OLJEDIREKTORATET

Attn.: Bernt Egeland

Deres ref.:	Vår ref.:	Dato:
	TEN-OD-2015-0008	06.05.2015

Utvinningstilaltelse 664S - Tilbakeleveringsrapport

Med referanse varsel om oppgivelse av utvinningstillatelse 664S til OED datert 05/02-2015, vennligst finn vedlagt tilbakeleveringsrapporten.

Med hilsen,
for Talisman Energy Norge AS

[redacted]

Team Lead Exploration

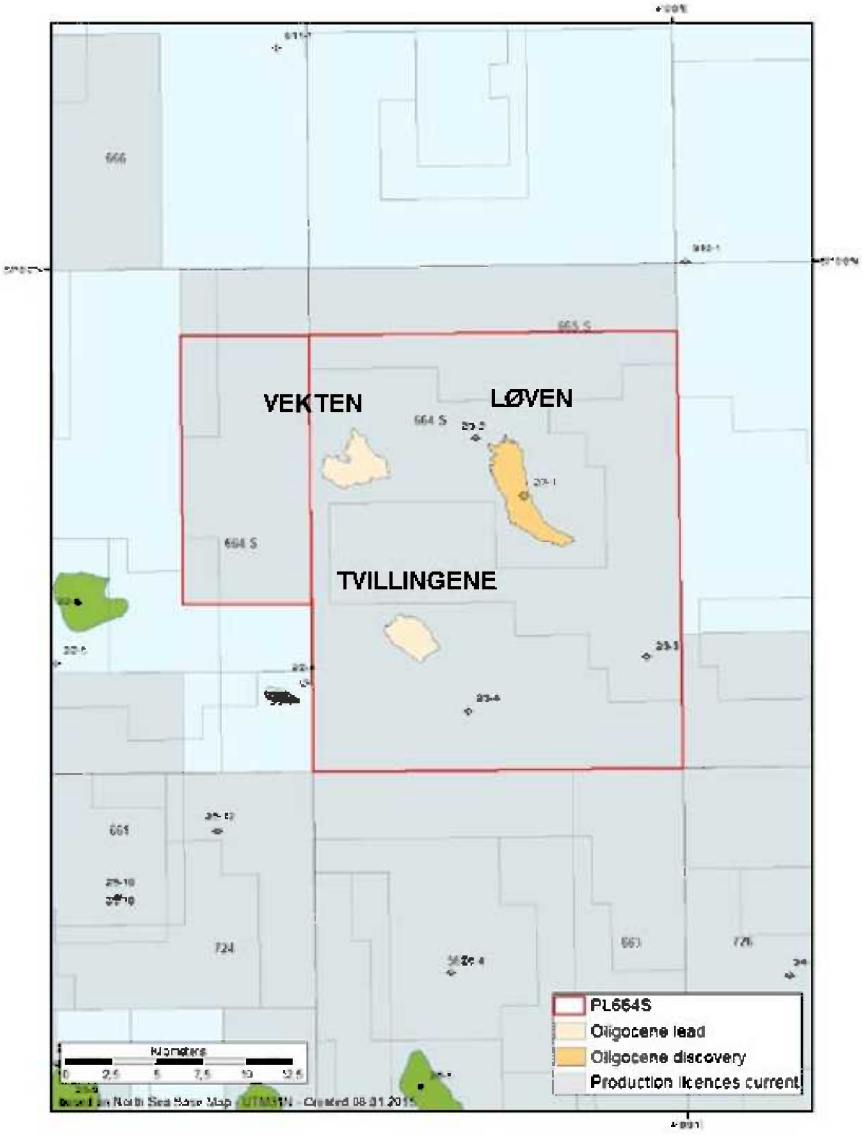
Vedlegg: PL664S Relinquishment Report

Talisman Energy Norge AS, Verven 4, P. O. Box 649 – Sentrum, N-4003 Stavanger, Norway
Tel.: (+47) 52 00 20 00 Fax: (+47) 52 00 15 00 Ent. No.: NO 985 706 050 VAT
Vennligst send offisielle svar og henvendelser til norcorrscontact@talisman-energy.com

PL664S

Relinquishment Report

May 2015



TALISMAN ENERGY

Table of contents

1 Key license history

Production license 664S is located in parts of blocks 2/2 and 2/3 in the southern part of the Sørvestlandet High. The blocks are stratigraphically divided and apply to all levels above the top Rogaland group.

