



PremierOil

PL725 Relinquishment Report

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2	2016-01-29	Final	Edits and QC		

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1. LICENSE HISTORY

PL726 was awarded to Premier Oil (Operator - 50%), Fortis Petroleum Norway (30%), and Petoro (20%) on February 7th, 2014 as part of the APA2013. The licence commitments were to reprocess seismic and make a drill-or-drop (DoD) decision by February 7th, 2016. The seismic reprocessing has been completed.

During the licence period four EC/MC meetings were held.

Following an evaluation of the prospectivity in the licence acreage the partnership concluded that, despite several promising leads, a lack of significant hydrocarbon generation meant it was not possible to mature a material opportunity in this area. A unanimous drop decision was therefore taken by the partnership in January 2016.

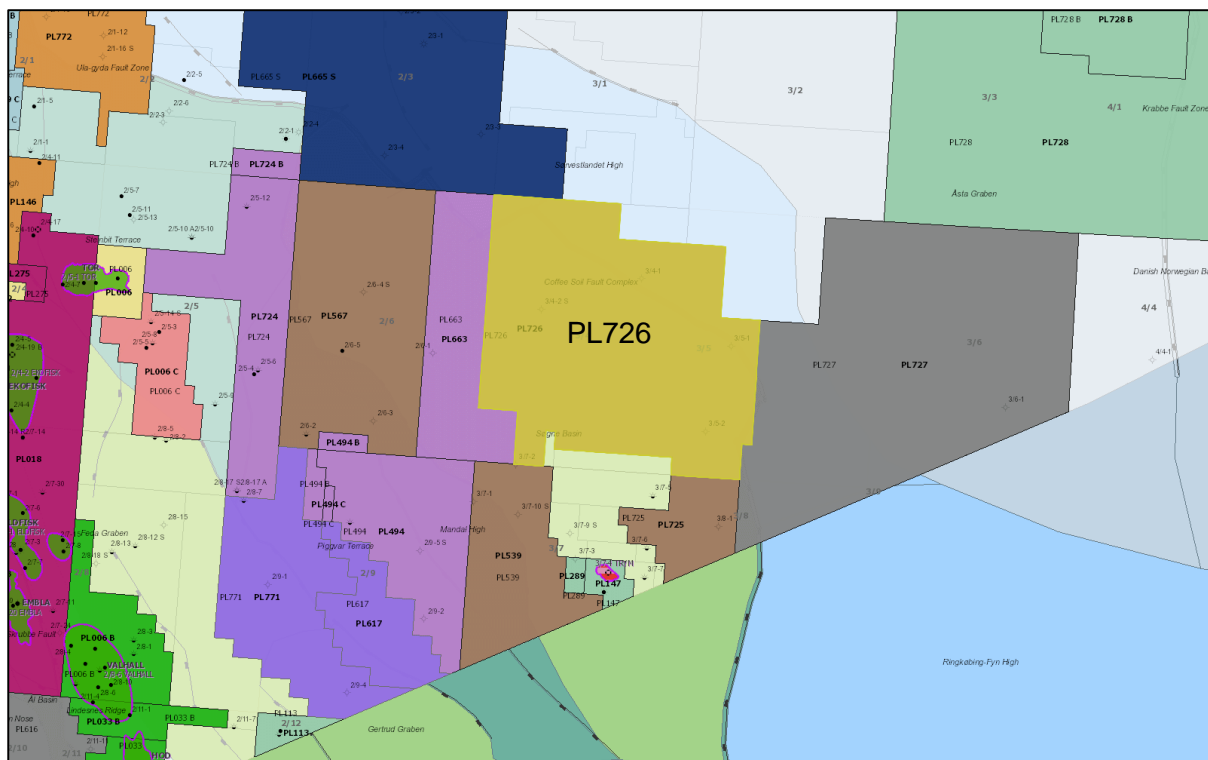


Figure 1. Map showing location of PL726 with the nearest fields & wells.

2. DATABASE

The seismic database for the licence at time of application consisted of 3D seismic surveys including the multiclient PGS Geostreamer MC3D-CGR2010 and 2011 surveys as well as the DNO0601R08 survey. The partnership licensed 610 km² of PGS reprocessed 3D Geostreamer seismic data, MC3D-CGR2013, to satisfy the seismic reprocessing commitment. The CGR2013 represents a significant uplift on both the original MC3D-CGR2010, and first reprocessing vintage in 2011, with broadband products in both time and depth. The quality of the seismic data is considered to be good but does not cover the licence in its entirety. In order to complete the interpretation across the northwestern section of the licence, the DNO0601R08 survey was used. After application of structurally-oriented filtering, it was noted that, although the DNO survey is of good quality, it is not quite as good as the broadband CGR2013RM dataset.

