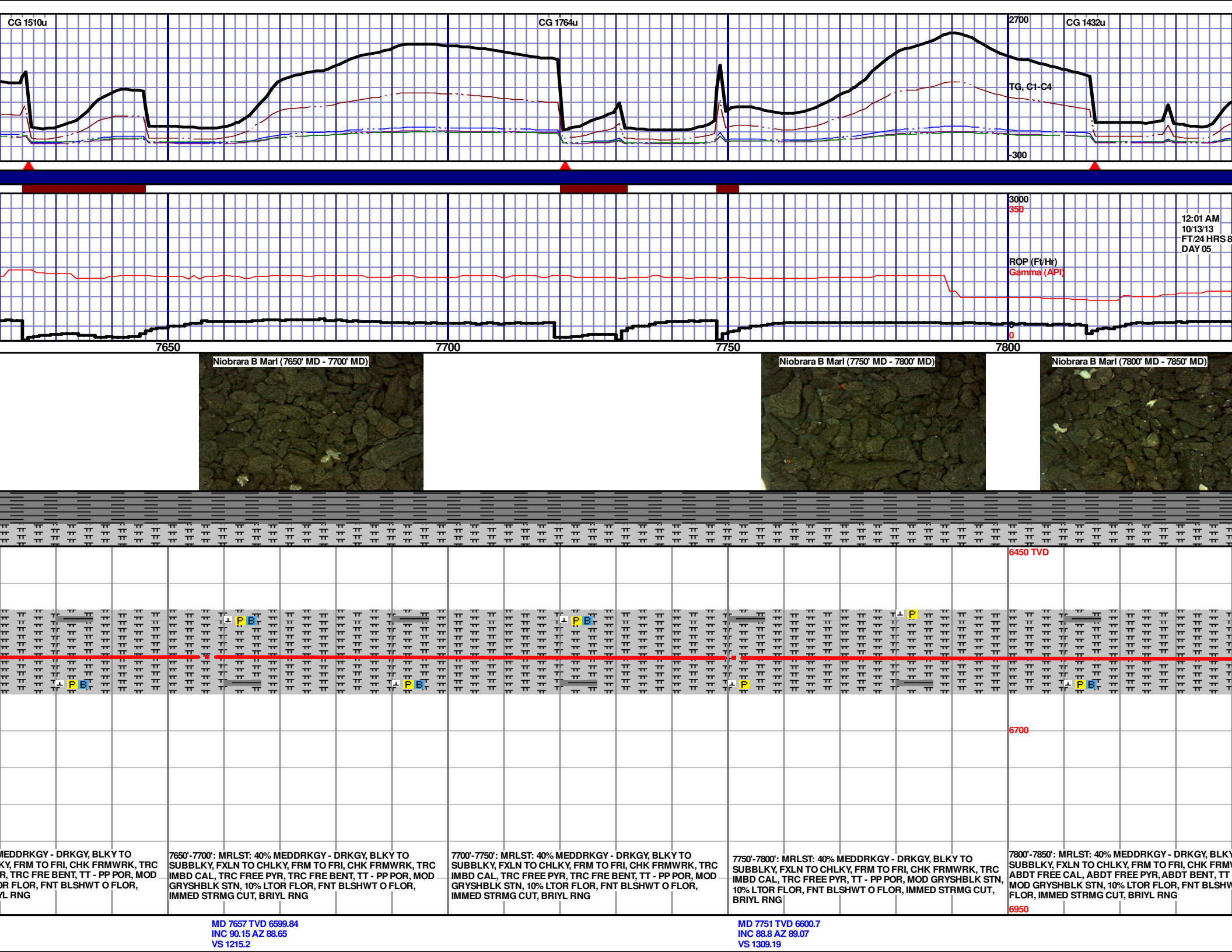
NIOBRARA B CHALK
7150' MD 6601' TVD

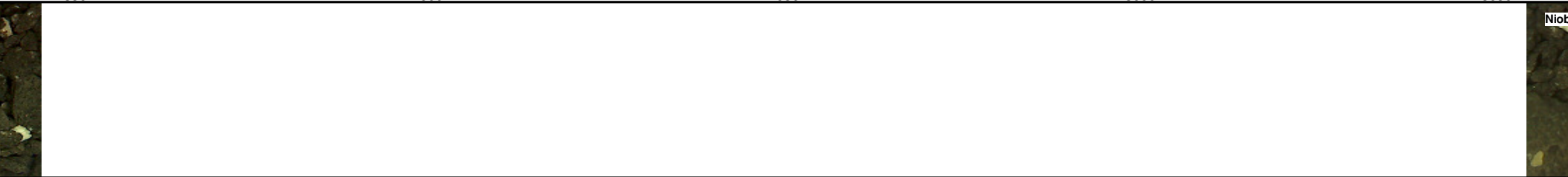
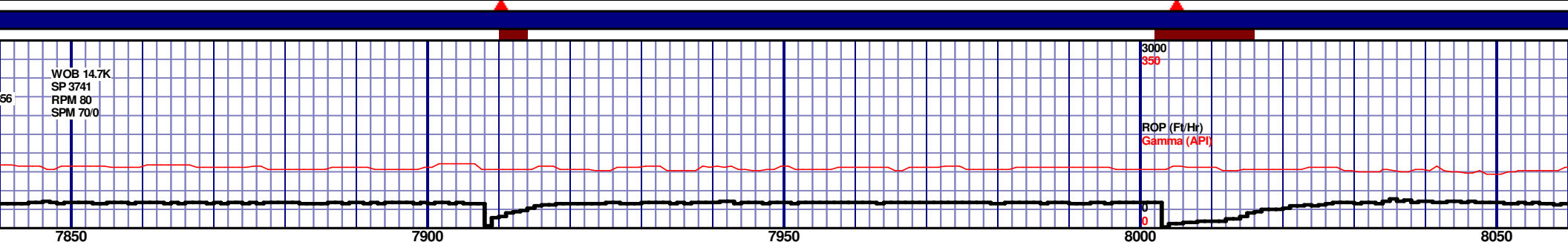
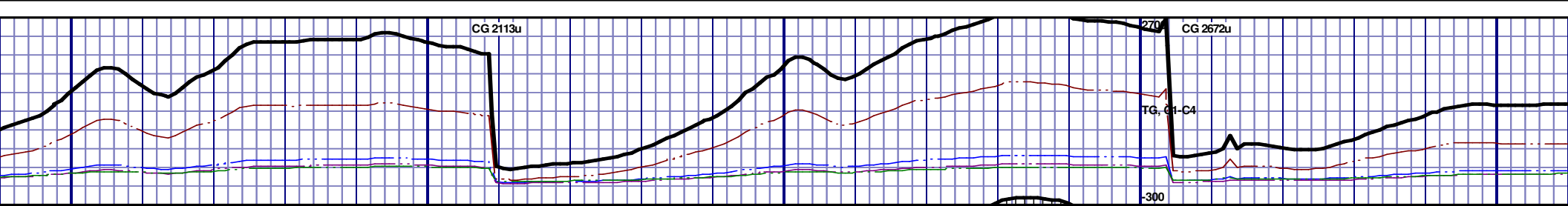
MD 7003 TVD 6598.67
INC 89.69 AZ 86.96
VS 561.8

