

# LIR-GT-01

## Formation Log



**Legend**

**Drilling Data:**

- BC bit condition
- BS bit size
- CB core bit
- CBR core bit re-run
- CR core
- CSG casing
- DC depth correction
- DIR directional survey
- DS deviation survey
- DST drill stem test
- LC lost circulation
- LCM lost circ material
- MM mud motor
- NB new bit
- PO pump output
- PP pump pressure
- RPM rotary speed
- RR re-run bit
- SPM pump strokes
- SPP stand pipe pressure
- TRQ torque
- TVD true vertical depth
- WLL wireline log
- WOB weight on bit

**Mud Data:**

- CL chlorides
- FC filter cake
- FV funnel viscosity
- LAT lagged after trip
- MW mud weight
- NR no reading
- pH mud pH
- PV plastic viscosity
- WL water loss
- YP yield point

**Operator:** WEP  
**Well:** LIR-GT-01  
**Location:** De Lier GT1  
**Country:** Netherlands  
**UWID:** W0090FB1DDC6DN5TLMY  
**Elevation GL:** -1.90  
**KB:** 6.70  
**Drilling Rig:** KCA T-49  
**Spud Date:** 20/05/2014  
**Print Date:** 22/08/2014

**Notes:**

**Surface coordinates**  
**E= 79087.72 m; N= 443732.33 m**

**Target coordinates**  
**E= 78922.60 m; N= 444532.40 m**

**Engineering**



**Bit Trip**



**Wireline Log**



**Side Wall Core**



**Dummy Trip**



**Casing**



**Plug Back**



**Mud Loss**



**Directional Drill**



**Perforated Interval**

**HoleData:**

17 1/2" hole, 135.0 m, 1080.3 m MDRT  
12 1/4" hole , 1080.3 m, 2565.1 m MDRT  
8 1/2" hole, 2565.1 m, 2897.0 m MDRT

**MudData:**















































































17 1/2" hole drilled with  
1.05 - 1.15 sg KCl Glycol Polymer WBM  
  
12 1/4" hole drilled with  
1.14 - 1.20 sg KCl Glycol Polymer WBM  
  
8 1/2" hole drilled with  
1.09 sg Drillcarb WBM

**CasingData:**

23" conductor, surface, 135.0 m MDRT,  
13 3/8" casing, surface, 1028.7 m MDRT,  
9 5/8" liner, 924.9 m, 2552.9 m MDRT,  
6 5/8" liner, 2499.4 m, 2881.0 m MDRT,

**Personnel:**

**DE:** Christopher Smale, Polly Miles  
Miles Stephenson, Sergio Boccola, Karol Rudnicki  
  
**ML:** Ralph Krauze, Abdul Rabim, Lucy Peaker  
Luke Edwards, Kyle Walker-Verkuil, Keith Mearns

Lithology				Fossil				Mineral				Geological			
	Anhydrite		Conglomerate		Foram		Gastropod		Chert Dark		Ferrug Stringers		Overtured Strata		
	Gypsum		Chert		Amphipora		Ostracod		Marly		Anhydrite Stringers		Tectonic		
	Coal		Tuff		Fish		Mollusc		Nodules		Bituminous		Reverse Fault		
	Shale		Dolomite		Fossils		Pelecypod		Ferruginous		Calcareous		Normal Fault		
	Siltstone		Not Available		Echinoid		Plant Remains		Kaolinite		Carbonaceous		Fractures		
	Limestone		No Sample		Crinoid		Spines		Glauconite		Coal Thin Beds	Oil Show			
	Metamorphic				Corals		Trilobites		Anhydrite		Bentonite				Dead Oil
					Bryozoa		Oolitic		Gypsiferous		Marl Stringers		Good		
					Belemnite		Bioturbation		Feldspar		Sandstone Stringer		Excellent		
					Bioclastic		Coated Grains		Siliceous		Argillaceous		Poor		
					Brachiopod		Algae		Sandy		Limestone Stringer				
									Particles		Siltstone Stringers				
									Silty		Shale Laminae				
									Phosphate Pellets		Mica				
									Pyrite		Dolomitic				
									Sulphur		Gypsum Stringers				
									Mineral Crystals		Salt				

Drilling Comments	WOB		TVD	Percentage Lithology	Remaining Sieved Sample %	Total Hydrocarbons MLS			C1 Out			Interpreted Lithology	Fluorescence	Lithology Comments	
	0	tons				50	0.01	%	10	1	ppm				100000
	ROP Average					C2 Out									
	50	m/hr				0	0.01	%	10	1	ppm				100000
	Gamma					C3 Out									
	0					350				1	ppm				100000
						iC4 Out									
						nC4 Out									
						iC5 Out									
						nC5 Out									
		ppm 100000													
		ppm 100000													

Spud in well LIR-GT-01  
on 19/05/2014 at 11:30am  
from 140.0 m MDRT

Bit Run #1  
17 ½" HCC Mill Tooth Roller Cone  
SN: 5188806  
In @ 140.0m , Out @ 845.0 m

Start recording from 187.0 m MDRT

Troubleshooting drawworks problems.  
Fixed at 227.0 m MDRT

150  
<150>

160  
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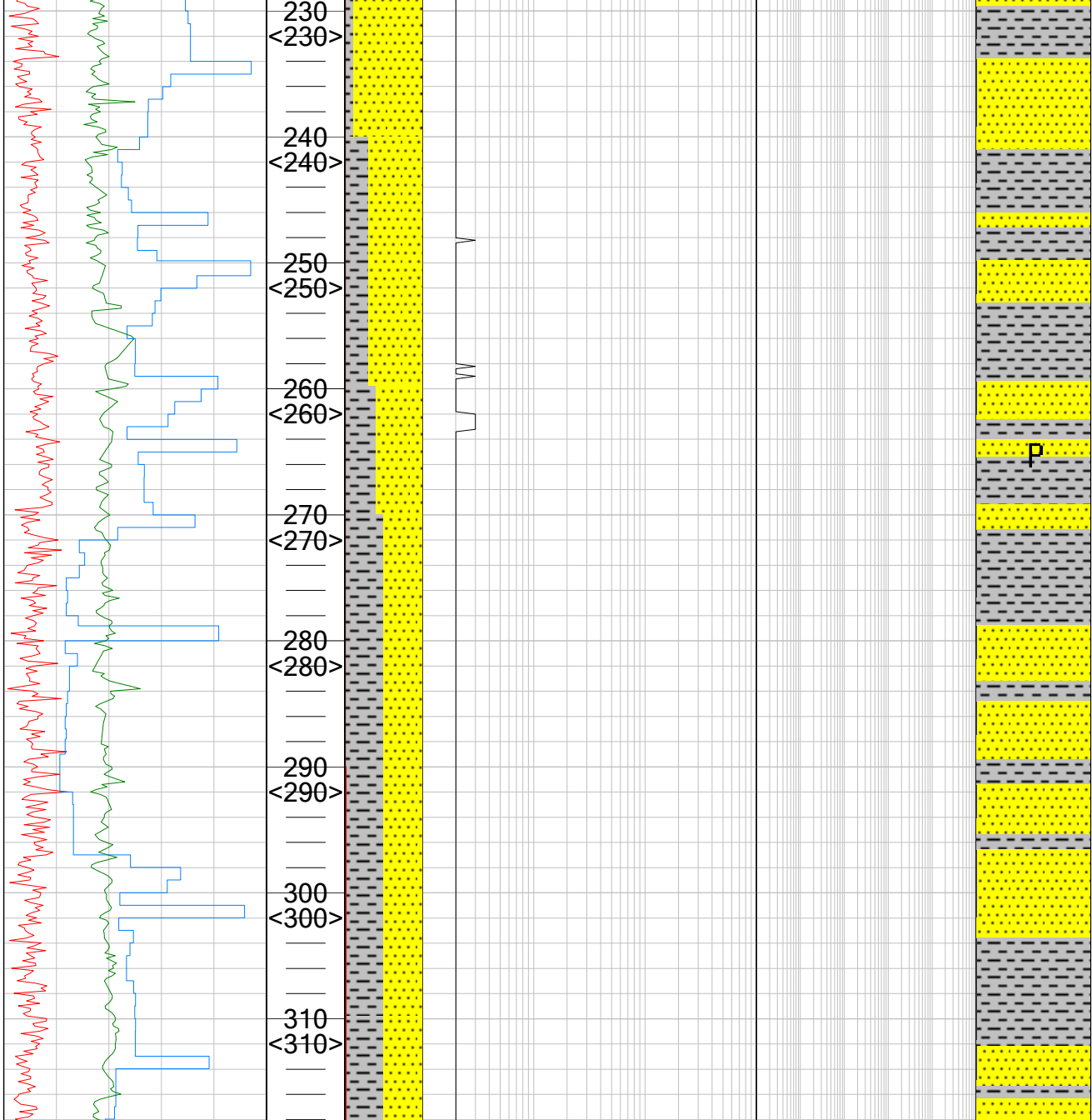
P

Sandstone: Translucent, very pale pink, very light grey, very fine to medium coarse, hard, calcareous, shell fragments, trace mica. trace pyrite.

Midnight depth on 20.05.2014:  
232.0 m MDRT

MW: 1.12 sg  
PV: 35 cP  
YP: 50 lbf/100ft2  
pH: 11

MWD Survey @ 307.0 m MDRT  
Azi: 353.88°, inc: 2.59°  
TVD: 307.0 m



Claystone: Grey to dark grey, silty, soft, shell fragments.

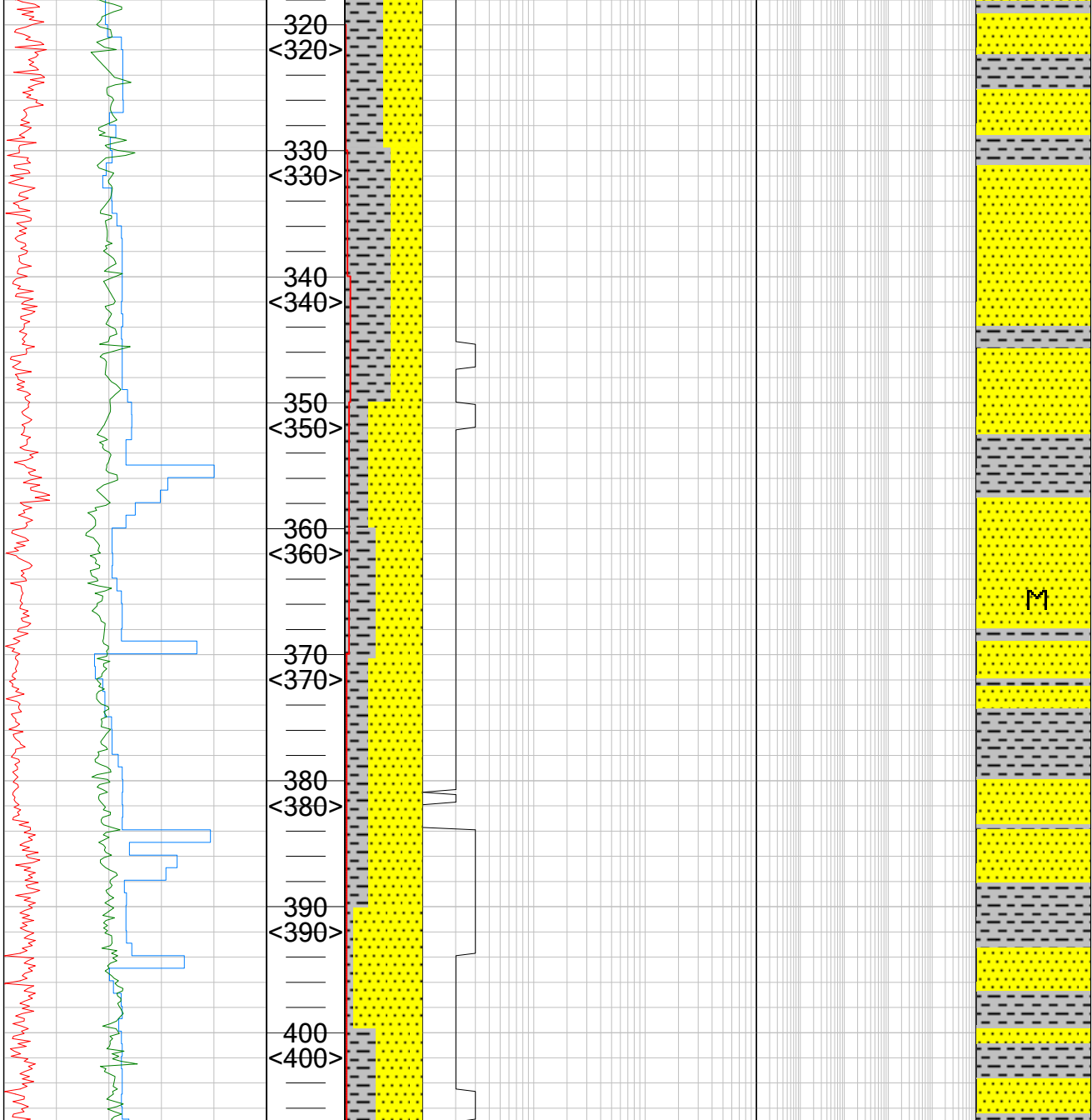
Top of OOSTERHOUT FM  
@ 250.0 m MDRT, 250.0 m TVD

Sandstone: Medium grey, dark grey, coarse, hard,  
sub-rounded, sub-spherical, shell fragments, trace pyrite.

Claystone: Medium grey, silty, soft, sticky, quartz rich, lithic  
fragments.

SPP: 79 bar  
WOB: 4 tons  
F/In: 2590 l/min

MWD Survey @ 364.0 m MDRT  
Azi: 350.05, inc 2.70°  
TVD: 363.9 m



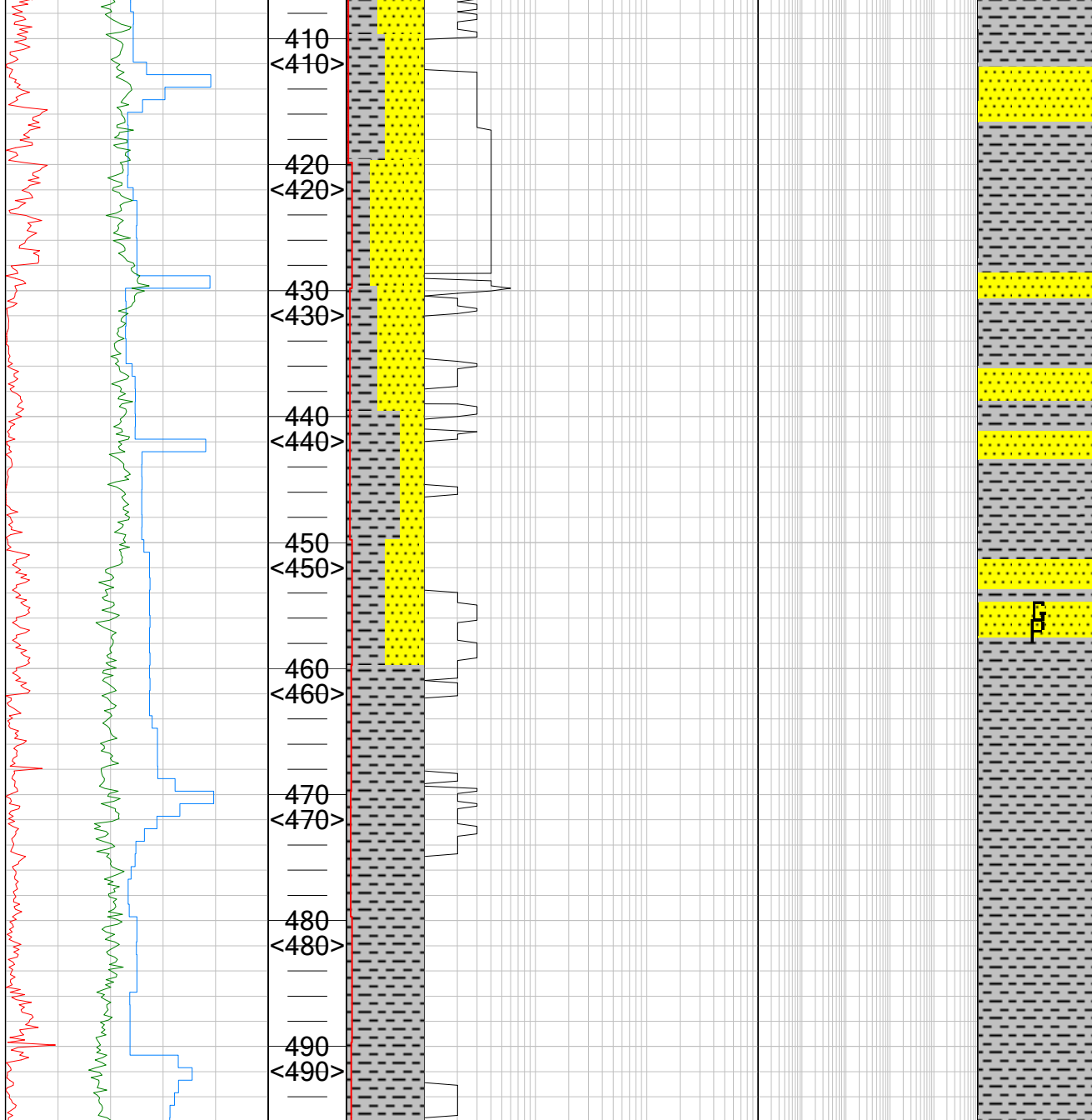
Sandstone: Light olive grey, unconsolidated, quartz rich, sub-angular to sub-rounded, coarse to very fine, moderately sorted, grain supported matrix, lithic fragments, trace mica.

