

DISPLAY G3

Characterisation of the Heimdal Sandstones within the PL203 Area, Norwegian North Sea.

**Roy Fitzsimmons, Dagfinn Veiberg & Tone Kråkenes
(ConocoPhillips Norge)**

Well 24/6-2 within the Kameleon structure in PL203 was cored to calibrate the well, seismic and fluid response. The cored interval traversed the gas and oil legs, in what appeared from the electronic logs to be a dominantly massive sandstone succession. Unfortunately, from the e-logs, the oil leg appeared to be developed within a fine-grained interval.

From core description and interpretation, facies within the T57 sequence comprised a linked suite of high-density sandy turbidites/debrites (Facies T1) interbedded with low density turbidites (Facies T2). These units were deposited within a linear fairway, the edges of which were controlled by the depositional topography associated with the previous T55 sequence. Although linear and focused, no true channel facies were developed, with the fairway being more depositional than bypass dominated.

This interpretation is key in understanding the lateral persistence of the finer grained interval within the oil leg. It is thought that these units are not persistent sheets but spatially restricted lenses, and as such will not prove to have a major affect on volumetrics or reservoir performance.

Plate A

Well: Norway 24/6-2 Interval: 2039 m – 2041 m

Typical expression of the Lista Formation mudstones, which form the top seal to the Kameleon accumulation. These mudstones are a mix of both pelagic and turbiditic muds, with occasional low density, silty turbidites. Soft sediment deformation is rare and is interpreted to be seismically triggered or induced through gravitational creep rather than by loading (2039.7 to 2040m)

Plate B

Well: Norway 24/6-2 Interval: 2096 m – 2099 m

Contact between the top Heimdal Member and the overlying fine-grained Lista. Thin (<15cm) beds of very fine-grained sandstone and silty sandstone, with well-developed current ripples where deposited by low density tractional flows in an unconfined setting. These provide a contrast to the more massive sandstones, preserved within the Heimdal, beneath the well developed fan abandonment surface at 2098.30m. Note also the floating, deformed, siltstone cast within the high-density turbidites of the Heimdal (2098.6m).

Plate C

Well: Norway 24/6-2 Interval: 2130 m – 2131 m

Two styles of dewatered fabric developed within Facies T1. An abrupt contact separates the deformed, silty fine-grained sandstones below from the deformed medium grained sands above. Deformation appears to be polyphase but the timing of events would have been almost instantaneous. It appears that the overlying flow, ploughed into the previous deposit, distorting/overturning the laminae. This sudden loading also triggered water release, from the older deposit into that above (partial flaming), but water release/dishing may have been inherent to the younger flow as well.

Plate D

Well: Norway 24/6-2 Interval: 2140 m – 2145 m

Typical example of facies T1 (thick bedded sandstones). This massive, seemingly homogeneous, event bed, is composed of lower-medium grain sizes. However, throughout the unit, coarser grains and granules “float” within this matrix. No clear amalgamation surfaces are seen, but subtle contacts may have been destroyed through post-depositional dewatering. Consolidation/dish-structures are evident within the massive sandstones (2140.5/2144.75m). The unit fines upwards into a silty fine-grained sandstone, with well developed planar laminae, highlighted through concentrations of organic material.

Plate E

Well: Norway 24/6-2 Interval: 2154 m – 2161 m

Complex bed architecture preserved through the deposits of a series of low-density flows (Facies T2). Thicker, sandy debrites show subtle grading and soft sediment deformation. Finer-grained, siltier components, show a variety of low angle laminae and rarer tractional features. These units are commonly colonised by *Scolicia*, *Planolites*, *Palaeophycus*, *Chondrites* and *Nereites*.

Plate F

Well: Norway 24/6-2 Interval: 2177 m – 2178 m

Lower portion of this interval (2177.9m) contains what appears to be a sheared texture, composed of wispy lamina and fragments of organic and lithic material. This is tentatively interpreted as a transitional slurry/debris flow.

Plate G

Well: Norway 24/6-2 Interval: 2181 m – 2182 m

Large, sand filled *Thalassinoides* and *Planolites* burrows developed with Facies T2.

