1. Key License History

This report summarizes the technical evaluation completed on Norwegian offshore licenses PL462 S awarded to *Nexen Norge AS* (Operator-*40%), Wintershall Norge AS (30%) and Aker Exploration Norge AS (later Det norske oljeselskap ASA 30%).* The PL462 S license was awarded to the partnership on February 29rd, 2008, applicable to all levels below the Top Cretaceous Unfonormity. The license (821.181 km²) is located within the blocks 29/3, 29/6, 30/1, 30/2 and 30/4 south of the Kvitebjørn-Valemon fields in the North Viking Graben (Figure1).

The license was held on a drill/drop basis 3 year evaluation period, expiring on February 28th, 2011. The initial work obligations within 3 years from award were to a) acquire 3D seismic data over the license area, b) conduct relevant geological studies, and c) conclude the drill or drop decision. A new 834 km^2 3D survey (NX0803) was acquired from August through September 2008, and completed with two 3D surveys NX0901 (1204 km2) and NX0902 (184 km2) acquired June-July 2009 (see Figure1 for outlines). These three data sets were in 2010 merged into one seismic survey (NX10M02) which was the primary seismic dataset that was used to evaluate the hydrocarbon potential on the license block (Hamilton 2010). One comprehensive geological study was completed during the evaluation period which addressed the reservoir quality assessment of deep Jurassic reservoirs (Mortimer *et al*, 2010).

The partnership met on a regular basis to discuss the technical and business aspects of the license blocks. A summary of these meetings and workshops that were held are listed in Table 1.

Table 1**. Partnership meeting summary**

Number	Date	Meeting Type	General Meeting Summary
1	14/3/2008	MC/EC	Establishment of license, budget and work program
2	12/12/2008	MC/EC	Seismic acquisition and processing review, License Budgets
3	13/3/2009	MC/EC	Integration of PL462 S and PL508 S work program
4	4/12/2009	MC/EC	Status G&G, budgets and work program
5	16/12/2010	MC/EC	Prospect key risks, Drill Recommendation, License Budgets

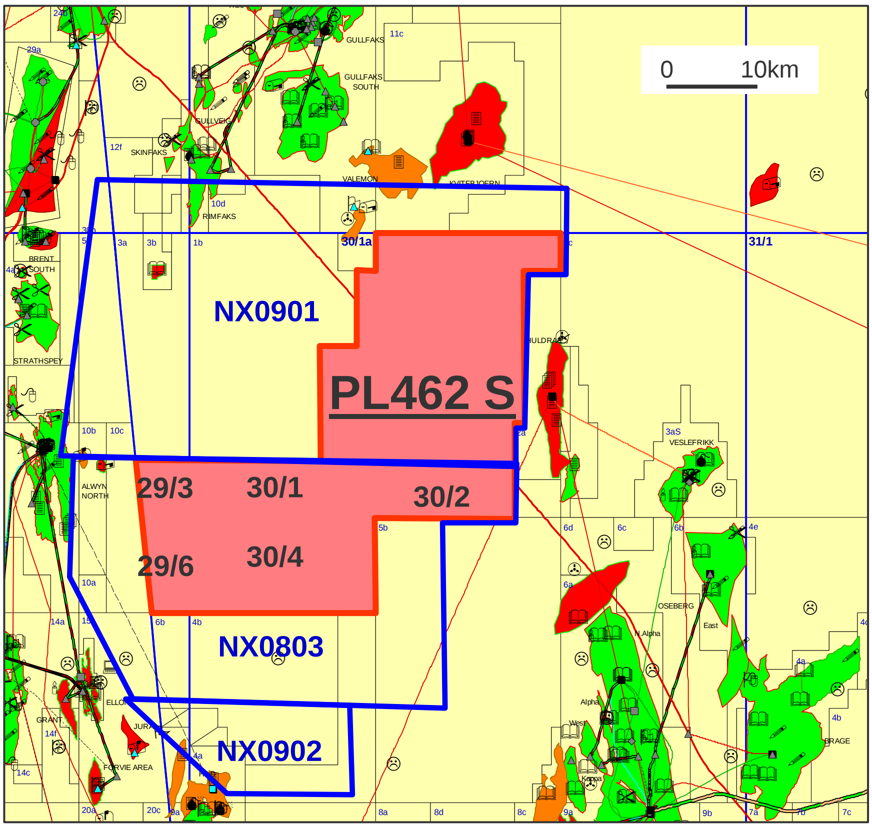

Figure1 PL462 S area basemap (red) including block lines, discoveries and seismic coverage (blue).

Interpretation of the 3D seismic cube NX10M02, resulted in several Mid-Jurassic prospects, where Orkla, downfaulted from Valemon, turned out to be the largest. However, severe risk on containment, reservoir compartmentalization and reservoir quality caused the partnership to agree upon relinquishment.

2. Database

2.1. Seismic Acquisition and Processing

The primary geophysical control used in the license was the proprietary 3D survey NX10M02. The survey covers 2210 km² and the water depths range from 120 to 160 m. The primary target zone was the Middle Jurassic Brent Group section located near 4 seconds. The survey was acquired by the Geco Triton vessel between August and September 2008 and by CGG's Geo Challenger during June-July 2009, subsequently processed by WesternGeco in Stavanger and Geotrace in Woking UK (Hamilton, 2010).

