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fax 866.534.4559

WWW.HZMUD.COM/25

Customer Information

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

Geologist: Holly Duncan
Noble Energy Inc.

Mud Logging Details

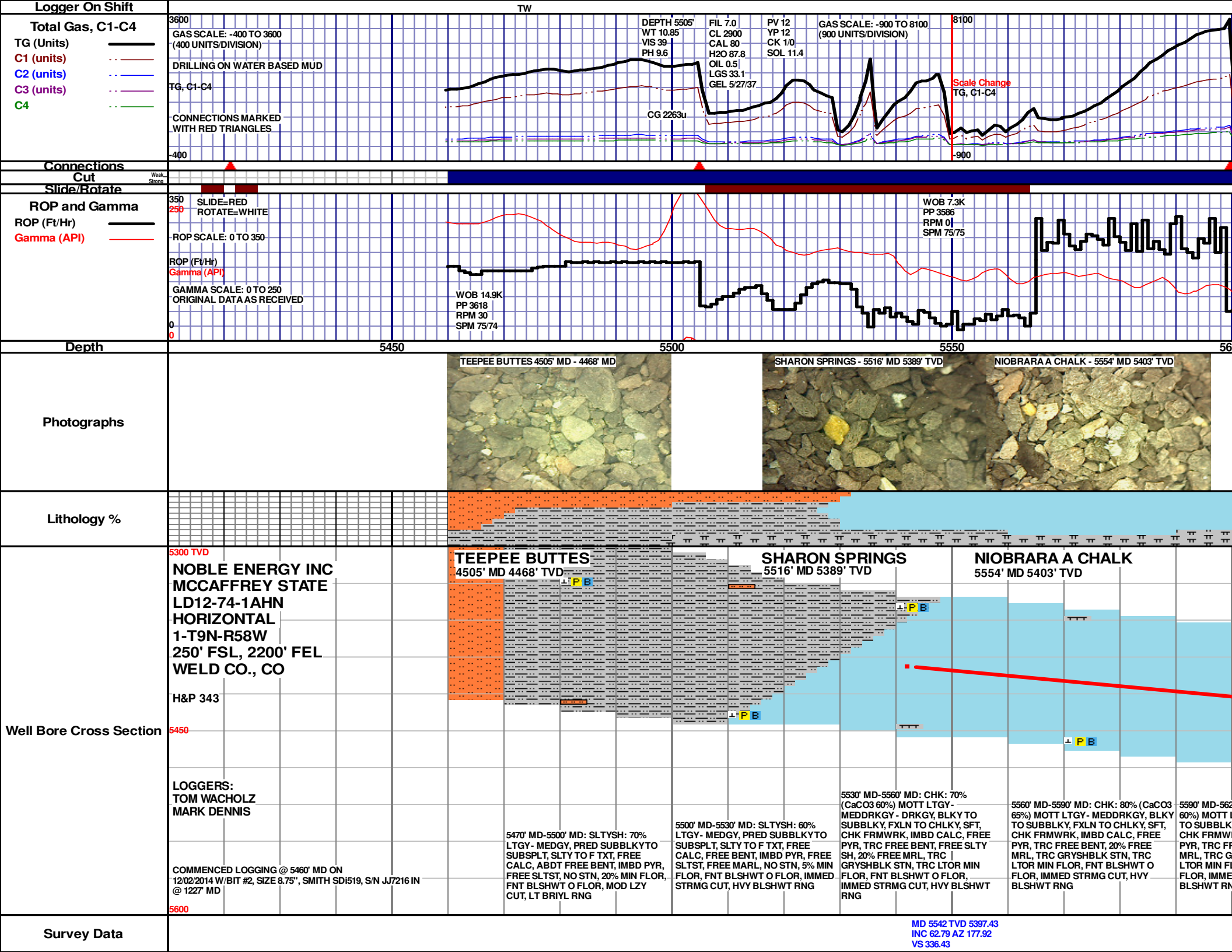
Logger: Tom Wacholz &
Mark Dennis
Log Interval: 5460' MD to TBD
Start Date: December 2, 2014
Release Date: December 5, 2014

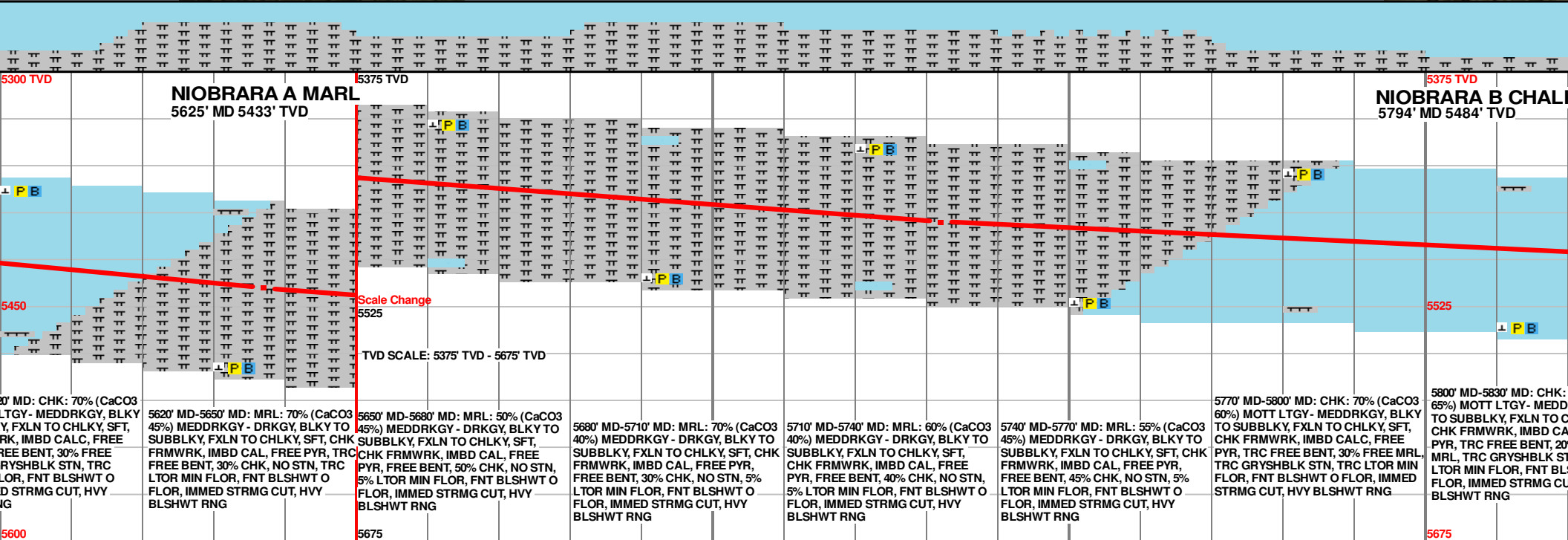
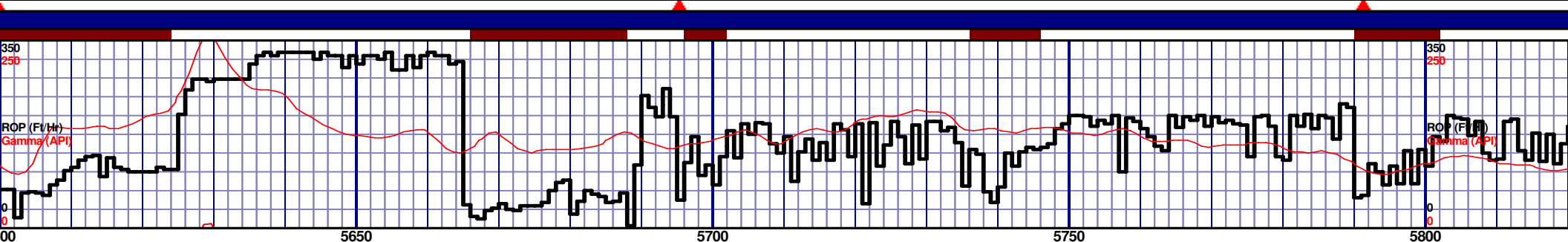
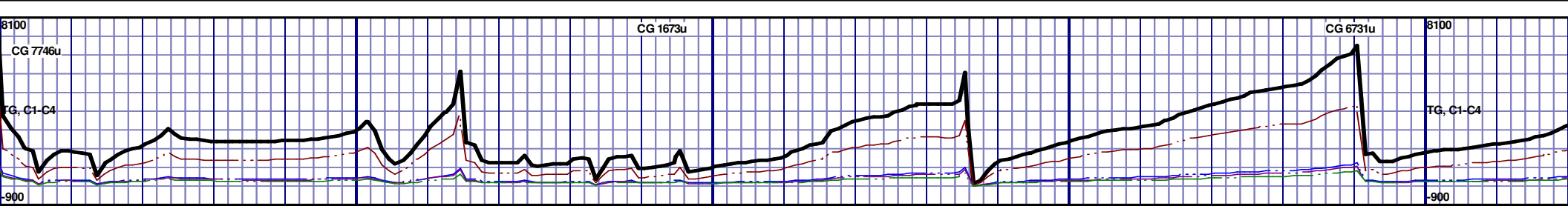
Well Information

Well Name: McCaffrey State
LD12-74-1AHN Horizontal
Location: 1-T9N-R58W
250' FSL, 2200' FEL

