Relinquishment Report

PL769 Pecten

OMV (Norge) AS

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1 Key License History

Production License (PL) 769, is located in the Barents Sea on the Finnmark Platform and consists of blocks 7124/4, 7124/5, 7124/6, 7124/8 and 7124/9 (Figure 1.1). The license was awarded on February 7th 2014 as a part of the APA2013 licensing round and was granted with an initial period of seven years, valid until February 7th 2021.

The license partnership consisted of OMV (Norge) AS (Operator), Concedo ASA, Lime Petroleum Norway AS and North Energy ASA.

The license interest between the companies are as follows:

- OMV Norge (AS) - 40%
- Concedo ASA - 20%
- Lime Petroleum Norway AS - 20%
- North Energy ASA - 20%

The initial work programme to evaluate the license was as follows:

- Phase 1 - Within two years (by February 7th 2016) reprocess available 3D seismic data within the license, G&G studies and make drill or drop decision.
- Phase 2 - Within four years (by February 7th 2018) drill exploration well.

During the lifecycle of PL769 various meetings were held between the Operator and the partners. A list of these meeting can be found below:

- 27.03.2014 - EC / MC Meeting
- 19.11.2014 - EC / MC Meeting
- 05.02.2015 - EC Meeting
- 04.03.2015 - Work Meeting
- 27.09.2015 - Work Meeting
- 26.11.2015 - EC / MC Meeting

The work programme for the initial phase of the license was fulfilled by the reprocessing of the multi-client 3D seismic survey MFZ02 and completing several G&G studies including a biostratigraphic review of key neighbouring wells. Based on the phase 1 work programme the volume potential recognized within PL769 is not sufficient for a drill decision, the license Management Committee has therefore concluded to relinquish the license.

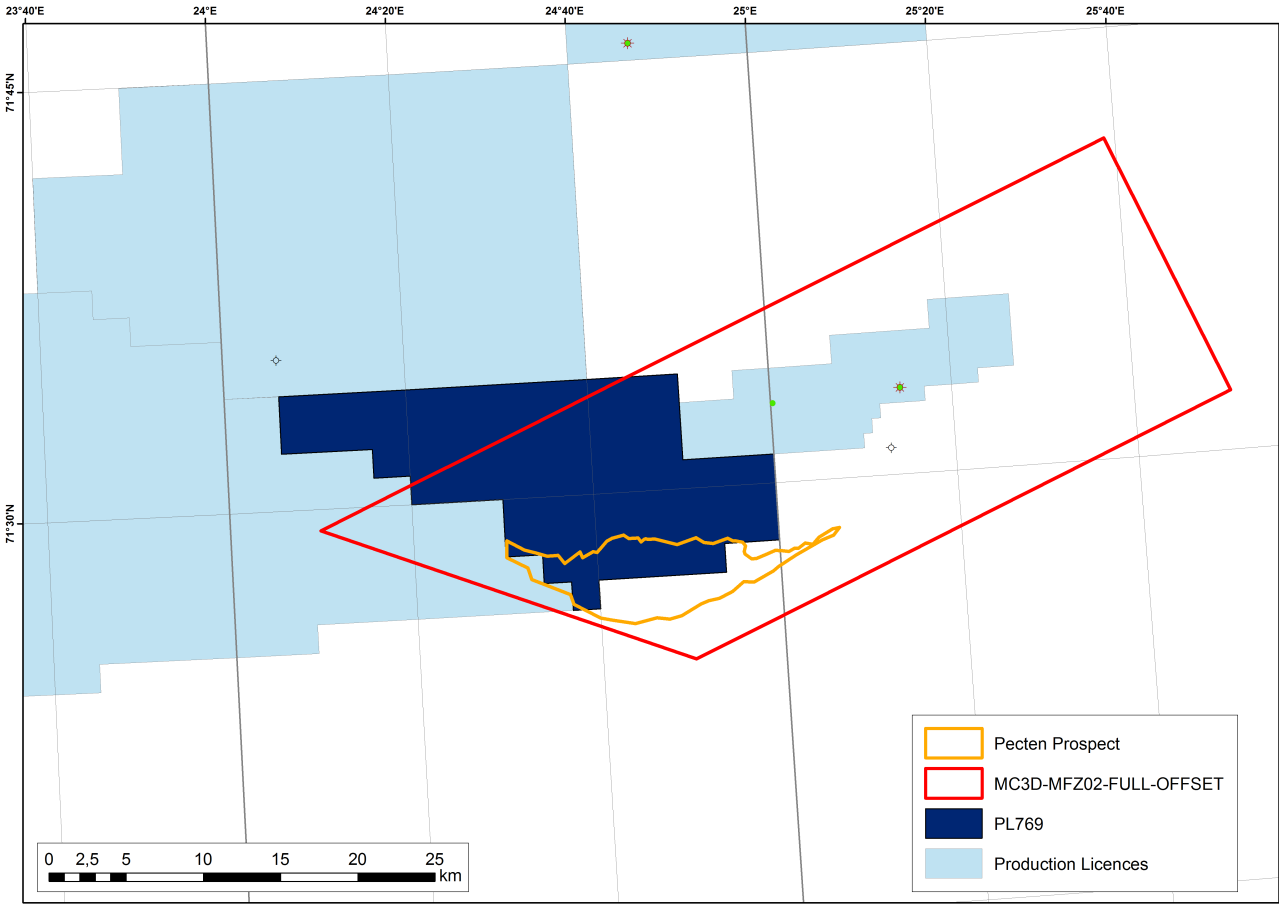

Figure 1.1 PL769 Area Map

Area map outlining PL769, in addition the Pecten Prospect is also identified, orange polygon. The Red polygon outlines the MFZ02 survey which was partially reprocessed by the Joint Venture.

