PL686 Relinquishment Report

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1 Key Licence History

PL686 is located in the Northern North Sea, on the Måløy slope/terrace area, between Norwegian mainland and Sogn Graben, and comprise Block 36/4 (Figure 1.1).

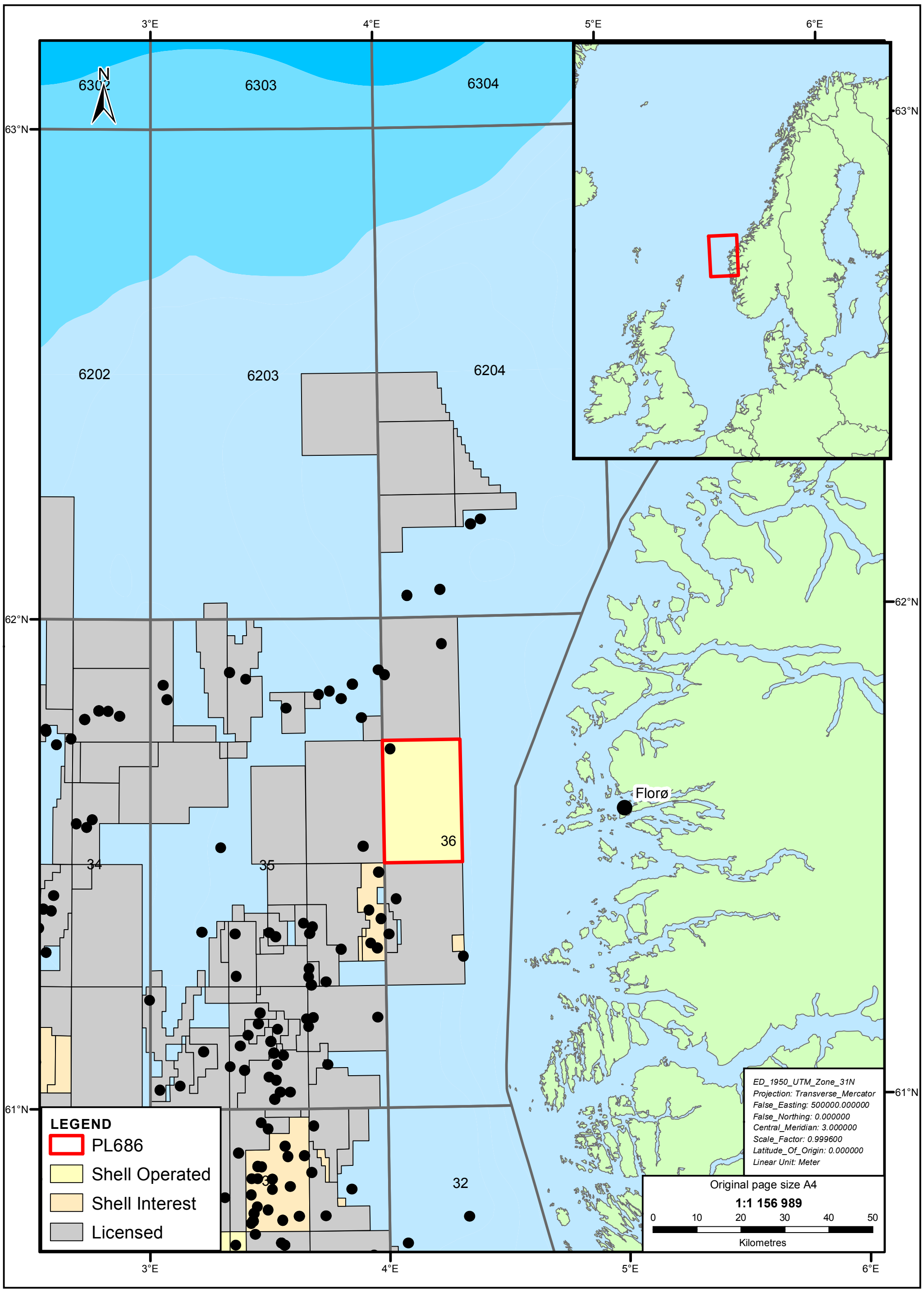


Figure 1.1 PL686 Location Map. Outline of license is indicated in red box

PL686 Partnership and Work Commitment

PL686 was awarded to A/S Norske Shell (Op, 40%), GDF Suez E&P (20%), Idemitsu Petroleum (20%) and Petoro AS (20%) on 8 February 2013 as part of the APA2012 Licensing Round. The work program was to 1) re-process available 3D seismic, and 2) perform geological and geophysical studies within the initial three years and make a Drill or Drop, before the license period expiry date of 8 February 2015. In the case of a drill decision, drill one (1) exploration well before 8 February 2017.

Status on Work Commitment

1) Re-process 3D seismic data. It was the license' aspiration to fully cover the Jotne anomaly by re-processed 3D, and tie it to nearby wells and the Gjøa field. It was therefore decided to perform a pre-stack merge reprocessing of a total of 1645 km^2 3D seismic data, which include input from four individual 3D surveys: ST0703 (Gjøa Field), BPN9401, NH9405, and NH9805 (Figure 1.2).

