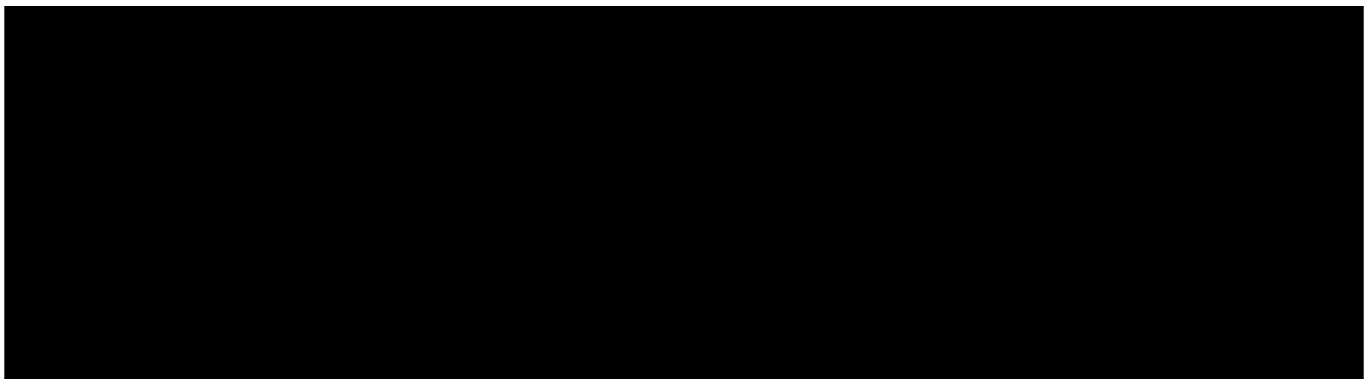




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Report title:

# PL459 Relinquishment Report



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## Summary

PL459 was awarded to a consortium of Revus Oil and Gas, and Bridge Energy in the 2007 APA round. It is located south east of the Heimdal field within block 25/4. A single prospect, Mot, was identified in Paleocene Heimdal sands. The work program was to reprocess 480sqkm of 3D seismic in order to better image the prospect and confirm the volumetrics. Mot extends into the adjacent Total Norge operated PL102 and is very similar in appearance to the 25/5-5 discovery within that license. Our work shows that the risked volumes in Mot are not economic as a standalone project. A dialogue between PL459 and Total Norge with a view to a joint development of Mot and 25/5-5 did not provide the assurances required to progress the project and the license was unanimously relinquished March 1st, 2010.

## Introduction

License PL459 comprises 33,2 km<sup>2</sup> within block 25/4. The license was awarded on 29th February 2008 for a 4 year initial period with a drill-or-drop decision after 2 years. Partners in the license are Wintershall Norge (Operator, 60%) and Bridge Energy (40%). The work program for the initial period was to reprocess 3D seismic and to carry out G&G studies. These have been fulfilled. The work focused on evaluation of the Mot prospect, however, the deeper stratigraphy was also investigated, and specifically the Jurassic, but no further prospects were identified. Two further Heimdal leads which were identified in the license application and lying between Heimdal and Mot were also evaluated, however volumes are uneconomic.