2 Database

The seismic database consists of a select number of 2D and 3D seismic surveys, the complete list can be found in Table 2.1 and the location of the surveys in Figure 2.1. Two seismic surveys were key to the final assessment of license, the reprocessed 3D seismic survey MFZ02OMVT15, and the 2D seismic survey BSS01. The 3D seismic survey MFZ02-OMV-T15 has a total data coverage of 465 km², approximately 190 km² are within the license. The quality of the reprocessed 3D seismic cube is considered to be excellent. The northern area of the license, which is not covered by the 3D survey, contains six dip oriented and one strike oriented seismic line, totaling approximately 31km of 2D seismic data. The quality of these 2D lines is considered to be good.

Table 2.1 Seismic Database

Seismic Database - 3D			
Survey	Vintage	Area (km²)	Quality
MFZ02OMVT15	2015	~465	Good-Excellent
MFZ02	2002	~880	Good

Seismic Database - 2D			
Survey	Vintage	Area	Quality
BSS01	2001	N.A	Fair - Good

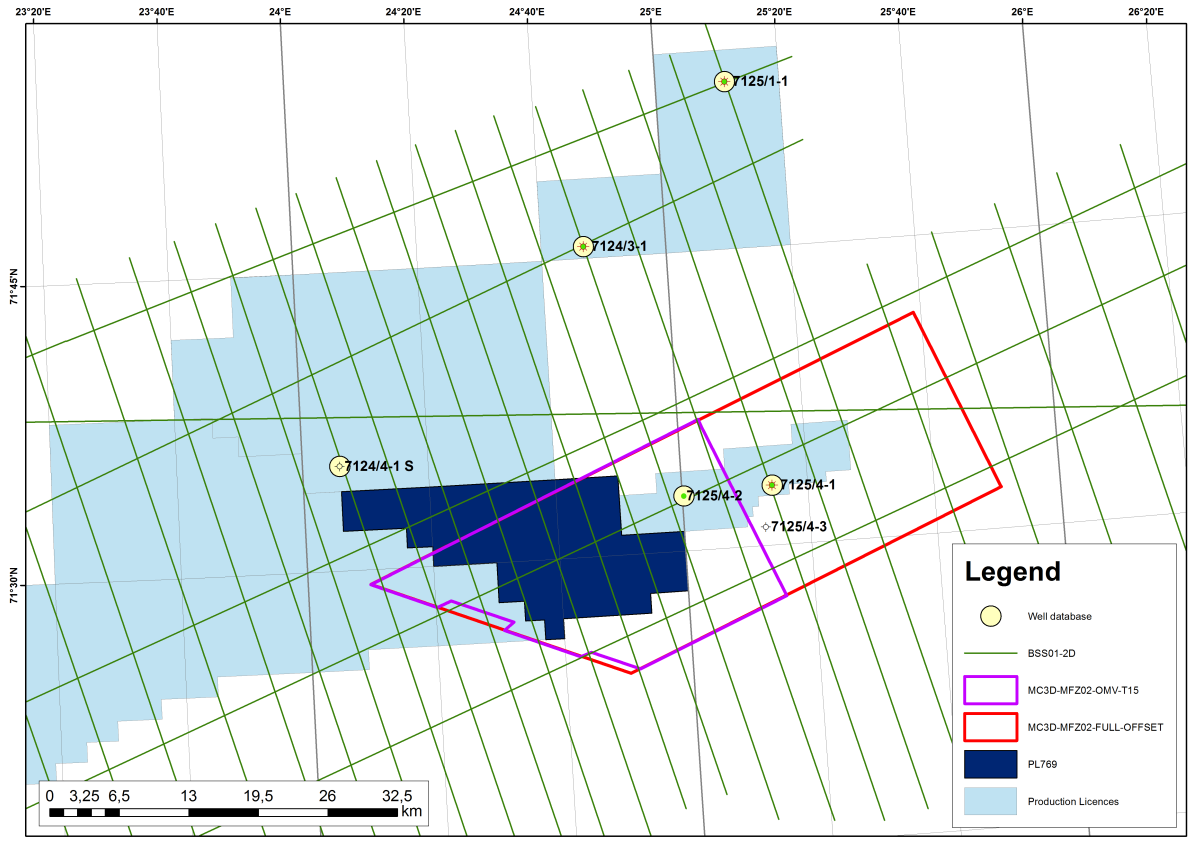

Figure 2.1 Seismic and Well Database Location Map

The field data for MFZ02 seismic survey was purchased and a reprocessing was undertaken to fulfill the Phase 1 work commitment. The main objective for the reprocessing was to increase the resolution of the seismic survey, preserve amplitudes and increase the structural definition. This would allow an effective evaluation of the license prospectivity including spectral decomposition and gather analysis.

The well database is summarized in Table 2.2 with the locations in Figure 2.1. Five wells were essential to understanding the stratigraphy in the area in particular 7125/4-2 and 7124/4-1S. The five wells were subject of a review based on biostratigraphy over the Cretaceous, Jurassic and Triassic sections, the results of which have changed the Operator's understanding of the likely statigraphy present within the license.

Table 2.2 Well Database

Well Name	Prospect Name	Drilled	TD TVD m RKB	Oldest Formation	Age	Hydrocarbons	Operator
7124/3-1	Bamse	1987	4727	Ørn	Carboniferous	Oil/Gas	Saga Petroleum
7124/4-1S	Heilo	2011	2730	Havert	Triassic	Dry	GDF Suez
7125/1-1	Binne	1988	2199	Kobbe	Triassic	Oil/Gas	Saga Petroleum
7125/4-1	Nucula 1	2007	1615	Klappmyss	Triassic	Oil/Gas	Norsk Hydro
7125/4-2	Nucula 2	2008	1750	Klappmyss	Triassic	Oil	StatoilHydro

3 Review of Geological Framework

The main prospect identified on application was named Pecten. The Pecten Prospect was a structural trap consisting of a down thrown hanging wall fault block. Consequently, the trap relied on the two bounding faults to seal. The fault seal was considered to be a high risk as the interpretation of the structure was restrained at the time by 2D seismic data. The primary reservoir was believed to be the Fruholmen Formation, Lower Jurassic / Upper Triassic in age, this was based on the 7125/4-2 (Nucula-2) well's reported formation tops. The Pecten Prospect belonged to the bjl,mj-7 play, belonging to the depositional system extending from the Bjarmeland Platform and to the Nordkapp Basin.

