RESERVOIR GROUP

Scale: 5" / 100'
Measured Depth Log

Well Name	Flaschenriem 3		
Location	Section 3, Township 4N, Range 68W		
State	Colorado	**County**	Weld
Country	USA	**Rig Number**	Ensign 140
API Number	05-123-49819	**AFE #**	N/A
Geographic Region	Rockies	**Field**	Wattenberg
Spud Date	3/23/2019	**Drilling Completed**	5/14/2019
Surface Coordinates	1,878'FNL & 2,179'FWL, Sec:3 T:4N R:68W Latitude: 40.34405, Longitude: -104.99154		
Bottom Hole Coordinates	1,861'FSL & 460'FEL, Sec:35 T:5N R:68W Latitude: 40.35425 Longitude: -104.96611		
Ground Elevation	5,068'	**K.B. Elevation**	5,091'
Logged Interval	7,900' **To** 15,655'	**Total Depth**	15,655'
Formation	Niobrara C		
Type of Drilling Fluid	Oil Based Mud		

Operator

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro Operatin
Company, LL

Geologist

Name Michael Domenick

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro Operatin
Company, LL

Other

Loggers: Byron Pitulski/Greg Diefenbach

Services Provided: 2 Man Logging, Geosteering

Equipment: ML-585, ML-533

Start Date 05/12/2019

Release Date: 05/14/2019

Job #: 2074RK1904

Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Rock Types

UNKNOWN	DOLOMITE	SHALE GRAY	TILL
ANHYDRITE	CHERT	SHALE COLORED	BENTONITE
GYPSUM	COAL	SILTSTONE	TUFF
SALT	MARLSTONE	SANDSTONE	IGNEOUS
SIDERITE or LIMONITE	CHALK	CONGLOMERATE	METAMORPHIC
LIMESTONE	SHALE	BRECCIA	CEMENT

Acc

Fossils

F FOSSIL		– ARGILLACEOU
GASTROPOD		ARGILLITE GR
ALGAE	OOLITE	B BENTONITE
AMPHIPORA	OSTRACOD	BITUMENOUS
BELEMNITE	PELECYPOD	BRECCIA FRA
BIOCLASTIC	PELLET	CALCAREOUS
BRACHOIPOD	PISOLITE	CARBONACEO
BRYOZOA	PLANT REMAINS	CHTDK
CEPHALOPOD	PLANT SPORES	CHTLT
CORAL	SCAPHOPOD	COAL - THIN BE
CRINOID	STROMATOPOROID	DOLOMITIC
ECHINOID		FELDSPAR
FISH		FERRUGINOUS
FORAMINIFERA		FERRUGINOUS

Minerals

ANHYDRITIC	

Other

Oil Show

D DEAD	P PINPOINT	
EVEN	VUGGY	
QUESTIONABLE		
SPOTTED STAINING		

Porosity

E EARTHY	CONNECTION (LEFT)	
FENESTRAL	CONNECTION (RIGHT)	
F FRACTURE	CONNECTION GAS	
INTERCRYSTALLINE	CORE - LOST	
INTEROOLITIC	CORE - RECOVERED	
MOLDIC	DST INTERVAL	
	FAULT	

Engineering

O ORGANIC		
BIT		
CASING		

essories

S
AIN
SUBSTANCE
GMENTS
US FLAKES
EDS
S PELLET
S

GLAUCONITE
GYPSIFEROUS
HEAVY MINERAL
KAOLIN
MARLSTONE
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY
TUFFACEOUS

Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

r Symbols

FORMATION TOP
AS SHOW
EPTH MN DEPTH
ORMAL FAULT
L SHOW
VERTURNED STRATA
EVERSE FAULT
DEWALL CORE (LEFT)
DEWALL CORE (RIGHT)
DE
SURVEY
TRIP GAS
RELINE TESTED - LEFT
RELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

Textures

BOUNDSTONE
CHALKY
CRYPTOXLN
EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

Curves
ROP
GAMMA

Bit #: 2
Type: ATD505T
Size: 8.5
Depth In: 1,580'
Depth Out: 15,655'
Hours: 58.8 hrs
Avg Ft/Hr: 239 '/hr
Jets: 5x15

1000
200
ROP (ft/hr)
GAMMA (API)
0
0

Slide/Rotate

Depth Labels

7,860 7,870 7,880 7,890 **7,900** 7,910 7,920 7,930 7,940 **7,950** 7,960 7,970 7,980 7,990 **8,000** 8,010 8,020 8,030 8,040 **8,050**

Notes

MD: 7,919'
INC: 46.4°
AZM: 43.18°
TVD: 6,833.29'
VS: 1,164.11'

Sharon Springs
7,994'MD / 6,850'TVD

WOB: 8.9klbs
RPM: 119
SPM: 205
SPP: 3,458psi

MD: 8,012'
INC: 50.29°
AZM: 51.1°
TVD: 6,895.15'
VS: 1,231.13'

MW IN: 9.
VIS IN: 41
MW OUT:
VIS OUT:

Total Gas
GAS
C1
C2
C3
C4
C5

Loggers
BP - Byron Pitulski
GD - Greg Diefenbach

System Calibrated
1% Methane = 100 units
100% Methane = 10000 units

1E4 2E6
1,000 2E5
GAS (units) C1-C5 (PPM)
100 2E4
10 2E3

282u
319u

Well Bore
TVD

Petro Operating Co.
Flaschenriem 3

9 5/8" Surface Casing @ 1,569'

Spud Date: 03/23/2019

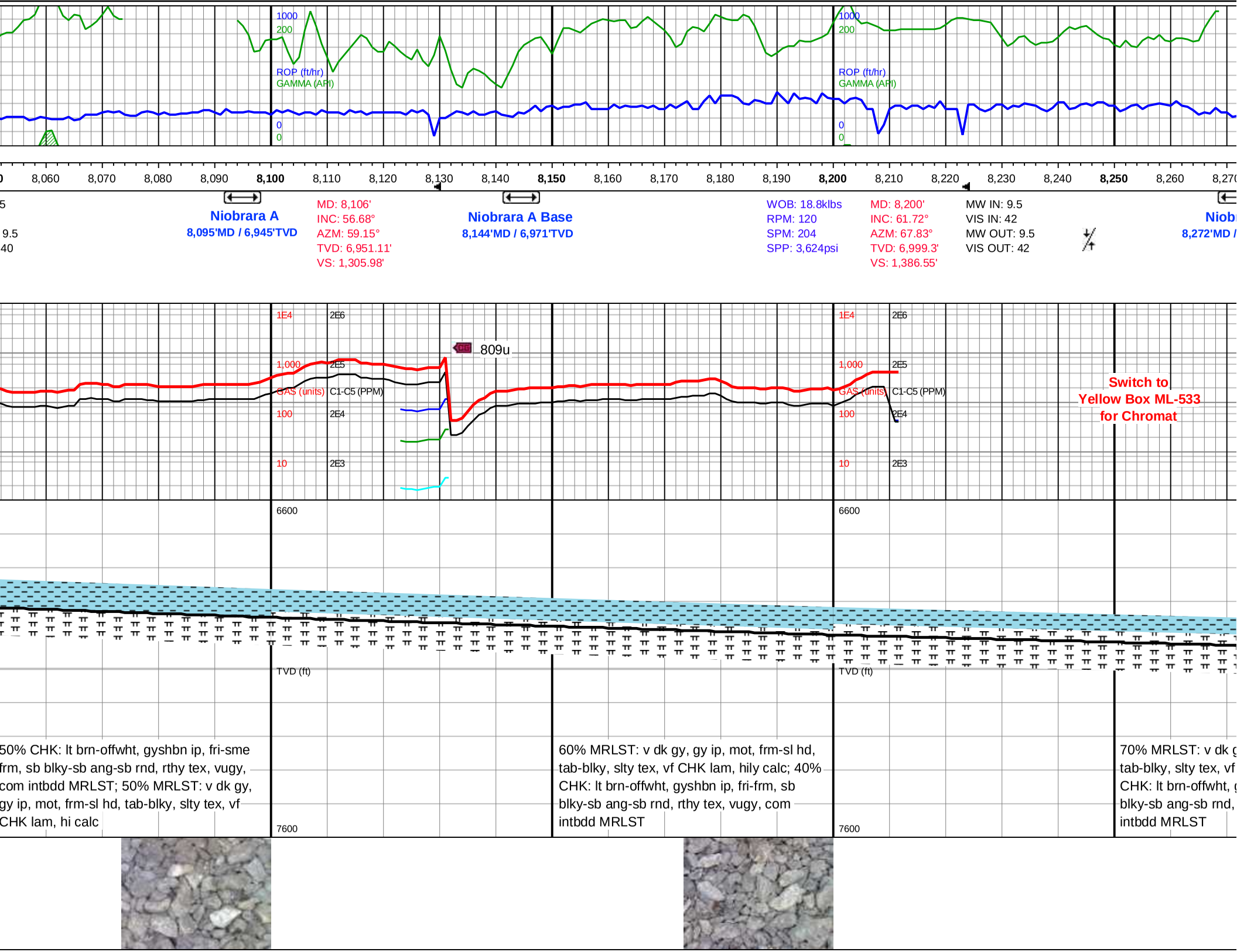
Logging Began: 05/12/2019 06:16

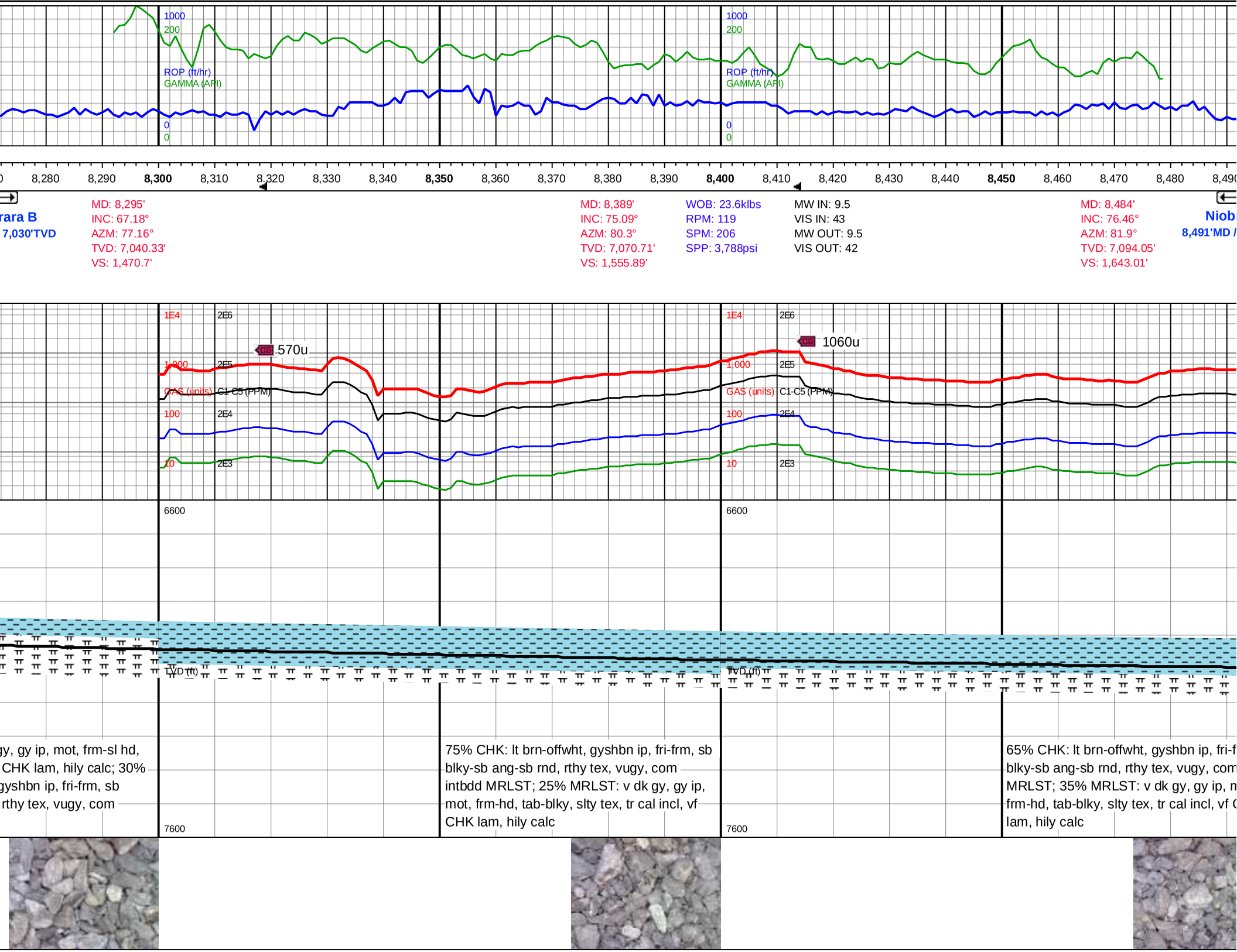
All Depths Correspond to Driller's Pipe Tally

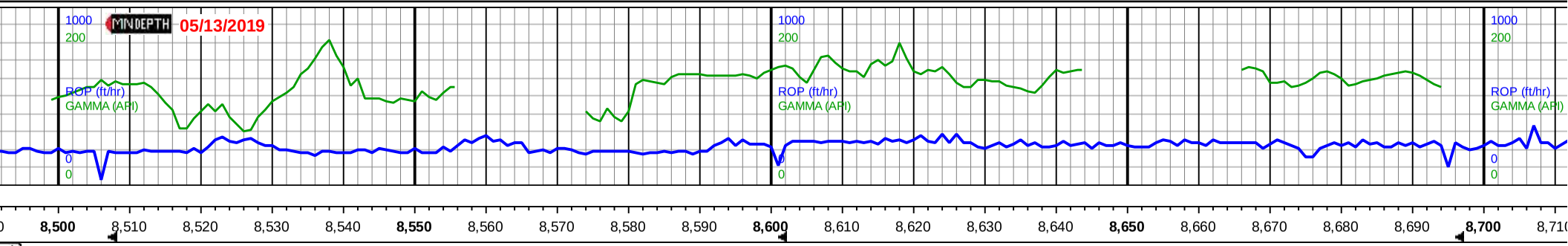
6600
TVD (ft)
7600

100% SH: med gy-dk gy, sb ang-tab, frm-hrd, slty-sl abrsv, mod suc, mod fiss, grdg to sltst, non-calc

Images


1000
200
ROP (ft/hr)
GAMMA (API)
0
0
8,060
8,070
8,080
8,090
8,100
8,110
8,120
8,130
8,140
8,150
8,160
8,170
8,180
8,190
8,200
8,210
8,220
8,230
8,240
8,250
8,260
Niobrara A
8,095'MD / 6,945'TVD
Niobrara A Base
8,144'MD / 6,971'TVD
MD: 8,106'
INC: 56.68°
AZM: 59.15°
TVD: 6,951.11'
VS: 1,305.98'
WOB: 18.8klbs
RPM: 120
SPM: 204
SPP: 3,624psi
MD: 8,200'
INC: 61.72°
AZM: 67.83°
TVD: 6,999.3'
VS: 1,386.55'
MW IN: 9.5
VIS IN: 42
MW OUT: 9.5
VIS OUT: 42
8,272'MD /
1E4
2E6
1,000
2E5
GAS (units)
C1-C5 (PPM)
100
2E4
10
2E3
809u
Switch to
Yellow Box ML-533
for Chromat
6600
7600
TVD (ft)
50% CHK: lt brn-offwht, gyshbn ip, fri-sme frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST; 50% MRLST: v dk gy, gy ip, mot, frm-sl hd, tab-blky, slty tex, vf CHK lam, hi calc
60% MRLST: v dk gy, gy ip, mot, frm-sl hd, tab-blky, slty tex, vf CHK lam, hily calc; 40% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST
70% MRLST: v dk g
tab-blky, slty tex, vf
CHK: lt brn-offwht,
blky-sb ang-sb rnd,
intbdd MRLST


1000
200
ROP (ft/hr)
GAMMA (API)
0
0
8,280
8,290
8,300
8,310
8,320
8,330
8,340
8,350
8,360
8,370
8,380
8,390
8,400
8,410
8,420
8,430
8,440
8,450
8,460
8,470
8,480
rara B
7,030'TVD
MD: 8,295'
INC: 67.18°
AZM: 77.16°
TVD: 7,040.33'
VS: 1,470.7'
MD: 8,389'
INC: 75.09°
AZM: 80.3°
TVD: 7,070.71'
VS: 1,555.89'
WOB: 23.6klbs
RPM: 119
SPM: 206
SPP: 3,788psi
MW IN: 9.5
VIS IN: 43
MW OUT: 9.5
VIS OUT: 42
MD: 8,484'
INC: 76.46°
AZM: 81.9°
TVD: 7,094.05'
VS: 1,643.01'
Niob
8,491'MD /
1E4
2E6
1,000
2E5
GAS (units)
C1-C5 (PPM)
100
2E4
10
2E3
570u
1060u
6600
7600
TVD (ft)
gy, gy ip, mot, frm-sl hd,
CHK lam, hily calc; 30%
gyshbn ip, fri-frm, sb
rthy tex, vugy, com
75% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb
blky-sb ang-sb rnd, rthy tex, vugy, com
intbdd MRLST; 25% MRLST: v dk gy, gy ip,
mot, frm-hd, tab-blky, slty tex, tr cal incl, vf
CHK lam, hily calc
65% CHK: lt brn-offwht, gyshbn ip, fri-f
blky-sb ang-sb rnd, rthy tex, vugy, com
MRLST; 35% MRLST: v dk gy, gy ip, n
frm-hd, tab-blky, slty tex, tr cal incl, vf
lam, hily calc



rara C
7,095'TVD

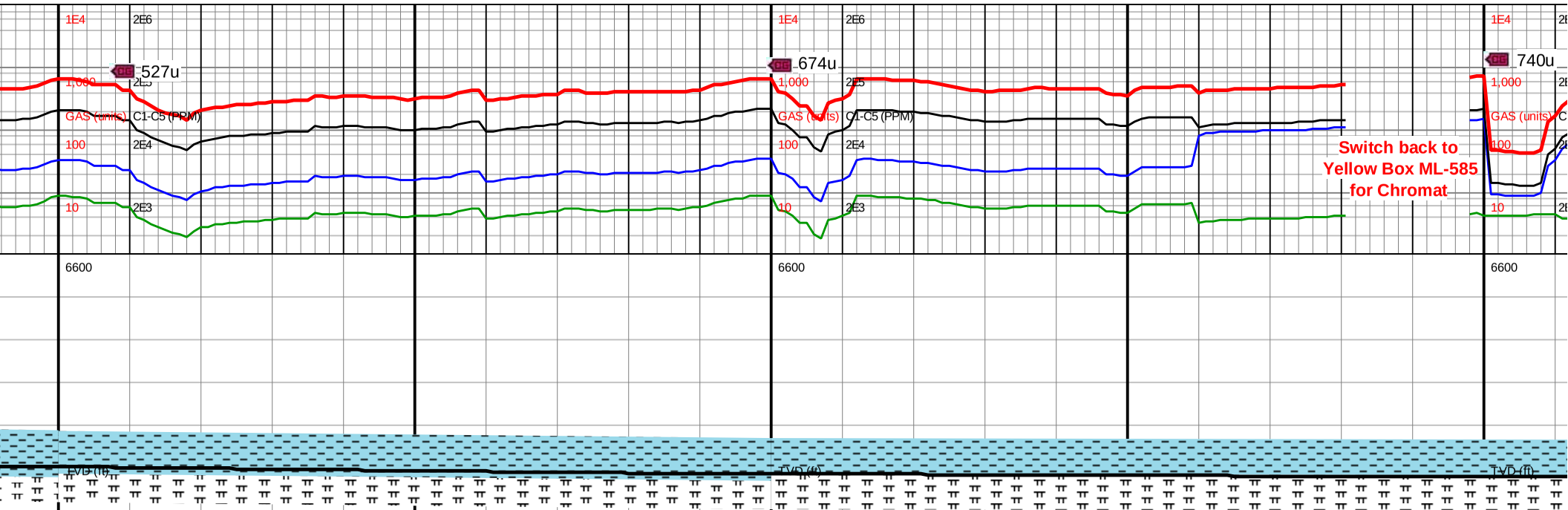
MD: 8,578'
INC: 82.09°
AZM: 85.63°
TVD: 7,111.54'
VS: 1,728.86'

WOB: 18.4klbs
RPM: 120
SPM: 208
SPP: 2,992psi

MW IN: 9.5
VIS IN: 43
MW OUT: 9.4+
VIS OUT: 43

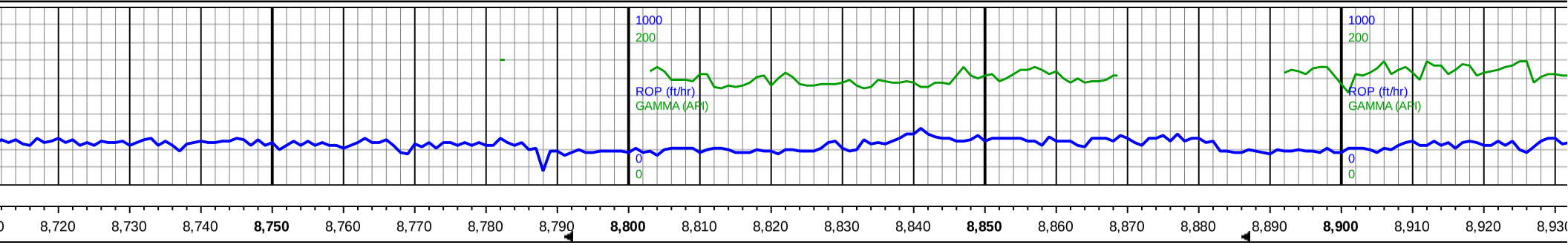
Land Curve
8,672'MD / 7,119'TVD

MD: 8,672'
INC: 88.89°
AZM: 90.73°
TVD: 7,118.94'
VS: 1,813.02'



rm, sb
intbdd
not,
CHK

60% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, slty tex, tr cal incl, vf CHK lam, hily calc