The main play in the license area is in the Oligocene Vade Fm. The area was applied for in APA 2012 and the PL664S was awarded in February 2013 with Talisman Energy Norge As as operator (50 %). Dong E&P Norge AS (30 %) and Ithaca Petroleum Norge AS (20 %) are partners.

The work program has been fulfilled, and the main objectives were to acquire 3D seismic and conduct studies in order to reduce the risk and improve the understanding of the prospectivity. After the evaluation, one prospect has been defined in relation to the Løven discovery well 2/3-1 and two other leads within the license area. Figure 1 shows the license acreage in addition to outlines for the defined prospect and leads.

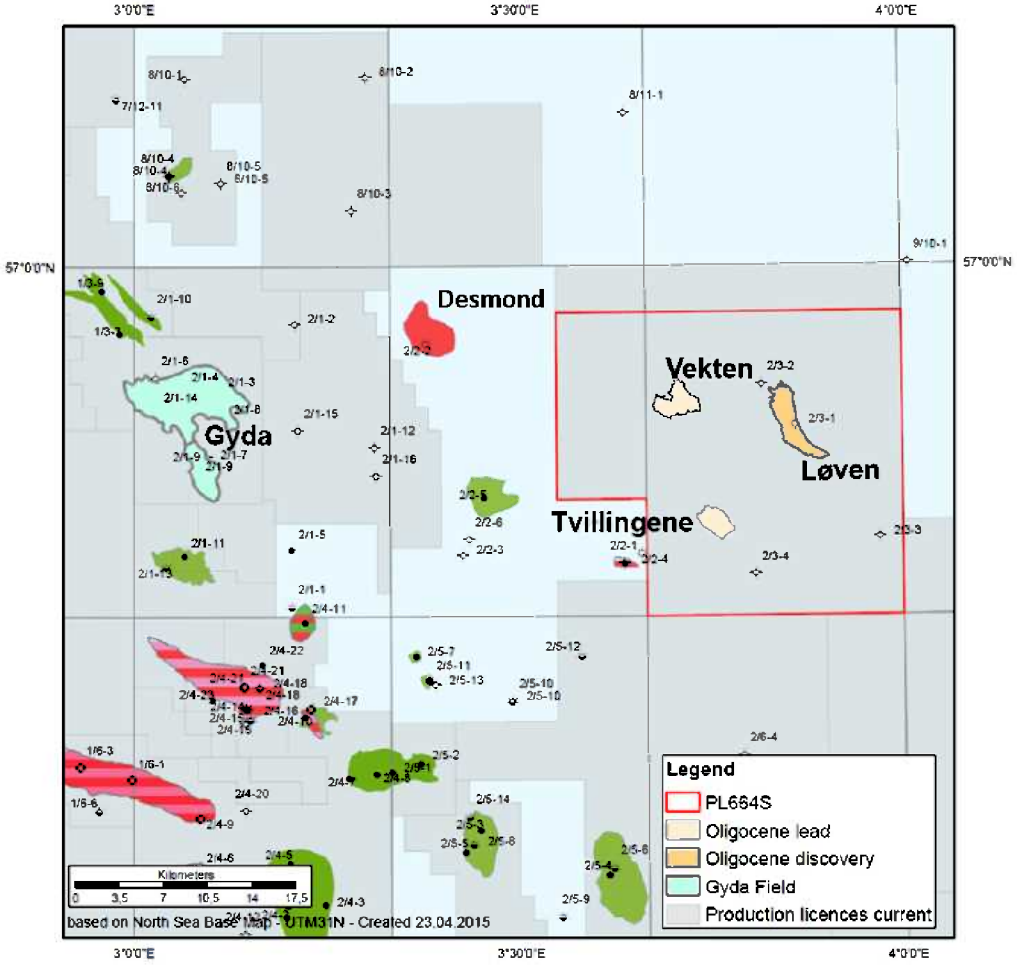


Figure 1 Overview of PL664S area and outlines for prospects and leads.

The results from the economic analysis indicate no remaining prospectivity in the area of commercial value to support a decision to drill a well. This is the reason for the application of relinquishment of the license.

An overview of the license history, initial work obligations, work periods and meetings held with PL664S is listed below:

- Talisman Licence History: - Acquired directly in APA 2012.
  - Recommendation to license partners for full relinquishment February 2015, as technical work of the license indicates no prospectivity of commercial value left to evaluate.
- Initial Commitments & Restrictions: - Acquire 3D seismic and conduct G&G studies within 2 years.
- Initial period of 7 years: - Decision to drill by 08.02.2015 (Drill exploration well).
  - Decision to concretize (BoK) by 08.02.2017 (Complete conceptual studies).
  - Decision to continue (BoV) by 08.02.2019.
  - Decision on PDO by 08.02.2020.
- License Meetings: - ECMC 2/yearly from license award.
  - License Work meeting 2/yearly from license award.