The license work programme was designed to de-risking the Pecten Prospect whilst fully assessing the remaining potential of the license. The two main constituents of the work programme were to reprocess recently available MFZ02 3D seismic data set and to conduct a biostratigraphic review of five local wells.

Geological Studies

In 2014, a review of the Cretaceous, Jurassic and Triassic biostratigraphy for five wells in the vicinity of PL 769 was performed by Ichron on behalf of the licence. The work conducted has shown that the Jurassic is largely absent in wells 7125/4-1 and 7125/4-2, consequently, what was reported as the Fruholmen Formation is in fact the Carnian aged Snadd Formation. The biostratigraphic results show a significant change in preserved stratigraphy between 7124/4-1S (Heilo Well) and 7125/4-2 (Nucula-2) (Figure 3.1).

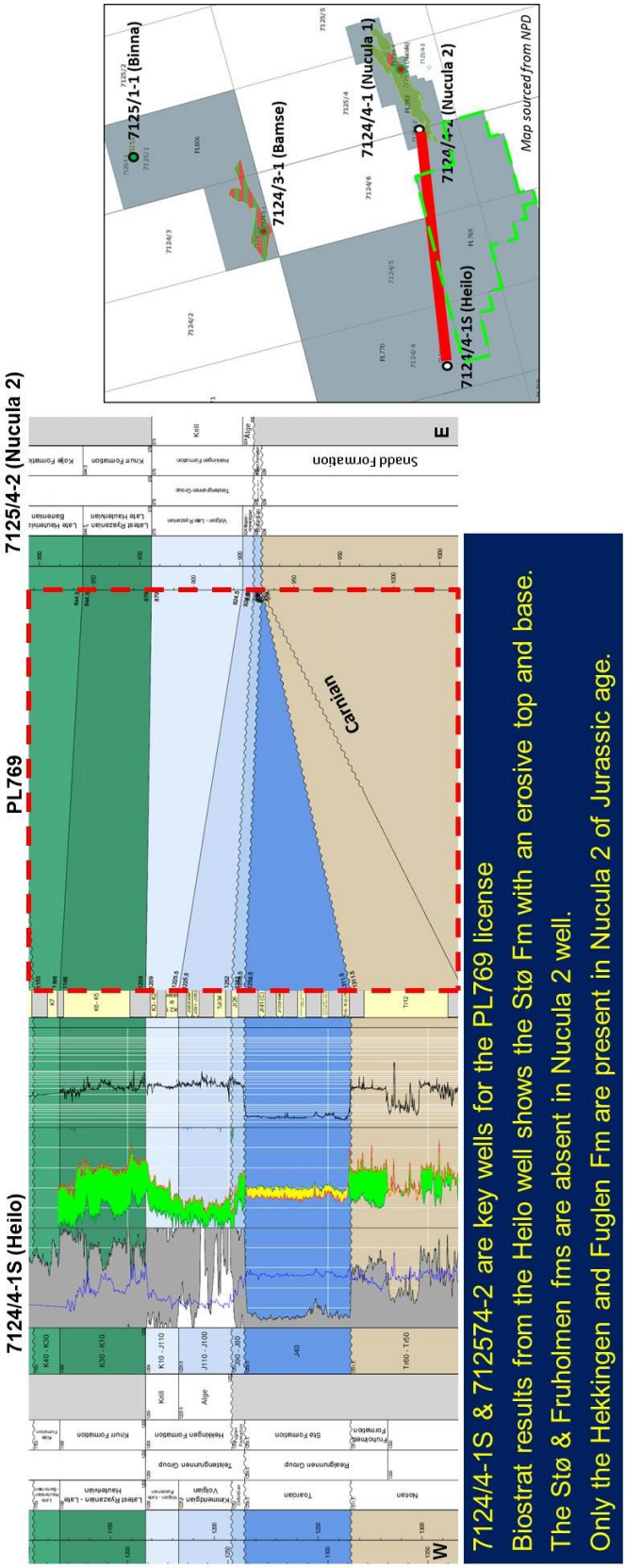

Figure 3.1 Example of Biostratigraphy Results
Biostratigraphy results shows a series of significant unconformities within the location of PL769

Seismic Reprocessing and Interpretation

The reprocessing of the MFZ02 3D seismic survey represented the main activity in the work programme and was completed by OMV's in-house processing group in Vienna. The purpose for the reprocessing was to improve the resolution of the orginial MFZ02 3D survey in order to identify reservoir characteristics and accurately interpret structural linearments, in particular the bounding faults of the Pecten Prospect. A large improvement in seismic quality was observed in the reprocessed data set. The reprocessed seismic cube (MFZ02OMVT15) was incorporated with the regional 2D seismic data (BSS01) allowing the five wells which were updated by reassessing the biostratigraphy to be fully incorporated. In total ten horizons were interpreted regionally, including; Sea Bed, Near Base Tertiary, Top Hekkingen Fm., Top Stø Fm., Top Snadd Fm., Top Kobbe Fm., Top Klappmyss Fm., Top Havert Fm., Top Røye Fm., and Intra-Permian Carbonates. Further infill horizons were interpreted at prospect level on the 3D seismic data.

