PL496 Relinquishment Report

Corrie East Prospect

PremierOil

PL496 Relinquishment Report

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1 Key License History

Licence PL496 has an area of 30 km2 and covers part blocks 7/7 and 7/10, which lie immediately east of the 'Corrie' discovery, located in UK block 23/22b. Premier Oil and Talisman Energy were awarded the PL496 licence on the 23'rd of January 2009. The licence was awarded as a 5 year initial period (2+2+1). The initial work program included geology and geophysics studies to evaluate the extension of a Jurassic Fulmar prospect (Corrie) extending from the UK sector in the Norwegian block 7/7 and 7/10, with a drill or drop decision. The PL496 license holders in the license during active period were Premier Oil (Operator, 70%) and Talsiman (30%). Premier Oil, in addition, had active licences on the other side of the border in blocks 23/22b and 23/22 (Fig. 1.1) to explore the Upper Jurassic Ula pod interpod play and the Triassic Skagerrak play.

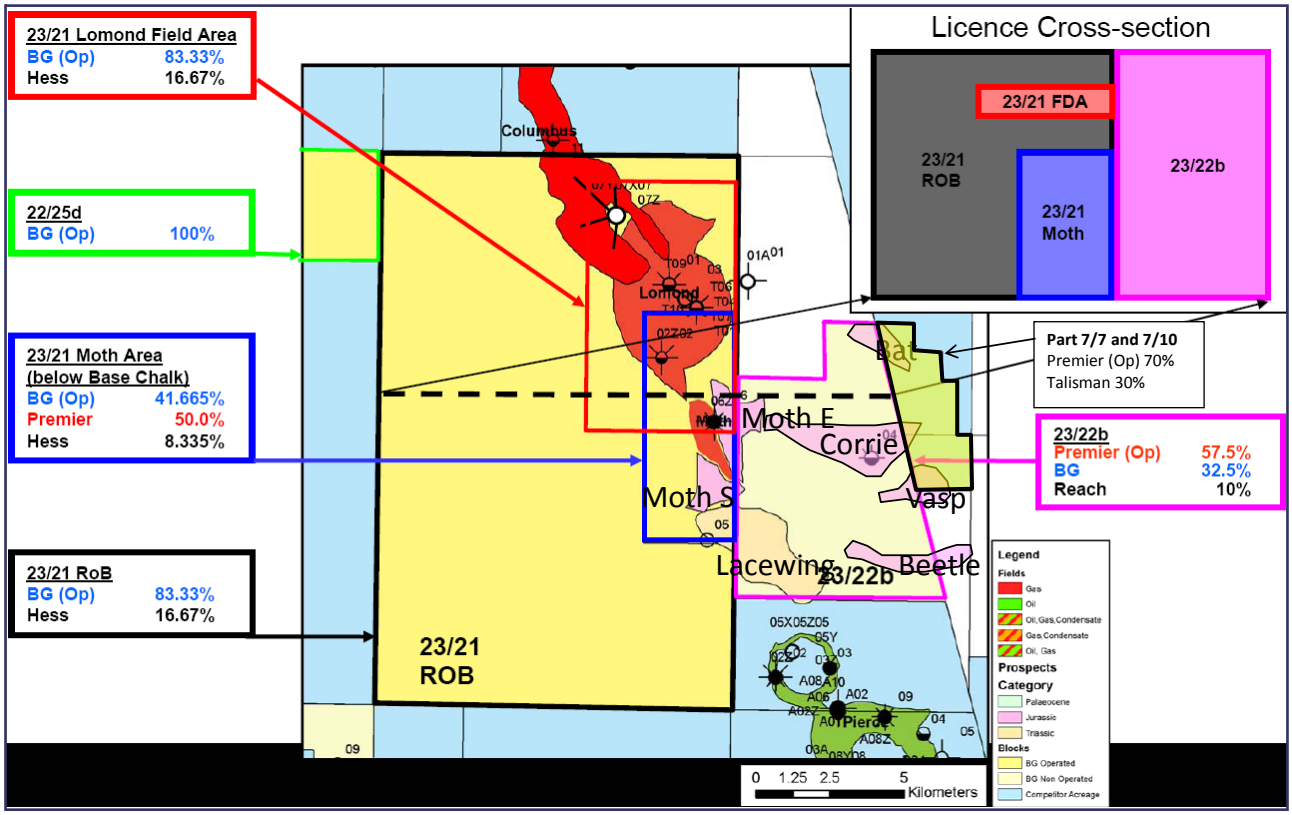


Fig. 1.1 Location Map and Equity Positions

In order to evaluate the 'Corrie' prospect extension in PL496, Premier purchased the CGGVeritas VERQ22 PH3 Moth PSTM and PDSM datasets, carried out petrophysics on eight adjacant wells, and carried out a Triassic chemostratigraphy and biostratigraphy study to evaluate the prospectivity. An Extended Elastic Impedance (EEI) seismic volume was also generated to try to resolve the presence of Fulmar sands. Unfortunately, the EEI volume results were ambigious and the Joint Venture was unable to resolve the Fulmar sands within the target interval. This, combined with a reduction in the closure area when mapped on the PSDM seismic volume, has resulted in a Joint Venture decision to relinquish this acreage. A well, scheduled for 2010, that would have de-risked this play in the UK sector was was removed from the drilling programme in light of the above work program. Two EC/MC meetings were held with the partner Talisman during the license period.