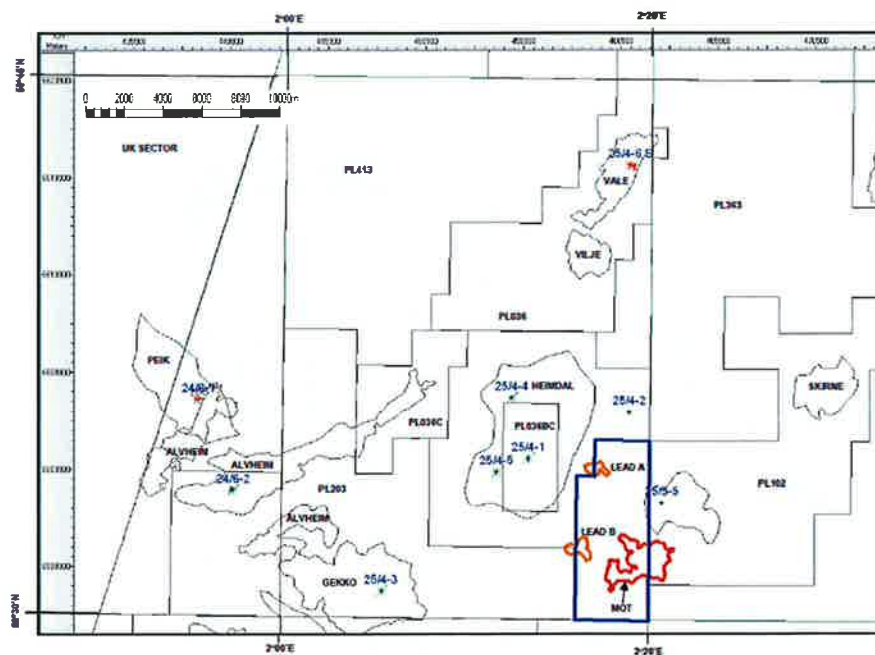


Figure 1 Mot prospect and two leads identified in the license area

## Prospects and leads

### Mot

The Mot prospect is a 4 way dip closure at Heimdal (Paleocene) level, straddling the boundary between PL459 and the Total Norge operated PL102. Approximately 50% of Mot lies within PL459. The target reservoir is the Heimdal Fm. The structure can be unambiguously mapped on the reprocessed 3D seismic, and is assumed to reflect the depositional geometry of a sand mound and/or differential compaction between the sandstone body and the surrounding less sandy envelope.

We have not identified a seismic amplitude anomaly associated with the Mot Prospect. This is analogous to the nearby 25/5-5 oil discovery where 334 m of Heimdal Fm was encountered, but no seismic anomaly is associated with these sands. Seismic modeling and fluid substitution predict that the brine case shall have a generally higher stack amplitude response than the hydrocarbon filled cases, although this has not been observed on the reprocessed seismic.

The Heimdal Fm. is a sand rich and laterally extensive deep-marine fan system with good reservoir quality in the nearby fields and discoveries; the 25/5-5 discovery, the Heimdal Field, and Alvheim. Sele Fm., Balder Fm. and Eocene shale are proven cap rocks in the area and assumed to be reliable also over the Mot Prospect.

Analysis of oil samples from the 25/5-5 discovery suggest a different source to the Heimdal field to the north-west. This observation is favorable for the charging of Mot as this alternative charge route places Mot on a 'fill and spill' path between the 25/5-5 discovery and mature source within the deeper basin to the west.

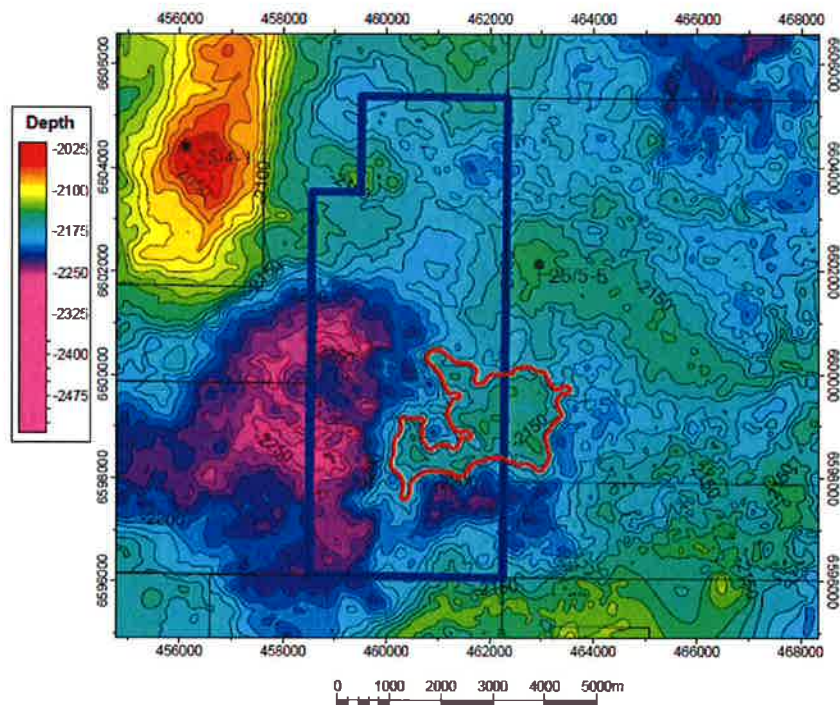


Figure 2 Top Heimdal depth map over Mot

## Work Program.

The main component of the work program was to reprocess 3D seismic over PL459. This required the merging of 3 vintage seismic data sets in order to properly image Mot. The seismic surveys used and the processing outline are shown in Fig. 3. The reprocessing was performed by ION GXT in London in Q2/3 2008. The data were reprocessed from field tapes via a pre stack time migration sequence. The merge was critical as Mot is located at the merge point of the 3 surveys. Figures 4 and 5 show the seismic quality over Mot prior to reprocessing. We were able to achieve a significant improvement in signal/noise through reprocessing, which confirmed the geometry and size of the structure. This was the primary objective of the reprocessing. We did not remove the ringing seen in Figures 4 and 5 and we do not understand the origin of this anomalous signal.