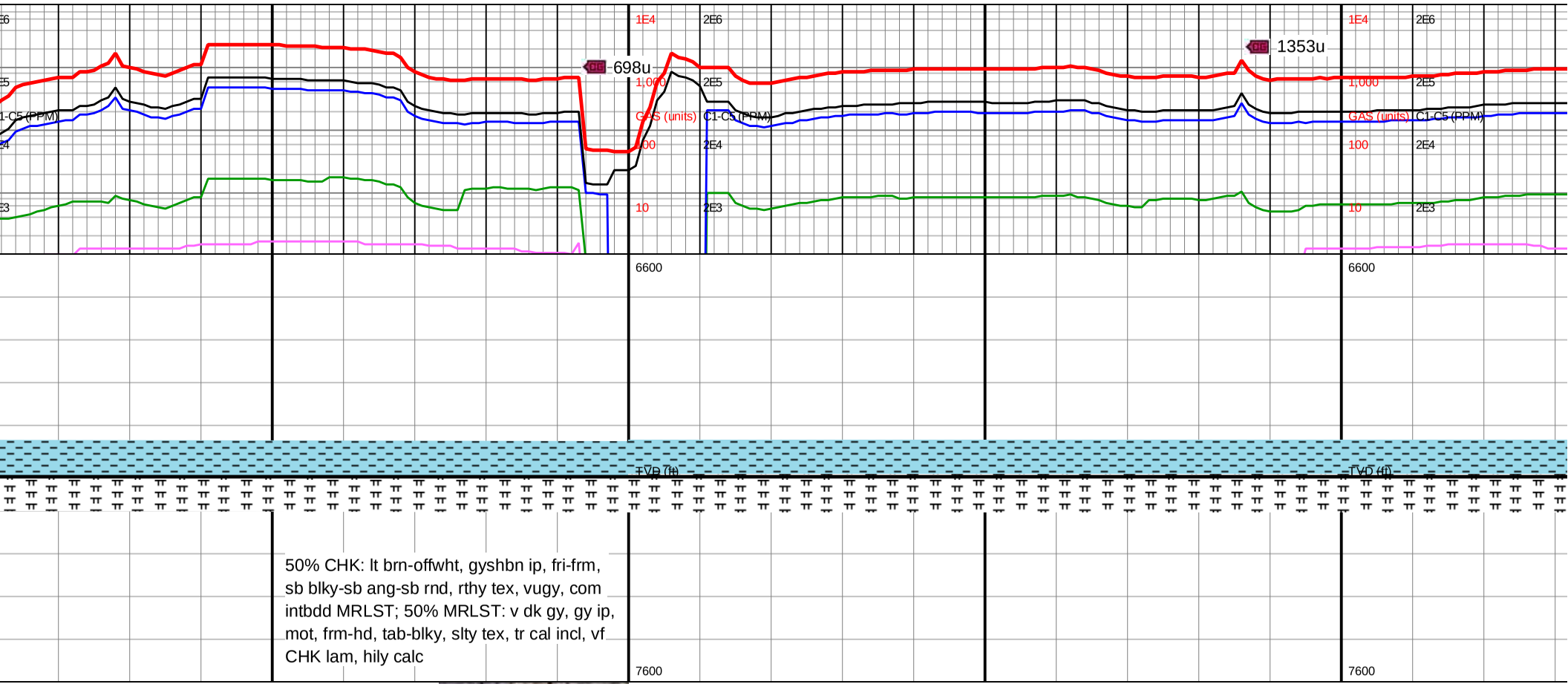


MW IN: 9.6
VIS IN: 43
MW OUT: 9.5
VIS OUT: 42

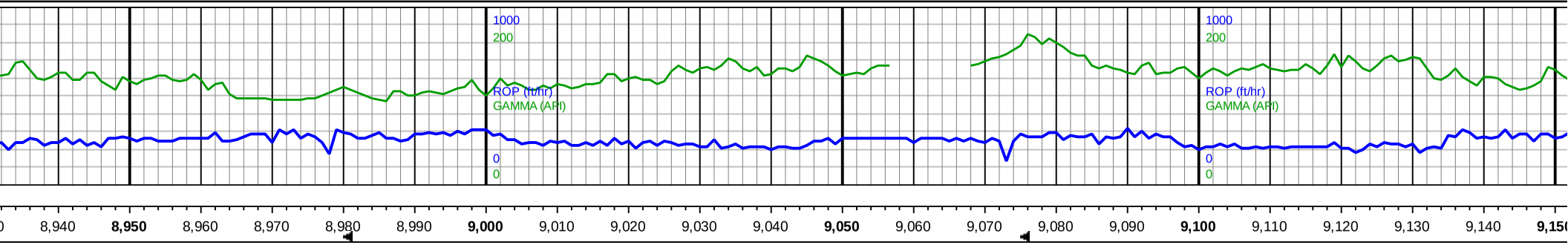
MD: 8,767'
INC: 89.78°
AZM: 91.79°
TVD: 7,120.04'
VS: 1,896.07'

WOB: 20.2klbs
RPM: 100
SPM: 204
SPP: 3,630psi

MD: 8,861'
INC: 90.22°
AZM: 91.75°
TVD: 7,120.04'
VS: 1,977.85'



50% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST; 50% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, slty tex, tr cal incl, vf CHK lam, hily calc



MD: 8,956'
INC: 90.15°
AZM: 92.05°
TVD: 7,119.73'
VS: 2,060.38'

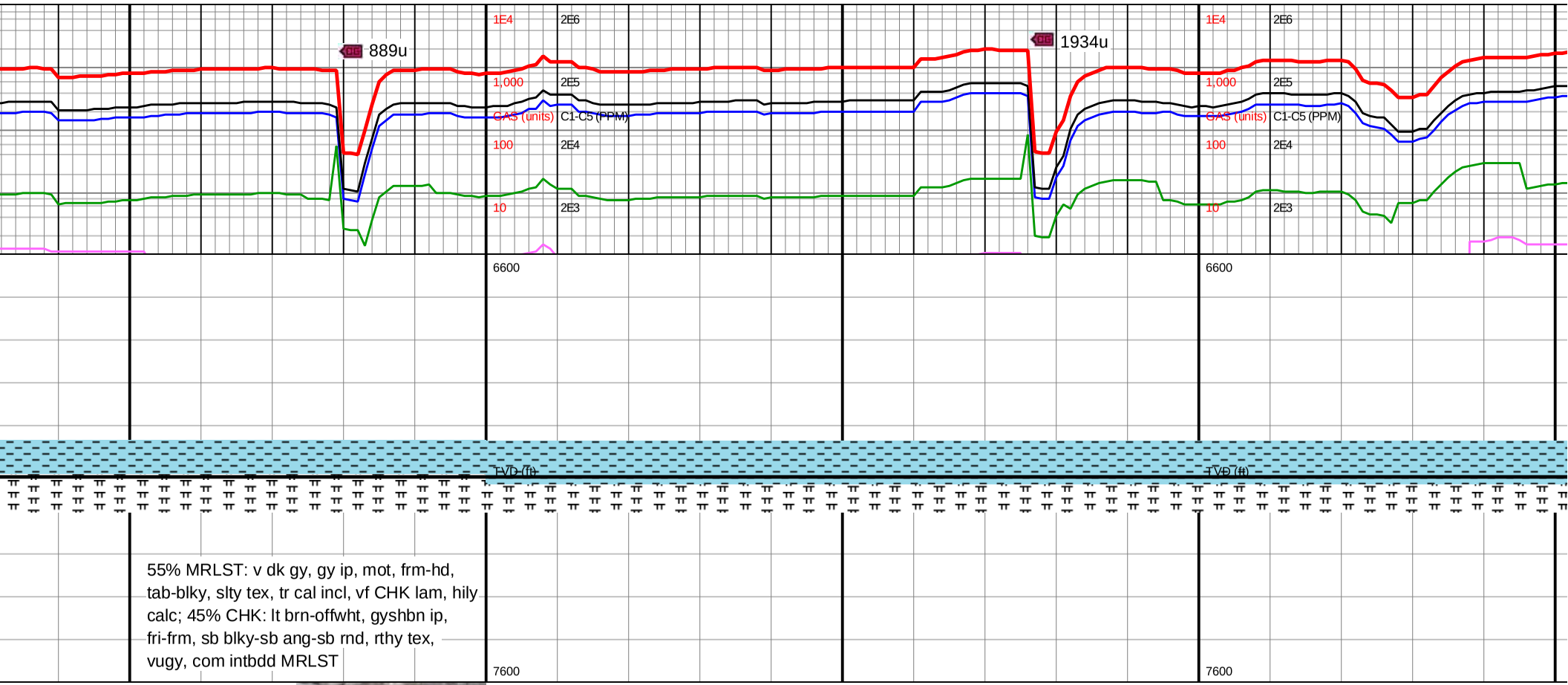
MW IN: 9.6+
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43

WOB: 29.1klbs
RPM: 101
SPM: 204
SPP: 3,885psi

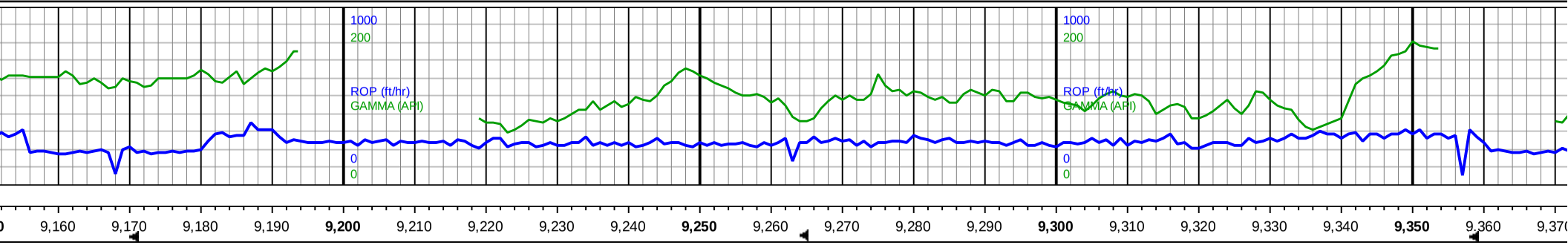
MD: 9,051'
INC: 90.03°
AZM: 90.73°
TVD: 7,119.58'
VS: 2,143.33'

MW IN: 9.6+
VIS IN: 43
MW OUT: 9.7
VIS OUT: 42

MD: 9,146'
INC: 89.82°
AZM: 90.04°
TVD: 7,119.71'
VS: 2,227.08'



55% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, slty tex, tr cal incl, vf CHK lam, hily calc; 45% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST

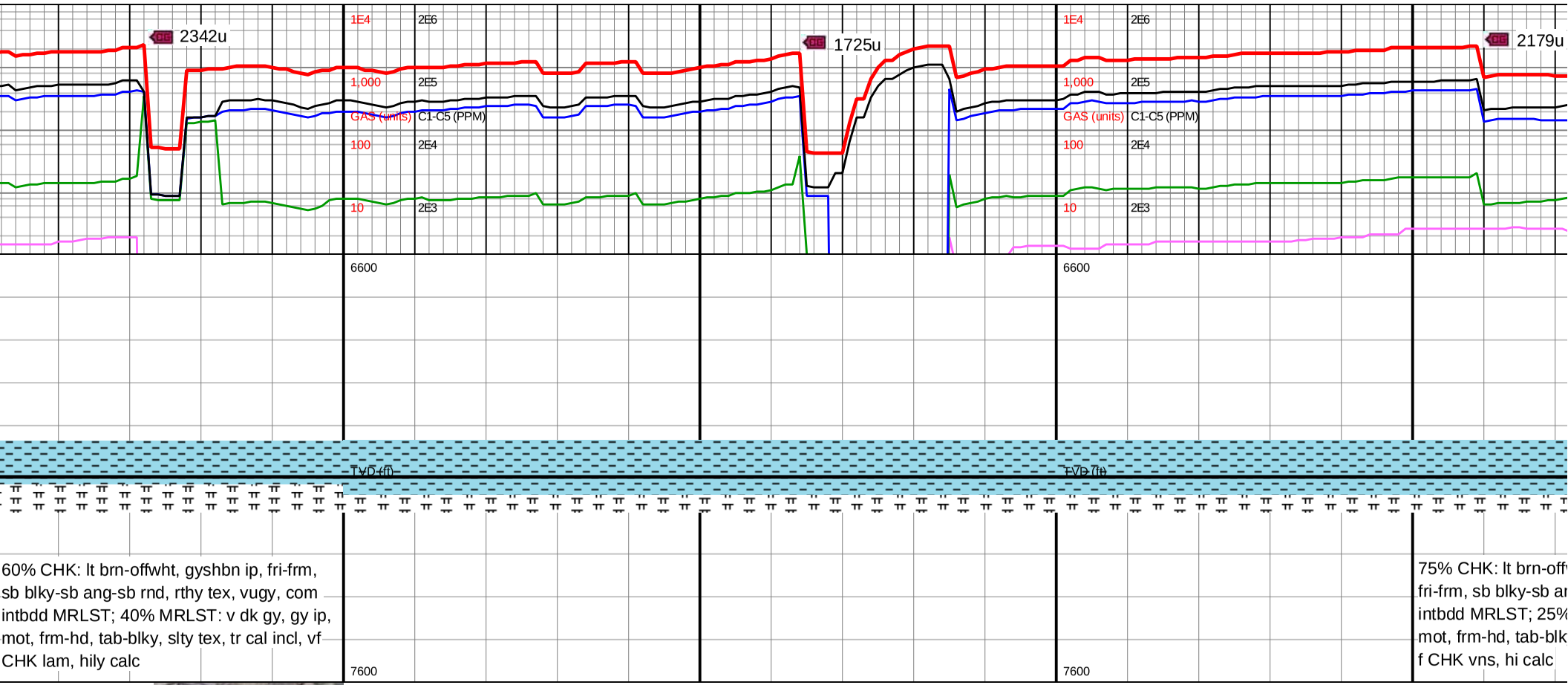


WOB: 24.1klbs
RPM: 100
SPM: 204
SPP: 2,890psi

MD: 9,239'
INC: 89.85°
AZM: 89.48°
TVD: 7,119.97'
VS: 2,309.54'

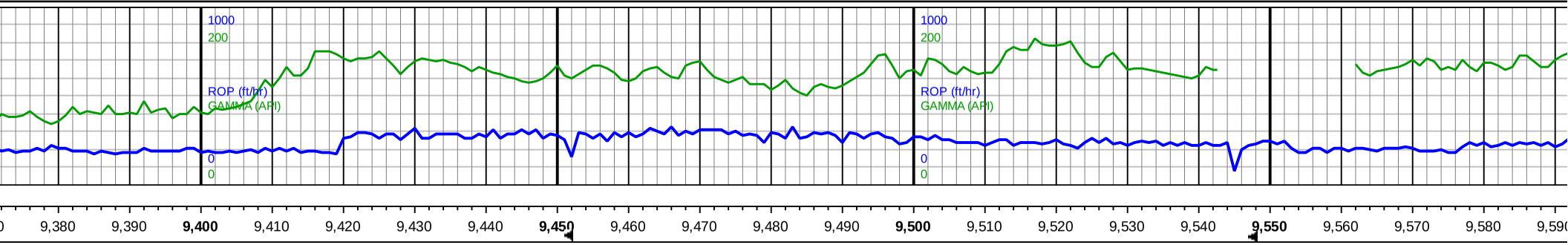
MW IN: 9.7
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43

MD: 9,334'
INC: 89.82°
AZM: 89.54°
TVD: 7,120.25'
VS: 2,393.97'



60% CHK: lt brn-offwht, gyshbn ip, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, slty tex, tr cal incl, vf CHK lam, hily calc

75% CHK: lt brn-off
fri-frm, sb blky-sb ar
intbdd MRLST; 25%
mot, frm-hd, tab-blk
f CHK vns, hi calc



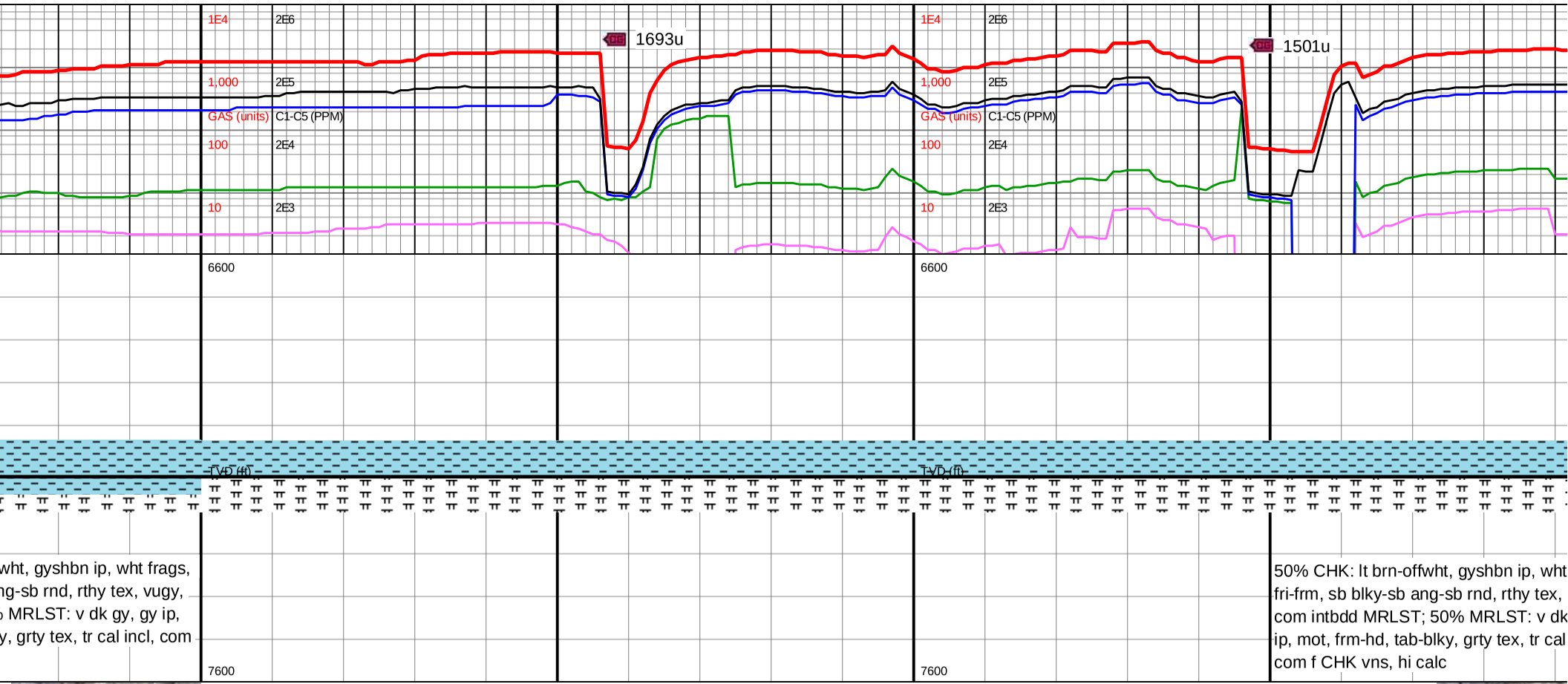
BP

WOB: 27.5klbs
RPM: 101
SPM: 204
SPP: 3,880psi

MD: 9,428'
INC: 90.34°
AZM: 88.78°
TVD: 7,120.12'
VS: 2,477.77'

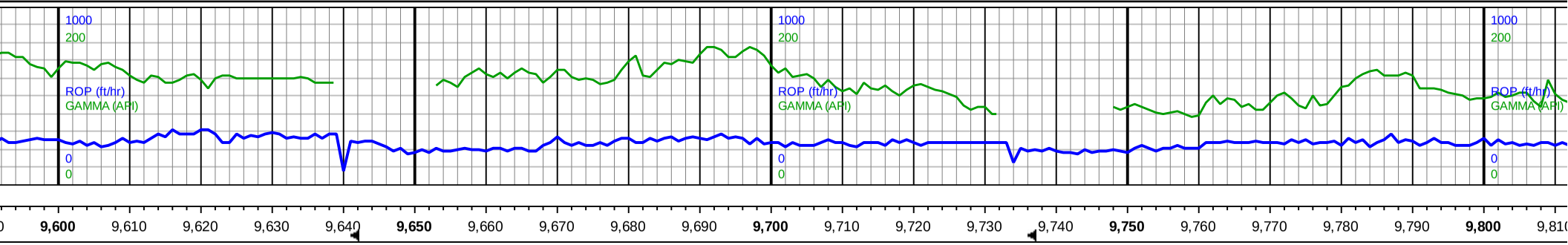
MW IN: 9.6
VIS IN: 42
MW OUT: 9.7
VIS OUT: 43

MD: 9,523'
INC: 90.37°
AZM: 88.35°
TVD: 7,119.53'
VS: 2,562.9'



wht, gyshbn ip, wht frags,
ng-sb rnd, rthy tex, vugy,
% MRLST: v dk gy, gy ip,
y, grty tex, tr cal incl, com

50% CHK: lt brn-offwht, gyshbn ip, wht
fri-frm, sb blky-sb ang-sb rnd, rthy tex,
com intbdd MRLST; 50% MRLST: v dk
ip, mot, frm-hd, tab-blky, grty tex, tr cal
com f CHK vns, hi calc



WOB: 12.6klbs
RPM: 120
SPM: 187
SPP: 3,267psi

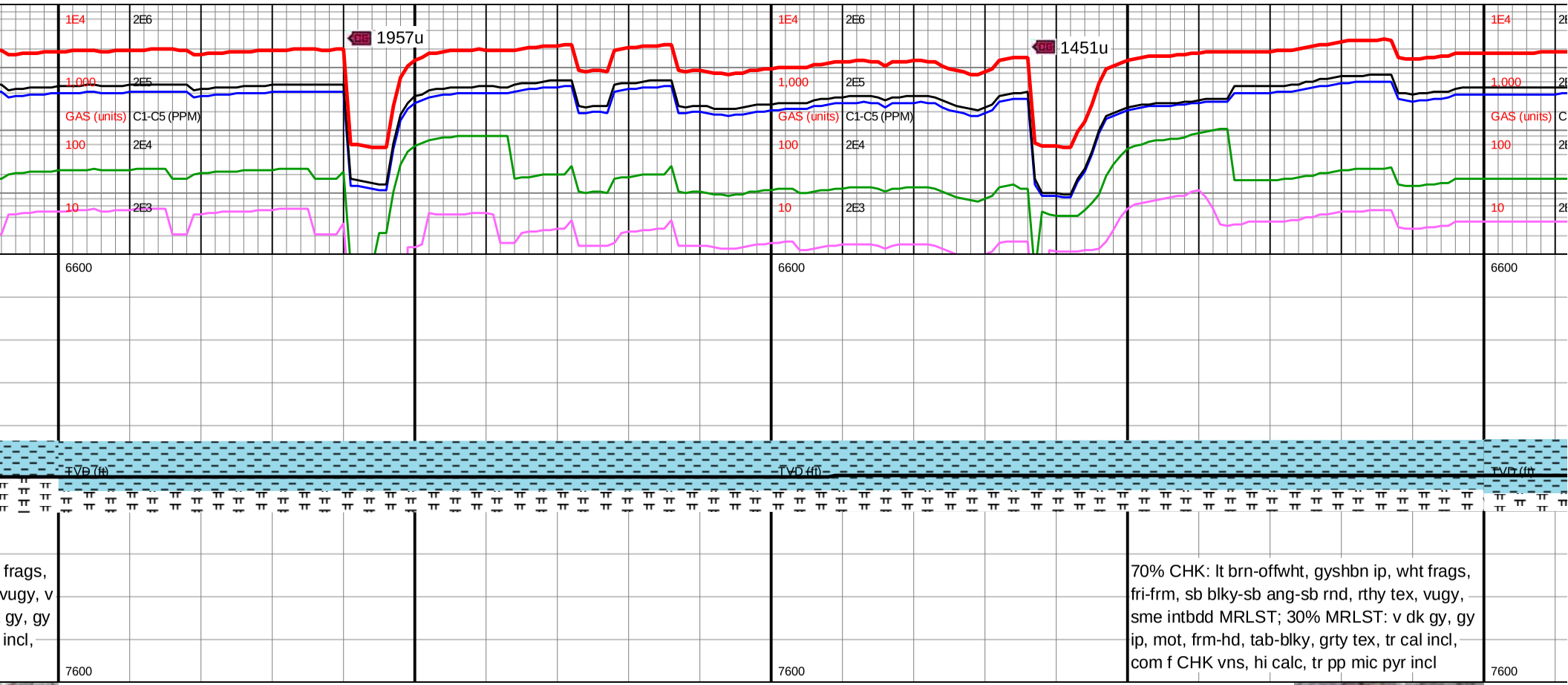
MD: 9,617'
INC: 90.34°
AZM: 87.24°
TVD: 7,118.95'
VS: 2,647.69'

MW IN: 9.6
VIS IN: 43
MW OUT: 9.6+
VIS OUT: 43

MD: 9,712'
INC: 90.43°
AZM: 86.56°
TVD: 7,118.31'
VS: 2,734.01'

