Lundin Norway

PL 546 Relinquishment Report

July 2015

Lundin Norway AS
Strandveien 50B, P.O. Box 247,
N-1326 Lysaker, Norway
Tel. +47 67 10 72 50
www.lundin-norway.no

Contents

1. Summary

The evaluation of PL 546 resulted in a prospect portfolio consisting of three leads with Upper Jurassic objectives. All leads have a high chance for seal failure (base and lateral) and migration is also considered high to very high risk. The partnership regarded the Torvastad (16/2-20S&A) the Kopervik (25/10-12S) wells as key wells to de-risk the PL546 leads. They did however not contribute to reduce the main risk factors and the decision to relinquish the license was made by the partnership on the 8th of May 2015.

2. Introduction

PL 546 is located in the central part of the North Sea on the prolific Utsira High. It comprises 418 km^2 of blocks 25/11 and 12. The license is located East-Southeast of the Grane Field and North of the Johan Sverdrup discovery (figure 1).

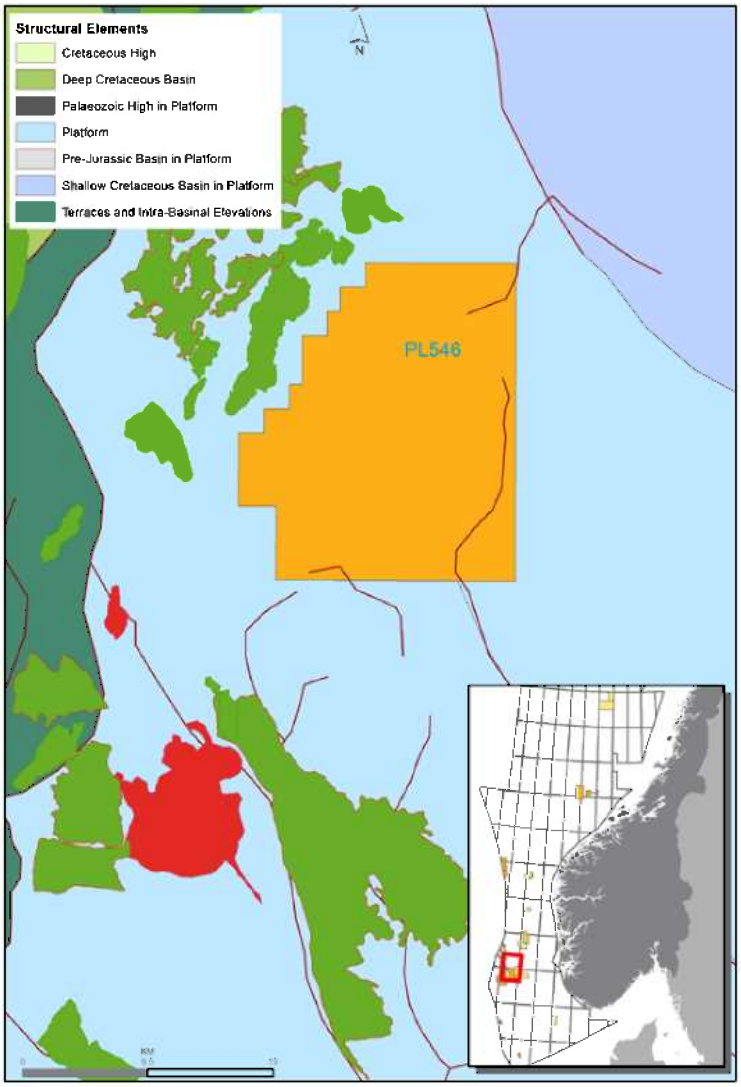

Figure 1: PL 546 location and main structural elements

3. License award, partnership and period extension

PL546 was awarded in APA 2009 on 19th February 2010 to Lundin (60% Operator) and Bayerngas (40%) with a 6 year initial license period. On 30th April 2014 Petrolia entered into the partnership with a 10% share transferred from Lundin.