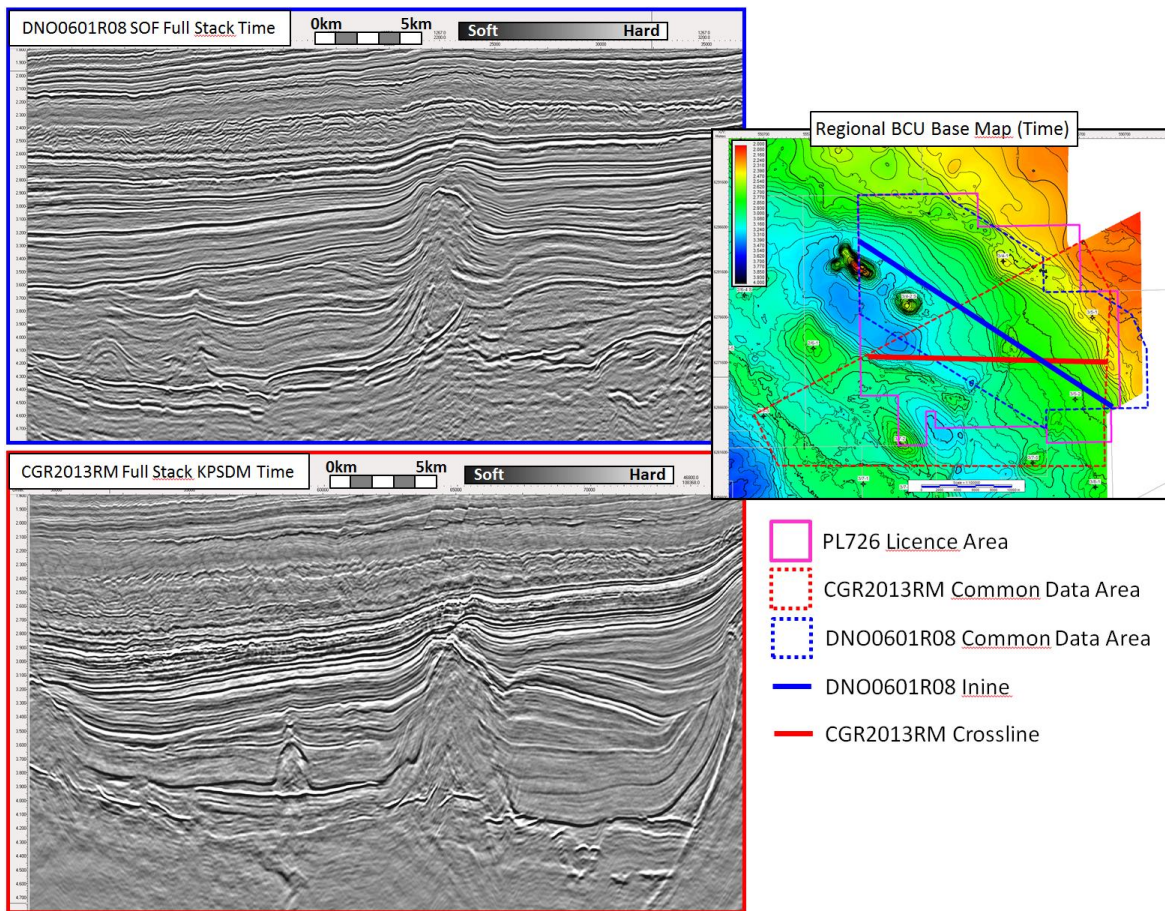


Figure 2. A comparison between the DNO0601R08 (top-left) and CGR2013RM (bottom-left) data quality. Inset map shows data areas and locations of lines of section.

The Søgne Basin has 14 well penetrations in the Norwegian and 19 penetrations in the Danish sectors of the basin. A common well database was established by the partnership during the first ECMC meeting and included the following wells.

3/4-1	3/7-5
3/4-2S	2/6-4S
3/5-1	2/6-1
3/5-2	3/7-4
3/7-2	W Lulu-3

3. REVIEW OF GEOLOGICAL FRAMEWORK

Two stratigraphic intervals were highly ranked at the time of the application.