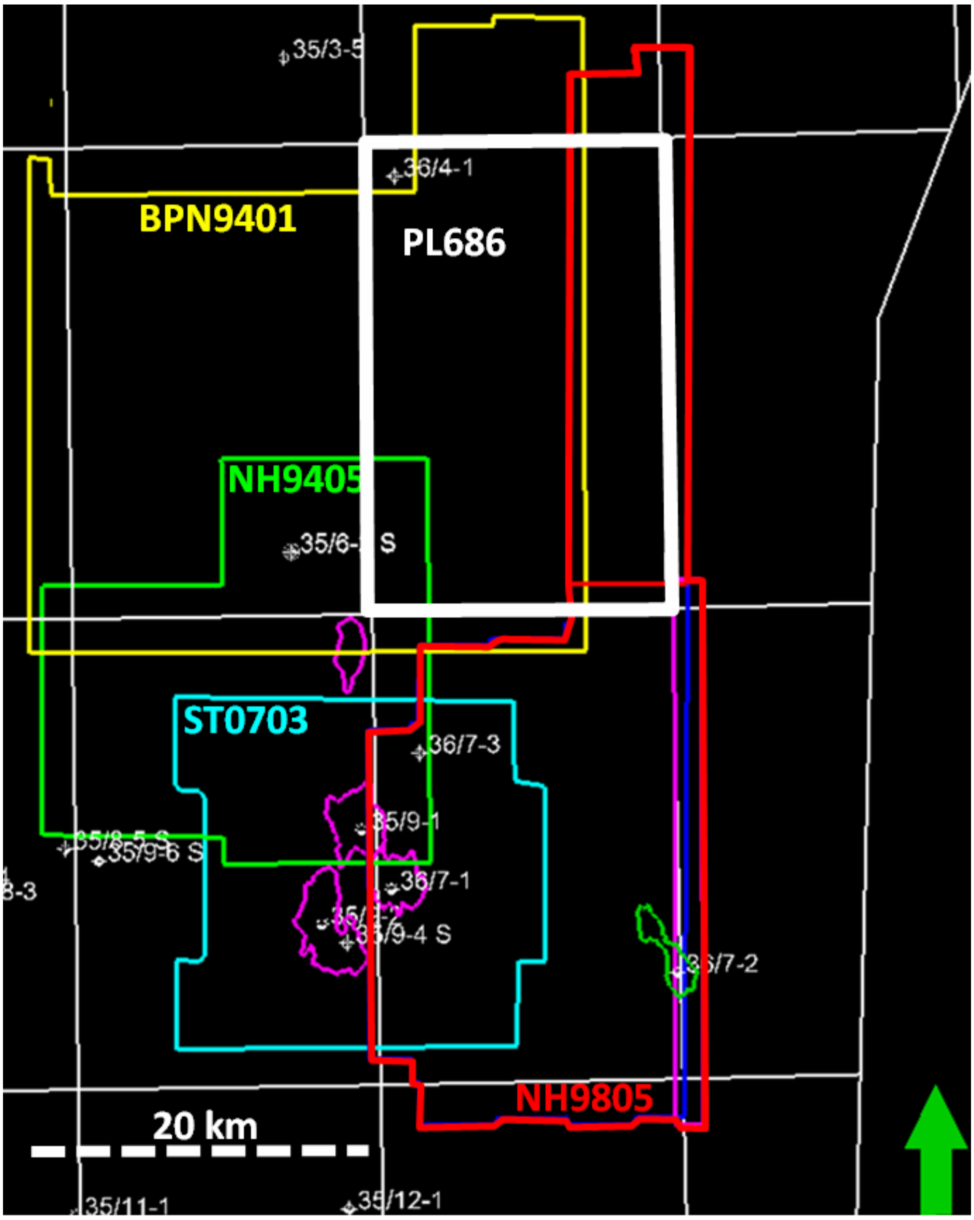


Figure 1.2 3D pre-stack merge re-processing input

2) Perform geological and geophysical studies. CSEM feasibility modeling, seismic QI/AVO inversion, basin modeling, revised reservoir fairway and revised biostratigraphy have been completed - see Section 2 Database.

In January 2015 the partnership unanimously agreed that a prospect of sufficient volume potential and risk profile to warrant an exploration wellbore cannot be identified in the licence. There are no remaining commitments.

Licence Meetings

Meetings have been held at regular basis in the licence. A listing of meetings is found in table 1.1. Documents related to meetings can be found on Licence2Share.

Table 1.1: Meeting History

Meeting	Date
MCM/ECM #1	7 March 2013
Work Meeting #1	18 June 2013
MCM/ECM #2	19 November 2013
Work Meeting #2	5 February 2014
Work Meeting #3	6 May 2014
MCM/ECM #3	25 November 2014

Reason for Relinquishment

Geological and geophysical evaluations of PL686 (see short summary in Table 1.2) do not support presence of a drill-worthy opportunity in the license (Figure 1.3*)*. No other prospectivity have been identified in the licence acreage. A summary of the evaluations is given in table below.

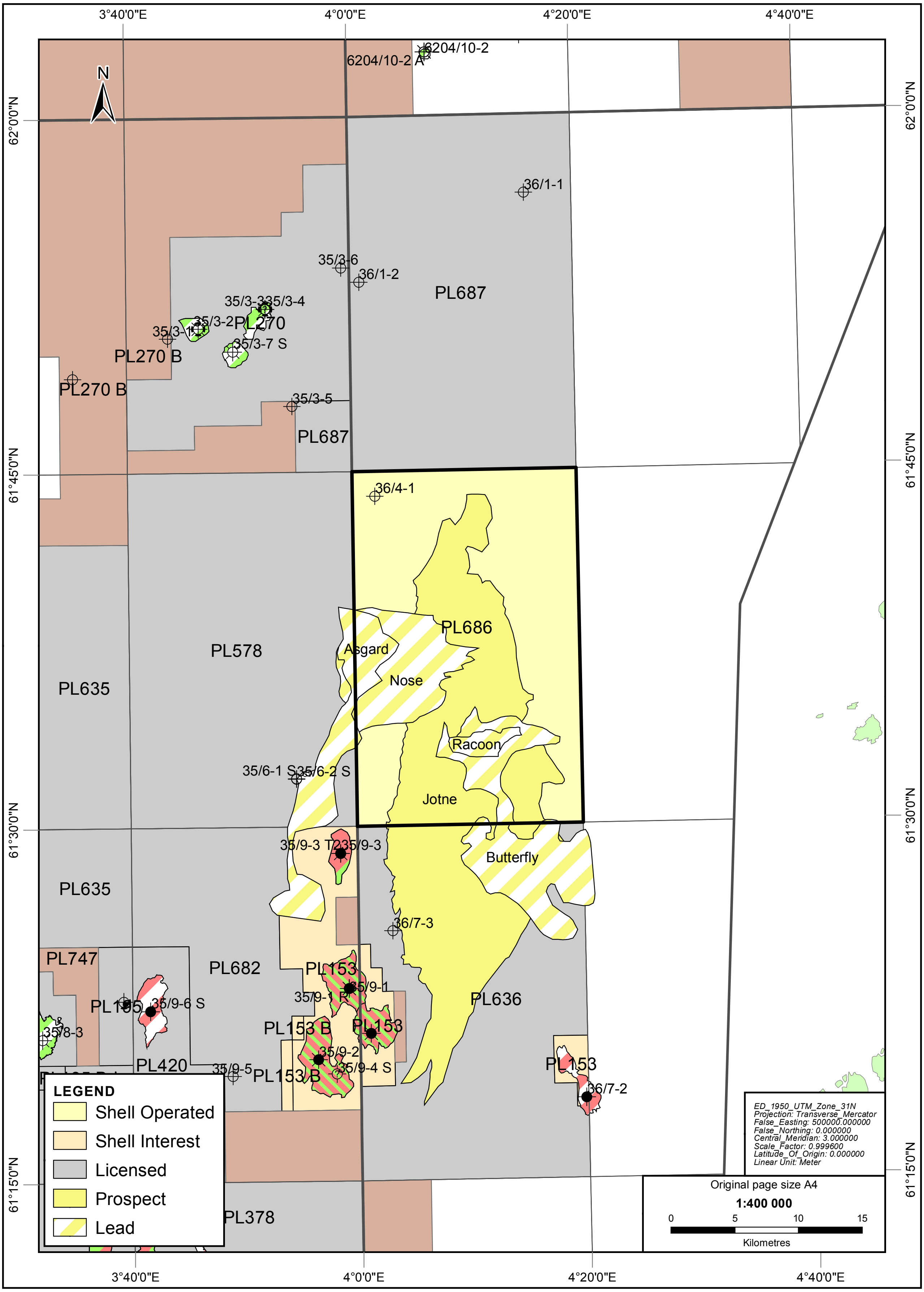


Figure 1.3 PL686 Prospect and Leads overview.