2 Database

The key well in the area is the UK well 23/22b-4. This well encountered a 2.5 m thick Ula sandstone, with an oil-down-to and good reservoir properties. The 23/22b-4 well was drilled at the crest of a rotated fault block; and seismic interpretation indicates the Jurassic section thickening down-dip of the 23/22b-4 well location. The Corrie prospect, straddling UK block 23/22b and Norwegian part blocks 7/7 and 7/10, consists of thicker Ula sandstones, with a predicted deeper oil water contact. Regional well calibration points indicate the Ula sandstone thicknesses varying from 2.5m to 245m, with a range of porosities from 13.5% to 22%. The closest offset well, the Moth 23/21-6z discovery well, encountered 92 m of gas-bearing Ula sandstones, with average porosities of 18%. 23/21-6z confirmed the likelihood of thicker Ula sandstones being present down dip of the 23/22b-4 Corrie discovery well (Fig. 2.1).

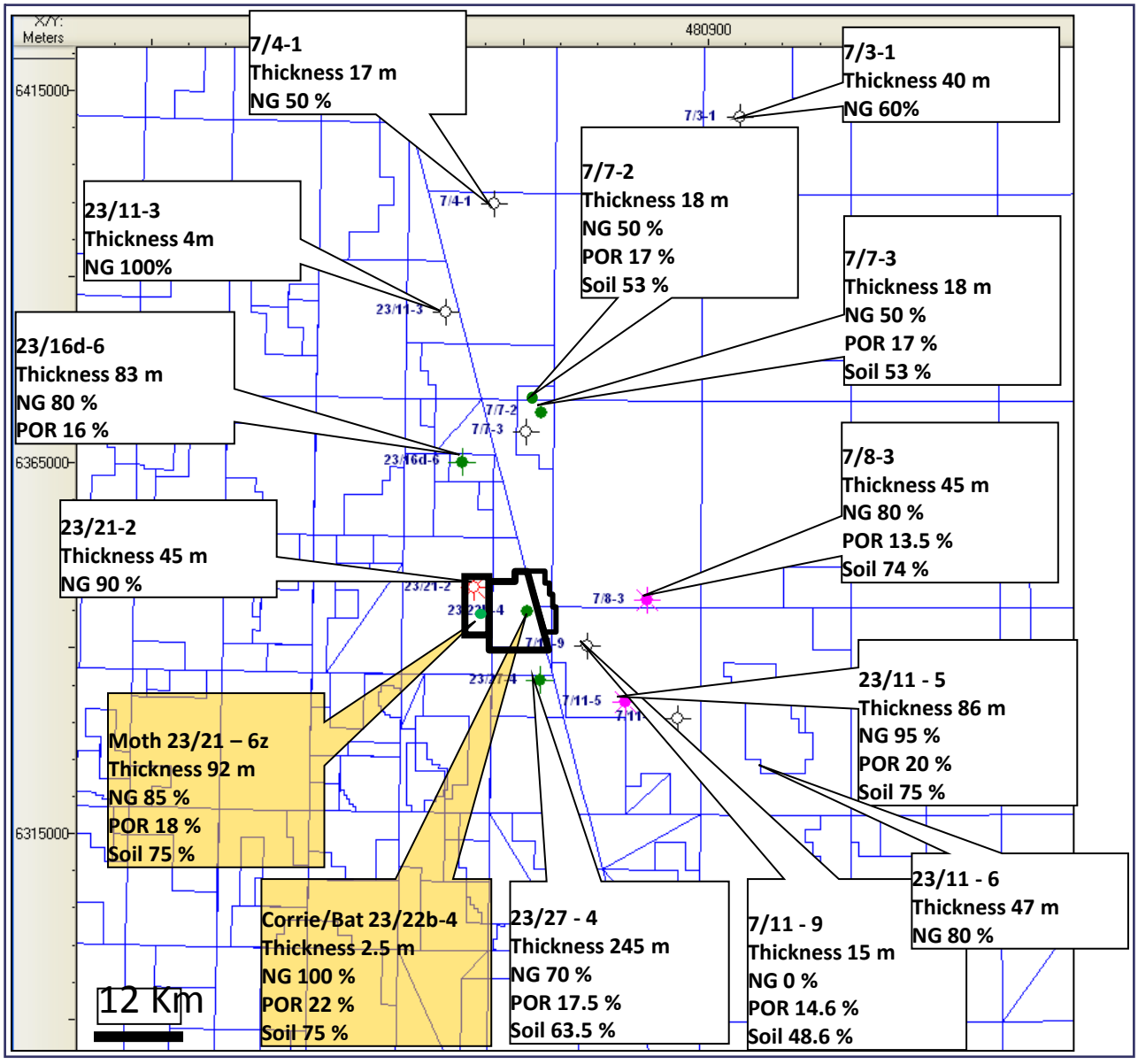


Fig. 2.1 Offset Wells With Fulmar Formation

The key seismic surveys covering the prospect are the LOM95 Repro MAZ, and the CGMNOR94 3D's. The LOM95 survey covers the part of the Corrie prospect located on the UK side of the median line, while the CGMNOR94 3D covers the part of the prospect located on the Norwegian side of the border. A small strip of PGS MM data was used to fill a gap between the LOM95 Repro MAZ and the CGMNOR94 3D's. After the sucessful award of the PL496 license, the long offset Veritas 3D data (CGG VERITAS Q22 PH3) was purchased to give complete coverage of the prospect on one single 3D survey (Fig. 2.2).