The main part of the work program was performed during 2013 and 2014 (Figure 2).

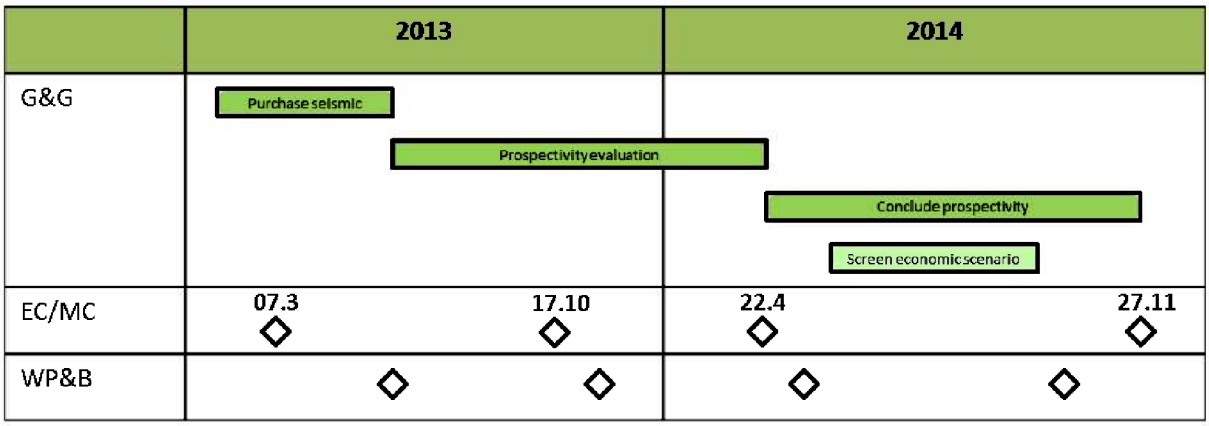


Figure 2 License history timeline.

2 Database

The 3D seismic data used for the PL664S evaluation is shown in Figure 3. The license partners agreed to purchase a 3D seismic volume that covers most of the license acreage as a common seismic database for the license; Q30_CNS_3D, a part of the cornerstone 3D survey acquired by CGG Veritas in 2006 and consist of 492.3 km2 of high quality long-offset data. The well data used in the PL664S evaluation is shown in Figure 3 and Table 1.

