



7136 South Yale Avenue, Suite 414

Tulsa, Oklahoma 74136-6378

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM

Customer Information

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

Geologist: **Cassidy Miller**
Noble Energy Inc.

Mud Logging Details

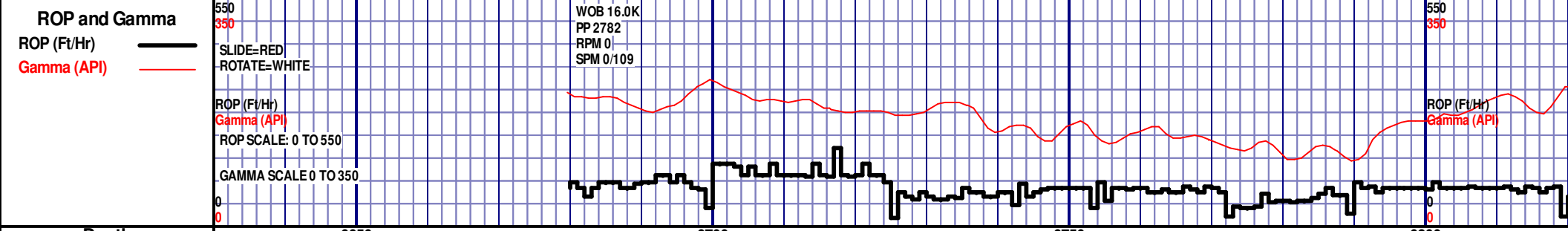
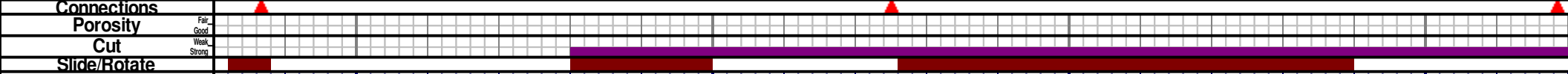
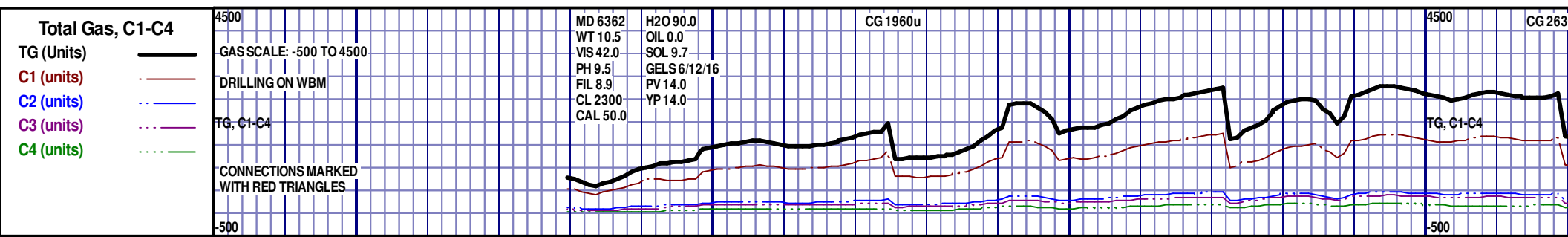
Logger: **Alec Walker &
Nikki Graber**
Log Interval: 6680' MD to 11082' MD
Start Date: November 15, 2012
Release Date: November 19, 2012

Well Information

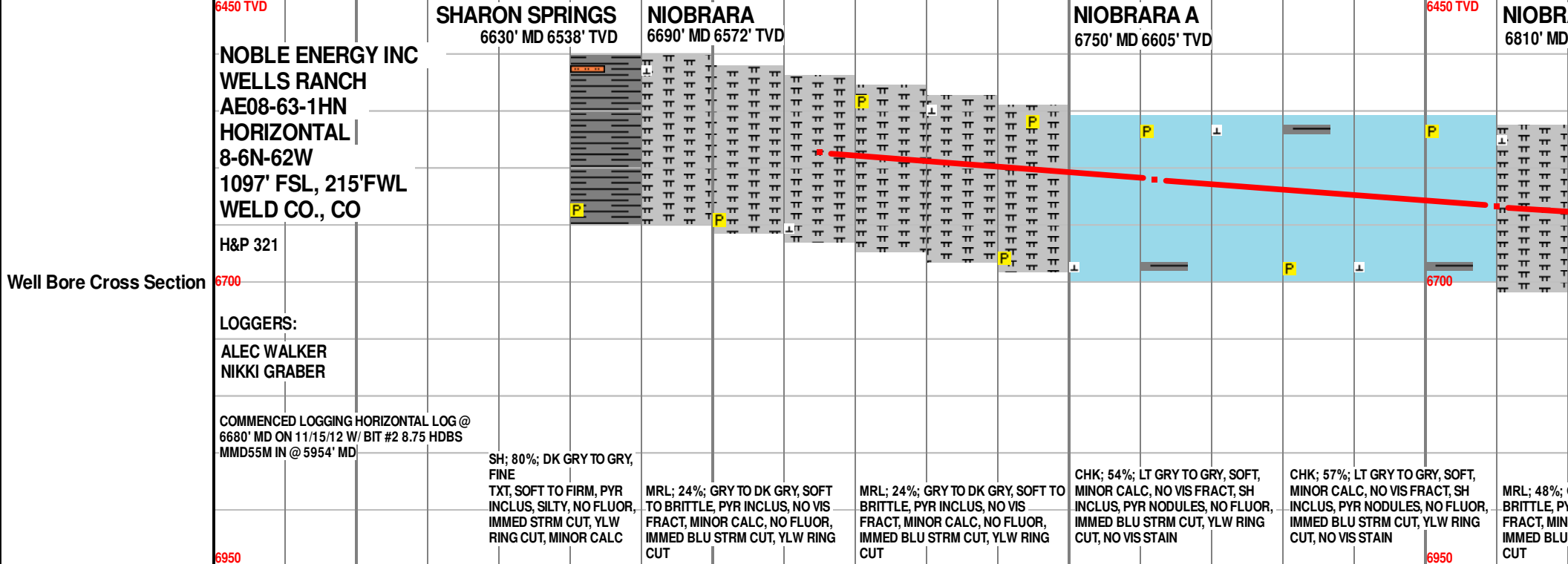
Well Name: **Wells Ranch AE08-63-1HN**
Horizontal
Location: **8-6N-62W**
1097' FSL, 215' FWL

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

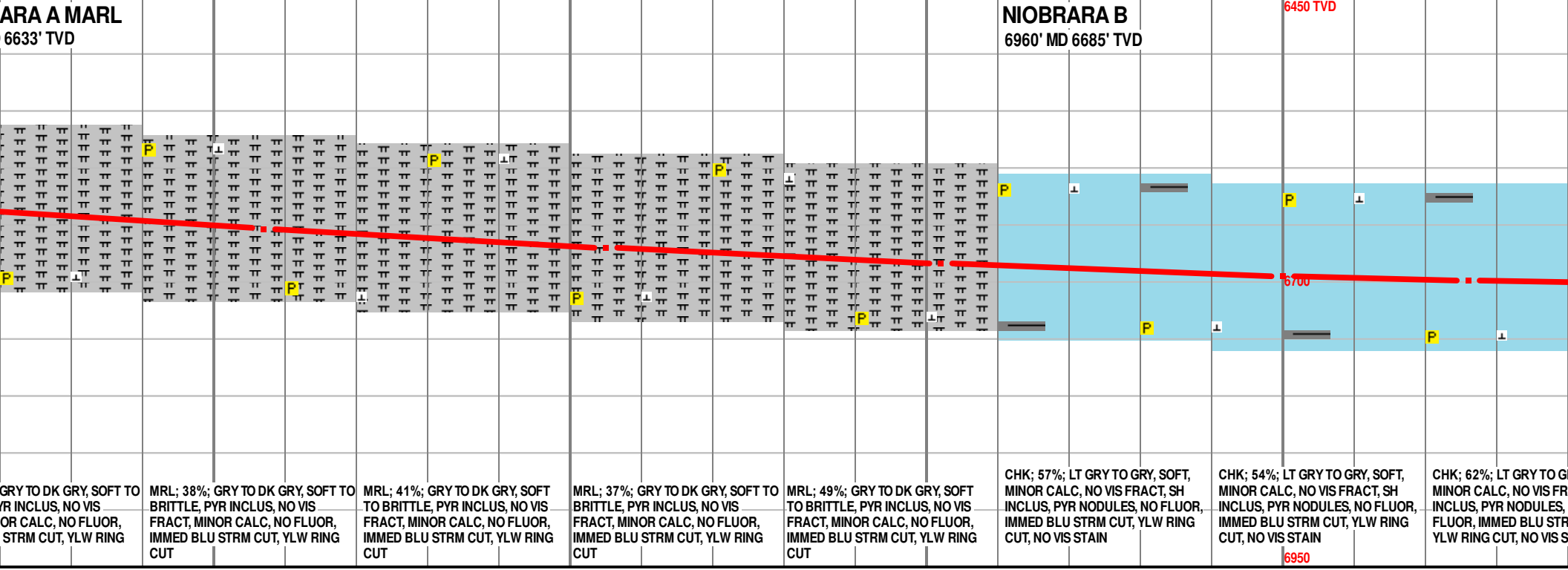
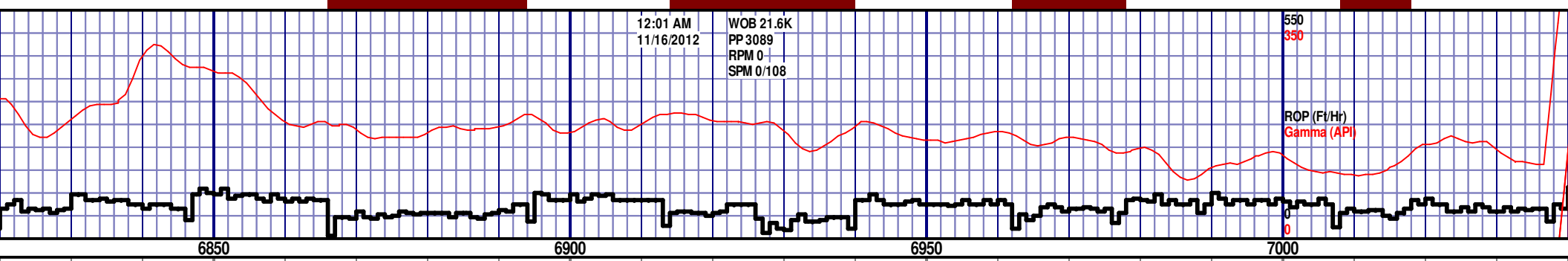
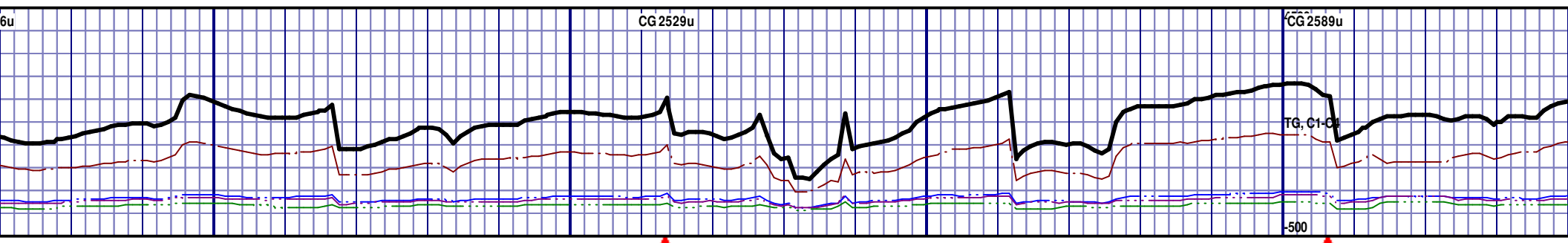
Drilling Rig: **H&P 321**
Total Depth: **11082' MD**
TD Date: **November 19, 2012**
Formation: **Niobrara B**
KB Elevation: **4959'**
GR Elevation: **4929'**
API Number: **05-123-35638**