The license group has applied for extension to the drill or drop decision (four times) such that the date for a decision to drill was 13th May 2015 at the time of relinquishment.

The APA 2009 application identified one main prospect named Misteltein as well as leads at Balder and pre Zechstien levels. The Misteltein prospect had been interpreted on mainly 2D seismic and its definition was very sensitive to depth conversion since the high velocity Shetland Gp increased significantly in thickness from East to West (hence the two alternative extents of the prospect on figure 2).

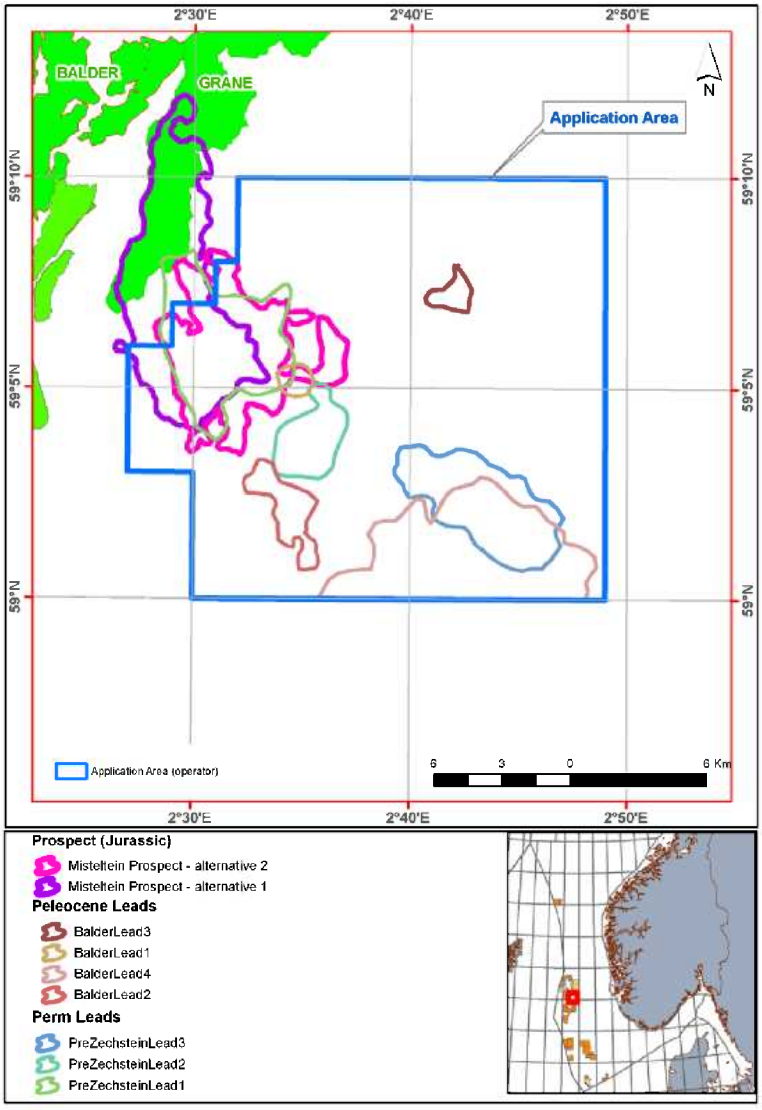

Figure 2: Prospectivity portfolio at application time from APA 2009

4. Completed work program and special studies

The work commitment for PL546 was to acquire 3D seismic data. This work commitment was fulfilled during 2010 by the acquisition of a 504 km^2 3D seismic survey LN1002. This survey was merged and processed with several existing 3D surveys in the area to provide a merged data set was named LN10M04 as shown in figure 3.