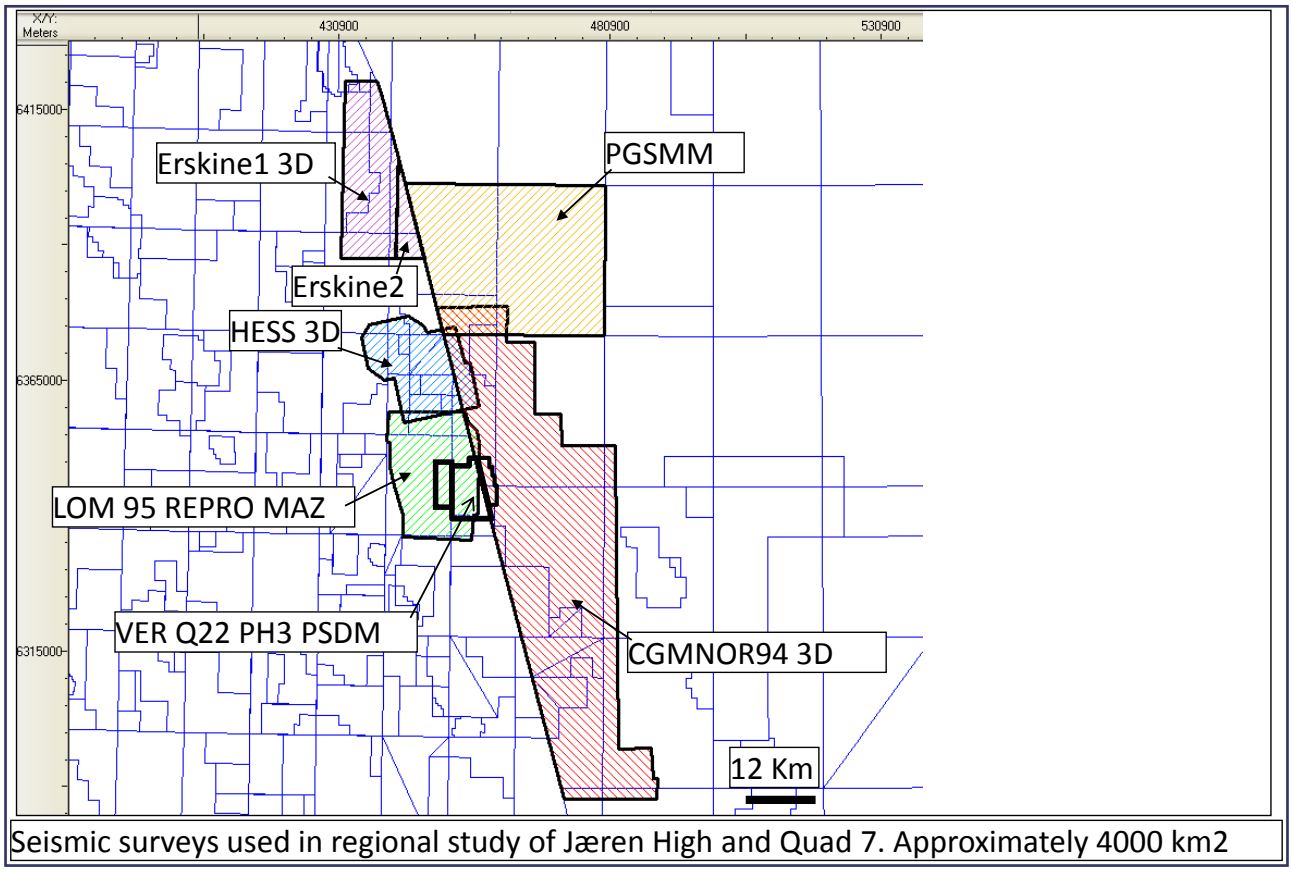


Fig. 2.2 Seismic Database

3 Review of Geological Framework

The key prospect in the license is the 'Corrie' prospect of Upper Jurassic Ula age. Several other discoveries has been made in similar age sandstones in the vicinity (Fig. 3.1). The trapping mechanism of the 'Corrie' prospect is believed to be a combination of structural and stratigraphic elements; with Ula sandstones pinching out away from the Jurassic depocentre being cut by several faults, resulting in the trapping of hydrocarbons. As noted above, the 23/22b-4 well, drilled at the crest of a rotated fault block, encountered only 2.5 m of Ula sandstone, with oil down to tight Triassic Skagerrak Formation. However, seismic lines show that the Jurassic section thickens up down dip towards the depocentre created by salt withdrawal (Fig. 3.2). The areal extent of this depocentre can be seen on an RMS amplitude extraction from "Base Cretaceous Unconformity (BCU)" - (BCU + 200ms). The RMS amplitude extraction detects the high amplitudes associated with the Kimmeridge clay deposited between Triassic 'pods'. The pod interpod relationship can be seen on an arbitrary seismic line running from the 23/22-1a well to the 23/22b-4 well (Fig. 3.3). The trap could be sourced by migration from mature source rock in the Central Graben, but basin modelling indicate the prospect could also be locally charged from mature source rock in the mini basins located to the north and south of the 23/22b-4 Corrie well.