Top of BREDA FM  
@ 387.0 m MDRT, 387.0 m TVD

Sandstone: Quartz rich, unconsolidated, very fine to coarse

MWD Survey @ 421.0 m MDRT  
Azi: 349.97°, inc 3.83°  
TVD: 420.83 m

MWD Survey @ 479.0 m MDRT  
Azi: 347.90°, inc 3.76°  
TVD: 478.70 m



grained, sub-angular to sub-rounded, sub-spherical, moderately to poorly sorted grain supported lithic fragments.

Claystone: Light olive grey to olive grey, soft, sticky, occasionally silty.

**Top of RUPEL FM**  
**@ 432.0 m MDRT, 432.0 m TVD**

Claystone: Light olive grey to olive grey, soft, sticky.

**Top of DONGEN FM / ASSE MBR**  
**@ 452.0 m MDRT, 452.0 m TVD**

Sandstone: Loose quartz, very fine to fine grained, trace pyrite, trace glauconite.

Claystone: Light brown to greenish/blue grey, soft, sticky, sub-blocky to blocky, silty.

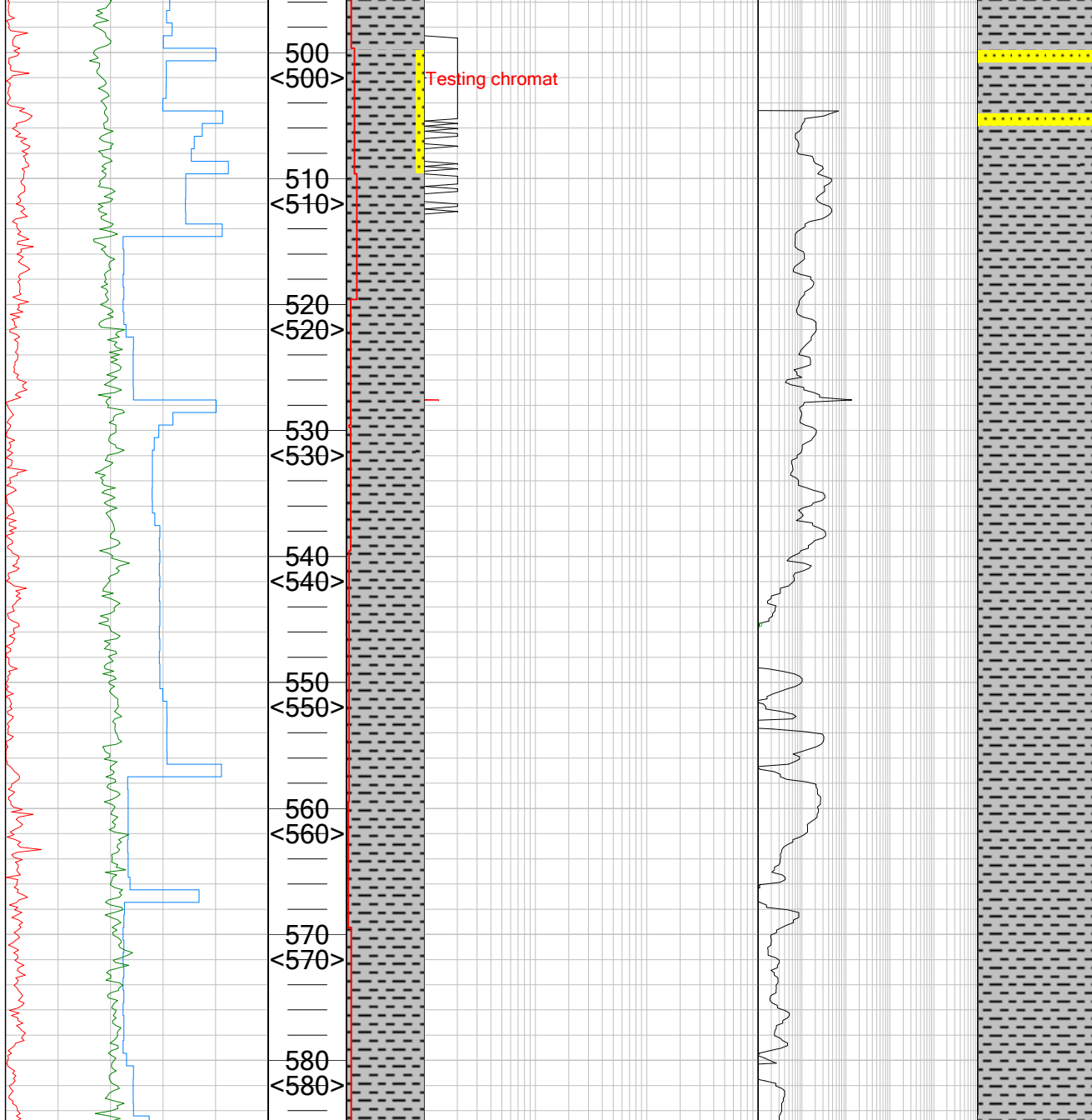
**Top of BRUSSEL SANDS MBR**  
**@ 486.0 m MDRT, 486.0 m TVD**

MW: 1.12 sg  
PV: 35 cP  
YP: 45 lbf/100ft<sup>2</sup>  
pH: 10.6

Midnight depth on 21.05.2014:  
527.0 m MDRT

SPP: 107 bar  
RPM MM: 118  
WOB: 2.6 tons  
F/in: 2949 l/min

MWD Survey @ 566.0 m MDRT  
Azi: 347.04°, inc 4.22°  
TVD: 565.46 m



Top of LEPER MBR  
@ 505.0 m MDRT, 505.0 m TVD

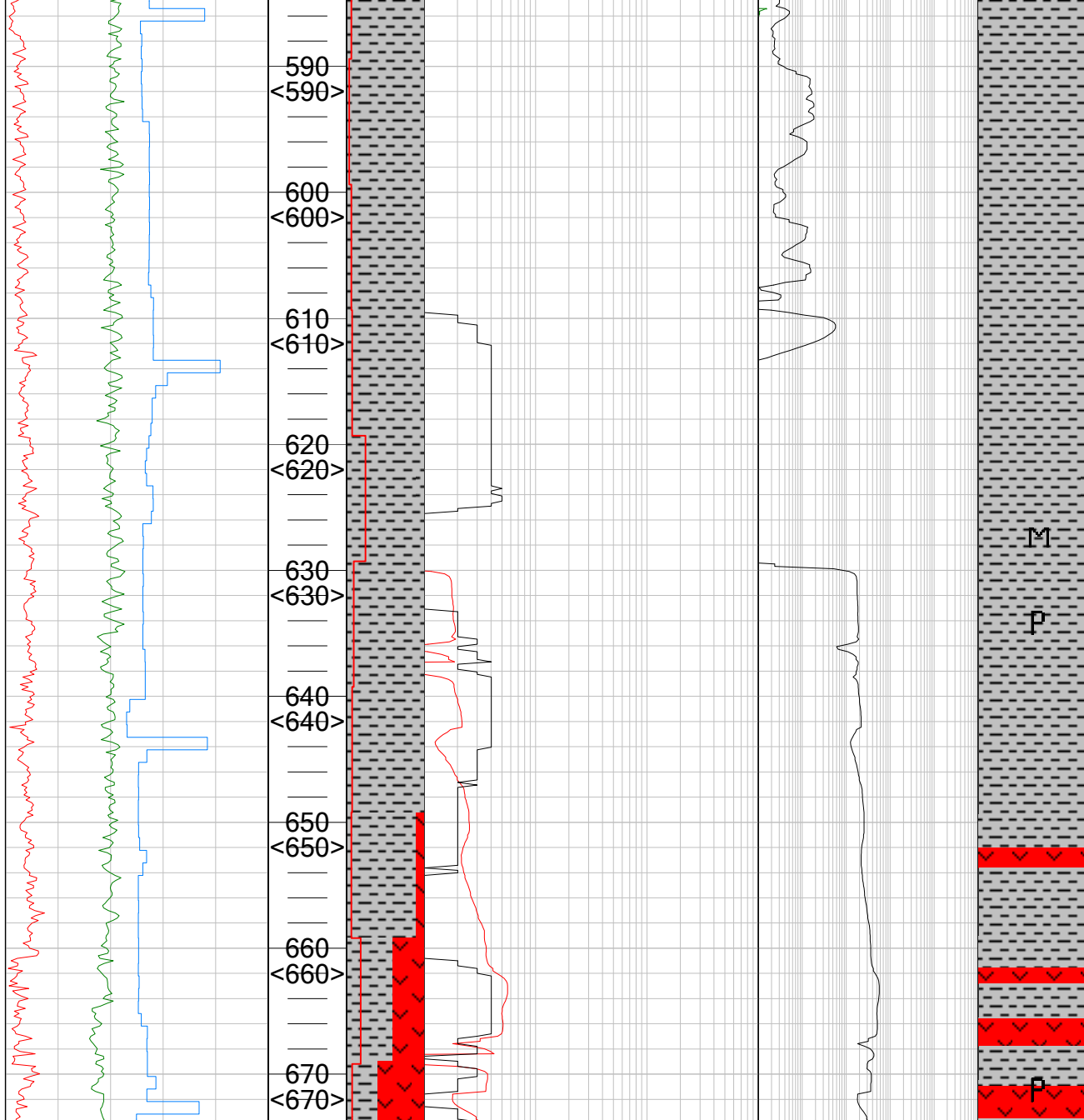
Claystone: Light grey to grey, occasionally light brown, light green, soft, amorphous.

Claystone: Light bluish grey to grey, occasionally light brown, light green, soft, amorphous to sub-blocky, sticky.

MW: 1.10 sg  
PV: 24 cP  
YP: 40 lbf/100ft<sup>2</sup>  
pH: 9.8

MWD Survey @ 624.0 m MDRT  
Azi: 348.27°, inc 4.47°  
TVD: 623.3 m

SPP: 165  
WOB: 3.6 tons  
F/In: 3512 l/min



Claystone: Light bluish grey to light grey, occasionally greenish grey, soft, amorphous,

Claystone: Olive grey to brownish grey, amorphous to sub-blocky, soft, trace mica, trace pyrite

Claystone: Olive grey, occasionally reddish brown, soft to firm, sub-blocky, argillaceous, earthy, olive grey silty.

Tuff: Medium bluish grey, soft to firm, argillaceous, sub-blocky, very fine black crystals, sub-euhedral, trace pyrite, trace greyish orange very fine grained sandstone.

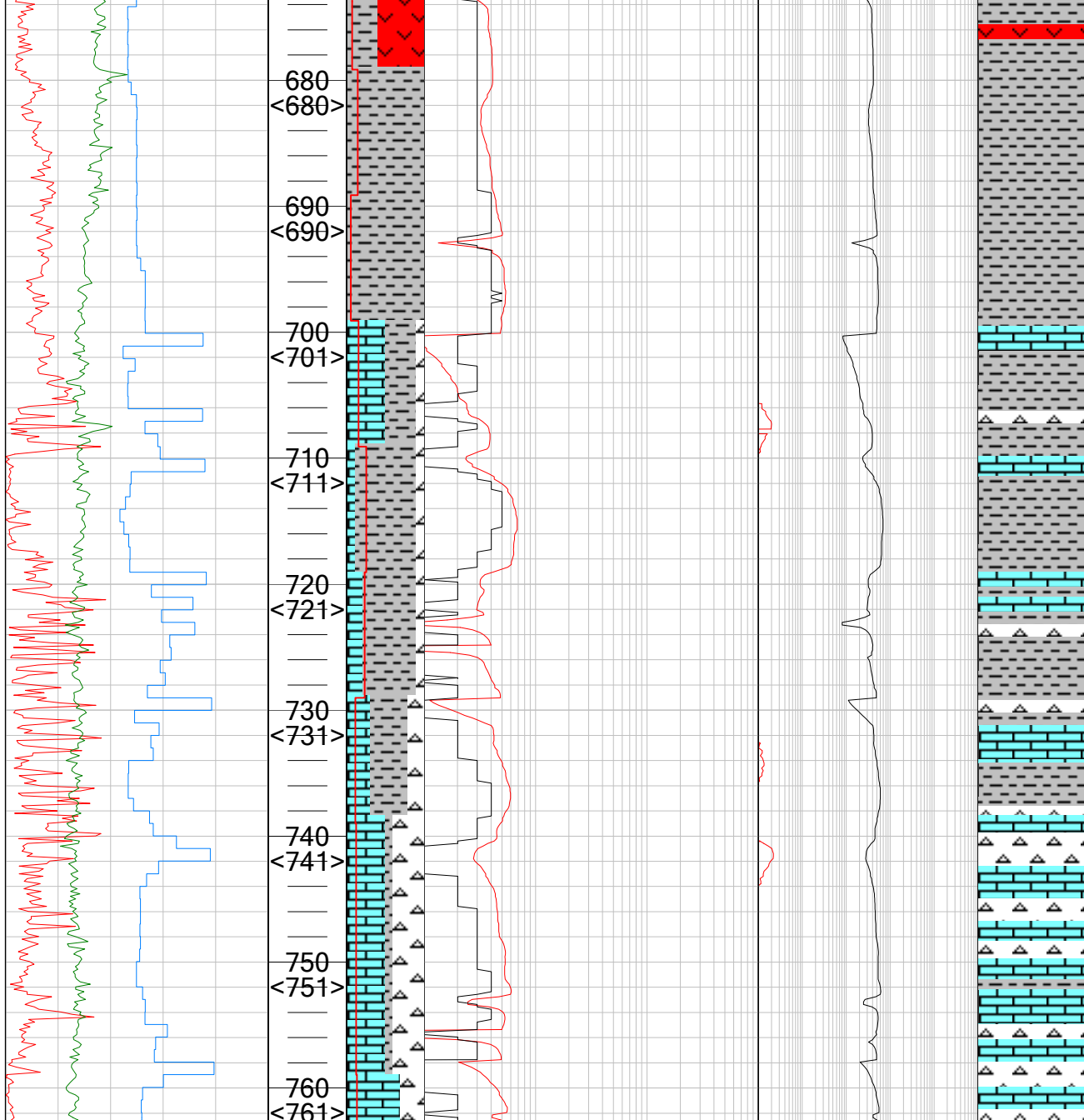
Top of BASEL DONGEN TUFFITE MBR  
@ 667.0 m MDRT, 666.0 m TVD

Top of LANDEN FM



MWD Survey @ 682.0 m MDRT  
Azi: 346.11, inc: 4.07°  
TVD: 681.1 m

SPP 160 bar  
RPM MM: 139  
WOB: 3.9 tons  
F/in: 3470 l/min



@ 682.0 m MDRT, 681.0 m TVD

Claystone: Olive grey, occasionally reddish brown, soft to firm, sub-blocky, argillaceous, occasionally silty.