The Middle Jurassic comprises fluvially-dominated coastal plain deposits overlain by estuarine, back-barrier and sandy shoreface deposits, sealed by the Upper Jurassic shales and charged by Middle Jurassic lacustrine shales and coals. Traps are dip-closed structures related to faulting, inversion and salt movement and reliant on cross fault seals. For the main Middle Jurassic structures in PL726, charge and migration are considered to be the major risks.

The Upper Jurassic shallow and deep marine (turbidites), likely charged and sealed by Upper Jurassic Mandal Formation or by Lower Cretaceous mudstones. Trapping mechanism is heavily reliant on stratigraphic pinch-out or truncation. At the time of application, the principal risk was believed to be retention. Although this is still considered to be a major risk, basin modelling suggests that charge is also one of the major risks in the licence.

The PL726 partnership has in cooperation with other joint ventures in the area undertaken six major studies to better understand the hydrocarbon potential within PL726 and neighbouring areas. Geological studies included biostratigraphy, geochemistry, fluid inclusion analysis, sedimentology and petroleum systems modelling. All of these studies contributed to building a comprehensive understanding of the area.

Petroleum system modelling indicates that the Bryne is early-mature to mature throughout most of the licence area. Even so, expulsion is generally low due to the moderate temperatures within the basin at source depths. Accordingly, spider diagrams show very little accumulation in any of the structural leads, with only Grjortgard receiving enough charge to be interesting. For upper Jurassic source rocks the situation is somewhat better however it is still be concluded that, in general, the traps that are most-likely to be charged are those that are closest to the source kitchens. And even those that are, are most likely underfilled.

To help further our understanding of hydrocarbon presence and migration in the basin, Fluid Inclusion Technologies of Tulsa, Oklahoma carried out a study on 5 wells (2/6-4S, 3/4-1, 3/5-2, 3/7-2, and 3/7-3) in the Søgne Basin. They note evidence of petroleum inclusions in both Upper and Middle Jurassic stratigraphy in the licence area. The study also suggests appreciable gas-prone and marginal oil-prone kerogen in the Middle Jurassic. In addition, there was also oil-prone kerogen in the Upper Jurassic. The low abundance of inclusions in the work suggests possible hydrocarbon migration in the system.

4. PROSPECT UPDATE

The main prospects as described in the APA document were Haagenti and Grjortgard in the Middle Jurassic. However, the licence also contains a number of other leads in the Middle Jurassic through Cretaceous that were identified by both Premier and Fortis (Figure 3).