Plate H

Well: Norway 24/6-2 Interval: 2187 m – 2189 m

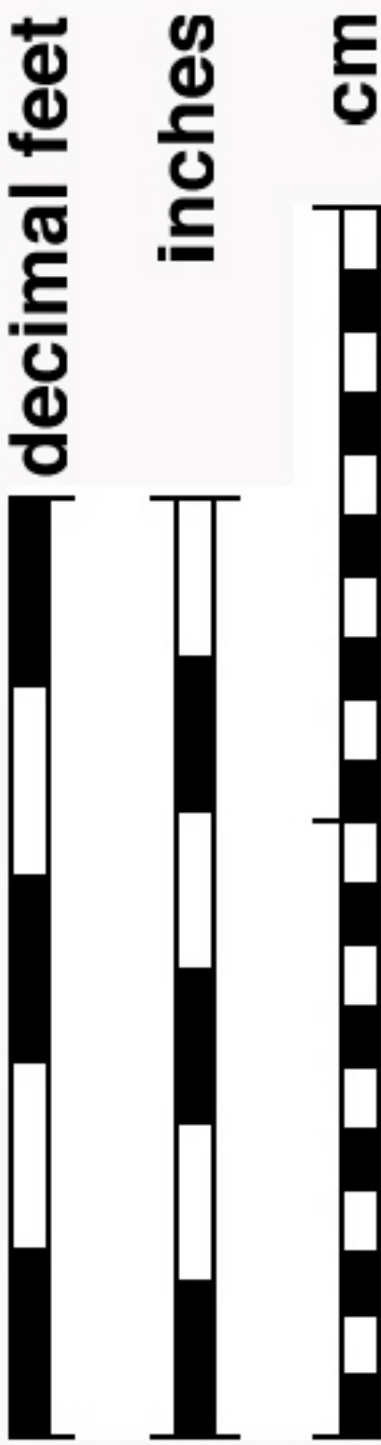
Preservation of amalgamation surface within facies T1. Coarse sands grade rapidly into medium above an interval containing consolidation lamina. Well-developed ripple forms (2188.7m) are preserved in the lower density portion of these deposits.

Display G3 Plate A

Well Norway 24/6-2

2039 m

2040 m



Core photography and digital processing by
Robert Leppard (**Leppard** Sedimentology Ltd)
and
Colin Oakman (*Colin Oakman Associates*)