Top of EKOFISK FM  
@ 692.0 m MDRT, 691.0 m TVD

Limestone: off white to white, wackestone to packstone, soft to firm, hard in parts, chalky.  
Chert: White to light grey, very hard, sub-elongate, angular.

Top of OMMELANDEN FM  
@ 709.0 MDRT, 708.0 TVD

Chert: Black to dark grey, occasionally light brown, very hard, elongate, angular, vitreous

Chert: White to light grey, very hard, sub-elongate, angular.

Limestone: Light yellow to white, chalky, unconsolidated, amorphous.

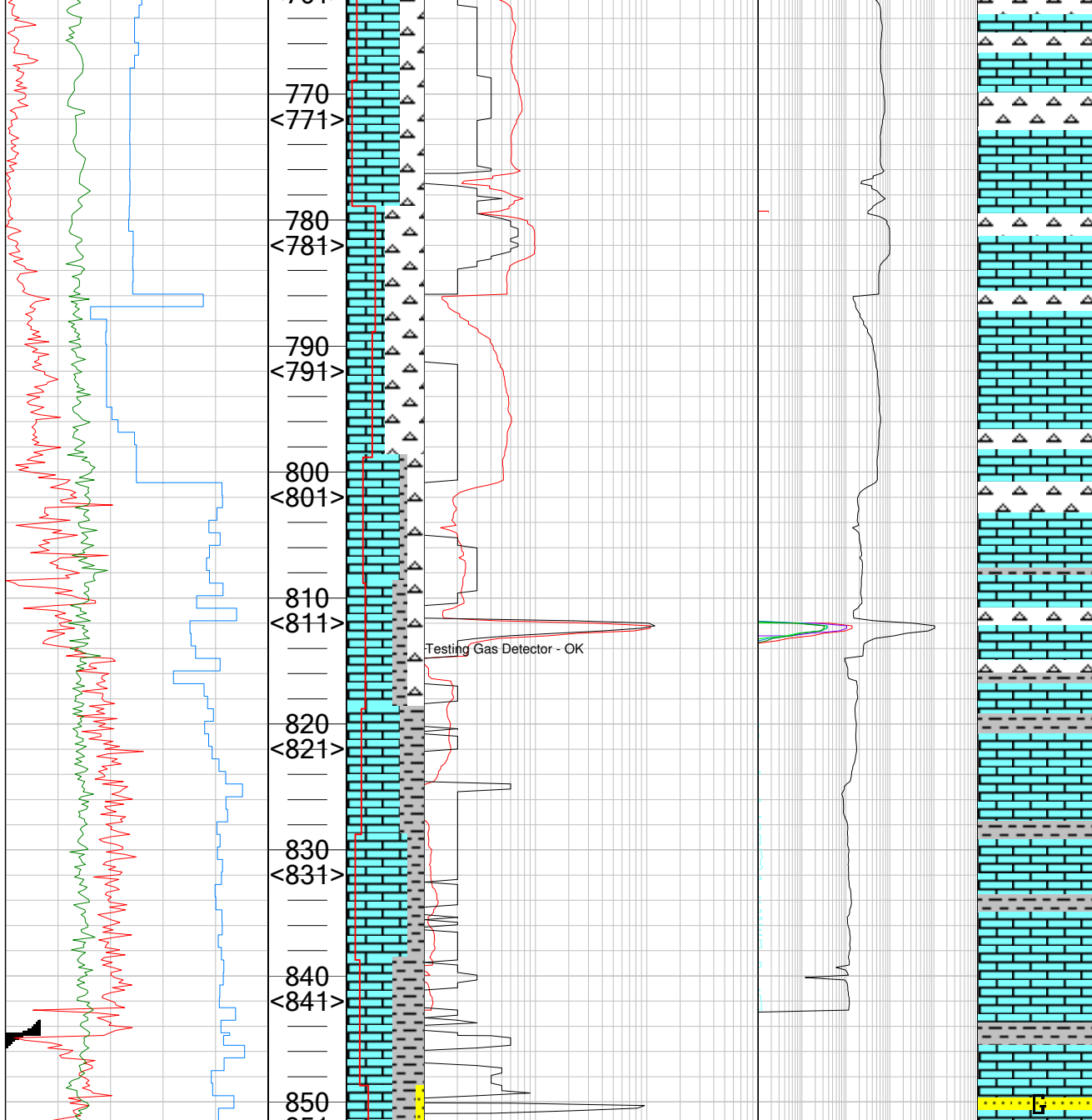
MWD Survey @ 767.0 m MDRT  
Azi: 353.53, inc: 4.07°  
TVD: 765.9 m

MW: 1.11 sg  
PV: 16 cP  
YP: 29 lbf/100ft2  
pH: 9.4

MWD Survey @ 824.0 m MDRT  
Azi: 351.05°, inc 4.15°  
TVD: 822.77 m

Midnight depth on 22.05.2014:  
843.0 m MDRT

Bit Run #2  
17 ½" HCC Insert/Rollercone  
SN: 5190800/EP620202  
In @ 845.9 m, Out @ 1080.0 m

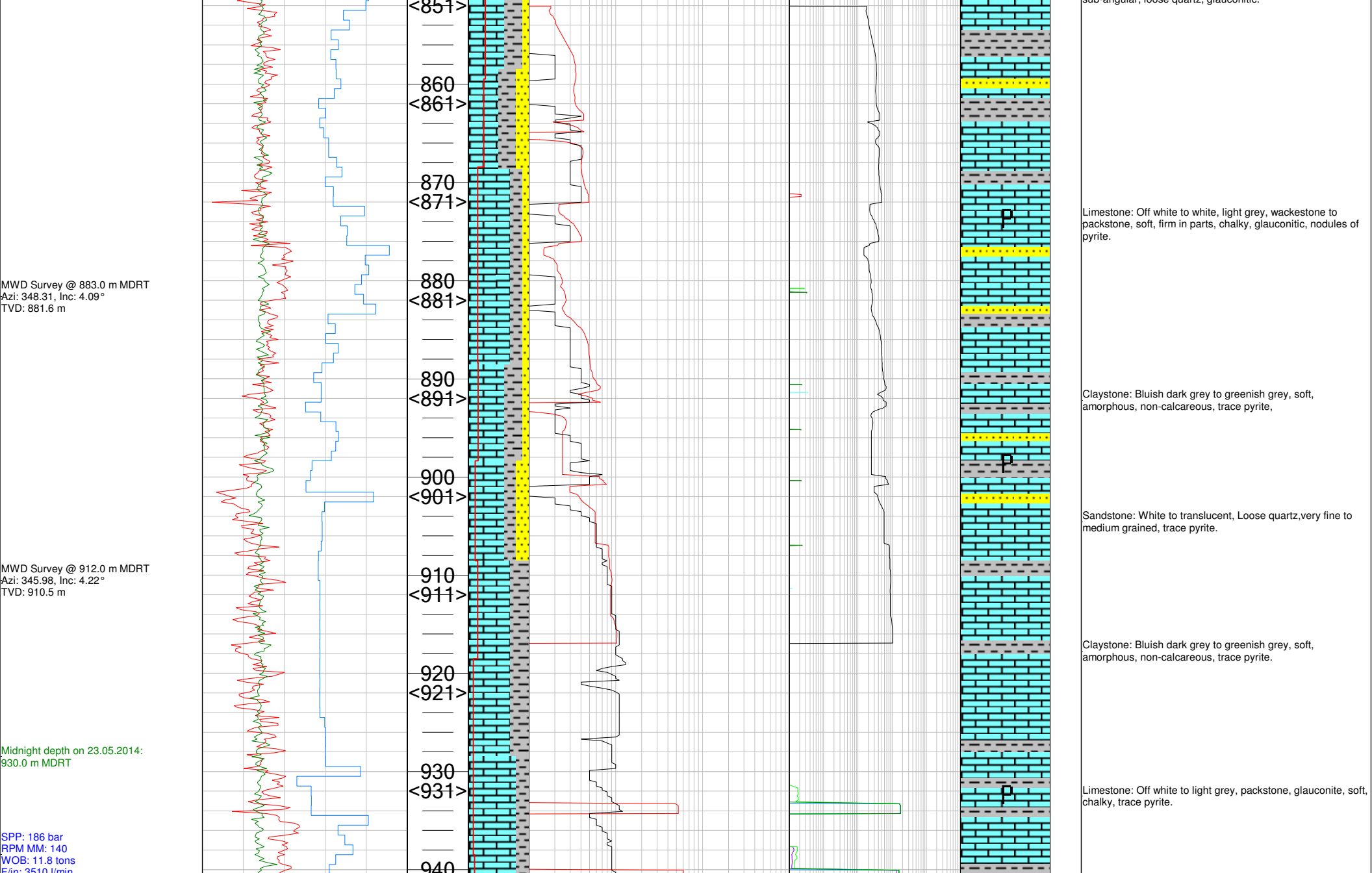


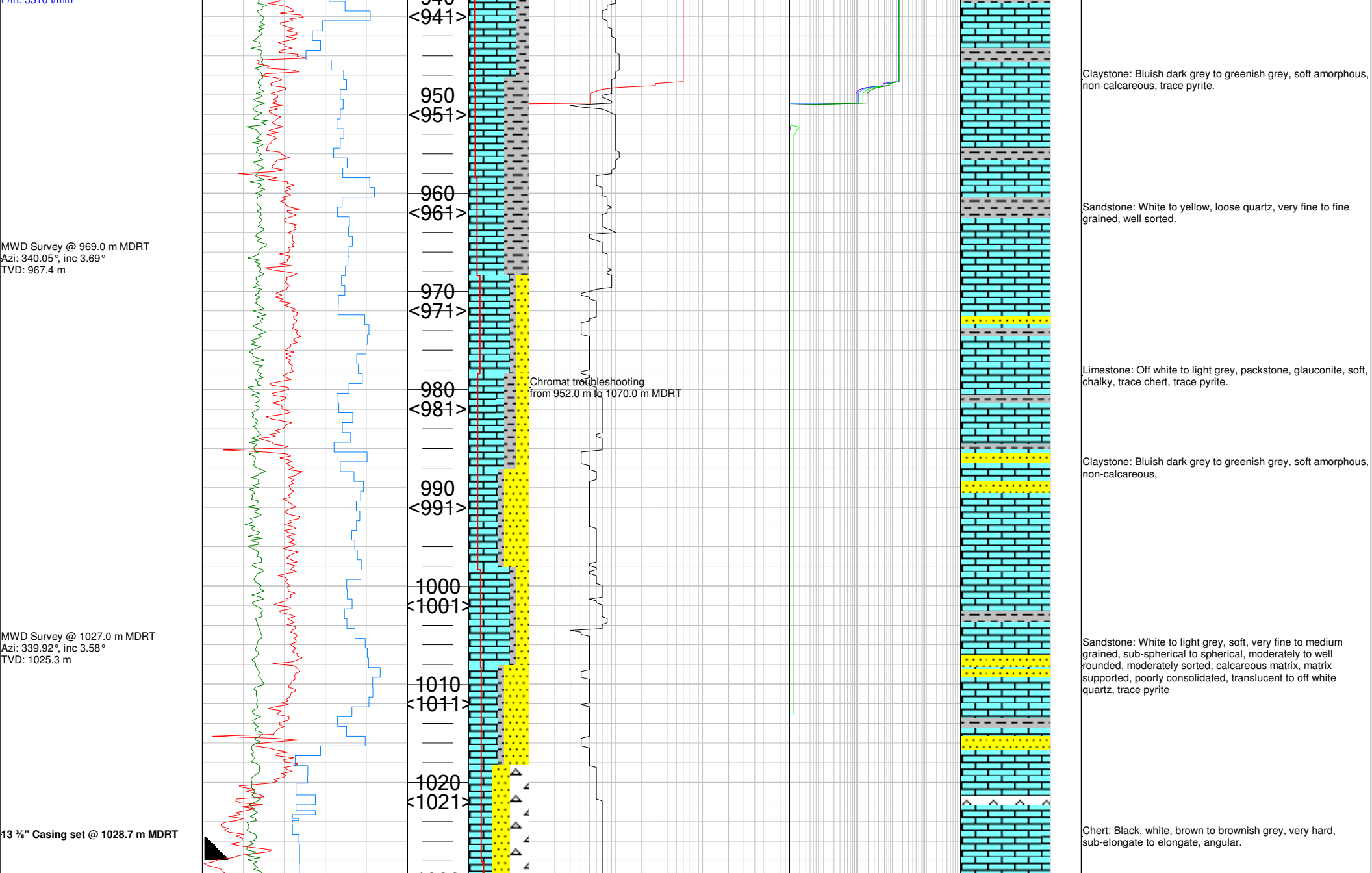
Chert: Black to dark grey, occasionally light brown, very hard, elongate, angular, vitreous

Limestone: Off white, milky, mudstone, soft, firm in places, glauconitic.

Claystone: Brownish grey to greenish grey, soft, sub-blocky to blocky, slightly calcareous.

Sandstone: White to yellow, translucent to transparent, very fine to fine, moderately to well sorted, rounded to sub-angular, loose quartz, glauconitic.





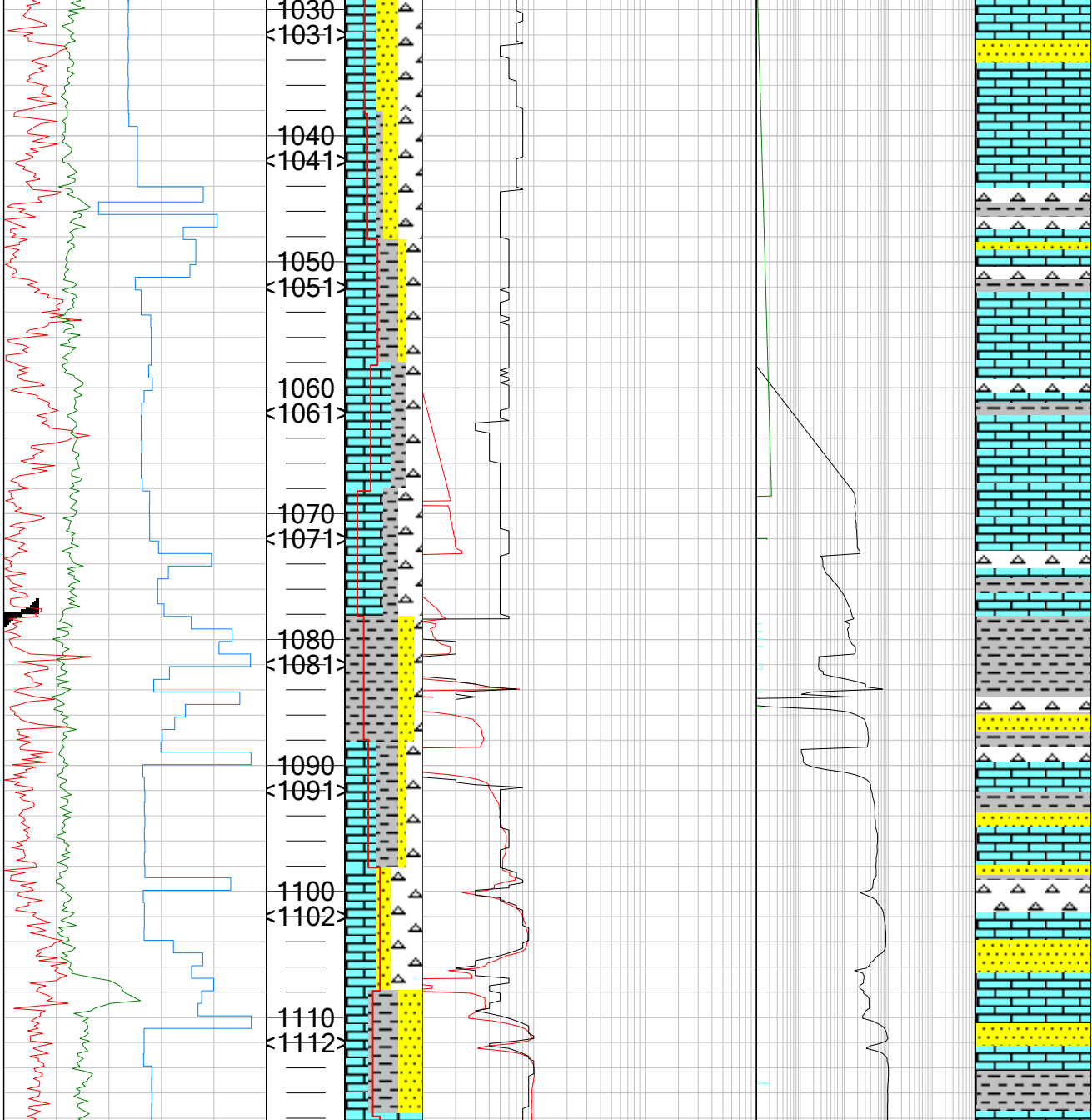
FIT to 1.46 s.g. EMW

MW: 1.18 sg  
PV: 14 cP  
YP: 22 lbf/100ft2  
pH: 8.7

Bit Run #3  
12 1/4" PDC; SN: 7147646  
In @ 1080.0 m, Out @ 2565.1 m

Midnight depth on 01.06.2014:  
1090.3 m MDRT

MWD Survey @ 1095.0 m MDRT  
Azi: 342.55°, inc 4.26°  
TVD: 1092.2 m



Claystone: Off white to yellowish grey, amorphous, unconsolidated, calcareous, argillaceous.