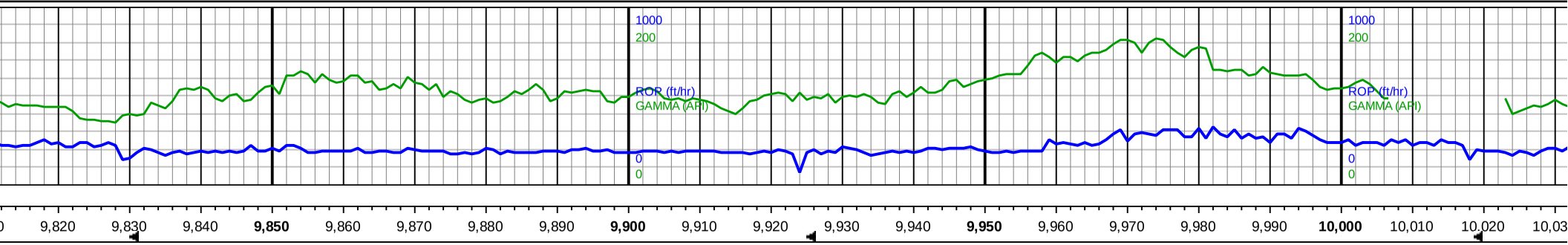
WOB: 12klbs
RPM: 119
SPM: 186
SPP: 3,359psi

MD: 9
INC: 9
AZM:
TVD:
VS: 2



frags,
vugy, v
gy, gy
incl,

70% CHK: lt brn-offwht, gyshbn ip, wht frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, sme intbdd MRLST; 30% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, tr cal incl, com f CHK vns, hi calc, tr pp mic pyr incl



,807'
91.05°
87.43°
7,117.08'
820.25'

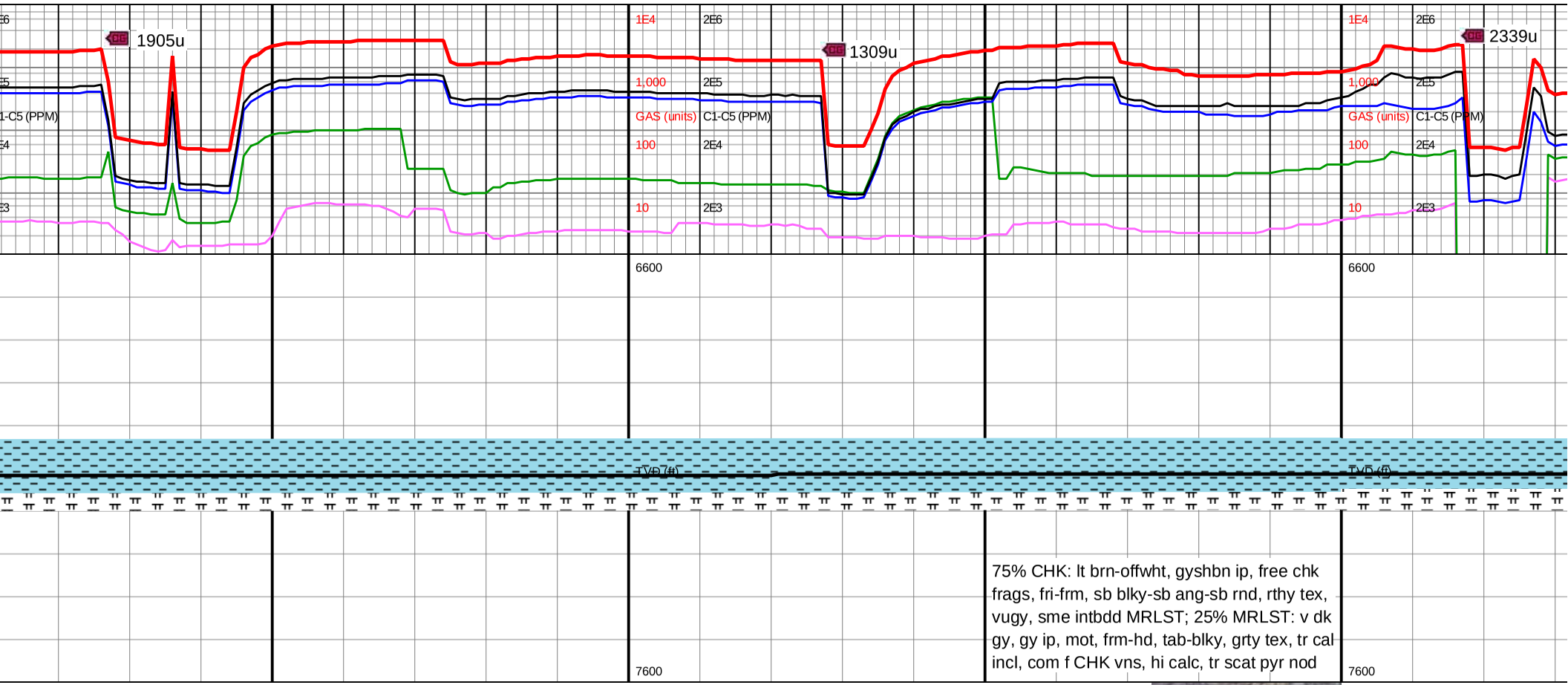
MW IN: 9.6
VIS IN: 43
MW OUT: 9.6+
VIS OUT: 44

MD: 9,901'
INC: 91.08°
AZM: 89.46°
TVD: 7,115.33'
VS: 2,904.56'

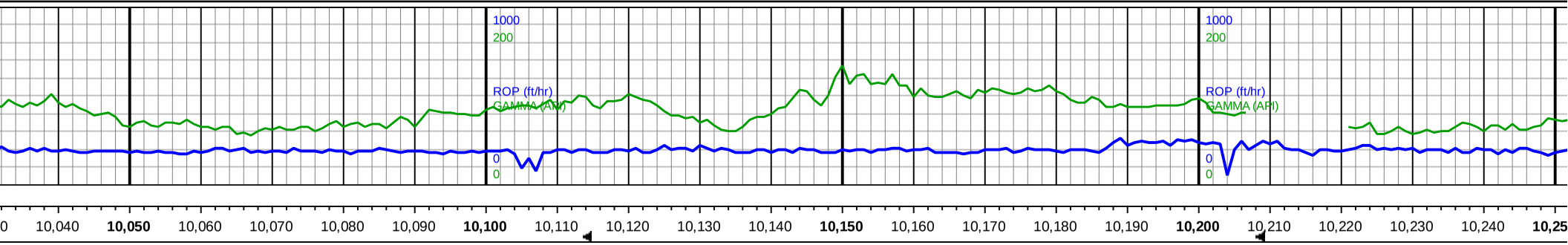
MD: 9,995'
INC: 90.89°
AZM: 91.73°
TVD: 7,113.72'
VS: 2,987.25'

WOB: 19klbs
RPM: 120
SPM: 186
SPP: 3,469psi

MW IN: 9.6+
VIS IN: 43
MW OUT: 9.6+
VIS OUT: 42



75% CHK: lt brn-offwht, gyshbn ip, free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, sme intbdd MRLST; 25% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, tr cal incl, com f CHK vns, hi calc, tr scat pyr nod



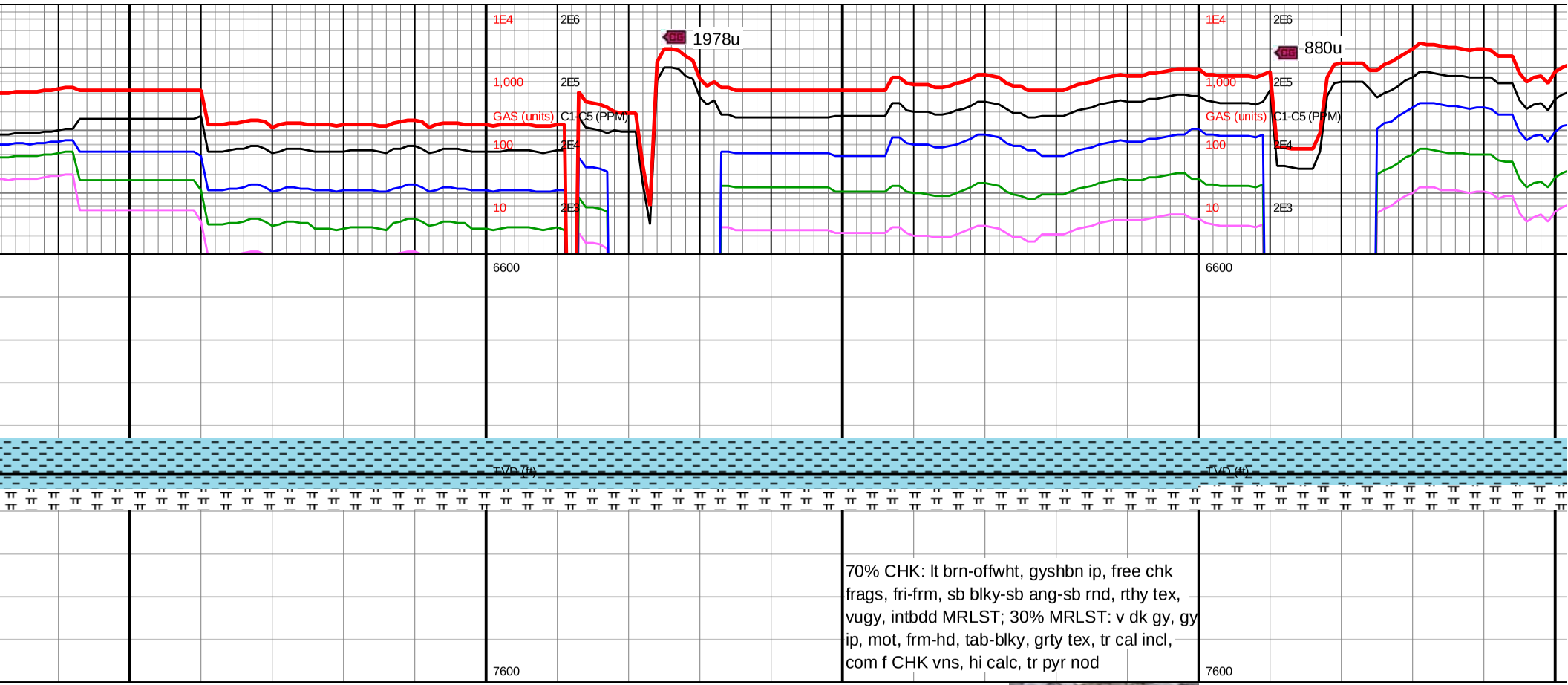
MW IN: 43
VIS IN: 9.6
MW OUT: 44
VIS OUT: 9.7

MD: 10,090'
INC: 89.88°
AZM: 92.5°
TVD: 7,113.08'
VS: 3,069.6'

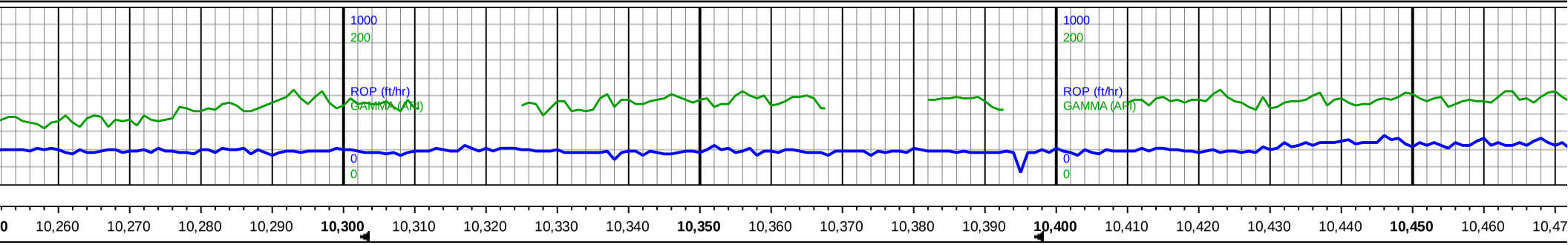
MD: 10,184'
INC: 89.91°
AZM: 93.65°
TVD: 7,113.25'
VS: 3,150.3'

WOB: 18klbs
RPM: 119
SPM: 188
SPP: 3,489psi

MW IN: 9.6+
VIS IN: 42
MW OUT: 9.7
VIS OUT: 42



70% CHK: lt brn-offwht, gyshbn ip, free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 30% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, tr cal incl, com f CHK vns, hi calc, tr pyr nod



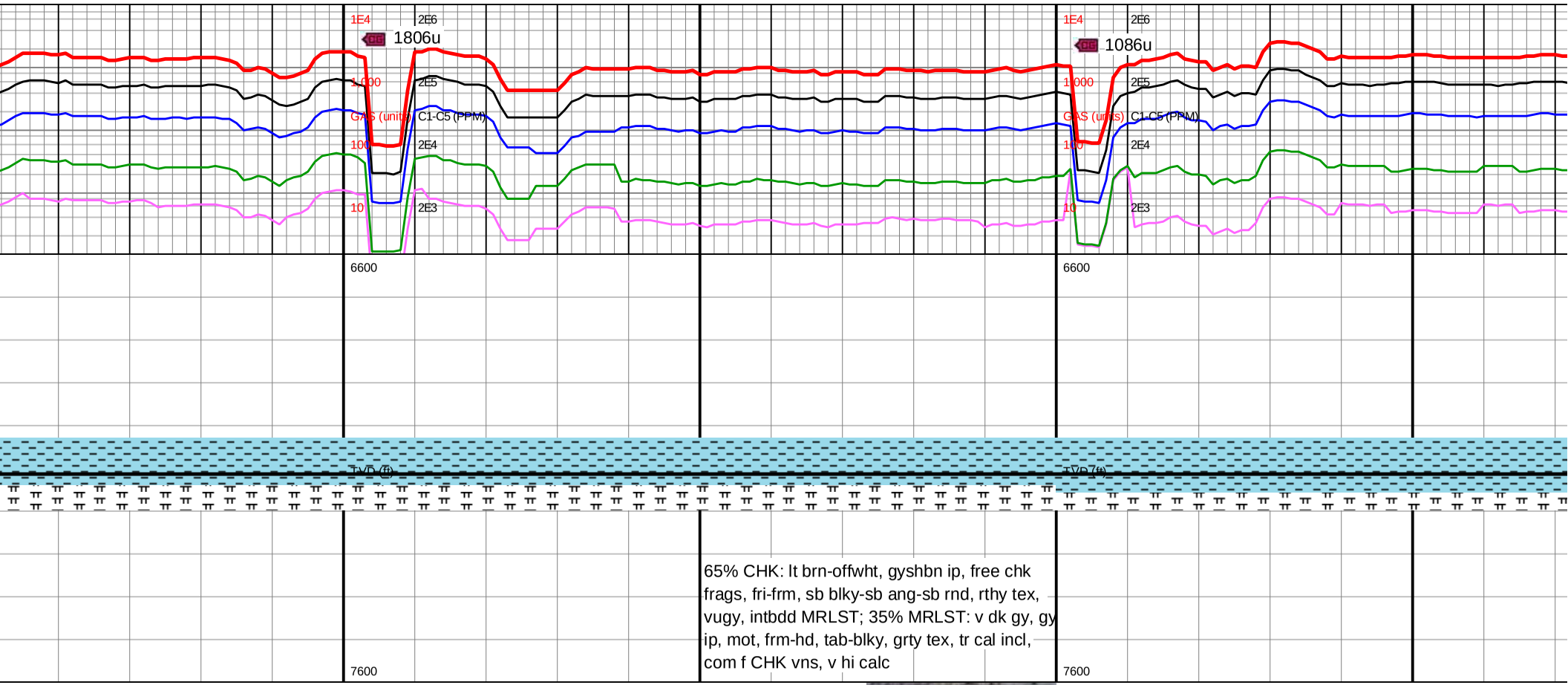
MD: 10,279'
INC: 89.97°
AZM: 94°
TVD: 7,113.35'
VS: 3,231.21'

MW IN: 9.6
VIS IN: 44
MW OUT: 9.6+
VIS OUT: 42

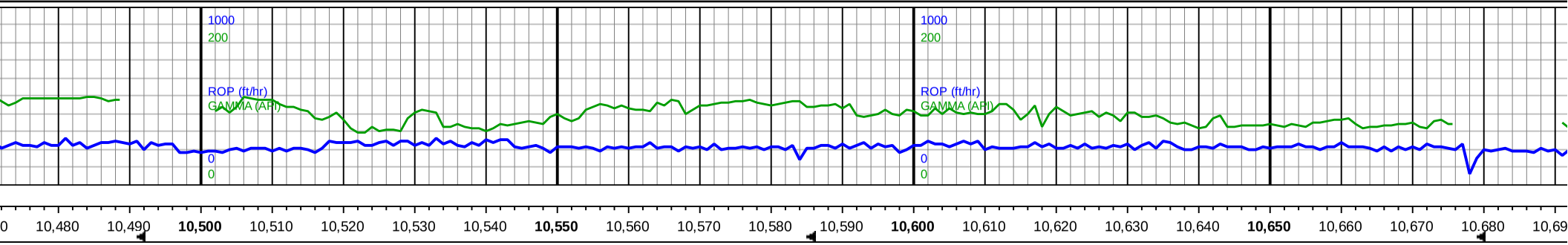
MD: 10,373'
INC: 89.94°
AZM: 91.41°
TVD: 7,113.42'
VS: 3,312.21'

WOB: 7klbs
RPM: 119
SPM: 184
SPP: 3,309psi

MD: 10,467'
INC: 90.18°
AZM: 85.75°
TVD: 7,113.3
VS: 3,396.4'



65% CHK: lt brn-offwht, gyshbn ip, free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 35% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, tr cal incl, com f CHK vns, v hi calc

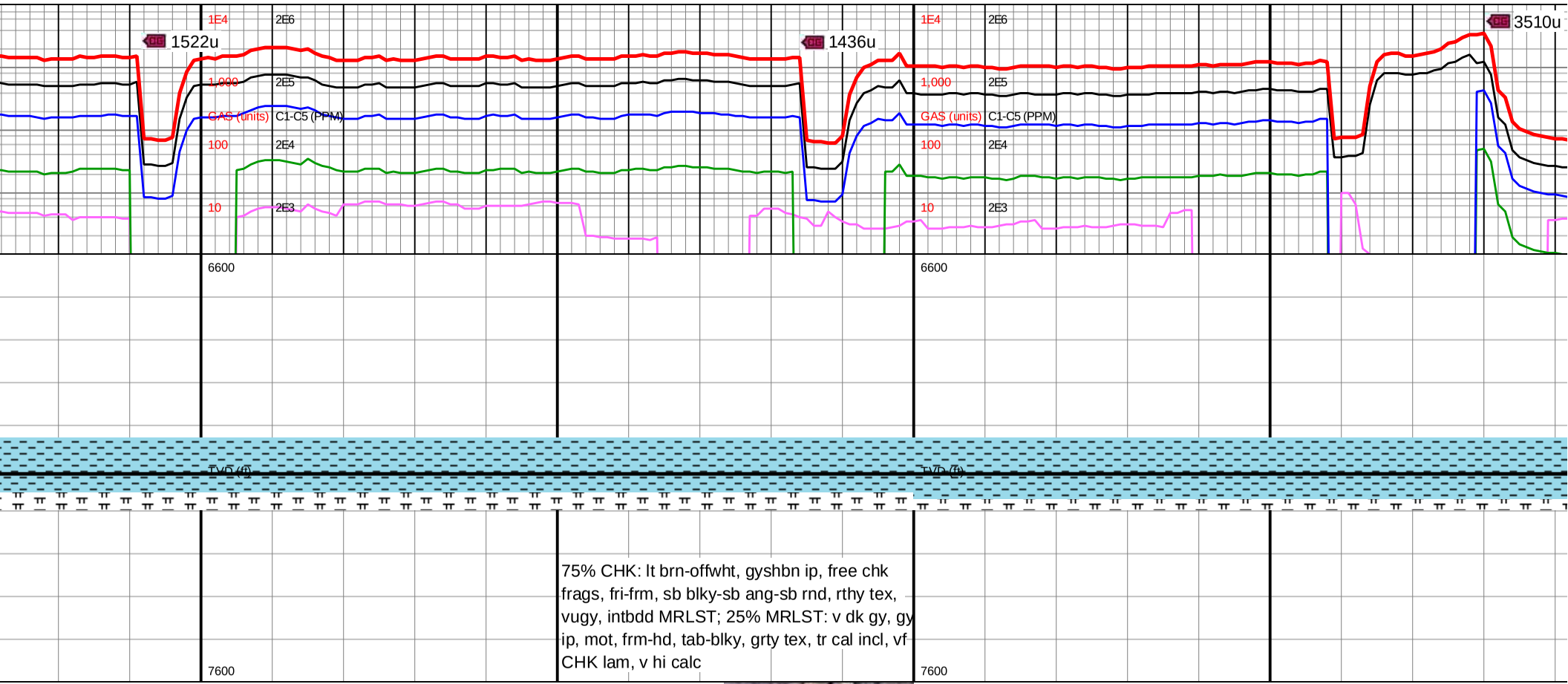


MW IN: 9.6
VIS IN: 43
MW OUT: 9.6
VIS OUT: 45

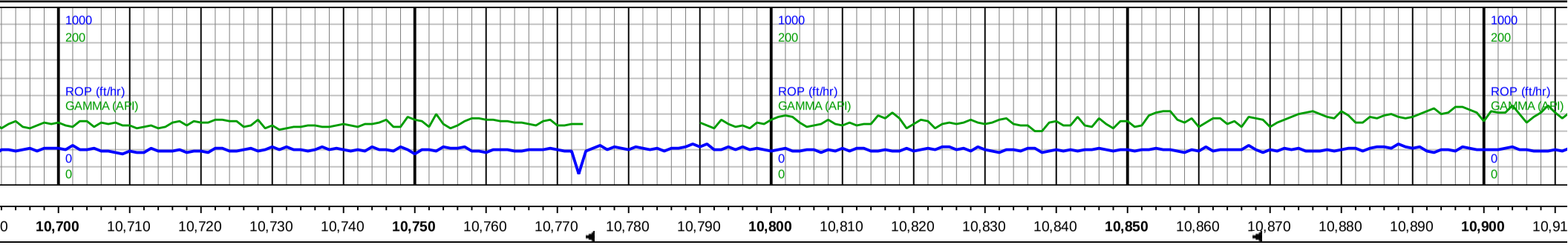
MD: 10,561'
INC: 90.25°
AZM: 85.12°
TVD: 7,112.97'
VS: 3,482.79'

WOB: 11klbs
RPM: 120
SPM: 186
SPP: 3,490psi

MD: 10,655'
INC: 90.31°
AZM: 87.15°
TVD: 7,112.51'
VS: 3,568.71'



75% CHK: lt brn-offwht, gyshbn ip, free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 25% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, tr cal incl, vf CHK lam, v hi calc