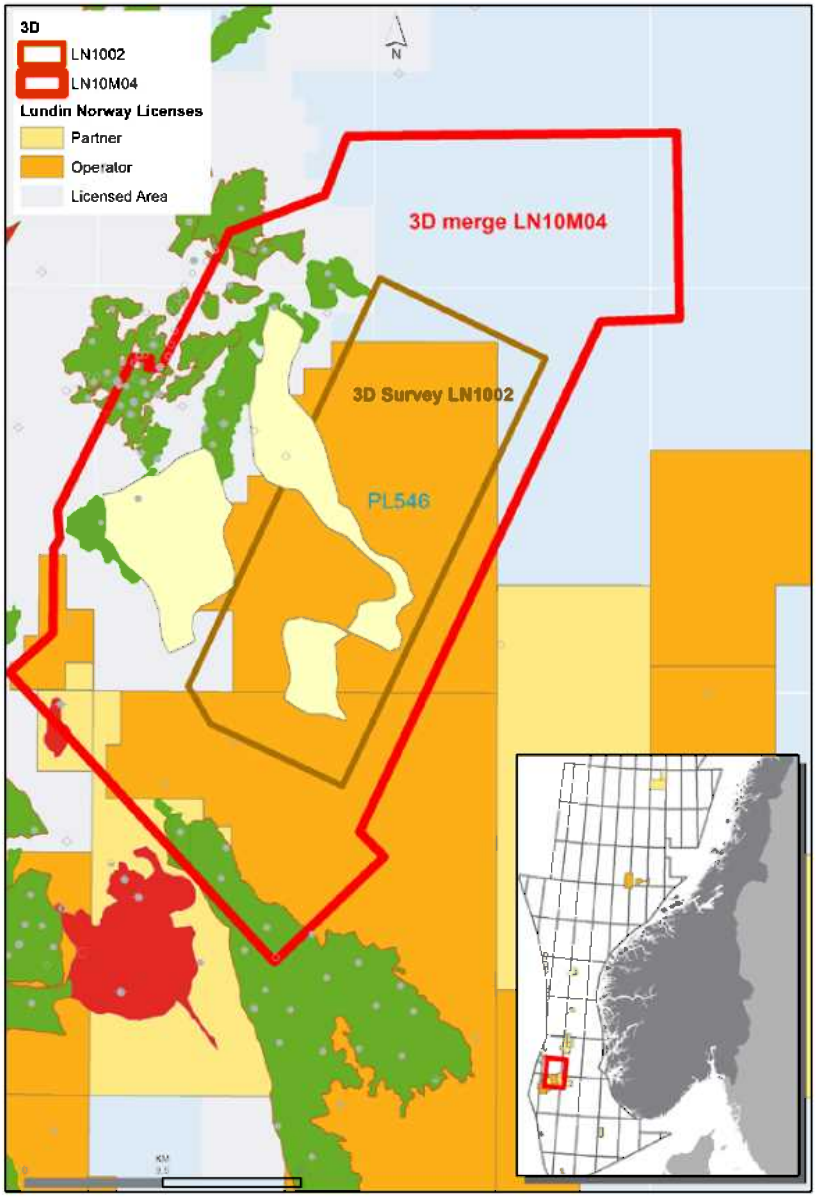

Figure 3: PL546 3D seismic coverage

In addition to the seismic commitment, special studies have been performed. These included oil population studies, basin modelling, sequence stratigraphy and several in-house seismic reprocessing efforts. The pre-Paleocene lithostratigraphy of the Utsira High is illustrated on figure 4.