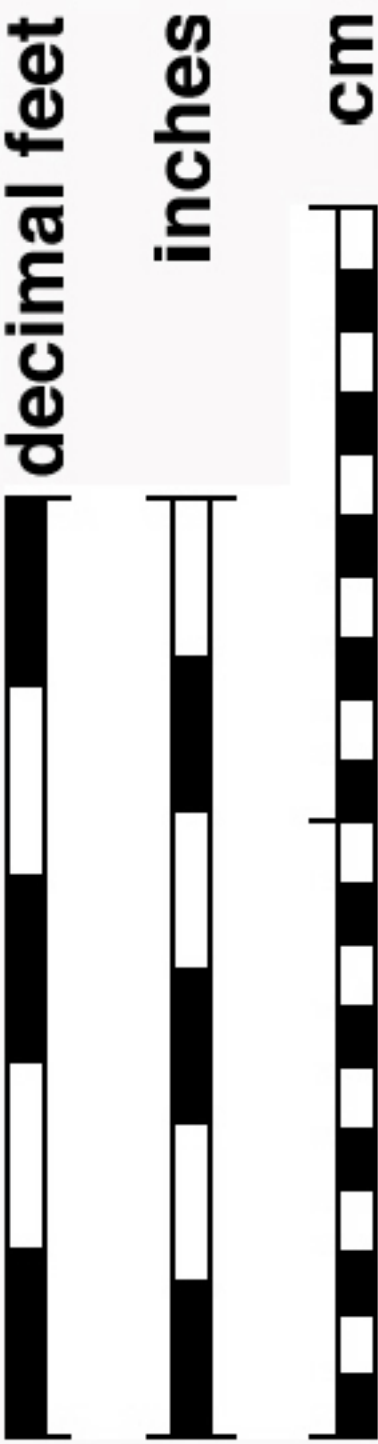
Display G3 Plate B

Well Norway 24/6-2

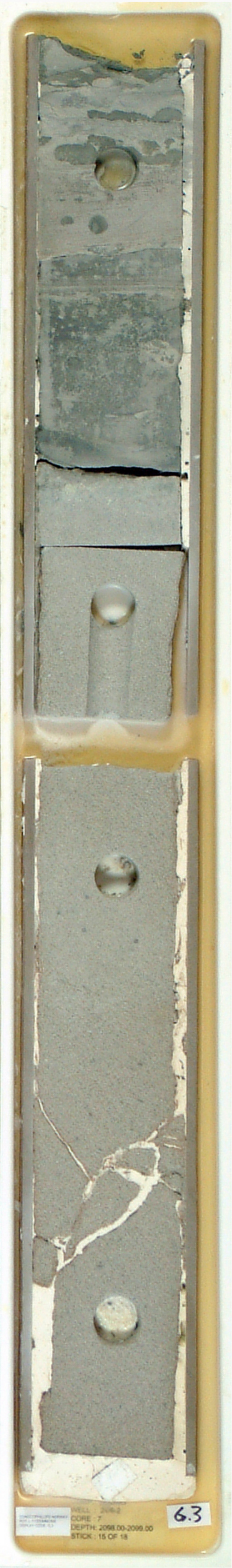
2096 m

2097 m

2098 m



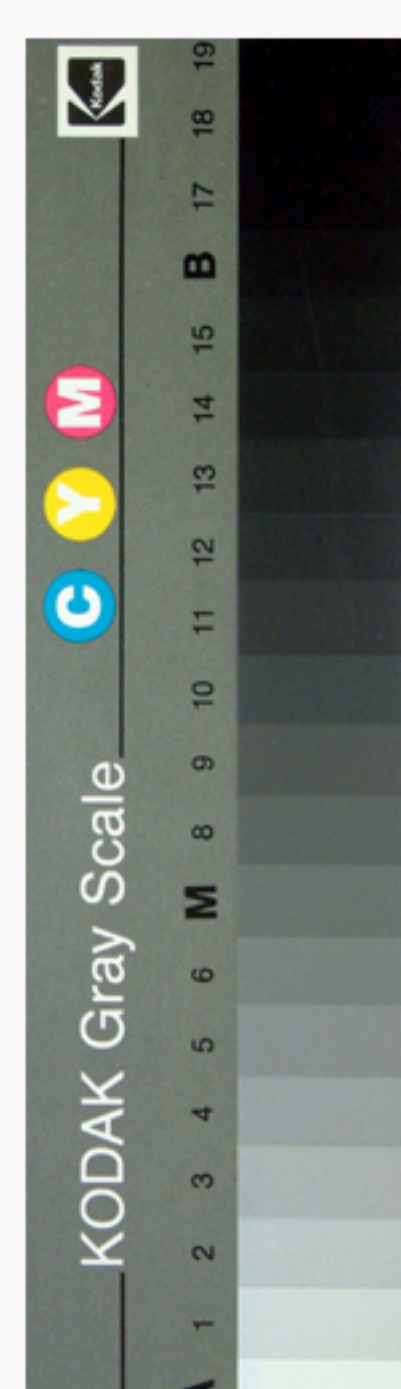
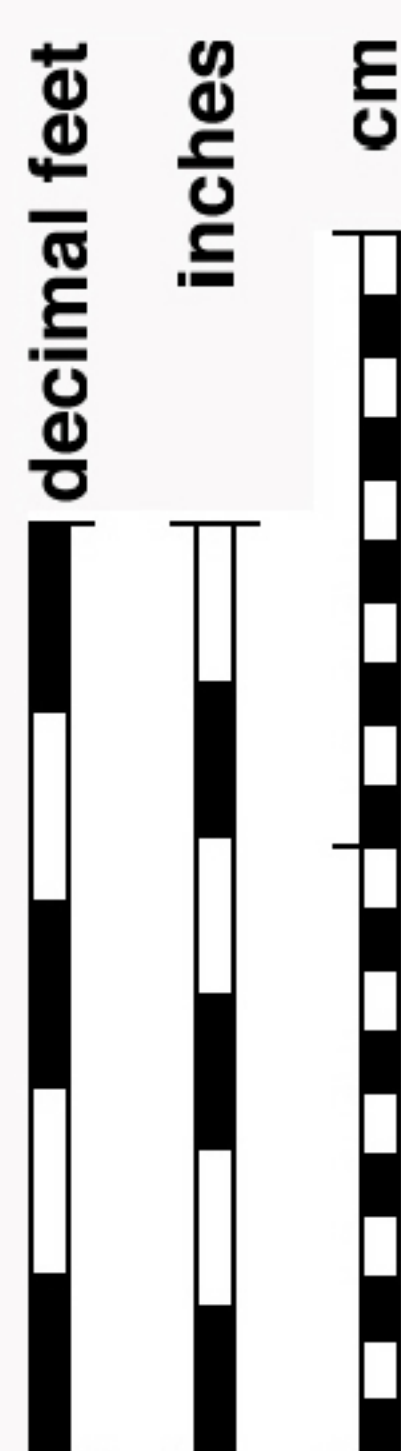
Core photography and digital processing by
Robert Leppard (**Leppard** Sedimentology Ltd)
and
Colin Oakman (*Colin Oakman Associates*)