Claystone: Greenish black, firm, sub-blocky, non-calcareous.

Sandstone: Pearly to white, hard, very fine, spherical, rounded, well sorted, calcareous cement

Top of TEXEL FM / PLENUS MARL MBR  
@ 1108.5 MDRT, 1106.5 TVD

Top of TEXEL MARLSTONE MBR  
@ 1111.5 MDRT, 1109.0 TVD

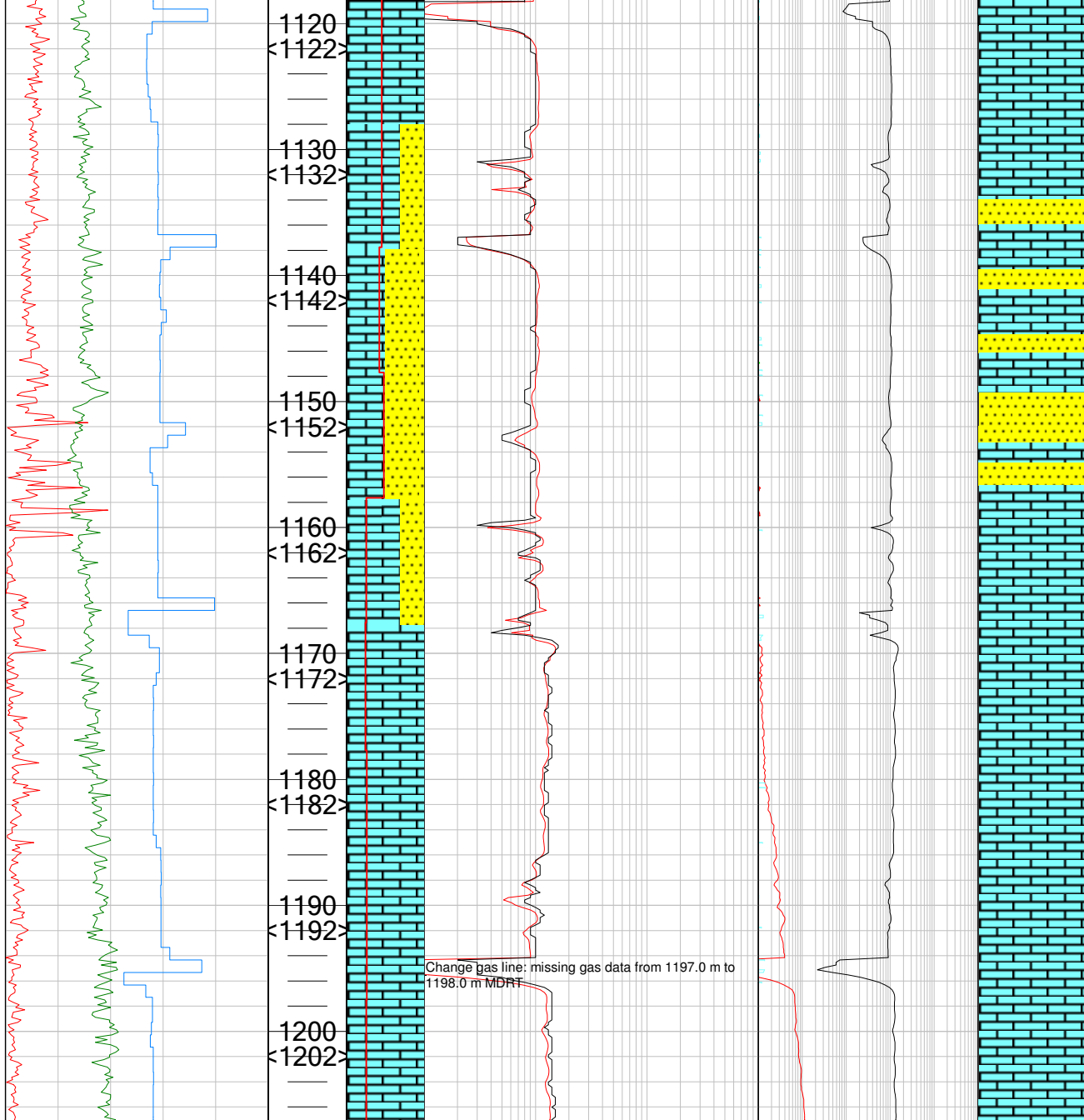
MWD Survey @ 1124.0 m MDRT  
Azi: 343.5°, inc 5.06°  
TVD: 1121.1 m

SPP: 200 bar  
RPM MM: 92  
WOB: 11.4 tons  
F/in: 3346 l/min

MWD Survey @ 1153.0 m MDRT  
Azi: 345.52°, inc 6.30°  
TVD: 1150.0 m

MWD Survey @ 1181.0 m MDRT  
Azi: 346.25°, inc 7.69°  
TVD: 1177.79 m

MWD Survey @ 1210.0 m MDRT



Marl: Light to medium grey, soft, occasionally firm, sub-blocky to blocky, calcareous.

Sandstone: Pearly to off white, black, hard, very fine, sub-elongate, sub-rounded, well sorted, calcareous cement.

Top of TEXEL GREENSAND  
@ 1152.0 MDRT, 1150.0 TVD

Top of HOLLAND FM / UPPER HOLLAND MARL  
@ 1165.0 MDRT, 1162.0 TVD

Marl: Light to medium grey, soft, sub-blocky, occasionally amorphous, calcareous.

Azi: 347.1°, inc 8.22°  
TVD: 1206.5 m

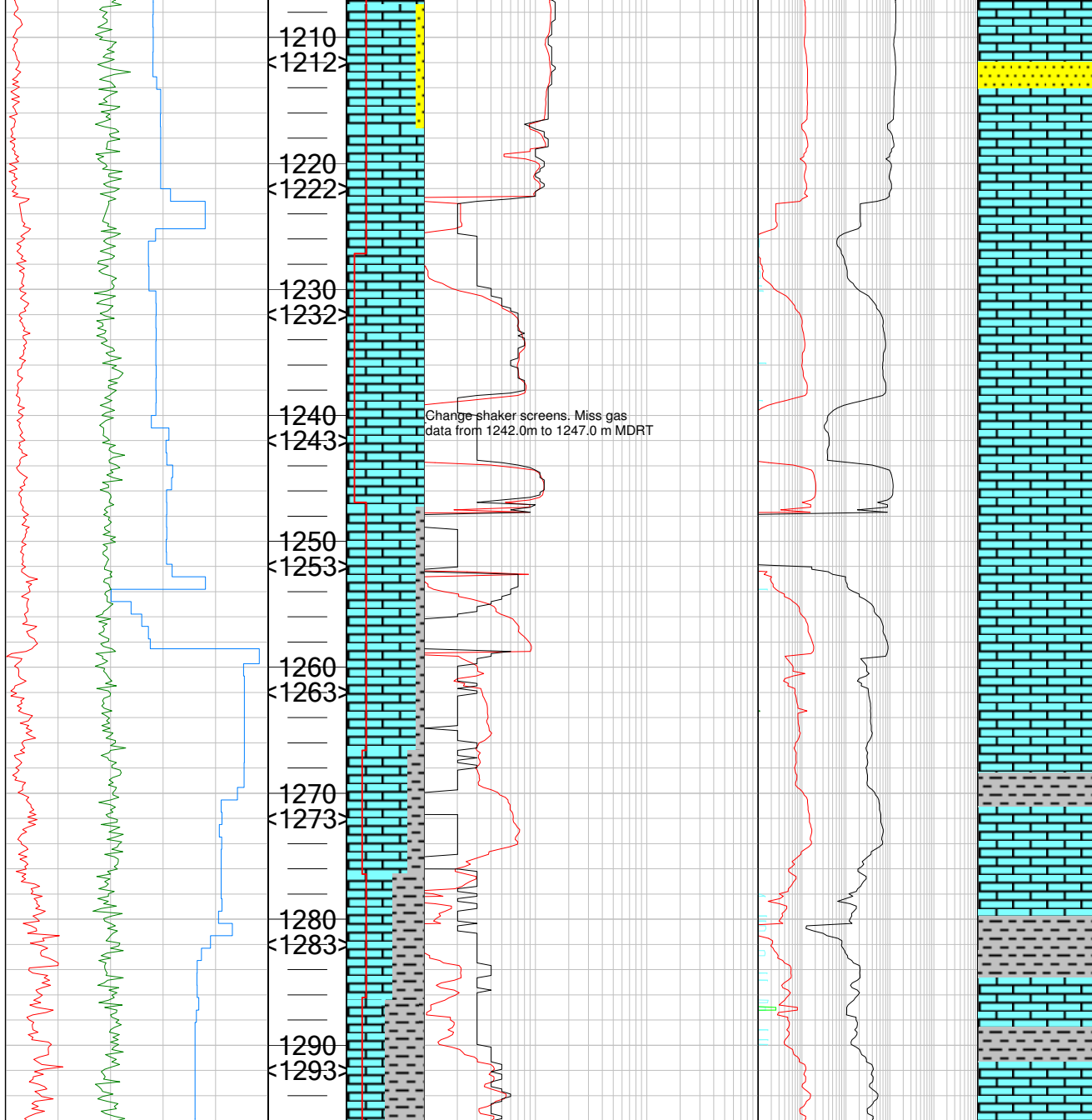
MWD Survey @ 1245.0 m MDRT  
Azi: 348.38°, inc 9.57°  
TVD: 1241.1 m

MW: 1.16 sg  
PV: 26 cP  
YP: 33 lbf/100ft<sup>2</sup>  
pH: 9.4

MWD Survey @ 1268.0 m MDRT  
Azi: 347.9°, inc 10.39°  
TVD: 1264.6 m

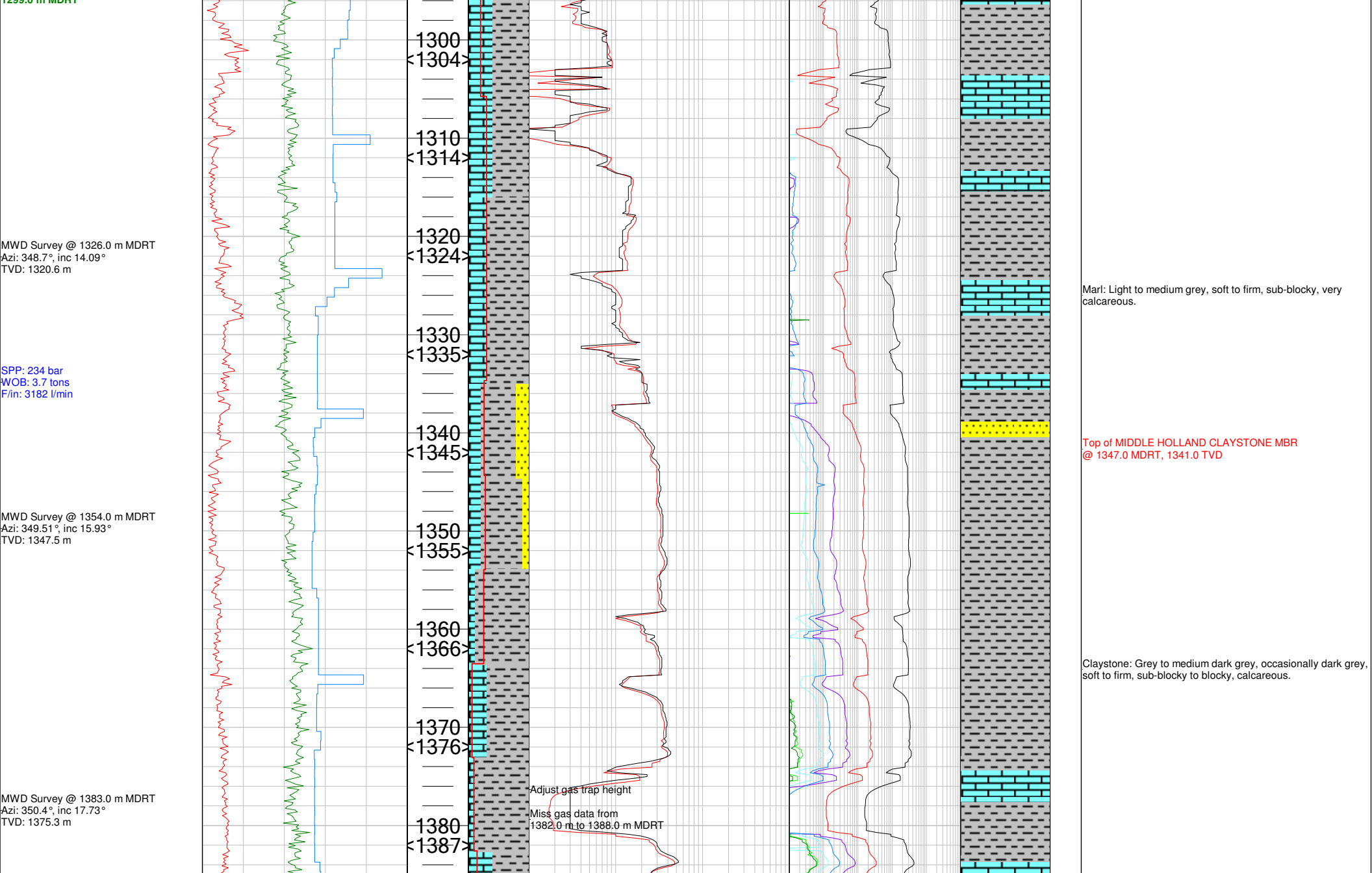
MWD Survey @ 1297.0 m MDRT  
Azi: 348.78°, inc 14.09°  
TVD: 1320.5 m

Midnight depth on 02.06.2014:  
1299.0 m MDRT



Marl: Light to medium grey, very soft, sub-blocky, calcareous.

Claystone: Grey to medium grey, soft to firm, blocky to sub-blocky, in parts grading to shale, occasionally argillaceous, calcareous.