Table 1.2: Technical Evaluation Overview

Name	Current Status	Outcome of Technical Evaluation
Jotne	Prospect	Prospect defined by seismic amplitude anomaly, stratigraphically trapped with main risk elements related to hydrocarbon seal and retention. It is carrying a low GPOS of 14% (tPOS after downgrade is 9 %, as reported in Table 5.1), and is not seen as a drill-worthy candidate.
Nose	Lead	Lead defined by a pinch out stratigraphic trap supported by seismic amplitudes in the Agat Fm sst. It is carrying a low POS of 13%, and is not seen as a drill-worthy candidate.
Åsgard	Lead	Lead defined by a pinch out stratigraphic trap supported by subtle seismic amplitudes in the Åsgard Fm sst. It has limited volumes inside PL686, and is not seen as a drill-worthy candidate.
Butterfly	Lead	Lead defined by a pinch out trap supported by structural components (fault dependant, compartmentalized), in the Brent Gp sst. It is mainly located in PL636, and is not seen as a drill-worthy candidate
Raccoon	Lead	Lead defined by a pinch out stratigraphic trap, erosionally truncated by the Base Cretaceous Unconformity (BCU), compartmentalized by faults, in the Fensfjord Fm sst. It carries very small volumes and is not seen as a drill-worthy candidate

2 Database

The seismic and well database used for PL686 for prospectivity evaluation comprises regional 2D seismic data, 3D seismic data and all relevant wells in the license area. In addition, a DNME survey (Differentially Normalized Method of Electrical Prospecting) was conducted in the license over the initial definition of the Jotne prospect.

Well Database

Relevant wells for PL686 evaluation are listed in table below. A sub-selection of the wells (13 wells, in bold) was utilised in the rock-physics project supporting the QI/AVO inversion project.

Table 2.1: Well and seismic database (wells utilised in rock physics/AVO inversion study is annotated with a star)

Wells	2D seismic	3D seismic
* 35/3-1	Released 2D seismic	ST0703MR13
35/3-2	to support regional	with the following input:
* 35/3-4	interpretation, with	BPN9401
35/3-5	main emphasis on:	NH9405
35/3-6	NVGT-88	ST0703
* 35/3-7 S	ST8408	NH9805
* 35/6-2 S		
35/9-1		
* 35/9-2		
* 35/9-3 T2		
* 36/1-1		
* 36/1-2		
* 36/4-1		
36/7-1		
* 36/7-2		
* 36/7-3		
* 6204/10-2 A/R		
* 6204/11-1		

Seismic Database

The PL686 seismic database is listed in table above. The license commitment was fulfilled upon completion of 3D pre-stack merge reprocessing of ST0703MR13. The final outline of the reprocessed 3D data is shown in Figure 2.1.

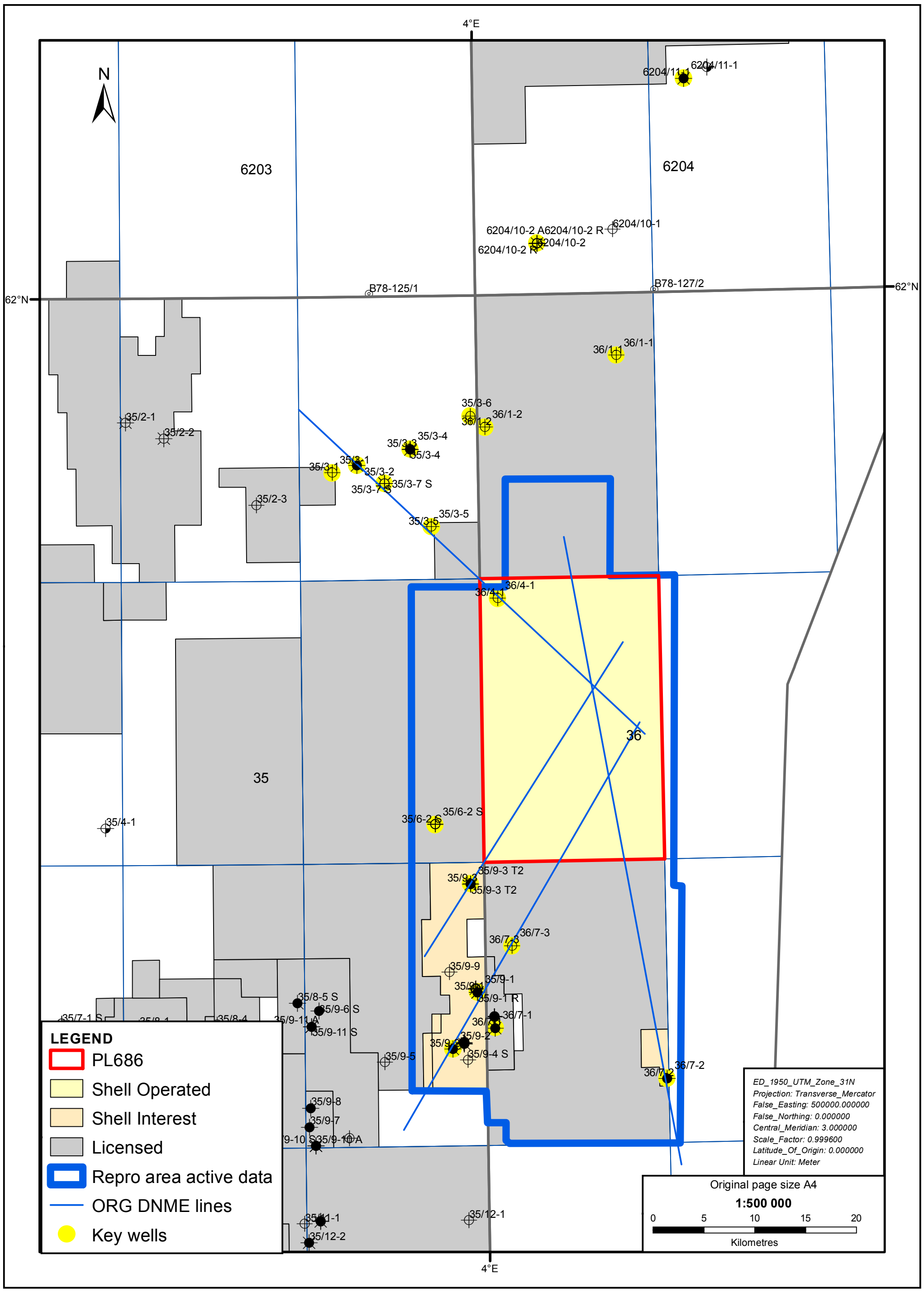


Figure 2.1 PL686 database. Re-processed 3D survey in blue polygon, key wells annotated with yellow, and DNME survey lines as thin blue lines.