In addition to the seismic reprocessing, a rigorous petrophysical study of 10 Heimdal analogue wells in quad 25 was undertaken and carried out by Sintef.

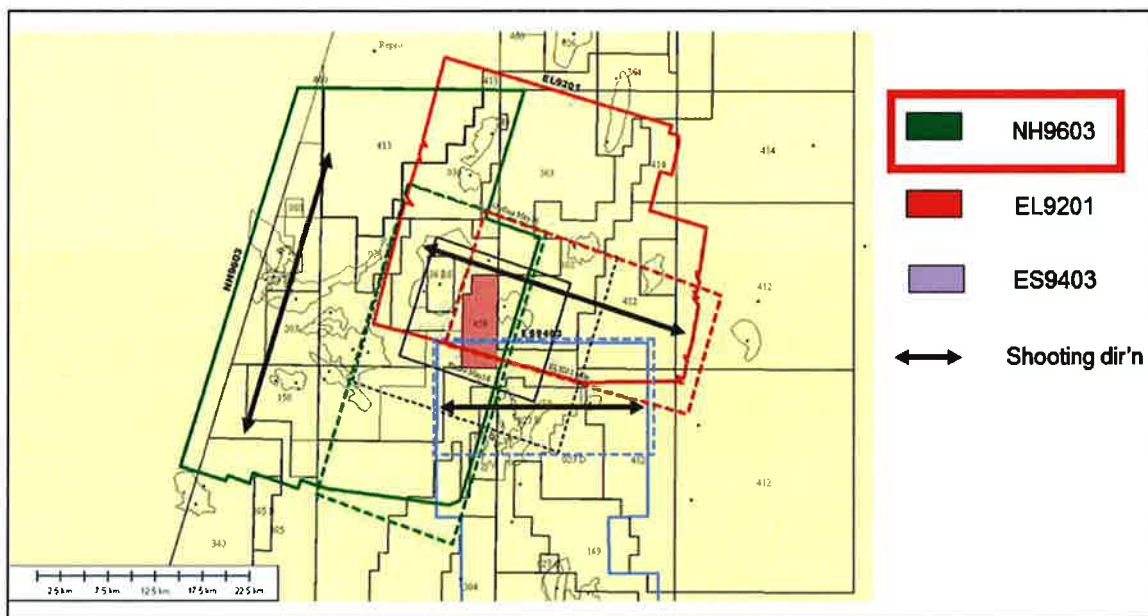


Figure 3 Seismic reprocessing outline

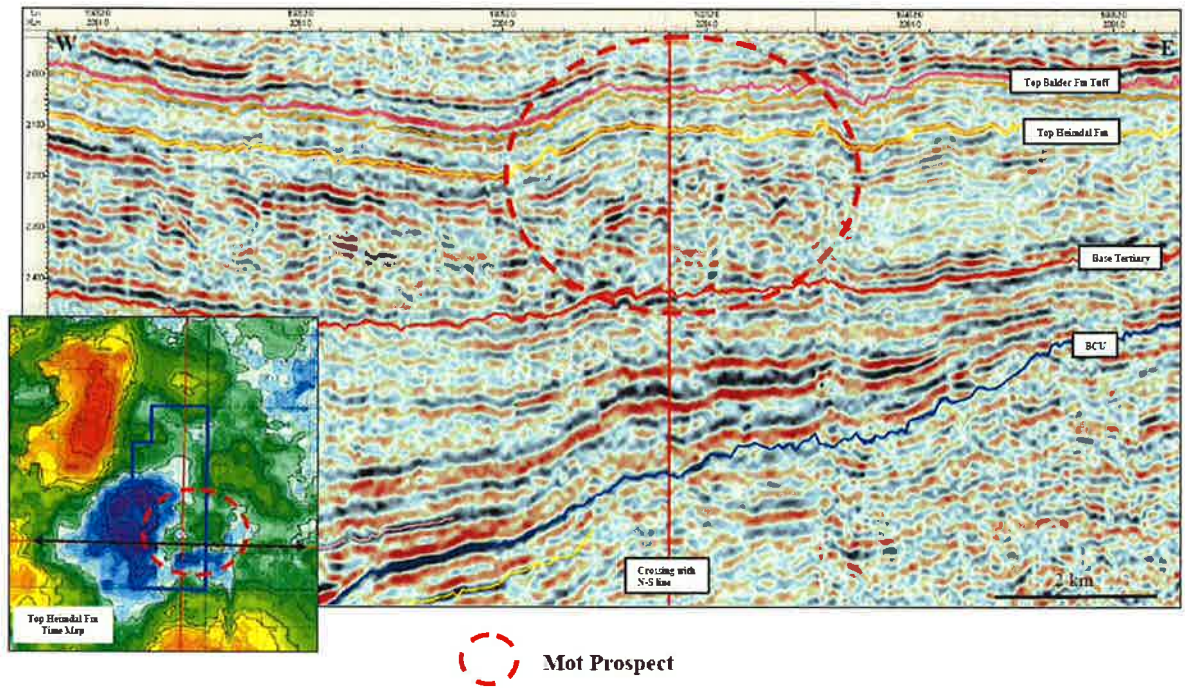


Figure 4 E\_W seismic intersection