County: Weld
State: Colorado

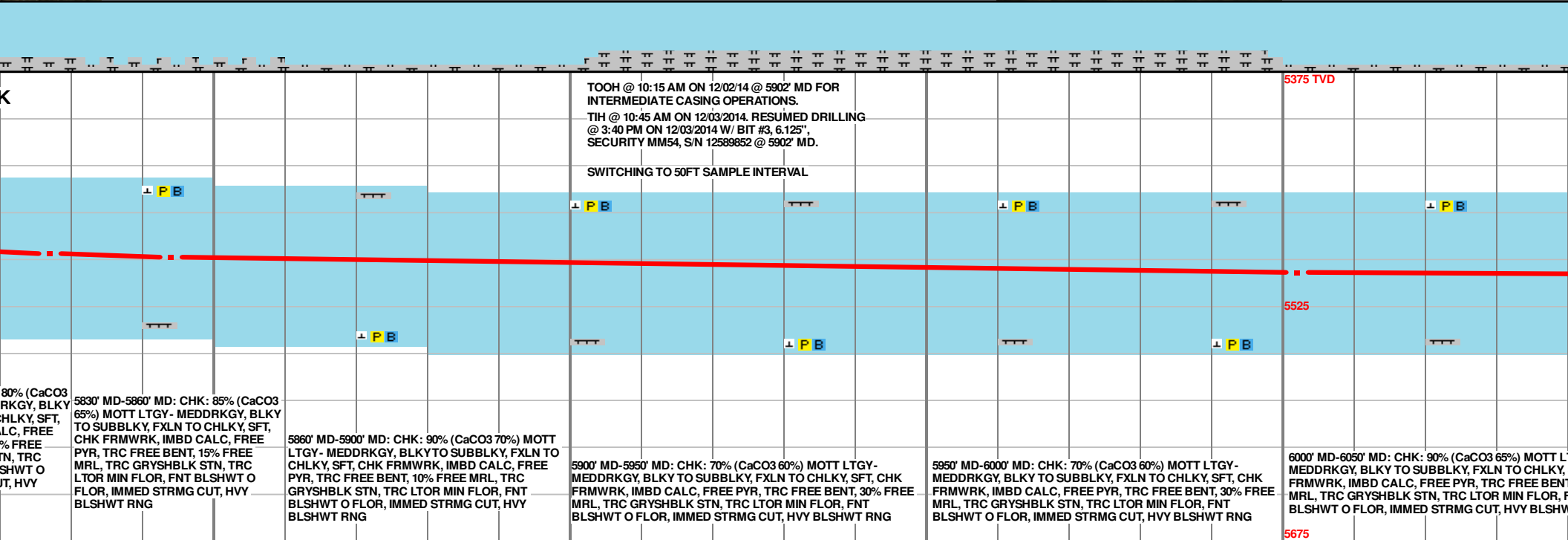
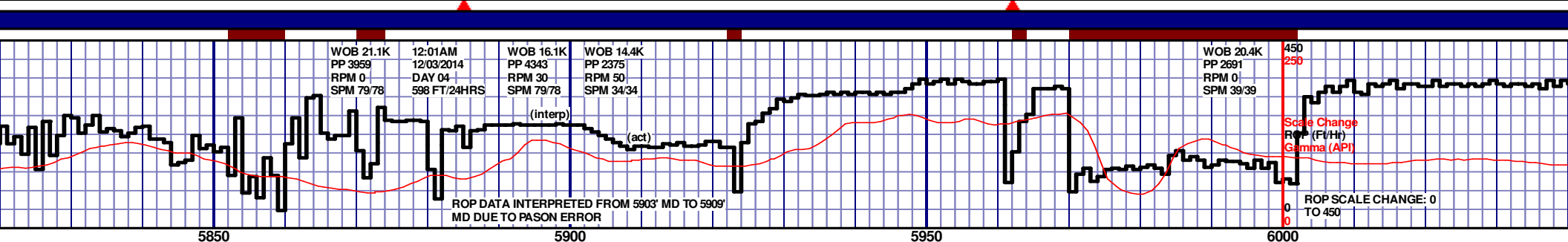
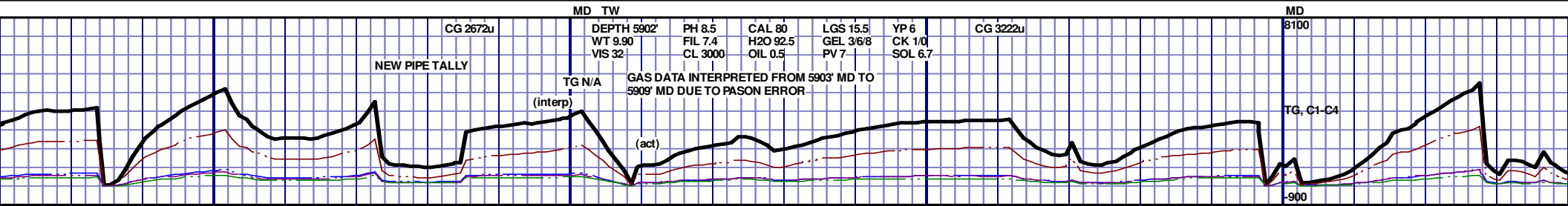
Drilling Rig: H&P 343
Total Depth: 10391' MD
TD Date: December 5, 2014
Formation: Niobrara B Chalk
KB Elevation: 4657'
GR Elevation: 4633'
API Number: 05-123-39672-0000





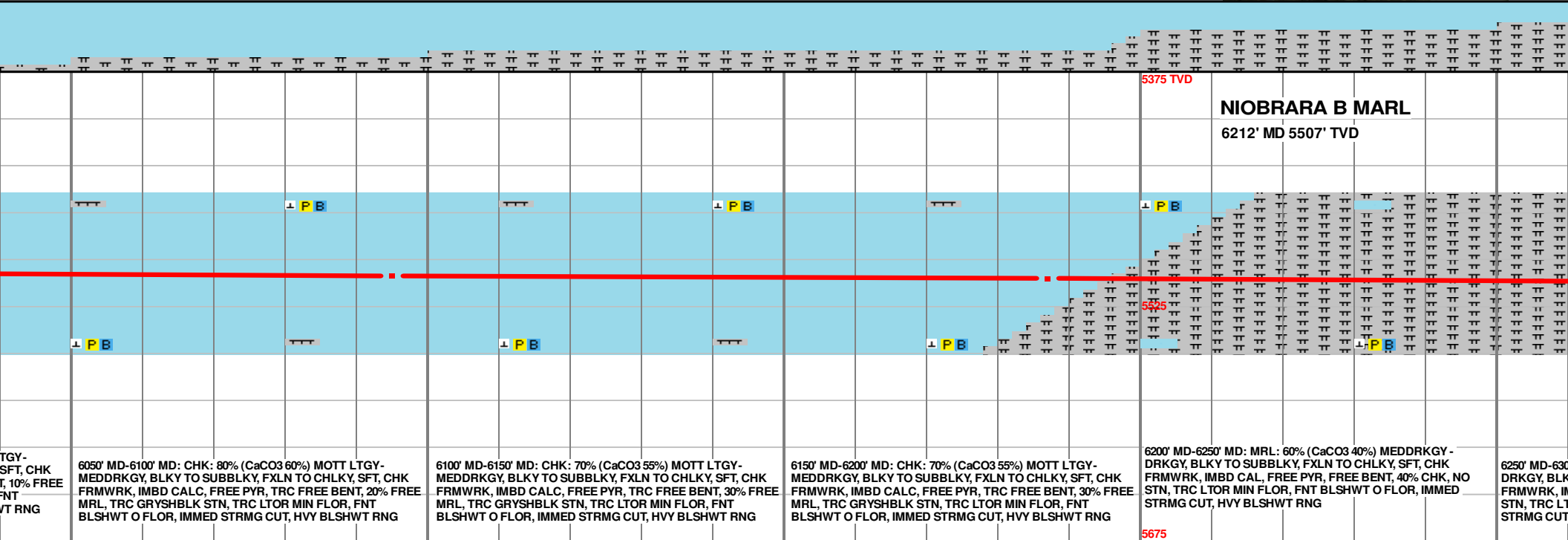
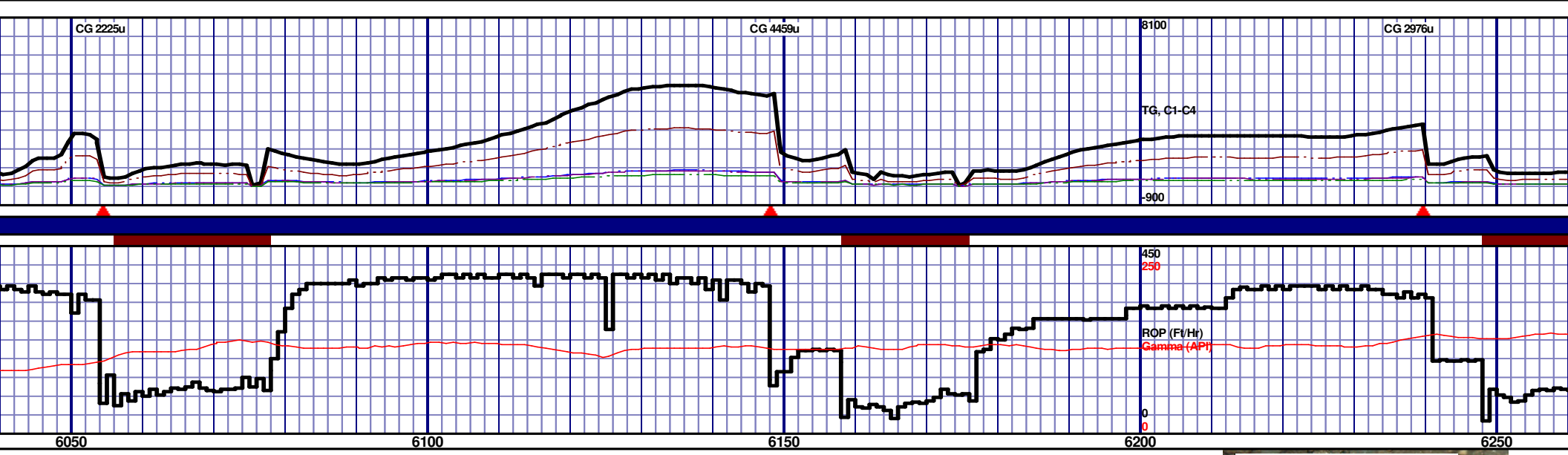
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INC 66.51 AZ 176.06
VS 422.23

MD 5732 TVD 5471.03
INC 72.9 AZ 176.84
VS 511.27



MD 5827 TVD 5491.24 MD 5844 TVD 5493.17
INC 82.53 AZ 183.83 INC 84.48 AZ 185.26
VS 603.57 VS 620.24

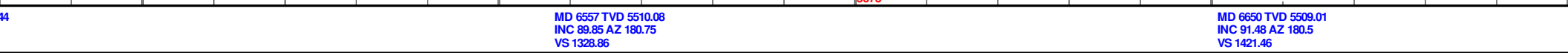
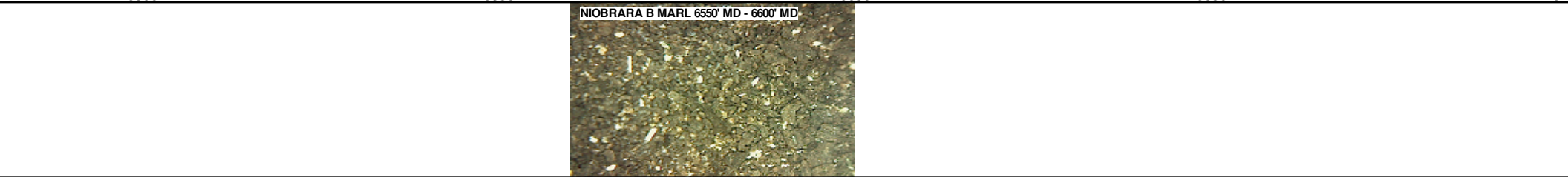
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INC 88.12 AZ 182.93
VS 776.06