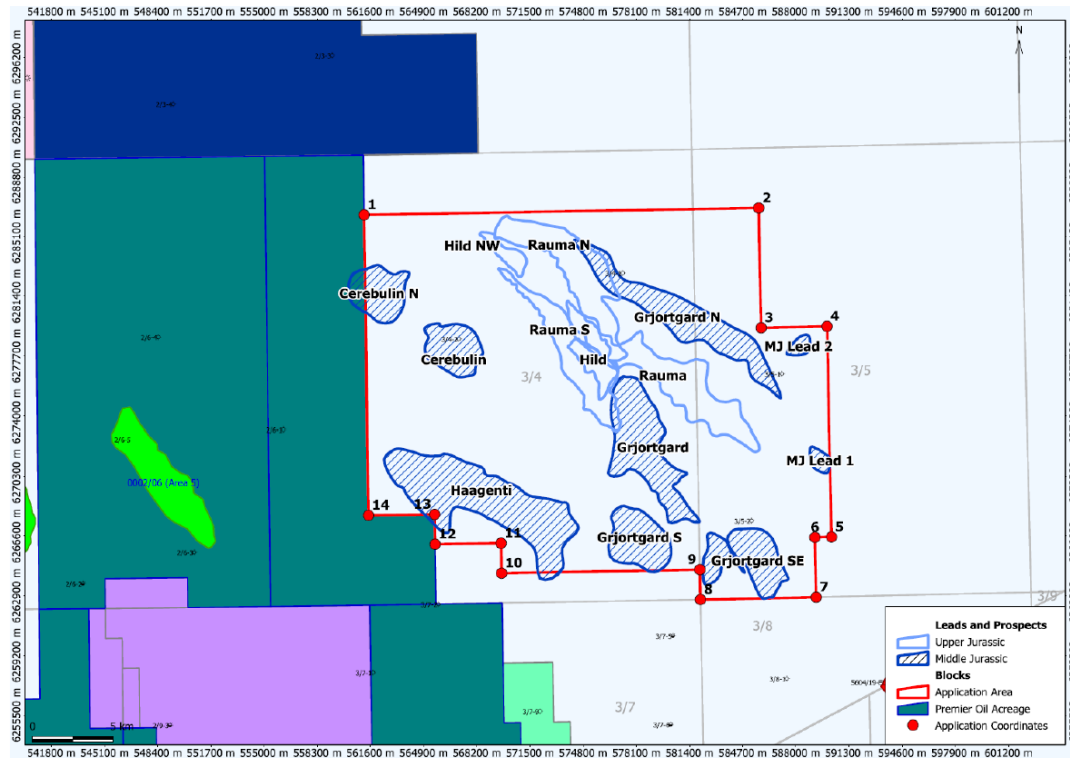


Figure 3. Leads identified in the PL726 licence area. Note that Cerebulin N is the same lead (although Jurassic instead of L. Cretaceous) as Brudekrona.

Haagenti

The Haagenti structure sits in the SW corner of the awarded area and can be described as a salt-cored structural lead with a requirement for Middle Jurassic pinchout towards the west. Three separate segments are identified, each with their own trapping geometries. Source and reservoir at Haagenti are both suggested to be Middle Jurassic while the seal relies on a combination of Lower Cretaceous, Upper Jurassic, and, in some areas, chalk. Post-award seismic interpretation indicates that the structure is more heavily faulted than initially appreciated and that this reduces GRV considerably. The Ph for each of the segments is considered to be low, ranging from 11-19%, with migration and seal being the main risks.

Grjortgard

The Grjortgard lead, which is located just to the west of the Coffee Soil Fault, is also a salt-cored structural lead with Middle Jurassic potential. In the minimum case, closure is 4-way but faults become important lateral seals as the GRV increases. The upper seal is suggested to be Upper Jurassic shales. In addition to providing the seal, it is also suggested that Upper Jurassic turbiditic facies (sourced from the east) may also be found in the overlying Upper Jurassic. The main risks at Grjortgard are reservoir presence at the crest of the structure and complicated sealing elements. In any case, potential volumes are considered to be small (and not economically interesting) with a mean HC recoverable of 15mmboe (oil case).