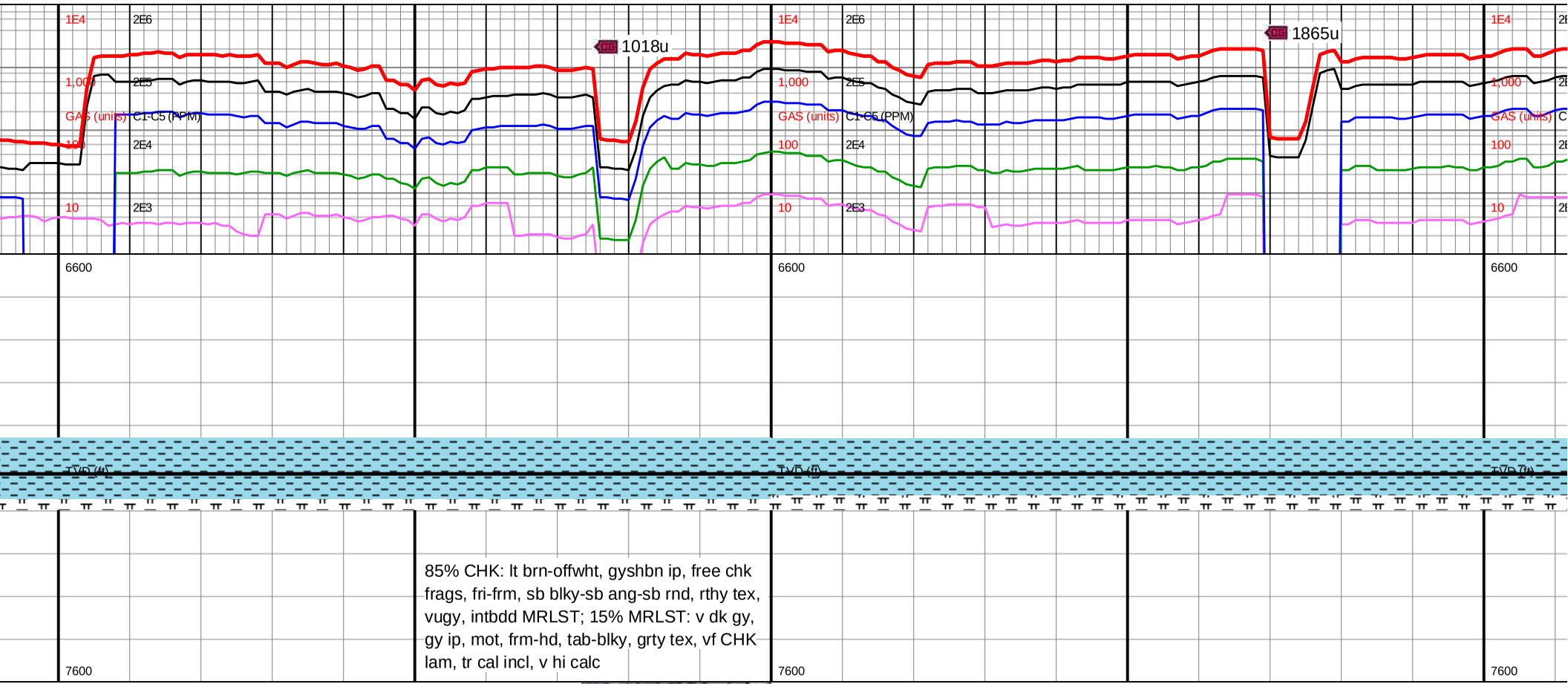
W IN: 9.6
S IN: 43
W OUT: 9.6+
S OUT: 44

MD: 10,750'
INC: 90.18°
AZM: 91.27°
TVD: 7,112.11'
VS: 3,653.34'

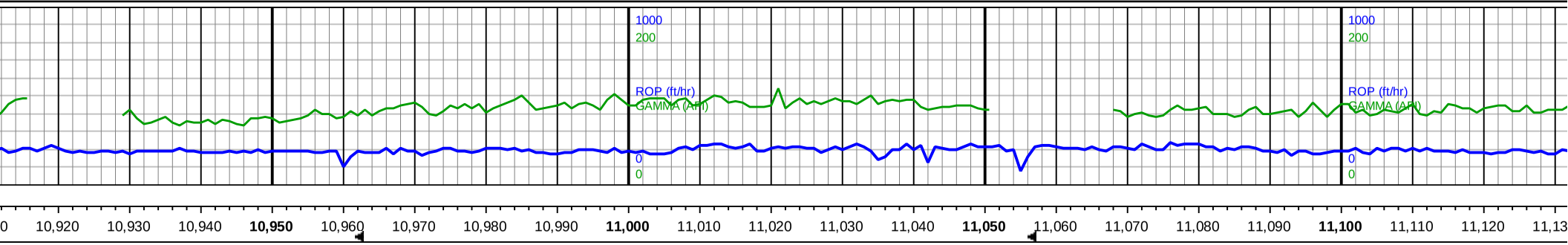
WOB: 16klbs
RPM: 120
SPM: 184
SPP: 3,473psi

MD: 10,844'
INC: 89.85°
AZM: 93.56°
TVD: 7,112.08'
VS: 3,734.58'

MW IN: 9.6+
VIS IN: 44
MW OUT: 9.6+
VIS OUT: 44



85% CHK: lt brn-offwht, gyshbn ip, free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 15% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, v hi calc



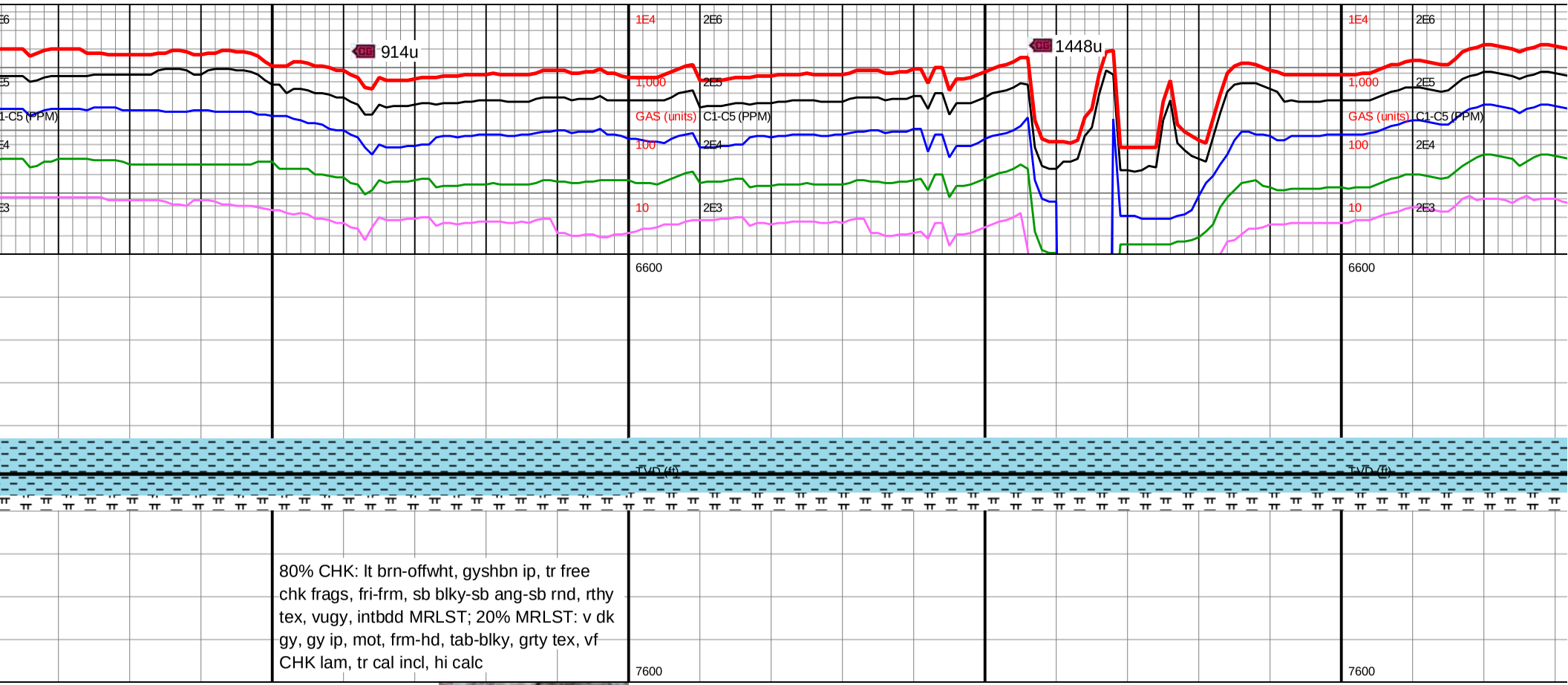
MD: 10,938'
INC: 89.85°
AZM: 94.21°
TVD: 7,112.33'
VS: 3,814.59'

WOB: 26klbs
RPM: 80
SPM: 199
SPP: 3,814psi

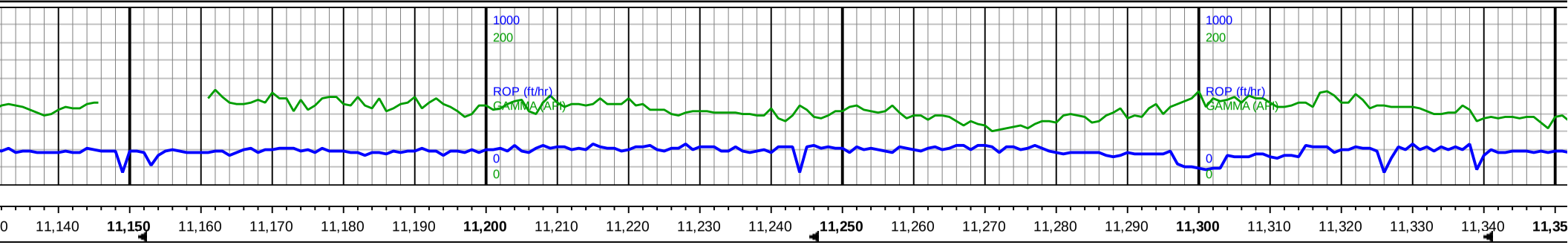
MD: 11,033'
INC: 89.75°
AZM: 92.43°
TVD: 7,112.66'
VS: 3,895.93'

MW IN: 9.6
VIS IN: 44
MW OUT: 9.6+
VIS OUT: 44

MD: 11,127'
INC: 90.09°
AZM: 93.3°
TVD: 7,112.7
VS: 3,976.8'



80% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 20% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hi calc



9'

GD

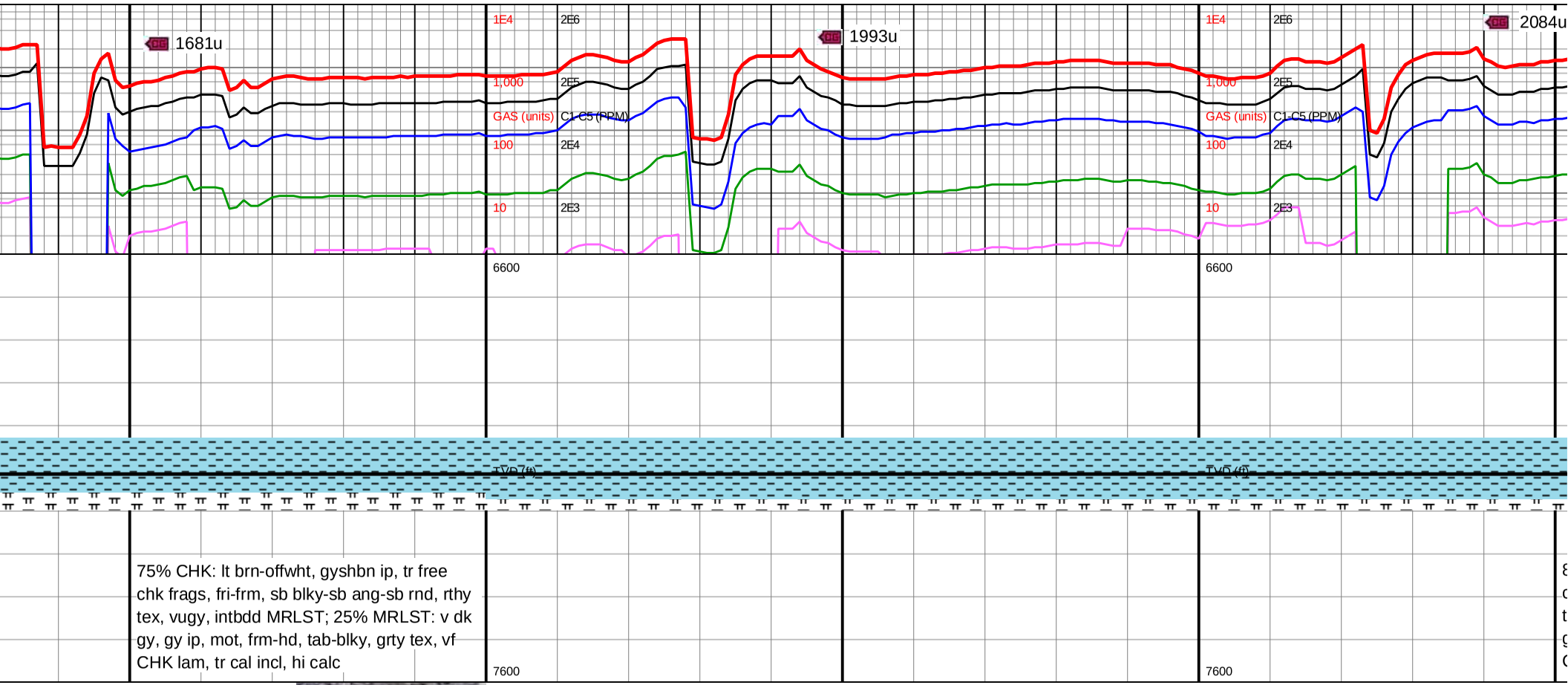
MW IN: 9.6+
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43

WOB: 20.2klbs
RPM: 100
SPM: 200
SPP: 3,955psi

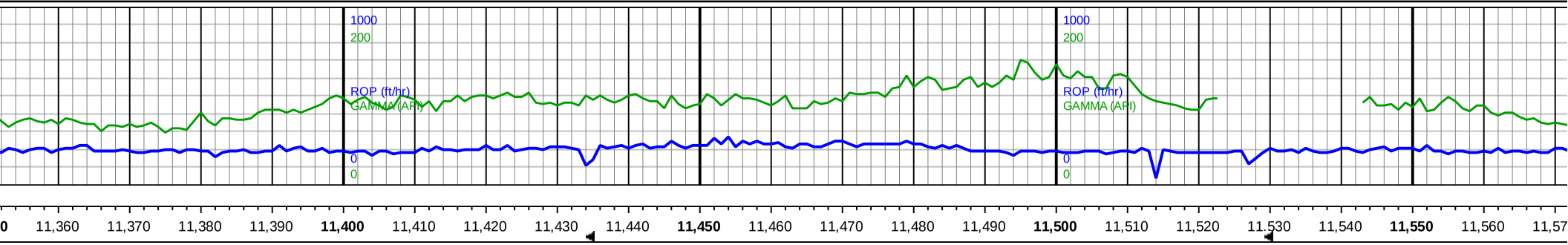
MD: 11,221'
INC: 89.63°
AZM: 91.89°
TVD: 7,113.02'
VS: 4,057.9'

MD: 11,316'
INC: 89.48°
AZM: 90.91°
TVD: 7,113.76'
VS: 4,140.84'

MW IN: 9.6+
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43



75% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 25% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hi calc

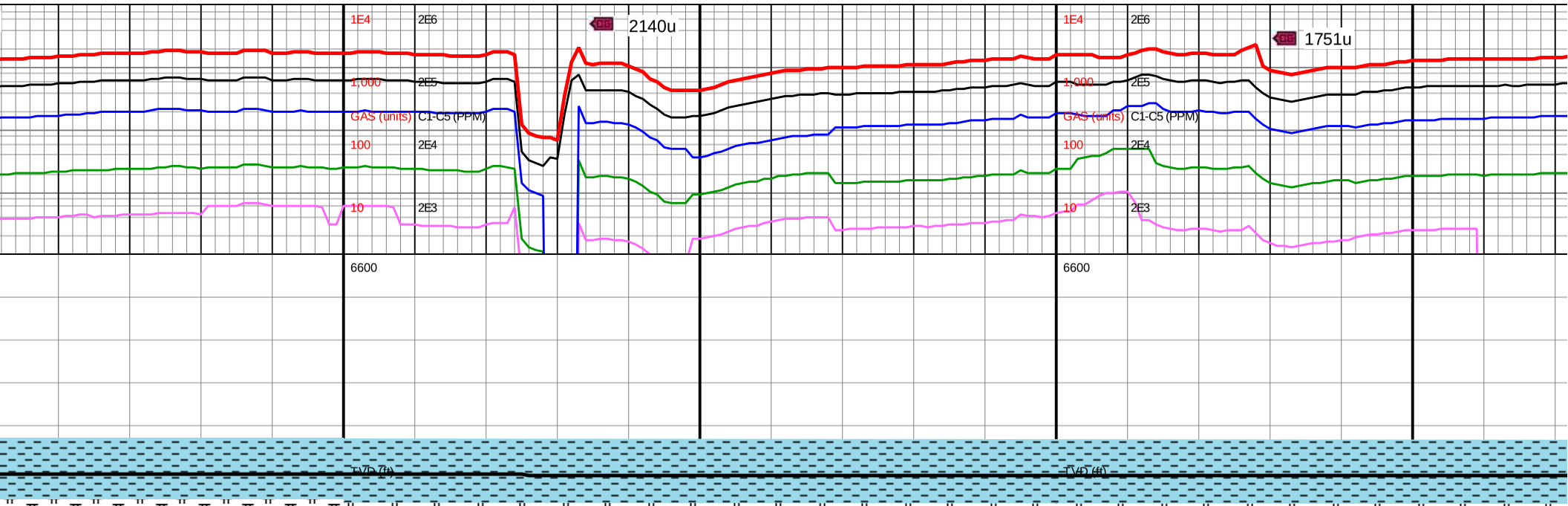


WOB: 19.3klbs
RPM: 100
SPM: 201
SPP: 3,940psi

MD: 11,410'
INC: 89.23°
AZM: 89.43°
TVD: 7,114.82'
VS: 4,223.87'

MW IN: 9.6
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43

MD: 11,505'
INC: 89.45°
AZM: 86.09°
TVD: 7,115.91'
VS: 4,309.56'

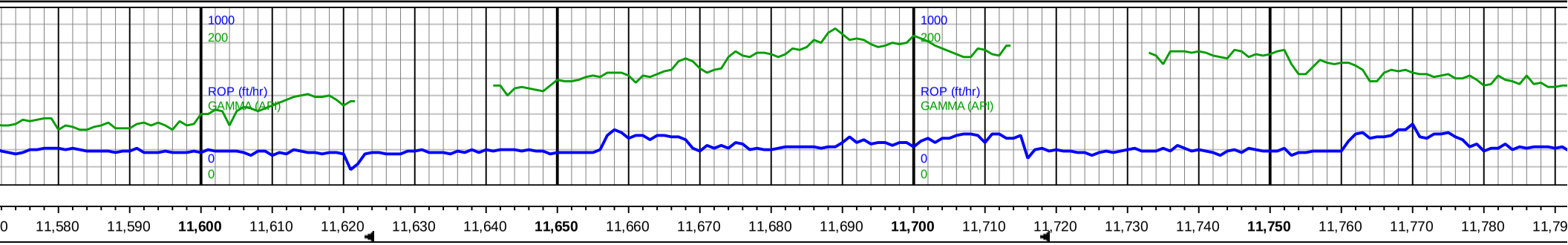


35% CHK: lt brn-offwht, gyshbn ip, tr free
chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy
ex, vugy, intbdd MRLST; 15% MRLST: v dk
gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf
CHK lam, tr cal incl, hi calc

7600

7600

90% CHK: lt brn-off
chk frags, fri-frm, sb
tex, vugy, intbdd MF
gy, gy ip, mot, frm-h
CHK lam, tr cal incl,



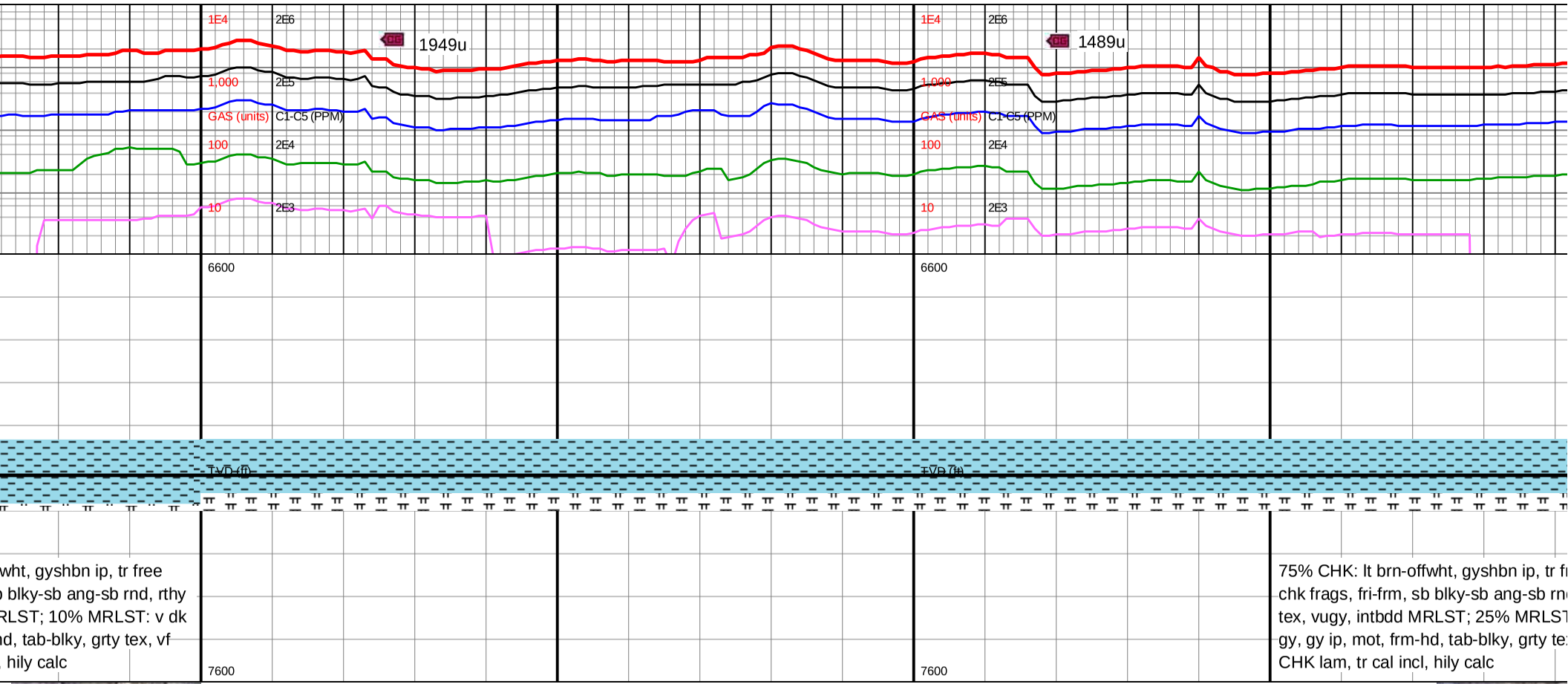
MD: 11,599'
INC: 89.54°
AZM: 85.65°
TVD: 7,116.74'
VS: 4,395.67'