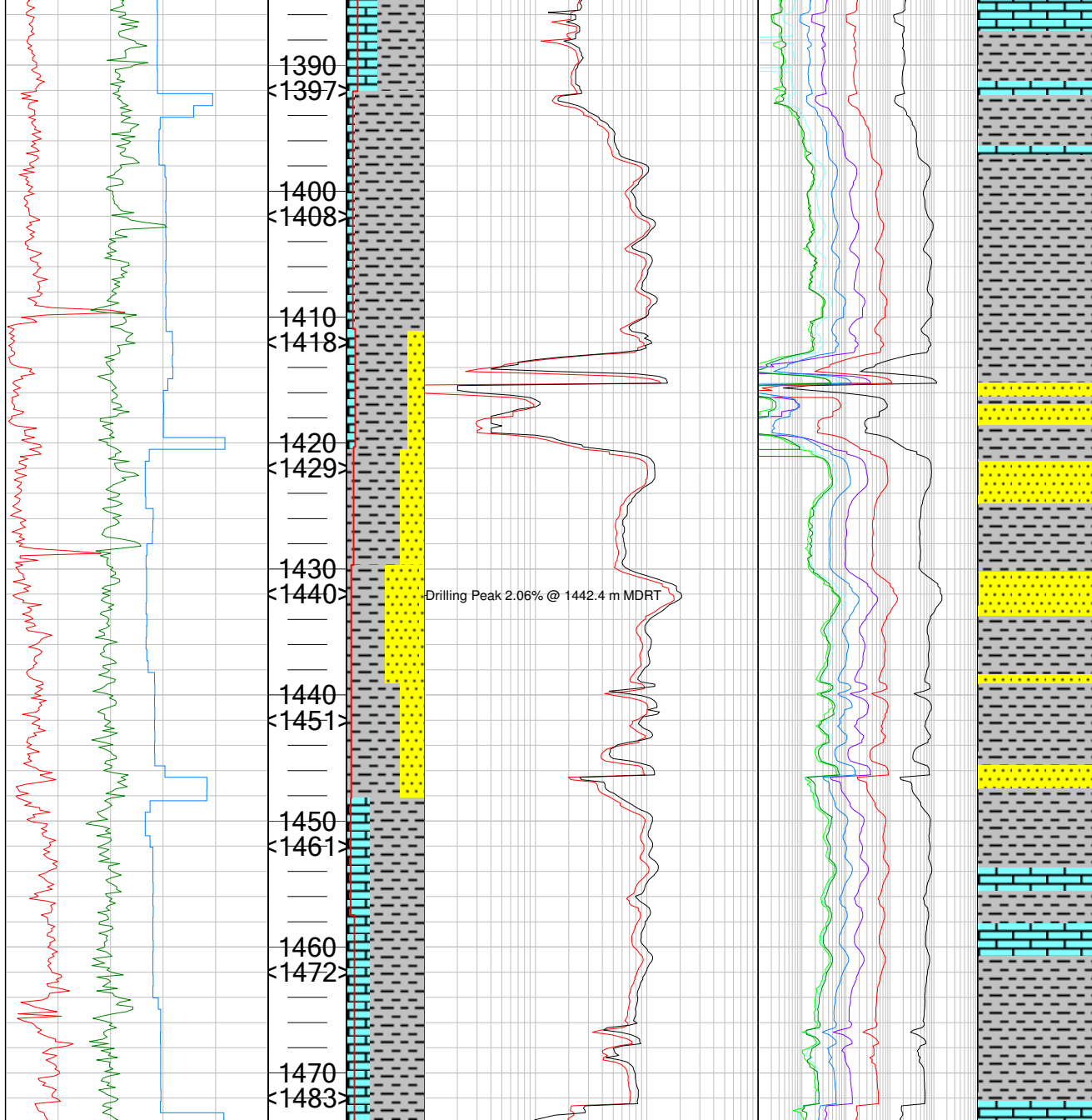


MWD Survey @ 1413.0 m MDRT  
Azi: 350.6°, inc 19.60°  
TVD: 1403.7 m

MWD Survey @ 1441.0 m MDRT  
Azi: 351.06°, inc 21.30°  
TVD: 1429.9 m

MW: 1.16 sg  
PV: 29 cP  
YP: 36 lbf/100ft2  
pH: 8.8

MWD Survey @ 1470.0 m MDRT  
Azi: 350.38°, inc 23.30°  
TVD: 1456.8 m



Top of HOLLAND GREENSAND MBR  
@ 1406.0 m MDRT, 1398.0 m TVD

Sandstone: Unconsolidated sands, pearly, translucent, very fine, well sorted.

Claystone: Medium to dark grey, soft to firm, sub-blocky, slightly calcareous.

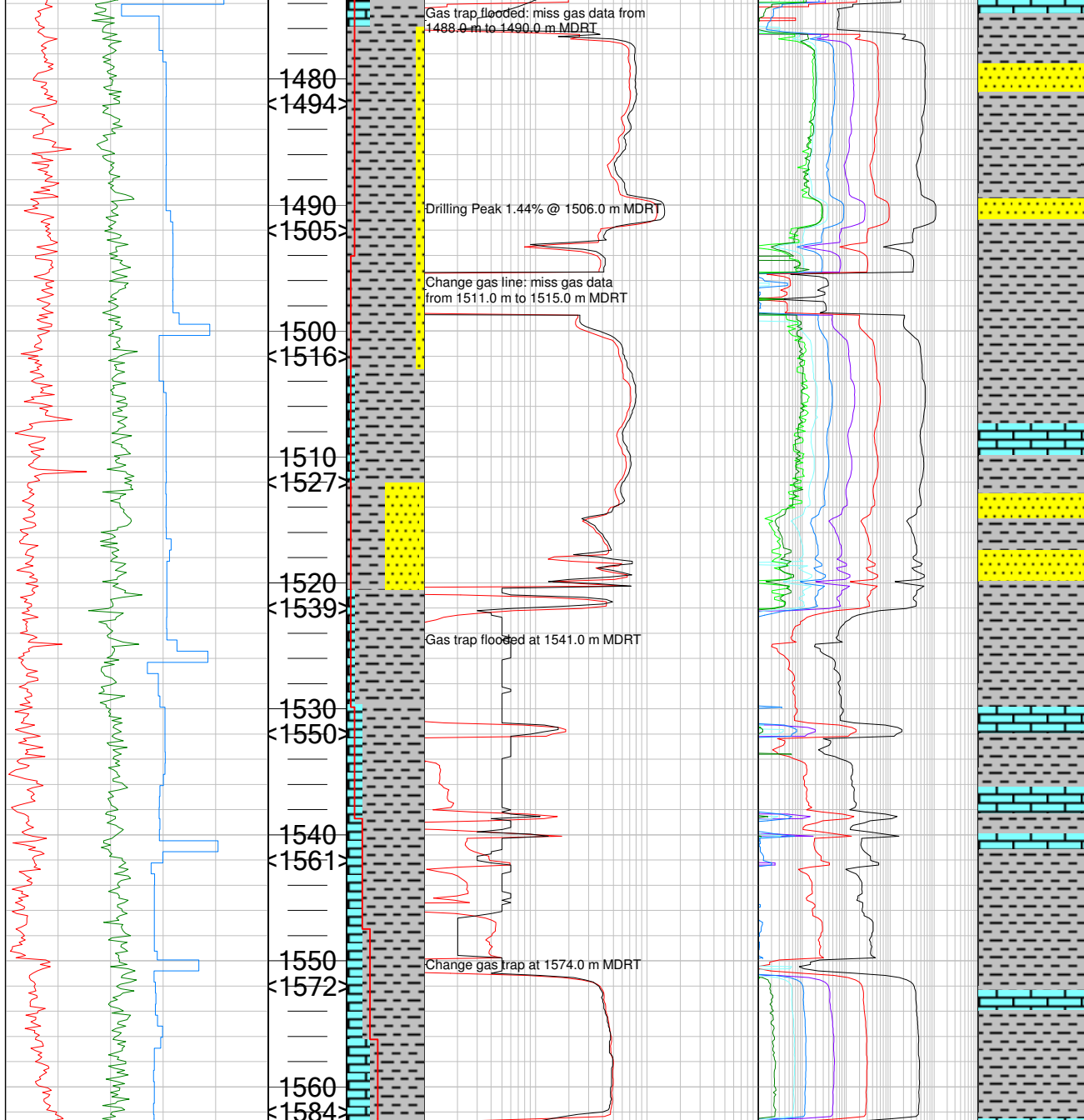
MWD Survey @ 1499.0 m MDRT  
Azi: 349.73°, inc 24.73°  
TVD: 1483.2 m

MWD Survey @ 1527.0 m MDRT  
Azi: 349.12°, inc 26.35°  
TVD: 1508.5 m

SPP: 299 bar  
WOB: 5.5 tons  
F/in: 3513 l/min

MWD Survey @ 1556.0 m MDRT  
Azi: 348.7°, inc 27.88°  
TVD: 1535.2 m

MWD Survey @ 1585.0 m MDRT  
Azi: 347.69°, inc 29.63°  
TVD: 1559.7 m



Sandstone: Pearly to off white, translucent, very fine, very well sorted, loose, unconsolidated sands.

Claystone: Medium to dark grey, soft to firm, sub-blocky, slightly calcareous.

Claystone: Light grey to medium dark grey, soft to firm, in parts amorphous, sub-blocky, slightly calcareous.

**Top of LOWER HOLLAND MARL MBR  
@ 1563.0 m MDRT, 1542.0 m TVD**

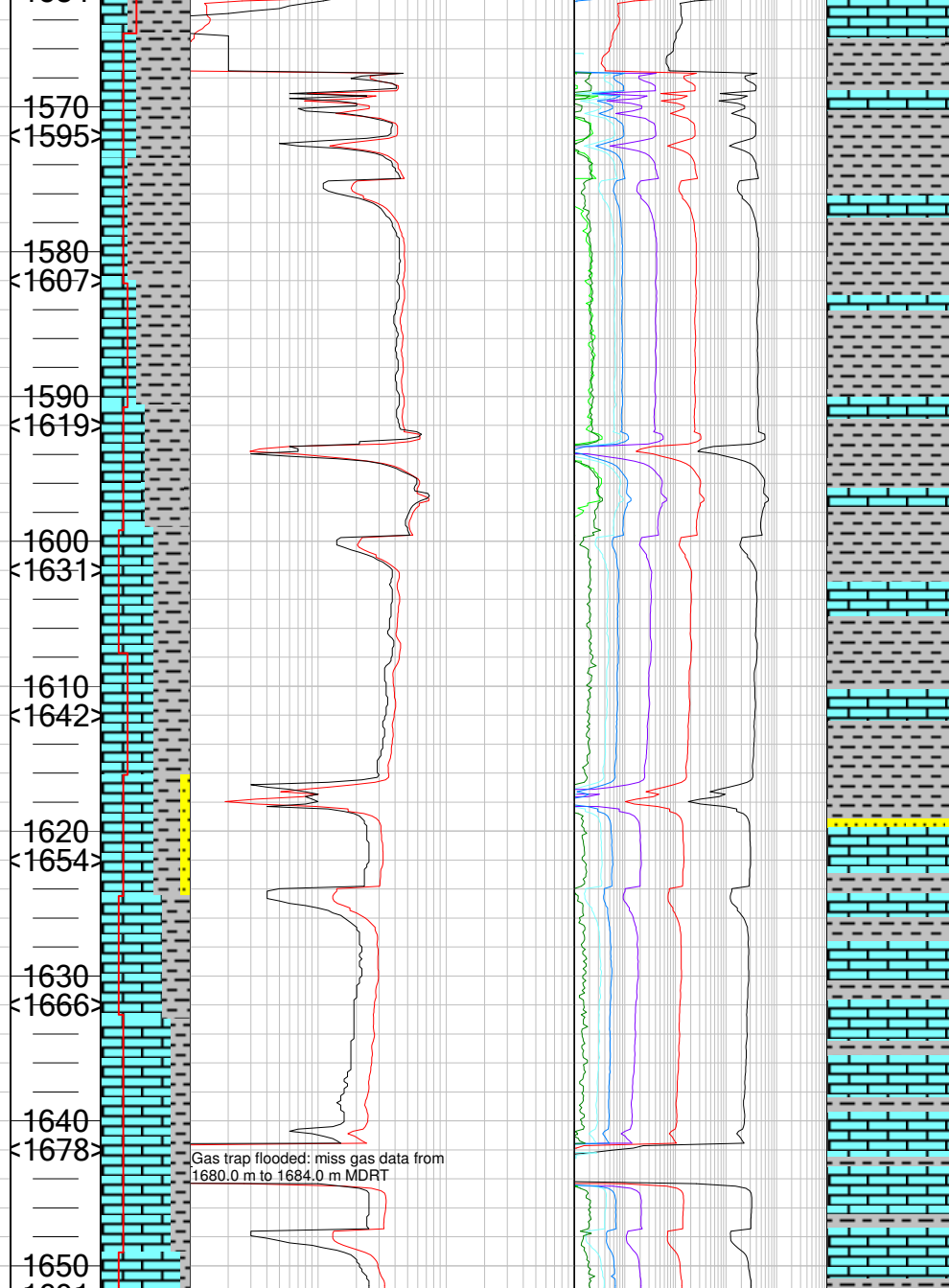
Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, bituminous.

MW: 1.17 sg  
PV: 34 cP  
YP: 38 lbf/100ft<sup>2</sup>  
pH: 8.4

MWD Survey @ 1643.0 m MDRT  
Azi: 348.44°, Inc 32.56°  
TVD: 1610.26 m

Midnight depth on 03.06.2014:  
1648.0 m MDRT

MWD Survey @ 1671.0 m MDRT  
Azi: 349.33° Inc 34.09°  
TVD: 1633.7 m



Marl: Light to medium grey, soft to firm, sub-blocky, calcareous.

Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, calcareous.

Sandstone: Greenish grey to dark grey, black, hard, very fine, argillaceous, sub-rounded, well sorted, glauconitic.

Marl: Light to medium grey, soft to firm, sub-blocky, calcareous.

Claystone: Medium grey to dark grey, firm, in parts moderately hard, in parts fissile, sub-blocky, calcareous.