By integrating the regional 2D seismic survey with the reprocessed 3D seismic data, the license partnership's understanding of the structural styles and inter-relationships has changed significantly. On 2D seismic data it is difficult to correlate the normal faults confidently. Through the interpretation of MFZ02OMVT15, it can be clearly seen that the license is located at the junction of two conflicting fault trends, the ENE-WSW oriented Måsøy Fault Complex and the NW-SE trending Trollfjorden-Komagelva Fault Zone. On 2D seismic data, these large basin bounding faults appeared to cross each other, and consequently contain hard linkage, through the interpretation of 3D seismic data, it can be observed that the Trollfjorden-Komagelva Fault Zone has had considerably less movement during the Mesozoic era, therefore much of the fault system is overstepping and only exhibiting soft linkage. A clear relay ramp is depicted at the junction of the two faults (Figure 3.2). The structural style over much of PL769 is of a fault terrace zone, with a series of normal faults and relay ramps. The centre of the license consists of an east-west oriented graben.

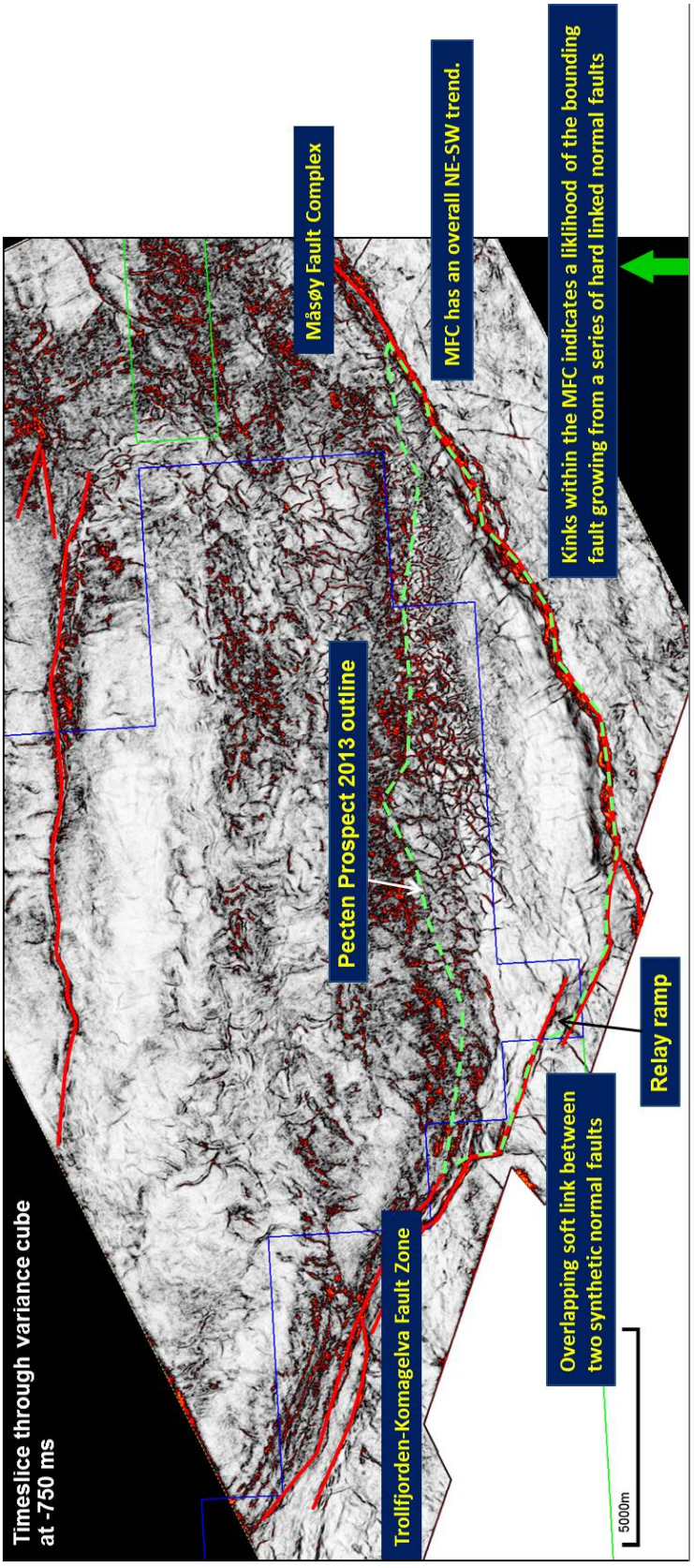

Figure 3.2 MFZ02OMVT15 Variance Cube
Timeslice at -750 ms highlighting the relay ramp located at the crest of the Pecten Prospect

With the increase in seismic resolution the MFZ02OMVT15 3D seismic dataset has been used as an input into a seismic stratigraphy study. A large erosional unconformity is observed at the Top Snadd Formation reflector. This unconformity truncates the Snadd internal reflectors with an increase in missing strata to the south in the license.

Spectral decomposition was carried out on the reprocessed 3D seismic data and extracted good examples of reservoir architecture throughout the data set, particularly within the levels of the Snadd and Kobbe formations. Within the Snadd Formation, several levels of channel belts have been extracted. The larger of these channel belts are found in the Upper Snadd Formation and represent possible hydrocarbon prospectivity in the form of stratigraphic traps.

4 Prospect Update

Pecten Prospect

The Pecten Prospect was the main prospect identified in the APA 2013 application. The prospect was defined as a northerly dipping hanging wall closure relying on a southern and western bounding fault to seal (Figure 4.1). The prospective reservoir at application was Fruholmen formation, same as the reported hydrocarbon level of the Nucula disocvery. The Fruholmen reservoir was anticipated to good quality shoreface sands such as those penetrated by the 7125/4-1 and 7125/4-2 wells. The main risk for the Pecten Prospect was seal due to the risk of fault seal failure.