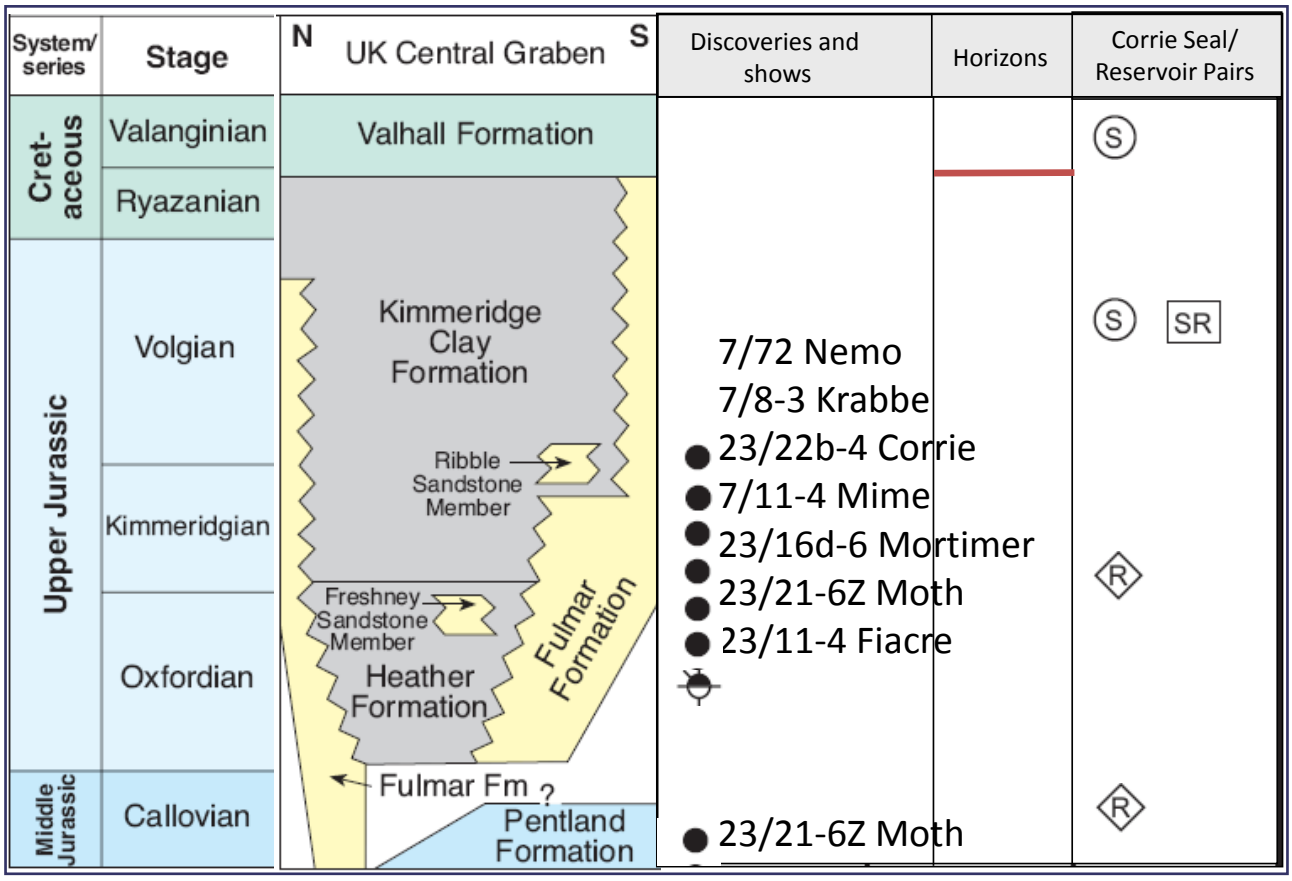


Fig. 3.1 Jurassic Stratigraphic Column

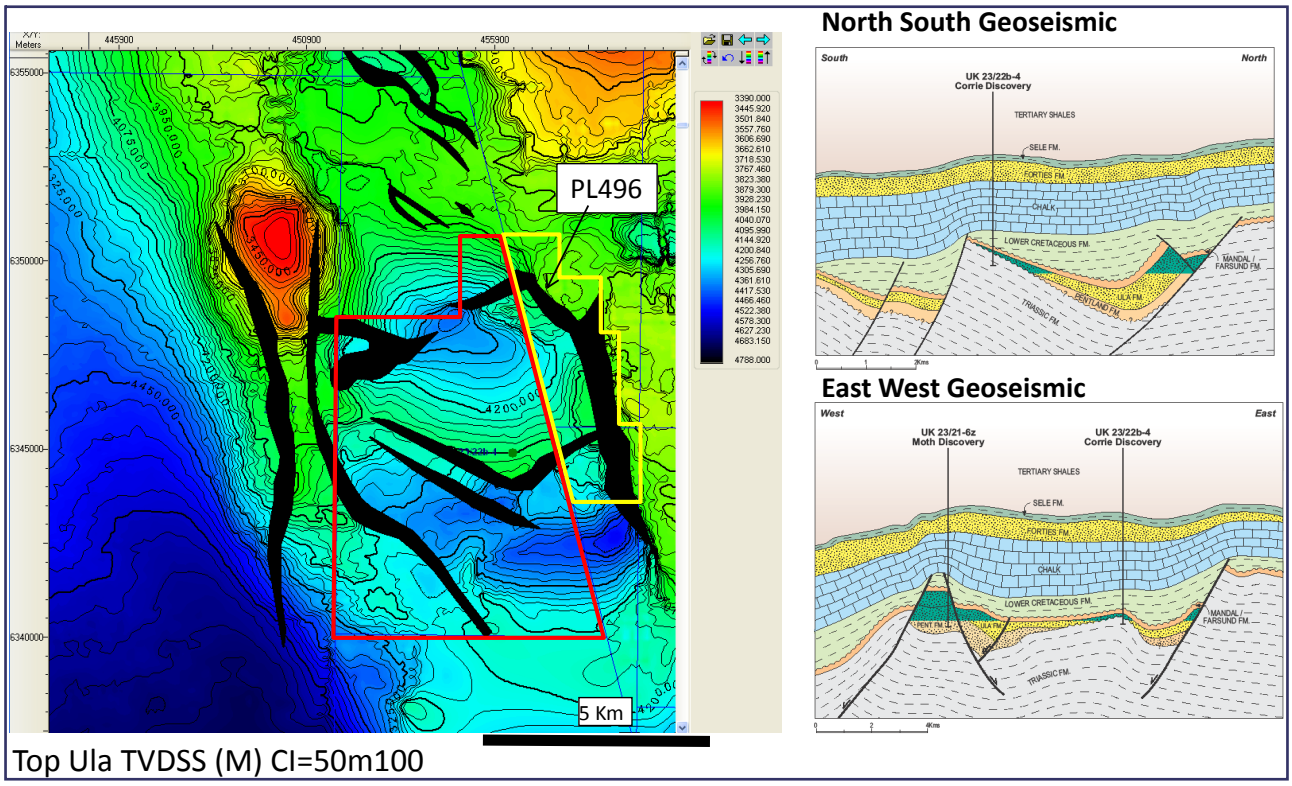


Fig. 3.2 Top Ula TVDSS (m) Structure Map and geoseismic Sections

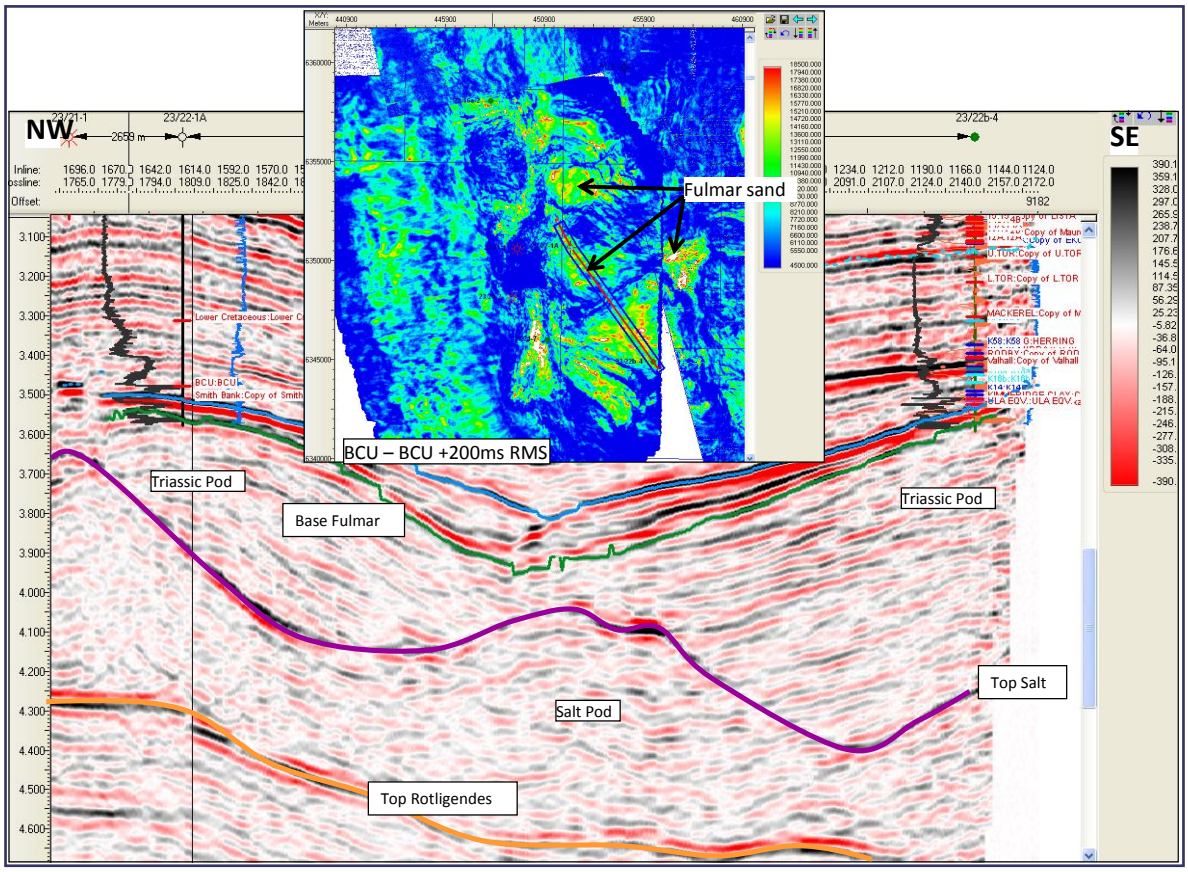


Fig. 3.3 BCU - BCU+200ms RMS Extraction Detecting Fulmar sst

4 Prospect Update

An inversion Extended Elastic Impedance Inversion (EEI) study utilising the CGG Veritas Q22 PH3 3D PSTM seismic data was carried out during the second quarter of 2011. Since the 23/22b-4 well missed density data and shear wave velocity data, the only well used in the study was the 23/21-6z Moth discovery well. During the EEI feasability study the correlations between the chi angle curves and gradient impedance versus acoustic impedance were investigated using cross-plots. The EEI cross correlation show good correlation with GR, VCL, Porosity and Sw with a regression coefficient of approximately 0.57 (Fig. 4.1). The chi angle for all properties varies between 19 and 34 degrees, with an average of 28 degrees. This produced a lithology cube at around 62 degrees. The cross-plots of gradient impedance versus acoustic impedance showed good discrimination of the reservoir from the background shale properties (Fig. 4.2). Ula sand is discriminated on the most negative(EEI +18 degrees) (Fig. 4.3). An EEI rotated volume to +18 degrees was therefore used