

# DISPLAY C2

## Upper Brent reservoir variations, Otter Field, Northern North Sea

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Otter is the most north-westerly of the Brent Province fields of the Northern North Sea, located in UK blocks 210/15a and 210/20d, 530 km north of Aberdeen, operated by TOTAL with partners Shell U.K. Exploration and Production, ExxonMobil and Dana. The field was discovered by the Phillips 210/15-2 well in 1977 (then called Wendy) and appraised by Fina well 210/15a-5 in 1997, following 3D seismic acquisition in 1994. Decision to proceed with development was confirmed after the success of appraisal well 210/15a-6 drilled by TotalFina in 2000.

The Otter structure is an easterly dipping tilted panel that is divided into four major blocks and several minor blocks by a network of subsidiary faults. The reservoir is the Middle Jurassic Brent Group, with the uppermost Tarbert Formation shallow marine sandstones comprising the main producing target. The oil source rock is the Late Jurassic Kimmeridge Clay, present in the off-structure areas, though locally absent over the Otter field area, top seal being provided by the Mid to Late Jurassic Heather shales. The Otter oil is a medium gravity crude (36.5° API) with a GOR of 79m<sup>3</sup>/m<sup>3</sup> (443 scf/bbl), in a normally pressured reservoir at a crestal depth of 1970m subsea.

The core displays from the 210/15a-5 and 210/15-2 wells, illustrate the major reservoir target of the Tarbert, the upper contact with the Heather Formation caprock and the facies variations in the underlying channelised Ness formation.

The 2002 to 2003 Otter field development drilling campaign utilised a combination of detailed trajectory planning and integrated geosteering techniques, including real time transmission of borehole image data and wellsite chemostratigraphy. The objective of this work was to maximise oil recovery, with a minimum number of wells, from the complexly faulted Otter structure. To achieve this, sub-horizontal production wells were planned to track near top reservoir, through the structural culminations, to connect adjacent fault blocks. Illustrations of this work are presented in the accompanying poster displays.

## **Plate A**

**Well: UKCS 210/15a-5    Interval: 6694 ft - 6718 ft**

Basal Heather contact to top Tarbert T30 at 6696 ft. Top Tarbert T20 at 6700.5 ft. Top Tarbert T10 at 6710 ft.

## **Plate B**

**Well: UKCS 210/15a-5    Interval: 6730 ft – 6749 ft**

Basal Tarbert contact to top Ness Formation at 6738 ft. Channelised sandstones present at top Ness

## **Plate C**

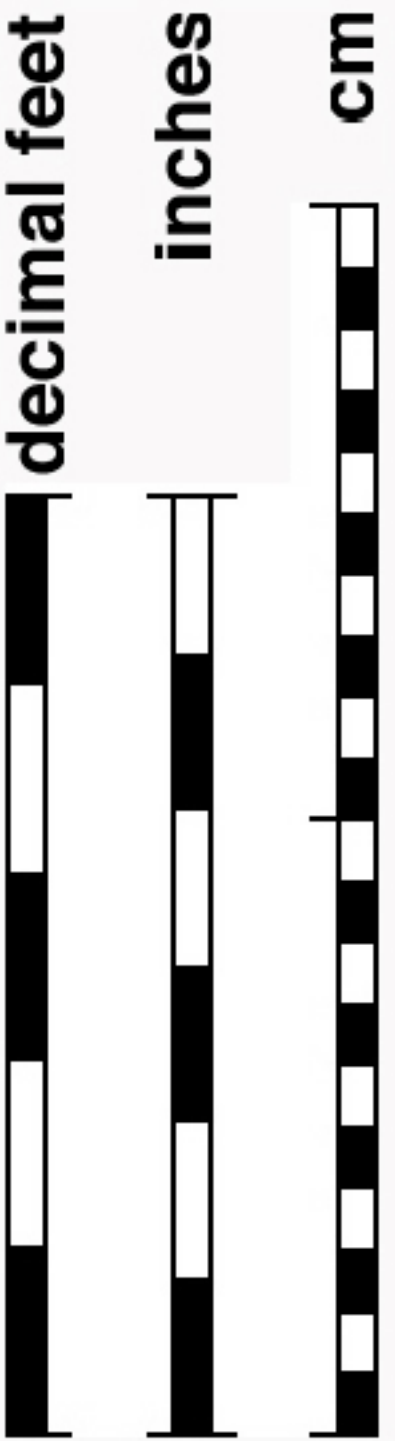
**Well: UKCS 210/15-2    Interval: 6780 ft – 6804 ft**

Tarbert contact to top Ness Formation at 6785.5 ft. Delta plain coals present at top Ness.