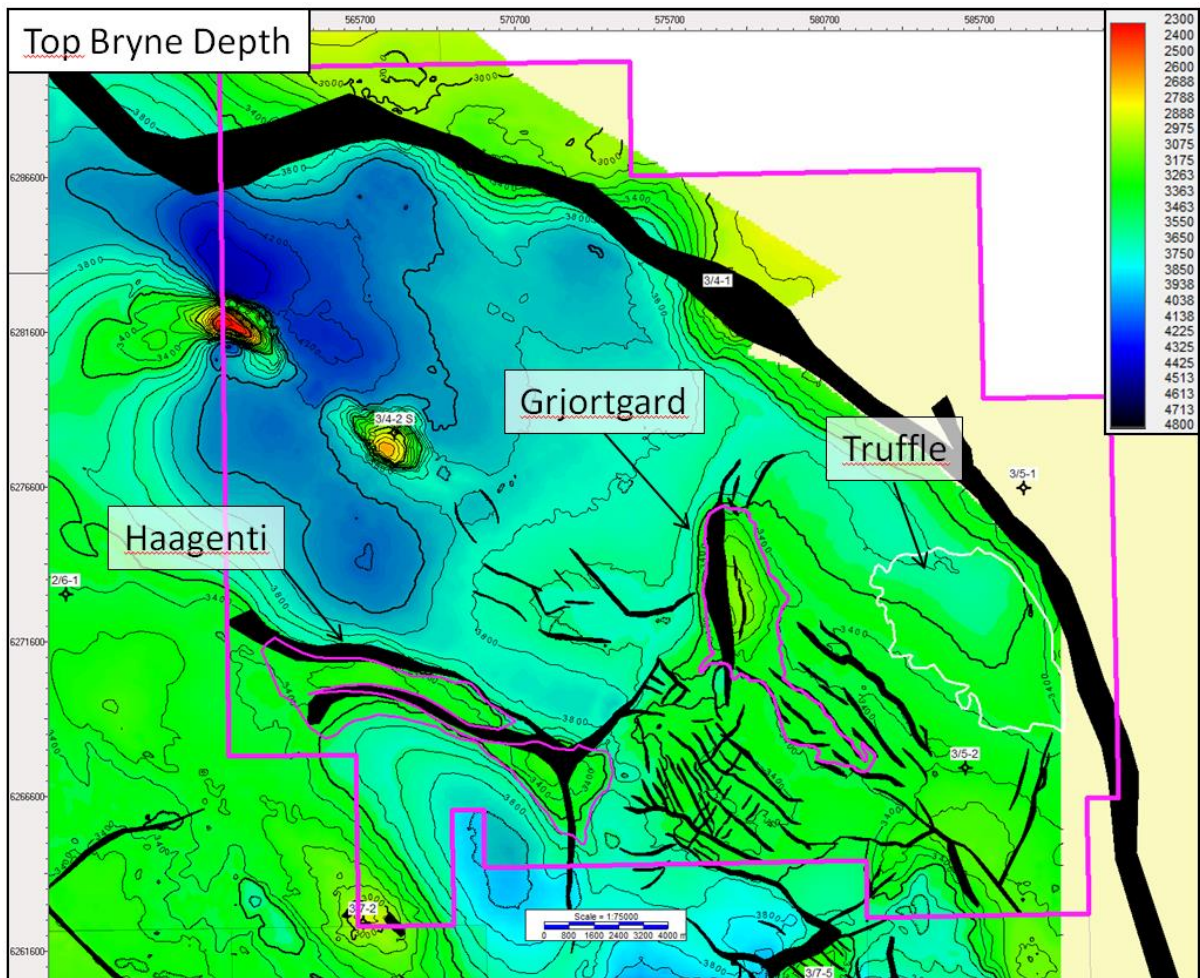


Figure 4. Top Bryne depth map showing location of Haagenti, Grjortgard, and Truffle leads.

Truffle

Between the southern extent of the Grjortgard structure and the Coffee Soil Fault lies the Truffle Upper/Middle Jurassic stratigraphic lead. Truffle has a fan-shaped appearance in both shape and isochor thickness and is presumed to be comprised of turbiditic facies sourced from the Sørvestlandet High to the east. Due to the geometry of the lead (climbs distally), it begins to fill from the distal (presumably poor quality) end of the fan. This means that the lead is best (in terms of average reservoir properties) when the deepest part of it fills. Given that the nearby 3/5-2 tests (dry) sands in both the Upper and Middle Jurassic that may extend into the lead, it is concluded that we either have inadequate/no local HC generation and/or a faulty seal. So, although, recoverable volumes (mean of 16mmboe) are similar to Grjortgard the risk is high due to the negative results at 3/5-2.