for detecting the Ula sand fairway. Seismic lines through the Corrie discovery well show that the inverted volume is ambiguous when trying to resolve thicker Ula sandstones down dip of the Corrie discovery well (Fig. 4.4). This could either be due to tuning, or to the possibility that the Ula sandstone thickness is below seismic resolution in this area. Uncertainty in inversion parameters based on the wells could also affect the result because only one single well within the inversion area had the necessary logs to be used in the inversion study. When mapping out the areal extent of the Ula sandstone based on the inverted volume, most of the Ula sandstone seems to be deposited on the UK side of the border in block 23/22b and less in part blocks 7/7 and 7/10 on the Norwegian side of the border (Fig. 4.5). We conclude that the EEI volume results are ambiguous and we are unable to resolve the Ula sandstones within the target interval.

EEI Peak Cross-correlation

Property	Negative Correlation		Positive Correlation	
	Chi Angle	Correlation	Chi Angle	Correlation
DTCO_splice (P-wave)	+90	-0.7860	-11	0.9252
DT4S_splice (S-wave)	+70	-0.9425	-82	0.9431
RHOM_splice (Density)	+90	-0.2496	+15	0.7445
GR_splice (Gamma Ray)	-90	-0.4097	+34	0.6280
VCLF (Volumetric)	-90	-0.3908	+33	0.6176
PHIF (Porosity)	+19	-0.5476	0	0.0000
SWF (Water Saturation)	-90	-0.1614	+26	0.5041