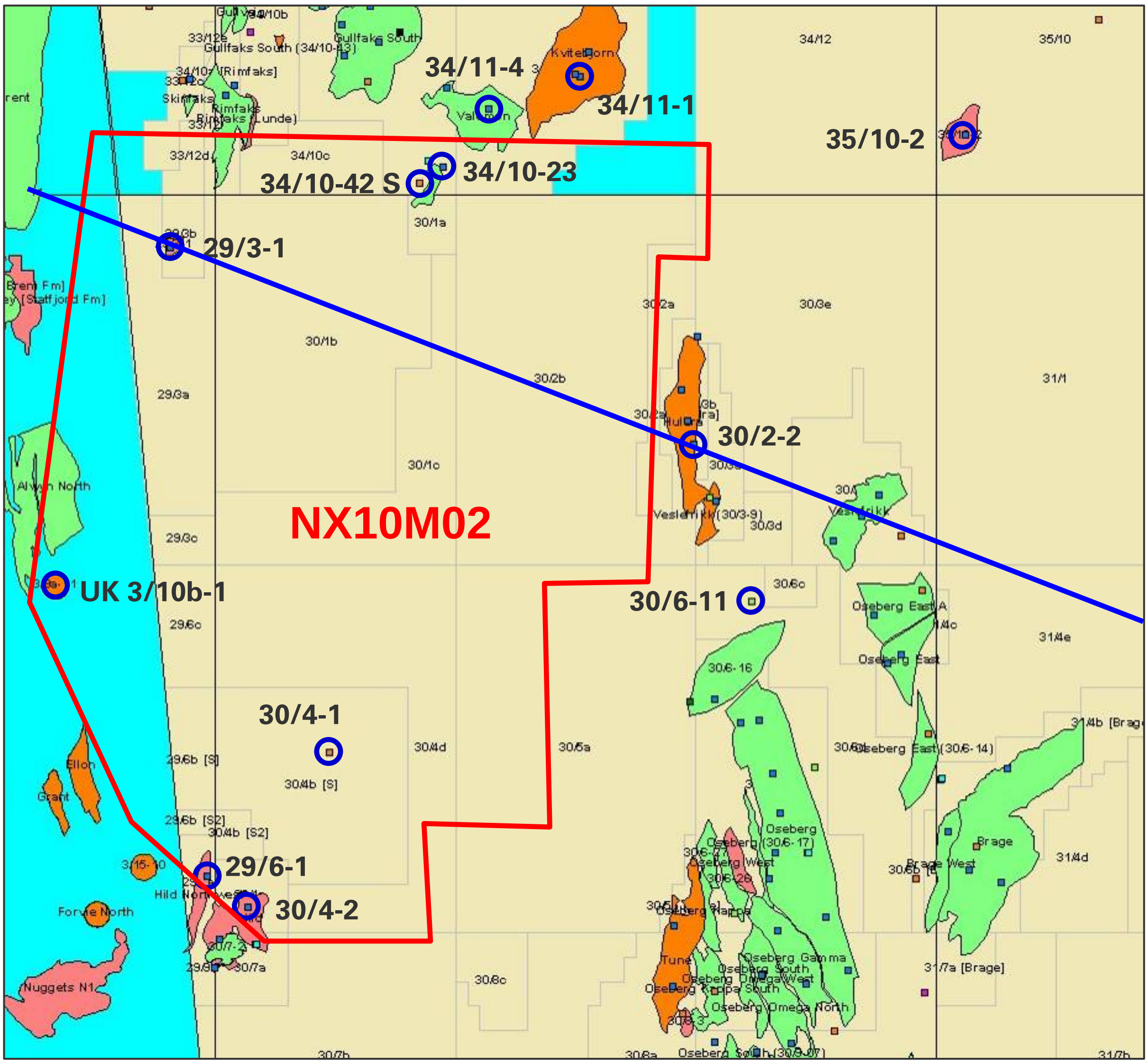

Figure 2 Seismic survey NX10M02 and well data base used in the evaluation of PL 462 S. The blue line is the transverse shown in Figure 3.

2.2. Seismic Interpretation

Detailed seismic interpretation was tied to seven key wells, 29/3-1, 29/6-1, 30/4-1, 30/4-2, 34/10-23, 34/10-42 S and UK 3/10b-1 (Figure 2). The following twelve stratigraphic horizons were interpreted in time from Triassic to present day over the combined block areas (Table 2).

Table 2. Interpreted Horizon picks over PL462 S

Horizon Pick	Group	Age
Seabed	Nordland	Recent
Jorsalfare Fm	Shetland	Maastrichtian
Rødby Fm.	Cromer Knoll	Albian
Base Cretaceous / Draupne Fm.	Viking	Volgian

Heather Fm.	Viking	Oxfordian
Top Reservoir	Brent	Bajocian
Cook Fm.	Dunlin	Pliensbachian

3. Review of Geological Framework

3.1. Structural Setting

The PL462 S license is situated in the Rungne sub-basin of the North Viking Graben. The sub-basin is limited to the west by major N-S trending fault complexes marking the boundary between the North Viking Graben to the East and the East Shetland Basin to the west. The northern part of the license is characterized by the intra-basinal Jurassic high Tjalve Terrace where the Kvitebjørn, Valemon and Valemon S (34/10-23) are located. The Jurassic fault pattern in the graben is mostly N-S trending with a NE splay from the Hild field (30/4-2). Between the Tjalve Terrace and the Huldra platform there are also some strike-slip movement which offsets the Rungne sub-basin with the Magne sub-basin. This combination of lateral and extensional tectonics creates a complex fault pattern at the Tjalve terrace with at least 3 different fault directions that increases the risk of reservoir compartmentalization. The main faults are associated with sub-seismic faults which may act as barrier for fluid flow and may result in anomalous gas/water contacts as observed at Valemon wells 34/10-23 and 34/4-2S.