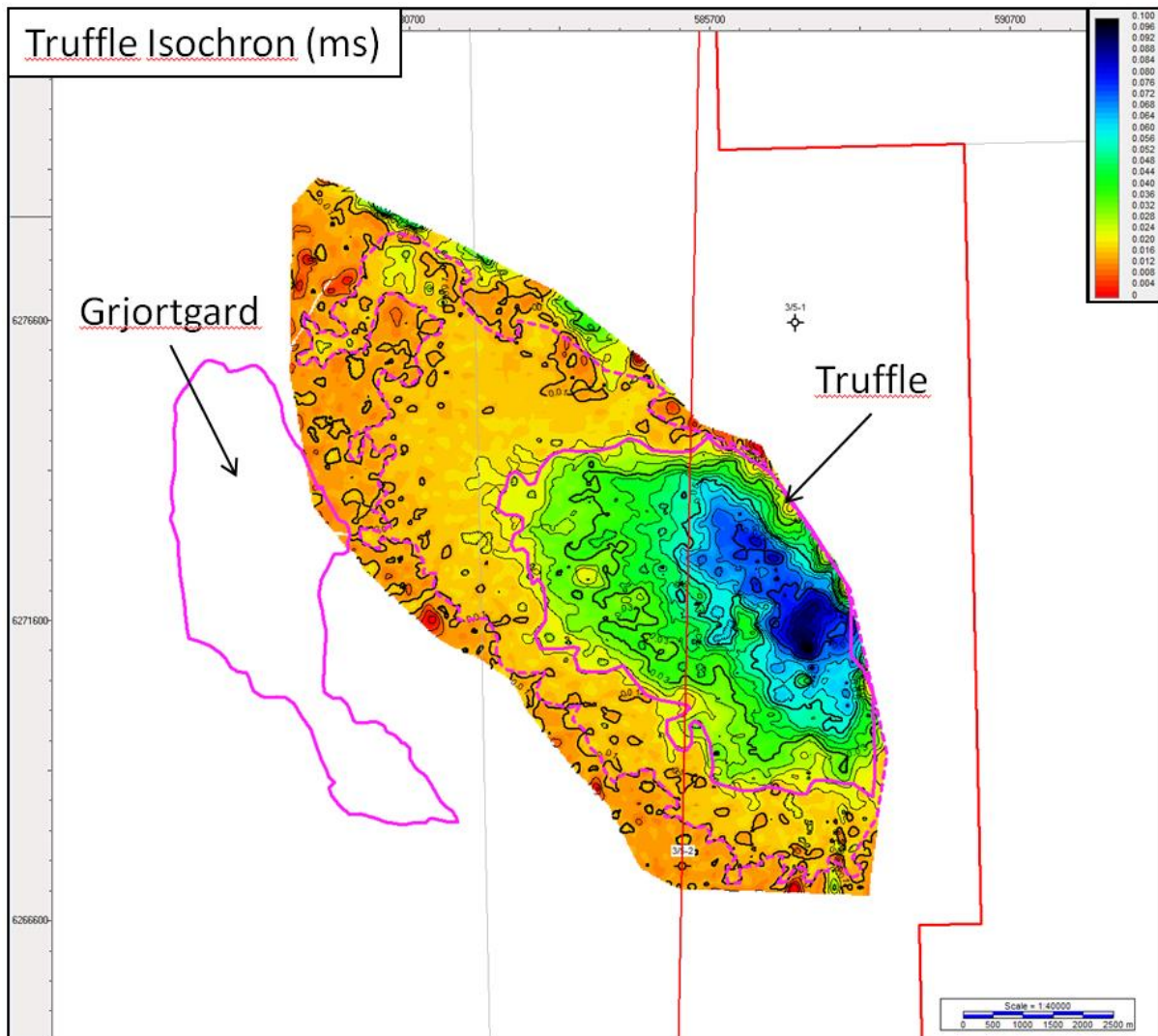


Figure 5. An isochron of the Truffle feature shows a thick, lobe-like feature coming off the Coffee Soil Fault. Note that the structural high is on the distal, western side of the lobe.

Brudekrona & Ulvehalen

Located in the NW section of PL726 are two salt-cored structures which have been considered as potentially prospective. Although the DNO0601R08 survey on which these structures are imaged is generally of good quality, it suffers due to poor imaging at the flanks of salt features. As a result, there is a large uncertainty in the interpretation of potential flank traps in the Jurassic section. Additionally, only about one half of the Brudekrona structure is covered by 3D data which further challenges the interpretation. During the Cretaceous we note the creation of accommodation space to the NE of the salt structures which could have been filled by sands sourced from the Sørvestlandet High. Detailed mapping, however, indicates that structural trapping components are small and that the stratigraphic upside is extremely risky. Gas chimneys above Brudekrona and possibly Ulvehalen suggest that there may be a working petroleum system (if the gas is sourced from depth). Since this appears to be associated with fault leaks, any related traps are considered to be of low integrity. As such, the leads related to these two salt features are considered non-prospective.

Other Prospectivity

During the application work a number of other structural and stratigraphic leads were identified in the Middle and Upper Jurassic. Those in the Upper Jurassic section (Rauma and Hild) are

stratigraphic based on the concept of turbidites from the Sørvestlandet high. These subtle (if not transparent) features are challenging to interpret and are thought to carry similar risks as Truffle.

As a result of the work programme, prospects identified during the licensing round have been downgraded to leads. Without any material volumes are currently attached to these leads; as such the partnership sees no prospectivity remaining within this license area.

Volumes and Risks

A summary of the prospective volumes is given in the table below. With the exception of Grjortgard, the chance of finding hydrocarbons (Ph) is less than 20% and, in all cases, mean recoverable volumes are less than minimum economic size for even a subsea tieback solution.

Table 1. Volumetrics and risks for main leads within the PL726 licence area.