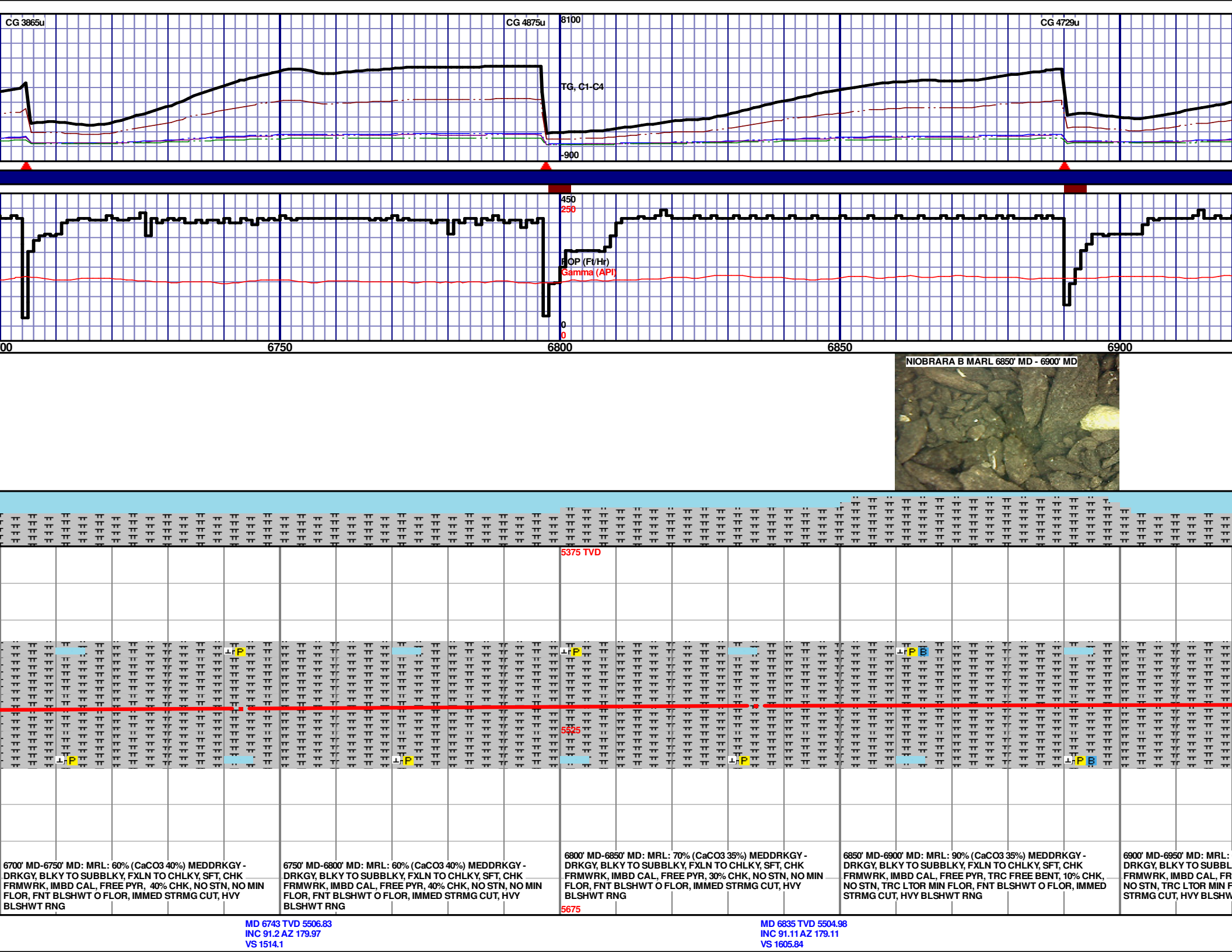


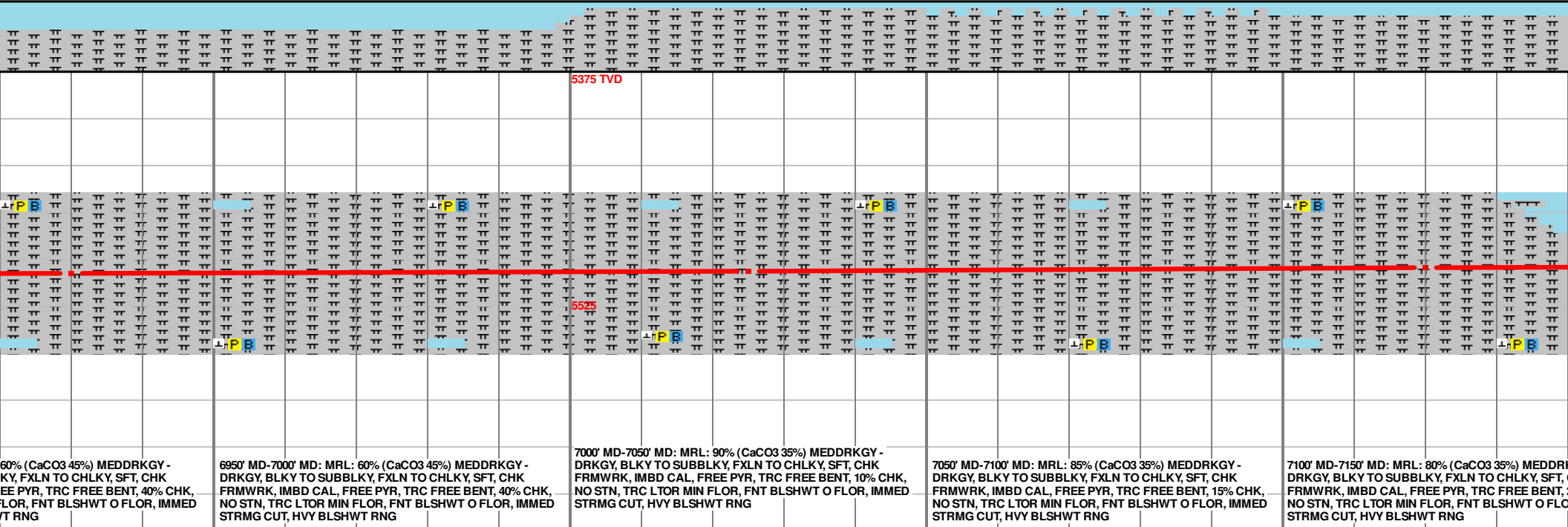
TGY-SFT, CHK T, 10% FREE FNT T RNG	6050' MD-6100' MD: CHK: 80% (CaCO3 60%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 20% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6100' MD-6150' MD: CHK: 70% (CaCO3 55%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6150' MD-6200' MD: CHK: 70% (CaCO3 55%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6200' MD-6250' MD: MRL: 60% (CaCO3 40%) MEDDRKGY - DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CAL, FREE PYR, FREE BENT, 40% CHK, NO STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG	6250' MD-6300' MD: DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, FREE BENT, 40% CHK, NO STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG
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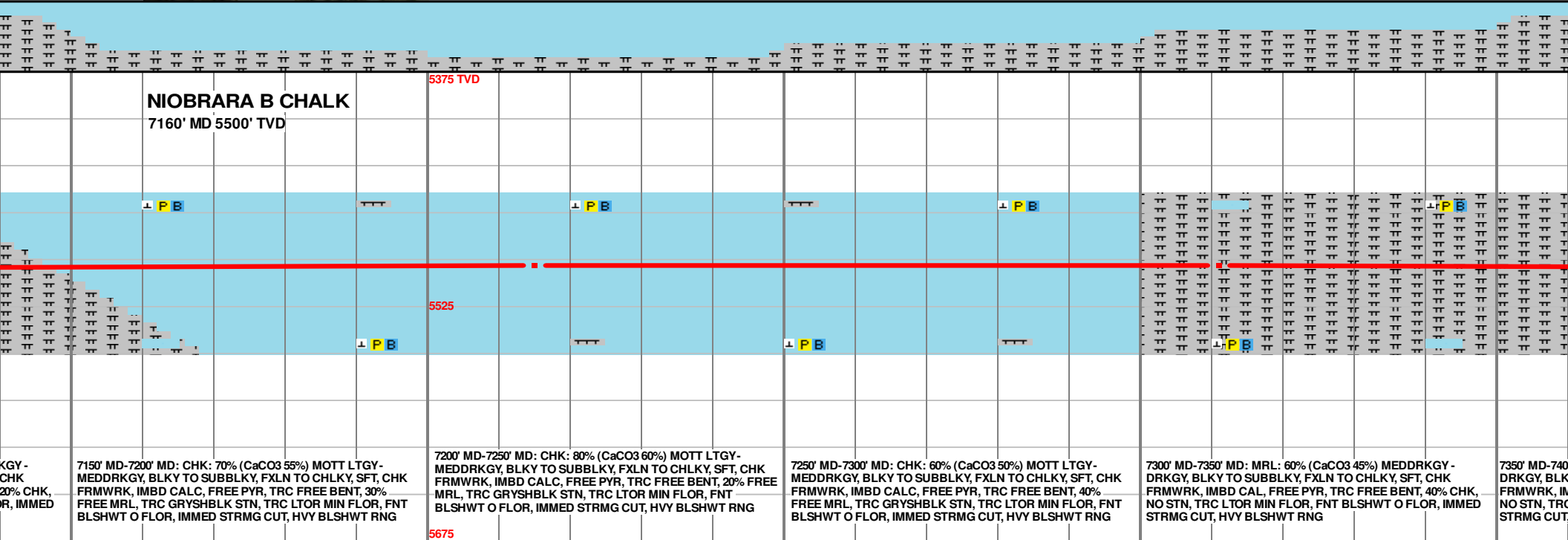
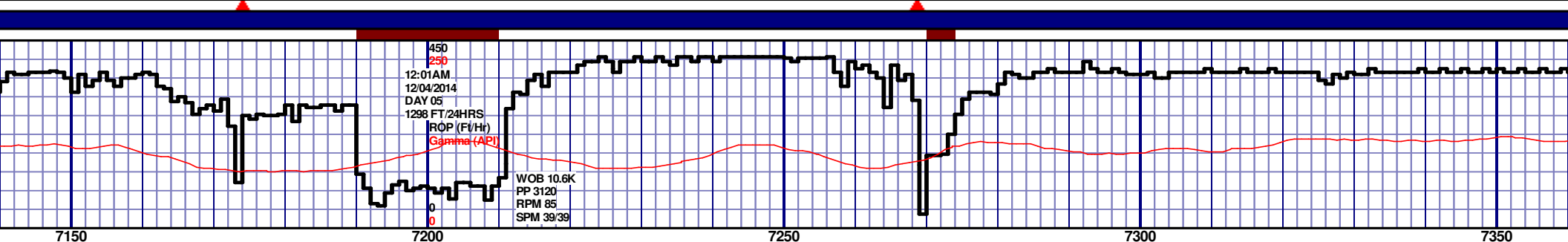
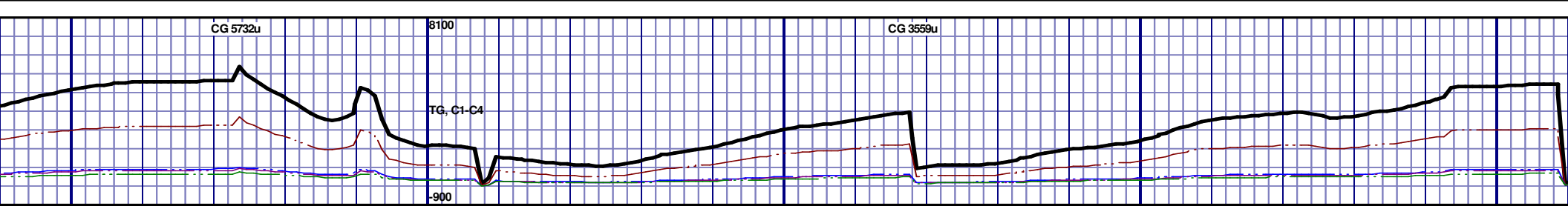
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INC 89.48 AZ 178.63
VS 868.61