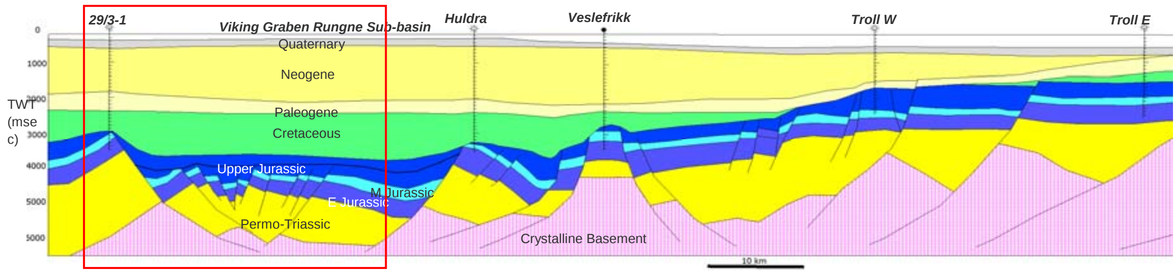

Figure 3 Geological cross section over the license (red box) from 29/3-1 to the Troll field. Location of the traverse is given in Figure 2.

The main prospectivity in the license is within the rifted Jurassic fault blocks, either rotated within the basin or detached from the terraces (Figure 4). The crest for the Brent reservoir ranges from 4250 – 4600 m SS, with the shallowest compartment being the primary Orkla prospect.

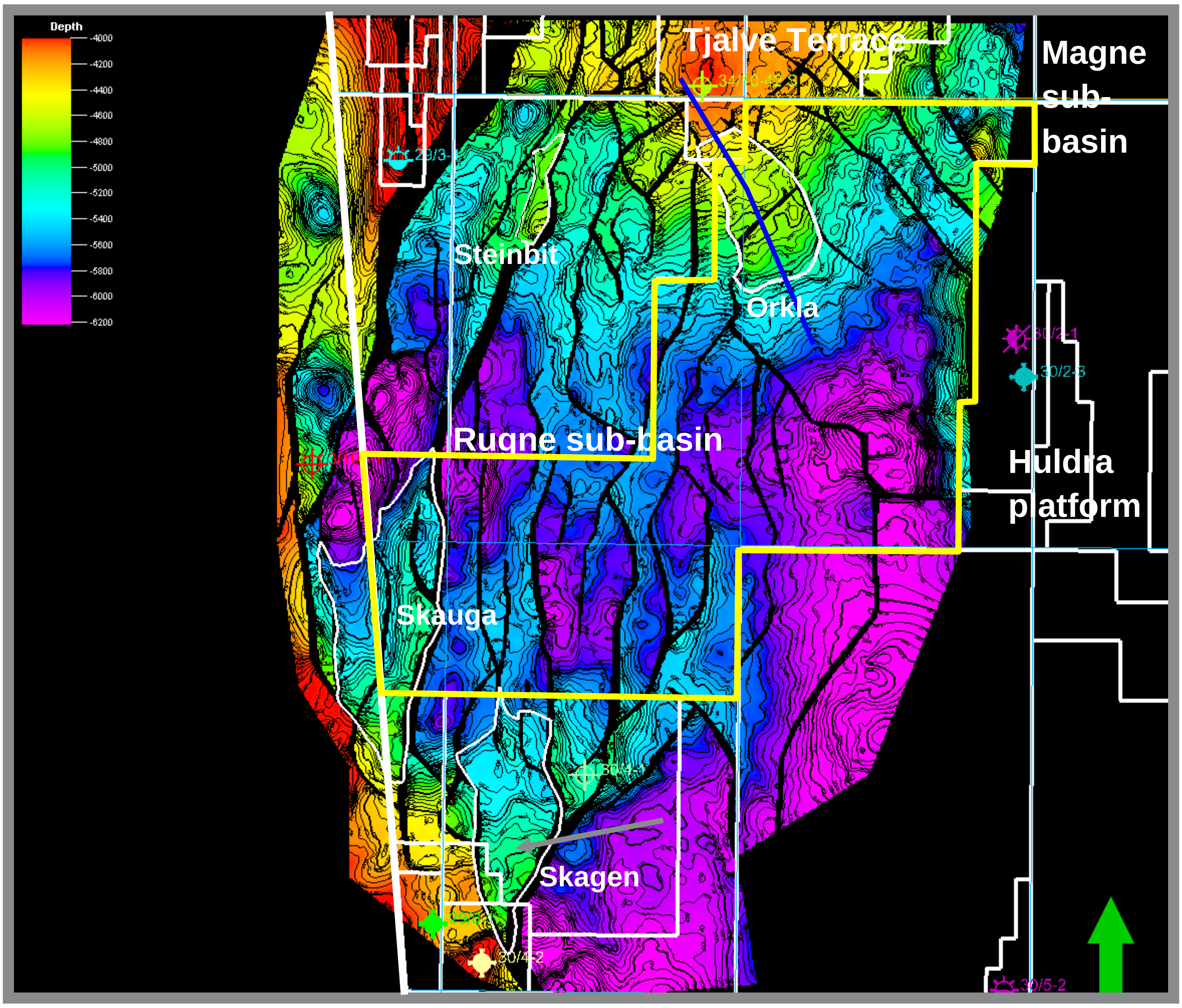

Figure 4 Top Brent Group depth map of the Rugne sub-basin in the Viking Graben. Some of the main prospects and leads are shown. The yellow line denotes the PL462 S license boundary.

3.2. Reservoir

An external reservoir study was commissioned to look at the reservoir quality in deep reservoirs (>4000m) in wells adjacent to the PL462 license blocks (Mortimer *et al*, 2010). Five main Triassic through Jurassic age stratigraphic units (Lunde Fm, Statfjord Fm, Dunlin Gp, Brent Gp, and Viking Gp.) were studied in detail from 11 cored wells (approximately 750m of core). For each of the stratigraphic units, an analysis and integration of a) stratigraphy and sedimentology, b) petrography and diagenesis, and c) reservoir quality trends and prediction were completed.