MD 7088 TVD 6599.47
INC 89.23 AZ 85.66
VS 646.64

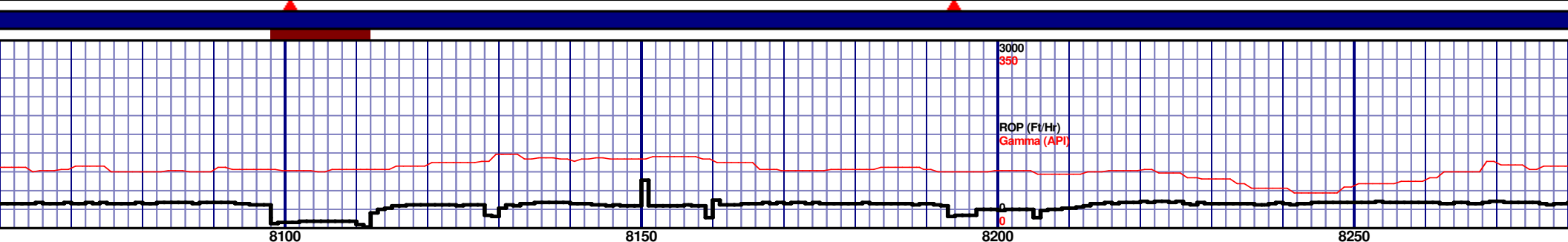
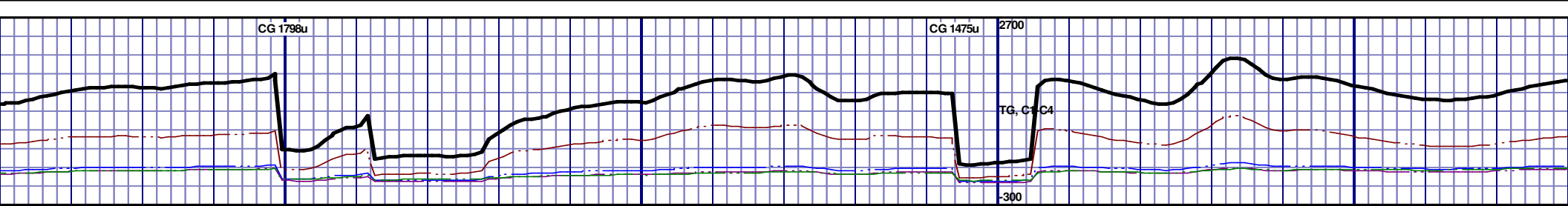


MD 7183 TVD 6601.8 INC 87.97 AZ 86.94 VS 741.43	MD 7278 TVD 6604.43 INC 88.85 AZ 88.65 VS 836.33	MD 7373 TVD 6604.8 INC 90.71 AZ 89.03 VS 931.32
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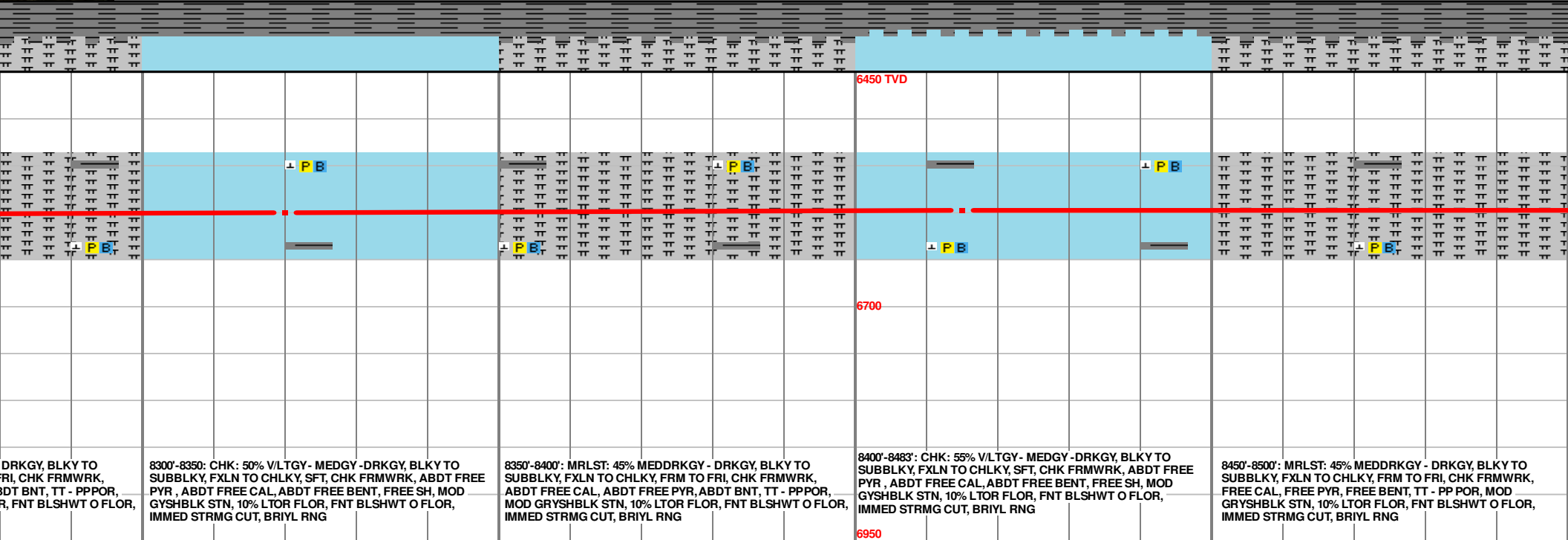
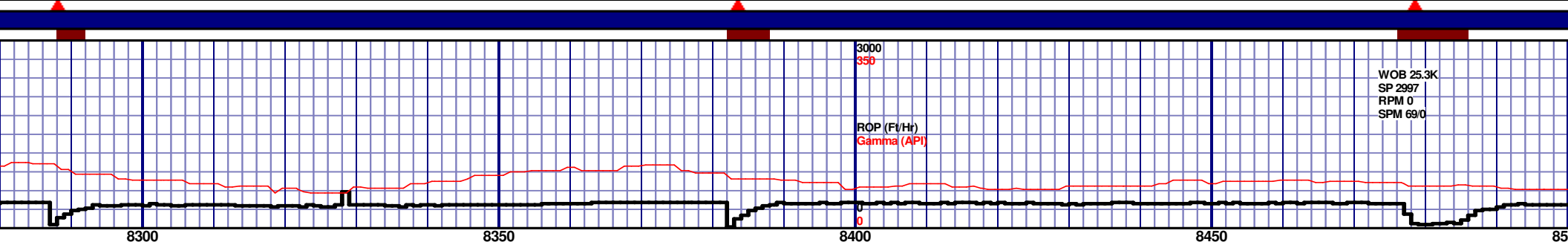
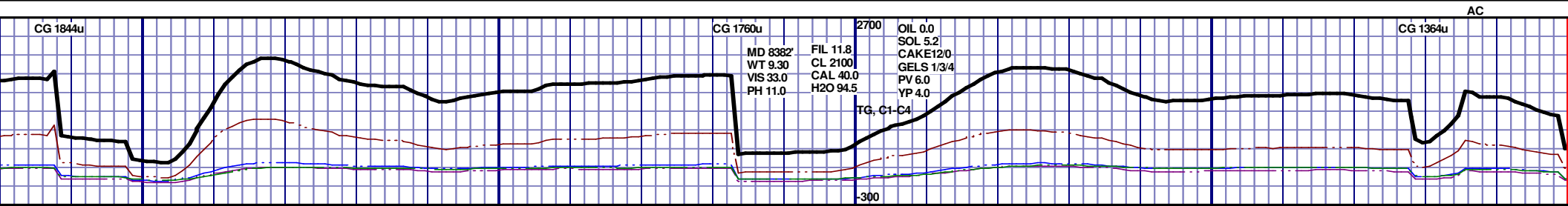
7850'-7900': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					7900'-7950': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					7950'-8000': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					8000'-8050': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD FREE CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					8050'-8100': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD FREE CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				
7850'-7900': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					7900'-7950': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					7950'-8000': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD IMBD CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					8000'-8050': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD FREE CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					8050'-8100': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABTD FREE CAL, ABTD FREE PYR, ABTD BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				