WOB: 14.4klbs
RPM: 100
SPM: 202
SPP: 3,911psi

MW IN: 9.6
VIS IN: 43
MW OUT: 9.7
VIS OUT: 43

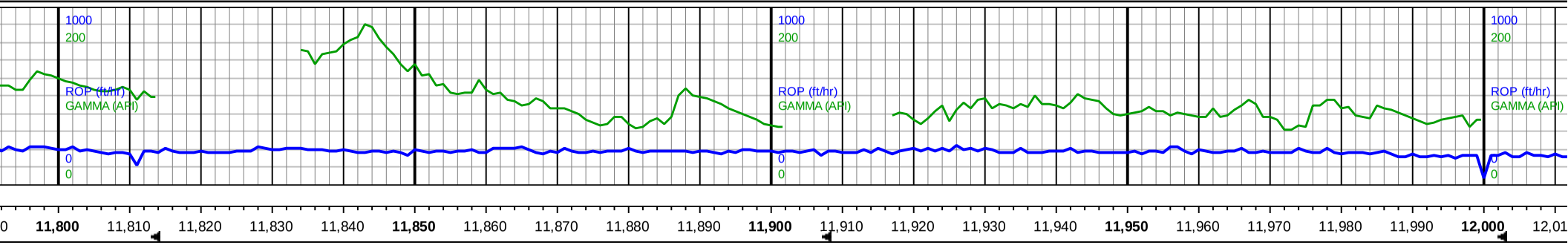
MD: 11,694'
INC: 89.72°
AZM: 85.67°
TVD: 7,117.35'
VS: 4,482.82'

MD: 11,789'
INC: 89.88°
AZM: 89.02°
TVD: 7,117.69'
VS: 4,568.82'



wht, gyshbn ip, tr free
blky-sb ang-sb rnd, rthy
RLST; 10% MRLST: v dk
nd, tab-blky, grty tex, vf
hily calc

75% CHK: lt brn-offwht, gyshbn ip, tr fr
chk frags, fri-frm, sb blky-sb ang-sb rn
tex, vugy, intbdd MRLST; 25% MRLST
gy, gy ip, mot, frm-hd, tab-blky, grty te
CHK lam, tr cal incl, hily calc



WOB: 19.8klbs
RPM: 100
SPM: 201
SPP: 4,031psi

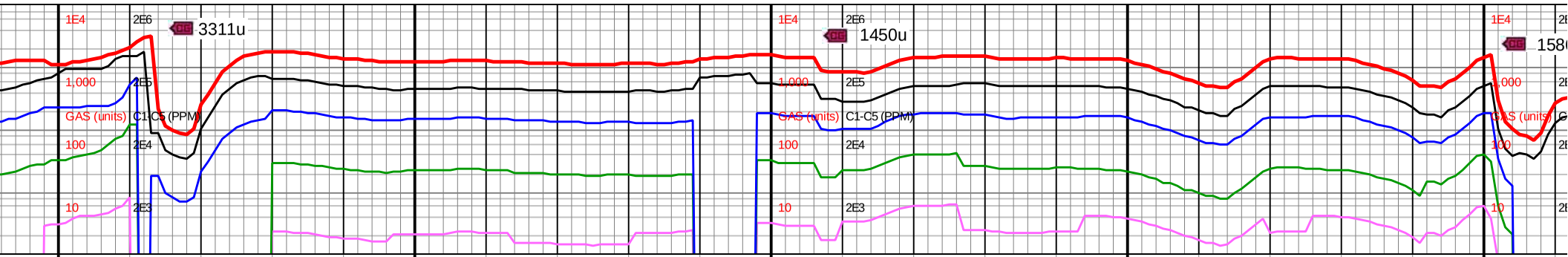
MW IN: 9.6
VIS IN: 44
MW OUT: 9.6+
VIS OUT: 44

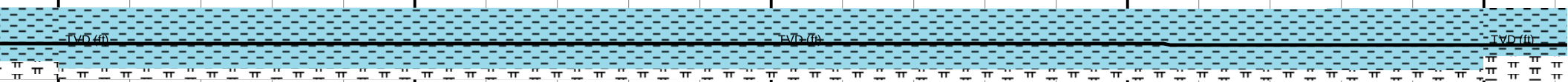
MD: 11,883'
INC: 89.78°
AZM: 91.42°
TVD: 7,117.96'
VS: 4,651.81'

MW IN: 9.6
VIS IN: 44
MW OUT: 9.6+
VIS OUT: 44

MD: 11,978'
INC: 89.63°
AZM: 90.61°
TVD: 7,118.45'
VS: 4,735.07'

WOB: 19.2klbs
RPM: 100
SPM: 202
SPP: 4,014psi

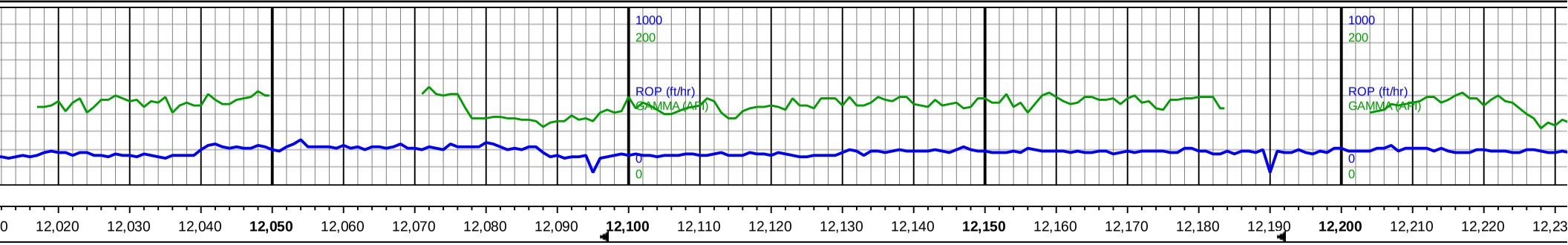




ree
d, rthy
T: v dk
x, vf

7600

85% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 15% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc

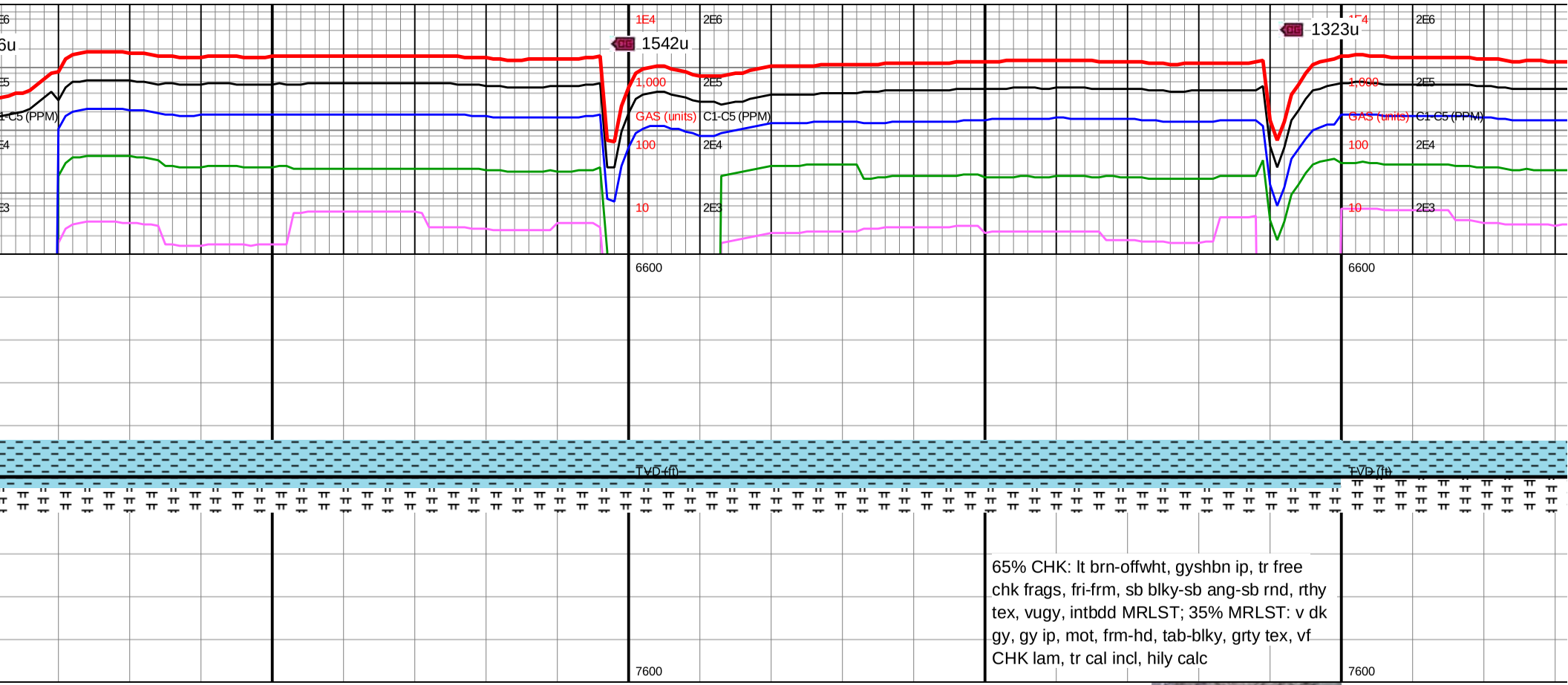


MD: 12,072'
INC: 89.75°
AZM: 88.42°
TVD: 7,118.96'
VS: 4,818.59'

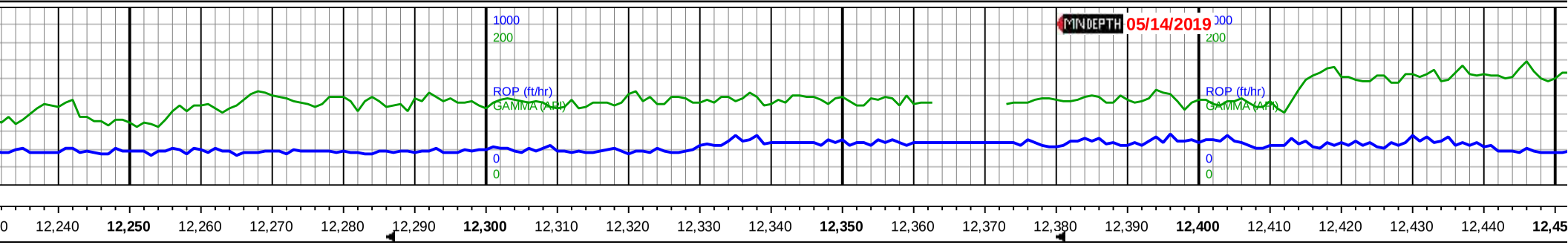
MW IN: 9.6
VIS IN: 46
MW OUT: 9.6+
VIS OUT: 46

MD: 12,166'
INC: 89.88°
AZM: 87.06°
TVD: 7,119.27'
VS: 4,903.42'

WOB: 18.8klbs
RPM: 100
SPM: 202
SPP: 4,057psi



65% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 35% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc



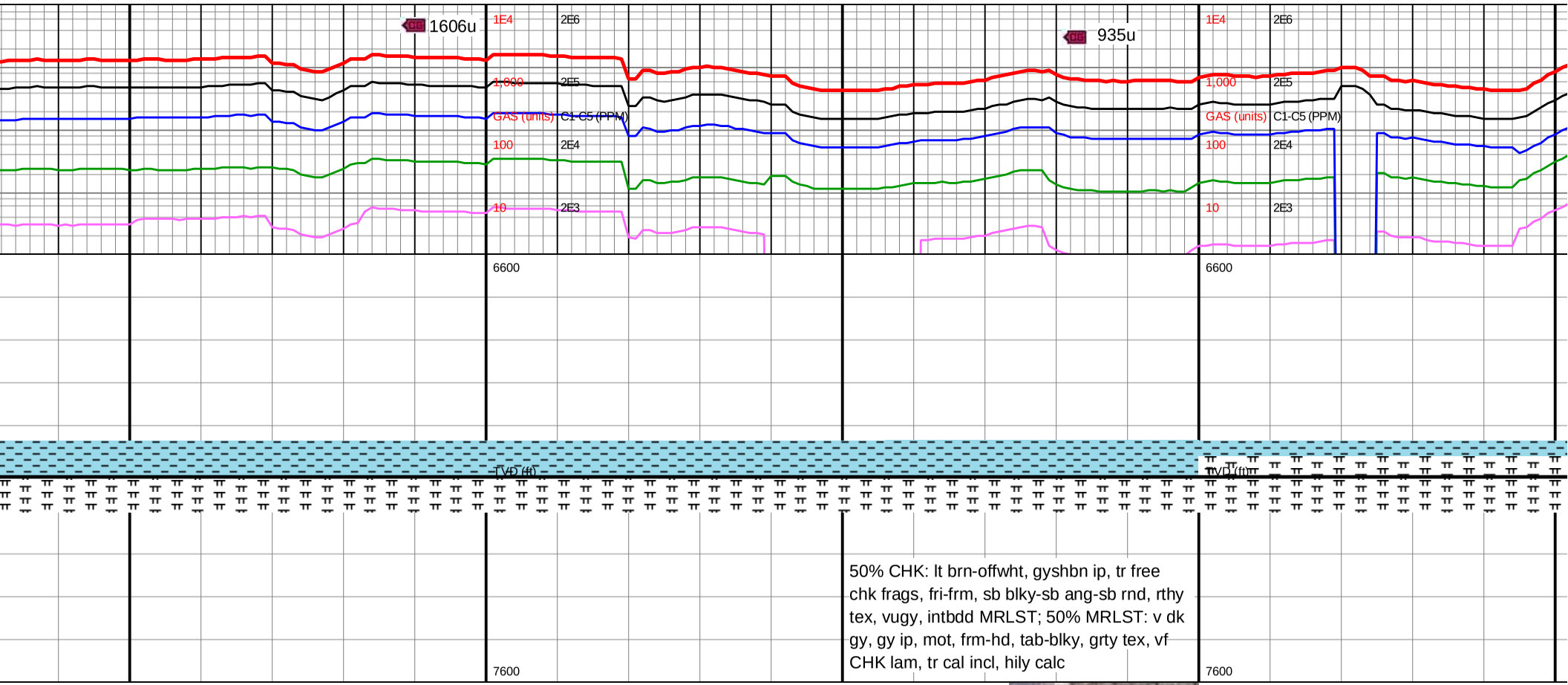
MD: 12,261'
INC: 89.72°
AZM: 85.92°
TVD: 7,119.6'
VS: 4,990.02'

MW IN: 9.6
VIS IN: 46
MW OUT: 9.6+
VIS OUT: 46

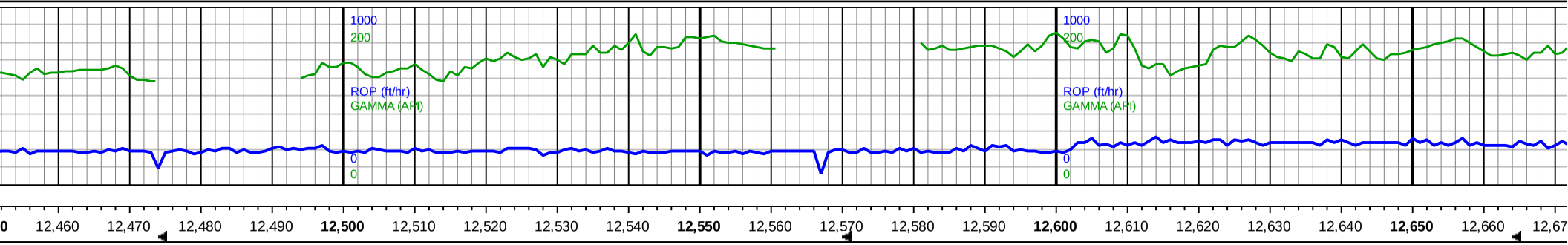
MD: 12,356'
INC: 90.4°
AZM: 88.74°
TVD: 7,119.5'
VS: 5,076.03'

WOB: 26.5klbs
RPM: 100
SPM: 201
SPP: 4,173psi

MD: 12,45
INC: 89.6
AZM: 87.9
TVD: 7,11
VS: 5,160



50% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST; 50% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc



50'
3°
9°
19.47'
.45'

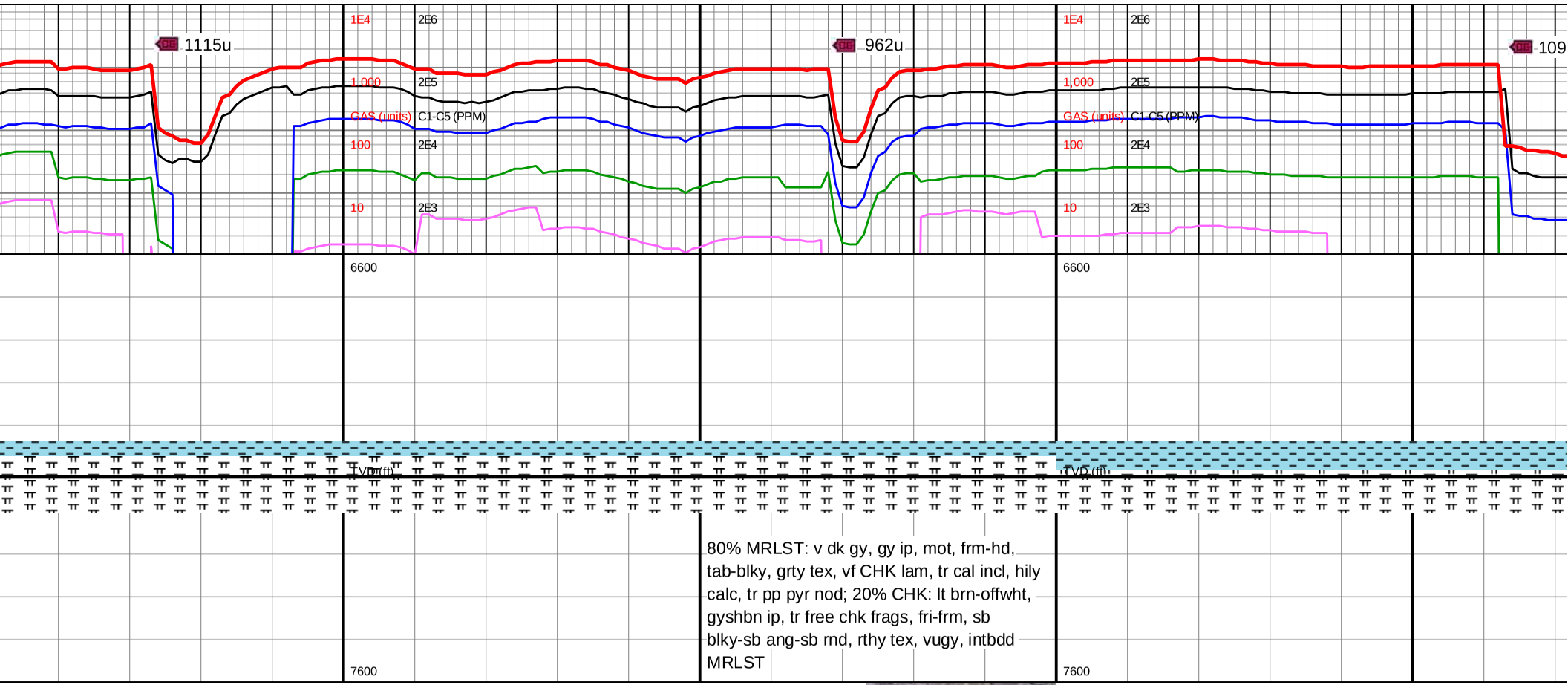
MW IN: 9.6
VIS IN: 45
MW OUT: 9.6+
VIS OUT: 45

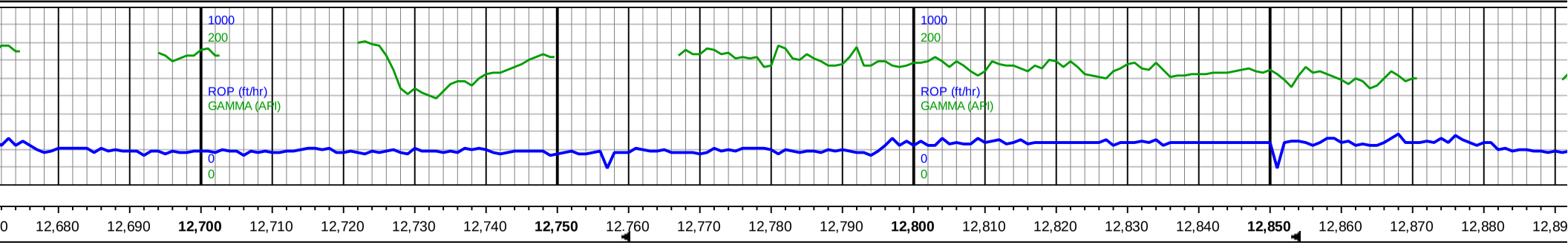
MD: 12,546'
INC: 90°
AZM: 86.17°
TVD: 7,119.78'
VS: 5,247.58'

WOB: 17.2klbs
RPM: 100
SPM: 202
SPP: 4,102psi

MD: 12,640'
INC: 90°
AZM: 89.7°
TVD: 7,119.78'
VS: 5,332.26'

MW IN: 9.6
VIS IN: 46
MW OUT: 9
VIS OUT: 4





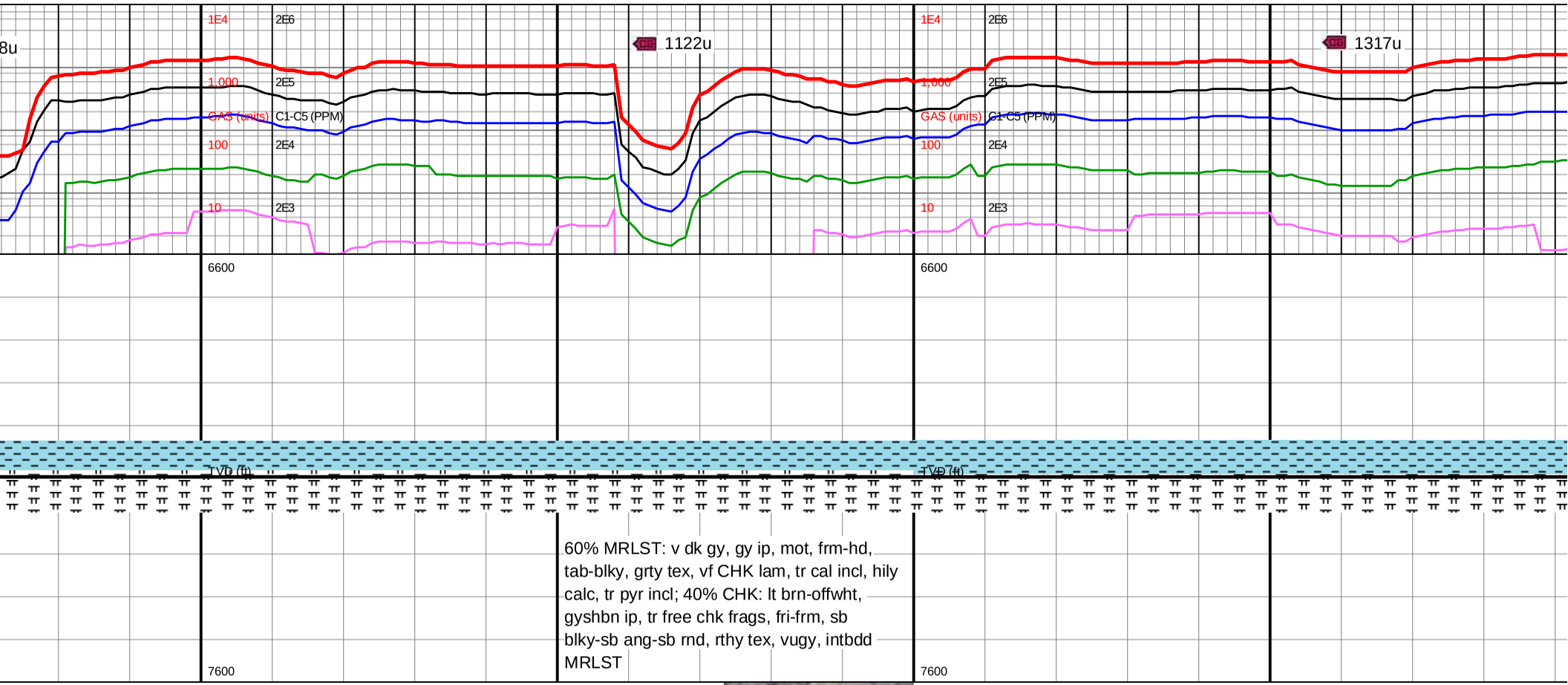
9.6+
45

MD: 12,734'
INC: 90°
AZM: 96.64°
TVD: 7,119.78'
VS: 5,412.82'