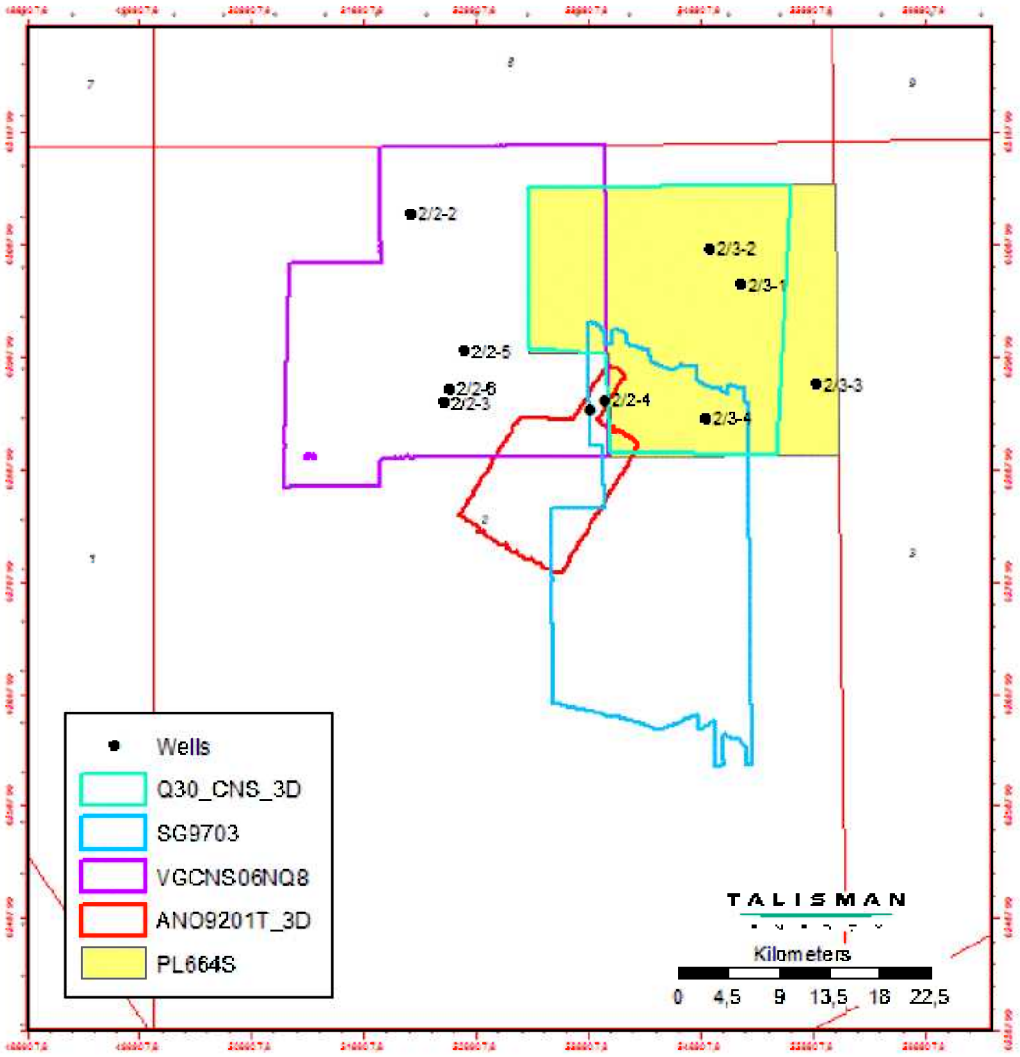


Figure 3 Seismic and well database.

Well name	Completion year	Comments
2/2-1	1982	Vade Fm. Gas discovery
2/2-2	1982	Vade Fm. Gas discovery
2/2-3	1983	Vade Fm. Water wet sandstones
2/2-4	1988	Vade Fm. Gas discovery
2/2-5	1992	Vade Fm. Water wet sandstones
2/2-6	2010	Vade Fm. Water wet sandstones
2/3-1	1969	Vade Fm. Gas discovery
2/3-2	1969	Vade Fm. Water wet sandstones
2/3-3	1971	Vade Fm. Water wet siltstones
2/3-4	1984	Vade Fm. Water wet sandstones

Table 1 Well database.

3 Review of geological framework

The license area is located on the Sørvestlandet High just south of 57°0'N in the southern part of the North Sea (Figure 1). The Sørvestlandet High is bounded in the north and north-east by the Åsta Graben and by the Søgne Basin to the south (Figure 4).