MD 6187 TVD 5507.14
INC 88.24 AZ 177.78
VS 960.47



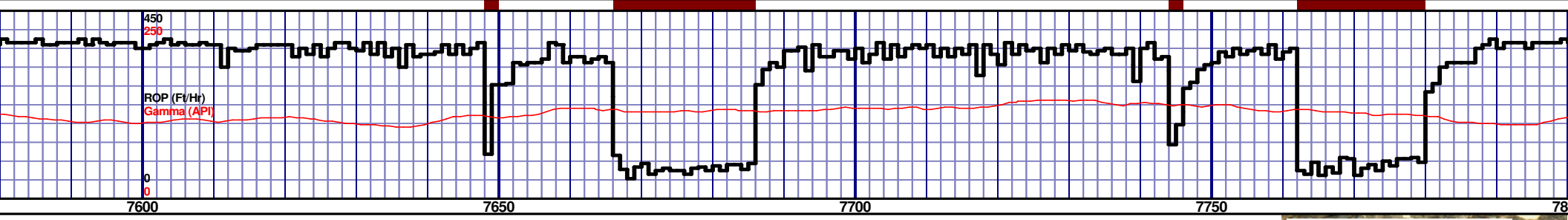
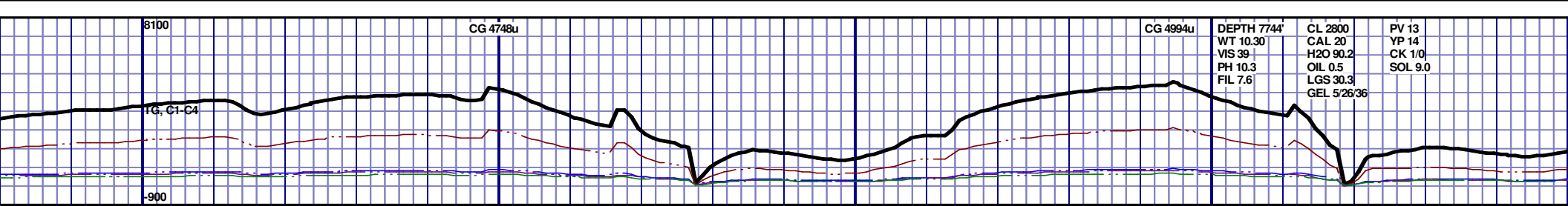




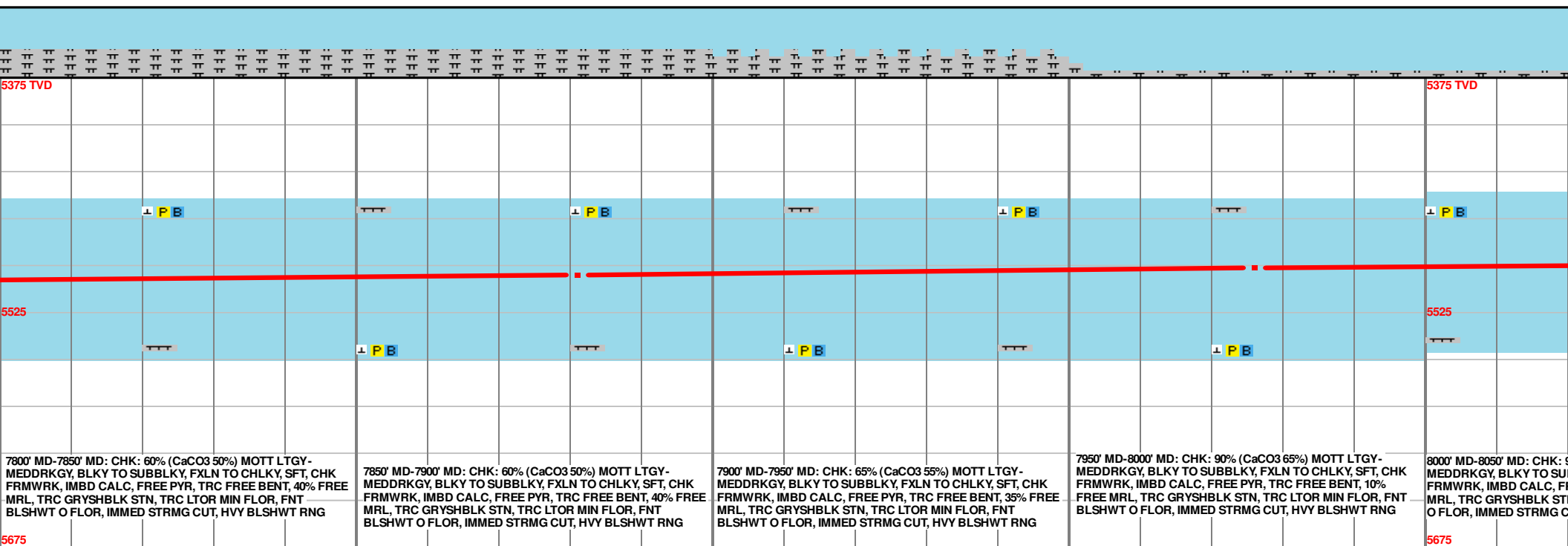
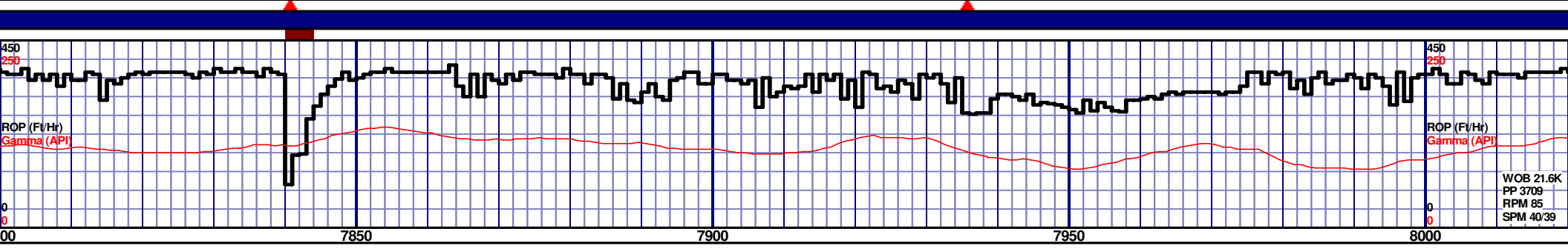
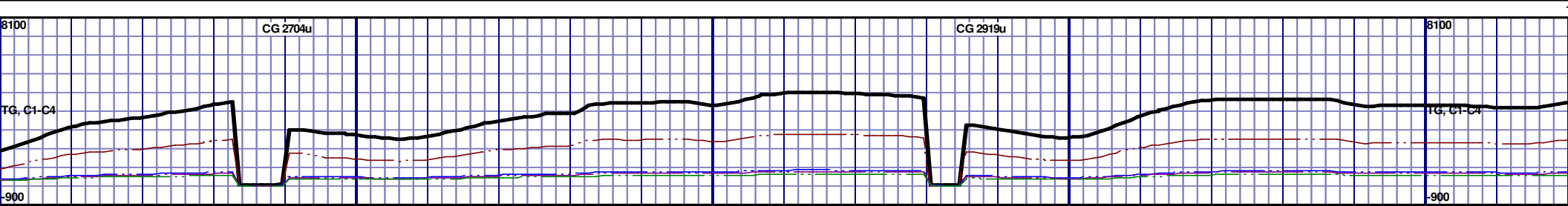