Non-seismic Database (DNME - Differentially Normalized Method of Electrical Prospecting)

Recent field trials of Differentially Normalized Method of Electrical Prospecting (DNME) has revealed interesting sensitivity to variations in electrical properties in the overburden. There are apparent close correlation between increased induced polarization (IP) effects and hydrocarbon accumulations. This correlation is theoretically explained by increased presence of electrical susceptible minerals, such as pyrite, in areas where sulfur from hydrocarbon micro seepage has reacted with iron in the overburden and thereby been formed. Increased amount of pyrite causes increased amount in variations of induced polarization which the DNME method can measure, and hence hydrocarbon accumulations below may be indirectly measured. The technology is still in its early phase, and better understanding and knowledge is necessary to fully understand its' strengths and weaknesses.

A DNME survey was acquired over the initial definition of the Jotne prospect (see DNME survey lines in Figure 2.1). No significant DNME anomaly encountered over the prospect area, see data presented in Figure 2.2. In order to aid interpretation support the acquisition was calibrated across multiple wells:

- 36/7-3 (dry) to Gjøa Field: Response encountered on Gjøa, but not above 36/7-3
- 35/9-3 T2 (gas discovery): Response encountered above discovery
- 36/4-1 (dry): No response encountered above dry well
- 37/7-2 (biodegraded oil): Response encountered above discovery

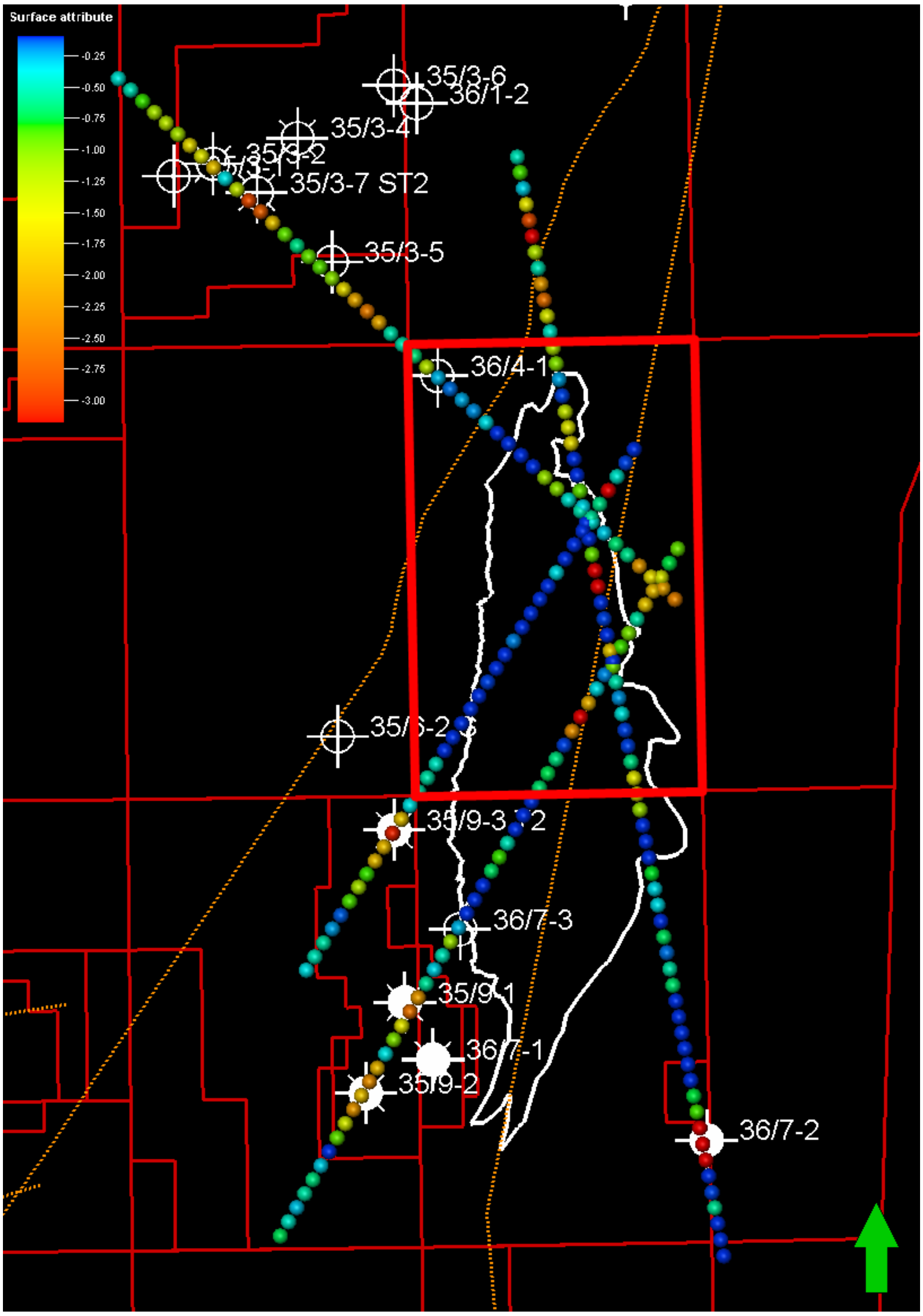


Figure 2.2 DNME survey results. Warm colors indicate increased pyrite anomaly from HC seepage. There is a very good correlation comparing calibration over known discoveries and dry wells, and also to the pipeline passing through PL686 (orange stippled lines).

All calibration points were resolved successfully.

