

PL849 Licence Status Report

Table of contents

1	Key license history	4
2	Database	5
3	Review of geological framework	8
4	Prospect update.....	9
5	Technical evaluations.....	13
6	Conclusion.....	25

Tables

Table 2.1	Common well database in PL 849.....	6
Table 4.1	Reservoir/fluid parameters	13
Table 4.2	Volume potential, prospects filled to spill	13

Figures

Figure 1.1	SW Barents Sea structural element map showing the location of the Blåmann license (PL849) and the surrounding discoveries in the Hammerfest Basin.....	5
Figure 2.1	Common seismic database for PL849	6
Figure 3.1	Geo-seismic depth section of ST05M09	8
Figure 4.1	License prospect map	9
Figure 4.2	Top Stø depth map with fluid cube extract draped on top. Untested closures indicated with yellow outlines.10	10
Figure 4.3	Top Snadd depth map, untested closures illustrated.	11
Figure 4.4	a) Seismic section, ST09M05_bal09_Depth XL1823. Top and Base Early Carnian interval illustrated with yellow dashed lines. b) Early Carnian channels visualized on RMS interval average map. Structural closure at Top Snadd Fm level indicated with yellow contour at 2263 m.	12

1 Key license history

License: PL849 - blocks 7121/7, 7121/8, 7121/9 and 7122/7

Awarded: February 5th, 2016

License period: Expires February 5th, 2022
Initial period: 6 years

License group:

Statoil Petroleum AS	50% (Operator)
Eni Norge AS	30%
Petoro AS	20%

License area: 359.723 km²

Work program: Firm exploration well and Decision to concretize, deadline February 5th 2018.

Meetings held:

21.04.2016	ECMC startup meeting
03.06.2016	EC work meeting – well location
13.07.2016	EC work meeting – well location
27.10.2016	ECMC meeting
30.05.2017	ECMC meeting – CapX dispute
12.07.2017	EC work meeting – well operation
24.11.2017	ECMC meeting

Work performed:

2016: License start-up and well planning.
2017: Well planning, drilling of exploration well and evaluation of well results.
2018: Decision made to surrender license.

Reason for surrender:

Due to the lack of gas capacity at Hammerfest LNG until 2042, and the lack of economical robustness of the project, the Blåmann gas discovery (Figure 1.1) will not be developed now. Reference is made to the Discovery Evaluation Report for more detailed information about the discovery (Statoil, 2018). The remaining potential in the license is limited, and none of the mapped prospects are regarded as drillable prospects.