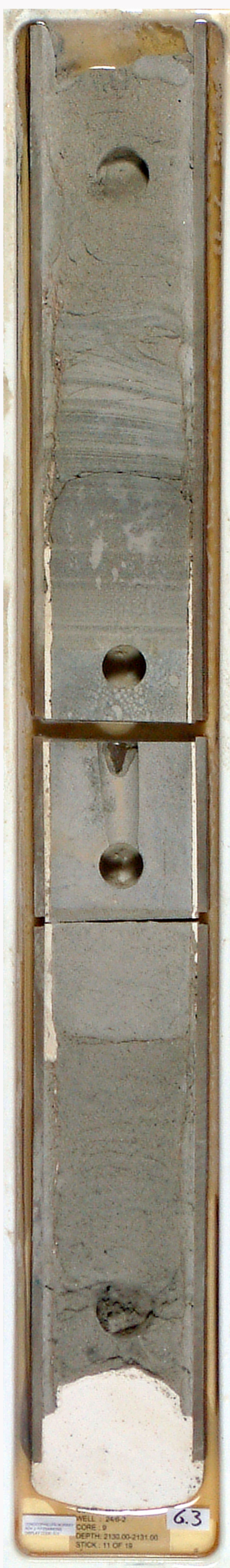
Display G3 Plate C

Well Norway 24/6-2

2130 m



Core photography and digital processing by
Robert Leppard (**Leppard** Sedimentology Ltd)
and
Colin Oakman (*Colin Oakman Associates*)