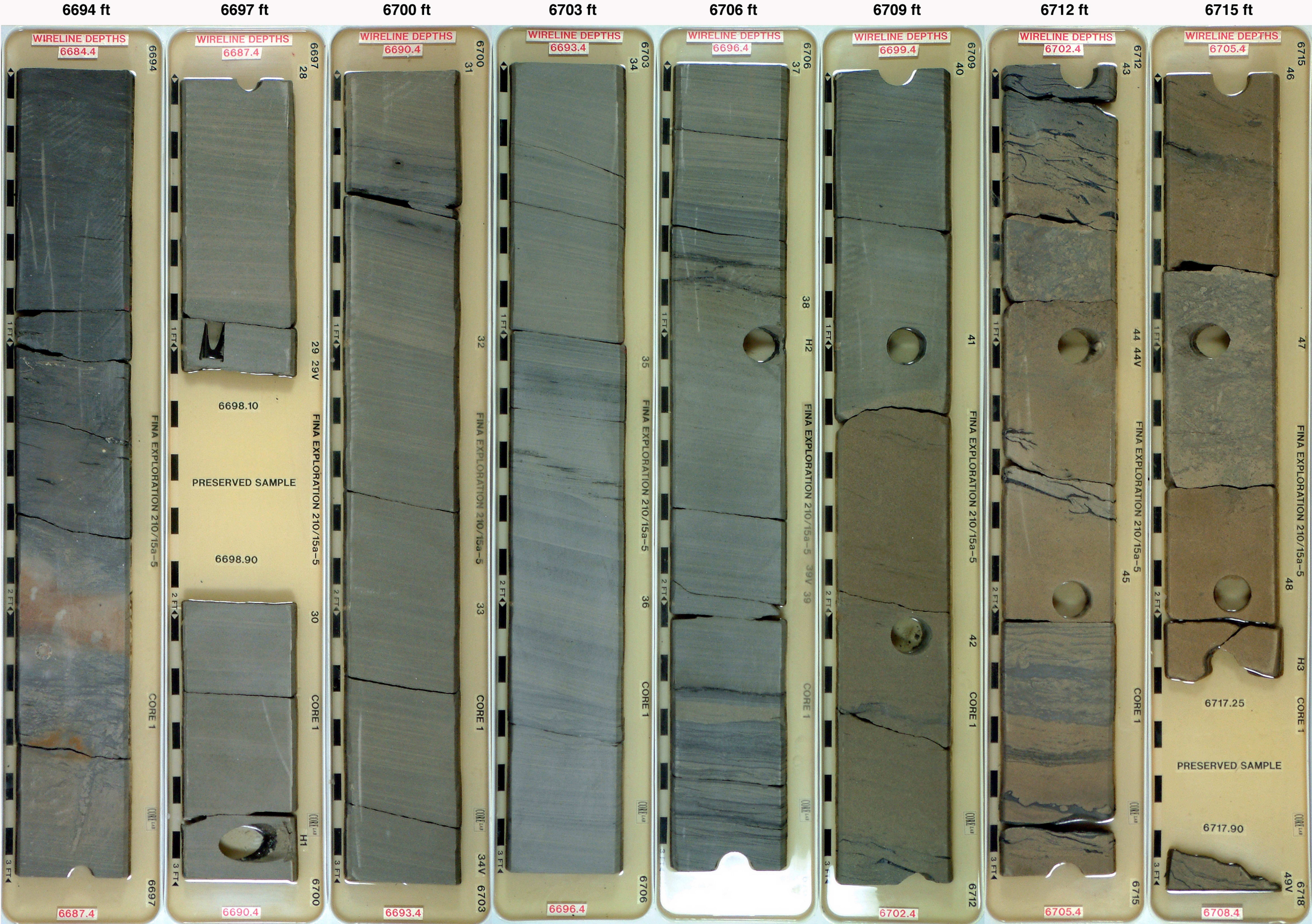


Display C2 Plate A

Well UKCS 210/15a-5



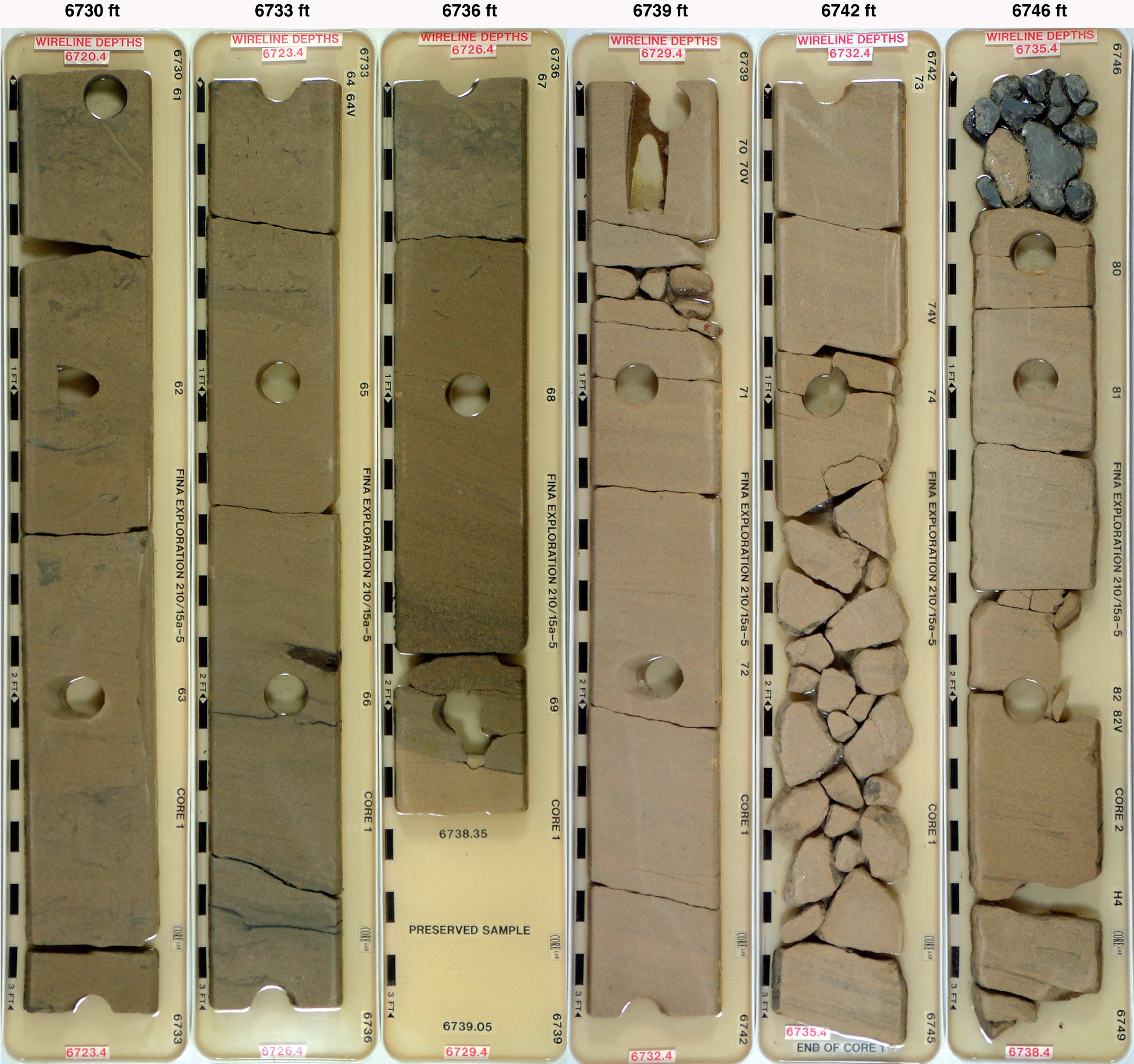
Core photography and digital processing by  
Robert Leppard (Leppard Sedimentology Ltd)  
and  