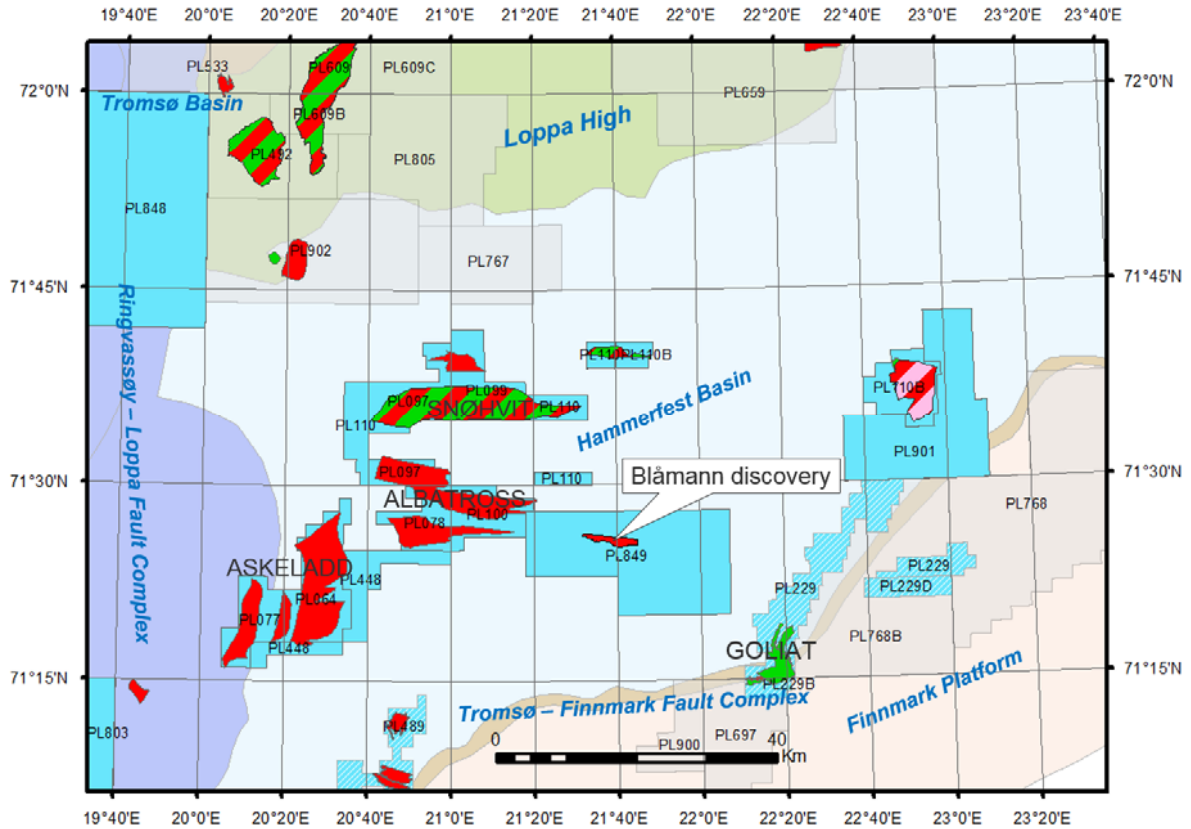


Figure 1.1 SW Barents Sea structural element map showing the location of the Blåmann license (PL849) and the surrounding discoveries in the Hammerfest Basin.

2 Database

2.1 Seismic

The 3D seismic data used for interpretation of the Blåmann Prospect and the evaluation of this discovery was ST05M09. An overview of seismic data included in the common data base is shown in Figure 2.1. Wells in common database are listed in Table 2.1.