Display G3 Plate D

Well Norway 24/6-2

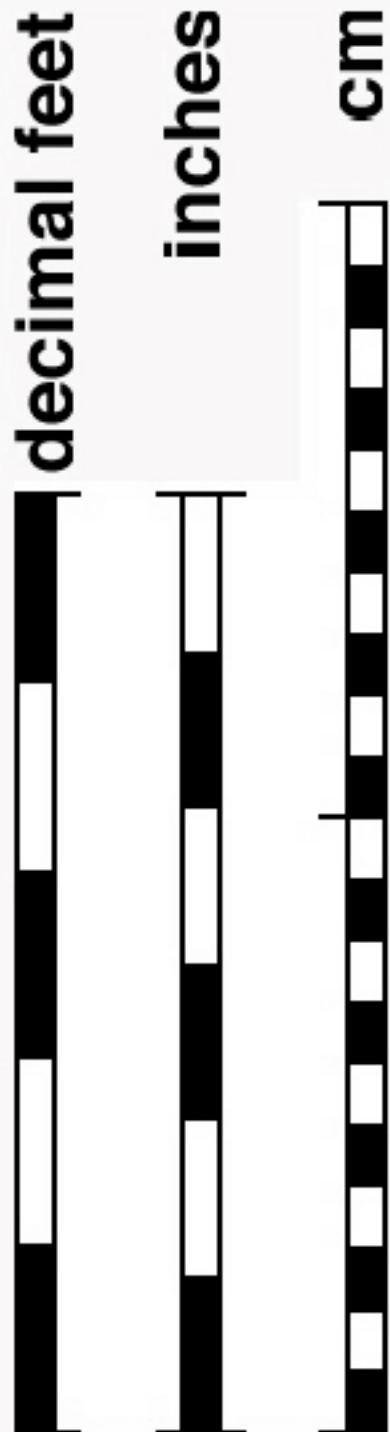
2140 m

2141 m

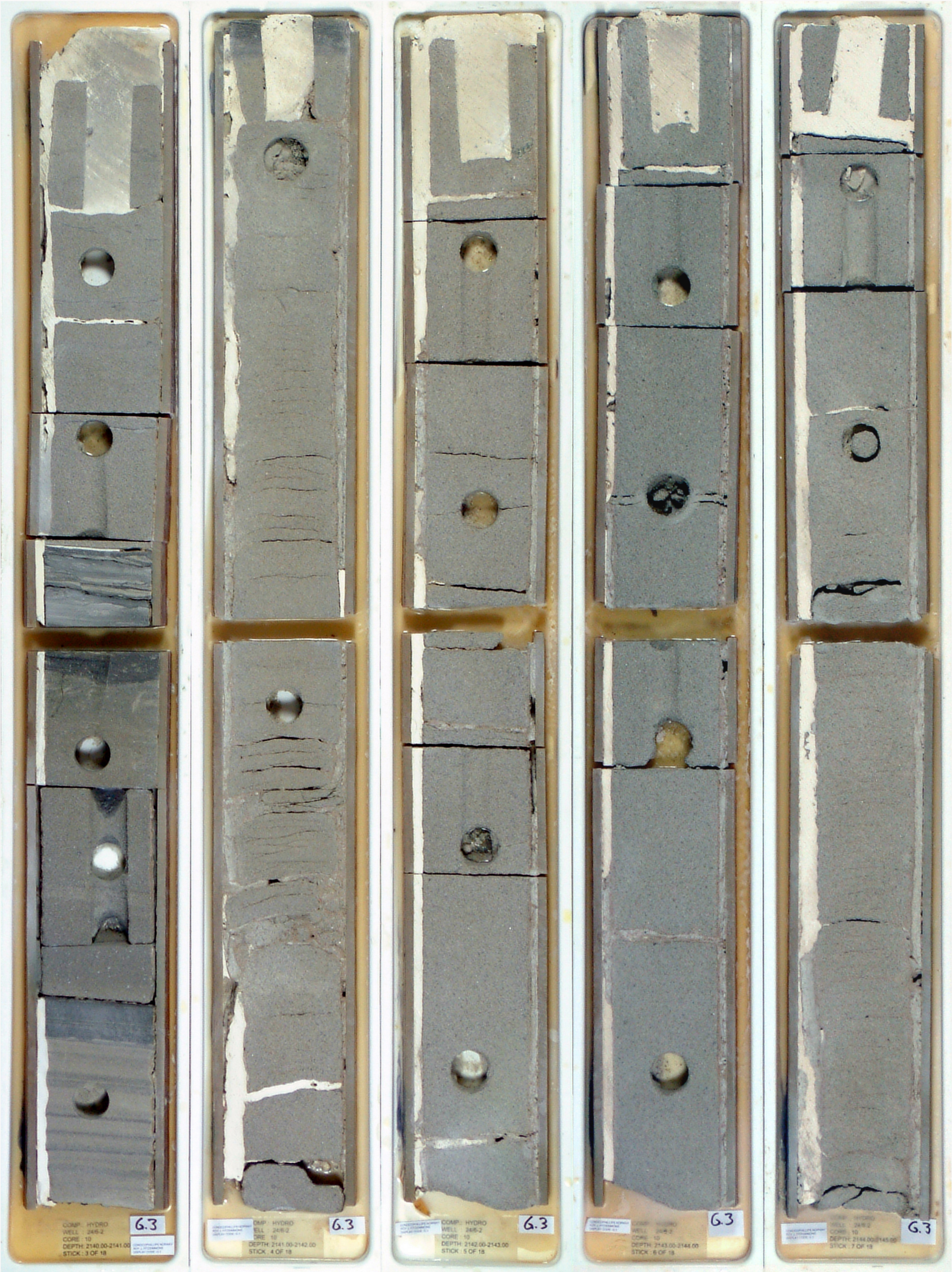
2142 m

2143 m

2144 m



Core photography and digital processing by
Robert Leppard (Leppard Sedimentology Ltd)
and
Colin Oakman (Colin Oakman Associates)