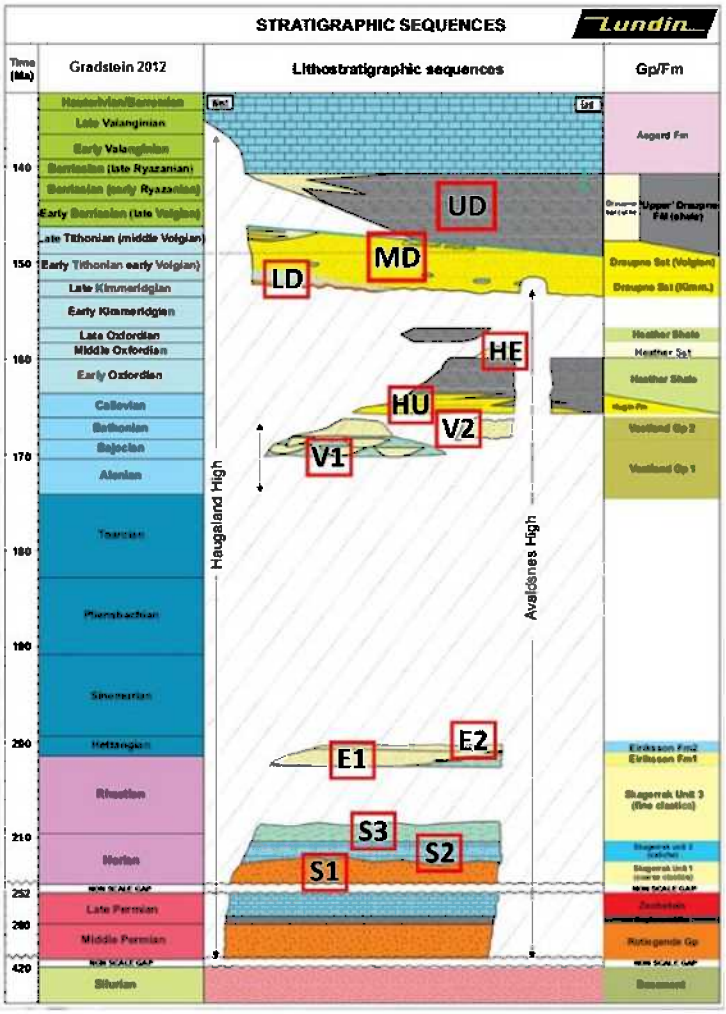

Figure 4: Lithostratigraphy of pre-Paleocene on the Southern part of the Utsira High.

5. Prospectivity evaluation

Following interpretation of the 3D seismic in the license, revised depth conversion based on the improved velocity data confirmed that the 25/11-17 well had been drilled very close to the apex of the high within PL546 so the Misteltein prospect was reduced to only a small 4-way closure and was no longer regarded as a valid trap. No closures or valid traps have been recognised in the shallower part of the stratigraphy.

Three leads were identified on the new 3D surveys (figure 5). They were interpreted as pinch-out traps of shallow marine sands of upper-middle Jurassic age (Draupne, Hugin and/or Sleipner Fms) which laps onto the Utsira High. Two of the leads (Eikje and Eikje North) are located on the eastern flank of the high, while the third (Romulus) are located centrally in the high, see figure 5.