MRLST: 40% MEDDRKGY - DRKGY, BLKY TO FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, CAL, ABDT FREE PYR, ABDT BNT, TT - PPPOR, IBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, MG CUT, BRIYL RNG				8100'-8150': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABDT FREE CAL, ABDT FREE PYR, ABDT BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				8150'-8200': MRLST: 40% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABDT FREE CAL, ABDT FREE PYR, ABDT BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				8200'-8250': CHK: 55% VLTGY- MEDGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, ABDT FREE PYR, ABDT FREE CAL, ABDT FREE BENT, FREE SH, MOD GYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				8250'-8300': MRLST: 45% MEDDRKGY - SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, ABDT FREE CAL, ABDT FREE PYR, ABDT BNT, TT - PPPOR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG			
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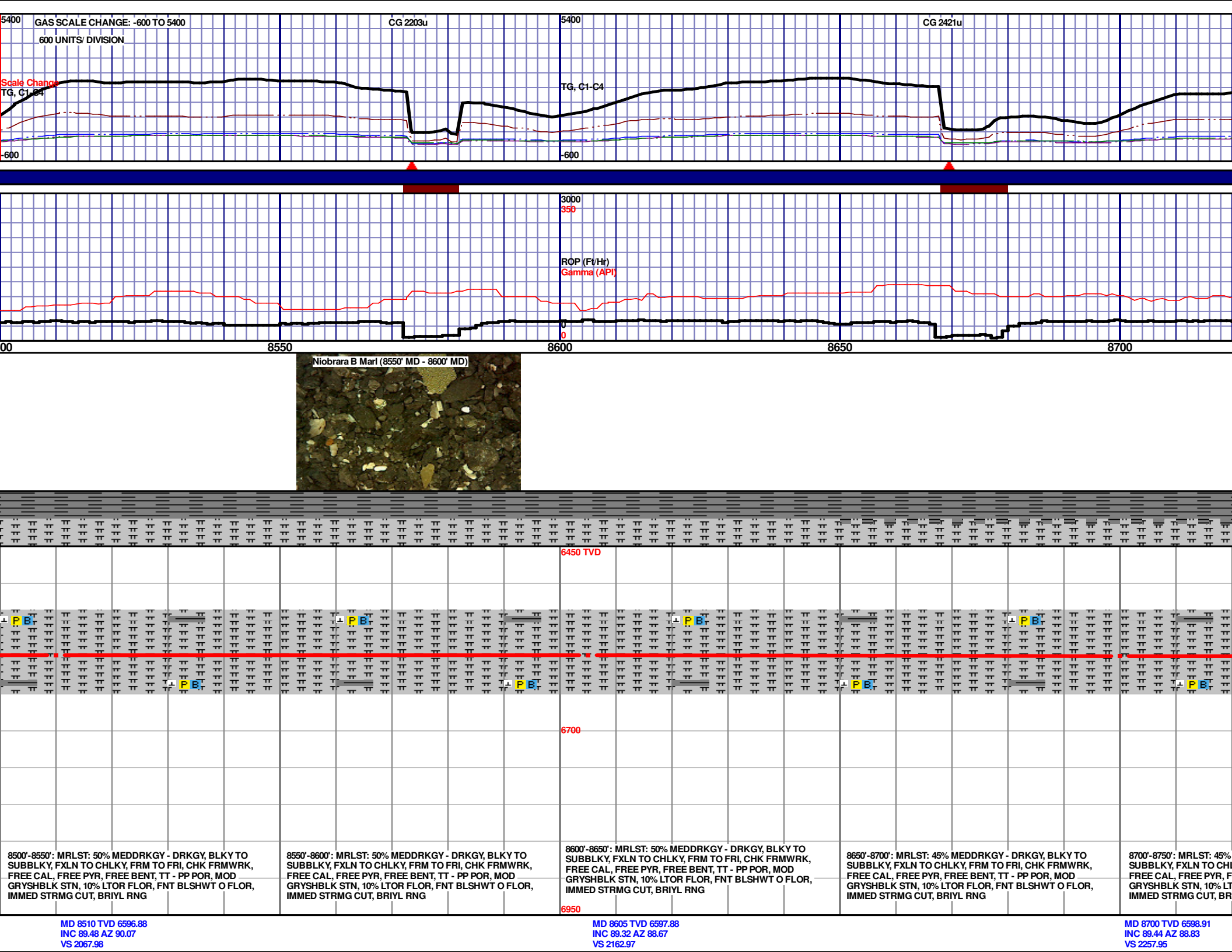
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VS 1689.09