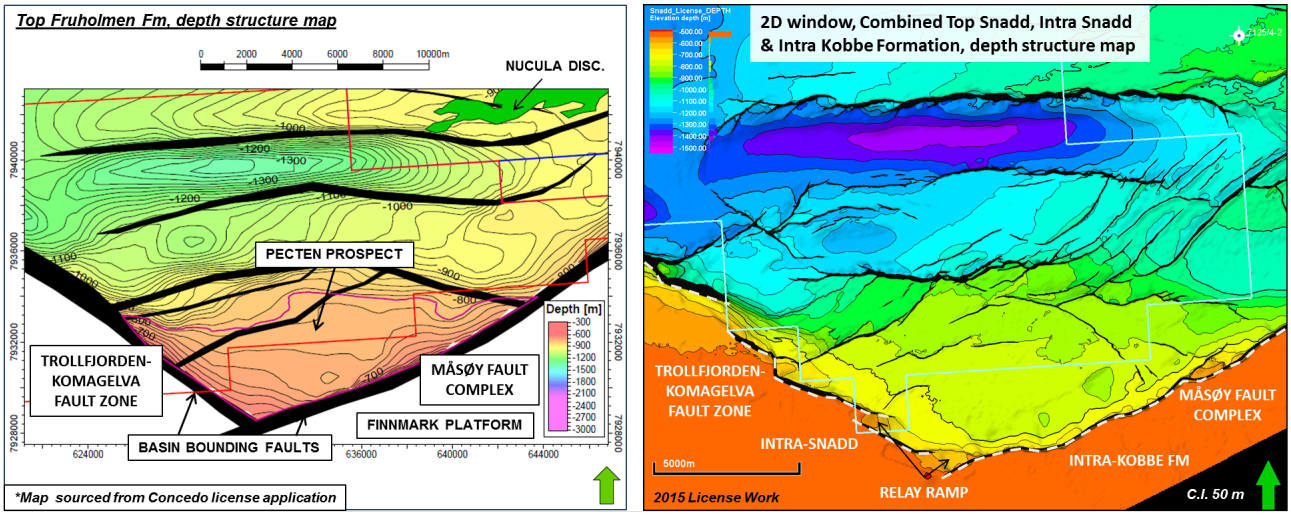

Figure 4.1 Pecten Prospect, Application vs. Present Day
Comparison between the Pecten Prospect top reservoir map for the 2013 APA Application and present day view

Work completed during the work programme has proven an absence of fault seal at the crest of the prospect due to the presence of a relay ramp between the Måsøy Fault Complex (MFC) and Trollfjorden-Komagelva Fault Zone (TKFZ) bounding faults (Figure 3.2). An arbitrary two-way time seismic line is oriented along the relay ramp in Figure 4.2. A possibility of a stratigraphic closure was investigated by assessing the liklihood of a facies change at the reservoir level. Spectral decomposition suggests several channel belts are located within the within the zone of interest.

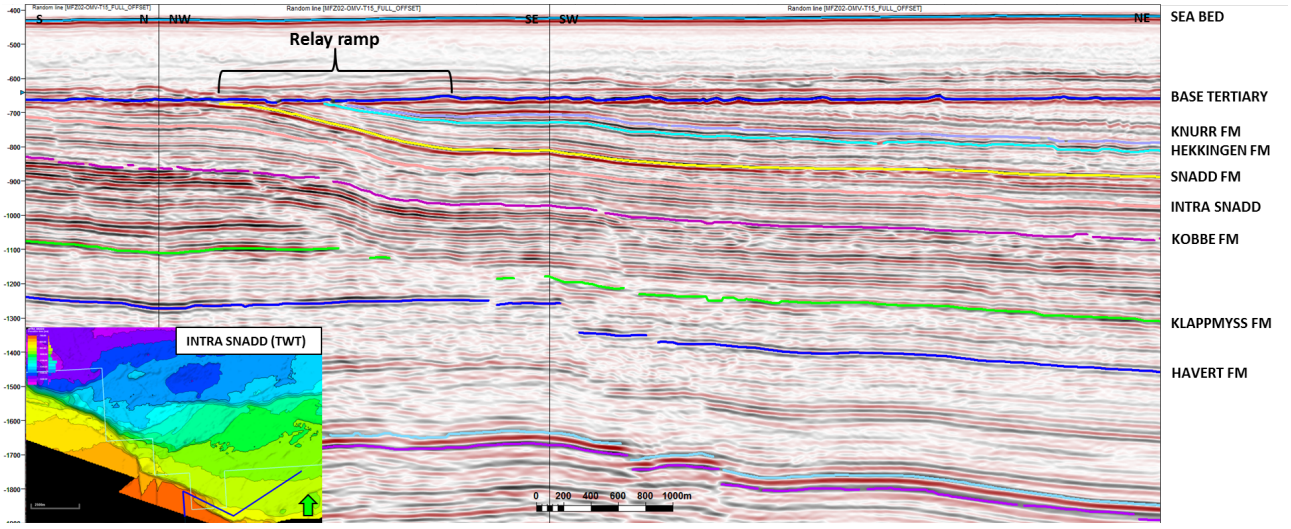

Figure 4.2 Seismic Cross Section Depicting Relay Ramp
Arbitrary TWT seismic line along the relay ramp and to the south. Inset is a location map showing the route of the seismic line.

As previously mentioned, the results of a biostragraphy study had shown the Nucula discovery to be in an upper shoreface facies of the Snadd Formation. Within the license, a significant unconformtiy is present between the Snadd Fm and overlying Fuglen Formation. The liklihood of these shoreface sand being preserved updip to the south of the license is unlikely.

Gather analysis was completed in the prospect comparing the change in amplitude response with offset. Modelling suggests oil, gas and brine cases all to be a Class I AVO repsonse. The AVO responses at the Pecten crestal location, a syncline on the data set and the 7125/4-2 well were compared and all locations supported the modelling with a consistent Class I effect (Figure 4.3. A brightening was observed on the 3D seismic data set, however this amplitude increase is proven to be a result of seismic wavelet tuning due to the erosional unconformity at top Snadd.