Studies

The re-processed seismic and well data have been integrated into regional and semi-regional models to form the basis of the interpretative framework for the PL686 evaluation. The studies of relevance are:

- EM feasibility modeling (Electromagnetic) performed over the initial understanding of the Jotne prospect. Modeling demonstrated that it was not a feasible survey candidate, and hence no EM-survey was recommended. Main contributor for the negative modeling results is related to limited response from target in combination with rapidly shallowing high resistive basement, which negatively influences the anticipated responses from the target itself as they get closer and shallower towards the east. This conclusions also counts for the final understanding of the Jotne prospect, since basement is unchanged.
- Seismic QI Study (Quantitative Interpretation), including Rock Physics and AVO Inversion, to investigate presence of reservoir sand and differentiate between probability of good reservoir and cemented reservoir sands (see example in Figure 2.3)
- Basin Model Study
- Biostratigraphy, revisiting Mid to Lower Cretaceous stratigraphy for four key wells (35/6-2S, 35/9-3 T2, 36/4-1, 36/7-3)
- Seismic amplitude extractions/sculpting for reservoir facies mapping

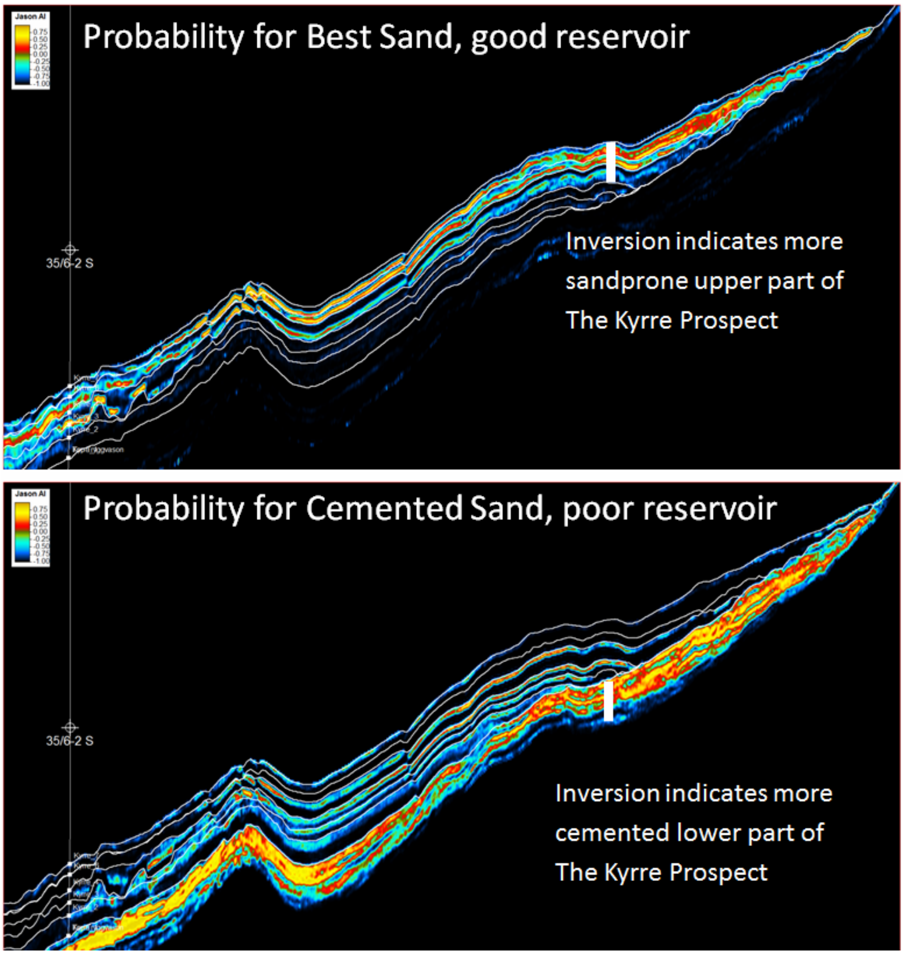


Figure 2.3 Inversion data example. The results show how inversion has been utilised to differentiate between good reservoir sands and cemented reservoir sands. This data has been actively utilized for volume calculations.

3 Review of Geological Framework

Structural Setting

The work in PL686 has not resulted in major changes in the understanding the regional setting for the license.The Jotne prospect is defined by a seismic amplitude anomaly located along the eastern, updip margin of the Måløy Slope/Terrace, in the Northern North Sea (Figure 3.1). The Måløy Slope/Terrace forms the eastern ramp margin of the Sogn Graben, and is defined by a series of gently tilted fault-blocks/half-grabens at Jurassic and deeper levels. It is bounded by the Øygarden Fault Zone to the east, and the eastern boundary fault to the Sogn Graben to the west (Figure 3.2). During the Cretaceous and Early Paleogene, the northern North Sea was a passively subsiding post-rift basin, whereas its basin margin was subject to a series of uplift events resulting in stepwise tilting of the Måløy Slope/Terrace (see stratigraphy with tectonic events in Figure 3.3).

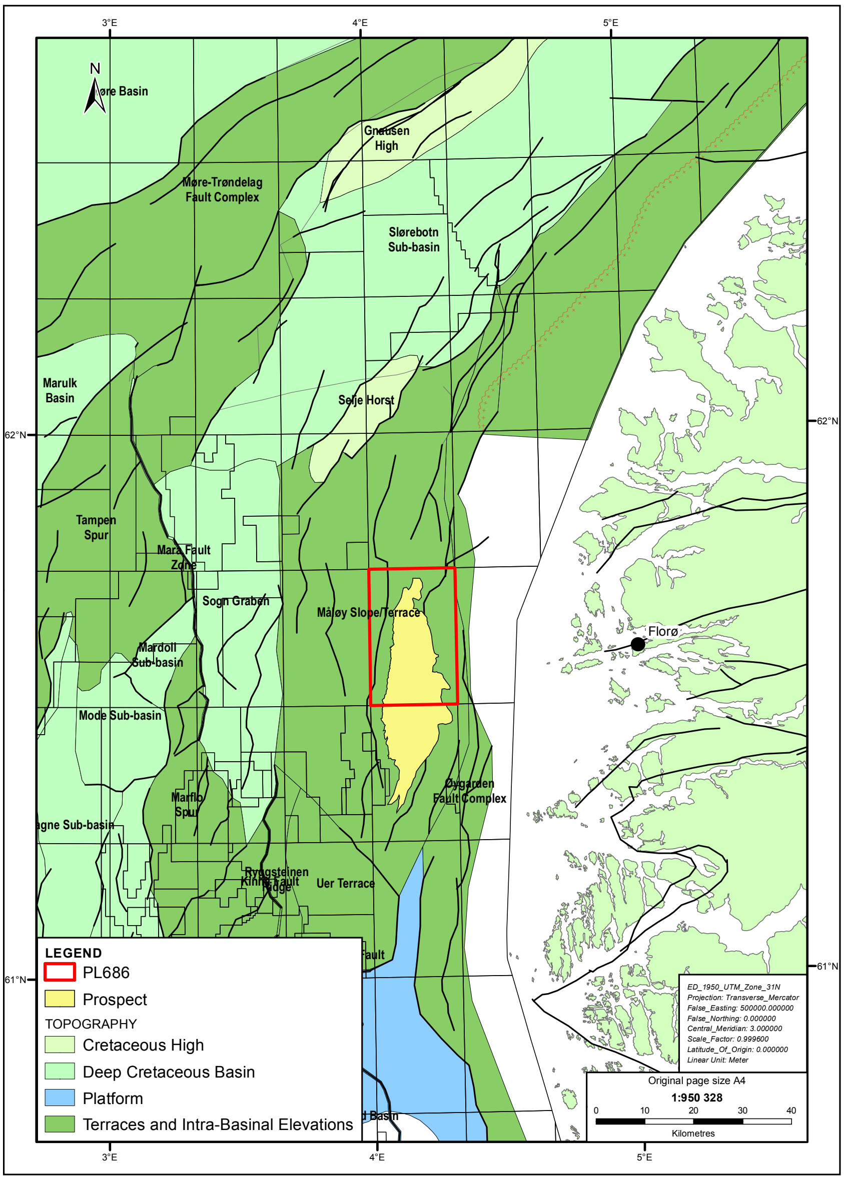


Figure 3.1 Jotne Structural Framework. PL686 in red, and Jotne prospect definition in yellow