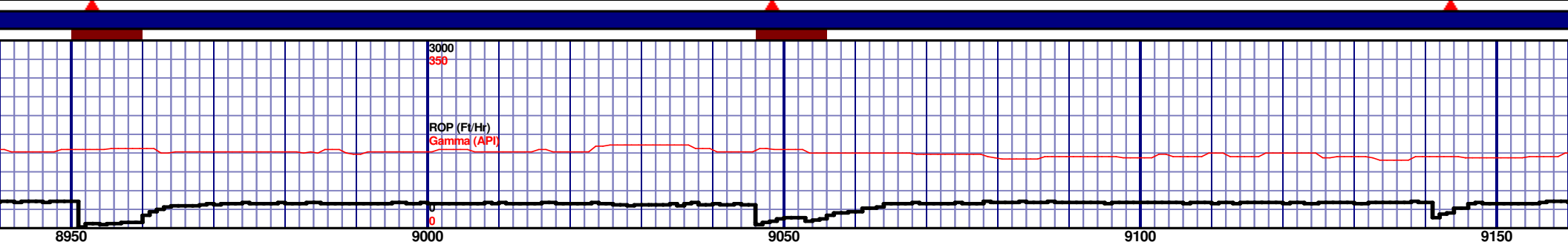
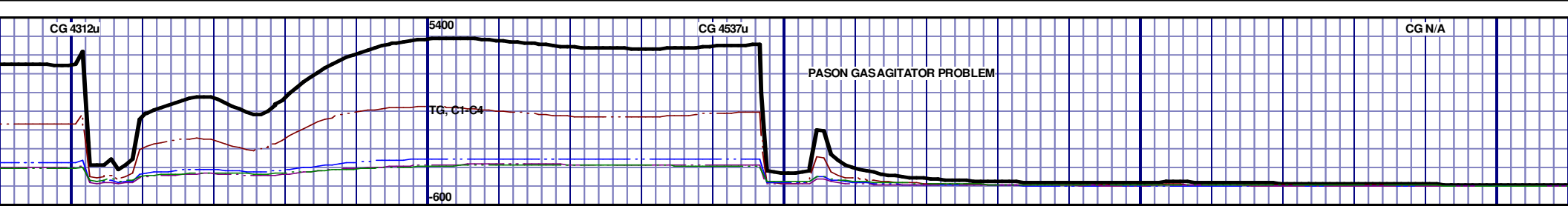
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INC 91.61 AZ 90.31
VS 1763.05



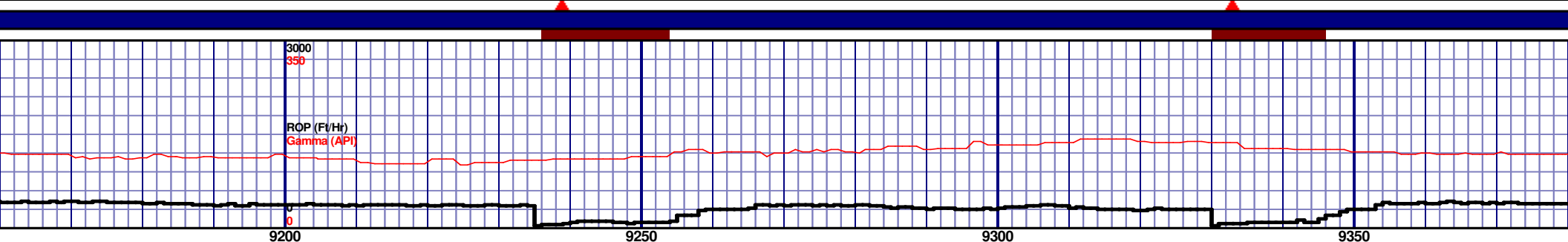
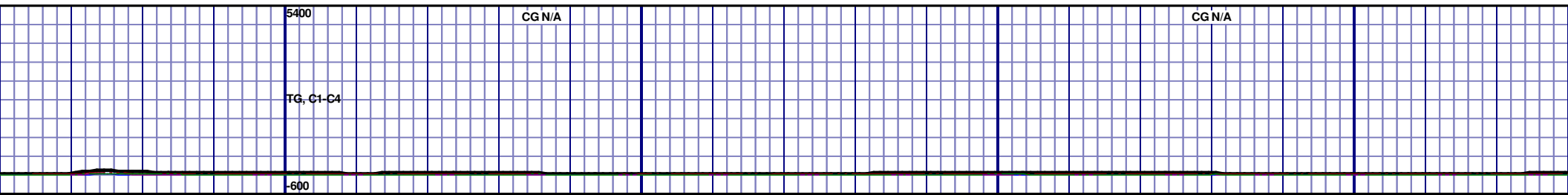
MD 8320 TVD 6600.06
INC 91.27 AZ 89.55
VS 1878.02