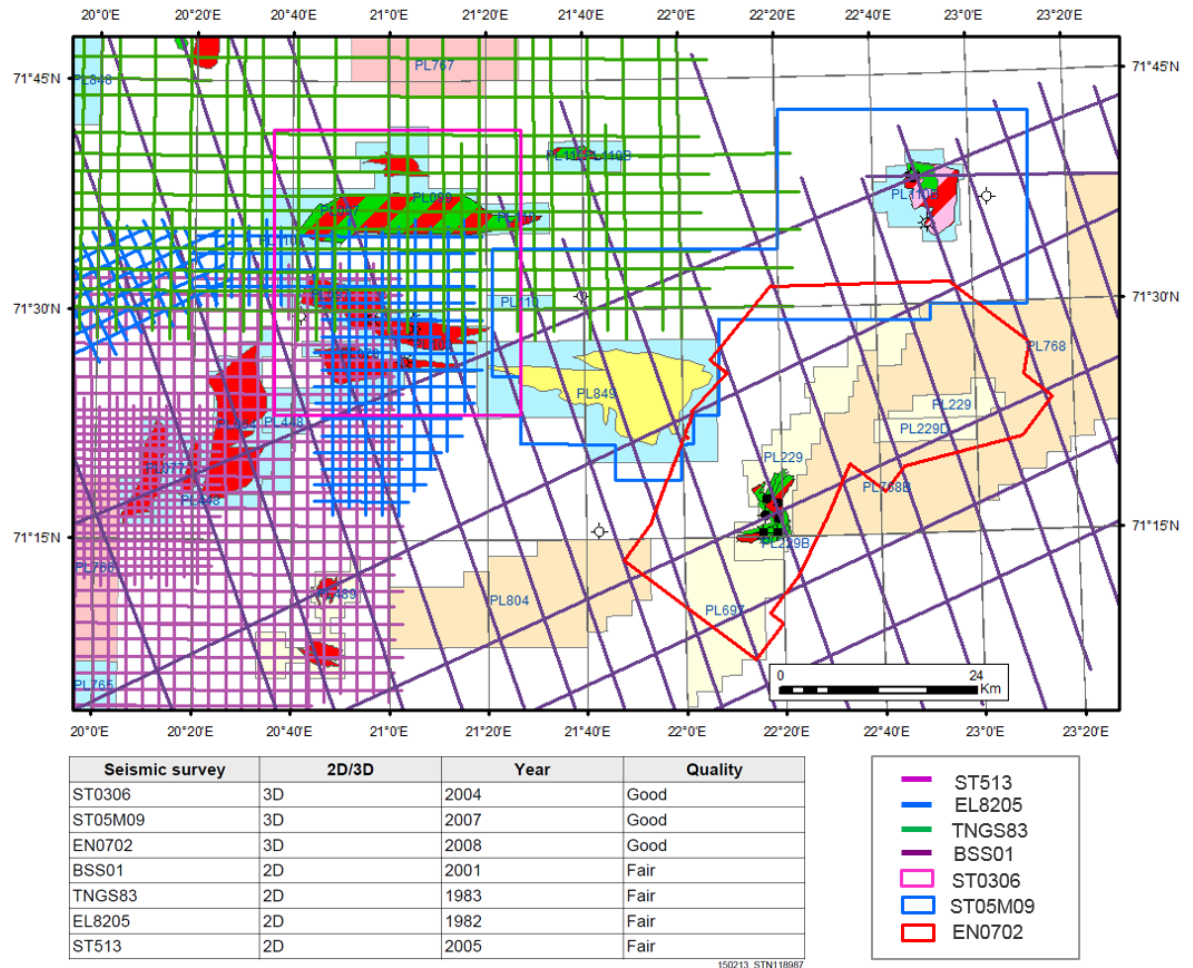


Figure 2.1 Common seismic database for PL849

2.2 Wells

Table 2.1 Common well database in PL 849.

Wells	Year	Drilling operator	Present license	Status	Age at TD	Formation at TD
7120/9-1	1982	Norsk Hydro produksjon AS	PL078	Gas	Late Triassic	Snadd Fm
7120/9-2	1984	Norsk Hydro produksjon AS	Open area	Gas	Late Permian	Røye Fm
7121/5-3	2001	Statoil Petroleum AS	Open area	Oil/gas shows	Late Triassic	Snadd Fm
7121/7-N-3H	2005	Statoil AS	PL100	Gas	Early Jurassic	
7121/7-1	1984	Statoil Petroleum AS	PL100	Gas/condensate	Late Triassic	Fruholmen Fm

PL849 Licence Status Report

Doc. No.

Valid from

Rev. no.

7121/7-2	1986	Statoil Petroleum AS	PL100	Gas	Late Triassic	Fruholmen Fm
7121/9-1	2011	Dong E&E Norge AS	Open area	Dry	Middle Jurassic	Kapp Toscana Gp
7122/6-1	1987	Total Norge AS	PL110B	Gas	Middle Triassic	Snadd Fm
7122/6-2	2006	Statoil ASA	PL100B	Gas	Middle Triassic	Kobbe Fm
7123/4-1 A	2008	StatoilHydro ASA	Open area	Shows	Late Triassic	Snadd Fm
7123/4-1 S	2008	StatoilHydro ASA	Open area	Shows	Middle Triassic	Snadd Fm
7131/4-1	2007	Statoil ASA	Open area	Dry	Middle Triassic	Kobbe Fm
7122/7-1	2000	Norsk Agip AS	PL229	Oil	Middle - Late Triassic	Snadd Fm
7122/7-2	2001	Norsk Agip AS	PL229	Oil	Middle – Late Triassic	Snadd Fm
7122/7-3	2005	Eni Norge AS	PL229	Oil/gas	Permian	Tempelfjorden Gp
7122/7-4 S	2006	Eni Norge AS	PL229	Oil/gas	Early Triassic	Havert Fm
7122/7-5	2006	Eni Norge AS	PL229	Dry	Early Triassic	Klappmyss Fm
7122/7-5 A	2007	Eni Norge AS	PL229	Oil	Middle Triassic	Kobbe Fm
7122/7-6	2013	Eni Norge AS	PL229	Oli/gas	Early Triassic	Klappmyss Fm

3 Geological framework

The regional geological framework is described in the application for blocks 7121/7, 7121/8, 7121/9 and 7122/7 from APA2015. No studies have been performed beside well planning and drilling of well 7121/8-1, with extensive data acquisition and post well studies for regional understanding of the petroleum system.