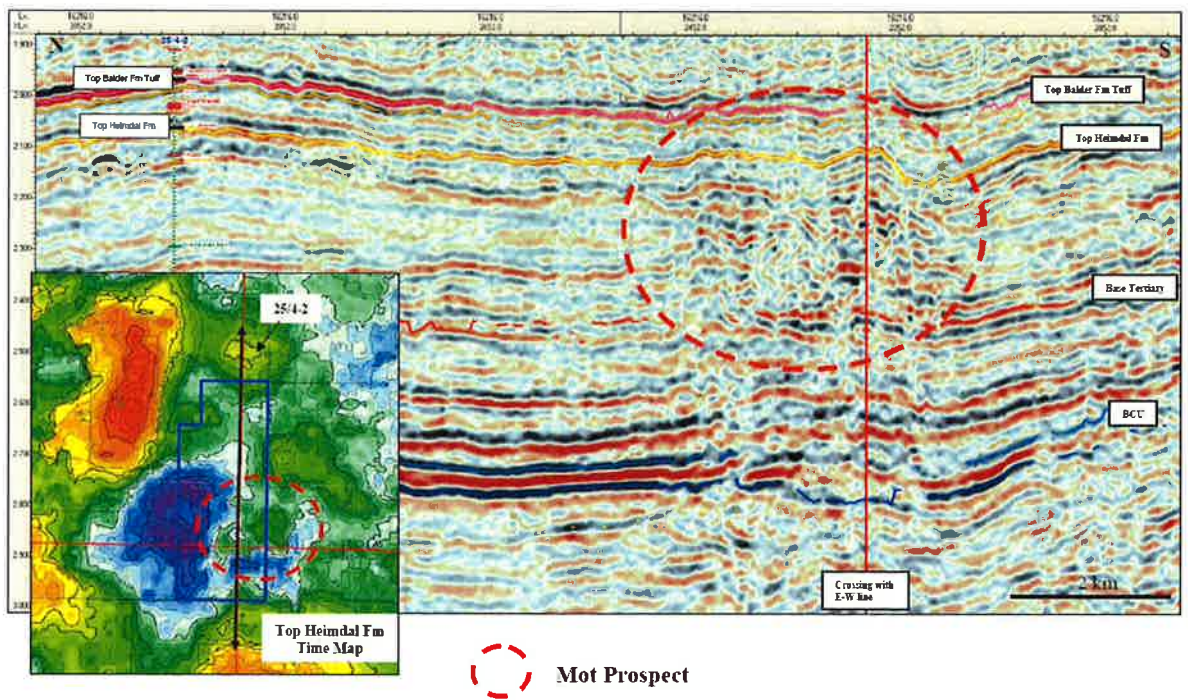


Figure 5 N\_S seismic intersection

## Reservoir Modeling

Since the economics of the prospect are so highly dependent on confirming sufficient hydrocarbon volumes for an economic development, a series of reservoir models were built for dynamic simulation in order to understand expected recoverability ranges.