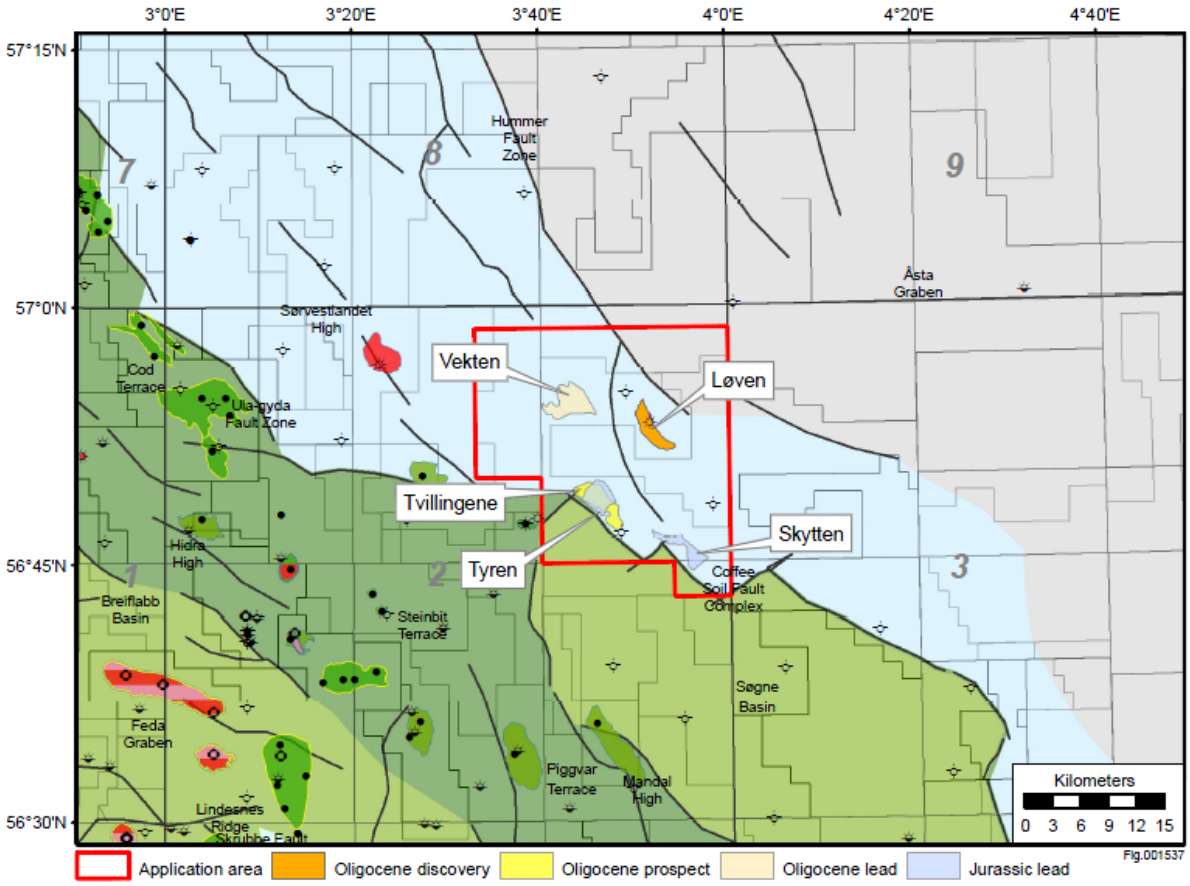


Figure 4 NPD structural elements of the Southern North Sea from APA 2012.

The primary prospectivity is defined within the Oligocene Vade Fm. The Vade Fm is believed to represent a response to uplift associated with Oligocene compressional tectonics in the Norwegian Greenland Sea and North Atlantic Ocean. In the Late Oligocene, erosional products, dominated by fine material, were transported to the North Sea basin from the elevated land masses of the Shetland and Scandinavian continental platforms. Thus the Vade Fm sandy depositional system (Figure 5) has a limited areal distribution and is only known to be represented in the Sørvestlandet High and Søgne Basin area (Block 2/2 and 2/3). The Vade Fm might have been deposited as a more or less continuous sandy unit from the hinterland from east to north-east. The sandstones are typically fine grained, have a characteristically high glauconitic content and are moderately sorted. The thickness of the Vade Fm varies between 50m to 113m.