MD 8415 TVD 6597.73
INC 91.54 AZ 89.51
VS 1972.99

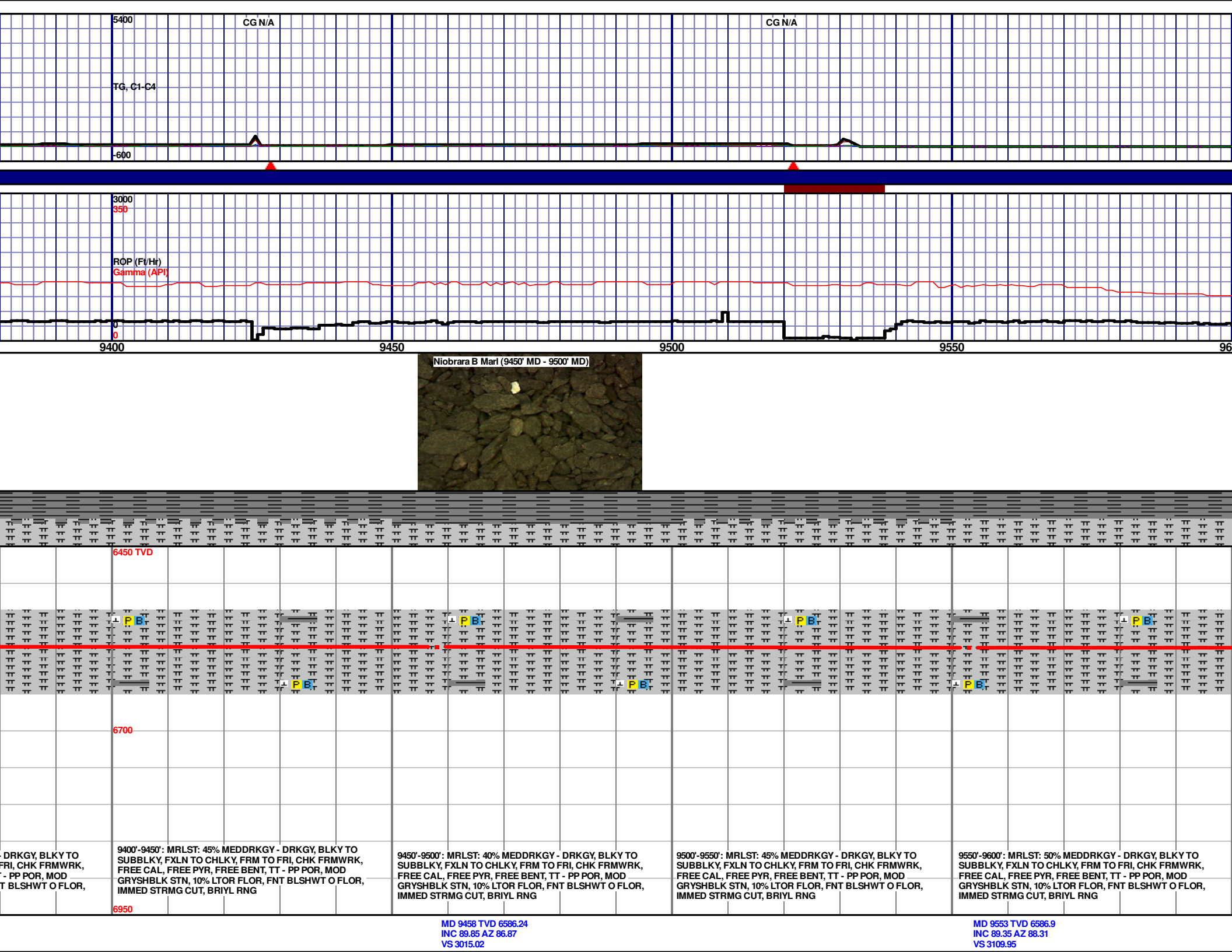


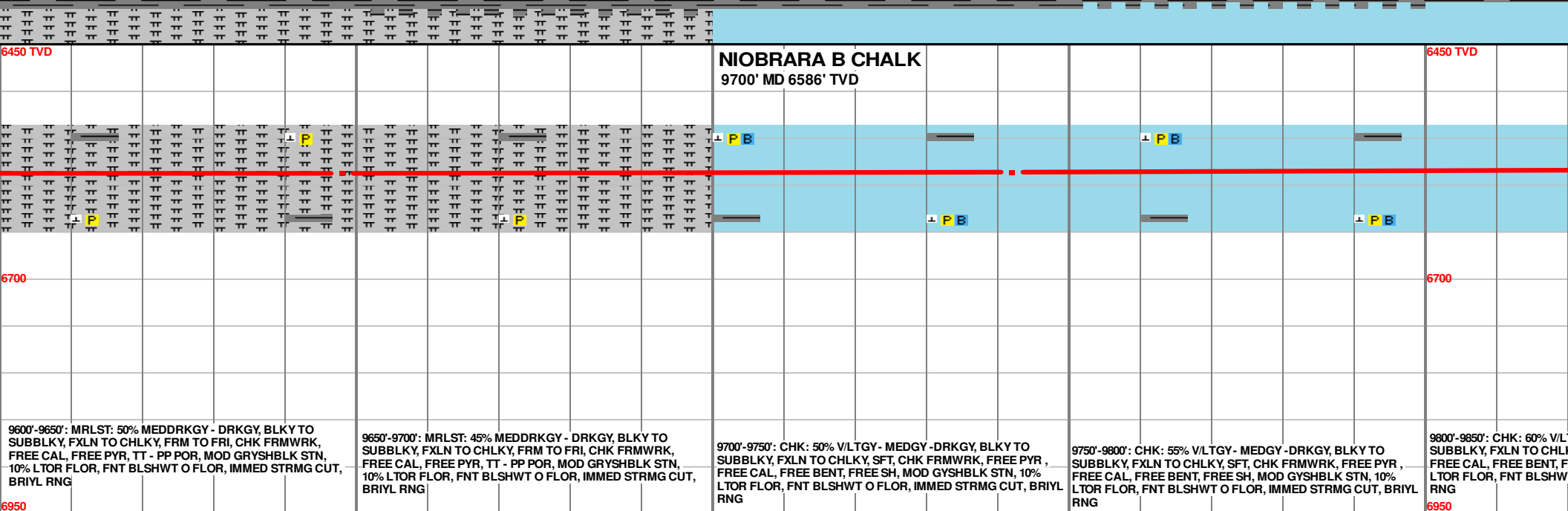
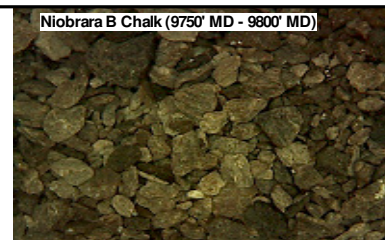
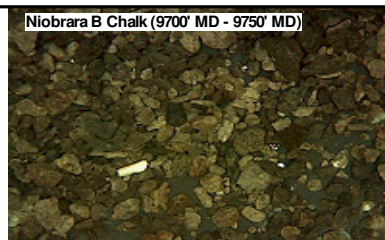
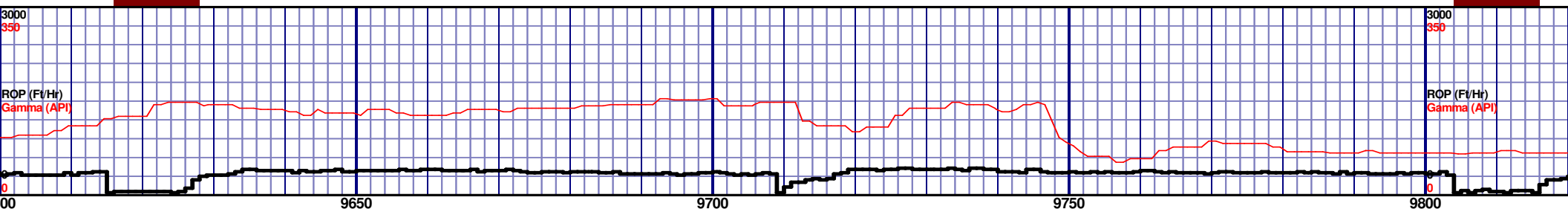