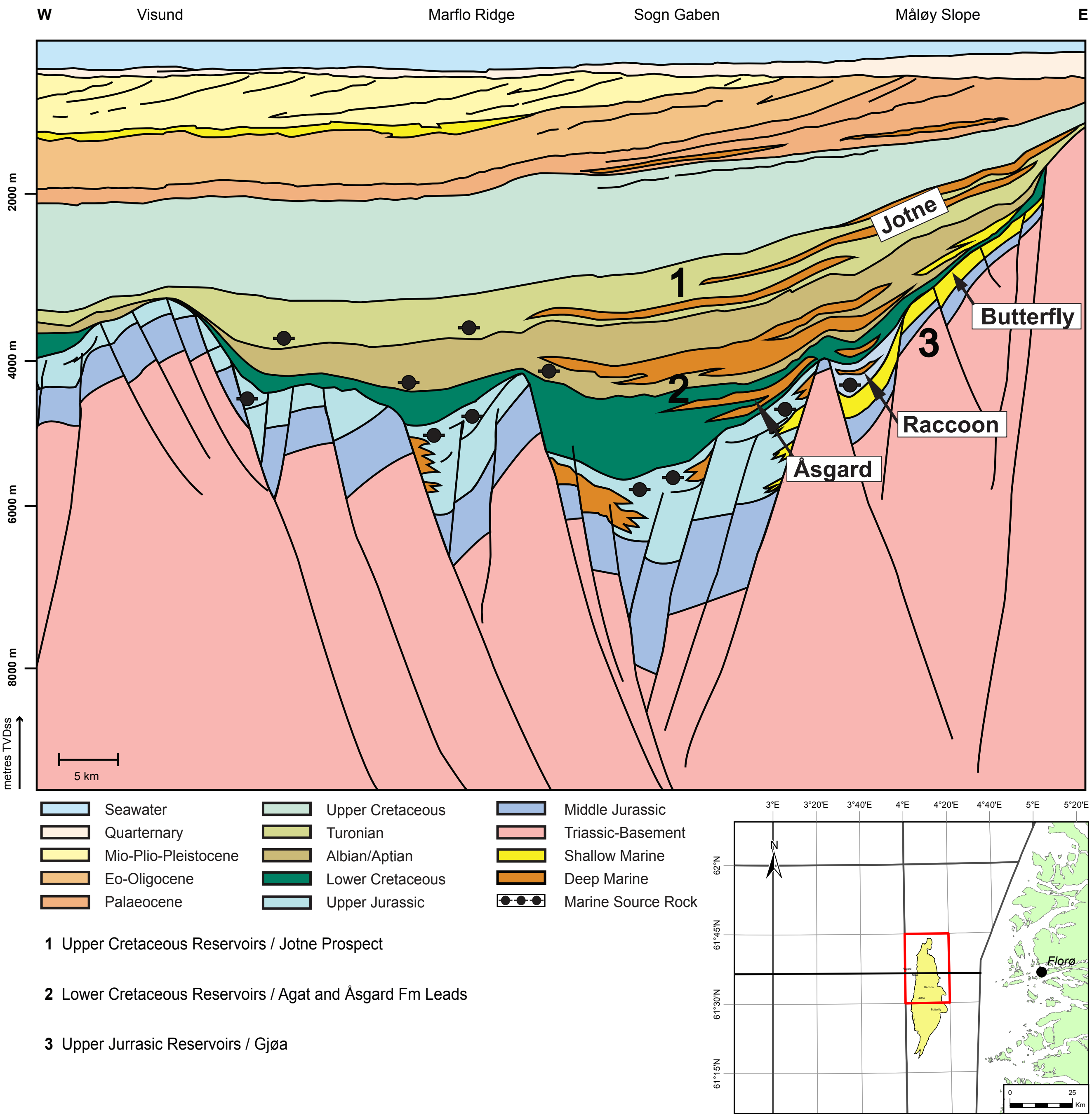


Figure 3.2 Regional Geosection.