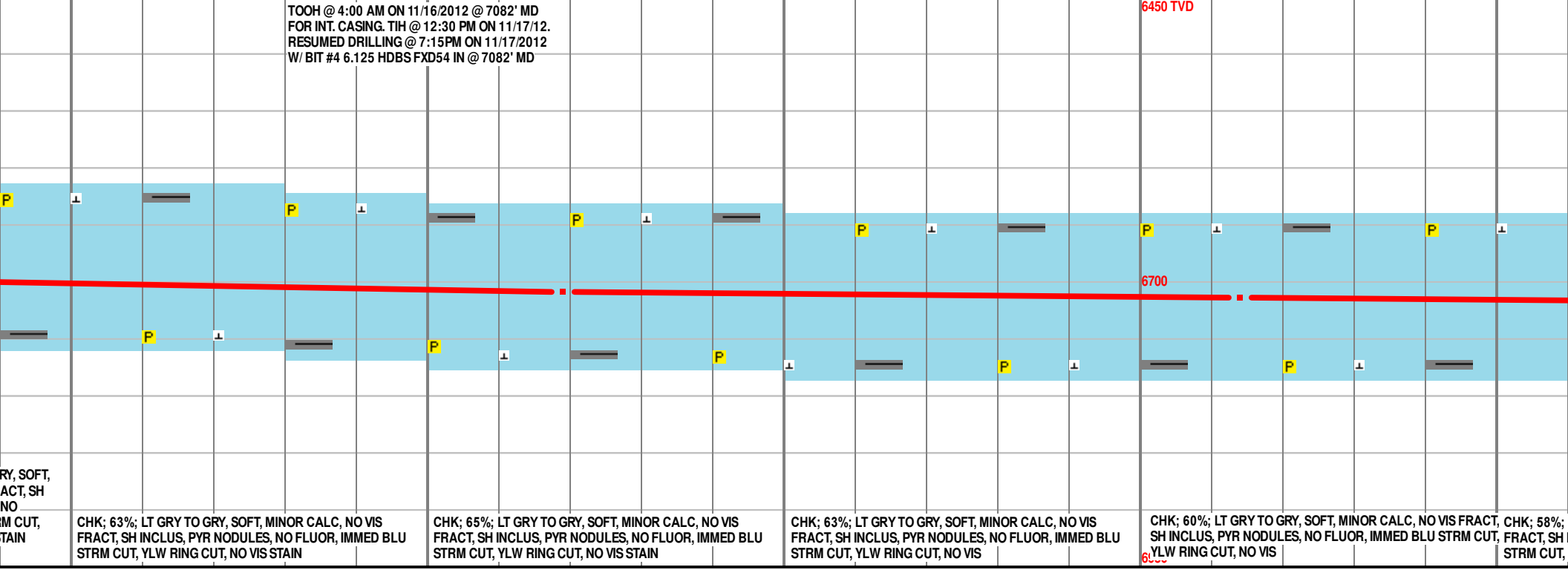
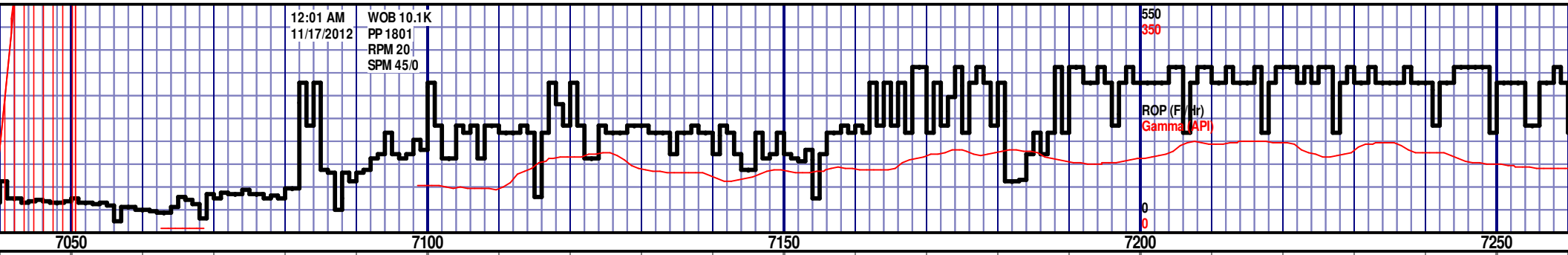
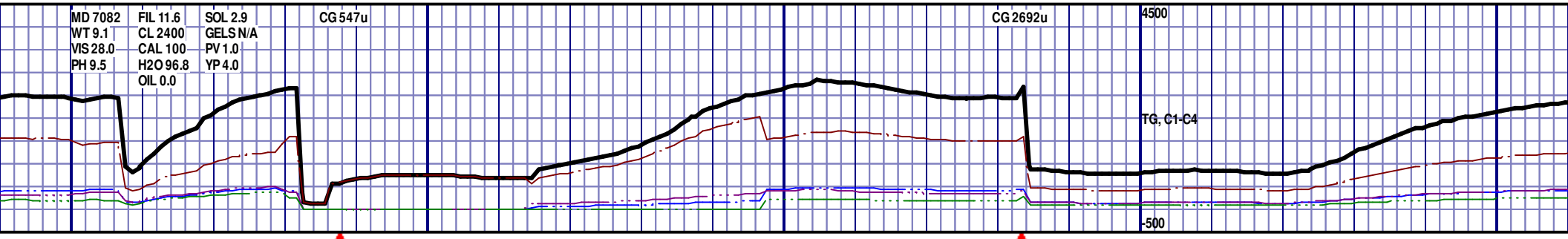
Depth 6650 6700 6750 6800

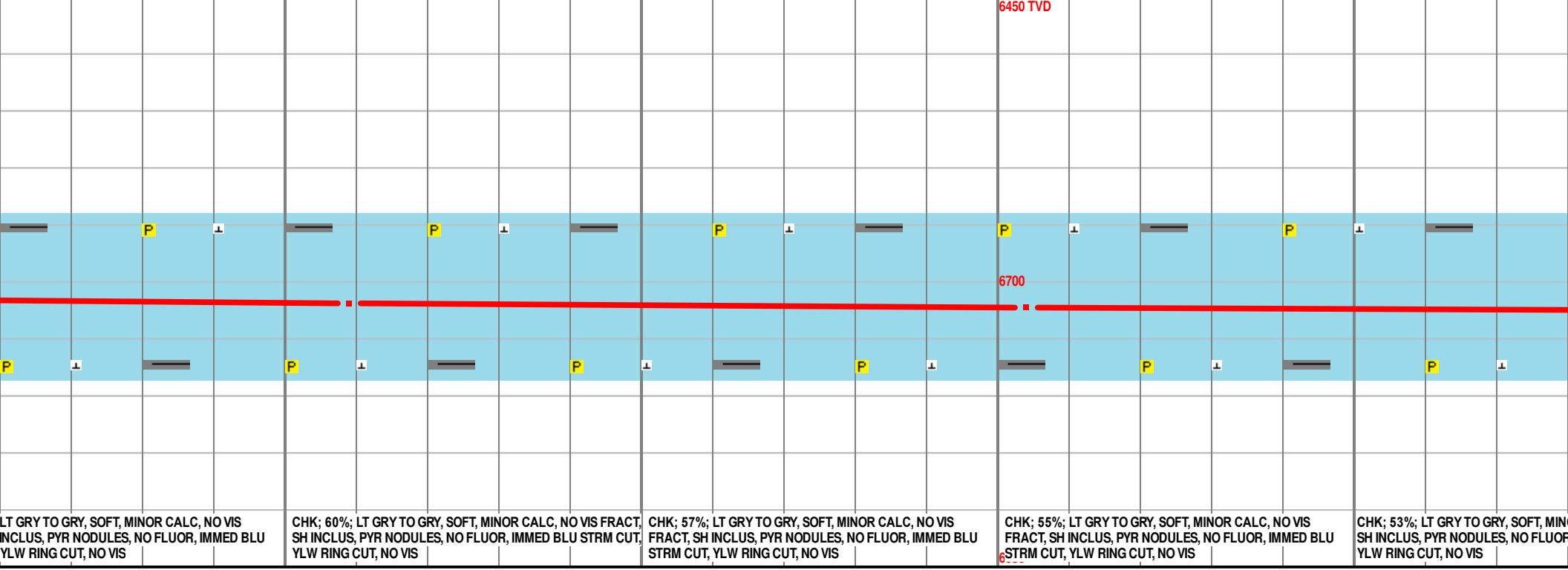
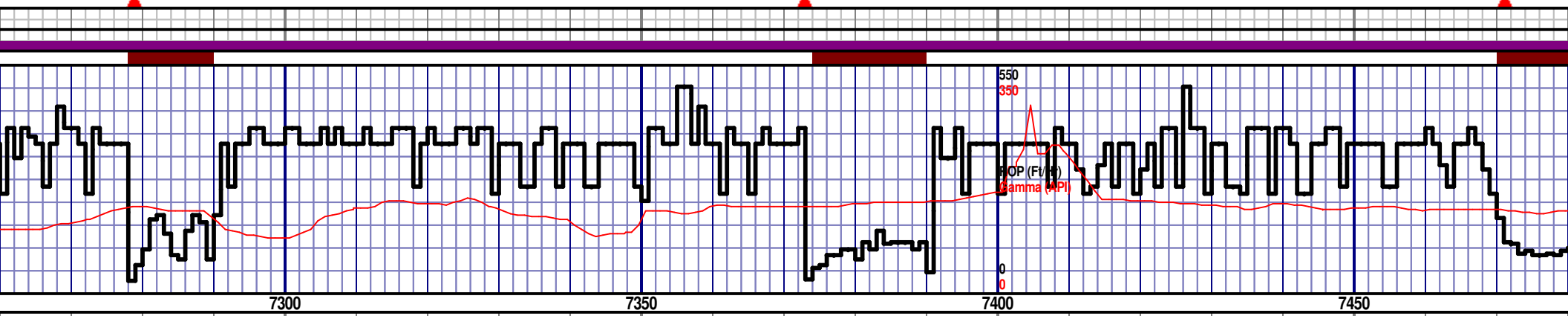
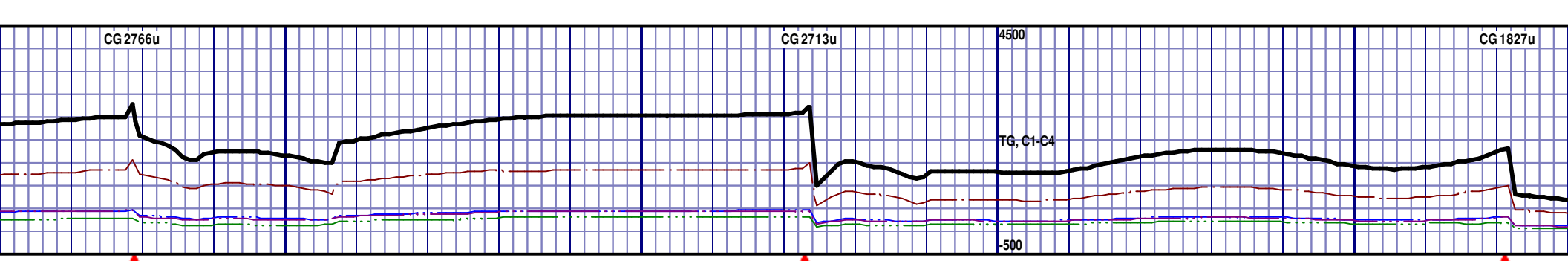