The primary reservoir interval in the PL462 S area is the Middle Jurassic Brent Group. These units were deposited during a northward progradation and subsequent retreat of a major wave dominated delta during Aalenian to Bajocian time. A variety of facies types were observed including higher energy fluvial and tidal channels, shoreface and tidal bar deposits to lower energy lagoonal, lacustrine and tidal flats. Secondary reservoir targets were also possible in the Dunlin Units 3 and 4 (Cook equivalent) and Statfjord Formation. Within the license block area, very little reservoir potential was found to be present in the Lunde Formation, and lower part of the Dunlin Formation. There is also little potential in the Upper Jurassic Heather and Draupne Formations. None of the adjacent wells have pay sand in these units and there is no indications on the seismic data that there are any sand presence.

Detailed petrographic work, including XRD, SEM, cathodoluminescence, and fluid inclusion analysis was performed to assess the depositional and diagenetic history of the area. Based on this work, the composition of the Brent Group sediments is generally classified as a quartz arenite to sublithic arenite. Primary depositional reservoir quality is strongly facies dependent. As one might expect, the higher energy facies are coarser grained, have better sorting, and have increases in porosity and permeability. The lower energy facies are finer grained, poorly sorted and have an increase in ductile grains. The overall reservoir quality has been subsequently strongly influenced by secondary processes. Authigenic cements and clays were observed including quartz overgrowths, carbonates, illite, kaolinite, and grain coating chlorite. In the case of chlorites, there is a significant positive impact for porosity preservation at depth as chlorites inhibit quartz overgrowth cementation for the Dunlin Grp sands.

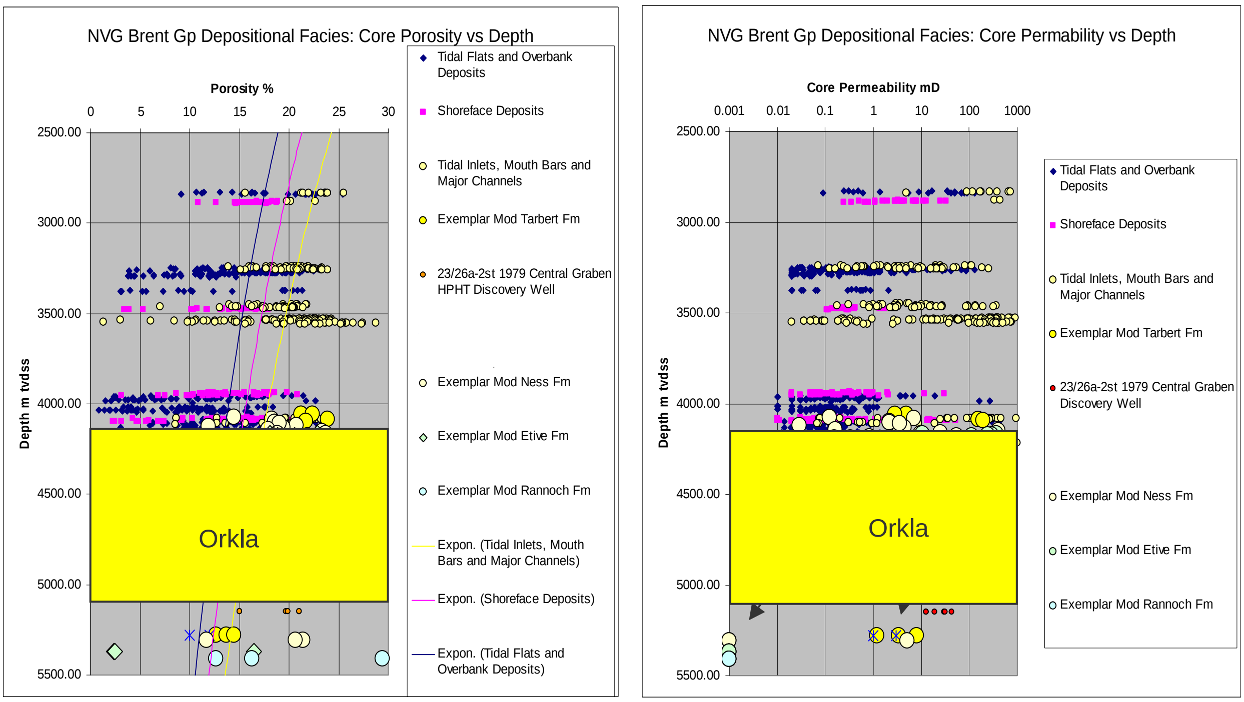

Figure 5 Core measurements of porosity and permeability and Exemplar modeling as a function of depth and facies.

Since all prospects are deep and in high temperature environment they have undergone diagenesis and compaction which reduce the ability for fluid flow. Figure 5 shows core measurements of porosity and permeability as a function of depth and facies. The Mid Jurassic prospects in PL 462 S range from 4250-5500 mSS in depth. The lack of regional core data at this depth made it somewhat uncertain how the trends are at greater depths.