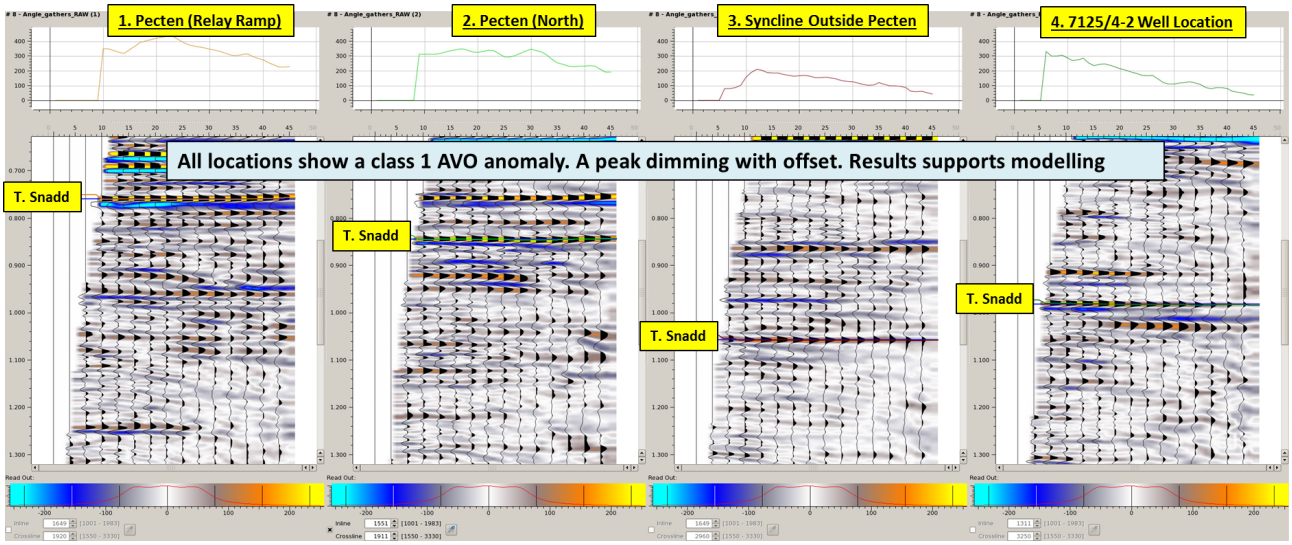

Figure 4.3 Pecten AVO Responses
AVO responses for four locations within the MFZ02OMVT15 3D seismic data set at Top Snadd level.

With the absence of a bounding fault towards the crest of the structure, Pecten is no longer considered a prospect.

Bivalvia Lead

The Bivalvia Lead was a possible extension of the Ensis Prospect in the neighbouring PL393B license. The lead consisted of Knurr Formation sands located in an east-west oriented graben. The drilling of the 7125/4-3 (Ensis) well has shown no reservoir to be present within the Knurr Formation.

Eel Prospect

The Eel Prospect was discovered as a result of the license work conducted by OMV Norge on behalf of the partners. The prospect is an intra-Snadd Formation isolated channel belt located on a tilted footwall high (Figure 4.4). The definition of the prospect on seismic cross sections is poorly contrained (Figure 4.5), however amplitude extractions on the reprocessed 3D data set allow good lateral definition. The channel definition has been further enhanced through spectral decomposition (Figure 4.4). The key risk for the Eel Prospect is seal due to the combination of base, lateral, top and fault seal all being required to work. Amplitude analysis on the seismic gathers was also carried out on this prospect, however further conditioning of the gathers would be required for a clear AVO response. Unfortunately, preliminary volumes calculated for the Eel Prospect suggests it is uneconomic with PMean recoverable resources of 27.5 10^6 Sm^3, the overall chance of success is 5%. The Eel Prospect data sheet is in Table 4.1.