Fig. 4.1 EEI Cross Peak Correlation

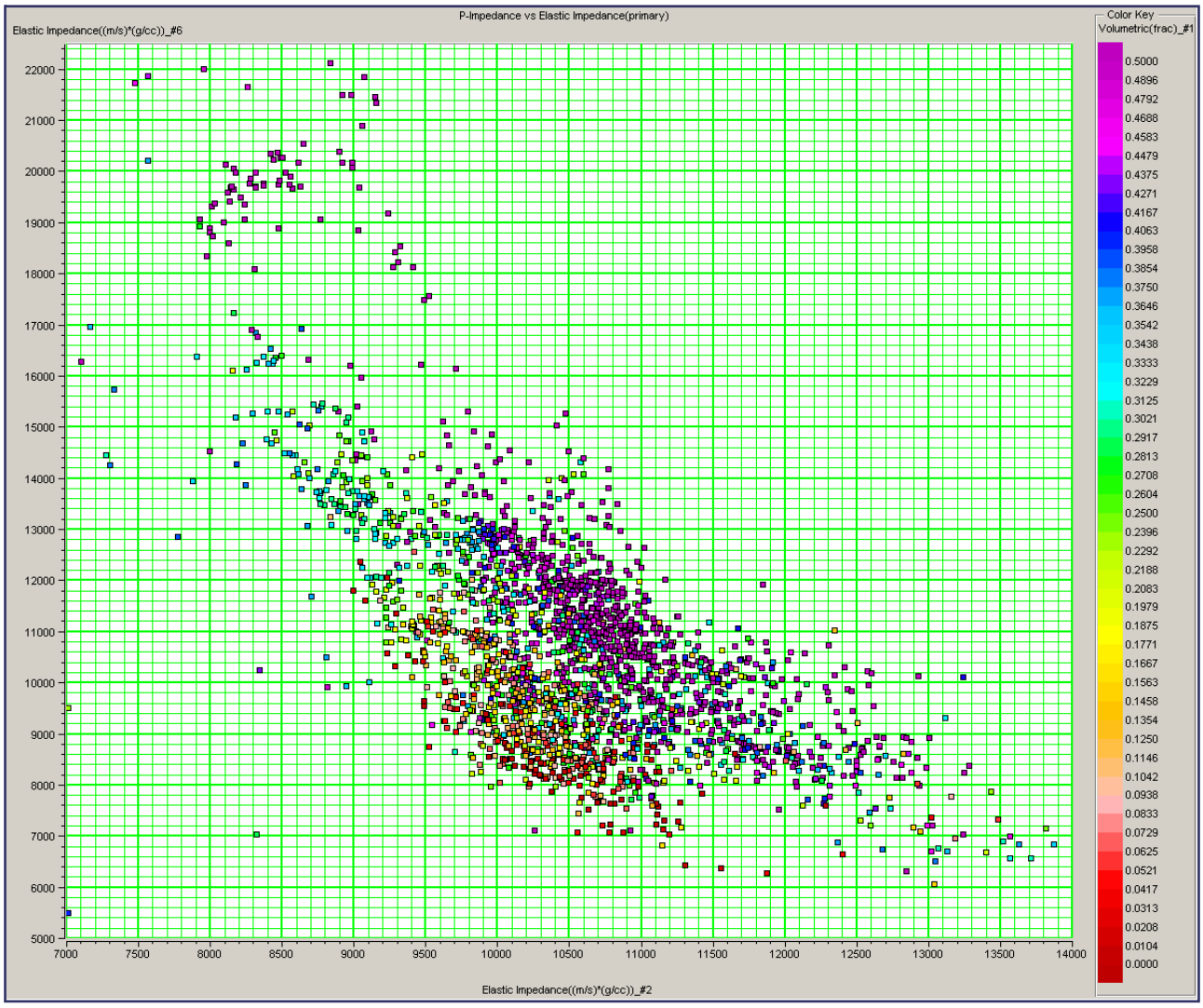