Display G3 Plate E

Well Norway 24/6-2

2154 m

2156 m

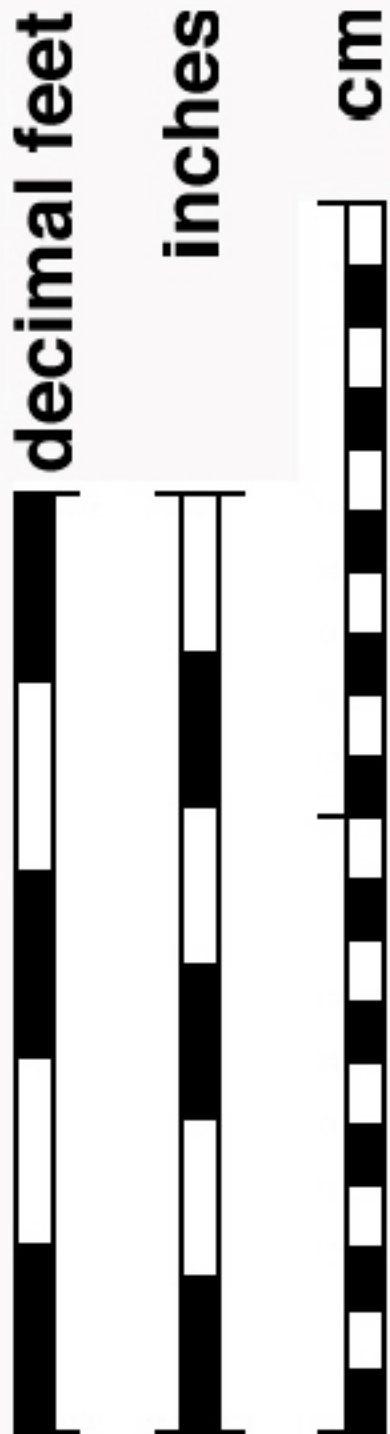
2157 m

2158 m

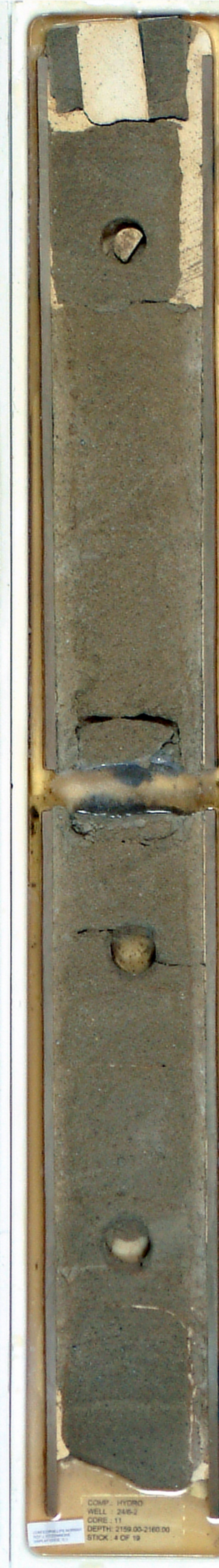
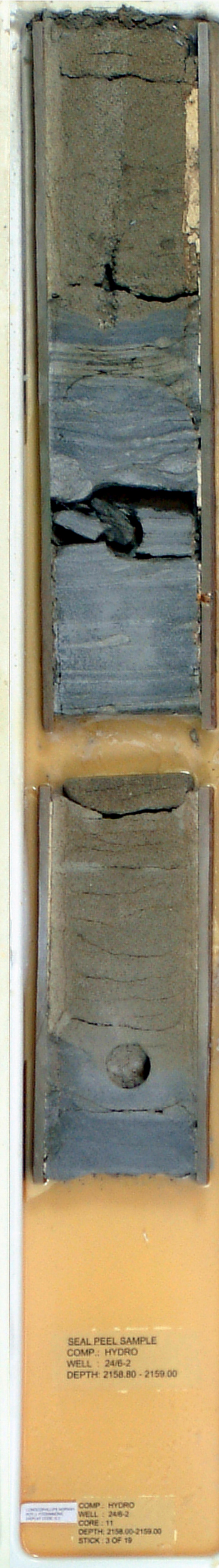
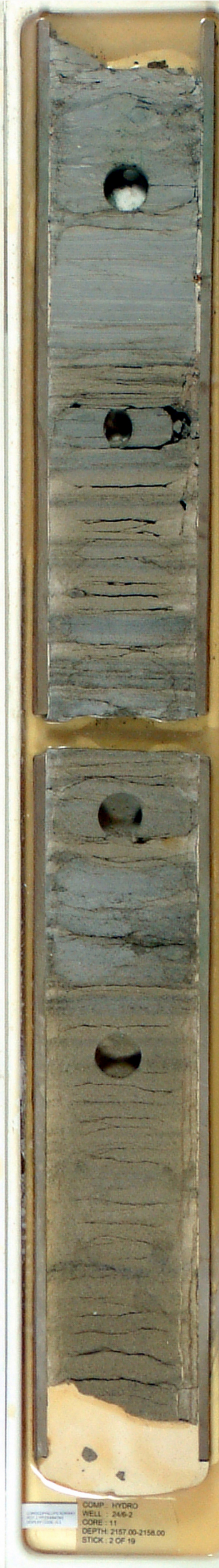
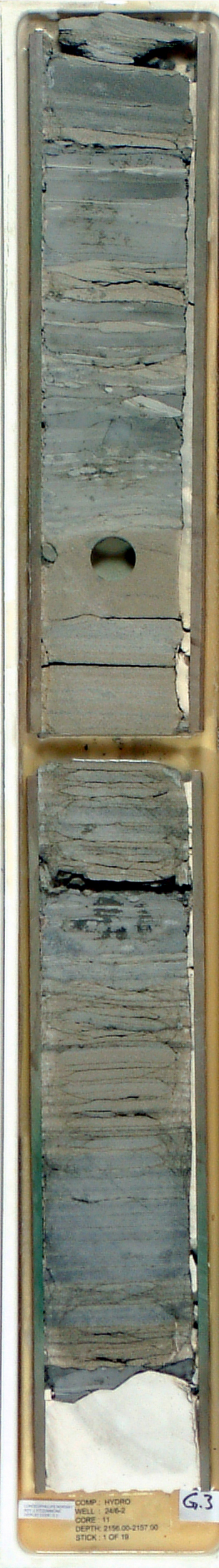
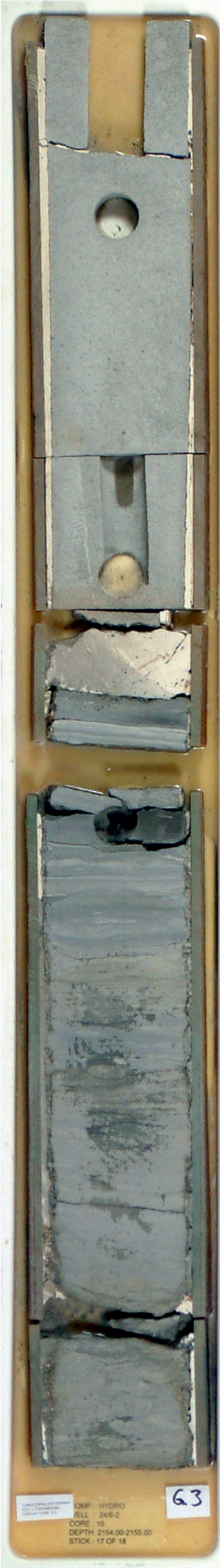
2159 m