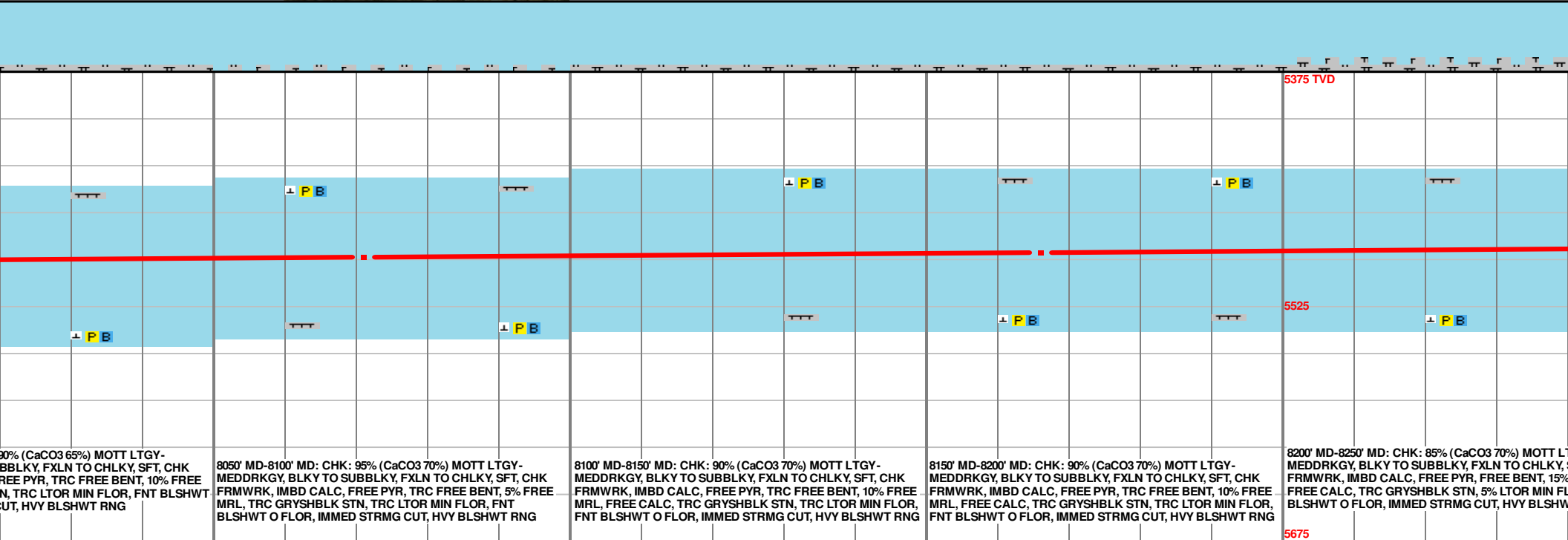
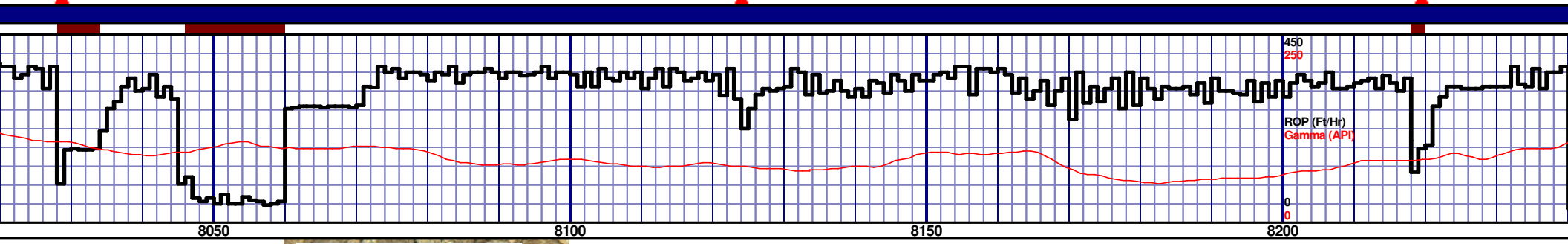
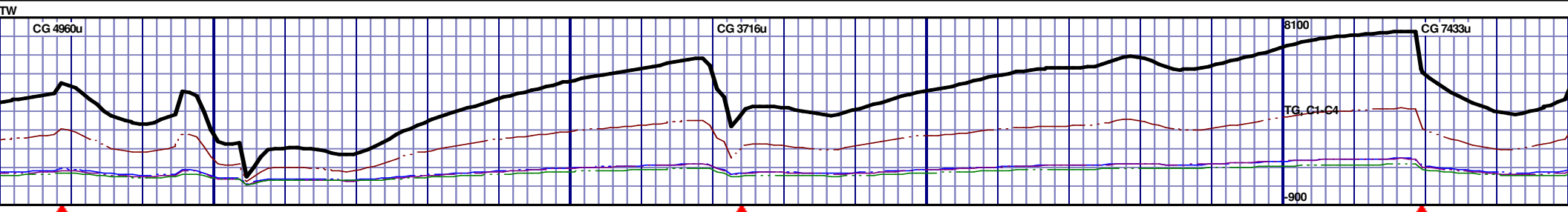
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INC 90.68 AZ 179.41
VS 1965.26

MD 7311 TVD 5498.66
INC 89.66 AZ 179.39
VS 2081.02



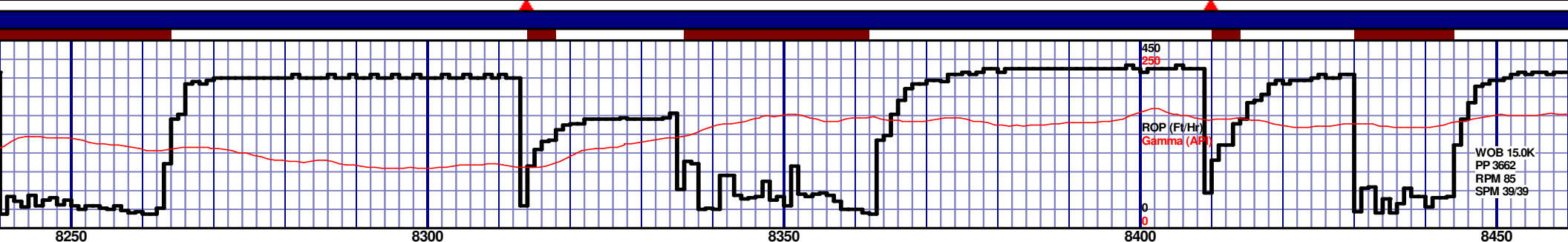
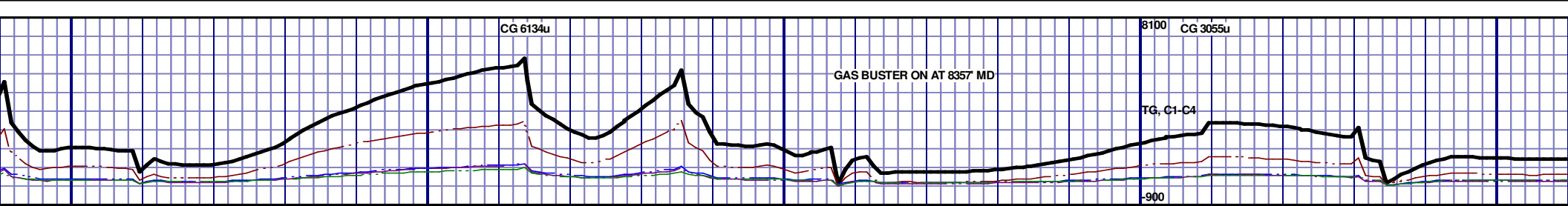
5375 TVD									
5525									
5675									
7600' MD-7650' MD: CHK: 70% (CaCO3 55%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7650' MD-7700' MD: CHK: 55% (CaCO3 45%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 45% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7700' MD-7750' MD: MRL: 70% (CaCO3 35%) MEDDRKGY-DRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% CHK, NO STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
7750' MD-7800' MD: CHK: 70% (CaCO3 55%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									





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INC 91.32 AZ 180.06
VS 2838.12

MD 8166 TVD 5490.43
INC 92.15 AZ 178.91
VS 2932.83

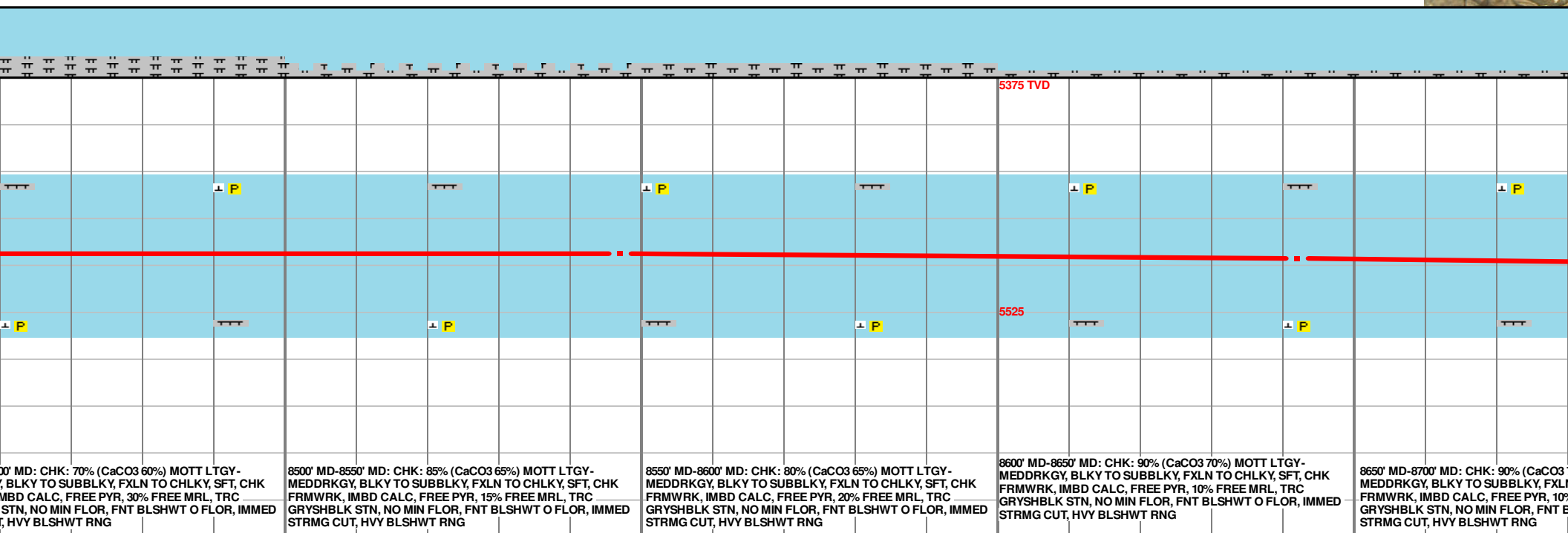
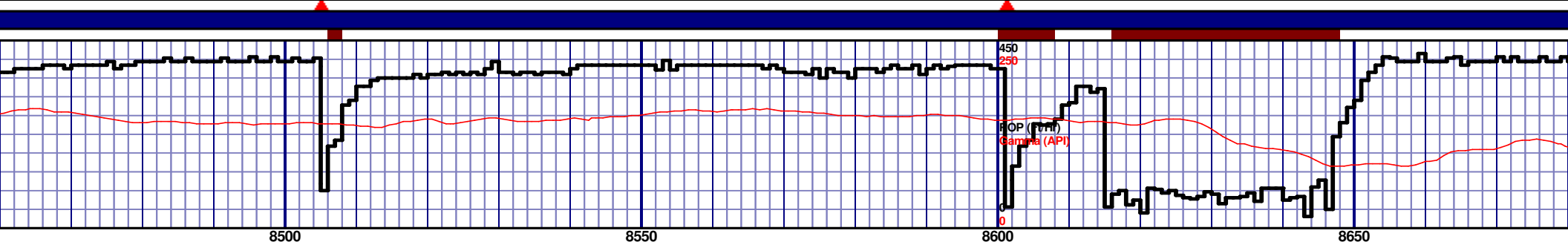
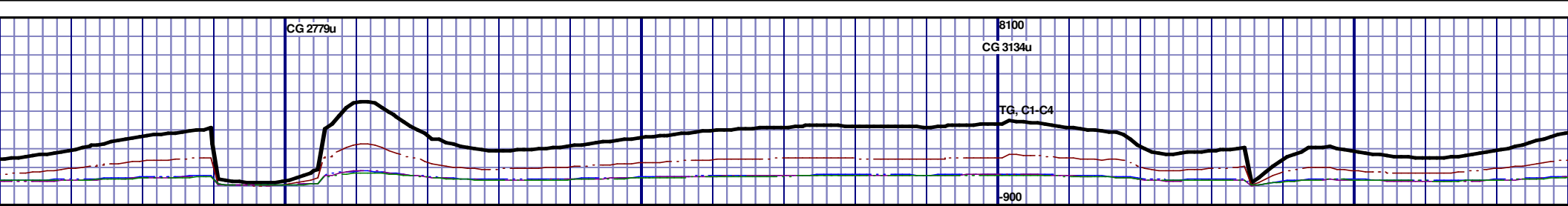