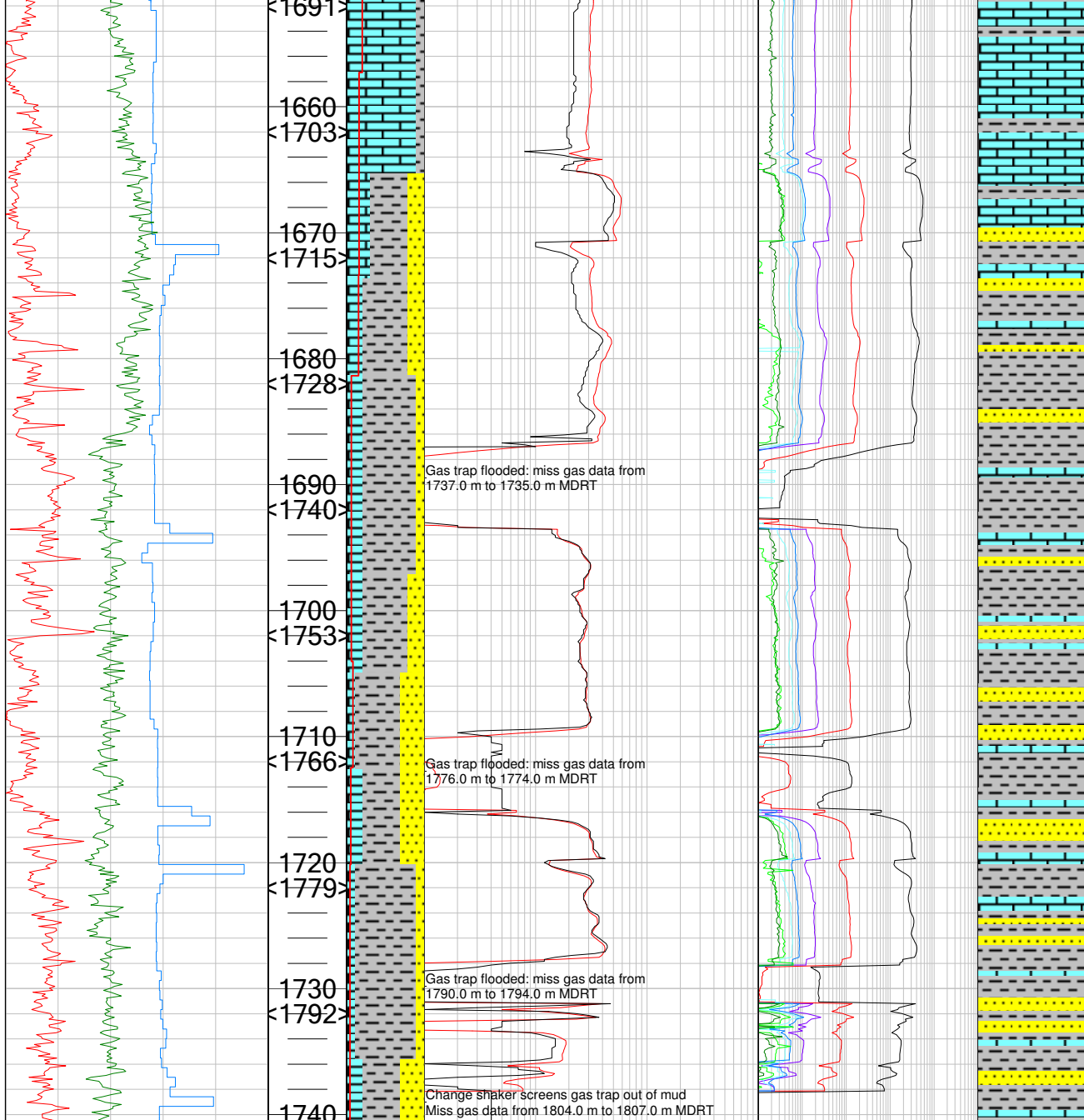
MWD Survey @ 1700 m MDRT  
Azi: 349.32 inc 35.71  
TVD: 1657.4 m

MWD Survey @ 1729.0 m MDRT  
Azi: 349.36°, inc 37.44°  
TVD: 1680.7 m

SPP: 315 bar, F/In: 3505 l/min  
Trd: 13 KNm, WOB: 5.8 tons

MWD Survey @ 1758.0 m MDRT  
Azi: 347.08°, inc 39.76°  
TVD: 1703.4 m

MWD Survey @ 1786.0 m MDRT  
Azi: 345.01°, inc 39.76°  
TVD: 1724.9 m



Sandstone: Greenish grey to dark grey, black, hard, very fine, argillaceous, sub-rounded, well sorted, glauconitic, lignitic.

**Top of VLIELAND SANDSTONE FM / DE LIER  
SANDSTONE MBR @ 1736.0 m MDRT, 1686.0 m TVD**

Claystone: Light to medium grey, soft, amorphous, very sticky, sandy, calcareous.

Sandstone: Light brown, light grey, hard, very fine to silty, sub-elongate, sub-rounded, moderately sorted, good siliceous cement.

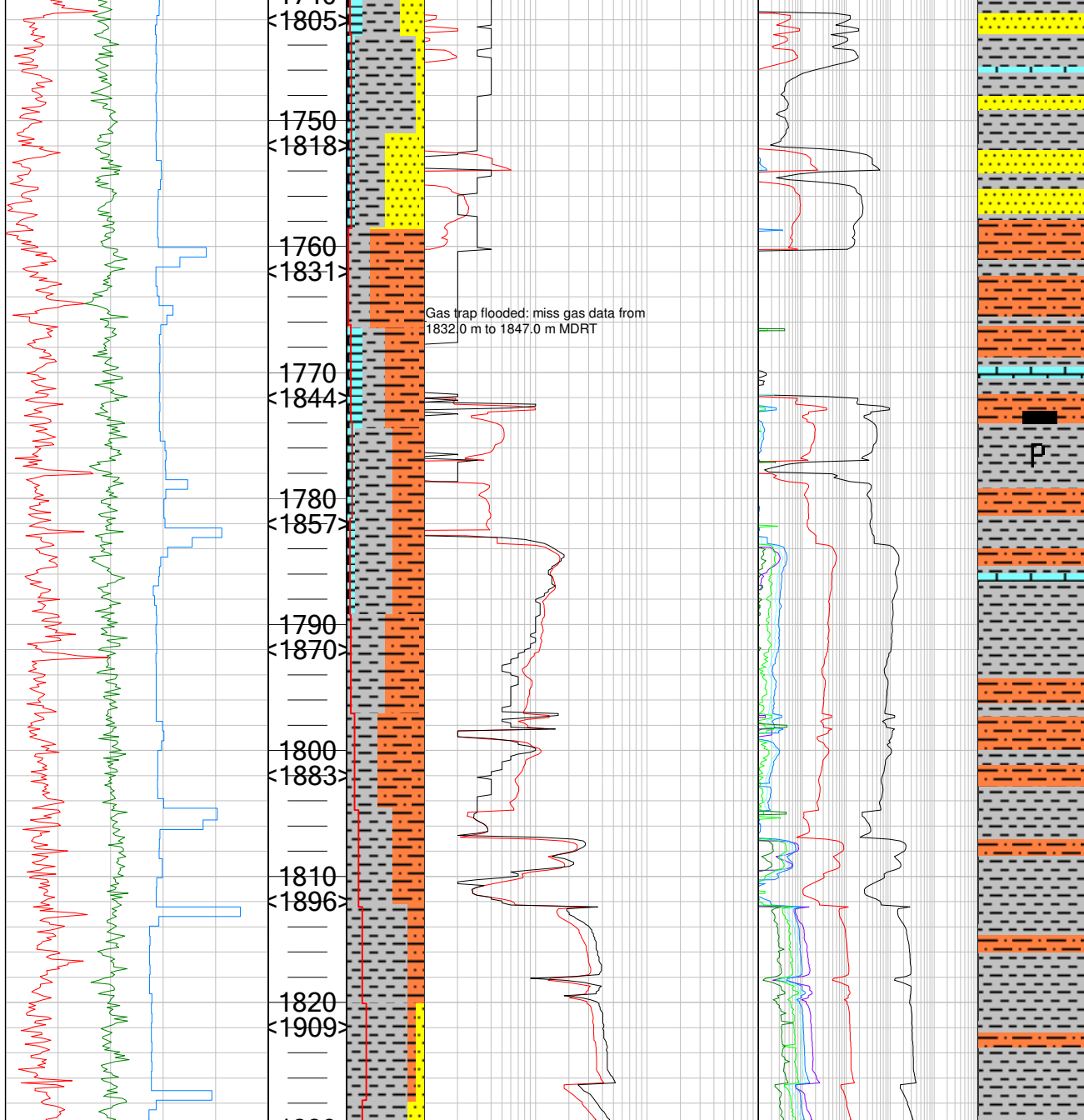
MWD Survey @ 1815.0 m MDRT  
Azi: 345.59°, inc 39.84°  
TVD: 1746.3 m

MWD Survey @ 1844.0 m MDRT  
Azi: 345.76°, inc 39.87°  
TVD: 1768.6 m

MW: 1.18sg  
PV: 34 cP  
YP: 39 lbf/100ft2  
pH: 8.4

MWD Survey @ 1873.0 m MDRT  
Azi: 345.73°, inc 39.85°  
TVD: 1790.8 m

MWD Survey @ 1902.0 m MDRT  
Azi: 346.81°, inc 39.95°  
TVD: 1813.1 m



Sandstone: Light to medium brown, firm to hard, occasionally very hard, very fine to silty, sub-elongate, sub-rounded, well sorted, good siliceous cement.

**Top of VLIELAND CLAY MBR  
@ 1838.0 m MDRT, 1765.0 m TVD**

Siltstone: Light brown, firm, silty to very fine, sub-elongate, sub-rounded, well sorted, trace lignite, trace pyrite.

Claystone: Light grey to medium grey, soft, amorphous, silty, occasionally sandy, sticky, slightly calcareous.

MWD Survey @ 1931.0 m MDRT  
Azi: 347.15°, inc 39.83°  
TVD: 1835.3 m

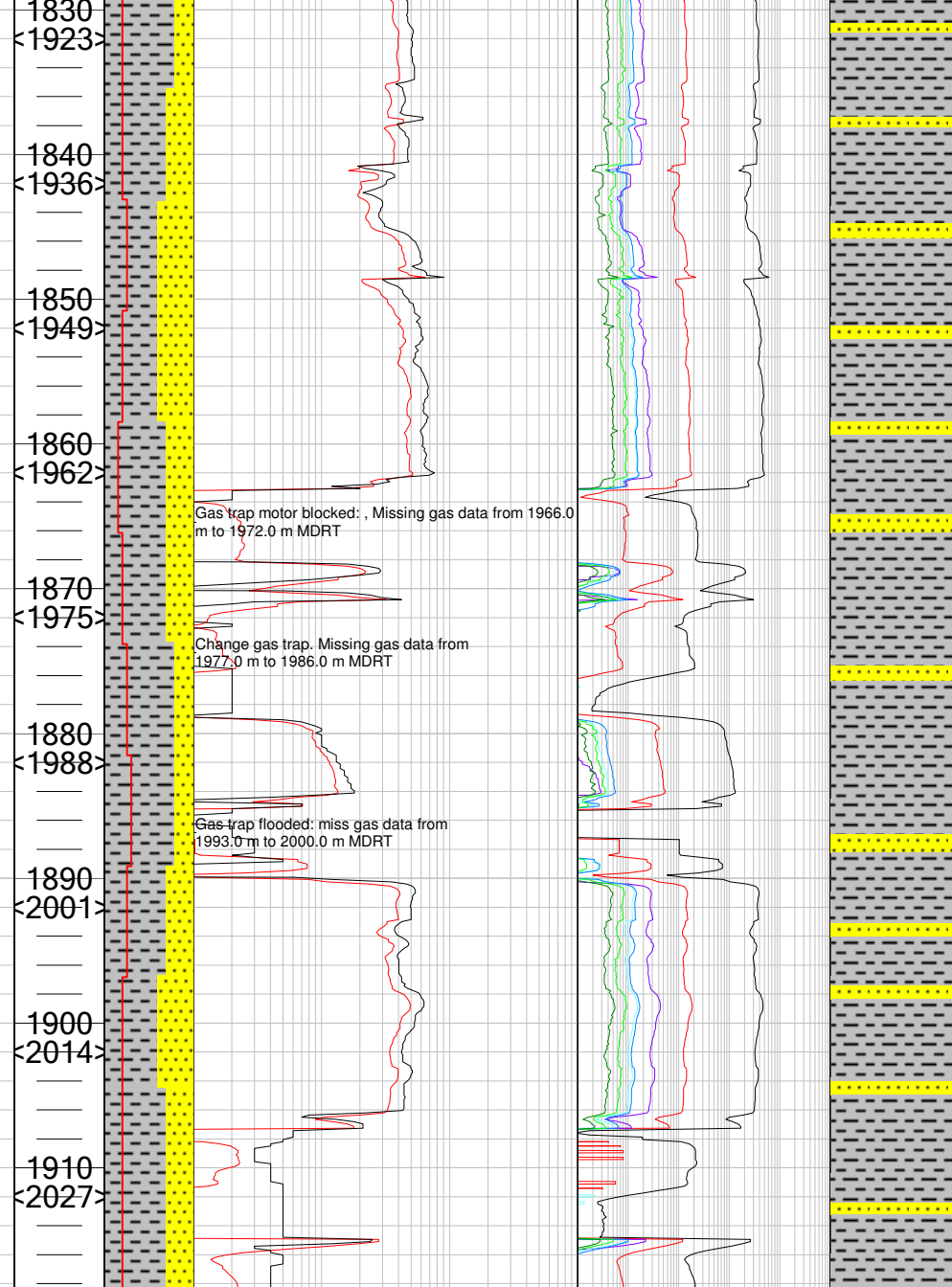
SPP: 329 bar, F/In: 3422 l/min  
Trq: 17 KNm, WOB: 6.4 tons

MWD Survey @ 1960.0 m MDRT  
Azi: 347.2°, inc 39.85°  
TVD: 1858.5 m

MWD Survey @ 1988.0 m MDRT  
Azi: 348.84°, inc 39.87°  
TVD: 1879.1 m

Midnight depth on 04.06.2014:  
2002.0 m MDRT

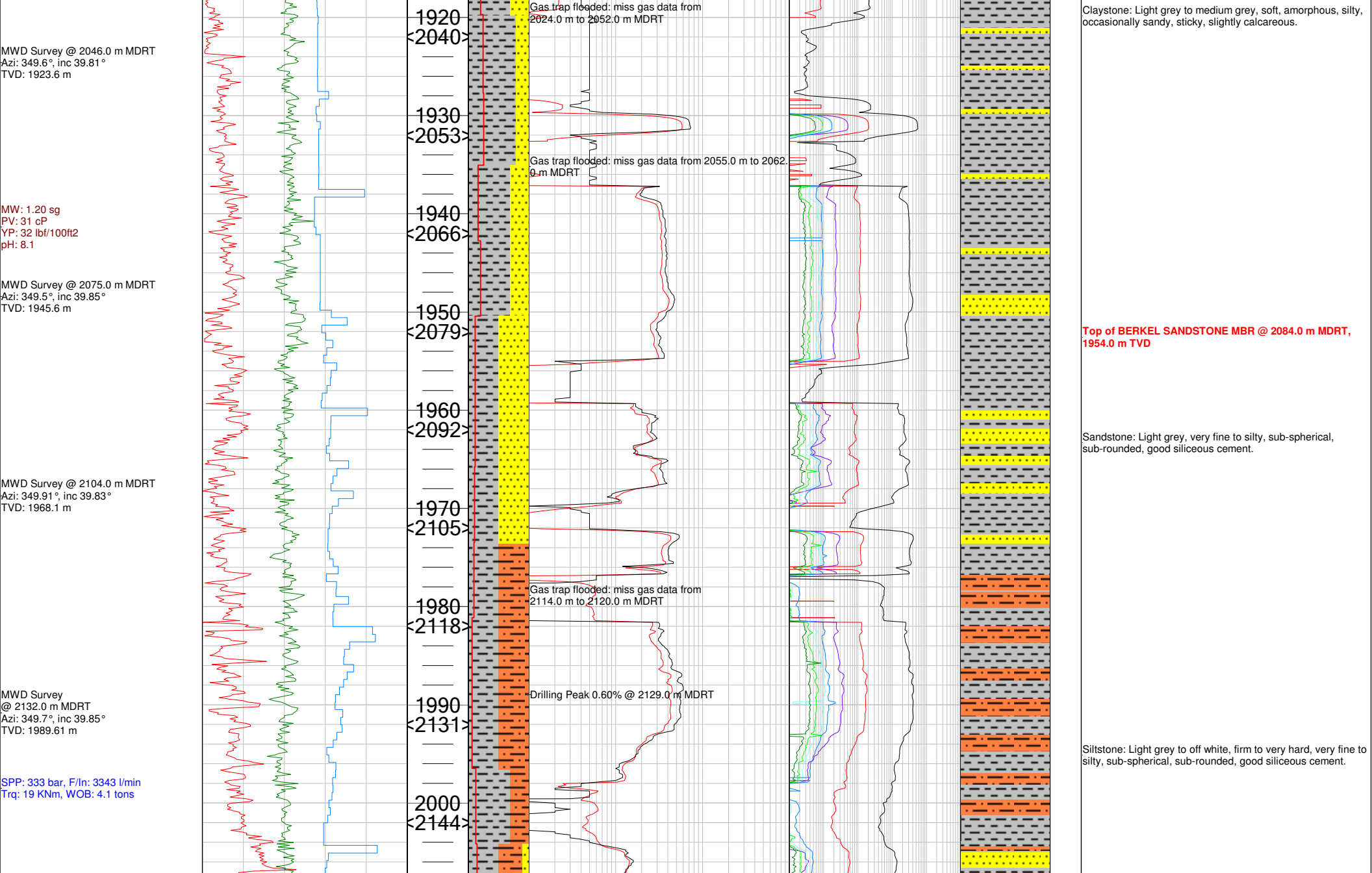
MWD Survey @ 2017.0 m MDRT  
Azi: 349.09°, inc 39.94°  
TVD: 1901.3 m



Sandstone: Greenish grey to dark grey, in parts brownish grey, friable, occasionally hard, very fine to medium grain, sub-angular to sub-rounded, moderately sorted, hi glauconitic and lignitic.