Colin Oakman (Colin Oakman Associates)





Display C2 Plate B

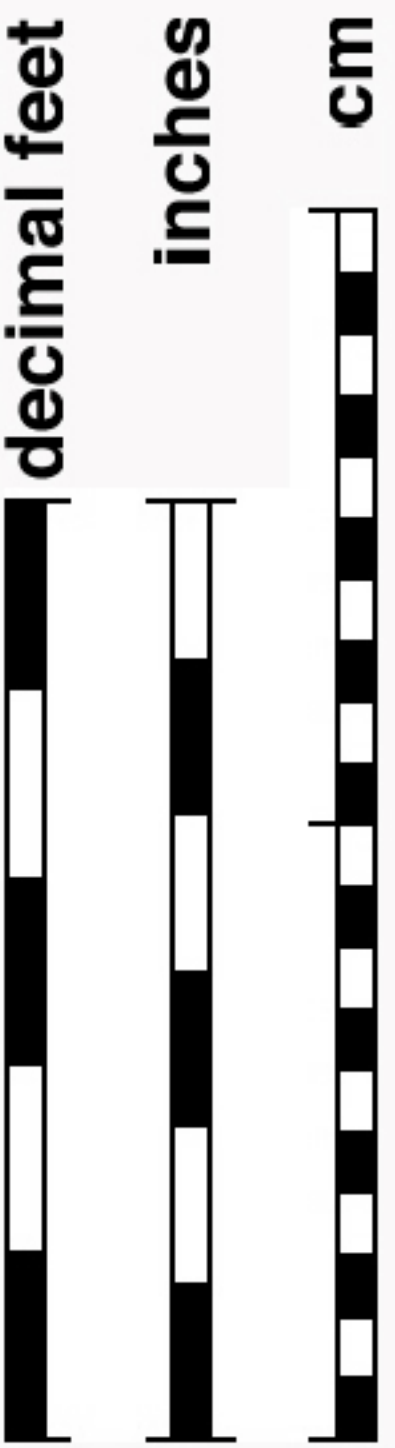
Well UKCS 210/15a-5





Display C2 Plate C

Well UKCS 210/15-2



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