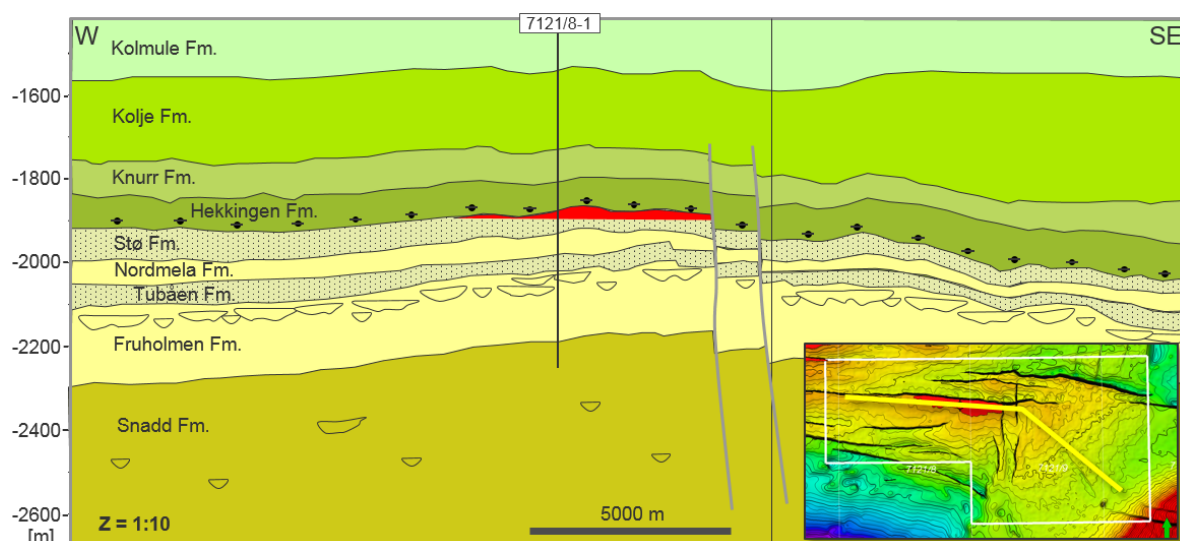


Figure 3.1 Geo-seismic depth section of ST05M09

Only one prospect, Blåmann, was evaluated within the license area applied for. Stø, Nordmela and Tubåen formations were treated as one communicating reservoir level with a pressure controlled eastwards tilted hydrocarbon water contact. Closures at Fruholmen and Snadd levels were expected, but were considered non-economical due to poor reservoir properties. Well 7121/8-1 was drilled 50 m into the Snadd Formation, and proved both Fruholmen and Snadd Norian waterfilled, whereas a small gas discovery was made within the Stø and Nordmela formations (Figure 3.1). See Discovery Evaluation Report (Statoil, 2018) for more information.

The remaining prospectivity in PL 849 is attached to the Lower-Middle Jurassic play and Upper Triassic play, and all prospects show low volume potential. Potential hydrocarbon accumulations can be found within smaller structural closures in the eastern part of the Blåmann structure, within Stø and Snadd formations. At deeper level, Early Carnian channels appear in the seismic data as amplitude anomalies. Due to the lack of top seal within top Nordmela/base Tubåen Formation, Fruholmen is disregarded as a prospective level. This is also in accordance with well observations made in the Snøhvit area.

The Kobbe Fm is not regarded prospective due to deep burial and low permeability, with a maximum burial depth of approximately 4000 m at apex of the closure.

Apart from well 7121/8-1, the closest reference wells targeting this play are the Albatross Sør (7121/7-2) and Albatross Nord (7121/7-1) discovery wells, and well 7121/5-3 on the Delta structure which was dry and interpreted to be a leaked structure.

4 Prospect update

In order to get an understanding of the maximum resource potential within the license area, all closures have been filled to spill in the volume calculations. A new risk assessment has not been performed. An overview of remaining prospectivity is given in Figure 4.1. Reservoir and fluid parameters are summarized in Table 4.1 and updated volume potential is shown in Table 4.2.