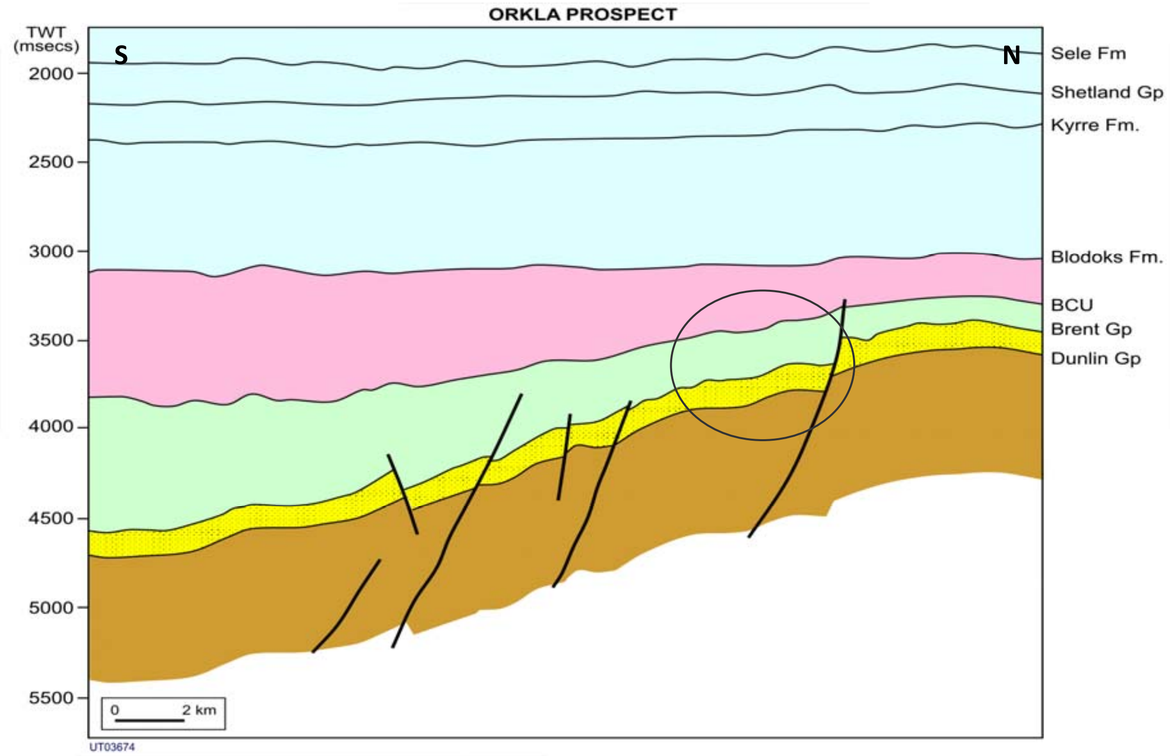

Figure 6 Geoseismic section along the Orkla prospect (blue line in Figure 4). Orkla is a Mid-Jurassic block detached from the Tjalve Terrace.

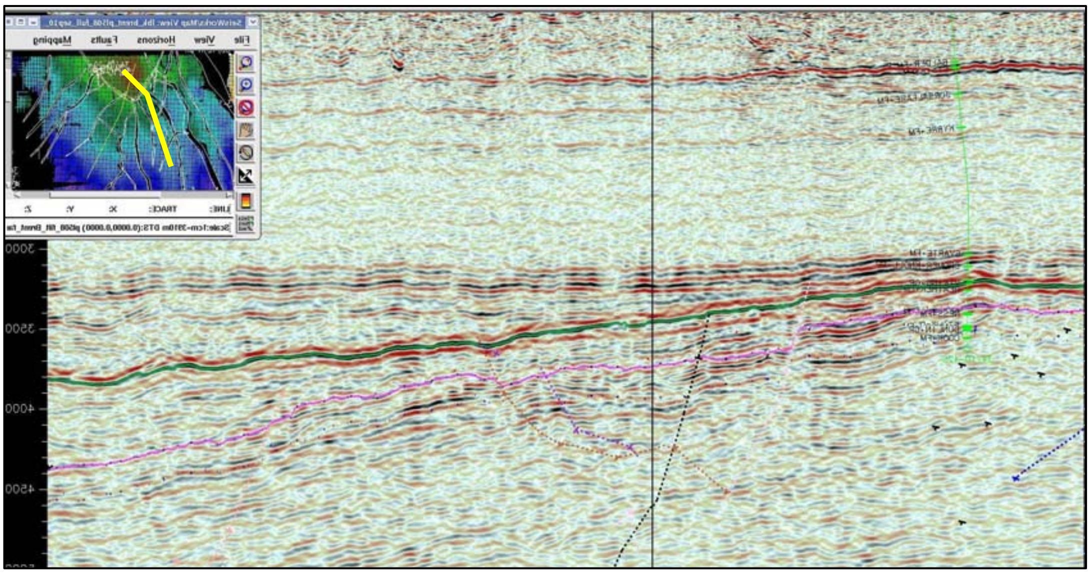

Figure 7 Seismic random line corresponding to the geoseismic section in Figure 6.

4. Prospect Update

4.1. Orkla Prospect

The Orkla Prospect is the principal material prospect that was evaluated. The primary target is interpreted to be the Middle Jurassic Brent Group deltaic deposits. Orkla is comprised of 6 fault blocks, with the crests of each individual Brent reservoir ranging from 4250 – 4600 mSS (Figure 8). Predicted temperatures and pressures are in the HPHT category with 150°C (300° F) and 810 bar (11750 psi).

Reservoir presence and effectiveness (P1): The Orkla prospect lies in a prolific area of Brent Group reservoir rocks, adjacent to producing fields like Huldra, Kvitebjørn, Valemon and Gullfaks Sør. The overall gross reservoir thickness in nearby key wells are ~200 m (Figure 2). The risk on reservoir presence is assumed to be low. However, since the depth of the prospect is at least 4250 mSS there is a risk on reservoir deliverability/permeability. Regional well tests in Brent Group of similar depth (34/8-7, 34/11-2 S and 34/12-1) show low rates, and studies on reservoir quality trends with depth show them to be highly dependent on facies (Figure 5).