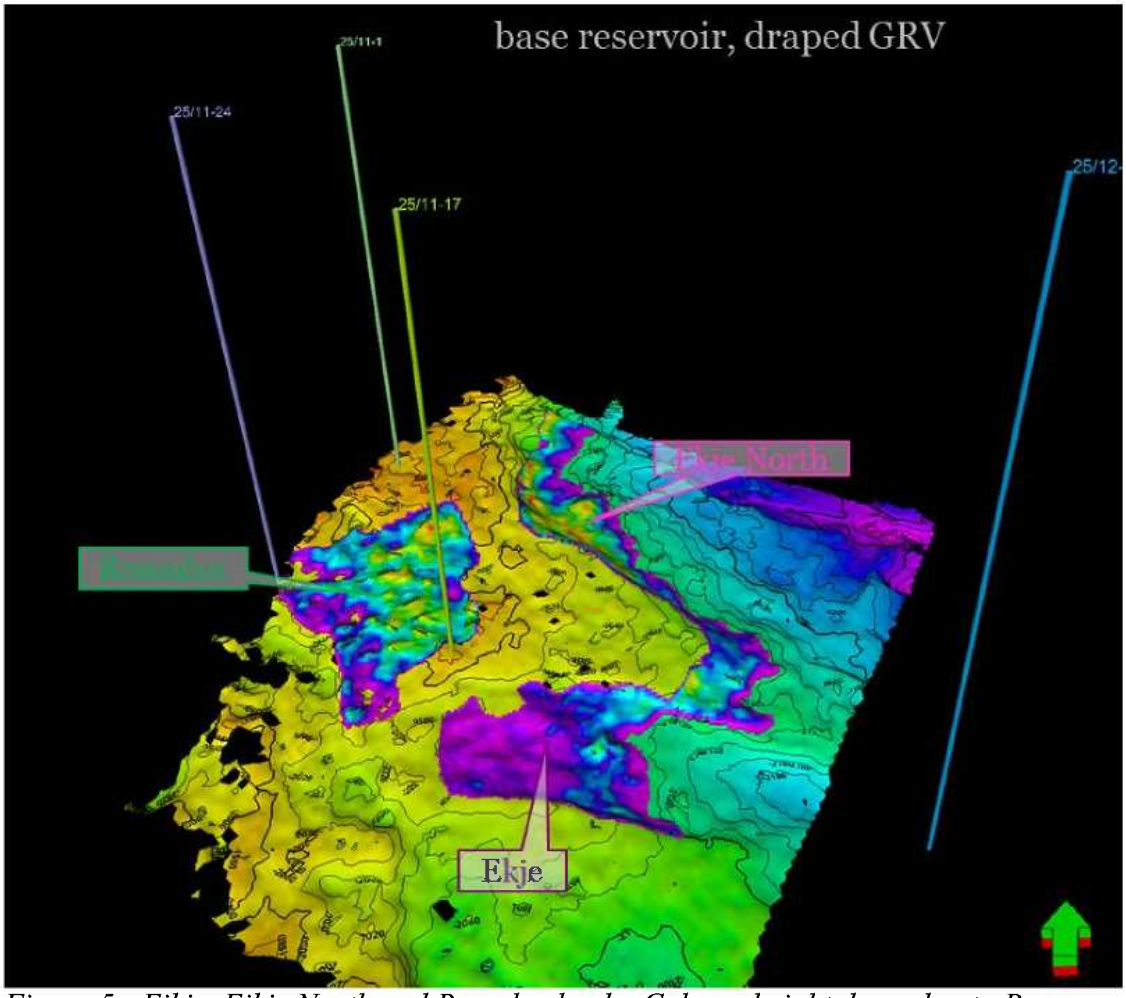

Figure 5: Eikje, Eikje North and Romulus leads; Column height draped onto Base reservoir surface

Eikje and Eikje North: These leads are recognised as stratigraphic traps in the interval between the BCU and top Statfjord (base gross reservoir) which thickens off the high into the Stord Basin to the east. Reservoir presence is regarded as very likely.

Base seal (into the underlying Stafjord Gp) has high risk. Lateral seal towards the south is necessary as the leads are located deeper than the oil-water-contact for the Johan Sverdrup discovery (apex about 100m deeper).

Different possible migration paths have been evaluated. The basin to the East (the Stord Basin) is modelled to be immature so hydrocarbons would have to migrate long-distance from Viking Graben (to the west) around or through the basement high in order to fill the Eikje and Eikje North traps – which are as a consequence considered to have a low chance of migration.

The Romulus Lead is interpreted as possible upper Jurassic sand between wells 25/11-17 and 25/11-24 on the high. Wells 24/11-17 had a 10m Draupne Fm shale resting unconformably on Statfjord Gp sediments. The well is dry with HC shows. Four meter oil-filled Draupne Fm sand is present in well 25/11-24 and Romulus is interpreted as a possible thickening of this interval away from the well. Note that the quality of the seismic data is moderate and the resolution limited, thus the interpretation of this reservoir thickening is uncertain and partly model based. The majority of the Romulus

GRV is located outside PL546 (figure 6). Highest risk is associated with presence of reservoir and with base seal (Statfjord Fm).