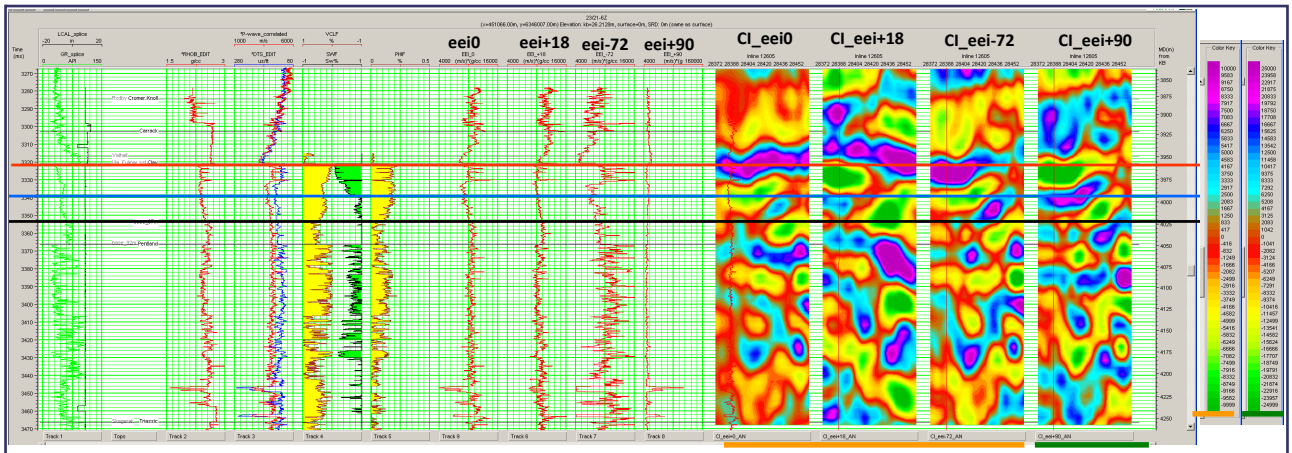
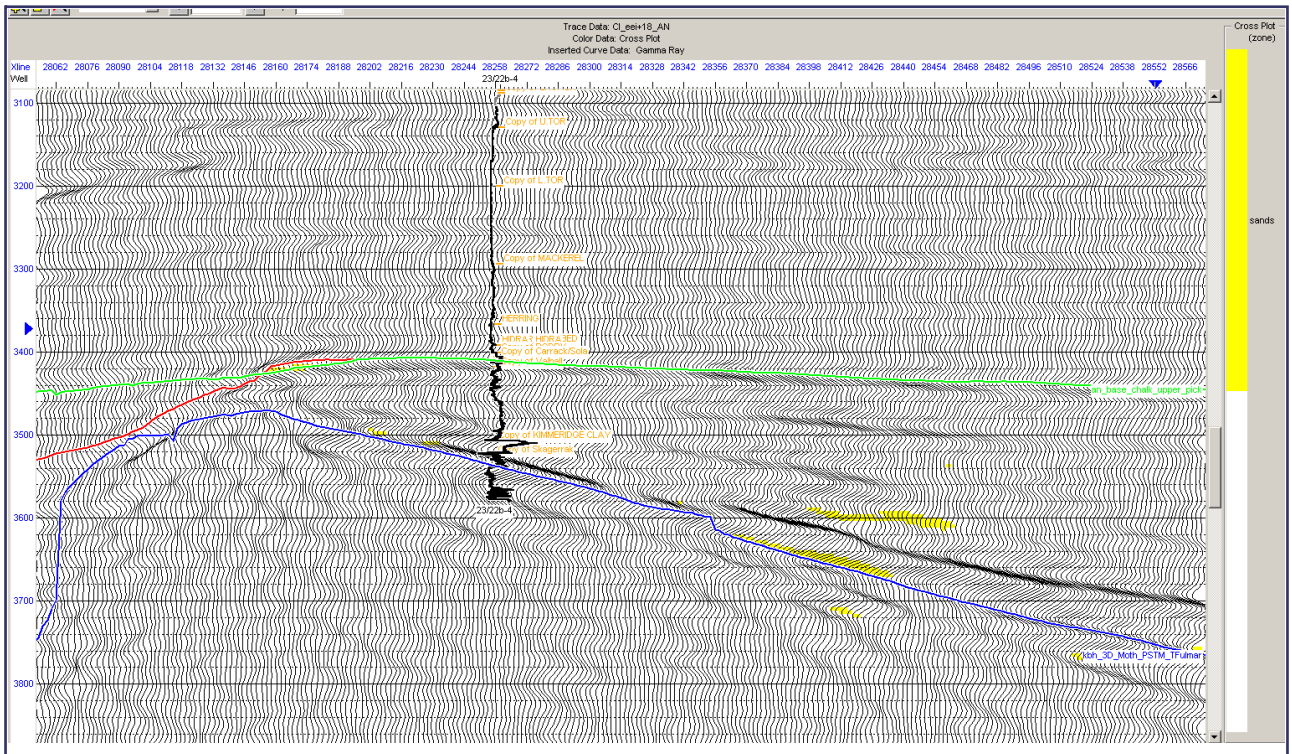