Survey Data MD 6715 TVD 6586.27 Az 85.67° Inc 57.64° VS 185.82 MD 6762 TVD 6610.51 Az 86.21° Inc 60.24° VS 225.99 MD 6810 TVD Az 87.65° Inc



MD 6633.39 Az 62.84° Inc VS 268.14	MD 6857 TVD 6653.34 Az 89.62° Inc 66.91° VS 310.68	MD 6905 TVD 6670.33 Az 90.05° Inc 71.62° VS 355.55	MD 6952 TVD 6683.69 Az 89.12° Inc 75.34° VS 400.60	MD 7000 TVD 6694.5 Az 88.1° Inc 78.63° VS 447.36	MD 7026 TVD 6694.5 Az 87.21° Inc 81.1° VS 447.36
---------------------------------------	---	---	---	---	---





LT GRY TO GRY, SOFT, MINOR CALC, NO VIS INCLUS, PYR NODULES, NO FLUOR, IMMED BLU YLW RING CUT, NO VIS

CHK; 60%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS

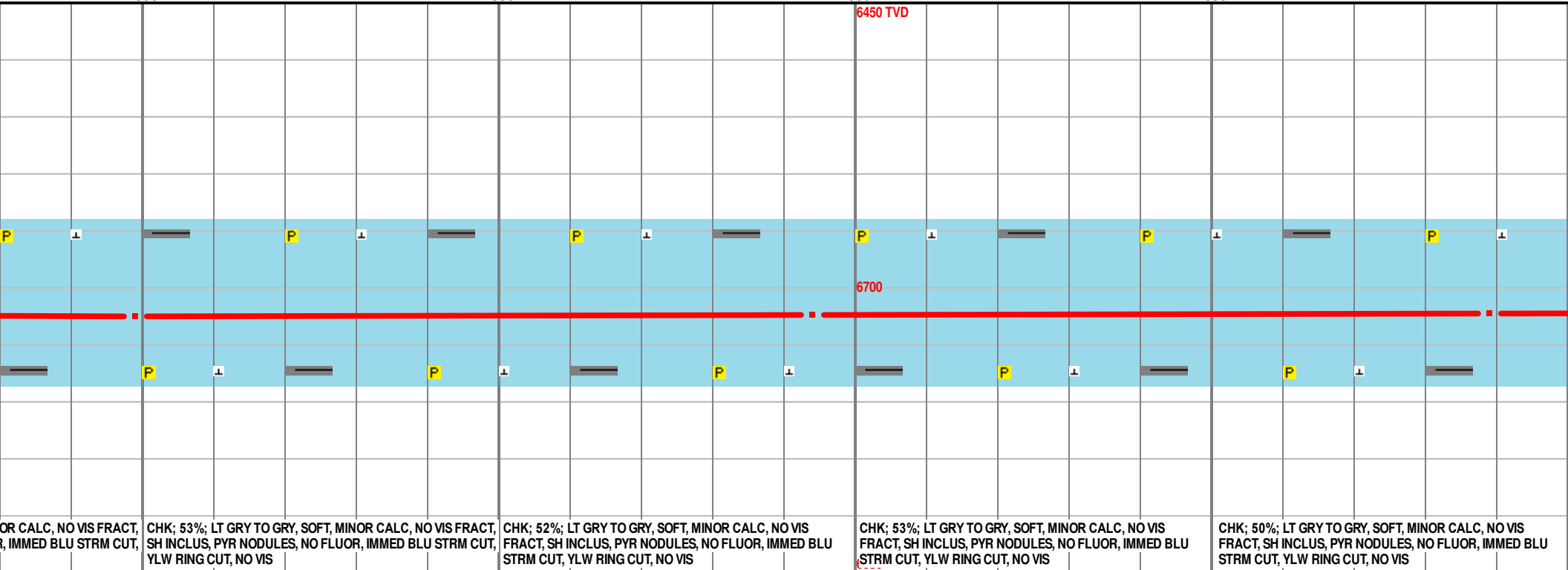
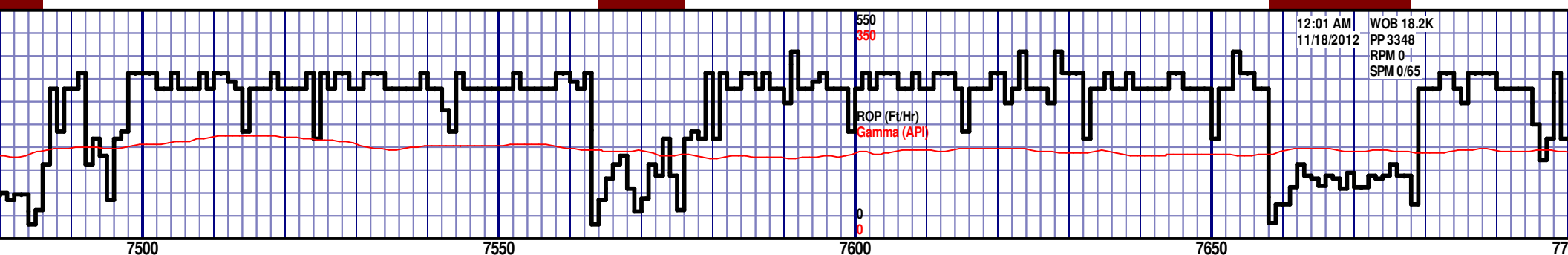
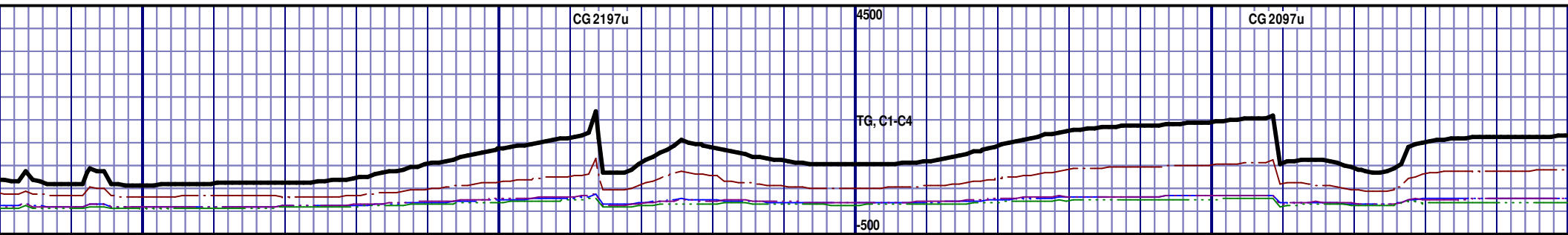
CHK; 57%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS

CHK; 55%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS

CHK; 53%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS

MD 7309 TVD 6718.13
Az 87.18° Inc 87.28° VS 754.99

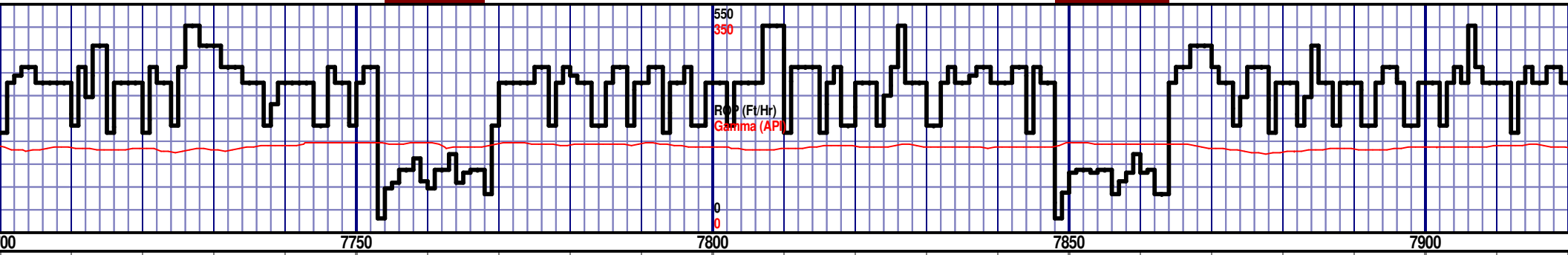
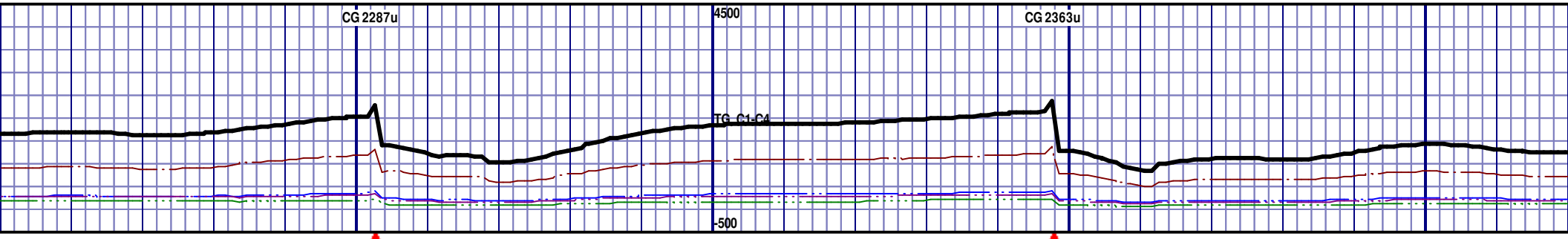
MD 7404 TVD 6722.25
Az 87.84° Inc 87.75° VS 849.83



MD 7499 TVD 6724.83
Az 88.19° Inc 89.14° VS 944.76

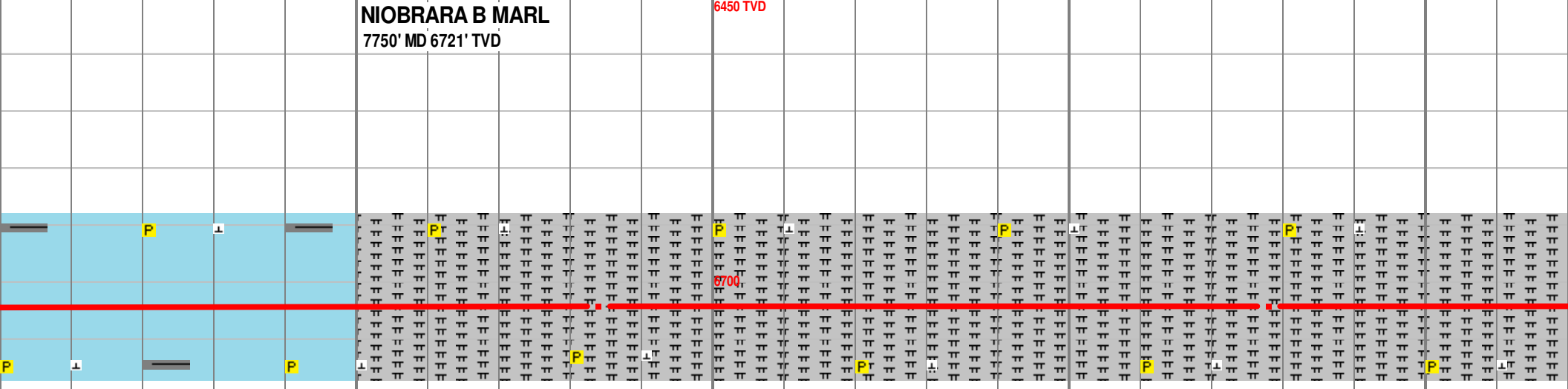
MD 7594 TVD 6724.13
Az 88.94° Inc 91.7° VS 1039.73

MD 7689 TVD
Az 88° Inc 90°



NIOBRARA B MARL
7750' MD 6721' TVD

6450 TVD



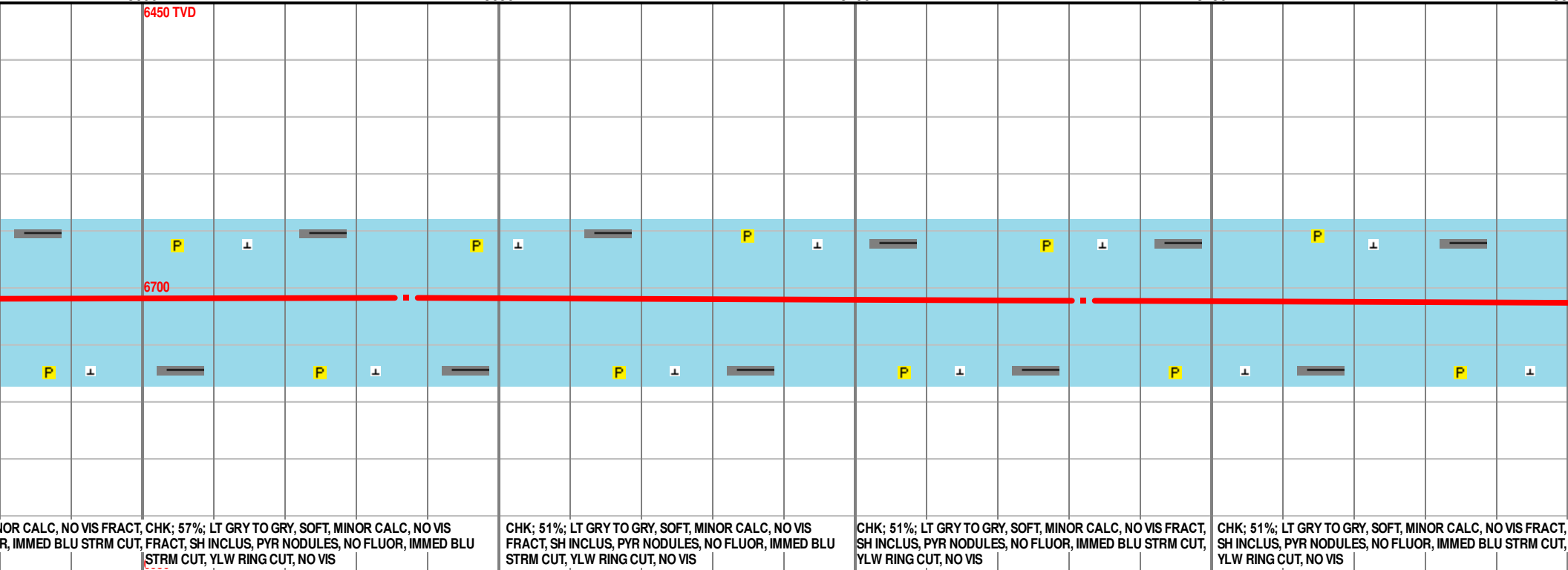
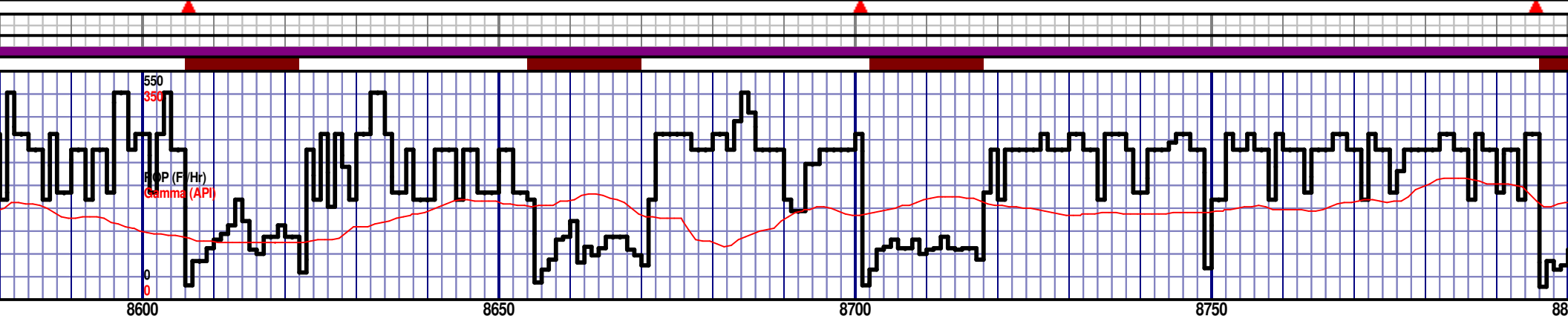
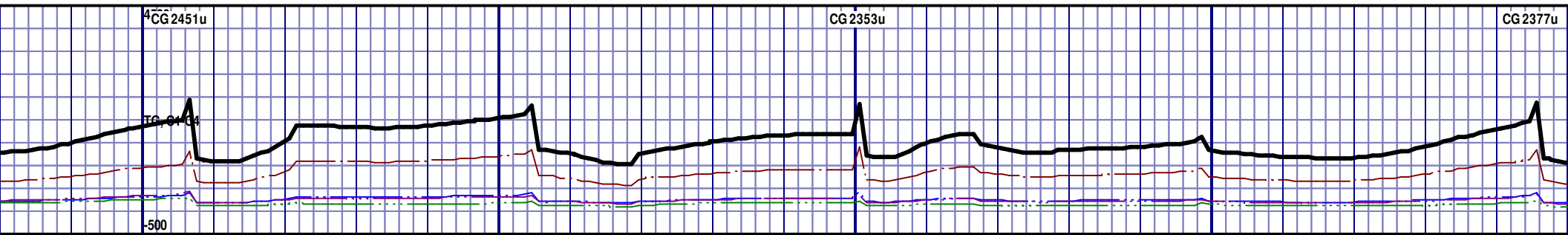
CHK; 50%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS

MRL; 37%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT

MRL; 40%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT

MRL; 43%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT

MRL; 43%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT



NO CALC, NO VIS FRACT, CHK; 57%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMEDIATE BLU STRM CUT, YLW RING CUT, NO VIS