GRV distributions are shown in figure 6. The GRV distributions are made assuming that Eikje and Eikje North are filled down to 2100mSS and that Romulus spills across a southward spill at 2000mSS. A seismic line across the leads is shown in figure 7.

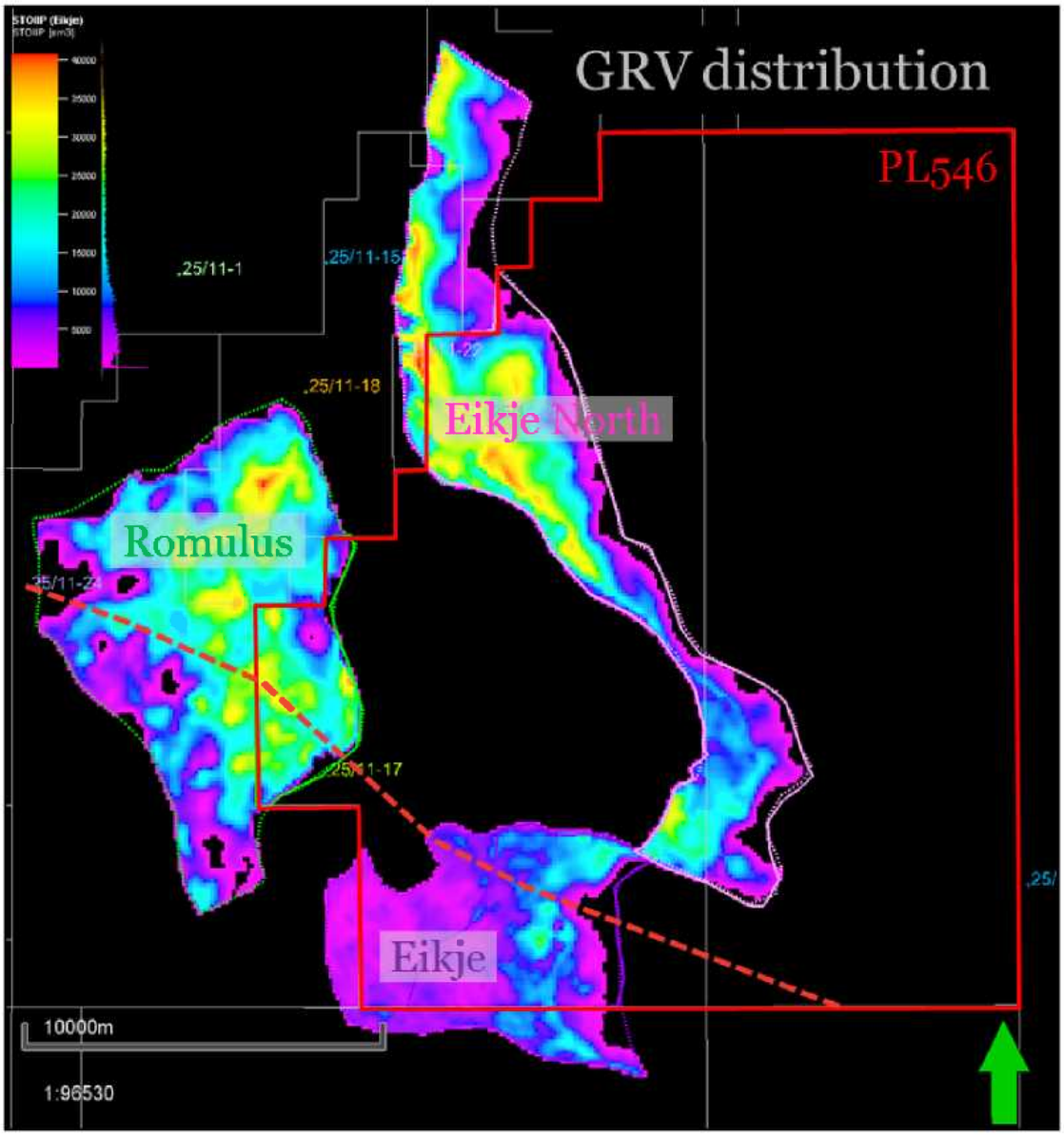

Figure 6: GRV for the leads within a hydrocarbon fill down to 2100mSS. The red dotted line is the line location for the seismic arbitrary line shown in figure 6.