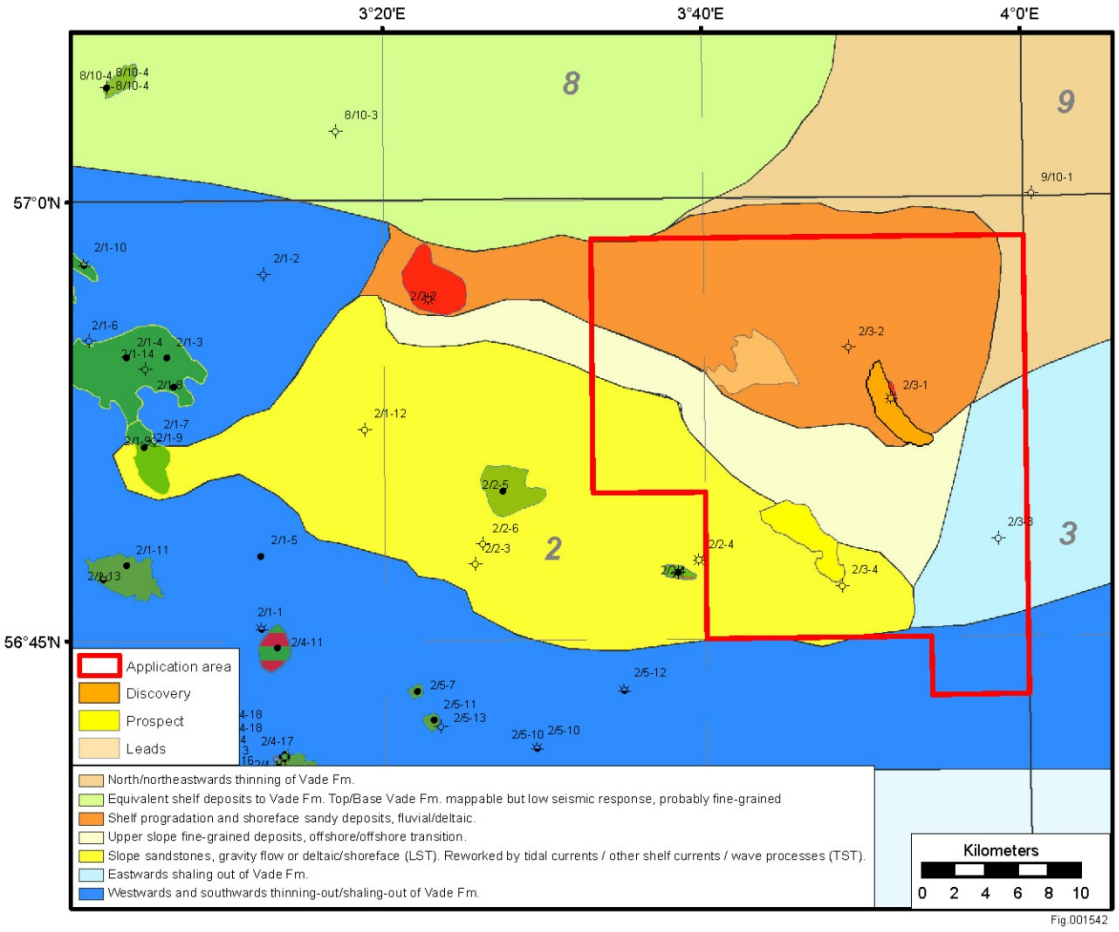


Figure 5 The Oligocene Vade Fm sandy depositional system from APA 2012.

Several comprehensive studies have been performed in the license since award. The purpose of these studies has been to increase confidence in the geological and geophysical understanding of the upside potential of the Oligocene Vade Fm play in the license area.

Geophysical studies were carried out with a systematic methodology to boost frequency/obtain less noise in the seismic data and also to model the effect of low saturation gas.

An overview of the geophysical studies performed within PL664S is listed below:

- Frequency enhancement
  - Increase resolution and geologic resolvability
  - Better define depositional geometries
- Depositional seismic Modeling
  - Test depositional ideas
  - Test Direct hydrocarbon responses
- AVO Analysis
  - Intercept and gradient analysis to map possible hydrocarbon accumulations
- Pre-Stack Inversion
  - P-Impedance for lithology and Fluid mapping

  - S-Impedance for Lithology mapping
  - Density Inversion for porosity and fluid mapping
  - VPVS mapping for Hydrocarbons definition
- Extended Elastic Impedance
  - Definite CHI angles defined for Lithology Fluid and seal Mapping
- Spectral attenuation
  - Defining Depositional systems
  - Defining depositional geometries
  - Looking for possible attenuation zones beneath hydrocarbon accumulations
- Low Saturation Gas Analysis
  - Quantify using Spectral Decomposition and density Inversion
  - Assign LSG risk to prospects

Based on the evaluation of the new data and studies performed the understanding of the prospectivity in the license area has improved significantly. The Oligocene Vade Fm prospectivity in the license area is most likely limited to subtle structures with a very thin reservoir section filled with high saturation gas.

4 Prospect update

The production license 664S is located east of the oil-producing Gyda field in the Southern North Sea (Figure 1).

The area applied for, with the Løven discovery, Tvillingene prospect and additional leads, are outlined in Figure 6. The resulting acreage awarded in 2013 covers only the Oligocene part (Figure 1).