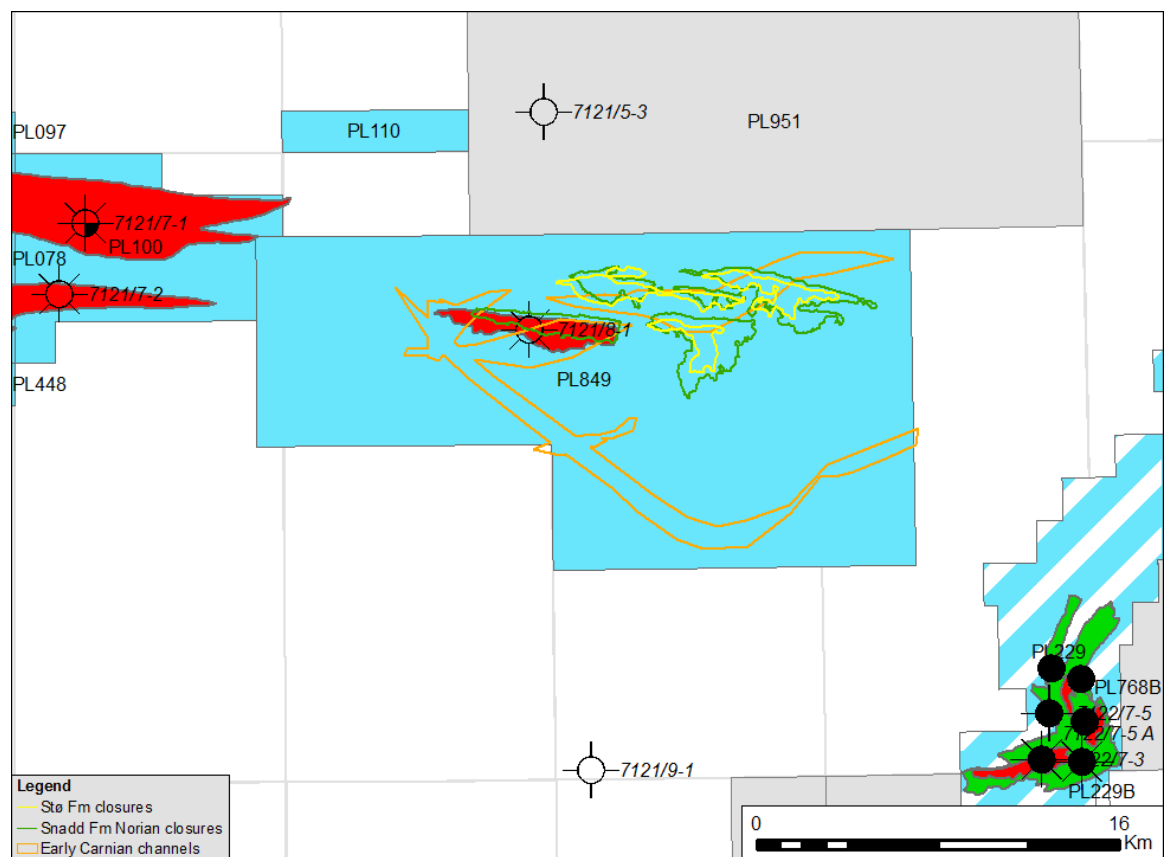


Figure 4.1 License prospect map

At Stø Fm level, four structural closures are mapped (Figure 4.2), all of which show low volume potential. For hydrocarbon filling deeper than the structural closures, sealing north-south trending faults are crucial and not considered an option due to reservoir self-juxtaposition across faults.

The Blåmann gas discovery is characterized by a depth conformant amplitude change. Similar amplitude response can be seen in the eastern part of the Blåmann structure (Figure 4.2). The eastern anomalies are however not depth conformant, and do not seem to correspond to the remaining undrilled closures. A more likely explanation of these anomalies is variations in thickness of the Fuglen Fm and tuning with the Top Stø reflector, together with some effect of residual hydrocarbon saturations.