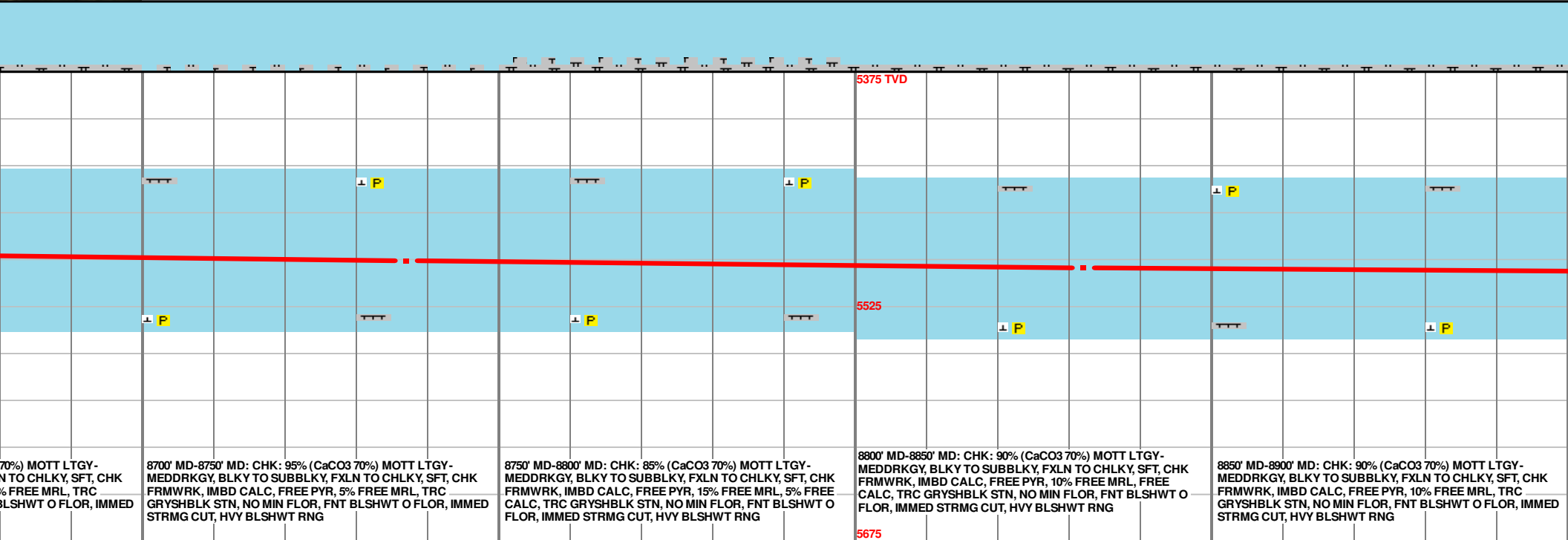
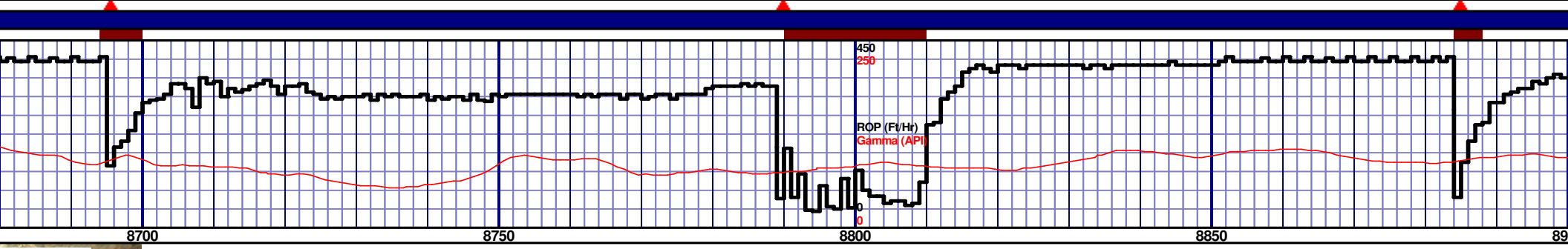
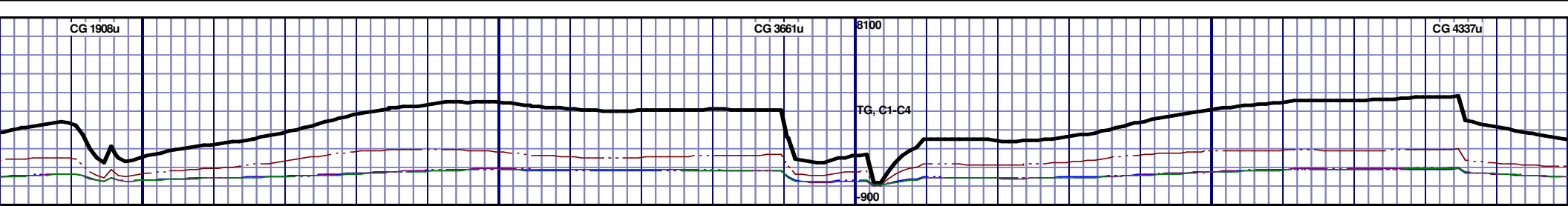
8250' MD-8300' MD: CHK: 90% (CaCO3 70%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, FREE BENT, 10% FREE MRL, FREE CALC, TRC GRYSHBLK STN, 5% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					8300' MD-8350' MD: CHK: 75% (CaCO3 65%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 25% FREE MRL, FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					8350' MD-8400' MD: CHK: 75% (CaCO3 60%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, 25% FREE MRL, TRC GRYSHBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					8400' MD-8450' MD: CHK: 80% (CaCO3 60%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, 20% FREE MRL, TRC GRYSHBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG					8450' MD-8500' MD: CHK: 80% (CaCO3 60%) MOTT LTGY-MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, 20% FREE MRL, TRC GRYSHBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG				
P B					P B					P					P					P				
5375 TVD					5525					5675														

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INC 91.2 AZ 180.29
VS 3027.53

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INC 90.06 AZ 180.8
VS 3122.14

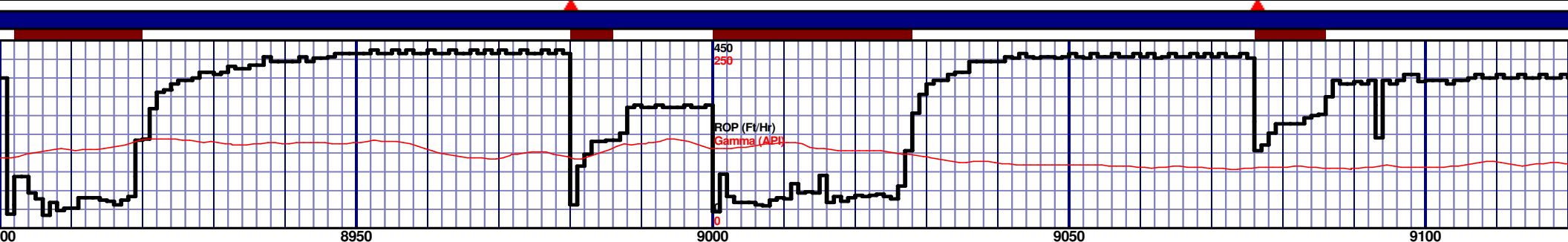
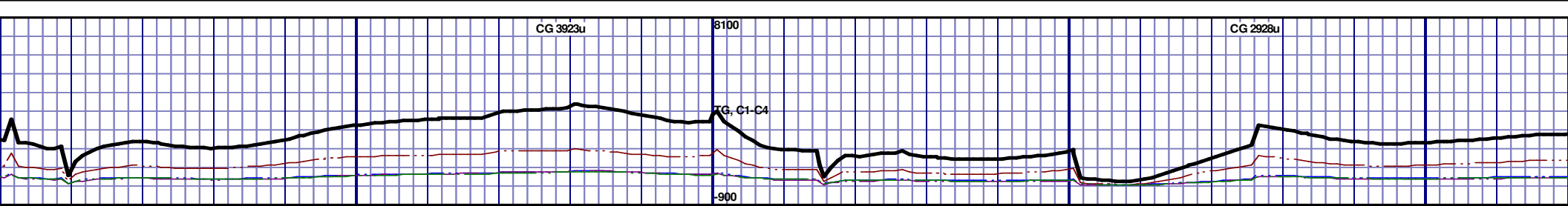
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INC 89.11 AZ 180.8
VS 3217.14





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INC 86.39 AZ 179.01
VS 3501.64