2160 m

NOTE
strip
2155 m
to
2156 m
omitted



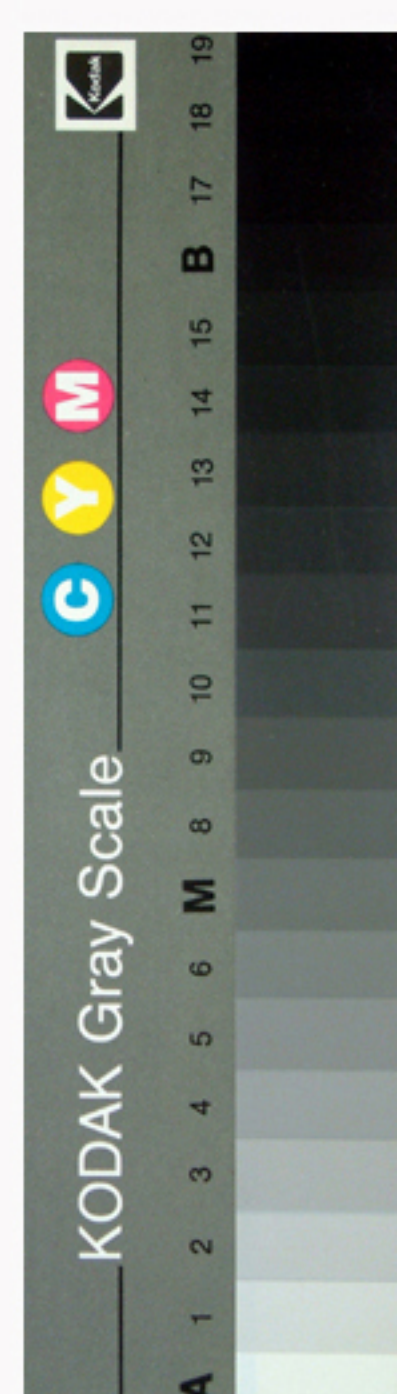
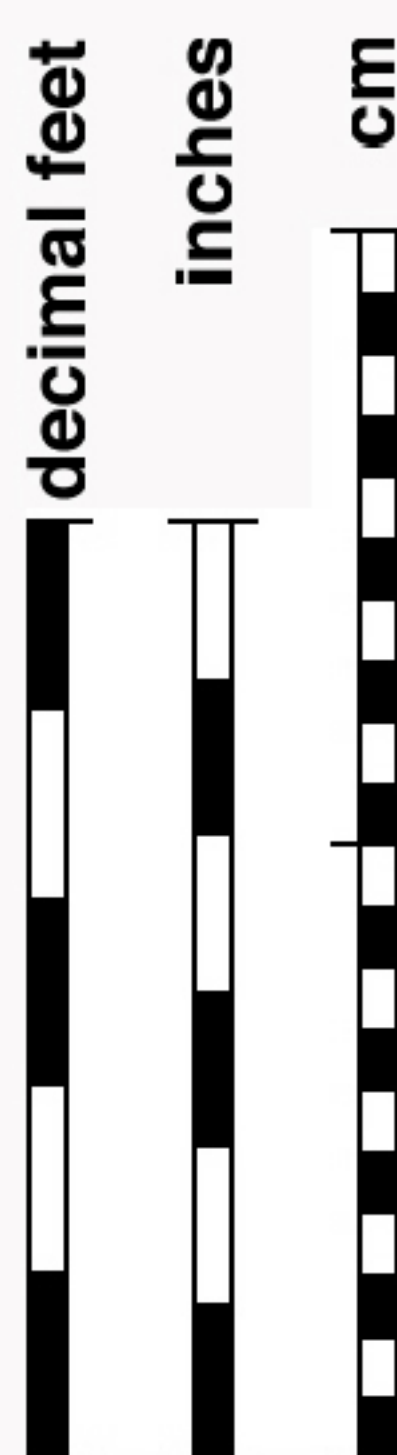
Core photography and digital processing by
Robert Leppard (Leppard Sedimentology Ltd)
and
Colin Oakman (Colin Oakman Associates)