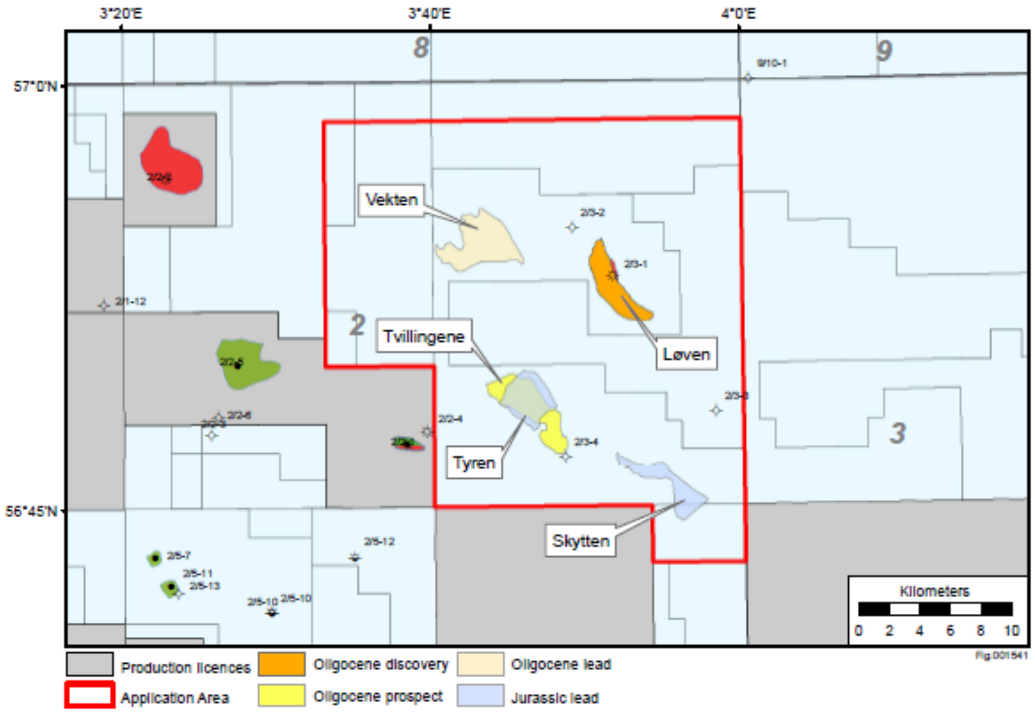


Figure 6 APA acreage applied for with the one discovery, one prospect and three leads (both Jurassic and Oligocene).

Compared to the prospects and leads originally presented in the license application from 2012 (Figure 6), the Løven discovery is the only remaining prospect in the license after the updated evaluation. Tvillingene has been reduced to a lead.

The Løven discovery is a well-defined three way dip closure, bounded by a fault to the north-east. Gas was proved in two Vade Fm reservoir zones separated by thin shale. The source of the gas accumulation is thought to be biogenic in origin with incipient thermogenic gas added, locally derived from Tertiary shales. The regional seal is provided by the overlying shales of the Hordaland Gp.

Several studies were performed to de-risk the prospects and try to define an upside potential without any positive results. It was challenging to define the Løven prospect upside because of increased content of silt or tuning between the mapped top reservoir and the observed GWC at the base (Figure 7).