The dominant control on recoverability was deemed to be N/G. Three scenarios were evaluated: analogue to the 25/5-5 discovery with heterogeneous sand distribution, a layered model, and a massive sand or 'tank' model.

Recovery factors from 7-27% were established for the 3 models using oil properties taken from the 25/5-5 discovery.

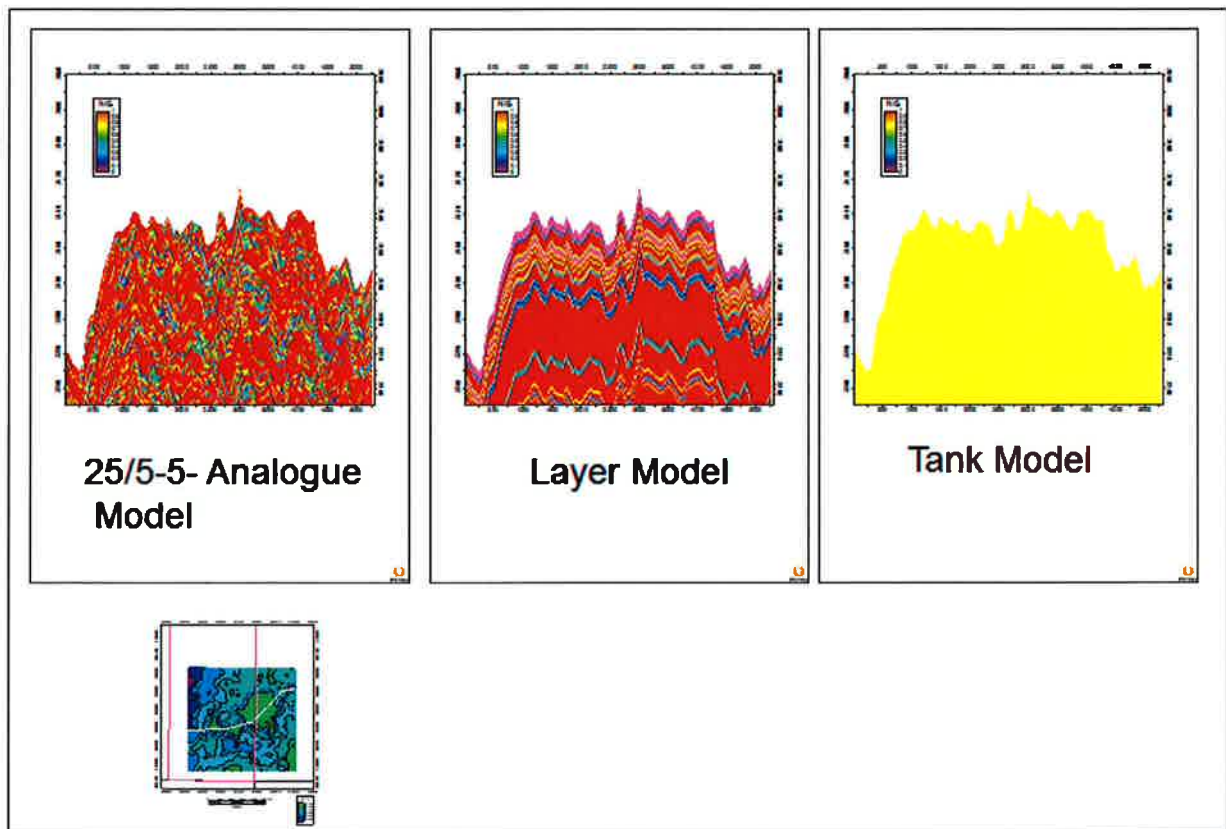


Figure 6 Distribution of N/G in the 3 simulation models

## Conclusions

The evaluation of license PL459 did not result in the hoped for upside in risked volumes. Following the seismic reprocessing the mapping of Mot was largely unchanged, and various depth conversion approaches did not indicate further upside potential.

In addition to the small volumes, a significant part of the prospect outline (>50%) is outside the license boundary and lies in PL102. Dialogue with the operator of PL102 did not indicate that the synergies needed for a joint development with the 25/5-5 discovery were present, and as a result the group chose to relinquish PL459.

**Table 1 Summary of recoverable volumes of oil in millions of cubic meters**

CASE	PL459	PL459 + PL102	Rec Factor %
25/5-5 analogue	0,3	0,9	12,5
Layered model	0,53	1,19	25,0
Tank	0,24	0,87	10,9