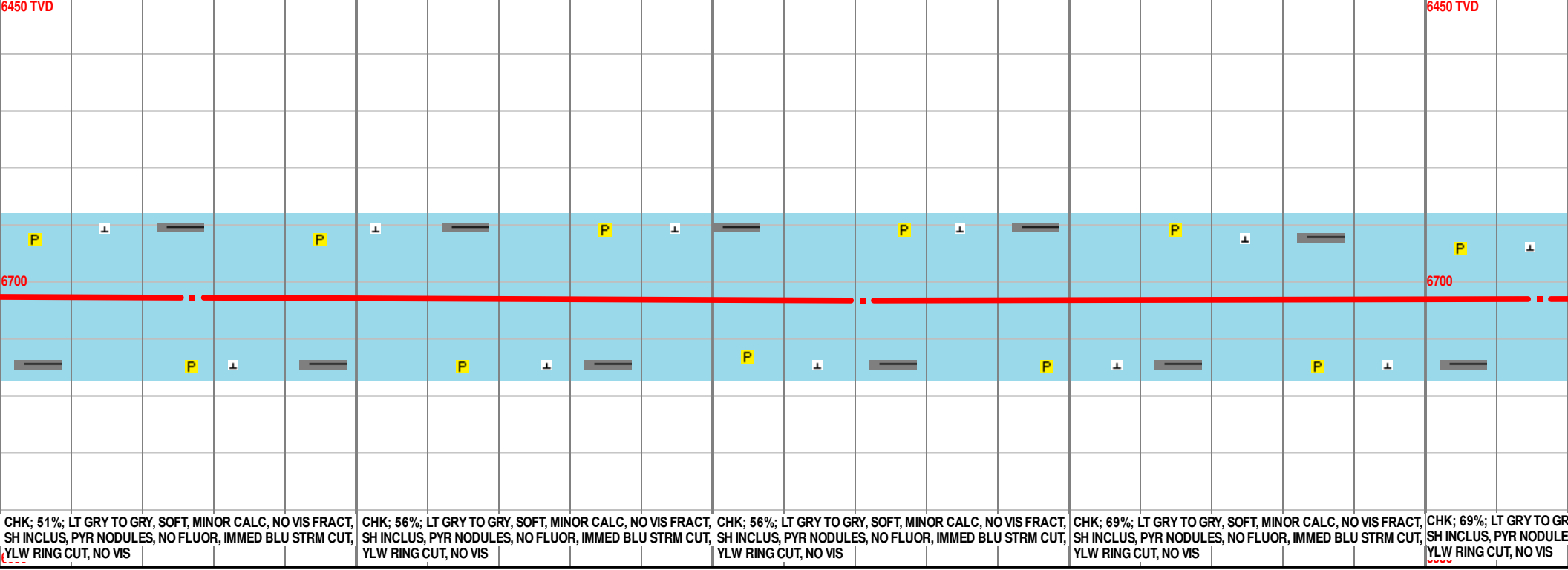
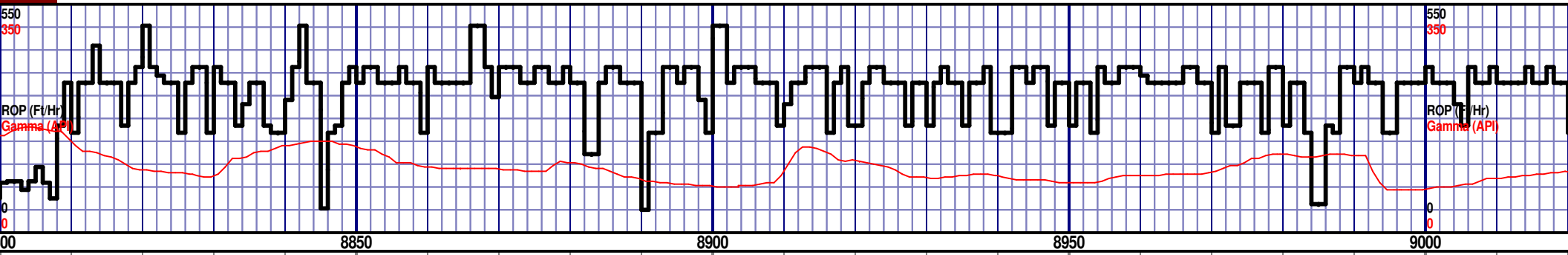
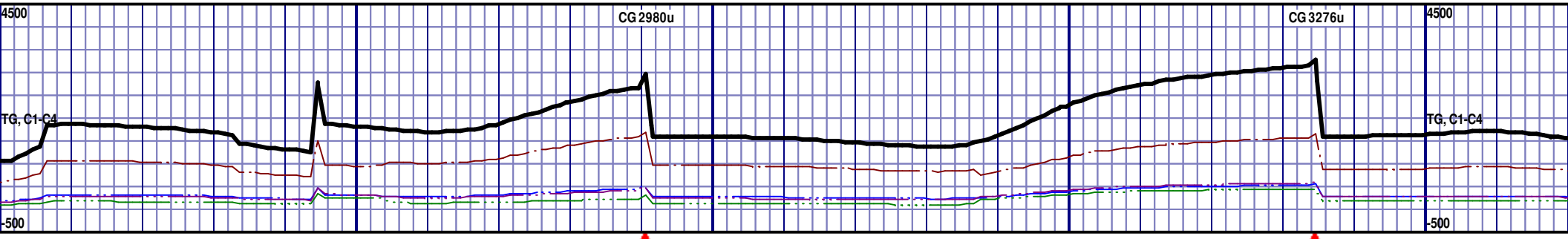
CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMEDIATE BLU STRM CUT, YLW RING CUT, NO VIS

CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMEDIATE BLU STRM CUT, YLW RING CUT, NO VIS

CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMEDIATE BLU STRM CUT, YLW RING CUT, NO VIS

MD 8637 TVD 6708.96
Az 90.76° Inc 89.85° VS 2082.07

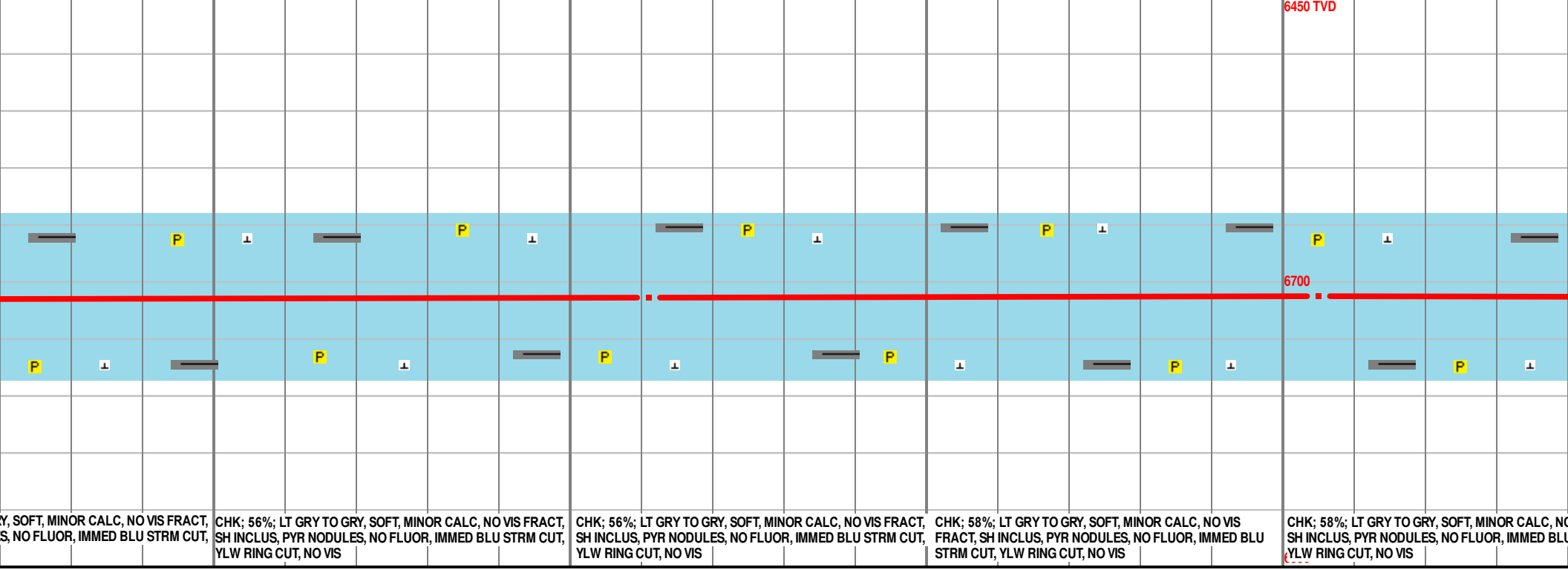
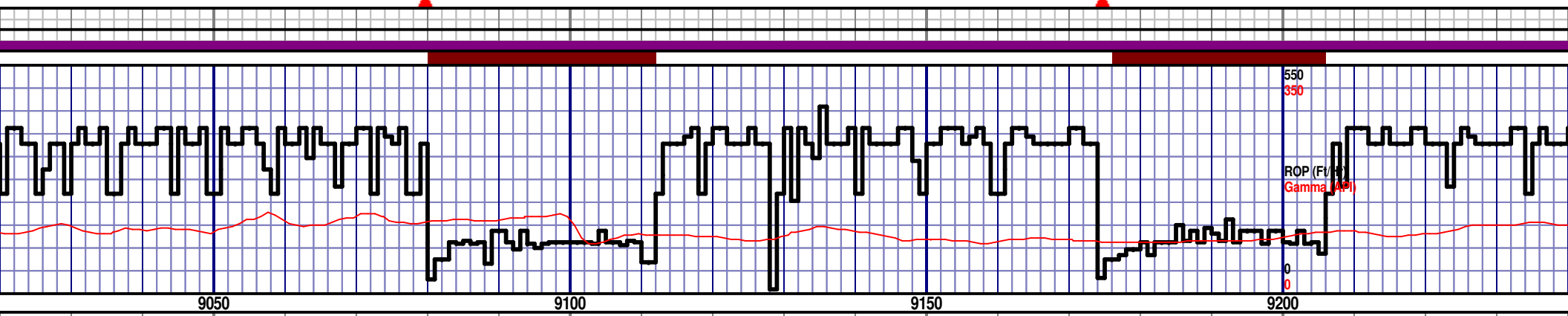
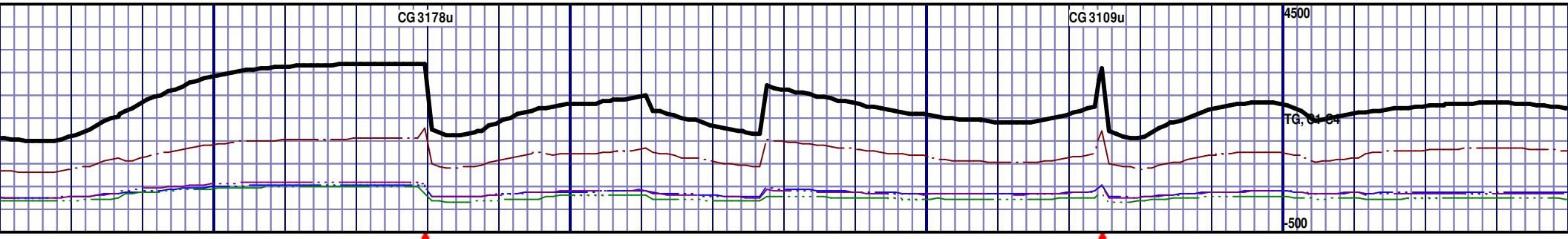
MD 8732 TVD 6711.11
Az 88.47° Inc 87.56° VS 2177.04