Trap (P2): The Orkla prospect is a structurally controlled (downthrown) trap developed in the hanging wall of the major fault towards Valemon S. It forms a 3-way dip closure of several separated fault blocks. These segmented fault blocks have throws from 0-200 m to adjacent fault blocks within the prospect. The new 3D data has improved the imaging but due to the low fault-throw and occasionally low angle faults there is still some uncertainty on the trap definition. The major fault throw varies from 50-200 m (Figure 9).

Source and Migration (P3): Mature organic rich shales of the Draupne and Heather Formations are present in a large fetch area to the south of the Orkla prospect. Current temperature and structure estimates suggest the primary Draupne source rock is currently within the gas window. Present day migration into Brent reservoir carrier beds would be achieved via downdip source-reservoir fault juxtaposition. New seismic data show reduced risk on charge since the faults blocks are more or less open to the kitchen area and Brent Group acts as carrier bed, and the major fault trends are N-S.

Retention and Seal (P4): The Orkla prospect is defined by a downfaulted 3-way dip closure. Since the vertical throw of the major updip fault is at most 200 m, there will be Brent-to-Brent juxtaposition along the entire fault, also within the critical triple-junctions (Figure 8). Even the presence of strike-slip movements the fault seal capacity is assumed to be the main risk element, together with reservoir deliverability. Top seal failure is assumed to be of low risk since there are thick sequences of Heather shale overlaying the prospect.

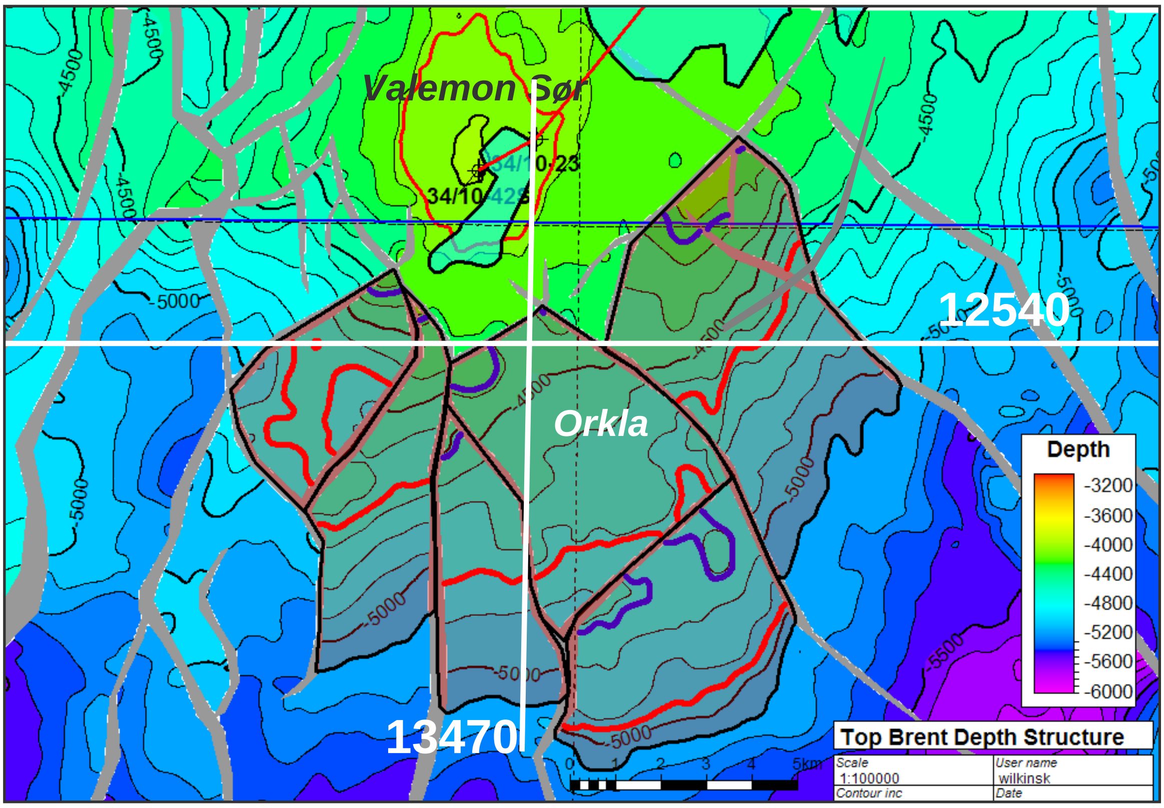

Figure 8 Greater Orkla complex prospect map. Top reservoir Brent Group depth structure. Blue and red contours are P90 and P10, respectively.