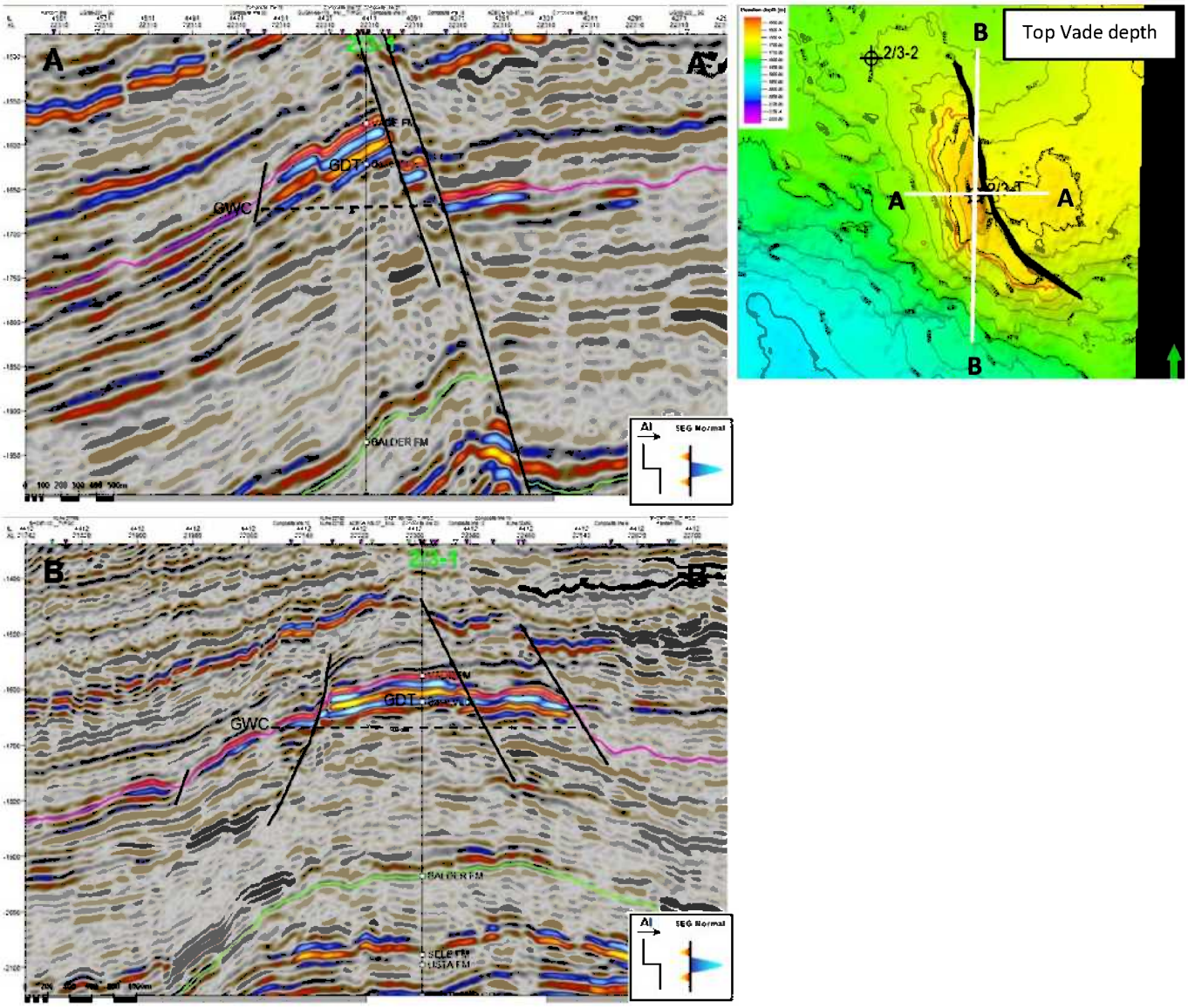


Figure 7 The Løven prospect.

The updated evaluation resulted in a probability of discovery of 51% for the Løven prospect upside. This was a considerable lower probability as compared to APA 2012 (100%, Table 2). The probability was reduced due to increased geological and structural understanding, which increased the uncertainty of the quality and thickness of the Vade Fm sandstone, from low relief, and the size of the prospect.

Discovery/ Prospect/ Lead name	D/ P/ L	Unrisked recoverable resources						Probability of discovery	Resources in acreage applied for %	Reservoir		Distance to infra-structure (km)
		Oil 10^6Sm^3			Gas 10^9Sm^3					Litho-/ Chrono-stratigraphic level	Reservoir depth (m MSL)	
		Low	Base	High	Low	Base	High					
Løven	D				1.00	1.80	2.80	1.00	100.00	Vade Fm/Oligocene	1589	46
Tvillingene	P				0.40	1.10	2.10	0.32	100.00	Vade Fm/Oligocene	1935	42
Vekten	L								100.00	Vade Fm/Oligocene	1808	38
Tyren	L								100.00	Ula Fm/Oxfordian	2890	42
Skytteren	L								100.00	Ula Fm/Oxfordian	2900	55

Table 2 NPD format prospect summary table from APA 2012.

As a result of the combined studies and re-evaluations of the different leads performed in the area, the risk for several play elements has increased and it has not been possible to support an increased probably of discovery for the Løven prospect upside. It is at present not considered that further studies can de-risk the prospect and increase the chance of success materially. Revised resource volume and probability estimates for the Løven prospect is shown in Table 3.

Prospect	P90	P50	P10	Pmean	Risk
Løven	0.61	1.62	4.3	2.1	0.51
Total				2.1	

Table 3 Revised license prospect summary table. Gas resources shown in 10^6Sm^3.

5 Technical evaluations

The Løven prospect lies on the Sørvestlandet High, about 45km east of the Talisman operated Gyda field (Figure 1).

The Desmond discovery (2/2-2, Figure 1), at the time of award part of the Talisman operated PL332, worked as a development scenario for the gas being tied back to the Gyda field. However, due to lack of firm gas export to market over the Ekofisk field within the timeline set in the license work obligations (2016-2021) this project was stopped and the license was subsequently relinquished in 2013.

The relinquishment of the Desmond discovery requires the Løven prospect to have a longer tie-back distance and consequently demand higher volumes to meet the economic criteria. For the development scenario, a subsea tie-back to Gyda has been the basis for the economics. With 1 gas production well, the Pmean case has negative economics and only the P10 case is economical (Table 3).

Based on the technical evaluations performed, the economics for Løven are too weak to support a drill decision.

6 Conclusions

The license partners in PL664S consider that the technical work done since the time of license award is sufficiently comprehensive and that the geological and commercial risk for the remaining prospectivity is still too high. The main risk elements are associated with the quality and thickness of the Vade Fm sandstone, low relief, and the general volume of the prospects.

Although some hydrocarbon potential remains within the license, the risk is unacceptably high and it is expected that any additional hydrocarbons found within the production license acreage is un-economic at present. Comprehensive technical studies done on the remaining prospectivity has not reduced any risk parameters since the Løven discovery well and a longer tie-back distance to Gyda (45km) drive the economic threshold volumes up.

The recommendation to relinquish is based on this evaluation and concludes that there are no viable exploration targets within the PL664S acreage. The partnership has therefore agreed to relinquish the entire license area.