MD 8827 TVD 6714.33
Az 86.63° Inc 88.55° VS 2271.91

MD 8921 TVD 6716.08
Az 86.31° Inc 89.32° VS 2365.75

MD
Az 8



Y, SOFT, MINOR CALC, NO VIS FRACT,
S, NO FLUOR, IMMED BLU STRM CUT,

CHK; 56%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT,
SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT,
YLW RING CUT, NO VIS

CHK; 56%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT,
SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT,
YLW RING CUT, NO VIS

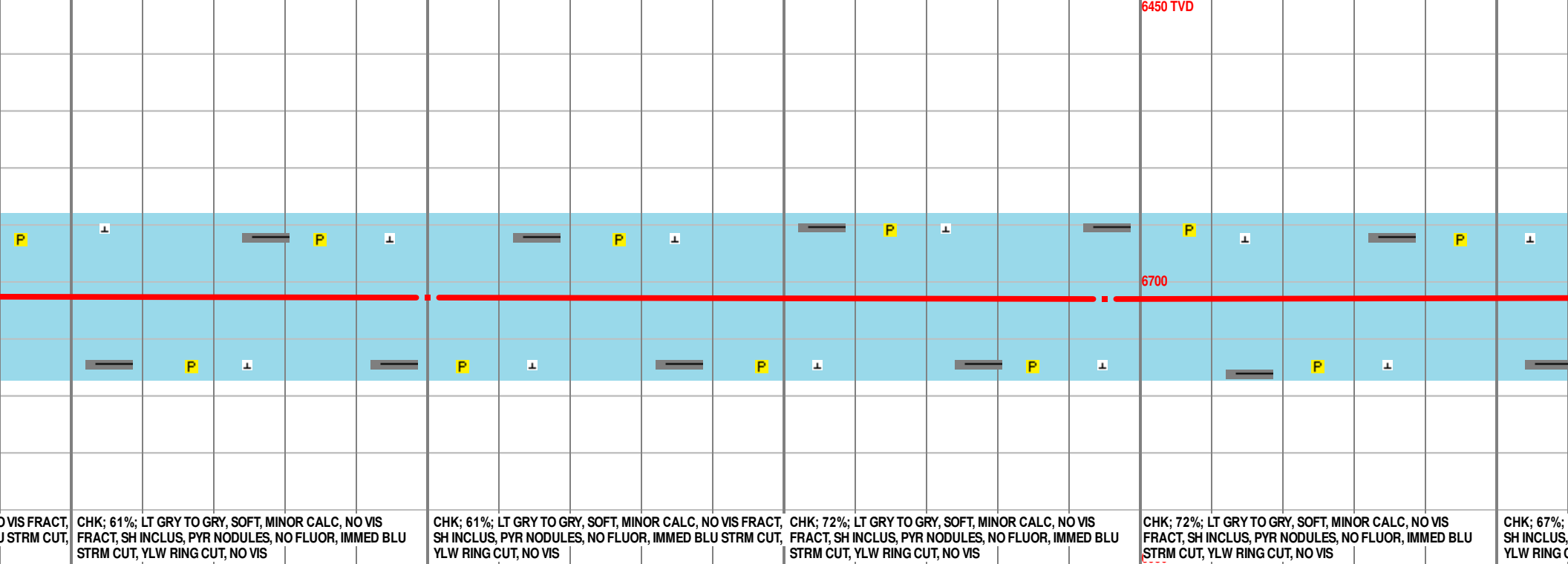
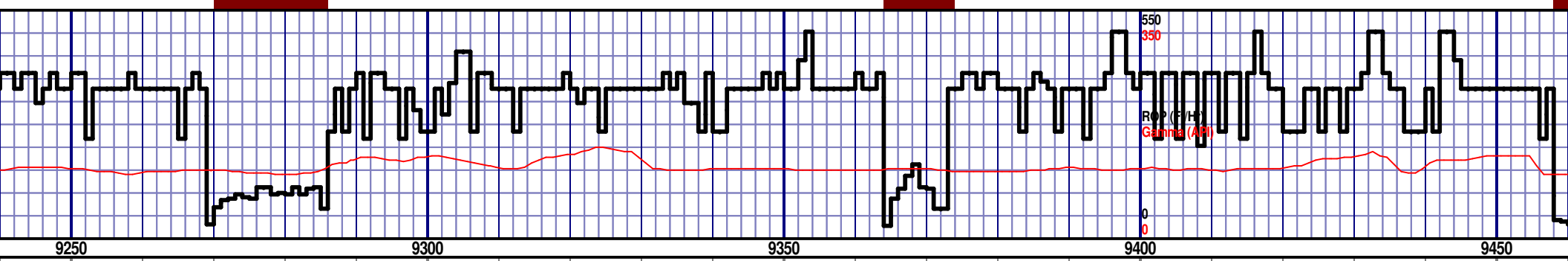
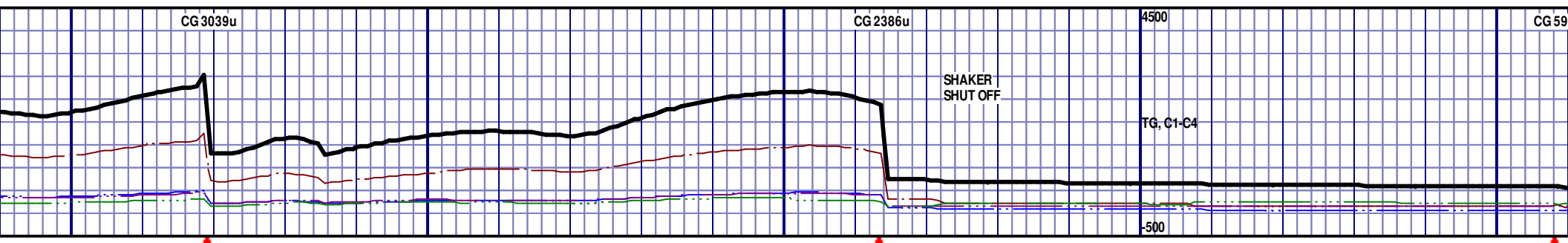
CHK; 58%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS
FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU
STRM CUT, YLW RING CUT, NO VIS

CHK; 58%; LT GRY TO GRY, SOFT, MINOR CALC, NO
SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU
YLW RING CUT, NO VIS

9016 TVD 6715.36
Az 5.59° Inc 91.54° VS 2460.44

MD 9111 TVD 6713.29
Az 87.02° Inc 90.96° VS 2555.37

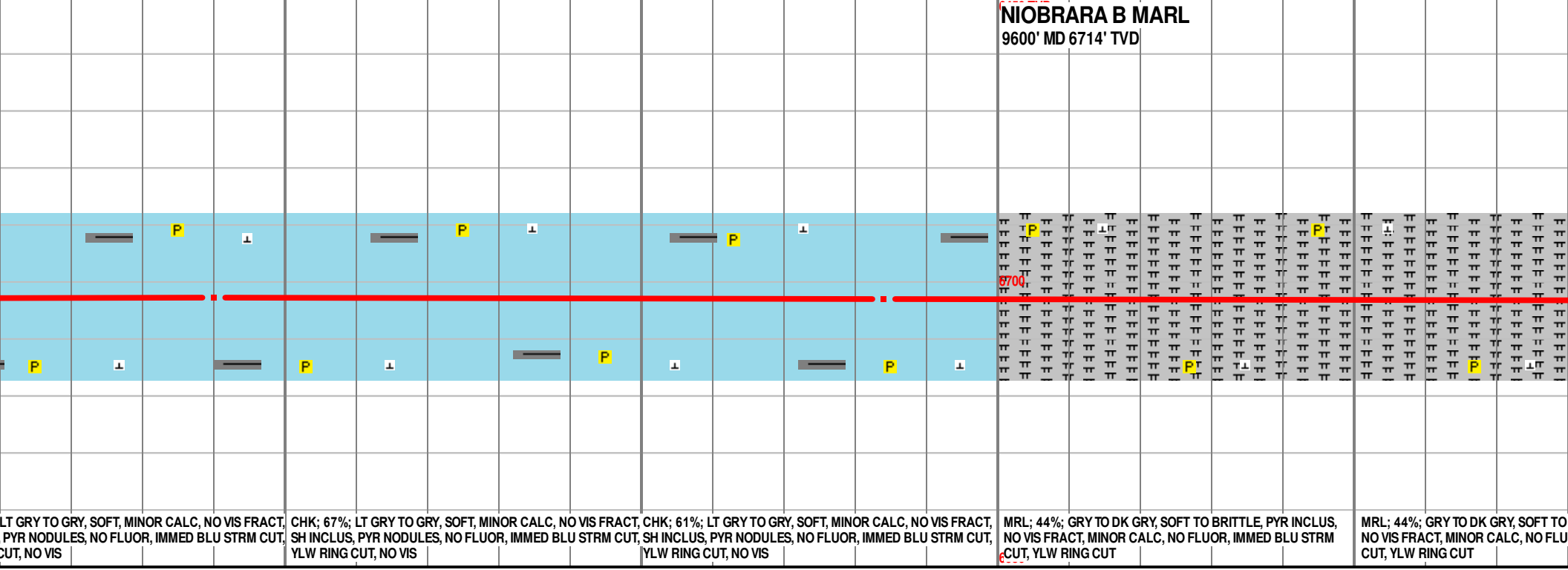
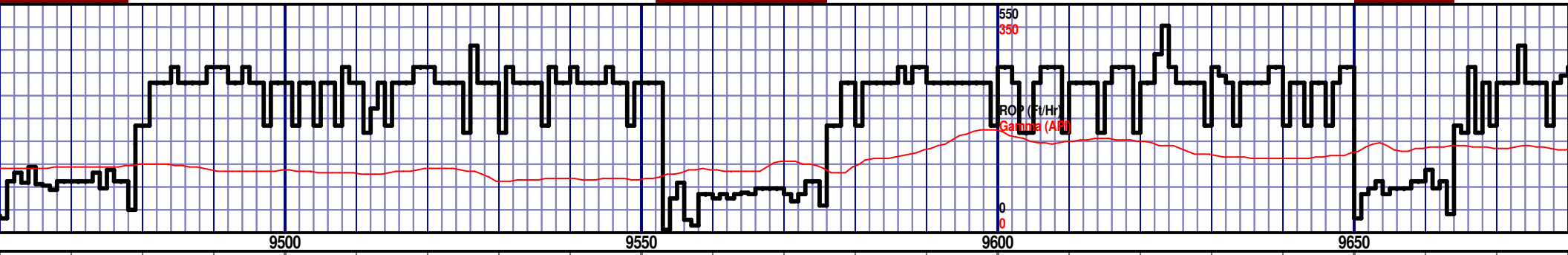
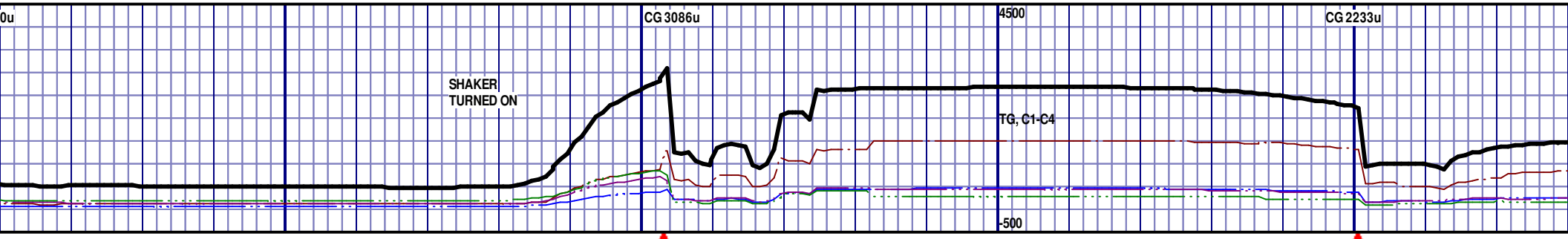
MD 9205 TVD 6712.71
Az 89.4° Inc 89.75° VS 2649.33