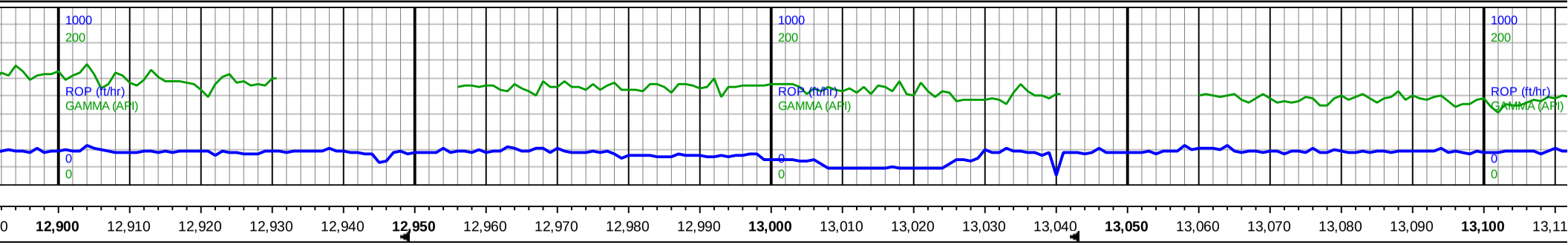
MW IN: 9.6
VIS IN: 46
MW OUT: 9.6+
VIS OUT: 46

WOB: 24.9klbs
RPM: 100
SPM: 200
SPP: 4,283psi

MD: 12,829'
INC: 89.97°
AZM: 96.95°
TVD: 7,119.81'
VS: 5,491.04'



60% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc, tr pyr incl; 40% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST



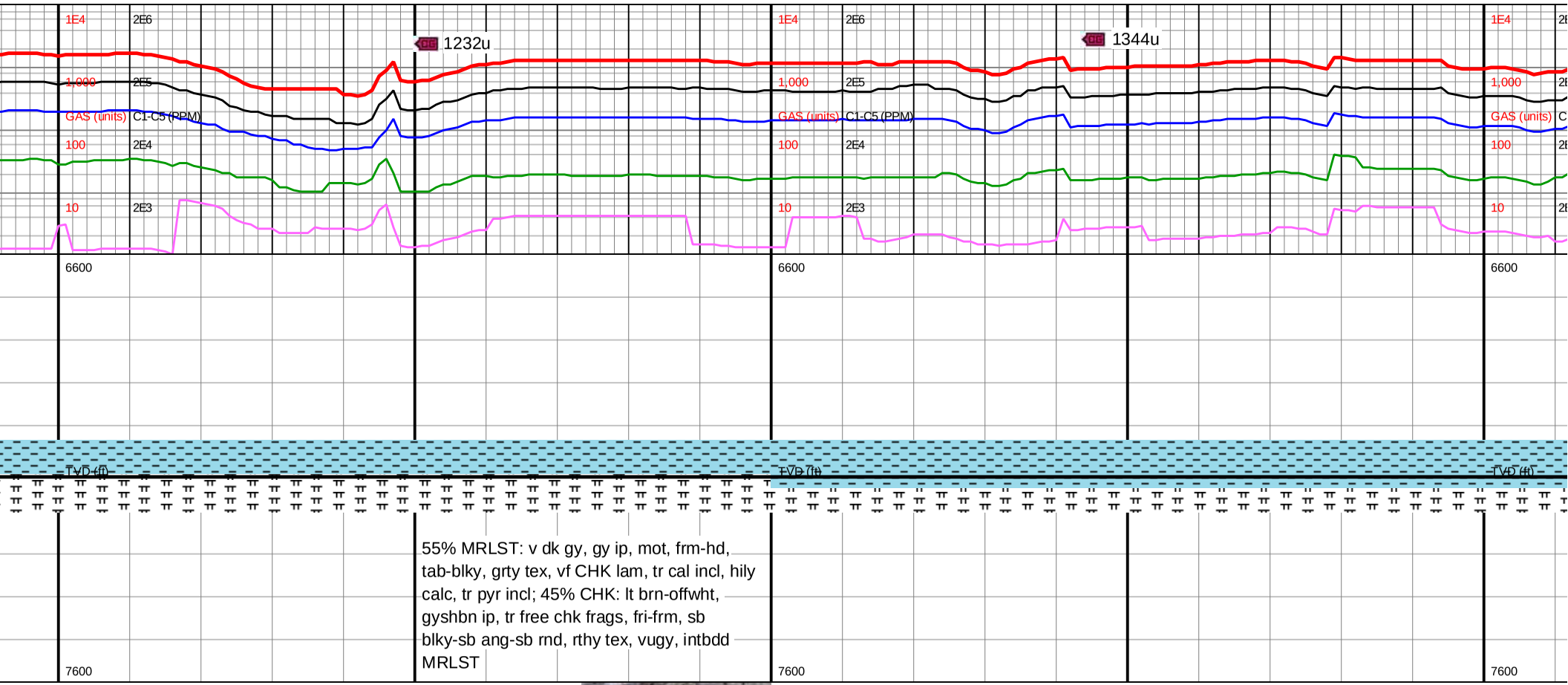
MD: 12,924'
INC: 89.88°
AZM: 98.43°
TVD: 7,119.93'
VS: 5,568.41'

MW IN: 9.6
VIS IN: 46
MW OUT: 9.6+
VIS OUT: 46

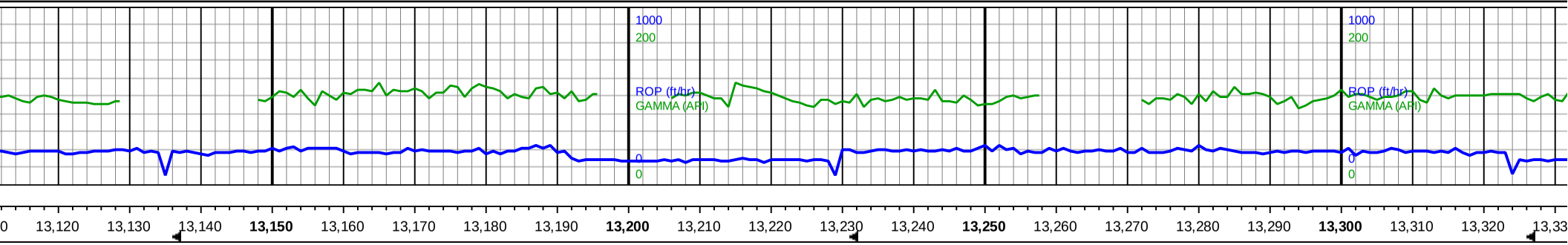
WOB: 16.4klbs
RPM: 100
SPM: 200
SPP: 4,158psi

MD: 13,018'
INC: 89.94°
AZM: 98.85°
TVD: 7,120.08'
VS: 5,644.05'

BP



55% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc, tr pyr incl; 45% CHK: lt brn-offwht, gyshbn ip, tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy tex, vugy, intbdd MRLST



,112'
.88°
4.3°
120.23'
21.63'

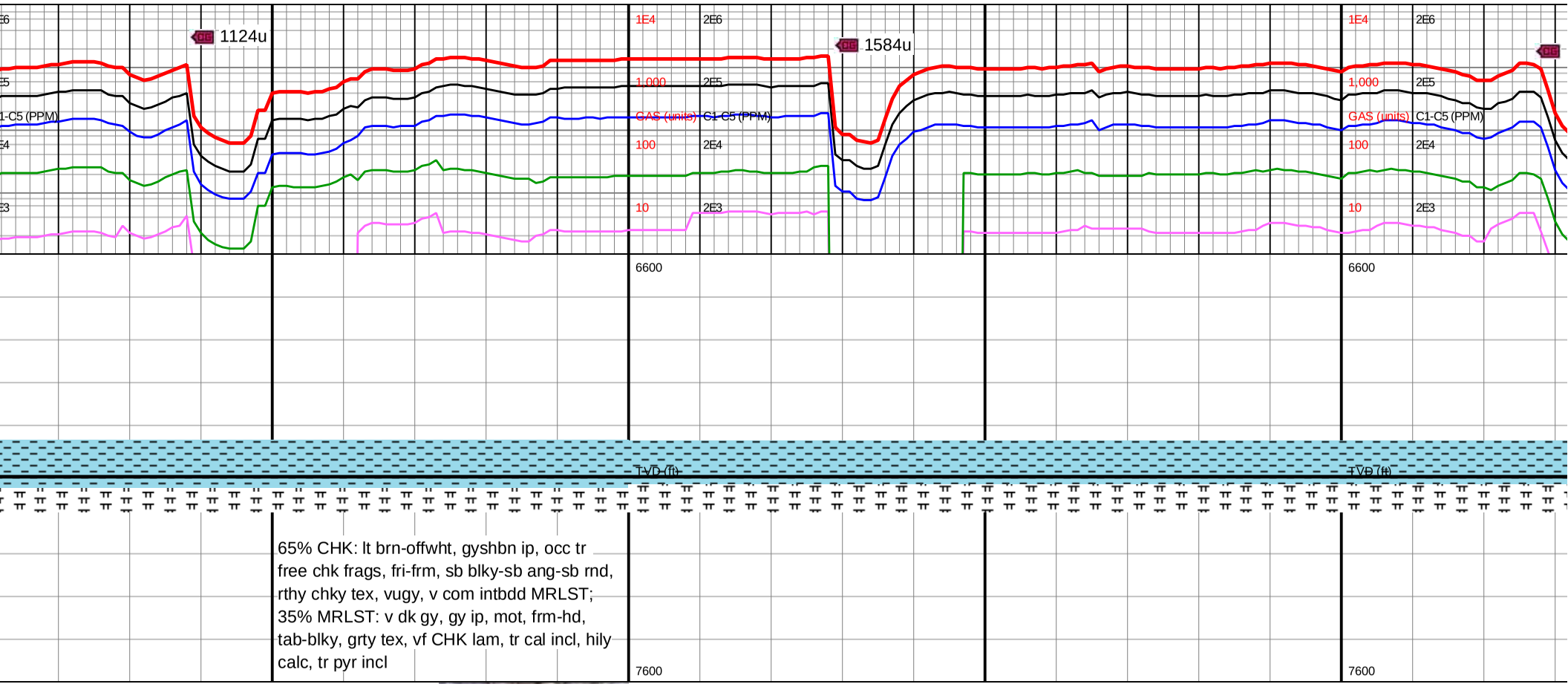
MW IN: 9.6+
VIS IN: 46
MW OUT: 9.6+
VIS OUT: 45

WOB: 24.3klbs
RPM: 100
SPM: 200
SPP: 4,241psi

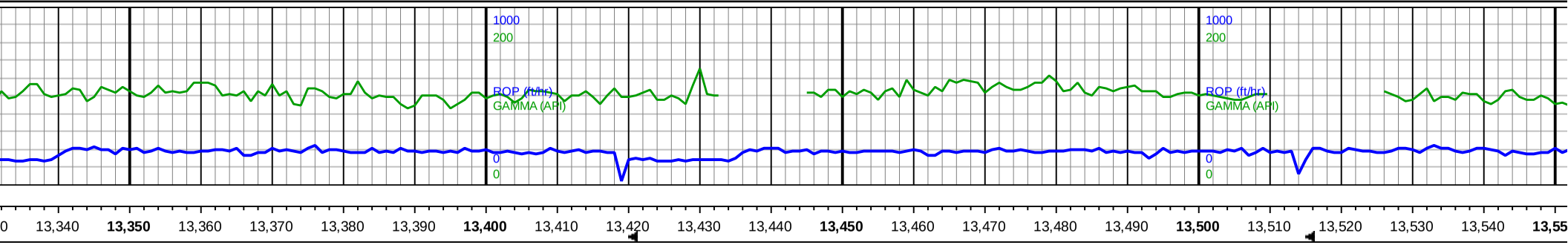
MD: 13,207'
INC: 89.94°
AZM: 94.16°
TVD: 7,120.38'
VS: 5,802.19'

MW IN: 9.7
VIS IN: 46
MW OUT: 9.7
VIS OUT: 45

MD: 13,301'
INC: 89.97°
AZM: 91.45°
TVD: 7,120.45'
VS: 5,883.1'



65% CHK: lt brn-offwht, gyshbn ip, occ tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 35% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, tr cal incl, hily calc, tr pyr incl

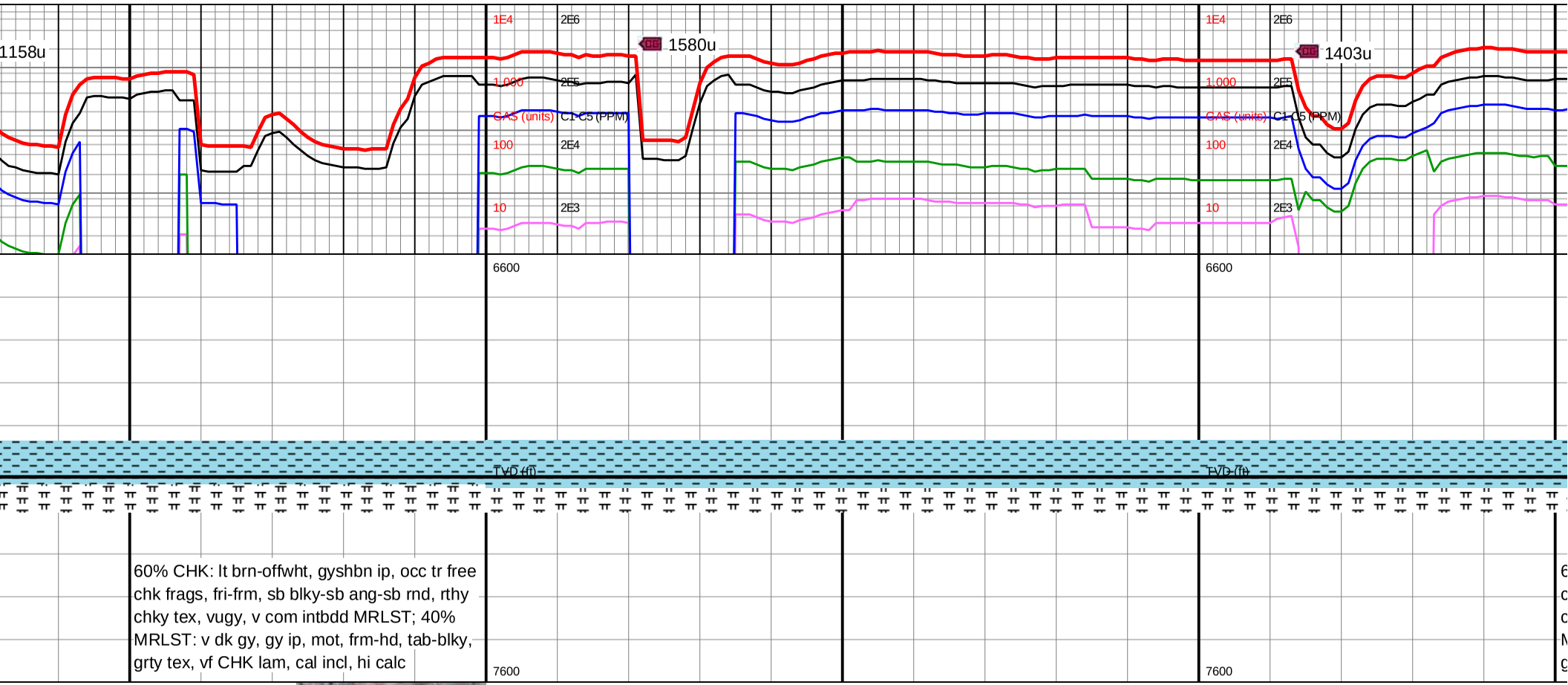


MD: 13,396'
INC: 89.94°
AZM: 90.16°
TVD: 7,120.53'
VS: 5,966.52'

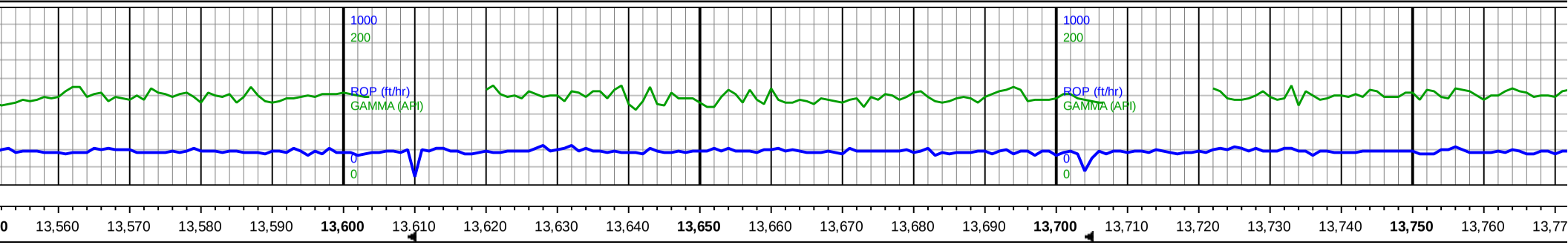
WOB: 30klbs
RPM: 100
SPM: 202
SPP: 4,281psi

MW IN: 9.7
VIS IN: 47
MW OUT: 9.7+
VIS OUT: 46

MD: 13,491'
INC: 89.78°
AZM: 88.11°
TVD: 7,120.76'
VS: 6,051.23'



60% CHK: lt brn-offwht, gyshbn ip, occ tr free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty tex, vf CHK lam, cal incl, hi calc



MD: 13,585'
INC: 89.97°
AZM: 87.98°
TVD: 7,120.96'
VS: 6,135.84'

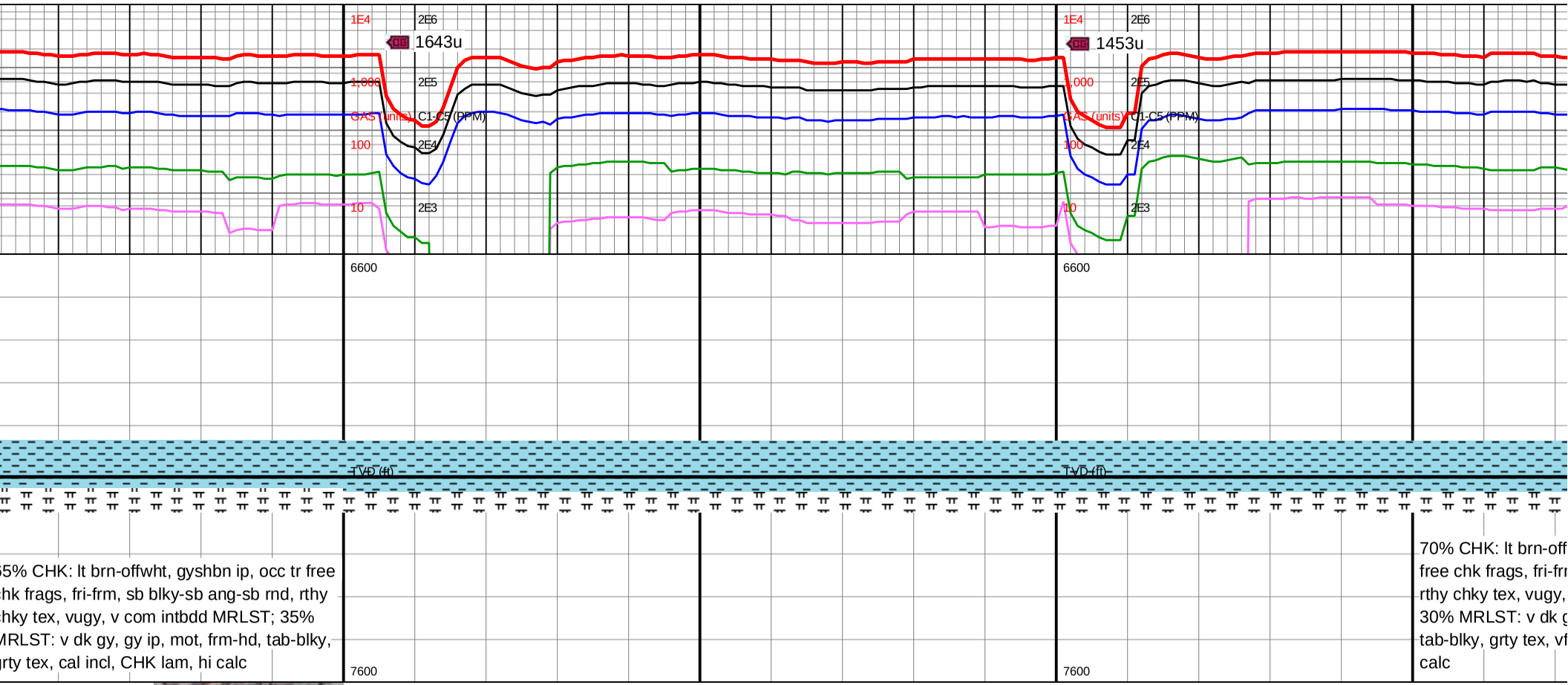
WOB: 26klbs
RPM: 100
SPM: 200
SPP: 4,312psi

MW IN: 9.6+
VIS IN: 46
MW OUT: 9.7+
VIS OUT: 45

MD: 13,680'
INC: 90.09°
AZM: 90.1°
TVD: 7,120.91'
VS: 6,220.62'

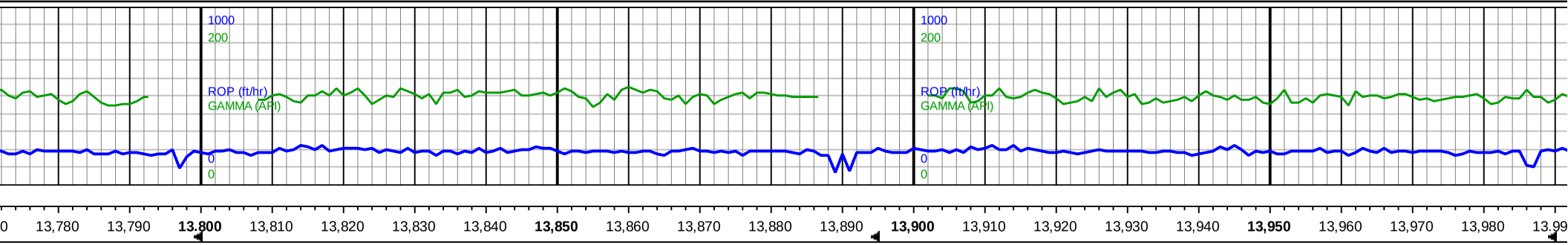
MW IN: 9.6+
VIS IN: 47
MW OUT: 9.6+
VIS OUT: 47

MD:
INC
AZM
TVD
VS:



65% CHK: lt brn-offwht, gyshbn ip, occ tr free
chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy
chky tex, vugy, v com intbdd MRLST; 35%
MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky,
grty tex, cal incl, CHK lam, hi calc