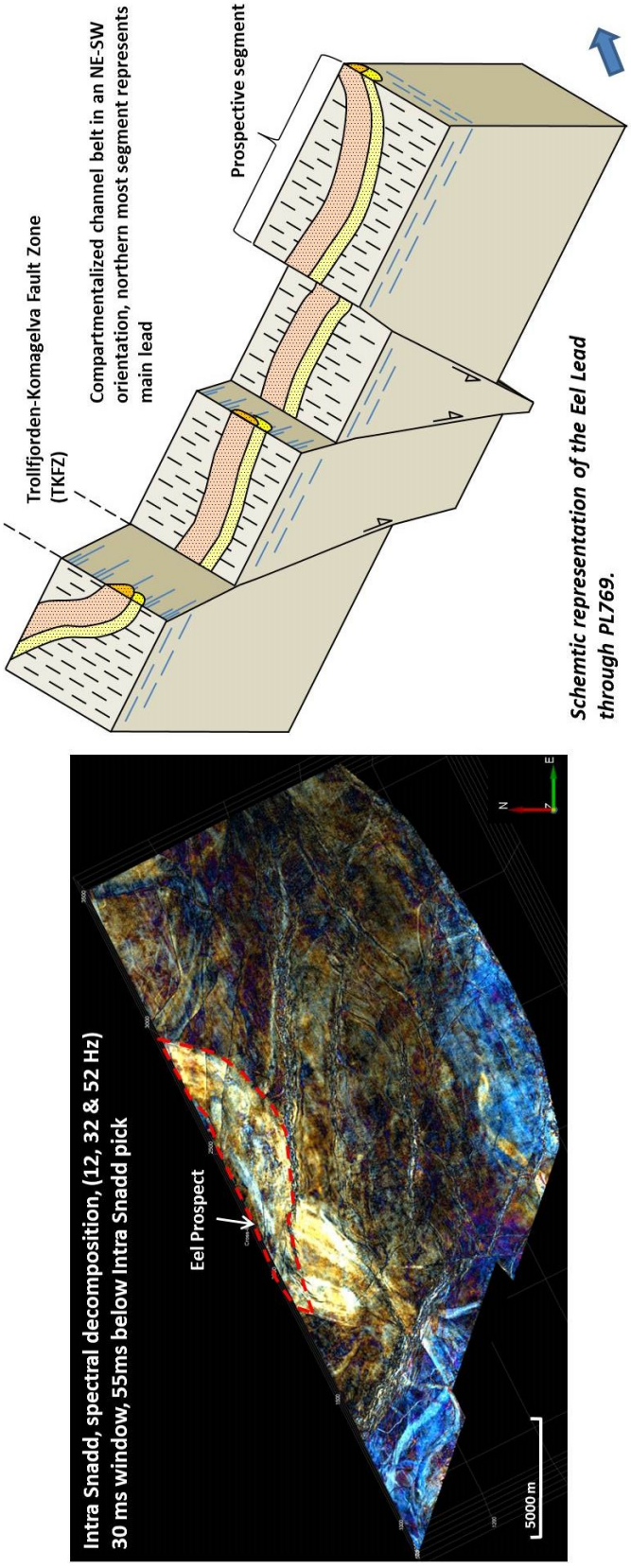

Figure 4.4 Eel Prospect Overview
Eel Prospect depicted on spectral decomposition and schematic diagram.

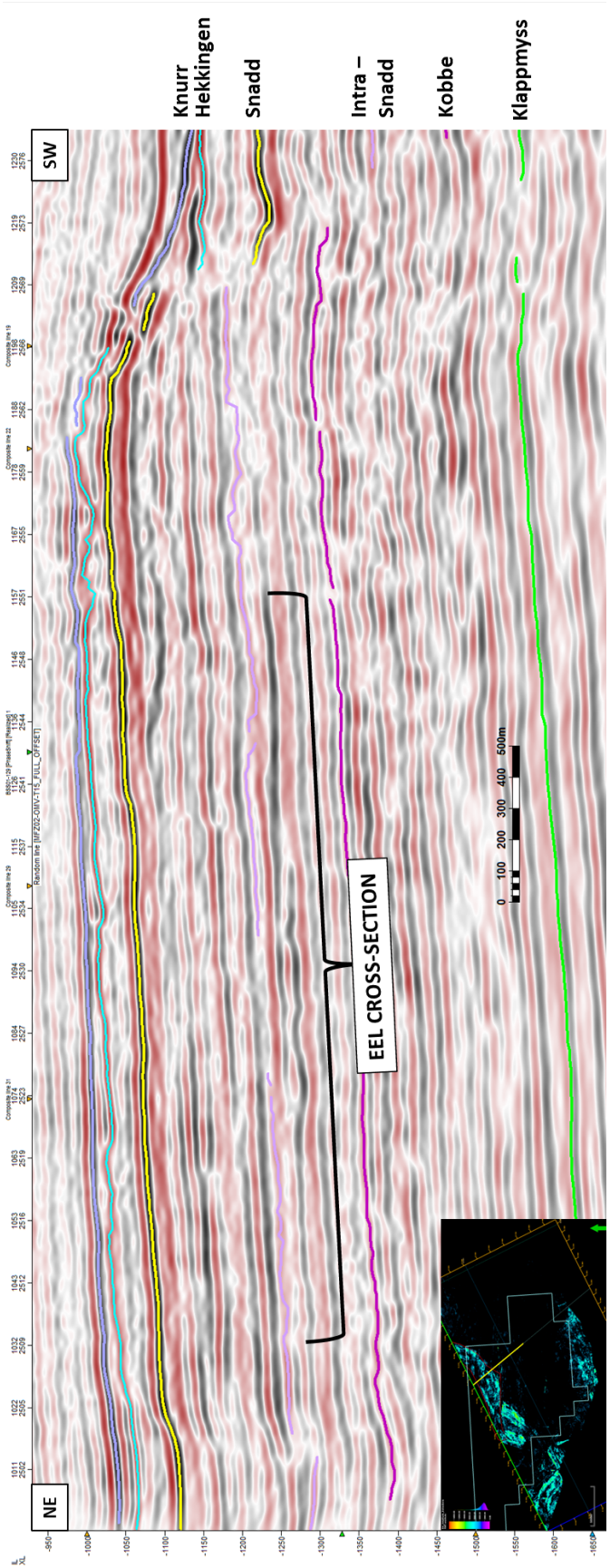

Figure 4.5 Arbitrary Seismic Cross-Section (TWT) Through Eel Prospect

Table 4.1 Eel Prospect Data Sheet (NPD)

Block	7124/5 & 7124/6	Prospect name	Eel	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Oil	Reported by company	OMV (Norge) AS	Reference document	PL769 Relinquishment Report			Assessment year	2015
This is case no.:	1 of 1	Structural element	Måsøy Fault Compl	Type of trap	Stratigraphic	Water depth [m MSL] (>0)	296	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		**Main phase**				**Associated phase**			
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10^6 Sm^3] (>0.00)	5.01	28.80	27.50	49.50				
	Gas [10^9 Sm^3] (>0.00)	5.01				0.16	0.02	1.16	2.40
Recoverable resources	Oil [10^6 Sm^3] (>0.00)	1.35	5.51	9.18	18.50				
	Gas [10^9 Sm^3] (>0.00)					0.01	0.01	0.43	0.91
Reservoir Chrono (from)	Carnian	Reservoir litho (from)	Snadd Fm	Source Rock, chrono primary	Anisian	Source Rock, litho primary	Steinkobbe	Seal, Chrono	Carnian
Reservoir Chrono (to)	Carnian	Reservoir litho (to)	Snadd Fm	Source Rock, chrono secondary		Source Rock, litho secondary		Seal, Litho	Snadd Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.05	Oil case (0.00-1.00)	0.05	Gas case (0.00-1.00)		Oil & Gas case (0.00-1.00)			
Reservoir (P1) (0.00-1.00)	0.64	Trap (P2) (0.00-1.00)	0.80	Charge (P3) (0.00-1.00)	0.80	Retention (P4) (0.00-1.00)	0.30		
Parametres:	Low (P90)	Base	High (P10)	*The Eel Prospect is an intra Carnian aged channel body. It is a stratigraphic trap with a structural component.*					
Depth to top of prospect [m MSL] (> 0)	1200	1260	1300						
Area of closure [km^2] (> 0.0)	2.8	15.2	23.0						
Reservoir thickness [m] (> 0)	15	20	25						
HC column in prospect [m] (> 0)	40	100	174						
Gross rock vol. [10^9 m^3] (> 0.000)	0.337	0.469	0.607						
Net / Gross [fraction] (0.00-1.00)	0.75	0.80	0.85						
Porosity [fraction] (0.00-1.00)	0.17	0.21	0.24						
Permeability [mD] (> 0.0)	900.0	1000.0	1100.0						
Water Saturation [fraction] (0.00-1.00)	0.28	0.30	0.33						
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)	0.86	0.90	0.96						
GOR, free gas [Sm^3/Sm^3] (> 0)									
GOR, oil [Sm^3/Sm^3] (> 0)	20	42	70						
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.20	0.32	0.45						
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0.25	0.37	0.50						
Recov. factor, gas main phase [fraction] (0.00-1.00)									
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)									
					For NPD use:				
Temperature, top res [°C] (>0)	38			Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	146			Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1. VSH 40%	2.	3.					Kart nr	NPD will insert value