NO VIS FRACT, US STRM CUT,	CHK; 61%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS	CHK; 61%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS	CHK; 72%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS	CHK; 72%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS	CHK; 67%; SH INCLUS, YLW RING C
-------------------------------	---	---	---	---	---------------------------------------

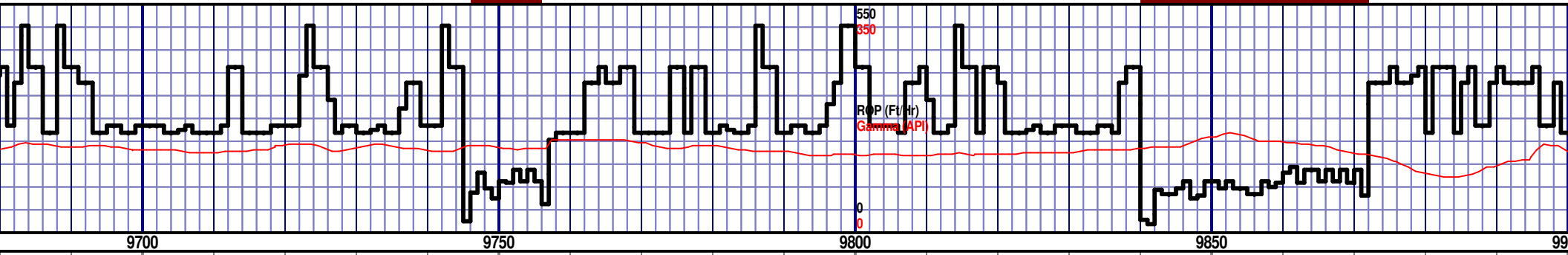
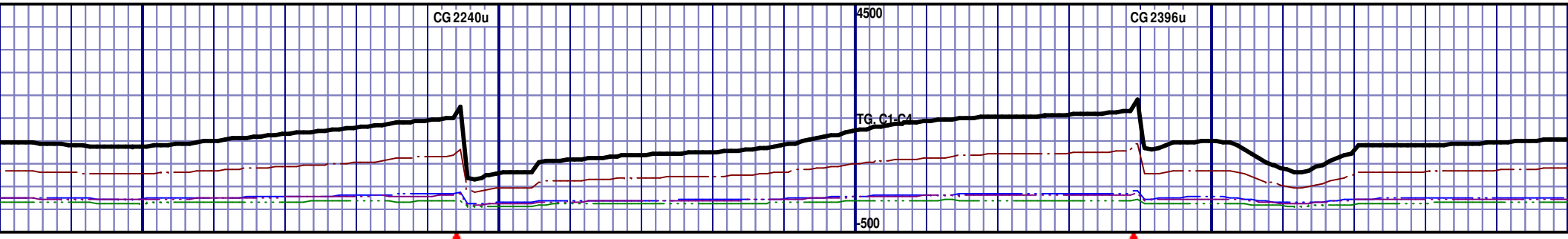
MD 9300 TVD 6713.99
Az 88.97° Inc 88.7° VS 2744.31

MD 9395 TVD 6714.71
Az 89.28° Inc 90.43° VS 2839.3



MD 9490 TVD 6714.22
Az 89.15° Inc 90.15° VS 2934.3

MD 9584 TVD 6714.73
Az 88.44° Inc 89.23° VS 3028.29

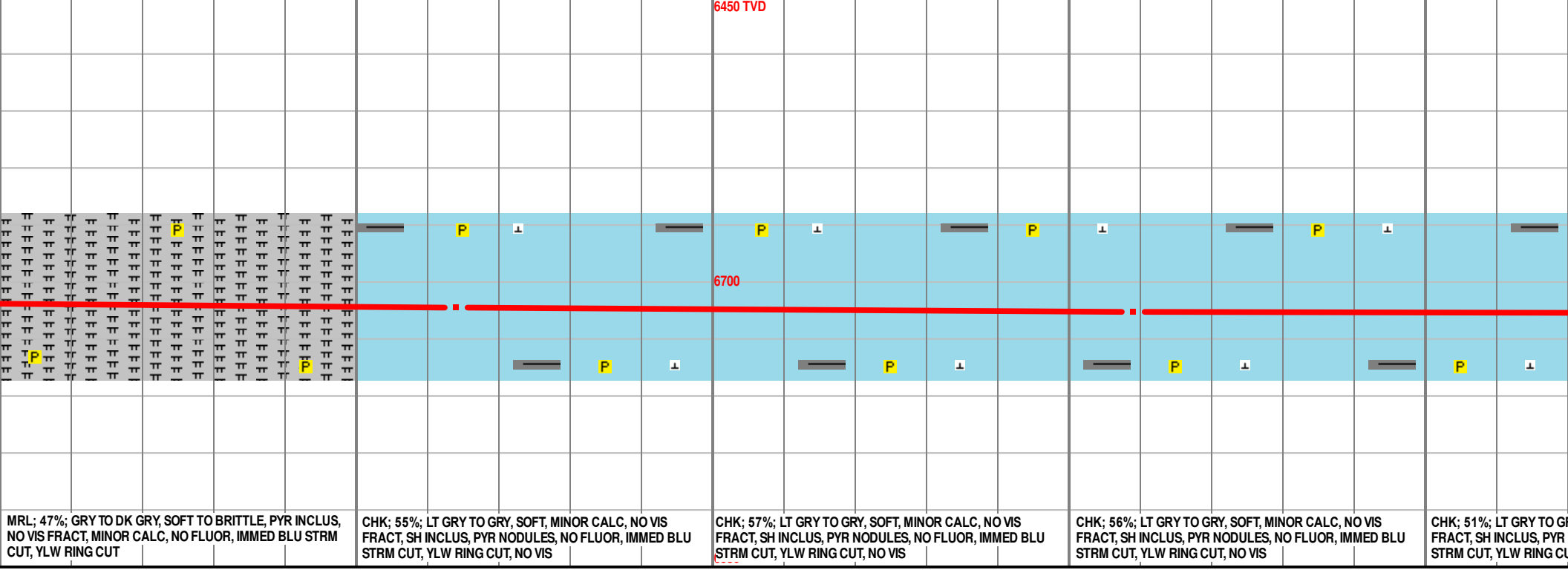
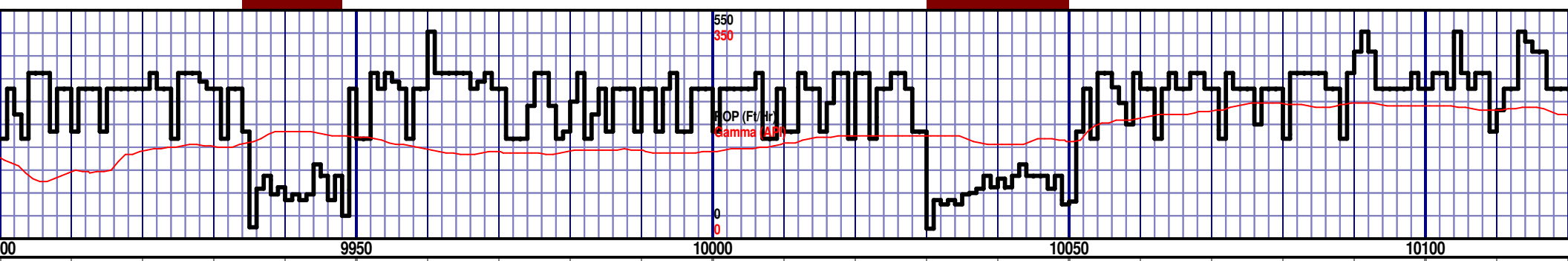
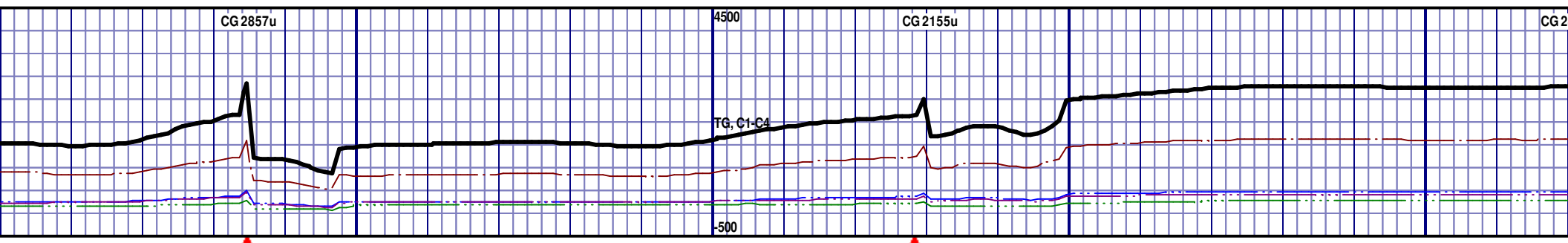