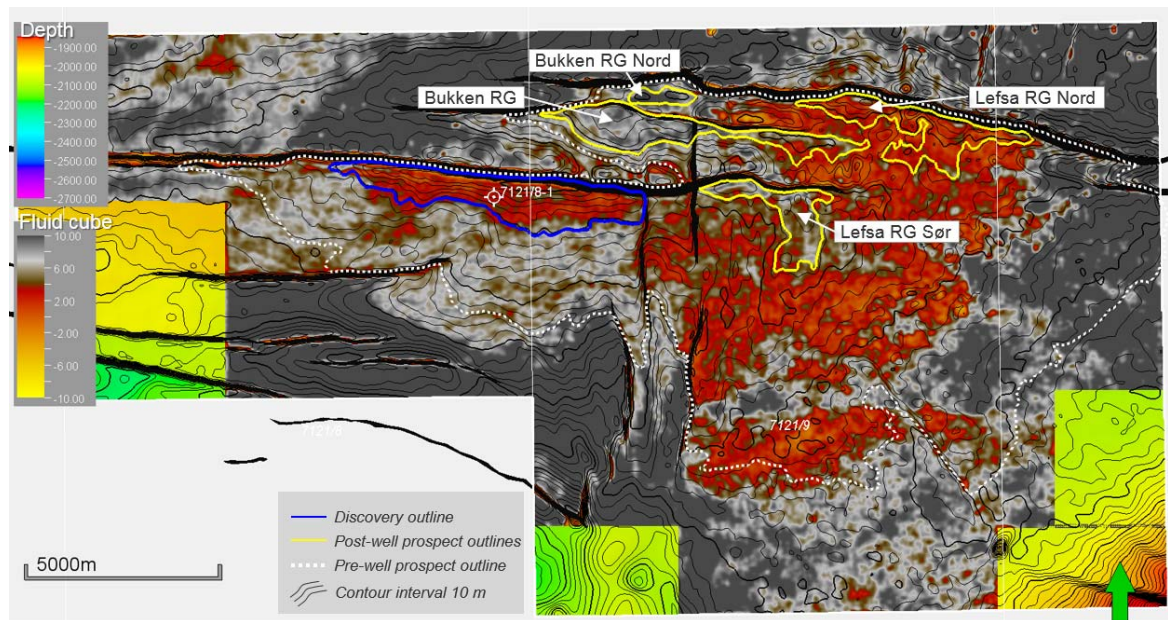


Figure 4.2 Top Stø depth map with fluid cube extract draped on top. Untested closures indicated with yellow outlines.

At top Snadd Fm level (Norian), remaining prospectivity is restricted to minor structural closures in the east and north (Figure 4.3). Deeper filling is required for reaching interesting volumes, however, this scenario was highly dependent of success in well 7121/8-1 and is not considered an option post-well. The eastern part of the Blåmann structure is down-thrown from the western part, and the separating north-south trending faults are not expected to seal a deeper hydrocarbon column in the east.

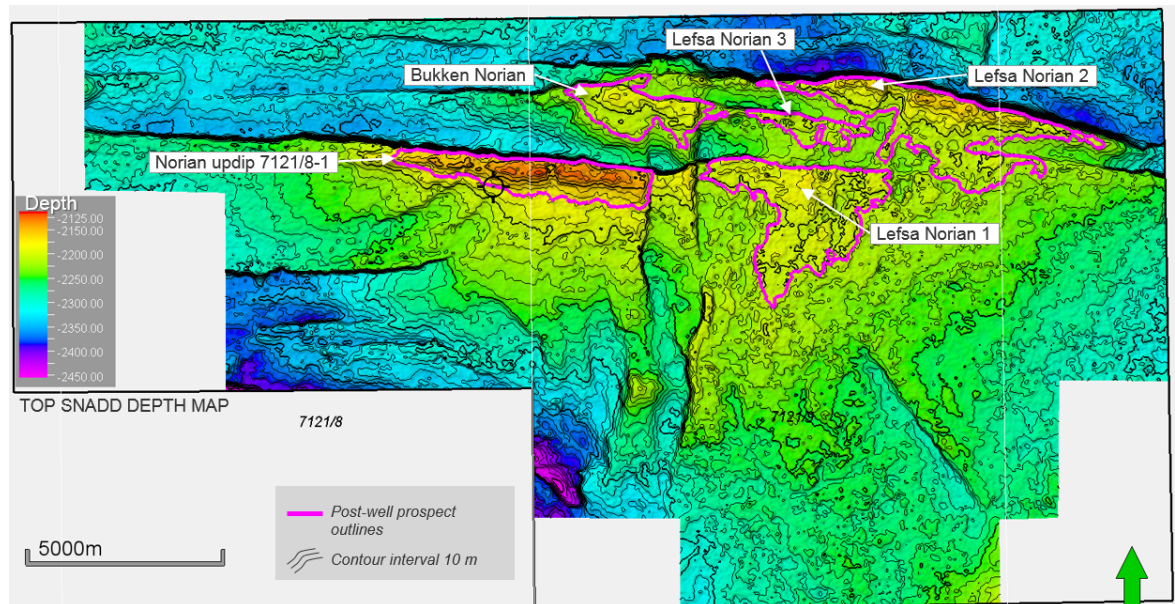


Figure 4.3 Top Snadd depth map, untested closures illustrated.