8950'-9000': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					9000'-9050': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					9050'-9100': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					9100'-9150': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG					9150'-9200': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG				
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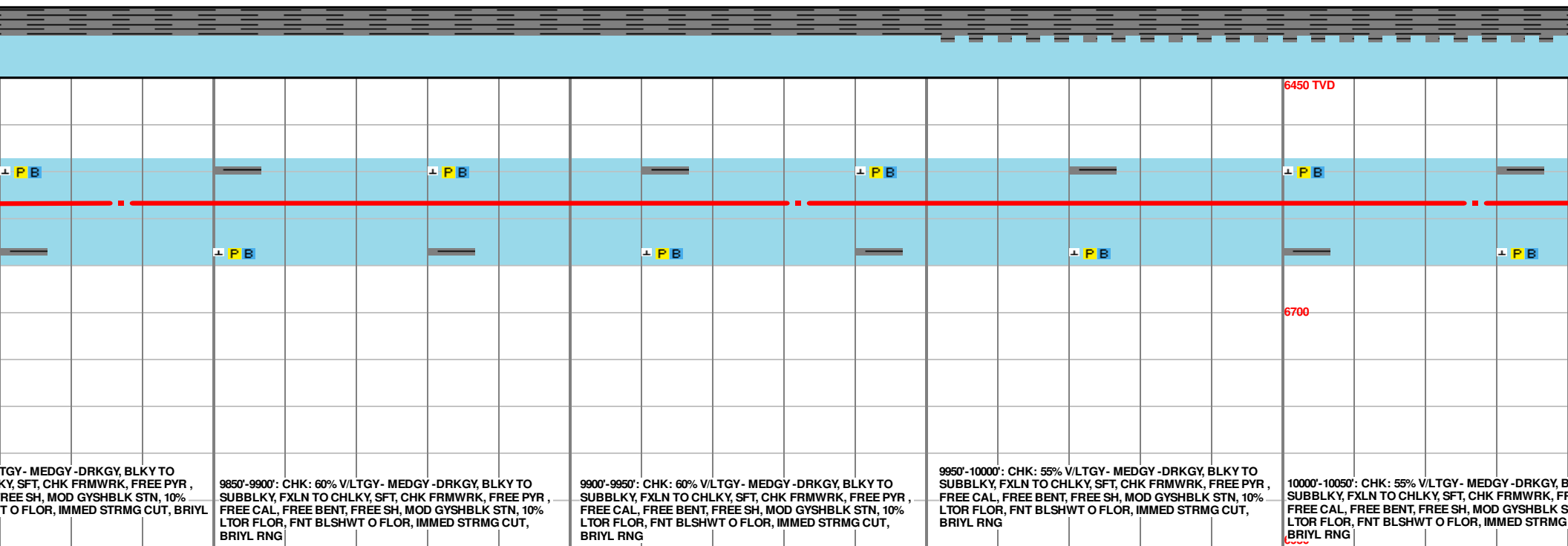
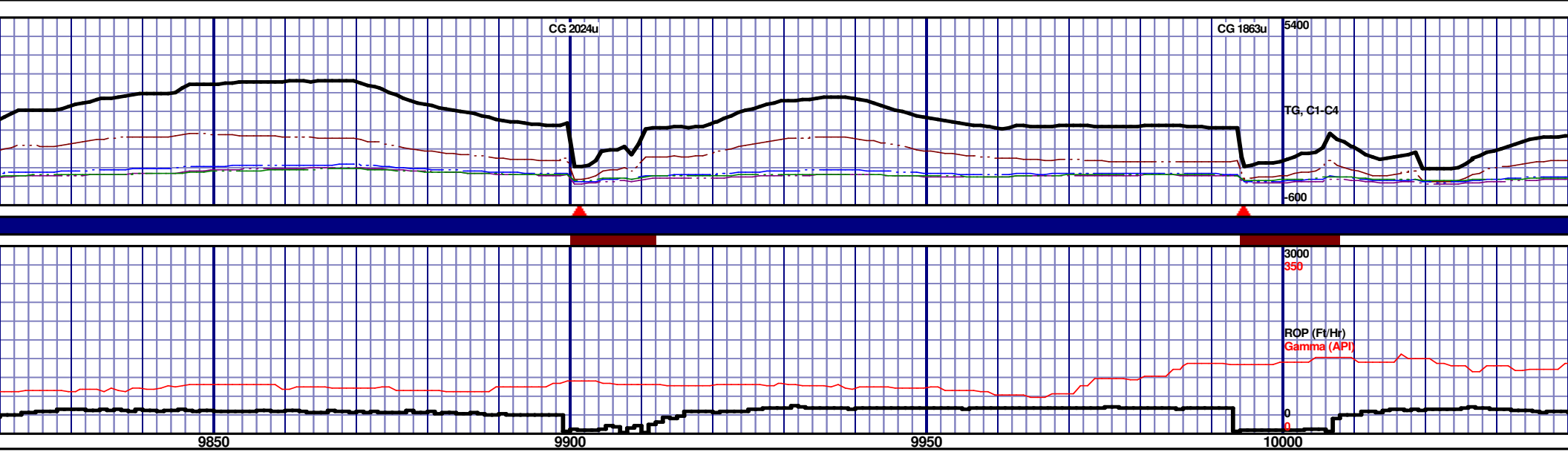
MRLST: 45% MEDDRKGY - DRKGY, BLKY TO FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE PYR, FREE BENT, TT - PP POR, MOD STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, MG CUT, BRIYL RNG									
9200'-9250': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
9250'-9300': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
9300'-9350': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									
9350'-9400': MRLST: 45% MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRM TO FRI, CHK FRMWRK, FREE CAL, FREE PYR, FREE BENT, TT - PP POR, MOD GRYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG									