MD 8832 TVD 5500.48
INC 88 AZ 178.95
VS 3596.33

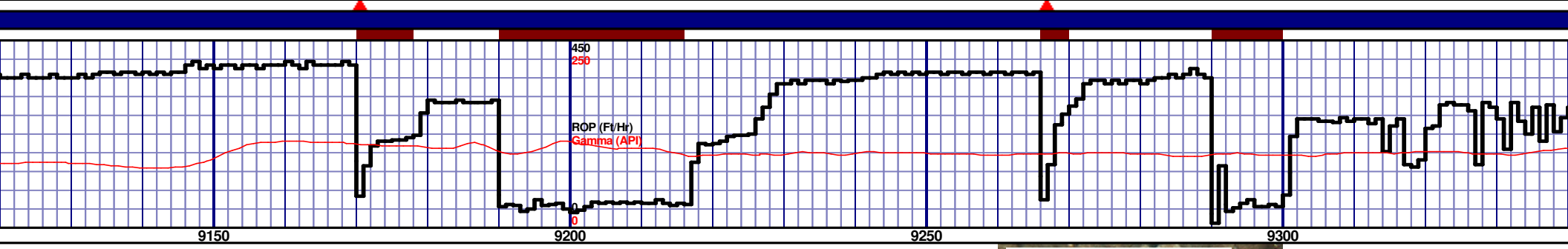
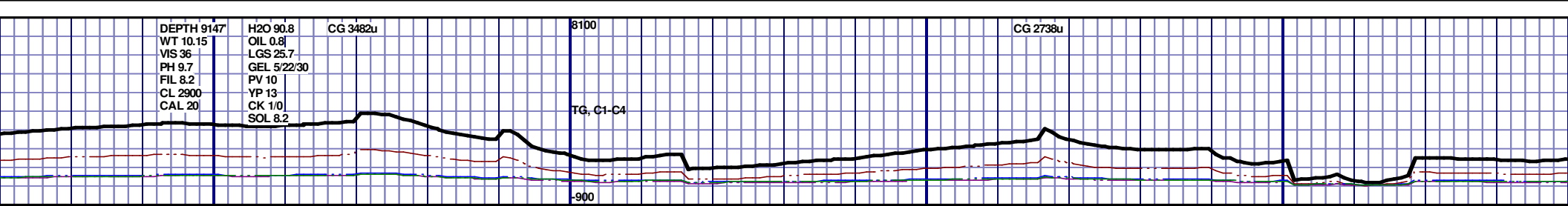


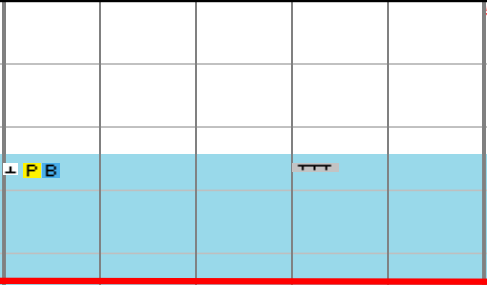
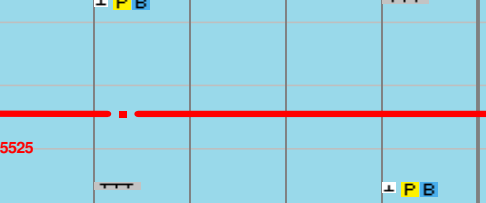
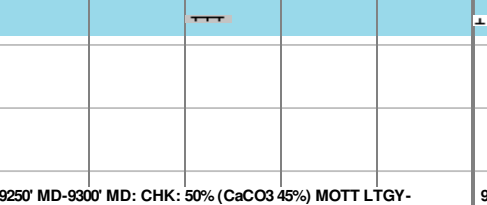
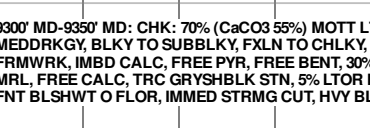
5375 TVD									
5525									
5675									
8900' MD-8950' MD: CHK: 80% (CaCO3 65%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, 20% FREE MRL, FREE CALC, TRC GRYSHBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
8950' MD-9000' MD: CHK: 70% (CaCO3 60%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, 30% FREE MRL, FREE CALC, TRC GRYSHBLK STN, NO MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
9000' MD-9050' MD: CHK: 60% (CaCO3 55%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 40% FREE MRL, ABDT FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
9050' MD-9100' MD: CHK: 70% (CaCO3 60%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, ABDT FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									
9100' MD-9150' MD: CHK: 70% (CaCO3 60%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 30% FREE MRL, ABDT FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG									

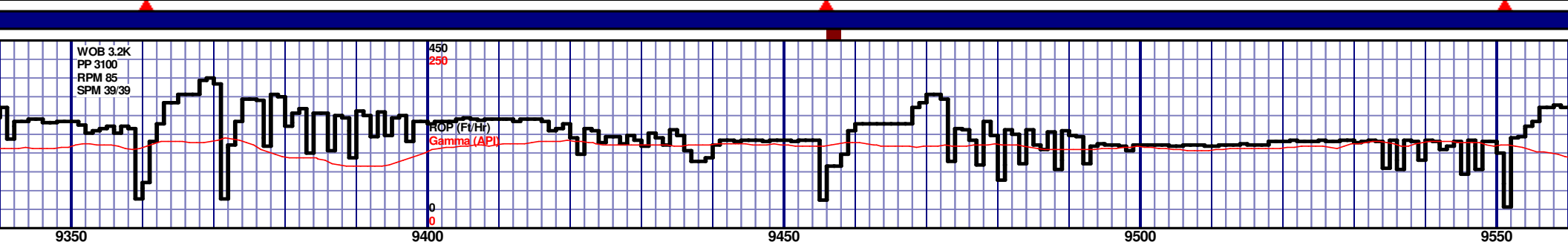
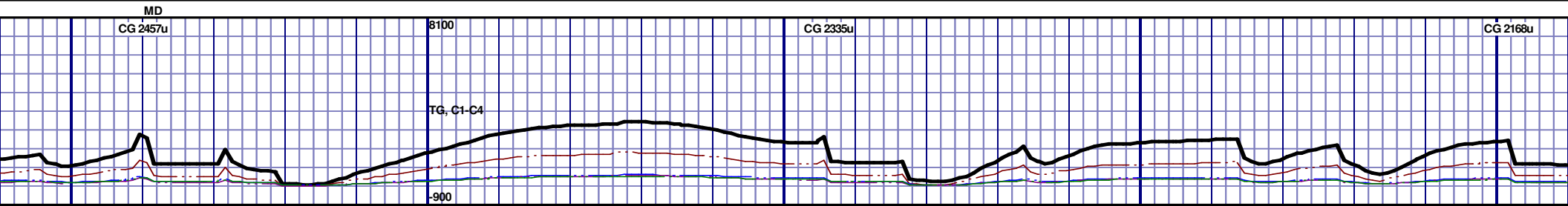
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INC 88.46 AZ 178.78
VS 3691.11

MD 9022 TVD 5505.64
INC 88.86 AZ 180.23
VS 3785.84

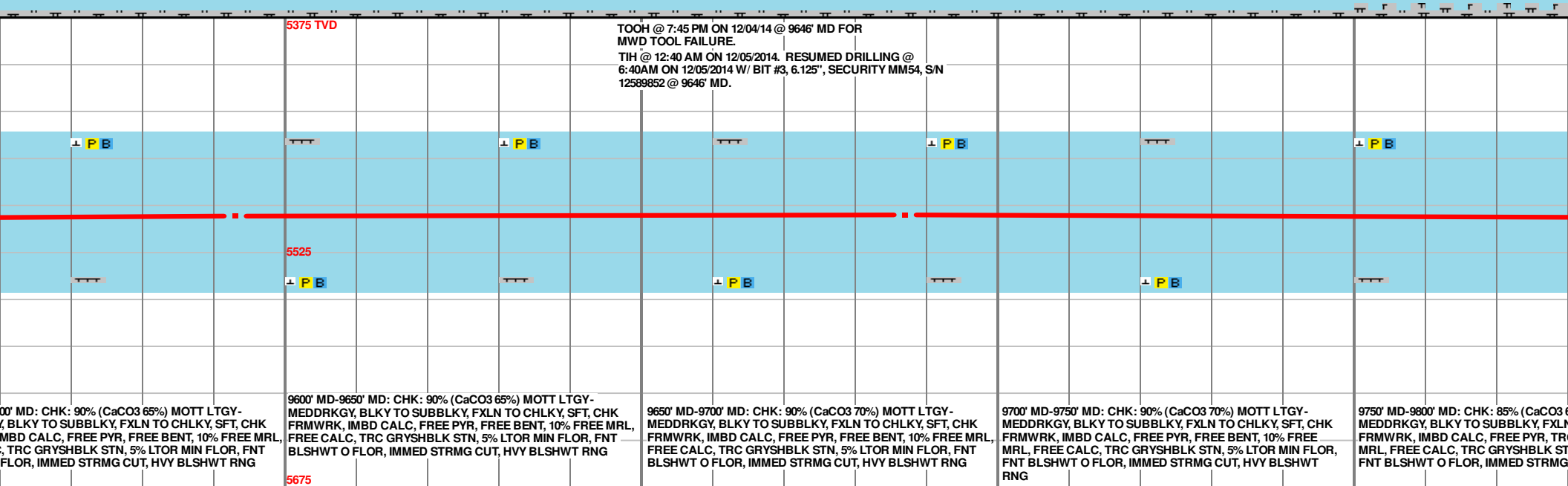
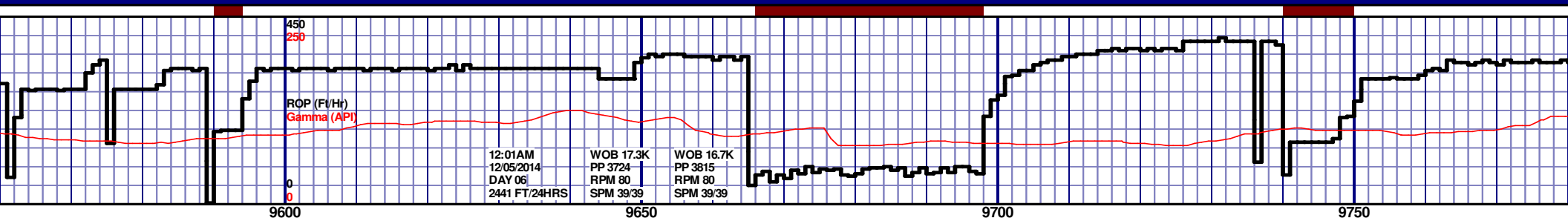
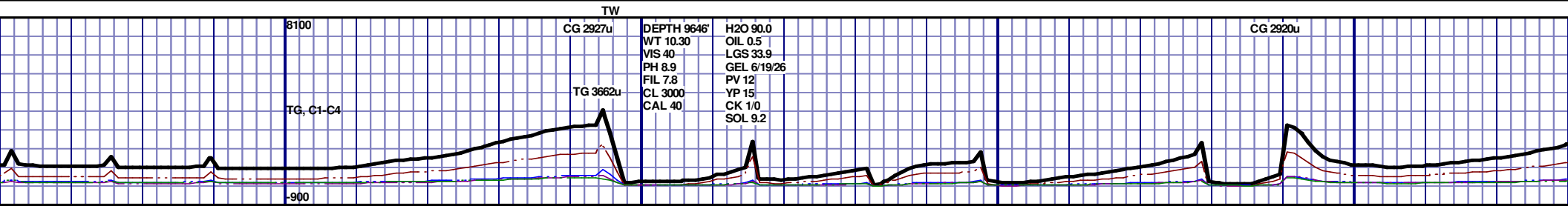
MD
INC
VS