In the Early Carnian, channels can be observed as amplitude anomalies. These are tilted stratigraphic traps, partly within structural closure at Top Snadd Fm level, characterized by low resource density and limited permeability. Maximum burial depth for these channels is between 3320 and 3700 m TVD. Reference is made to Figure 4.4 for appearance of the channels on seismic section and on amplitude map.

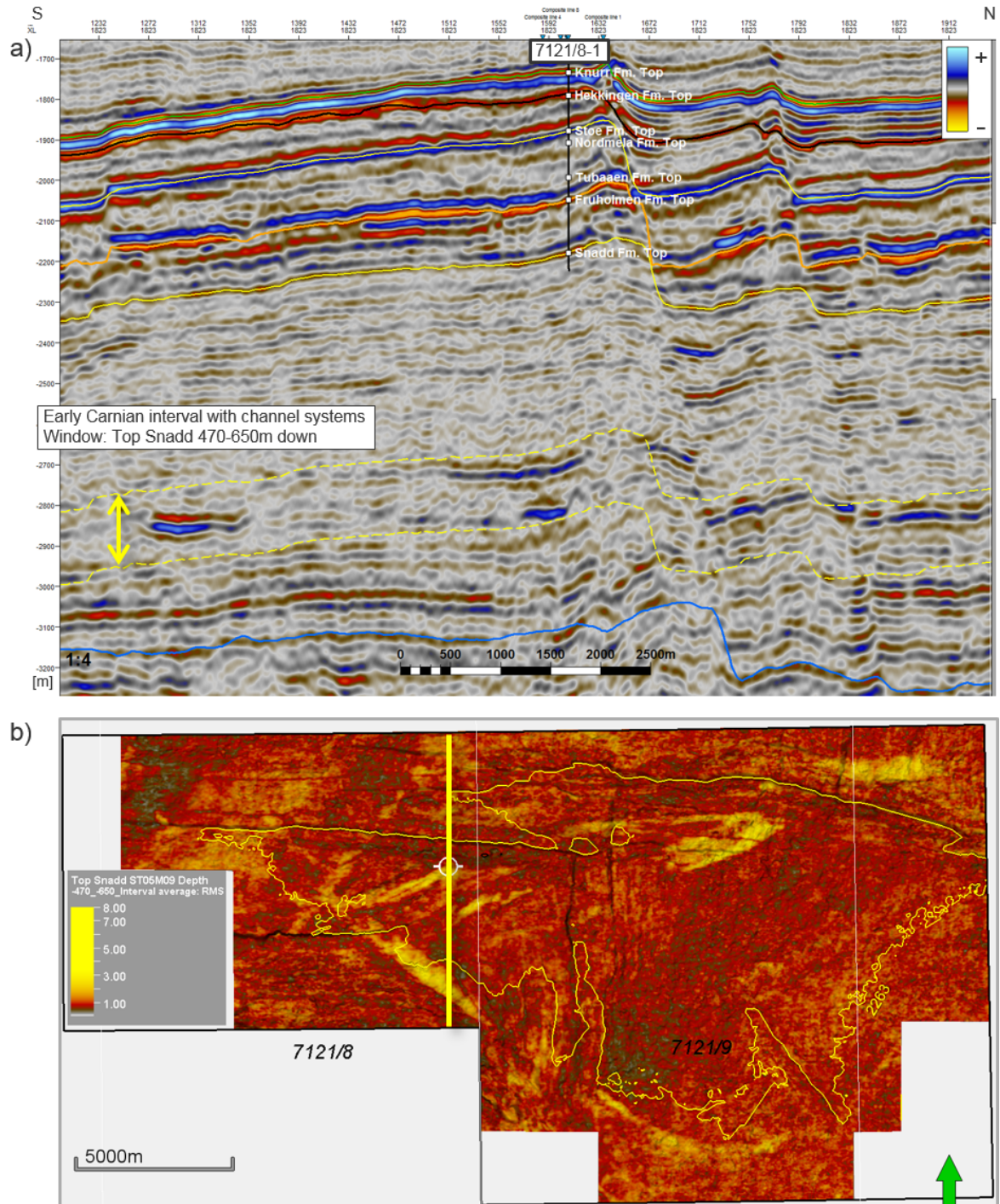


Figure 4.4 a) Seismic section, ST09M05_bal09_Depth XL1823. Top and Base Early Carnian interval illustrated with yellow dashed lines. b) Early Carnian channels visualized on RMS interval average map. Structural closure at Top Snadd Fm level indicated with yellow contour at 2263 m.