Fig. 4.2 GI versus VCL X Plot



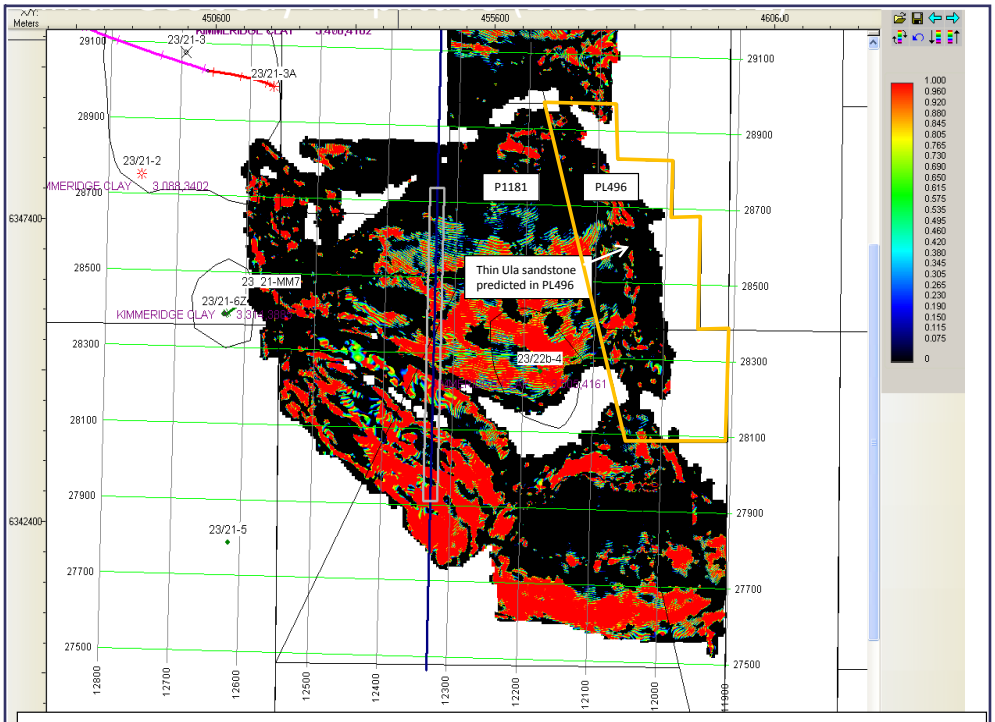
Coloured inversion panels shown against eei logs. EEI+18 is porosity and -72 is lithology. Pay is defined by most –ve eei on +18. It could be possible to map top and base of Fulmar sand on +90 that top as red and base as black line with the package defined by a couplet of -ve and +ve eei.

Fig. 4.3 Moth Ula Area Interpretation Scheme



Projected sand polygon on a line through Corrie well. Could be sandier downdip.

Fig. 4.4 Corrie North South Line. *Seismic line with possible Ula sandstone highlighted from EEI Inversion study in yellow.*



Extracted amplitude at top Fulmar on geobody volume eei0 vs eei-72. Red indicates sandy prone areas

Fig. 4.5 Ula Sand Presence Map. *Map showing the presence of Ula sandstones in red. Extracted at Top Ula on geobody volume EEI0 vs EEI-72. Red indicate sand prone areas.*

5 Conclusion

The EEI inversion feasibility test and the EEI inversion were undertaken during the second quarter of 2011. Unfortunately, the EEI volume results were ambiguous and we were unable to confidently resolve the Ula sands within the target interval. This, combined with a reduction in the closure area when mapped on the PSDM seismic volume, has resulted in a Joint Venture decision to relinquish this acreage.
A Well that would have de-risked this play, scheduled for 2011 in the UK sector, was removed from the drilling programme in light of the work carried out.