MD 9648 TVD 6586.98
INC 90.56 AZ 88.88
VS 3204.93

MD 9742 TVD 6585.68
INC 91.02 AZ 88.51
VS 3298.9

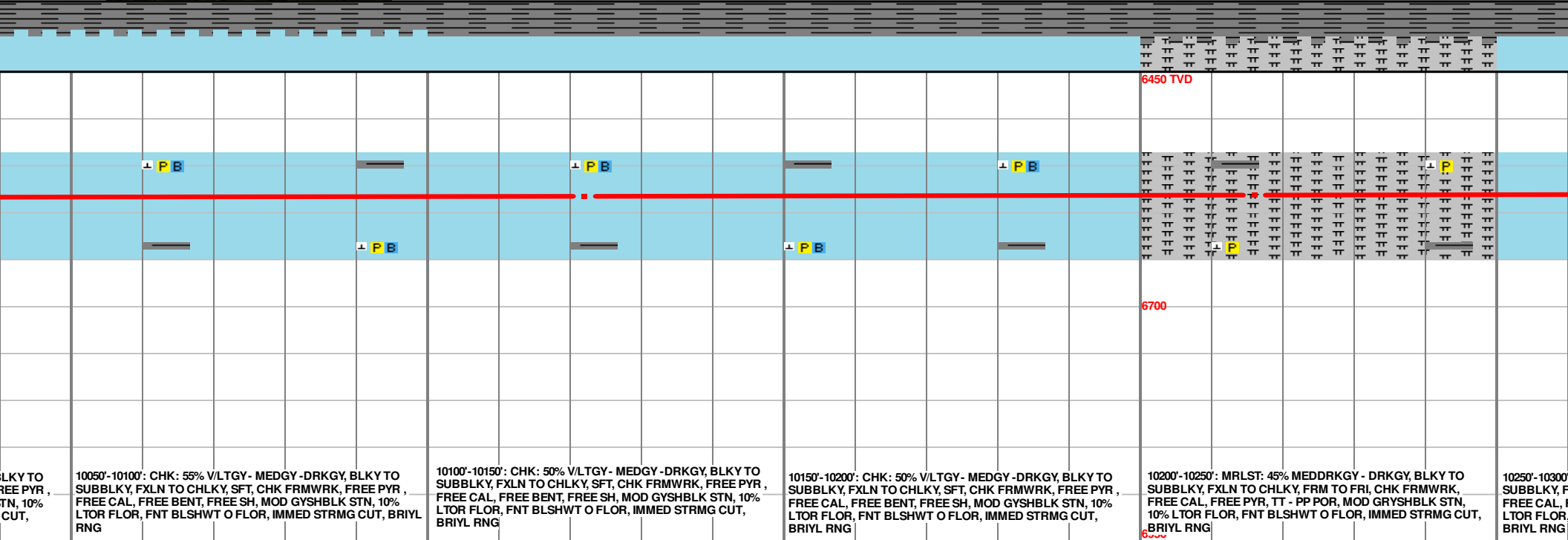
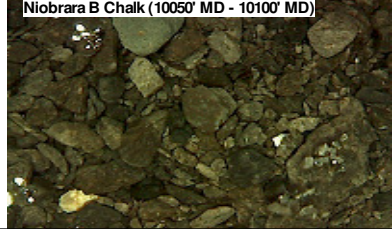
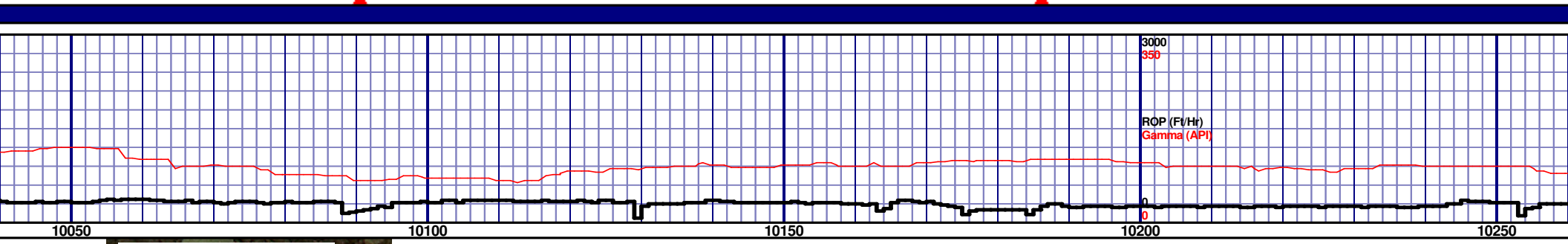
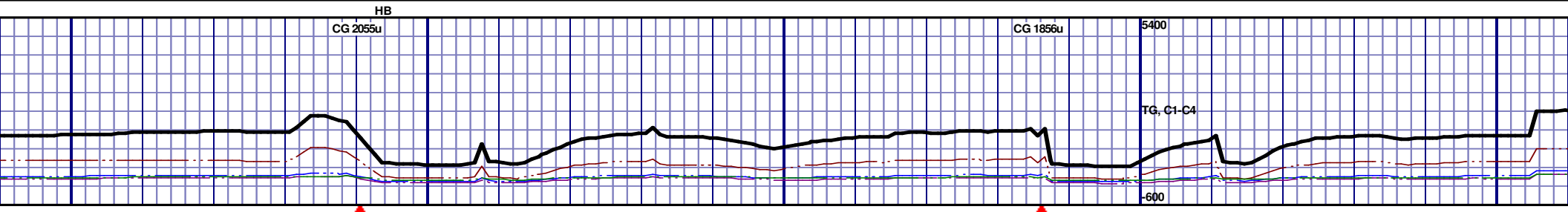