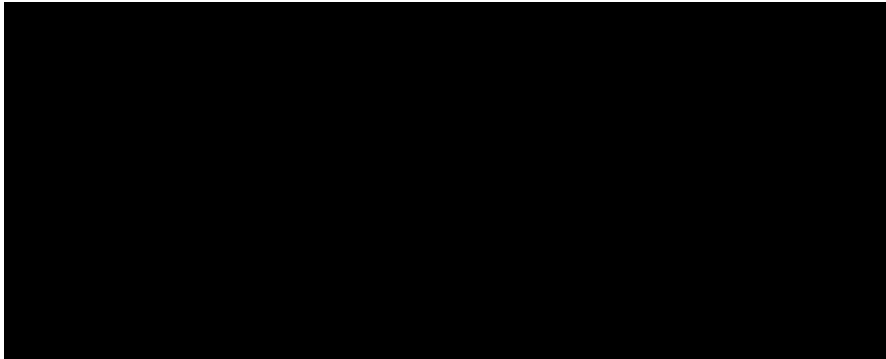


Table 4.1 Reservoir/fluid parameters

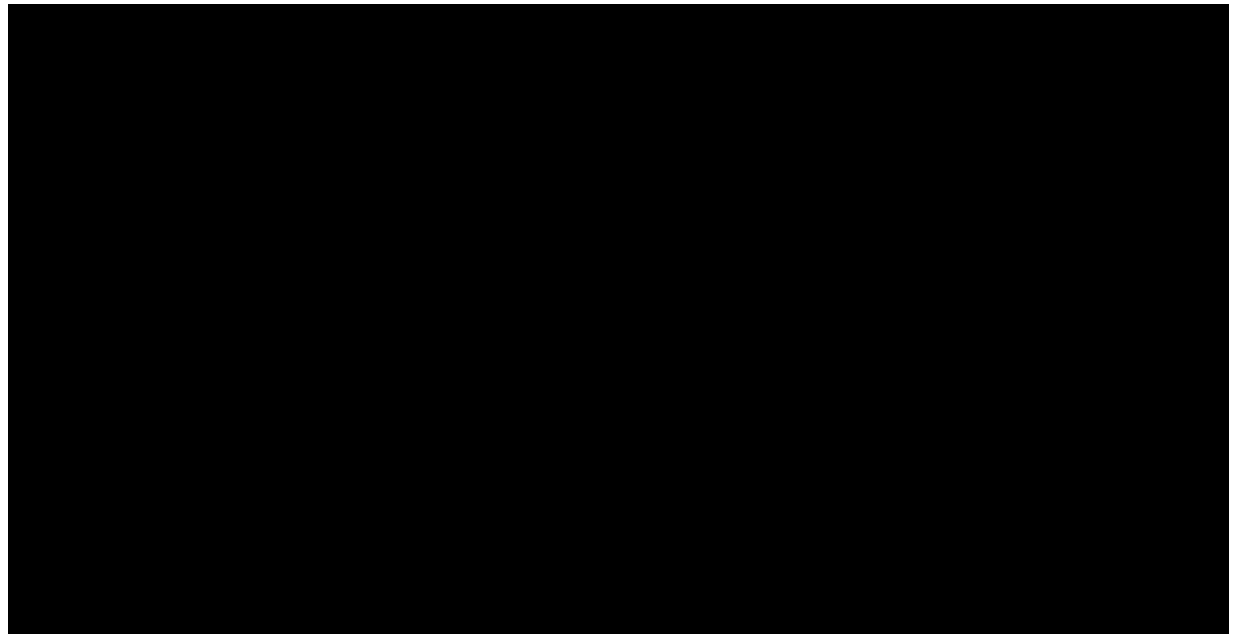


Table 4.2 Volume potential, prospects filled to spill

5 Technical evaluations

- Based on the well result and economics of the Blåmann gas discovery, the remaining prospectivity is not interesting. The remaining prospects/closures have a significantly lower volume potential than the volumes discovered in Blåmann.

6 Conclusions

The Blåmann discovery was made in the Lower to Middle Jurassic Nordmela and Stø formations and contains small gas volumes. Due to the lack of gas capacity at Hammerfest LNG until 2042, and the lack of economical robustness of the project, the discovery will not be developed at this point in time. At present, there are no remaining drilling candidates in the license and the license was surrendered at BoK 05.02.2018.

7 References