70% CHK: lt brn-off
free chk frags, fri-fr
rthy chky tex, vugy,
30% MRLST: v dk g
tab-blky, grty tex, vf
calc



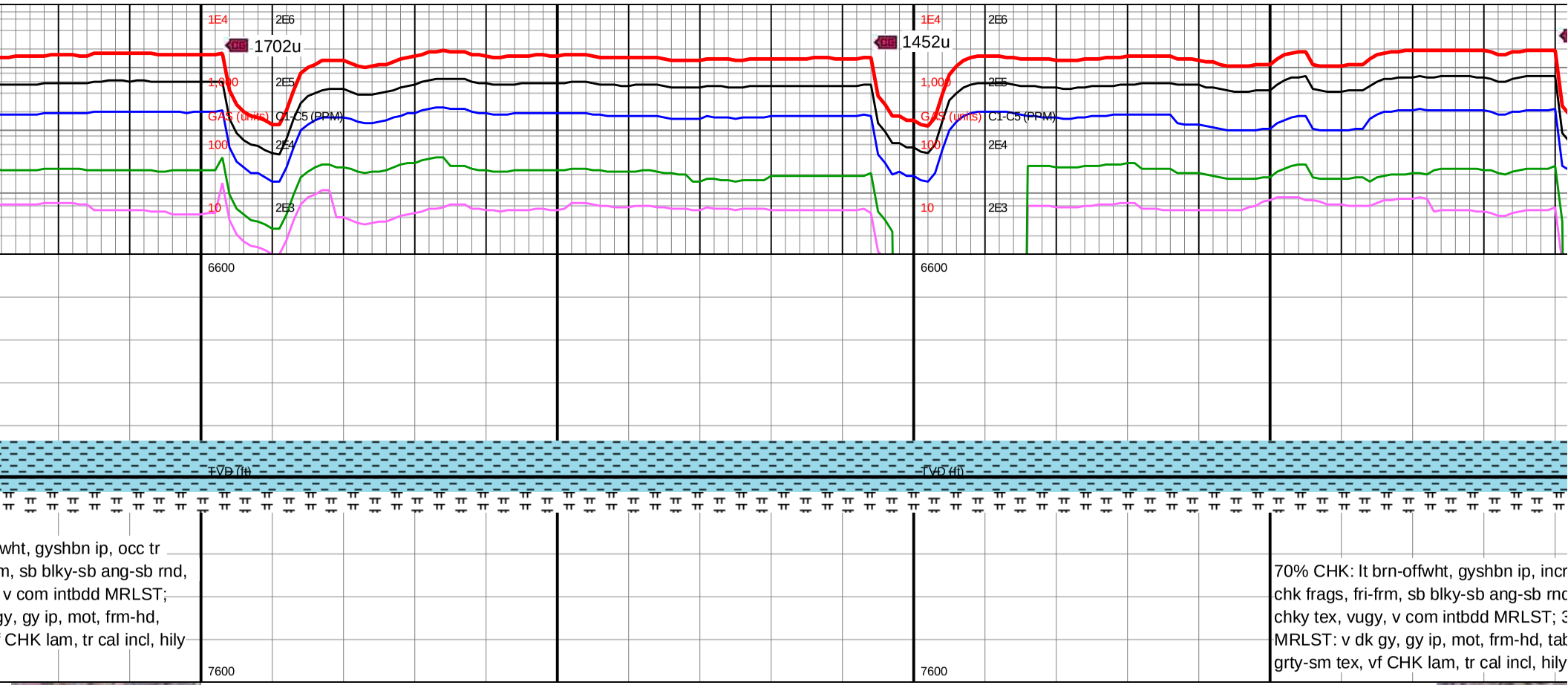
13,775'
90.18°
M: 91.18°
D: 7,120.69'
6,304.16'

WOB: 23klbs
RPM: 100
SPM: 200
SPP: 4,245psi

MD: 13,870'
INC: 90.15°
AZM: 89.57°
TVD: 7,120.42'
VS: 6,387.92'

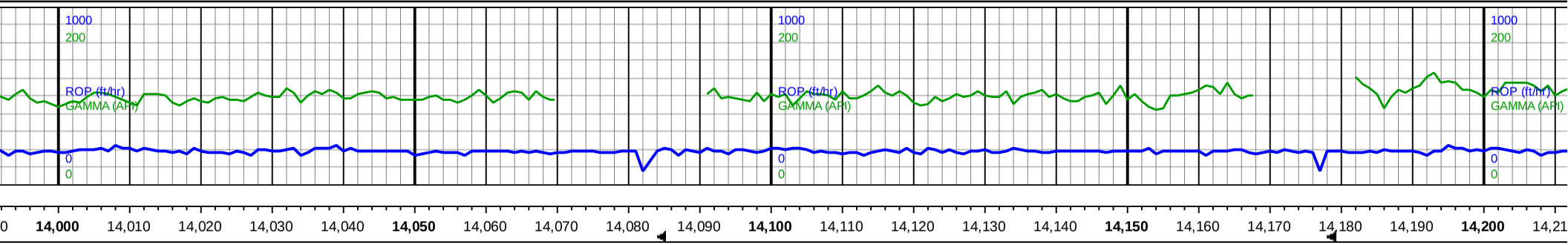
MW IN: 9.6
VIS IN: 45
MW OUT: 9.6+
VIS OUT: 43

MD: 13,964'
INC: 90.25°
AZM: 88.79°
TVD: 7,120.09'
VS: 6,471.7'



wht, gyshbn ip, occ tr
m, sb blky-sb ang-sb rnd,
v com intbdd MRLST;
gy, gy ip, mot, frm-hd,
CHK lam, tr cal incl, hily

70% CHK: lt brn-offwht, gyshbn ip, incr
chk frags, fri-frm, sb blky-sb ang-sb rnd
chky tex, vugy, v com intbdd MRLST; 3
MRLST: v dk gy, gy ip, mot, frm-hd, tab
grty-sm tex, vf CHK lam, tr cal incl, hily



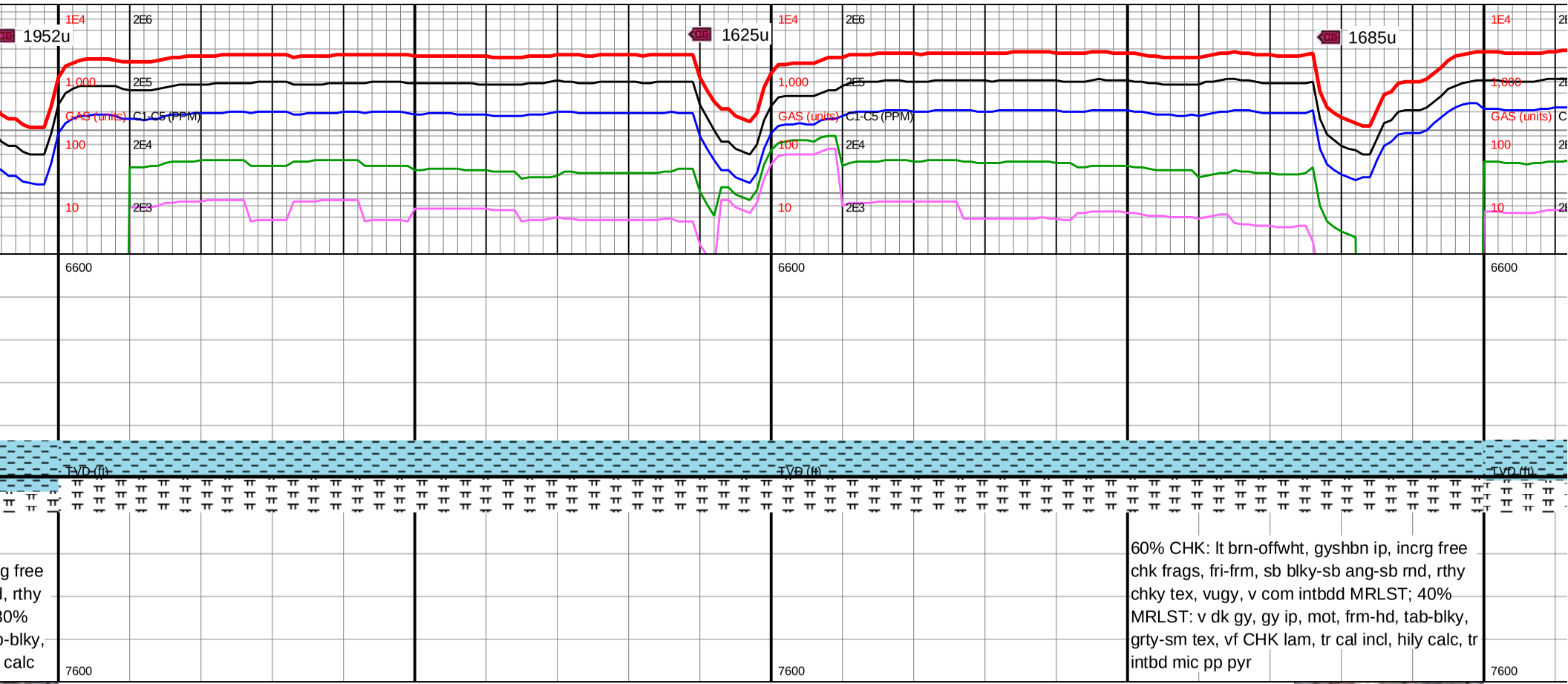
MW IN: 9.5+
VIS IN: 45
MW OUT: 9.6
VIS OUT: 46

MD: 14,060'
INC: 90.06°
AZM: 90.01°
TVD: 7,119.83'
VS: 6,557.1'

MW IN: 9.5+
VIS IN: 47
MW OUT: 9.5+
VIS OUT: 46

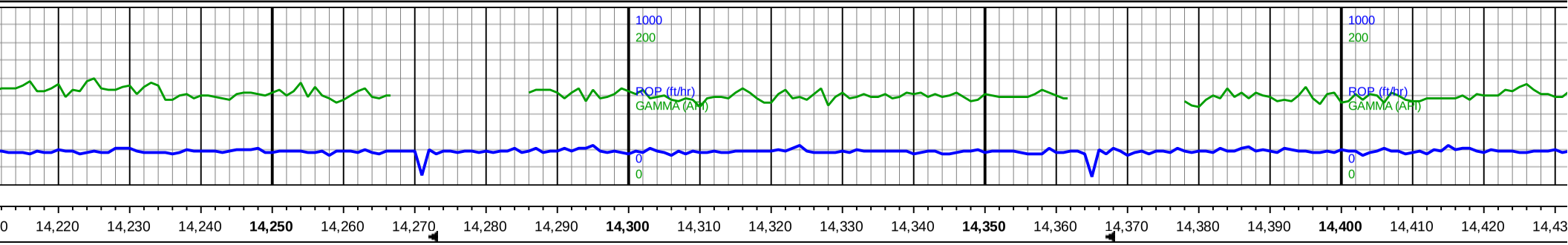
MD: 14,153'
INC: 90.4°
AZM: 88.99°
TVD: 7,119.45'
VS: 6,639.76'

WOB: 28klbs
RPM: 100
SPM: 202
SPP: 4,361psi



g free
l, rthy
30%
o-blky,
calc

60% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, tr intbd mic pp pyr

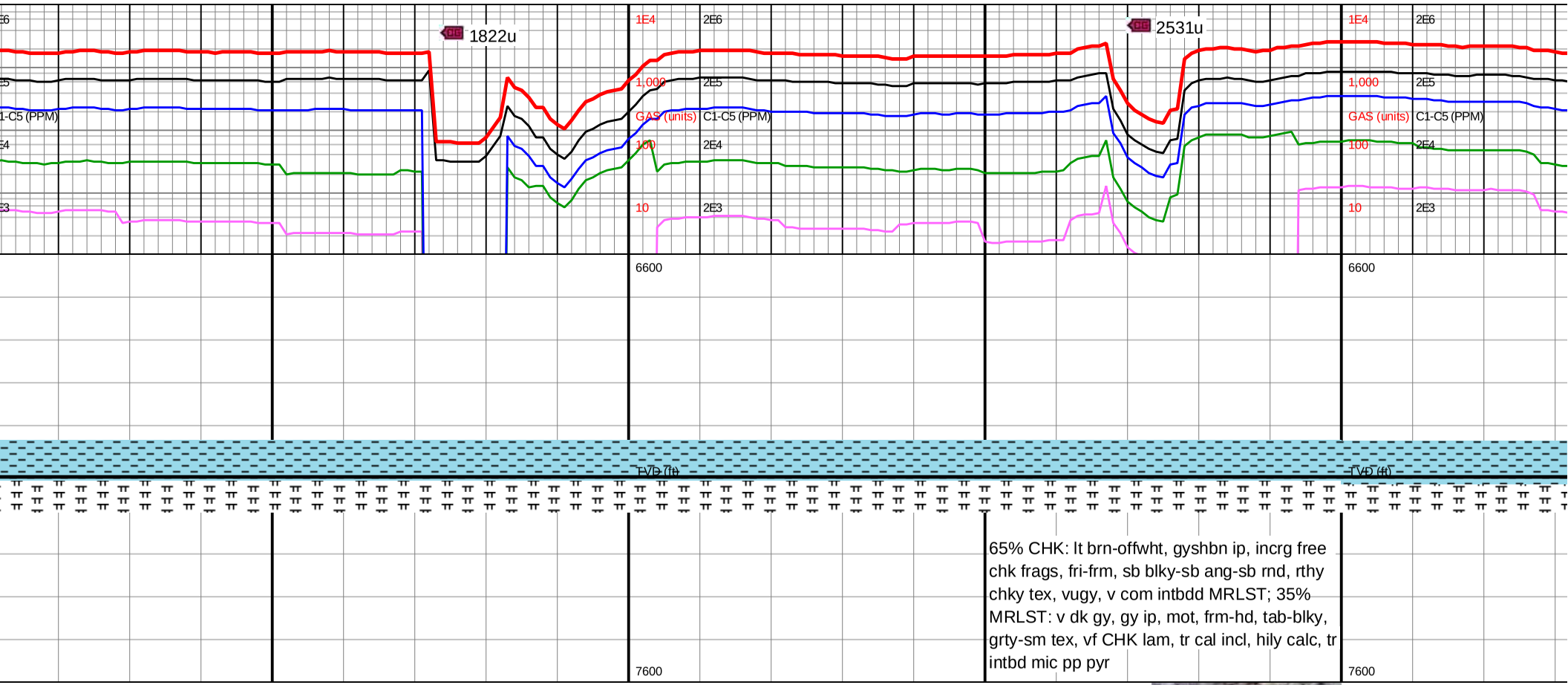


MD: 14,248'
INC: 90.12°
AZM: 86.18°
TVD: 7,119.02'
VS: 6,725.59'

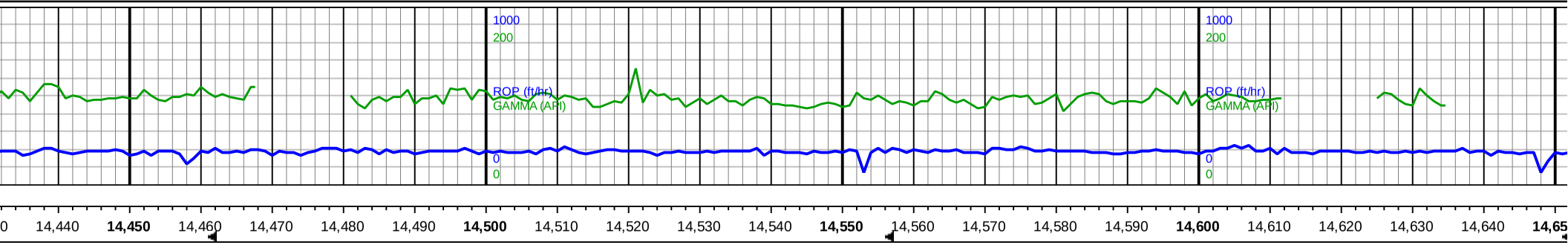
MW IN: 9.6
VIS IN: 47
MW OUT: 9.6
VIS OUT: 45

MD: 14,343'
INC: 90°
AZM: 85.54°
TVD: 7,118.92'
VS: 6,812.62'

WOB: 26klbs
RPM: 100
SPM: 200
SPP: 4,466psi



65% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 35% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, tr intbd mic pp pyr



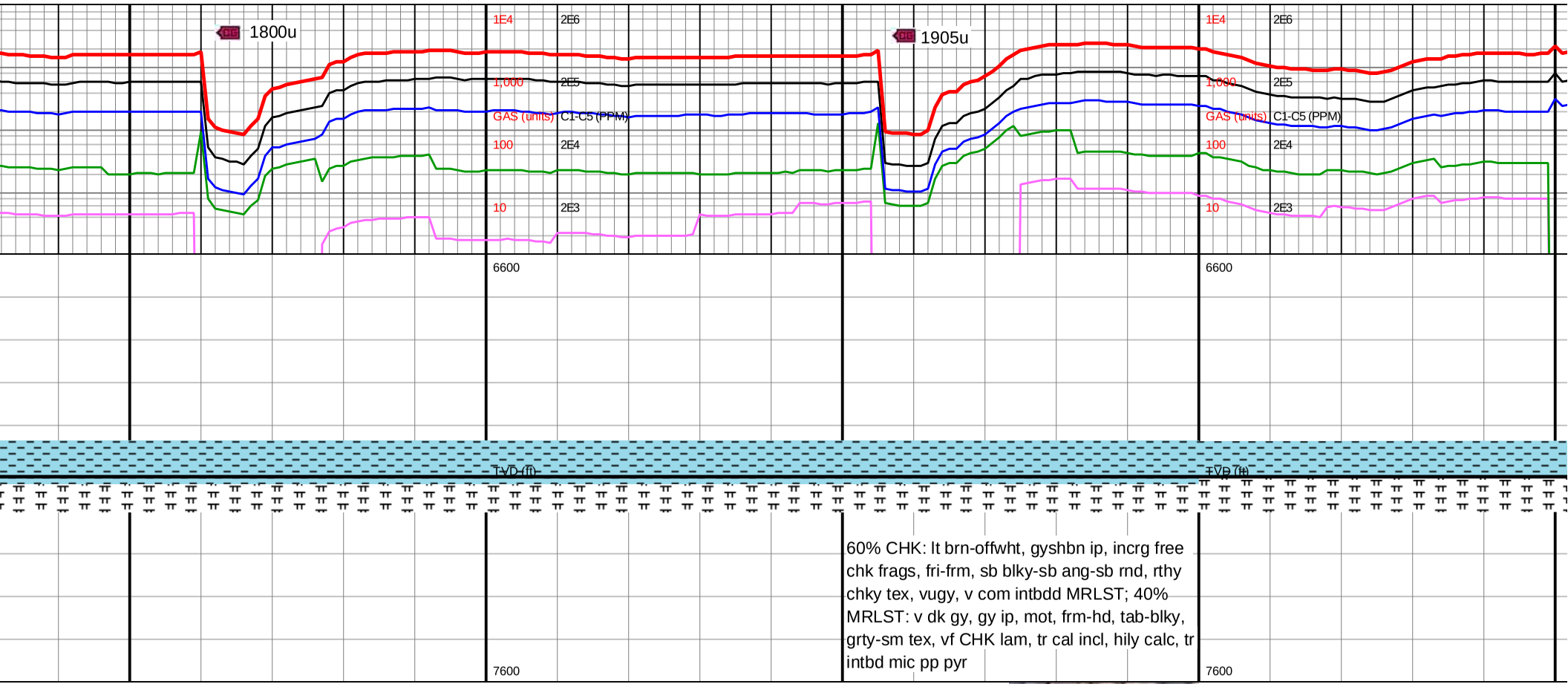
D: 14,437'
IC: 90.12°
ZM: 85.41°
VD: 7,118.82'
S: 6,898.98'

MW IN: 9.6
VIS IN: 47
MW OUT: 9.7
VIS OUT: 47

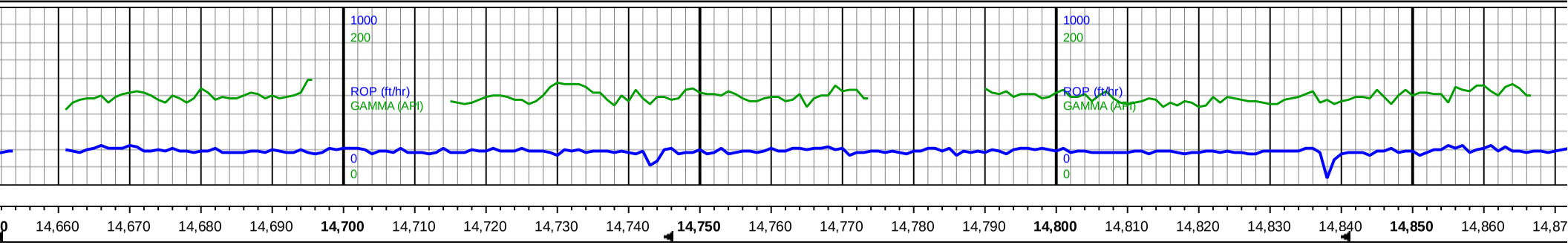
MD: 14,532'
INC: 90.18°
AZM: 87.56°
TVD: 7,118.58'
VS: 6,985.58'

WOB: 26.8klbs
RPM: 100
SPM: 200
SPP: 4,491psi

MD: 14,627'
INC: 89.97°
AZM: 85.81°
TVD: 7,118.45'
VS: 7,072.05'



60% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, tr intbd mic pp pyr



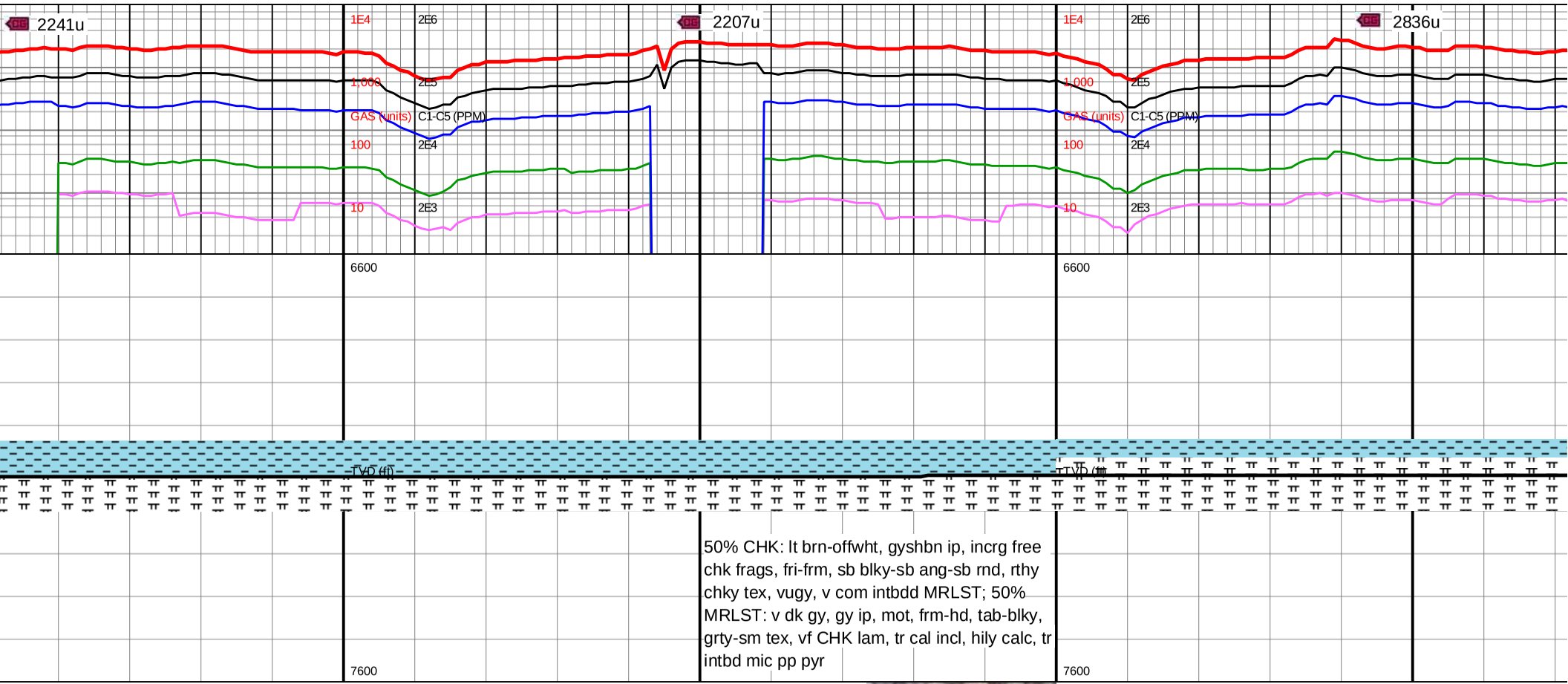
MW IN: 9.6+
VIS IN: 47
MW OUT: 9.6+
VIS OUT: 46