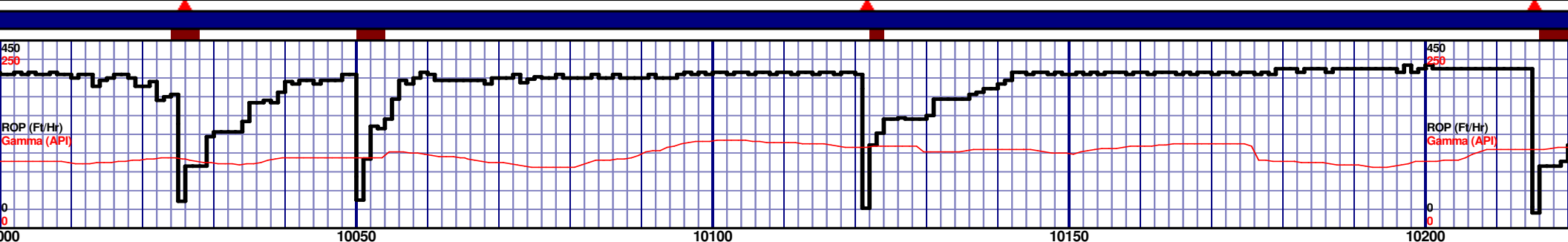
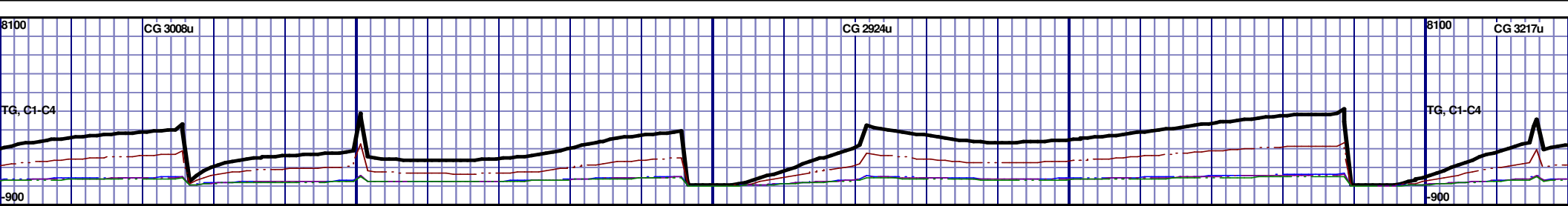


										5375 TVD																																																	
																																																											
0% (CaCO3 65%) MOTT LTGY- BBLKY, FXLN TO CHLKY, SFT, CHK FREE PYR, ABDT FREE BENT, 20% FREE TRC GRYSHBLK STN, 10% LTOR MIN OR, IMMED STRMG CUT, HVY BLSHWT										9150' MD-9200' MD: CHK: 90% (CaCO3 65%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, ABDT FREE BENT, 10% FREE MRL, ABDT FREE CALC, TRC GRYSHBLK STN, 10% LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9200' MD-9250' MD: CHK: 60% (CaCO3 50%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 40% FREE MRL, FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9250' MD-9300' MD: CHK: 50% (CaCO3 45%) MOTT LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK FRMWRK, IMBD CALC, FREE PYR, TRC FREE BENT, 50% FREE MRL, FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG										9300' MD-9350' MD: CHK: 70% (CaCO3 55%) MOTT L MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, FRMWRK, IMBD CALC, FREE PYR, FREE BENT, 30% MRL, FREE CALC, TRC GRYSHBLK STN, 5% LTOR FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT																			

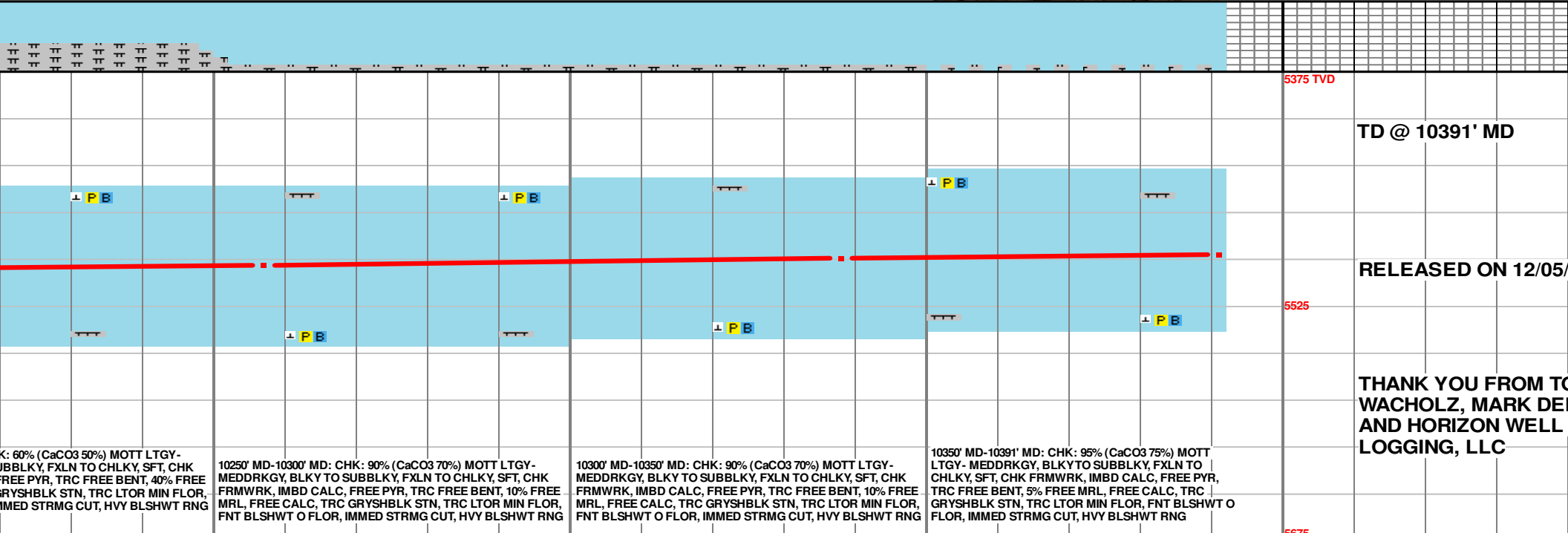
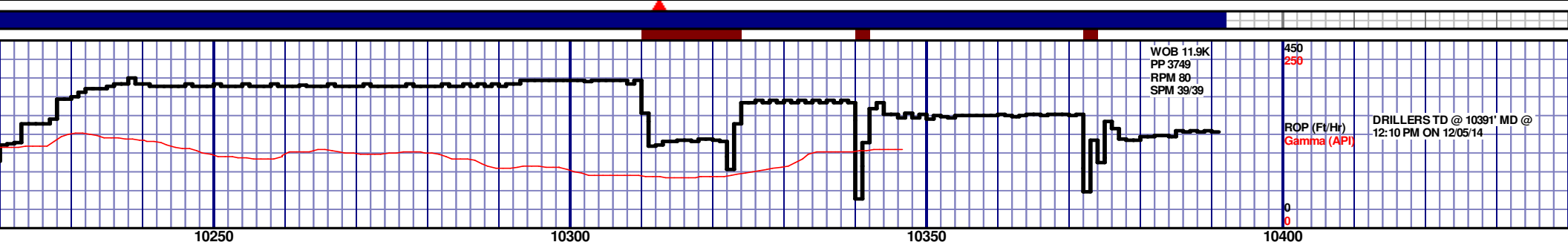
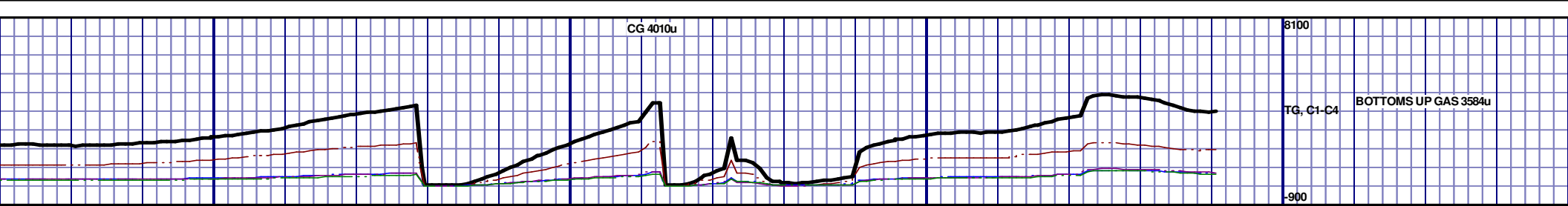


5375 TVD					
5525					
5675					
MD 9403 TVD 5507.03 INC 90.96 AZ 181.26 VS 4165.25					





5375 TVD										5375 TVD									
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10250' MD-10300' MD: CHK: 60% (CaCO3 50%) MOTT LTGY-
MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK
FRMWK, IMBD CALC, FREE PYR, TRC FREE BENT, 40% FREE
GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O FLOR,
IMMED STRMG CUT, HVY BLSHWT RNG

10250' MD-10300' MD: CHK: 90% (CaCO3 70%) MOTT LTGY-
MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK
FRMWK, IMBD CALC, FREE PYR, TRC FREE BENT, 10% FREE
MRL, FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR,
FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

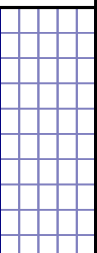
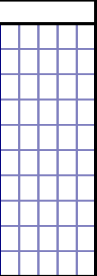
10300' MD-10350' MD: CHK: 90% (CaCO3 70%) MOTT LTGY-
MEDDRKGY, BLKY TO SUBBLKY, FXLN TO CHLKY, SFT, CHK
FRMWK, IMBD CALC, FREE PYR, TRC FREE BENT, 10% FREE
MRL, FREE CALC, TRC GRYSHBLK STN, TRC LTOR MIN FLOR,
FNT BLSHWT O FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

10350' MD-10391' MD: CHK: 95% (CaCO3 75%) MOTT
LTGY- MEDDRKGY, BLKY TO SUBBLKY, FXLN TO
CHLKY, SFT, CHK FRMWK, IMBD CALC, FREE PYR,
TRC FREE BENT, 5% FREE MRL, FREE CALC, TRC
GRYSHBLK STN, TRC LTOR MIN FLOR, FNT BLSHWT O
FLOR, IMMED STRMG CUT, HVY BLSHWT RNG

MD 10257 TVD 5498.42
INC 92.47 AZ 180.27
VS 5015.53

MD 10338 TVD 5491.58
INC 92.96 AZ 178.85
VS 5096.22

PTB MD 10391 TVD 5491.85
INC 92.96 AZ 178.85
VS 5149.05



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