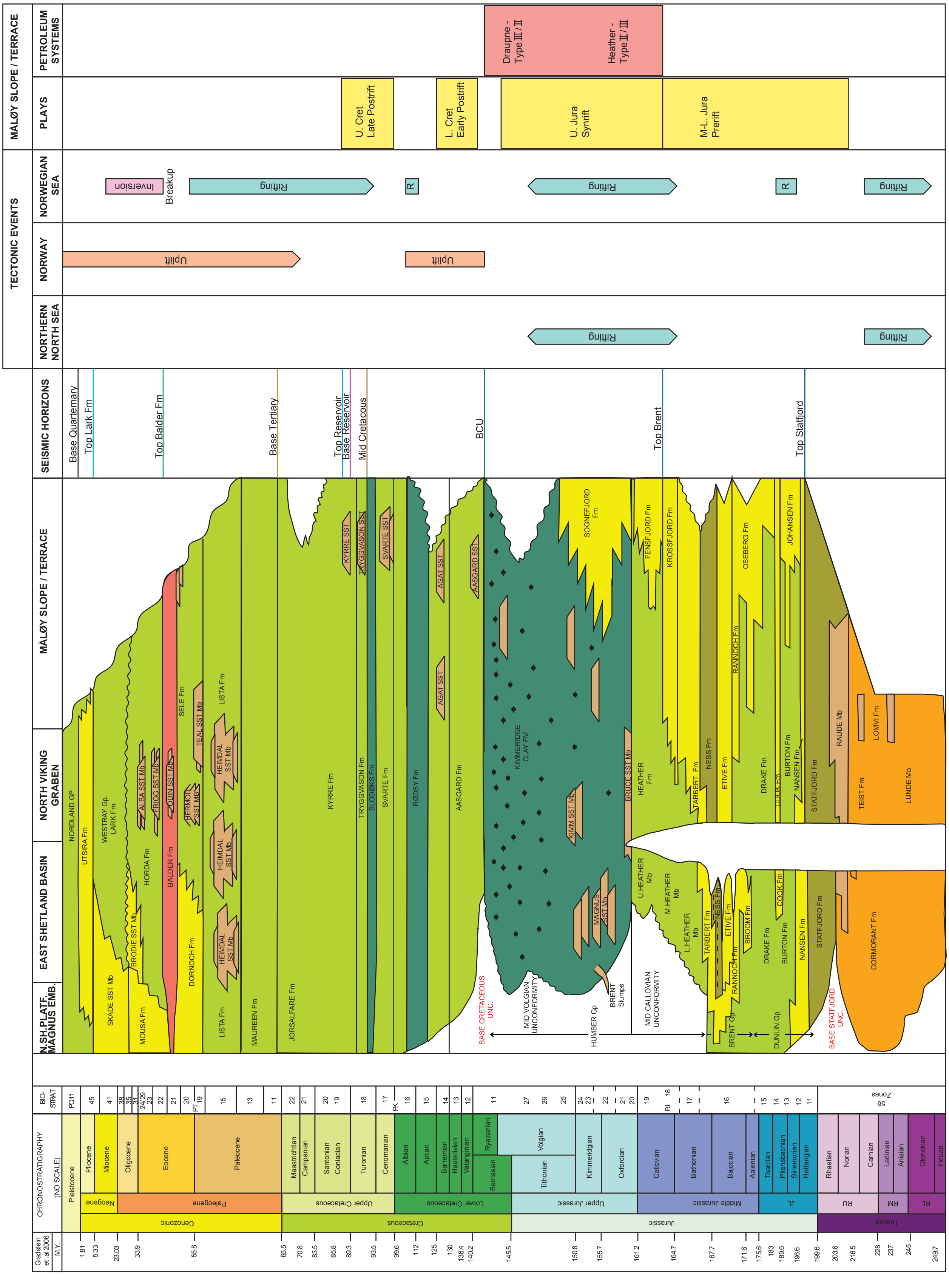


Figure 3.3 Stratigraphy with tectonic events.

Upper Cretaceous Reservoirs

Jotne prospect reservoirs of Turonian age are interpreted to have been formed by ponded slope turbidite fans. Reservoir distribution is dictated by feeder systems along the Øygarden Fault Complex to the east, as well as a subdued basin topography inherited from the Jurassic rifting. Reservoir architecture is charactarized by alternating layers of turbidite channel- and lobe complexes, interbedded by mudstones. Seismic AVO inversion has been actively utilized in order to separate reservoir from non-reservoir facies.

Lower Cretaceous Reservoirs

The Lower Cretaceous "Agat" play is proven in a number of wells in the Agat area to the north in PL686. It is comprised of Barremian to Albian slope to basinfloor turbidites, sealed by embedding and intraformational mudstones.

Jurassic Reservoirs

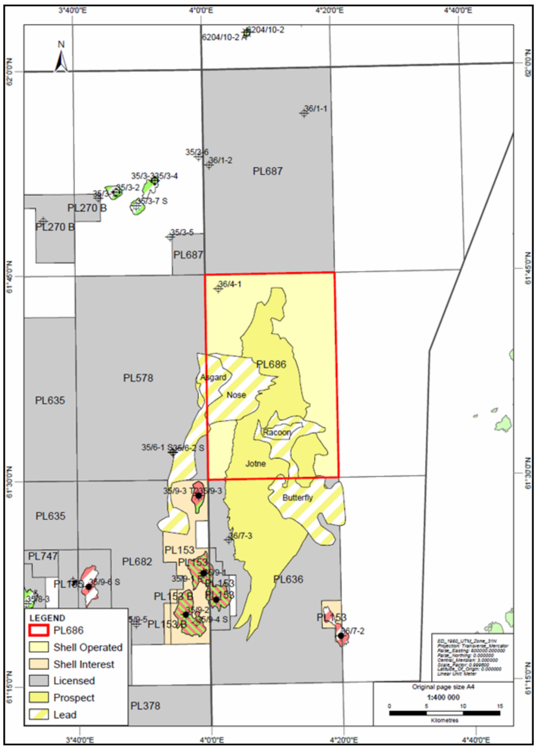
Additional prospectivity sits within the combined Lower-Middle Jurassic pre-rift play and the Upper Jurassic syn-rift plays, proven in the Gjøa Field to the south of PL686. On the Måløy Slope/Terrace these plays are defined by stacked fluviodeltaic reservoirs sealed by Upper Jurassic and Lower Cretaceous mudstones.

Charge Model

Charge is mainly from the Upper Jurassic in the Sogn Graben with minor contributions from the Upper Jurassic in local half-graben kitchens on the Måløy Slope/Terrace itself (the "back basin"). The main changes to the revised prospect definition is related to charge (initially gas, revised oil).

4 Prospect Update

The PL686 prospect and lead inventory consist of one (1) prospect (Jotne) and four (4) leads (Nose, Åsgard Lead, Butterfly and Raccoon). A summary of the respective volumes and risk are presented in Figure 4.1 and Table 5.1.



Prospect	
Jotne - Volumes (in PL686) Recoverable 10^6 STM^3	P90=0.8 P50=14 P10=81
Jotne - Volumes (total) Recoverable 10^6 STM^3	P90=1.2 P50=25 P10=145
Jotne - Risk	POS(Rec prior downgrade)=0.12 POS(Rec post downgrade)=0.09

Leads	
Nose - Volume (total) Recoverable 10^6 STM^3	P50=10.8
Nose - Risk	POS (in-place)=0.14
Åsgard - Volume (total) Recoverable 10^6 STM^3	P50=3.4
Åsgard - Risk	POS (in-place)=not evaluated
Butterfly - Volume (total) Recoverable 10^6 STM^3	P50=2.33
Butterfly - Risk	POS (in-place)=0.11
Raccoon - Volume (total) Recoverable 10^6 STM^3	P50=0.62
Raccoon - Risk	POS (in-place)=not evaluated