Lead Name	Recoverable (mmboe) P90/P50/P10 (Mean)	Ph	Main Risk
Haagenti West	1/9/35 (14)	18%	Migration & Seal
Haagenti SoW	1/3/7 (4)	11%	Migration
Haagenti East	1/6/21 (9)	19%	Migration
Grjortgard	1/9/36 (15)	32%	Reservoir Presence & Seal
Truffle	0.3/4/50 (16)	19%	Seal
Brudekrona	2/16/58 (24)	19%	Seal (gas above structure)

5. TECHNICAL EVALUATIONS

Economics have been run on the main leads in the licence assuming a tie-back to the 3/7-10S P50 case. In all runs, except for Grjortgard, NPV is negative and the reality now, with 3/7-10S coming in dry, is that Grjortgard also becomes negative NPV.

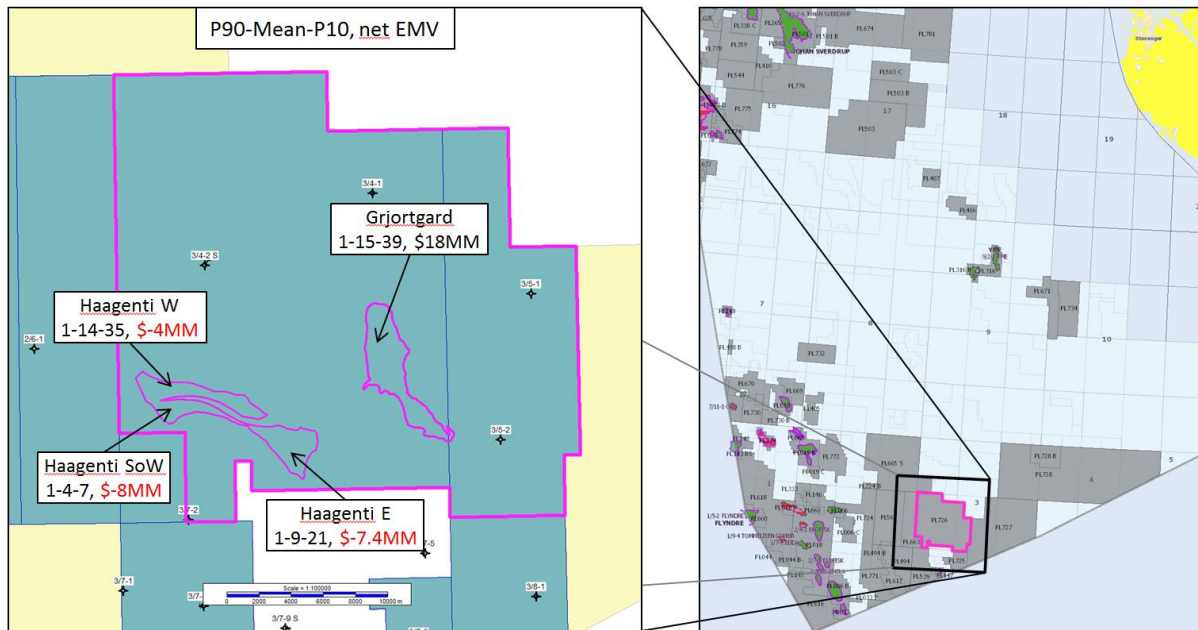


Figure 6. The economics of the two main leads were tested with the results shown on the left-hand panel.

Other leads identified during the round, and subsequent concepts were not possible to mature into viable prospects due to a combination of few robust structural trapping configurations and low confidence of lithological predictions to constrain stratigraphic trapping mechanisms. The partnership does not view consider there to be any viable prospectivity remaining on this license.

6. CONCLUSIONS

The operator and partners in the PL726 licence group have completed their regional and licence-level studies.

Thorough seismic interpretation since the award of the licence in 2014 provides a better structural understanding of the leads on the licence. The two main leads are now understood to be, structurally, more complex than originally thought. Consequently, volumetric analyses show them to have a much lower recoverable volume than was presented in the application document.

A modelling of the petroleum system has shown that the area of the Søgne thought to be sourcing potential leads in PL726, is early-mature to mature at best. As a result, the volume of hydrocarbons is likely insufficient to fill any of the structures to economic levels.

Although sedimentological and biostratigraphic studies indicate that there is a high-probability of sands at the target levels, CRS mapping and fluid inclusion studies suggest that, even though hydrocarbons appear to have migrated through the system, it is unlikely that there are any significant accumulations.

The technical and economical evaluation of PL725 has failed to mature any material prospectivity and a decision not to drill a well on the license was unanimously taken by the partnership.