5 Technical Evaluations

No new technical and economic evaluations have been performed due to the relatively low resource potential coupled with the very high geological risk. The mean case estimated resources for the Eel Prospect is below the minimum economic field size for the area.

6 Conclusions

The PL769 partnership has placed considerable effort in evaluating the prospectivity of the license. As a consequence of the work programme, the license stakeholders now have a greater understanding of the regional structural styles, in particular, the relationship between the Måsøy Fault Complex and the Trollfjorden-Komagelva Fault Zone. The reprocessed 3D seismic cube MFZ02OMVT15 clearly depicts an absence of hard linkage between the two fault trends. The evaluation of PL769 has also increased the partners knowledge of the preserved stratigraphy in the region, particularly the hiatus from Snadd Formation to Fuglen Formation in wells 7125/4-1 and 7125/4-2. Together these key aspects have allowed the partnership to reassess the main reservoir in the area, Snadd Formation instead of the Fruholmen Formation, and rule out the viability of the Pecten Prospect due to a lack of fault seal.

The reasons for relinquishment of the license are listed below:

- Main prospect on application lacks structural definition due to clearly imaged relay ramp on 3D seismic data at the crest of Pecten.
- The recoverable volumes for other prospects and leads within the license are regarded as non-commercial and contain a very high geological risk, therefore insufficient to support a drilling decision. Figure 6.1 depicts the prospectivity for the license, in addition to the location of the 2013 Pecten Prospect.

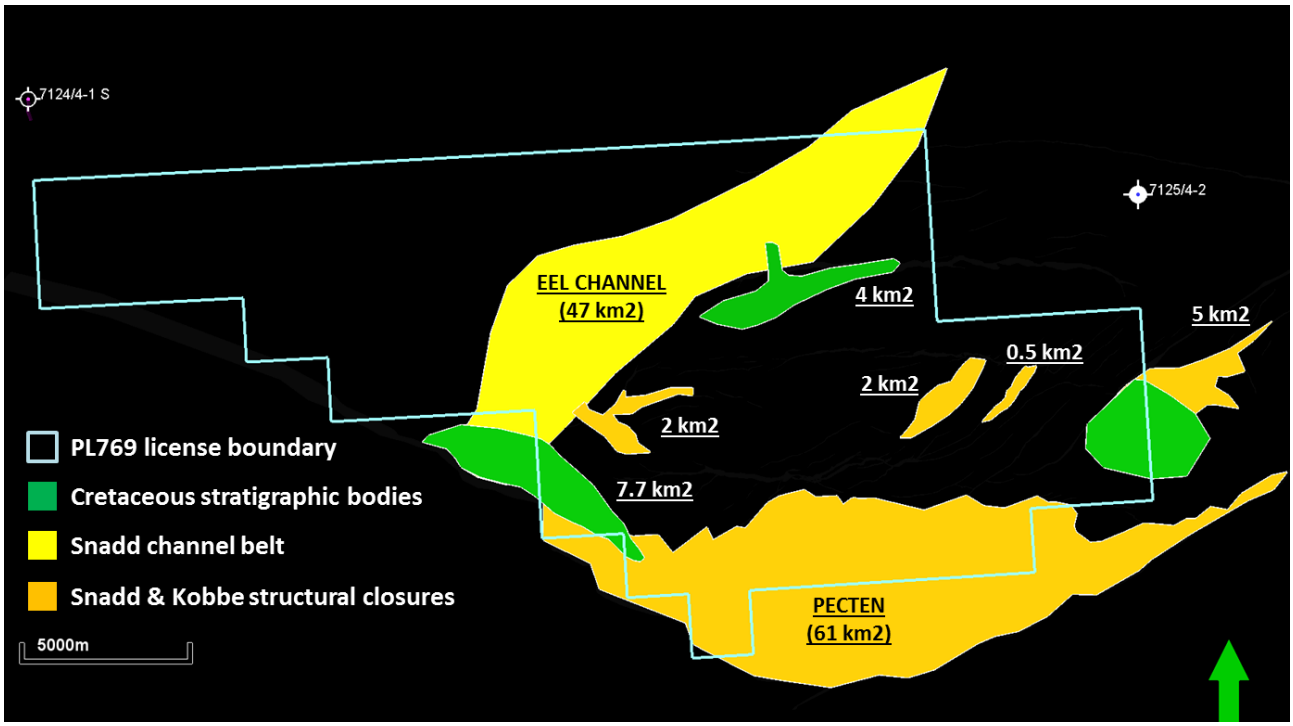

Figure 6.1 PL769 Prospectivity Map

All license commitments have been fulfilled.