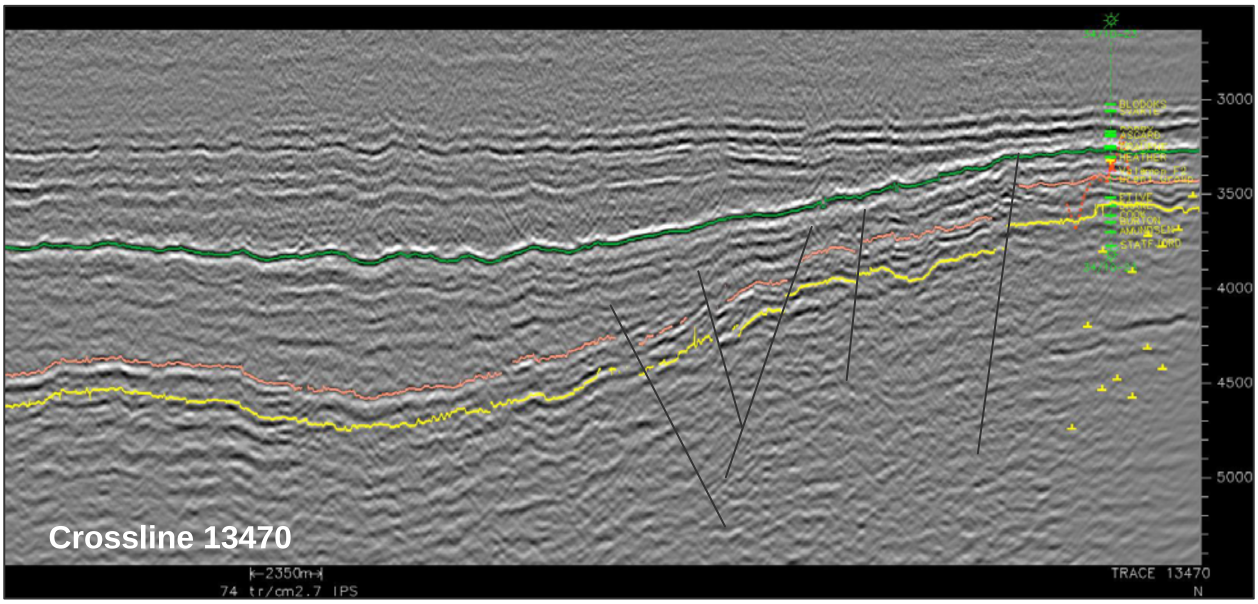

Figure 9 Orkla crossline 13470 as shown in Figure 8.

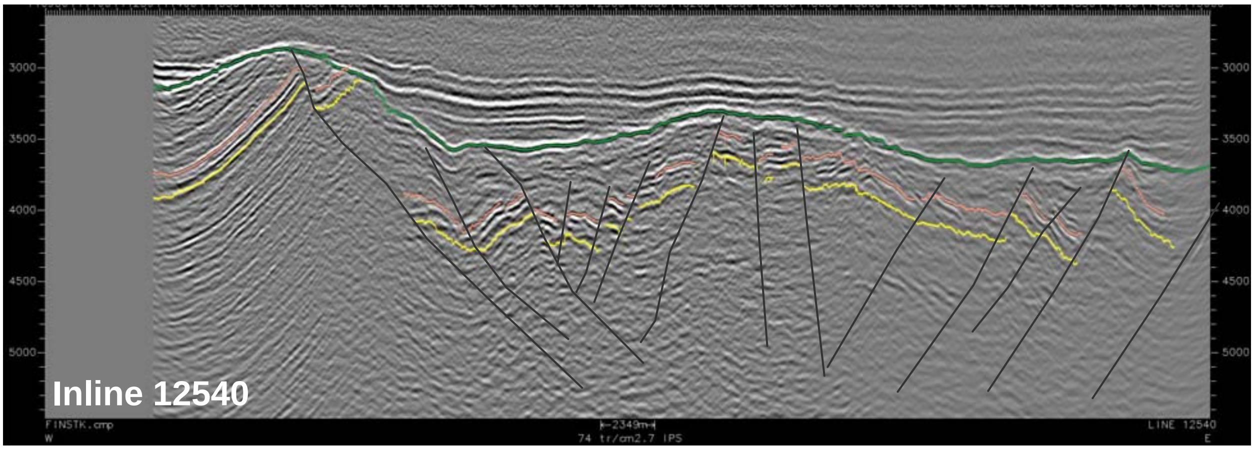

Figure 10 Orkla inline 12540 as shown in Figure 8

Summary: The overall technical risk factor is 0,3. Given the complexity of the faulting and risk on containment, a successful in the first exploration well does not ensure success in appraising adjacent fault blocks. The risk on trap would remain unchanged for subsequent wells and retention / seal risk would improve slightly so the overall technical risk on subsequent blocks would only increase to 0,6. A summary of the mean risked reserves (untruncated) is as follows:

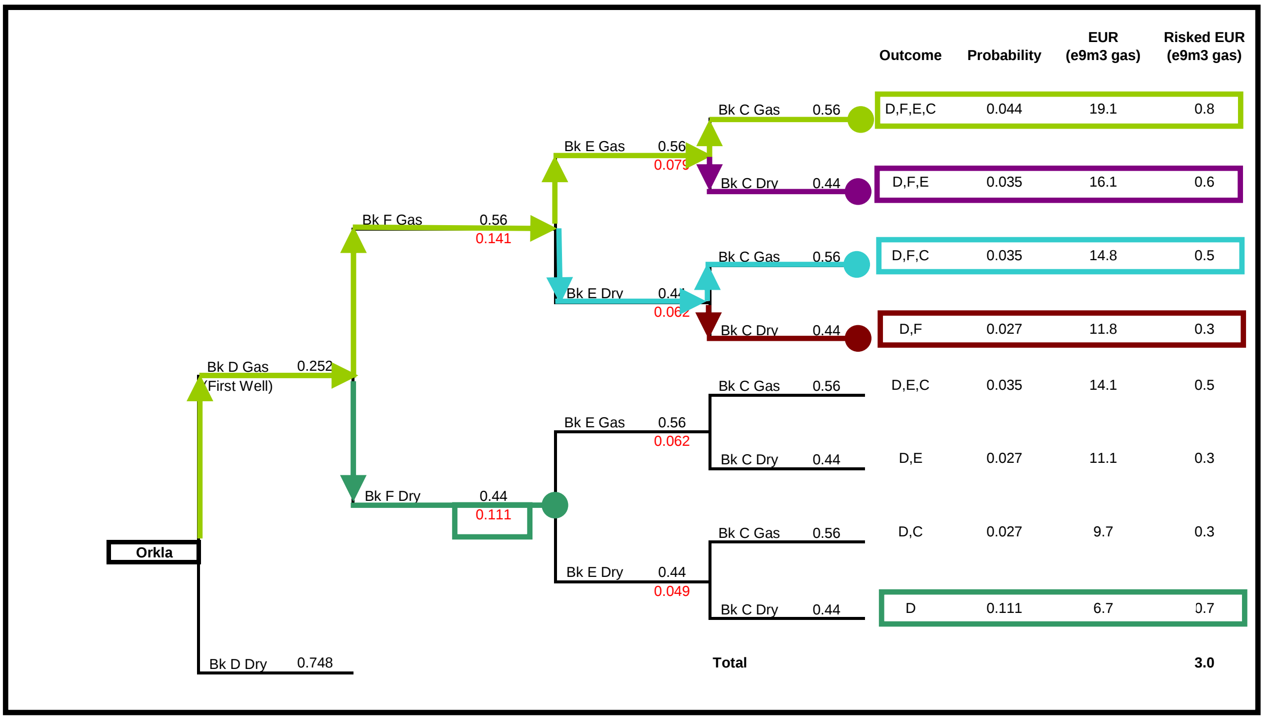

Figure 11 Aggregated Mean Risked Reserves (untruncated)

Given the risks on containment and complexity of faulting, there is a risk of achieving commercially viable volumes, with the aggregated mean risked reserves for the entire prospect being approximately equal to the minimum commercial field size for development.

The prospect data sheet, including a summary of the technical reserves (no commercial truncation) is provided in Table 3 for the main fault block.

4.2. Other Leads:

There are several rotated Jurassic fault blocks in the graben which are identified as leads (see Figure 2). The largest of these are the Skauga lead which is straddling the UK-Norway border. The depth to the crest is 4750 m. The recoverable gas resources are 0,7 – 5,0 – 11,4 GSm3 for the low, base and high estimates, respectively. The limited size and high risk on reservoir quality make it challenging to mature this lead into a drillable prospect. In addition, significant parts of the lead are outside the license, including 40 % in UK. Due to the depth no evaluation has been done for the conformable deeper Jurassic and Triassic reservoir units.

None of the adjacent wells show any indication of Upper Jurassic or Cretaceous sands, and there is no seismic indication of prospectivity at these levels within the license.

5. Conclusions

The technical evaluation indicates that there is a significant risk that the Brent reservoir will not flow at commercial rates due to reduced permeability resulting from the potential for secondary diagenisis and the anticipated reservoir depth in PL462S. The Orkla prospect is further complicated by complex faulting in which trap and retention risk would require each compartment to appraised separately. None of these compartments alone is large enough to prove up enough volumes for commercialization.

References

Hamilton, J., 2010: Processing of 3D Seismic Data NX10M02, PL462S & PL508S in Norwegian Blocks 29/3, 29/6, 30/1, 30/2 & 30/4. Geotrace Project No. c2279. July 2010.

Mortimer, E.G., Lucas, P.M., Rich, B., 2010: Reservoir Quality Assessment for Deep Jurassic Reservoirs Around Licence Areas PL462S, PL508S and PL465, and NOCS Blocks 29/3, 30/1, 34/10 and 35/10, Fugro Robertson Limited Report 9772: May 2010.

Table 3: Prospect data Main Orkla Compartment

Block	Prospect name	Discovery/Prosp/Lead	Prosp ID (or New!)	NPD approved?
30/1, 2	Orkla	Prospect	*NPD will insert data*	*NPD will insert data*

Play (name /new)	Structural element	Company/ reported by / Ref. doc.	Year
NPD will insert data	Rungne Sub-basin	Nexen/PL462S Relinquishment	2011

Oil/Gas case	**Resources IN PLACE**					
Gas	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 106 Sm3				.18	2.7	14.3
Gas 109 Sm3	0.6	7.4	33.1			

	Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3				0.1	1.4	7.5
Gas 10^9 Sm^3	0.3	3.9	17.7			
	Which fractiles are used as:		Low:	P90	High:	P10

Type of trap	**Water depth** (m)	**Reservoir Chrono** (from - to)	**Reservoir Litho** (from - to)
3-way close	135	Bath-Bajocian	Brent Group
Source Rock, Chrono	**Source Rock, Litho**	**Seal, Chrono**	**Seal, Litho**
Kimm-Oxf	Heather - Draupne Fm	Oxfordian	Heather Fm

Seismic database (2D/3D):	3D - NX10M02

Probability of discovery:				
Technical (oil+gas case)	0,30		Prob for oil/gas case	
Probability (fraction):	Reservoir (P1)	Trap (P2)	Charge (P3)	Retention (P4)
	0,7	0,8	0,9	0,6
Parameters:	Low	Base	High	Comments
Depth to top of prospect (m)	4310	4310	4310	
Area of closure (km^2)	1.4	9.7	21.1	
Reservoir thickness (m)	150	200	250	
HC column in prospect (m)	100	300	500	
Gross rock vol. (10^9 m^3)	3	18	38	
Net / Gross (fraction)	0,13	0,29	0,45	
Porosity (fraction)	0,11	0,17	0,22	
Water Saturation (fraction)	0,5	0,4	0,3	
Bg. (<1)	0,0026	0,0034	0,0041	
Bo. (>1)				
GOR, free gas (Sm^3 /Sm^3)				
GOR, oil (Sm^3 /Sm^3)				
Recovery factor, main phase	0,37	0,55	0,72	
Recovery factor, ass. phase				
Temperature, top res (deg C):	150	Pressure, top res (bar) :	810	