Claystone: Light grey to medium grey, soft, amorphous, silty, occasionally sandy, sticky, slightly calcareous.

Sandstone: Greenish grey to dark grey, soft, occasionally hard, very fine to medium grain, sub-rounded, moderately sorted, glauconitic and lignitic.





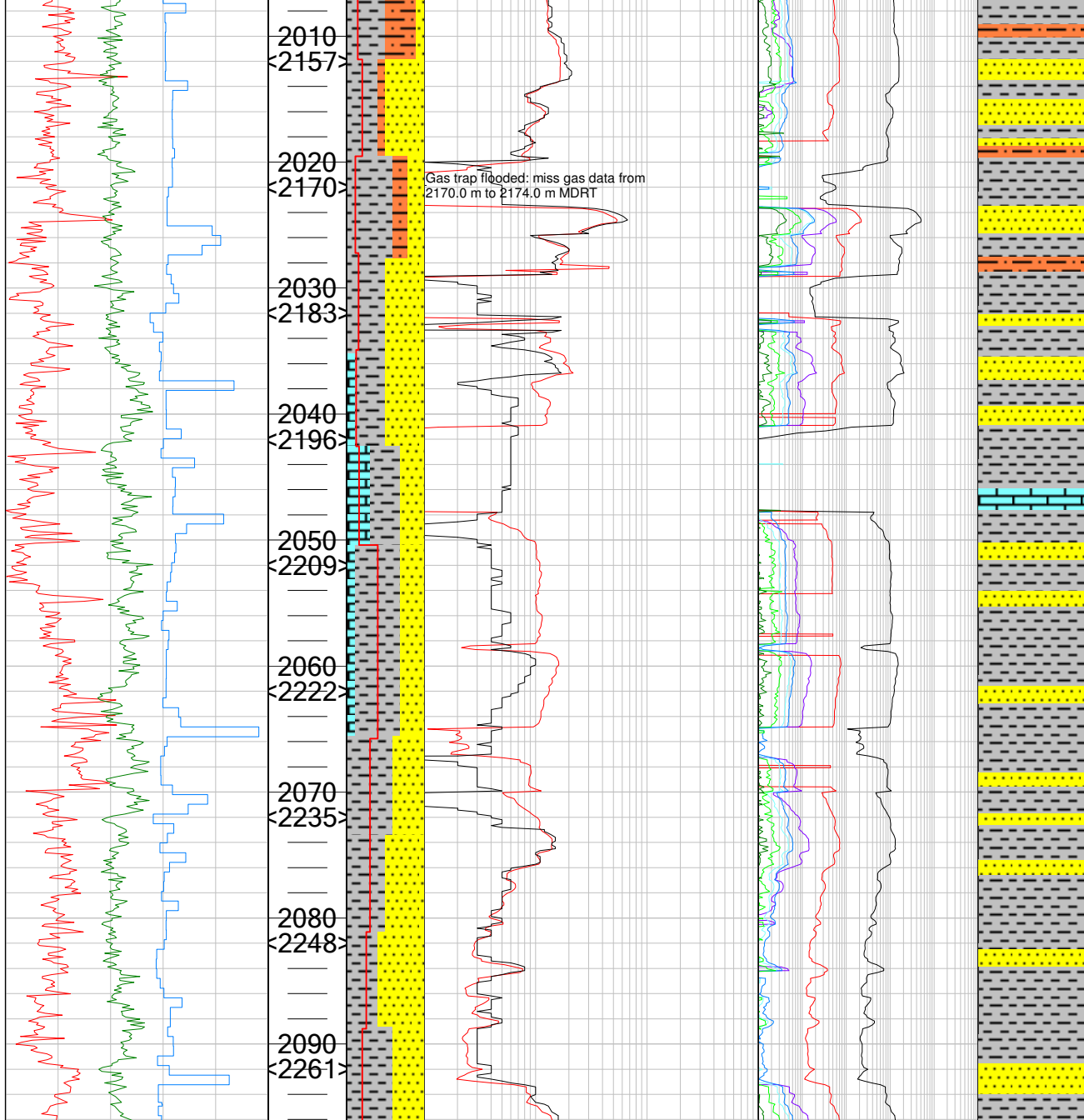
MWD Survey @ 2161.0 m MDRT  
Azi: 350.33°, inc 39.82°  
TVD: 2011.9 m

MWD Survey @ 2190.0 m MDRT  
Azi: 348.73°, inc 39.81°  
TVD: 2034.2 m

MWD Survey @ 2219.0 m MDRT  
Azi: 348.23°, inc 39.87°  
TVD: 2057.3 m

MWD Survey @ 2248. m MDRT  
Azi: 248.25°, inc 39.86°  
TVD: 2080.9 m

MW: 1.20sg  
PV: 25 cP



Sand: Translucent, very hard, medium to coarse grained, sub-elongate, sub-spherical, loose unconsolidated grains.

Top of BERKEL SAND/CLAYSTONE MBR @ 2195.5 m MDRT, 2036.0 m TVD

Sandstone: Light grey to beige, firm to hard, very fine to very coarse, sub-elongate, angular to sub-rounded, poorly sorted, good siliceous cement.

Claystone: Brownish grey, medium to dark grey, firm, moderately hard in parts, silty, sub-blocky, slightly, non calcareous.



YP: 21 lbf/100ft2  
pH: 8.7

MWD Survey @ 2277.0 m MDRT  
Azi: 348.90°, inc 39.79°  
TVD: 2101.8 m

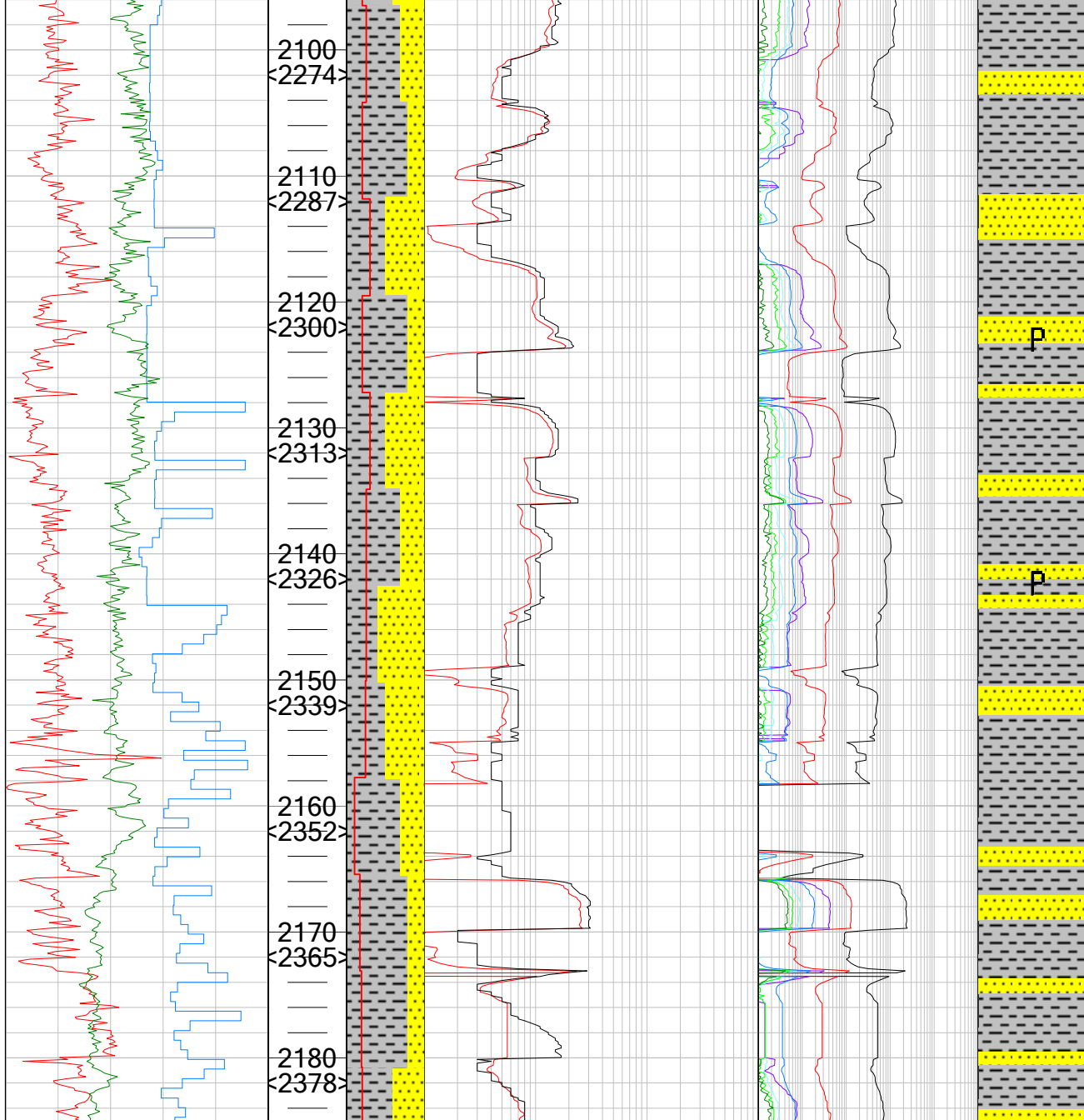
MWD Survey @ 2305.0 m MDRT  
Azi: 349.47°, inc 39.85°  
TVD: 2126.9 m

Midnight depth on 05.06.2014:  
2307.0 m MDRT

MWD Survey @ 2334.0 m MDRT  
Azi: 348.23°, inc .93 83°  
TVD: 2149.1 m

SPP: 333 bar, F/I/n: 3323 l/min  
Trq: 20 KNm, WOB: 8.9 tons

MWD Survey @ 2362.0 m MDRT  
Azi: 348.22°, inc 39.48°  
TVD: 2170.6 m



Sandstone: Light grey to beige, greenish grey to dark grey, firm to hard, fine to coarse grain, sub-angular to sub-rounded, elongate to spherical, poorly sorted, siliceous cement, glauconitic and lignitic.

Claystone: Dark grey to greyish black, firm, silty, occasionally fissile, sub-blocky, sideritic.

Sandstone: Light grey to beige, firm to hard, very fine to coarse, sub-elongate to sub-spherical, sub-angular to sub-rounded, poorly sorted, good siliceous cement.

Top of RIJSWIJK SANDSTONE MBR @ 2357.0 m MDRT,  
2163.0 m TVD

MWD Survey @ 2391.0 m MDRT  
Azi: 348.79°, inc 40.34°  
TVD: 2189.3 m

MWD Survey @ 2420.0 m MDRT  
Azi: 348.08°, inc 40.34°  
TVD: 2211.4 m

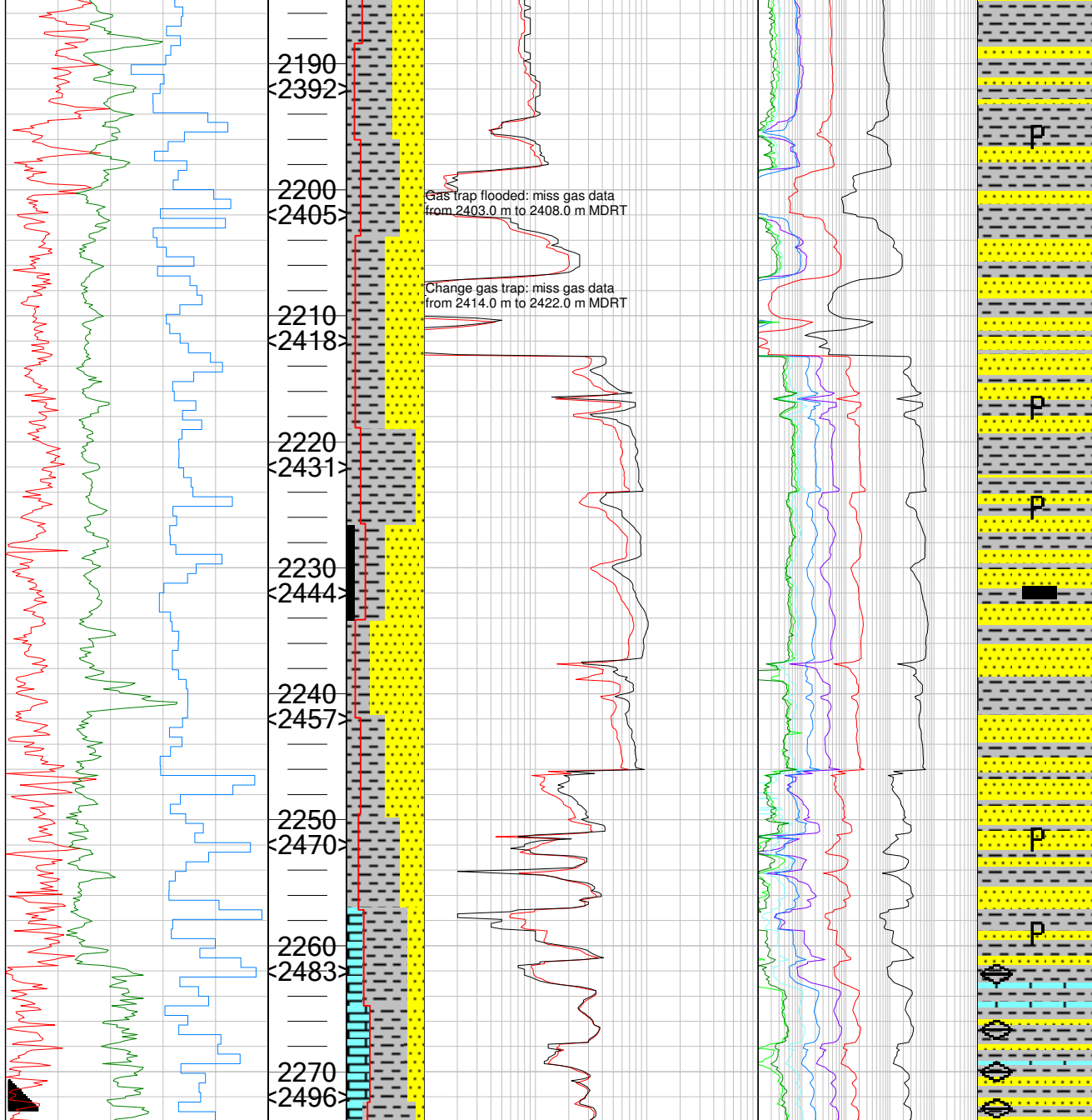
MWD Survey @ 2449.0 m MDRT  
Azi: 346.89°, inc 40.34°  
TVD: 2233.5 m

MW: 1.19sg  
PV: 23 cP  
YP: 27 lbf/100ft2  
pH: 8.7

MWD Survey @ 2478.0 m MDRT  
Azi: 348.52°, inc 40.29°  
TVD: 225.6 m

Midnight depth on 06.06.2014:  
2493.0 m MDRT

6 5/8" Liner set @ 2499.4 m MDRT, shoe  
depth 2499.4 m MDRT



Sandstone: Light grey to beige, firm to hard, very fine to coarse, poorly sorted, sub-elongate to sub-spherical, sub-rounded to sub-angular, some pyritized.

Claystone: Medium grey to dark grey, brownish grey, firm, silty, sub blocky, in parts splintery, slightly calcareous.

Top of RODENRIJIS CLAYSTONE MBR @ 2486.0 m MDRT, 2261.5 m TVD

Limestone: White, off white, light grey, soft to firm, amorphous, sub blocky, chalky, mollusc shell.