MD: 14,721'
INC: 89.94°
AZM: 84.65°
TVD: 7,118.53'
VS: 7,158.57'

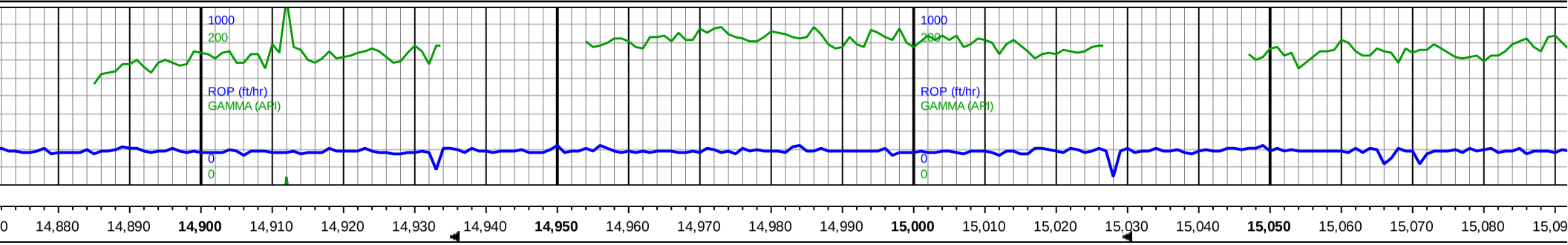
WOB: 26.3klbs
RPM: 99
SPM: 202
SPP: 3,353psi

MD: 14,816'
INC: 90.43°
AZM: 87.43°
TVD: 7,118.22'
VS: 7,245.46'

MW IN: 9.6
VIS IN: 48
MW OUT: 9.6+
VIS OUT: 46



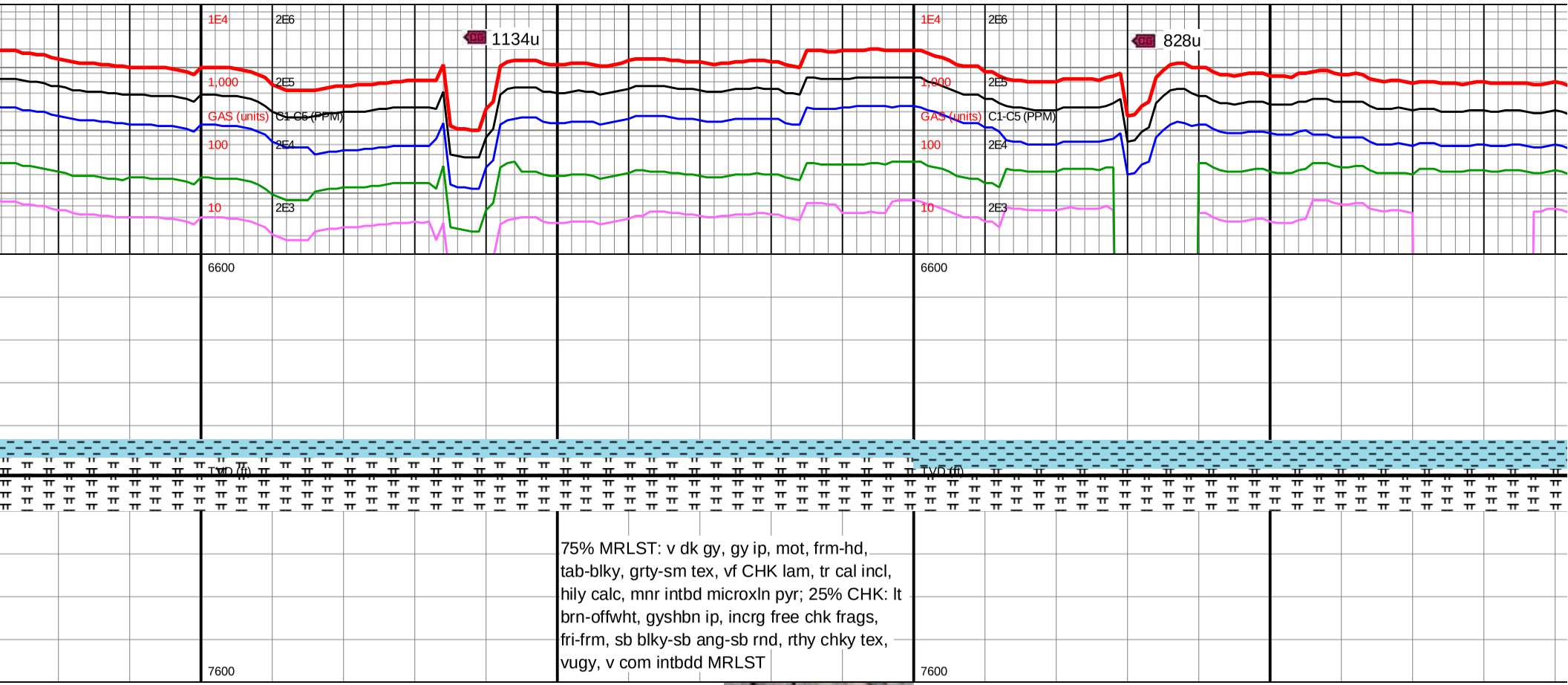
50% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 50% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, tr intbd mic pp pyr



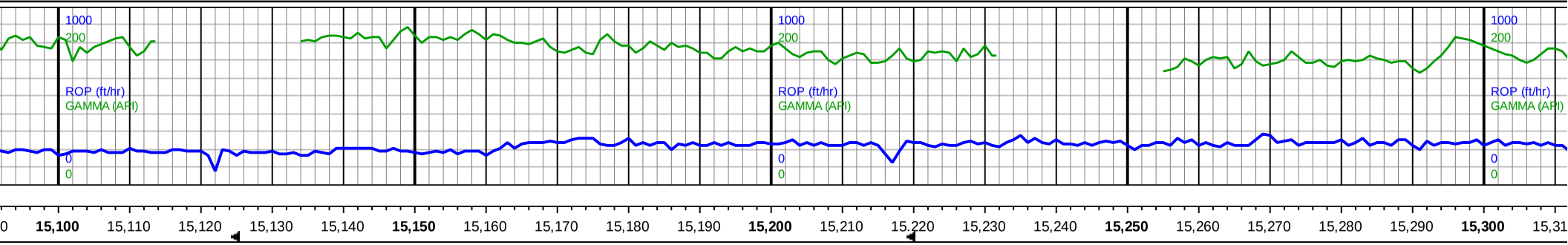
MD: 14,911'
INC: 90.58°
AZM: 92.64°
TVD: 7,117.38'
VS: 7,329.46'

WOB: 19.7klbs
RPM: 100
SPM: 200
SPP: 3,342psi

MD: 15,005'
INC: 90.34°
AZM: 94.02°
TVD: 7,116.63'
VS: 7,409.93'



75% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, mnr intbd microxln pyr; 25% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST



MD: 15,100'
INC: 90.06°
AZM: 93.48°
TVD: 7,116.29'
VS: 7,490.91'

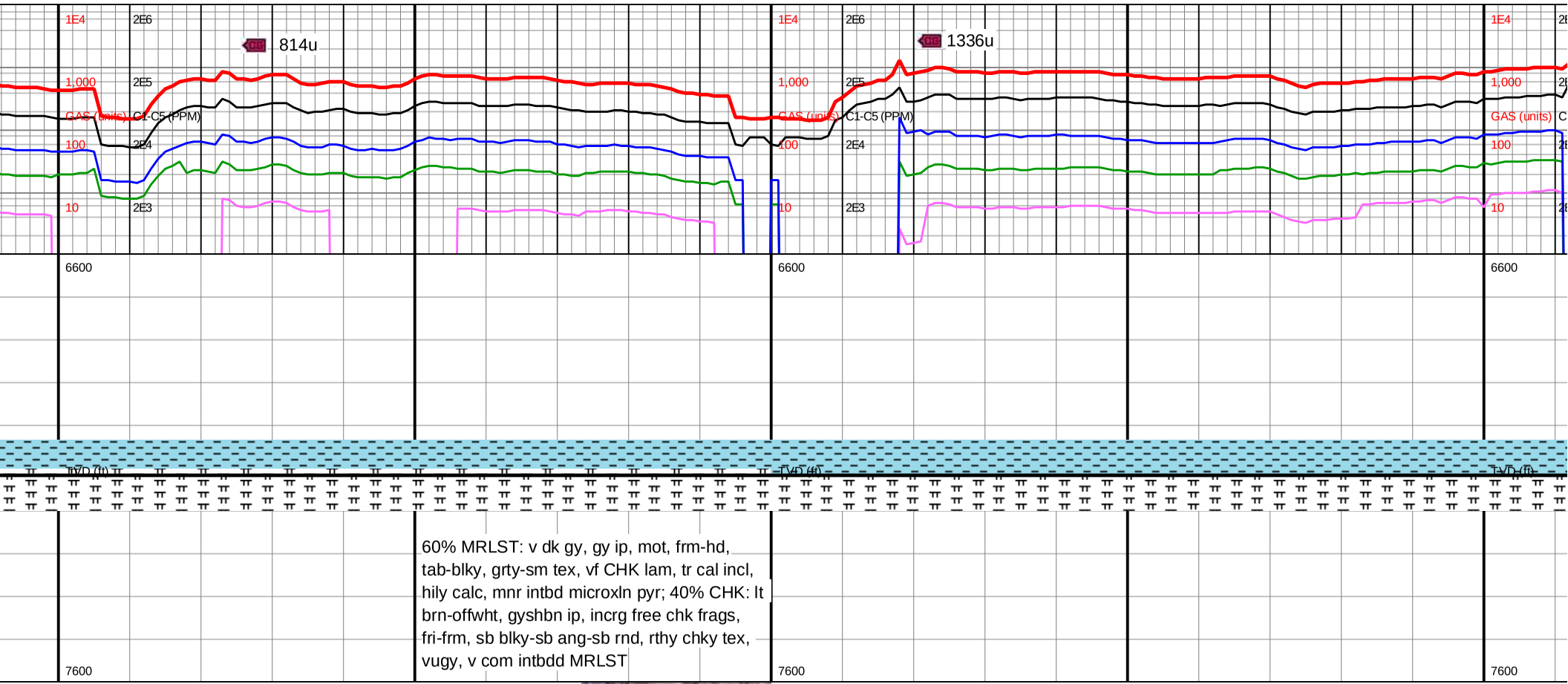
MW IN: 9.6
VIS IN: 48
MW OUT: 9.6+
VIS OUT: 46

MD: 15,195'
INC: 90.18°
AZM: 92.21°
TVD: 7,116.1'
VS: 7,572.65'

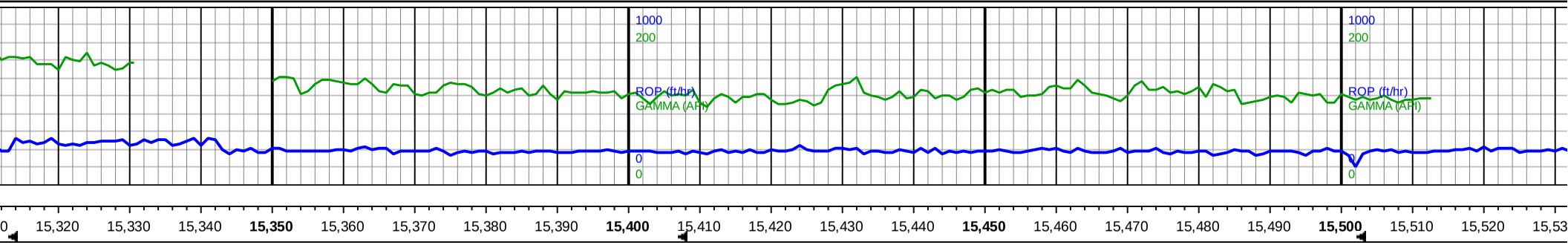
WOB: 28.3klbs
RPM: 100
SPM: 200
SPP: 4,659psi

MW IN: 9.6
VIS IN: 47
MW OUT: 9.6
VIS OUT: 45

MD: 15,289'
INC: 90.22°
AZM: 92.25°
TVD: 7,115.77'
VS: 7,654.05'



60% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, mnr intbd microxln pyr; 40% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST

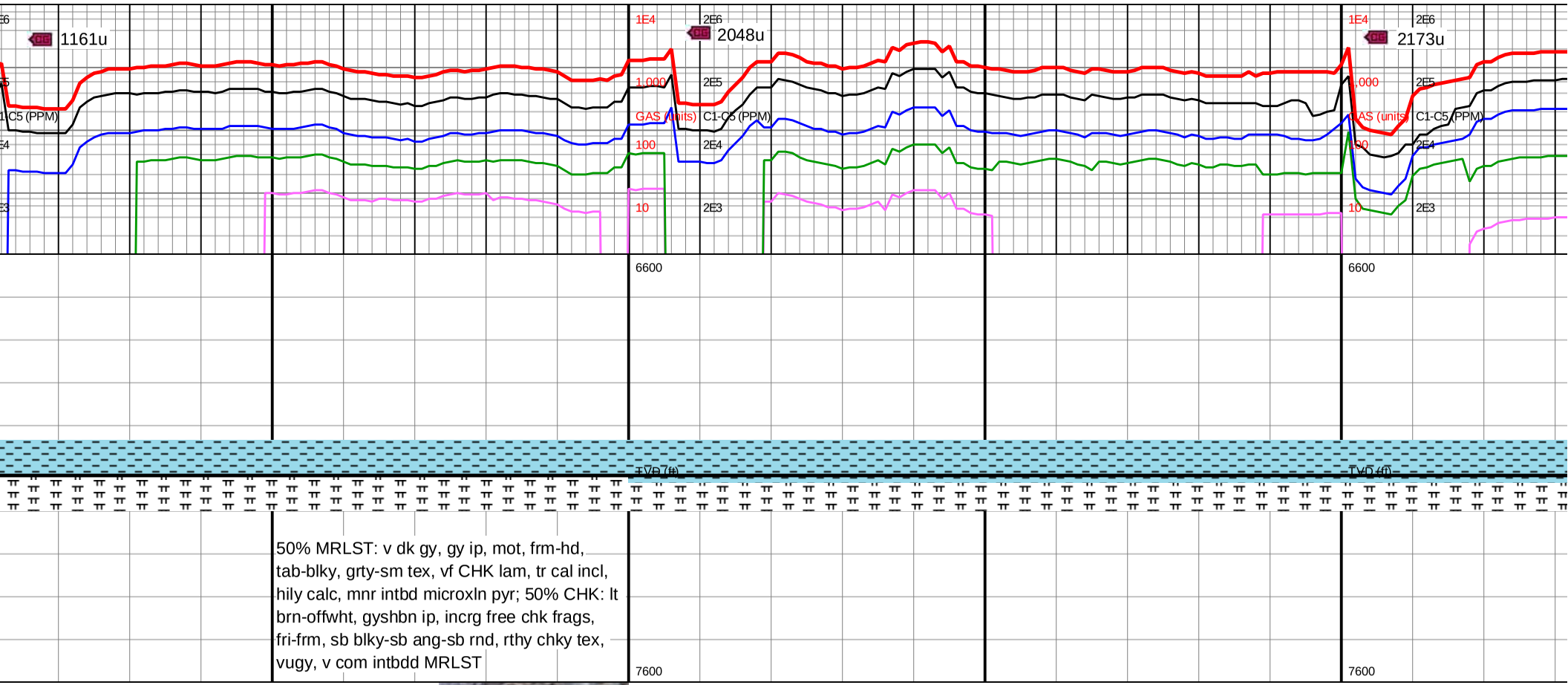


MD: 15,383'
INC: 89.78°
AZM: 90.94°
TVD: 7,115.77'
VS: 7,735.96'

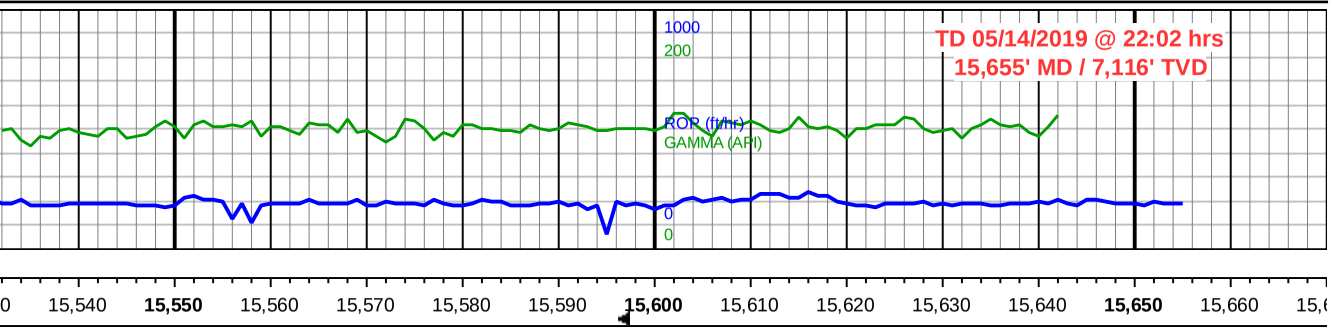
WOB: 27.2klbs
RPM: 99
SPM: 202
SPP: 4,729psi

MW IN: 9.6+
VIS IN: 49
MW OUT: 9.6
VIS OUT: 46

MD: 15,478'
INC: 89.78°
AZM: 89.96°
TVD: 7,116.13'
VS: 7,819.66'



50% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, mnr intbd microxln pyr; 50% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST



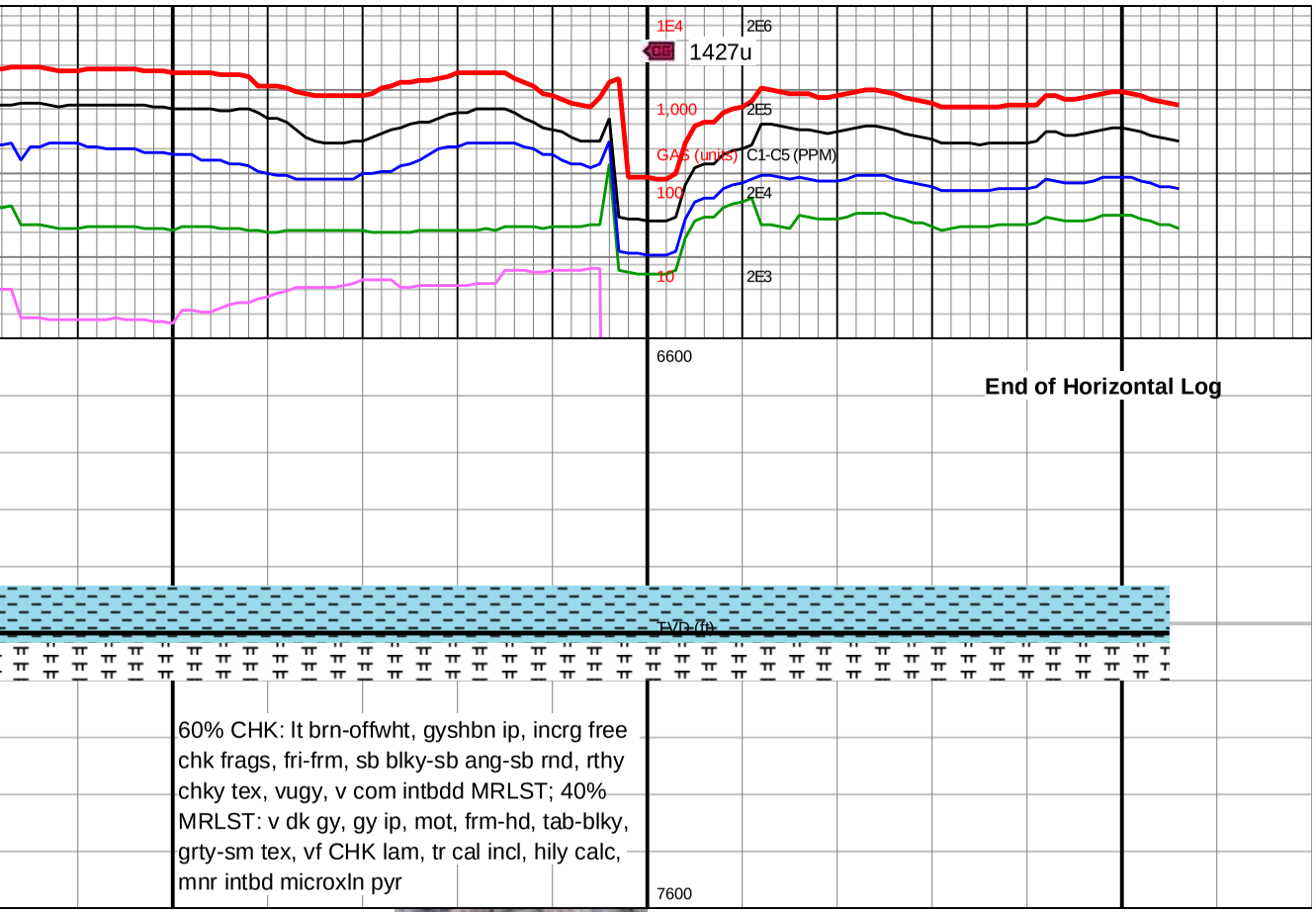
MW IN: 9.7
VIS IN: 49
MW OUT: 9.6+
VIS OUT: 46

MD: 15,572'
INC: 90.03°
AZM: 89.95°
TVD: 7,116.29'
VS: 7,902.86'

WOB: 27.1klbs
RPM: 100
SPM: 202
SPP: 4,771psi

MD: 15,631'
INC: 90.09°
AZM: 91.3°
TVD: 7,116.23'
VS: 7,954.76'

Projection to bit:
MD: 15,655'
INC: 90.09°
AZM: 91.3°
TVD: 7,116.19'
VS: 7,975.73'



60% CHK: lt brn-offwht, gyshbn ip, incrg free chk frags, fri-frm, sb blky-sb ang-sb rnd, rthy chky tex, vugy, v com intbdd MRLST; 40% MRLST: v dk gy, gy ip, mot, frm-hd, tab-blky, grty-sm tex, vf CHK lam, tr cal incl, hily calc, mnr intbd microxln pyr