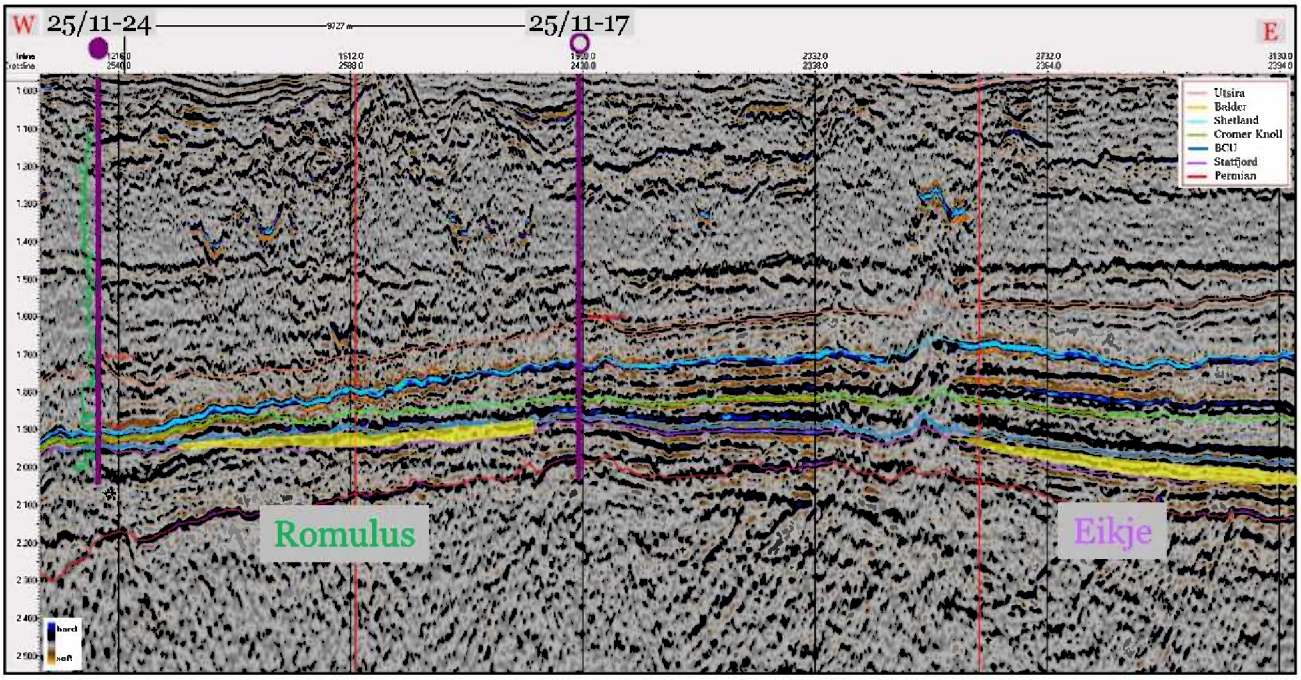

Figure 7: Seismic cross section through the Romulus and Eikje leads.

6. Conclusion

PL546 is located in a very prolific part of the Norwegian continental shelf with recent discoveries in the Mesozoic succession, such as Edward Grieg and Johan Sverdrup. Stratigraphic traps have been identified with upper Jurassic clastics as likely reservoir rocks with good to very good properties if present. The Eikje and Eikje North leads are located east of the Utsira high and consequently have high risk on migration and both base and lateral seal. Approximately 80% of the GRV of the Romulus lead lies outside PL546; Reservoir presence and base seal have the highest risks.

As a consequence, none of the leads in PL546 have been matured to drillable prospects and the licence was relinquished on May 11th 2015.