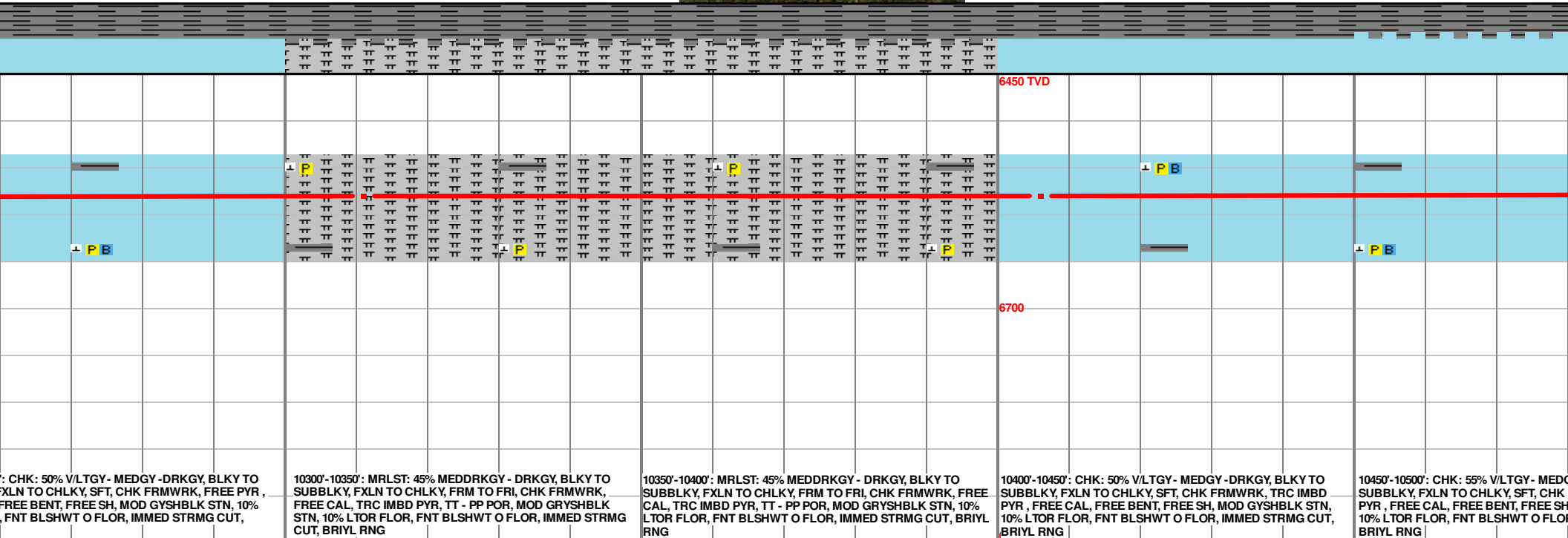
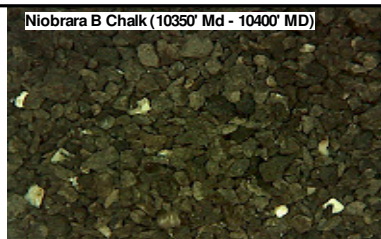
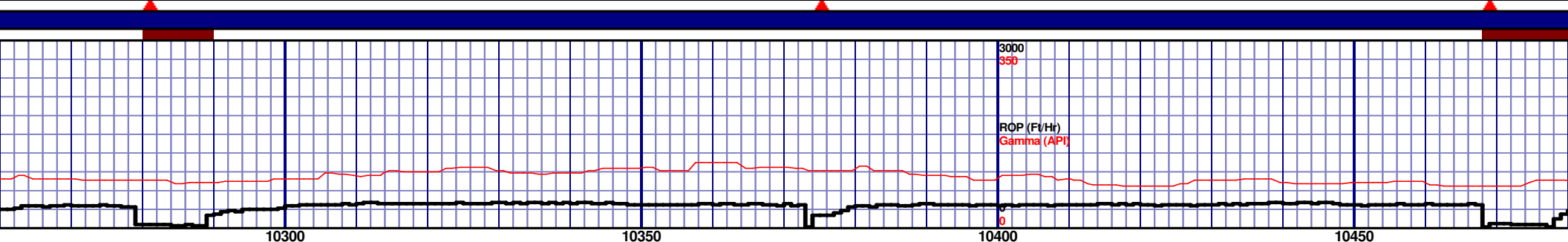
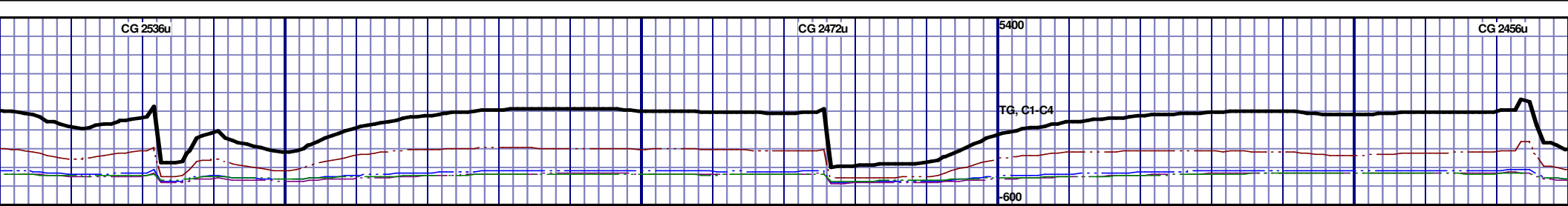
9850'-9900': CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWK, FREE PYR, FREE CAL, FREE BENT, FREE SH, MOD GYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

9900'-9950': CHK: 60% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWK, FREE PYR, FREE CAL, FREE BENT, FREE SH, MOD GYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

9950'-10000': CHK: 55% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWK, FREE PYR, FREE CAL, FREE BENT, FREE SH, MOD GYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG

10000'-10050': CHK: 55% V/LTGY - MEDGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWK, FREE PYR, FREE CAL, FREE BENT, FREE SH, MOD GYSHBLK STN, 10% LTOR FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, BRIYL RNG





MD 10311 TVD 6579.61
INC 90.22 AZ 87.92
VS 3867.79

MD 10406 TVD 6579.59
INC 89.81 AZ 87.8
VS 3962.74