6450 TVD										
6300										
BRITTLE, PYR INCLUS, OR, IMMED BLU STRM	MRL; 44%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 41%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 39%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 34%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT						

MD 9697 TVD 6716.11
Az 87.94° Inc 89.1° VS 3123.25

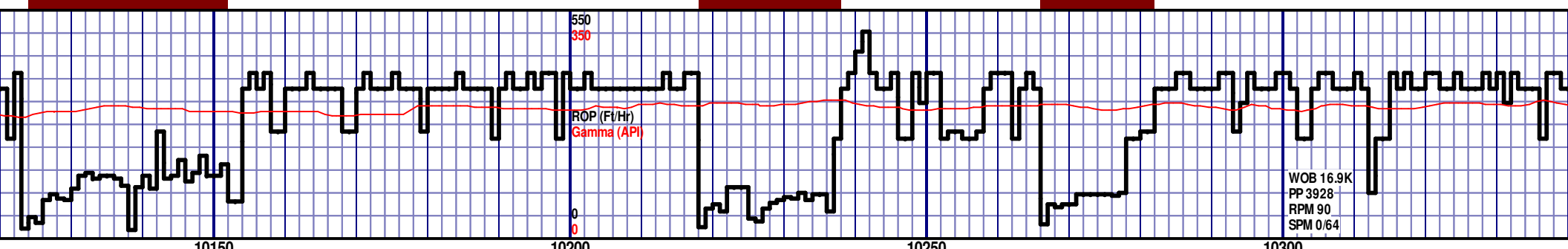
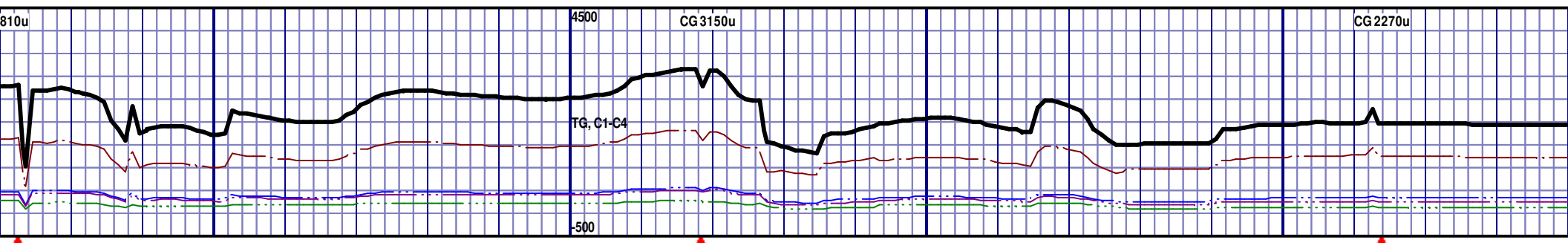
MD 9774 TVD 6716.19
Az 87.8° Inc 90.8° VS 3218.20

MD 9869 TVD 6717.59
Az 85.28° Inc 87.5° VS 3313.03



MD 9964 TVD 6722.4
Az 85.41° Inc 86.7° VS 3407.65

MD 10059 TVD 6726.77
Az 85.55° Inc 88.02° VS 3502.30

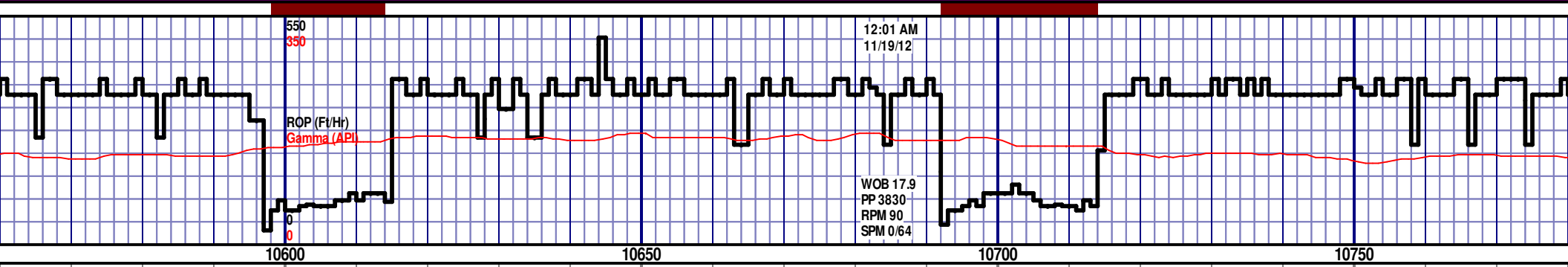
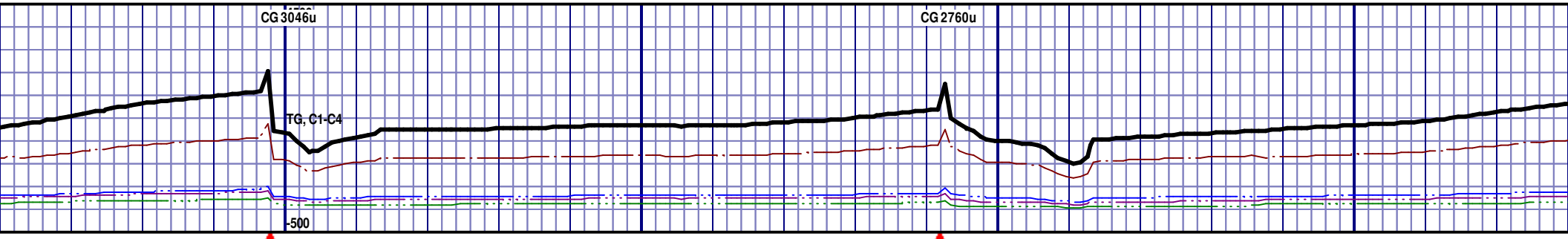


WOB 16.9K
 PP 3928
 RPM 90
 SPM 0/64

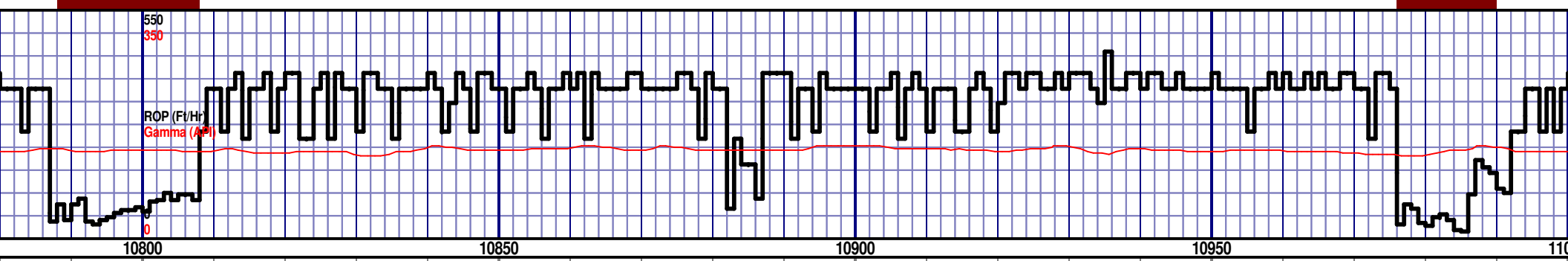
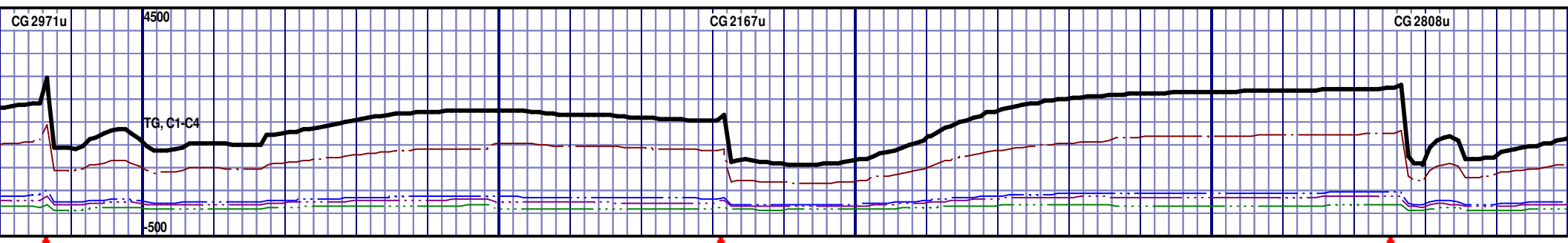
<p>RY, SOFT, MINOR CALC, NO VIS NODULES, NO FLUOR, IMMED BLU CUT, NO VIS</p>	<p>CHK; 52%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS</p>	<p>MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT</p>	<p>MRL; 45%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT</p>	<p>MRL; 46%; GRY TO DK GRY, SOFT TO BRITTLE, PYR NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU CUT, YLW RING CUT</p>
--	--	---	---	--

MD 10154 TVD 6727.67
 Az 86.58° Inc 90.89° VS 3597.08

MD 10249 TVD 6726.41
 Az 87.41° Inc 90.62° VS 3691.99



6450 TVD									
6700									
GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, CT, MINOR CALC, NO FLUOR, IMMED BLU STRM NG CUT	MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 49%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 48%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT	MRL; 47%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT					



6450 TVD					NIOBRARA B CHALK 10935'MD 6715' TVD				
BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT					MRL; 48%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT				
MRL; 49%; GRY TO DK GRY, SOFT TO BRITTLE, PYR INCLUS, NO VIS FRACT, MINOR CALC, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT					CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS				
CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS					CHK; 51%; LT GRY TO GRY, SOFT, MINOR CALC, NO VIS FRACT, SH INCLUS, PYR NODULES, NO FLUOR, IMMED BLU STRM CUT, YLW RING CUT, NO VIS				

MD 10818 TVD 6714.97
Az 89.37° Inc 90.65° VS 4260.63

MD 10913 TVD 6714.56
Az 88.37° Inc 89.85° VS 4355.62