Depth 2681.0 m MDRT

SPP: 307 bar, F/In: 3273 l/min  
Trq: 23 KNm, WOB: 7.6 tons

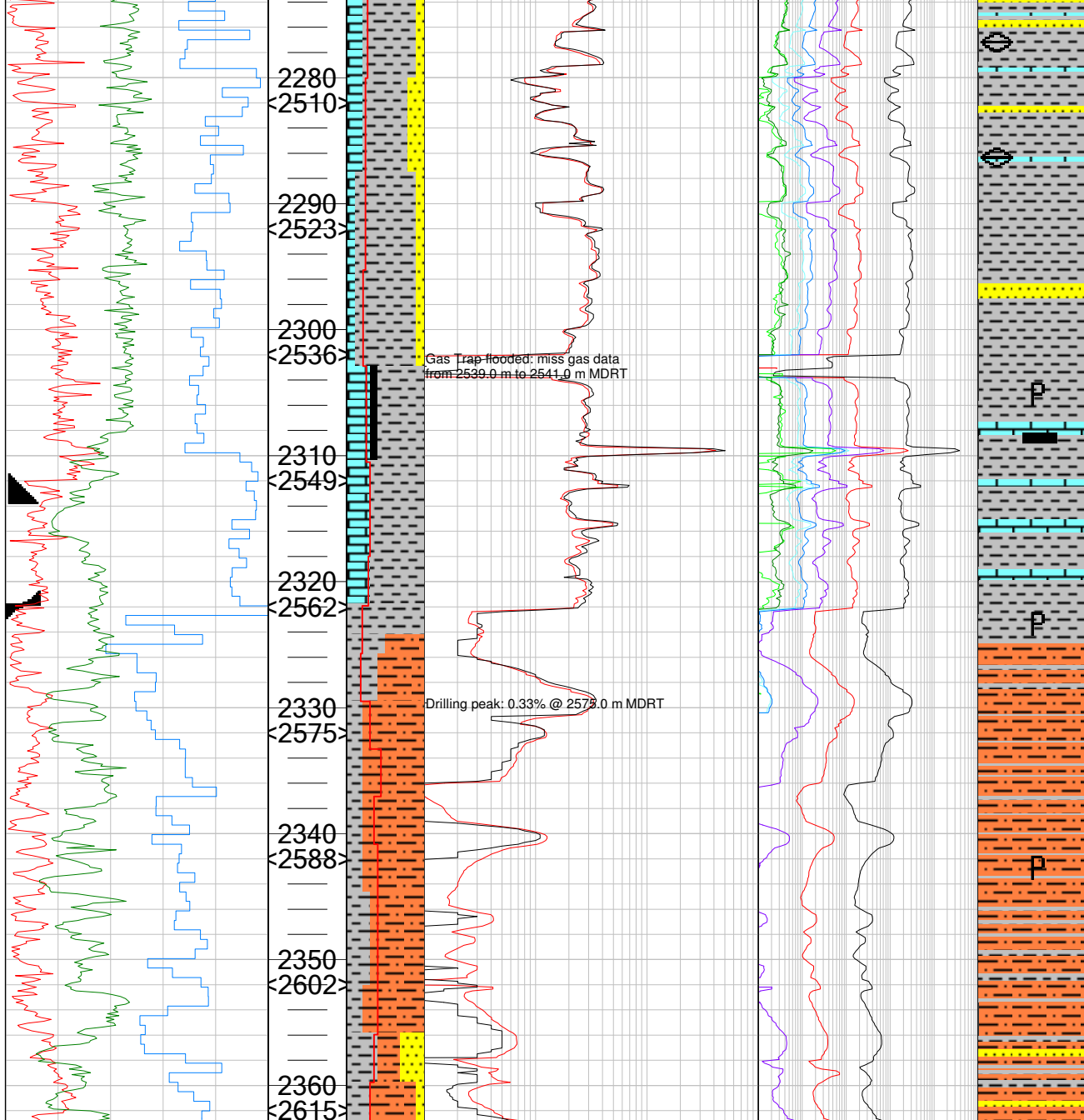
9 5/8" Casing set @ 2552.9 m MDRT

FIT to 1.37 s.g. EMW

Bit Run #5  
8 1/2" PDC; SN: 7500353  
In @ 2565.1 m, Out @ 2897.0 m MDRT

Midnight depth on 24.06.2014:  
2568.0 m MDRT

MWD Survey @ 2595.0 m MDRT  
Azi: 350.68°, Inc 40.97°  
TVD: 2344.5 m



Claystone: Medium to dark grey, brown, firm, amorphous to sub-blocky, occasionally fissile, trace pyrite, abundant siderite

Siltstone: Off white, beige, light to medium grey, firm to hard, very fine to fine, translucent, good siliceous cement.

Sandstone: Off-white, translucent, firm to hard, v. fine to fine, sub-spherical, well to moderately sorted, poor to moderate calcareous cement

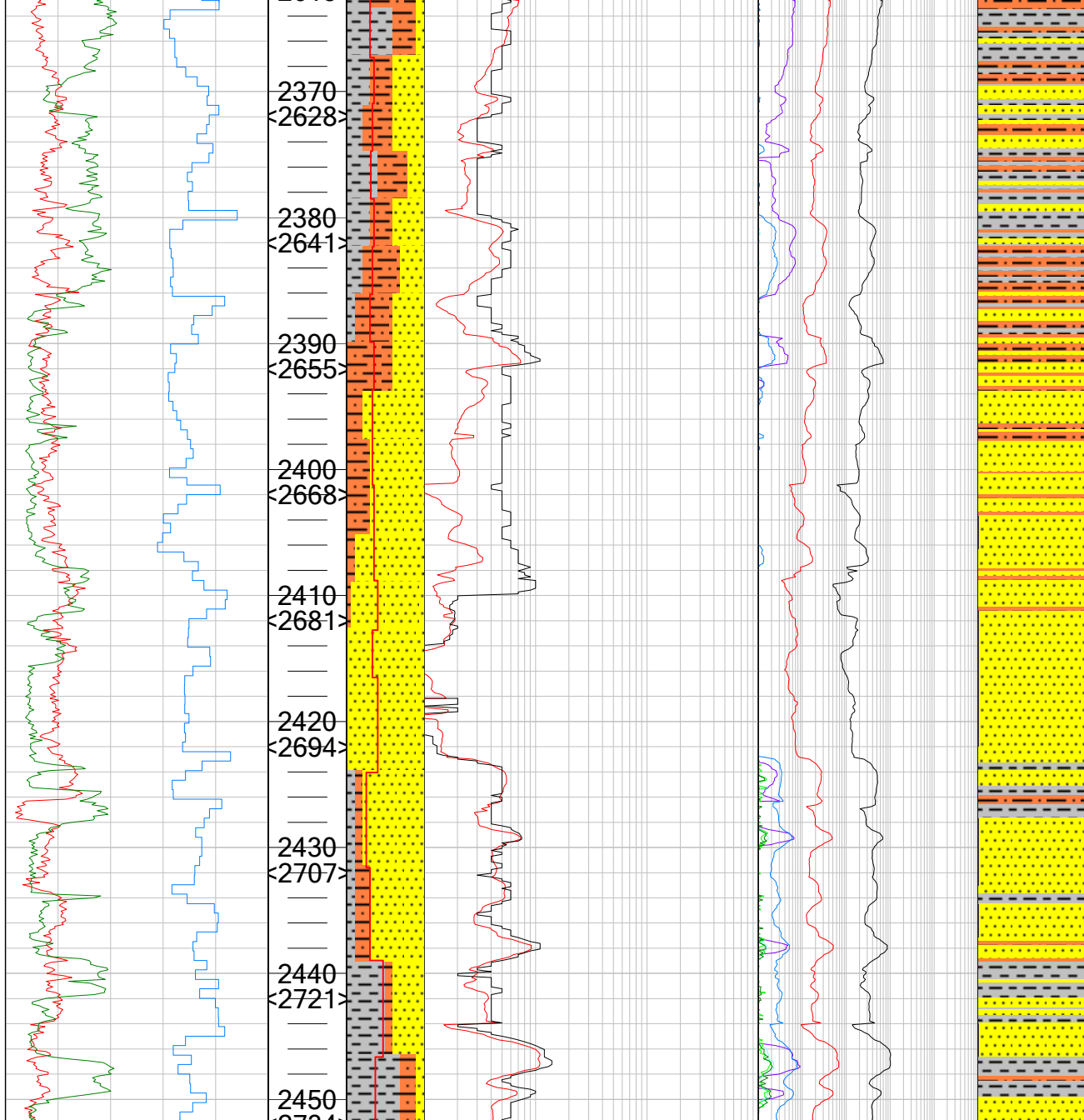
MWD Survey @ 2623.0 m MDRT  
Azi: 350.79 °, inc 40.84°  
TVD: 2365.2 m

MWD Survey @ 2653.0 m MDRT  
Azi: 351.18 °, inc 40.62°  
TVD: 2388.5 m

MW: 1.09 sg  
PV: 11 cP  
YP: 18 lbf/100ft2  
pH: 10.5

MWD Survey @ 2682.0 m MDRT  
Azi: 351.49 °, inc 40.96°  
TVD: 2410.47 m

MWD Survey @ 2710.0 m MDRT  
Azi: 351.13 °, inc 41.11°  
TVD: 2431.5 m

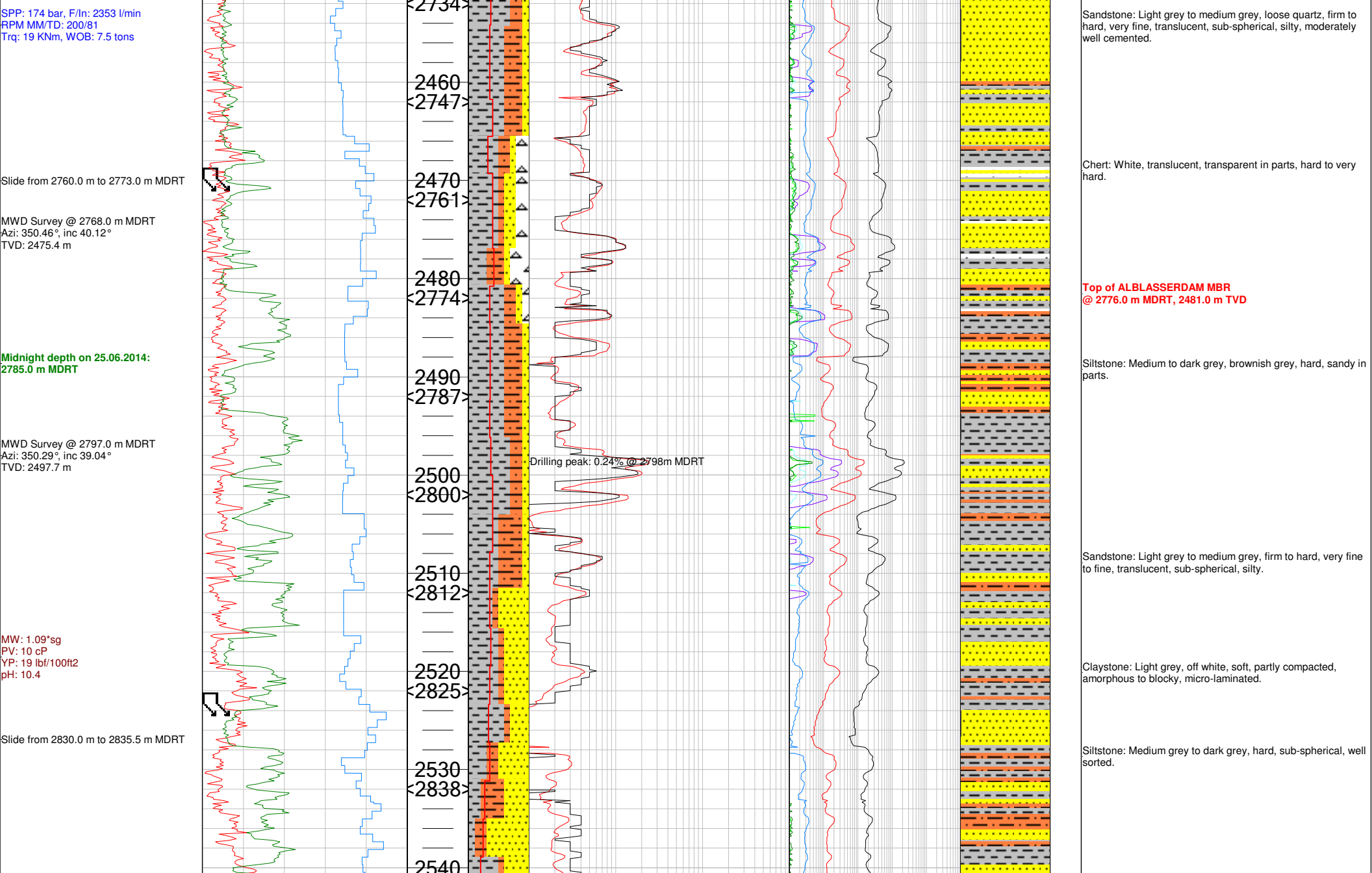


Claystone: Medium to dark grey, brownish grey, firm, sub blocky, silty.

**Top of Delft Sandstone FM**  
**@ 2651.0 m MDRT, 2387.0 m TVD**

Sandstone: Off white, light grey, translucent, firm to hard, very fine to medium grain, sub spherical, calcareous cement, moderately to well sorted.

Claystone: Light grey, beige, off white, soft to firm, smooth, silty in parts.

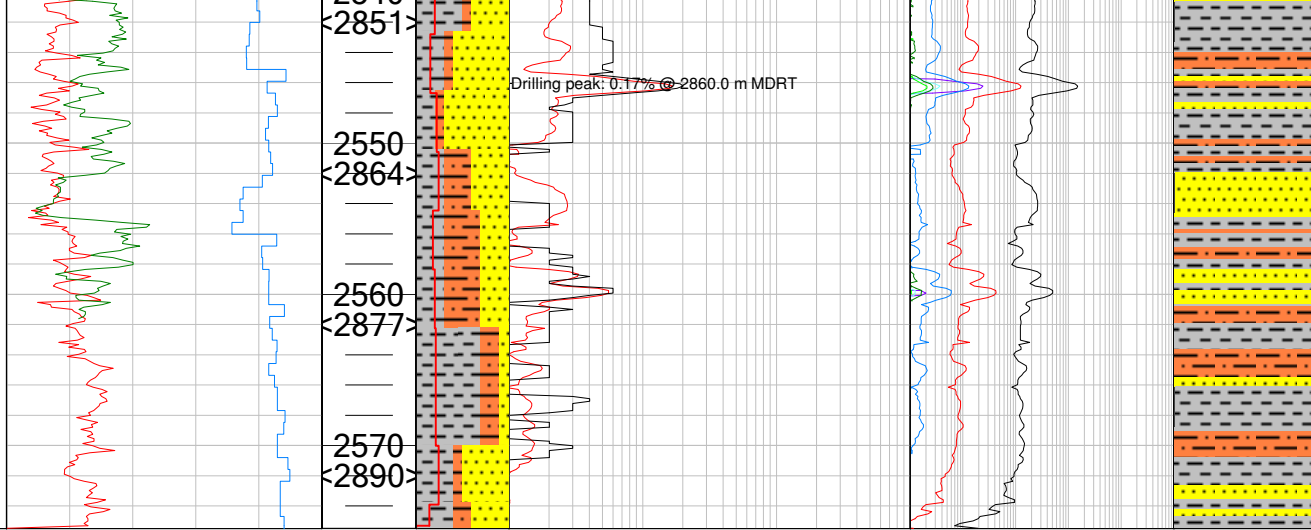


MWD Survey @ 2854.0 m MDRT  
Azi: 349.6°, inc 39.07°  
TVD: 2544.1 m

SPP: 167 bar, F/in: 2242 l/min  
RPM MM/TD: 202/86  
WOB: 18 tons  
F/in: 6.4 l/min

MWD Survey @ 2888.0 m MDRT  
Azi: 349.66°, inc 38.81°  
TVD: 2562.24 m

TD at 2897.0 m MDRT, 2575.5 m TVD  
on 26/06/14 at 13.30



Sandstone: Off-white, light grey, occasionally light brown, very fine to fine, firm to hard, poor calcareous cement.

Claystone: White, reddish brown, soft to friable, amorphous to blocky, micro-laminated