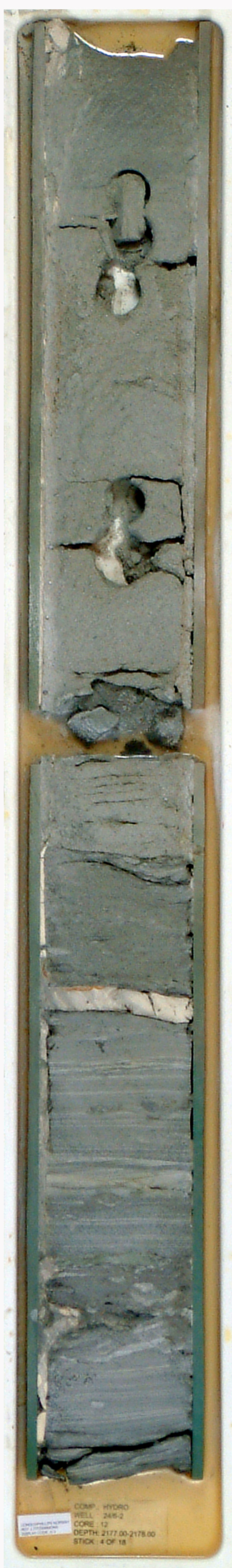
Display G3 Plate F

Well Norway 24/6-2

2177 m



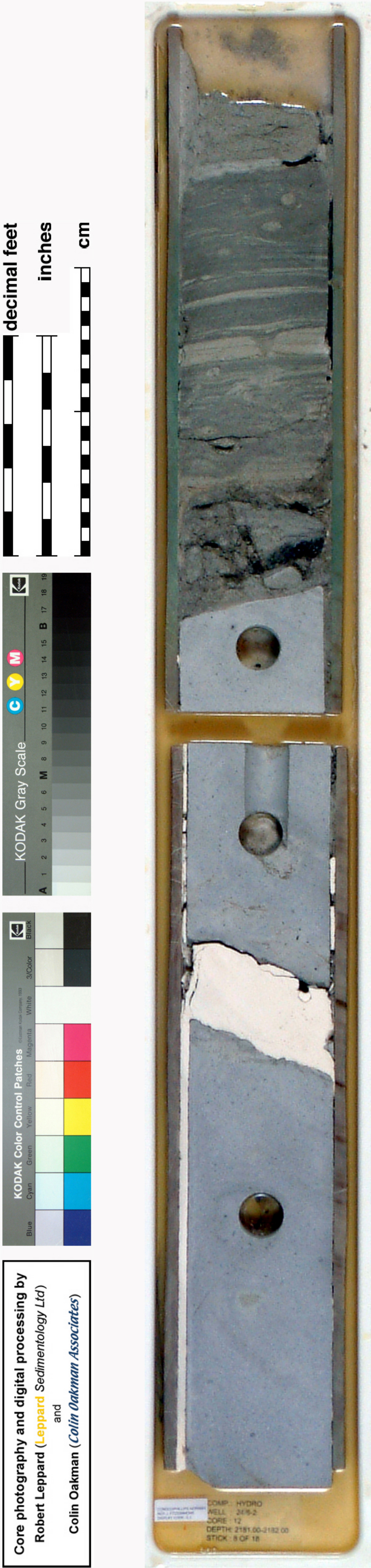
Core photography and digital processing by
Robert Leppard (**Leppard** Sedimentology Ltd)
and
Colin Oakman (*Colin Oakman Associates*)



Display G3 Plate G

Well Norway 24/6-2

2181 m

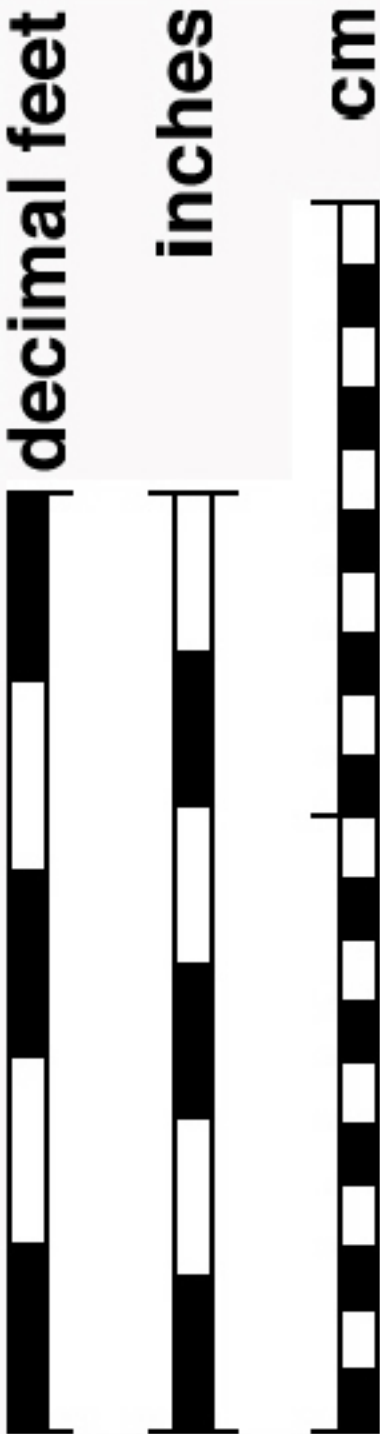


Display G3 Plate H

Well Norway 24/6-2

2187 m

2188 m



Core photography and digital processing by
Robert Leppard (**Leppard** Sedimentology Ltd)
and
Colin Oakman (*Colin Oakman Associates*)