Figure 4.1 Prospect and leads volumes and risk

Jotne Prospect

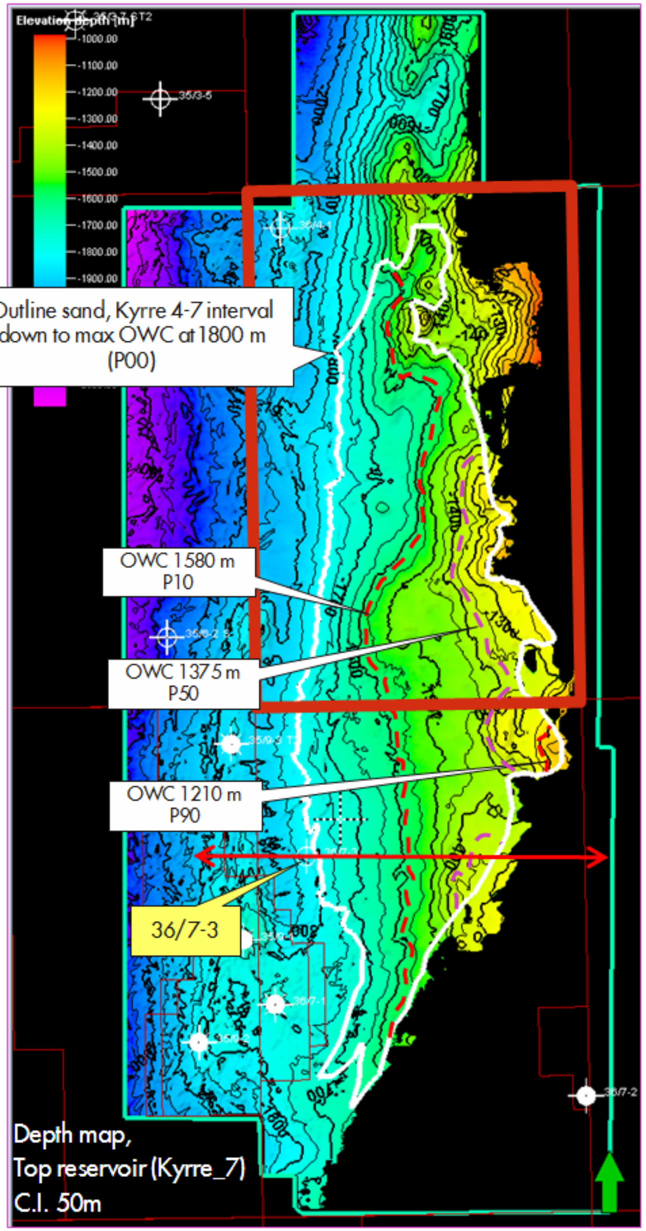
The Middle Cretaceous (Turonian) Jotne prospect is present across the larger part of PL686 (Figure 4.2). Ca. 55% of the prospect is located within the license acreage. It extends southwards into the neighbouring PL636.

Trap

The Jotne prospect is defined as a proximal onlap, stratigraphic pinch-out trap. It relies on up-dip pinch out of the Kyrre Formation reservoir units towards the east and lateral shale out/pinch out towards the north and south. Trapping requires a lateral sealing component separating the Jotne prospect from up-dip (upslope) reservoir feeder conduits, either via feeder system bypass (stratigraphic disconnectivity/trapping) or via sealing faults. The prospect was initially defined as a seismic amplitude-supported prospect; current reprocessed 3D dataset and new QI studies (see below) suggest that there is only limited seismic support for hydrocarbon presence.

Reservoir

Stacked Kyrre Formation slope channel lobe complexes constitute the reservoirs. The reservoir distribution and layered architecture (Figure 4.3) are extracted from thorough seismic facies and amplitude analysis of the Turonian interval and calibrated to wells (35/6-2, 35/9-3 and 36/7-3) within the distal parts of the reservoir fairway. A proximal (easterly) to distal (westerly) change of reservoir facies and properties are inferred, with an amalgamated channelized fan sequence in the up-dip, eastern part of the prospect, i.e. at the mouth of mapped canyon feeder systems,



JOTNE PROSPECT		Norske Shell (O) 40 %	
Water Depth (m)	~250 m	GDF SUEZ 20 %	
Target Depth (m TVDSS)	~1600 m	Idemitsu 20 %	
Prospect Area	~360 km²	Petoro 20 %	
100% Volumes 0-cutoff MCM UR (P90 - 50- 10)	1	25	145
POS InPlace (%), no QI uplift/downgrade applied	14		
POS Recoverable (%), with QI downgrade applied	9		
~55% of UR volumes inside PL686			
X-ORP	Step 3 25th April		
Play	Deep marine stacked turbidites		
Objective	Oil in stacked reservoirs - Cretaceous Kyrre Fm		
Key Risk	Trap		
Business Driver	Heartland rejuvenation NNS (Gjøa NFE)		
Data Coverage	ST0703MR13		

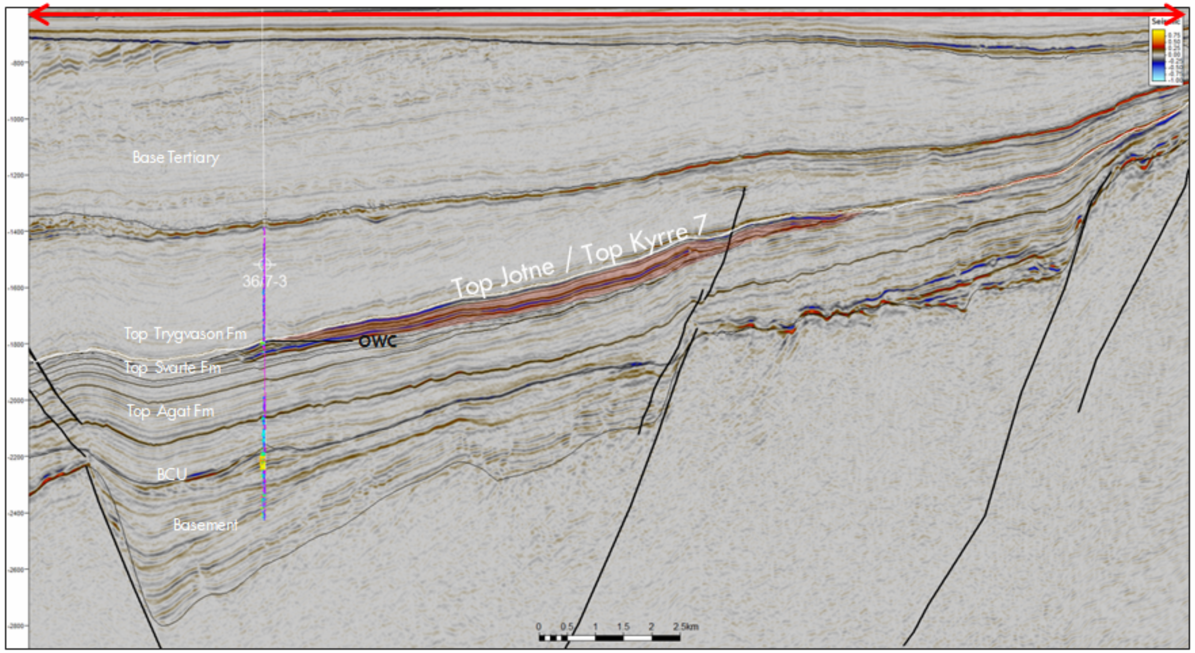


Figure 4.2 Jotne Prospect Summary Sheet.

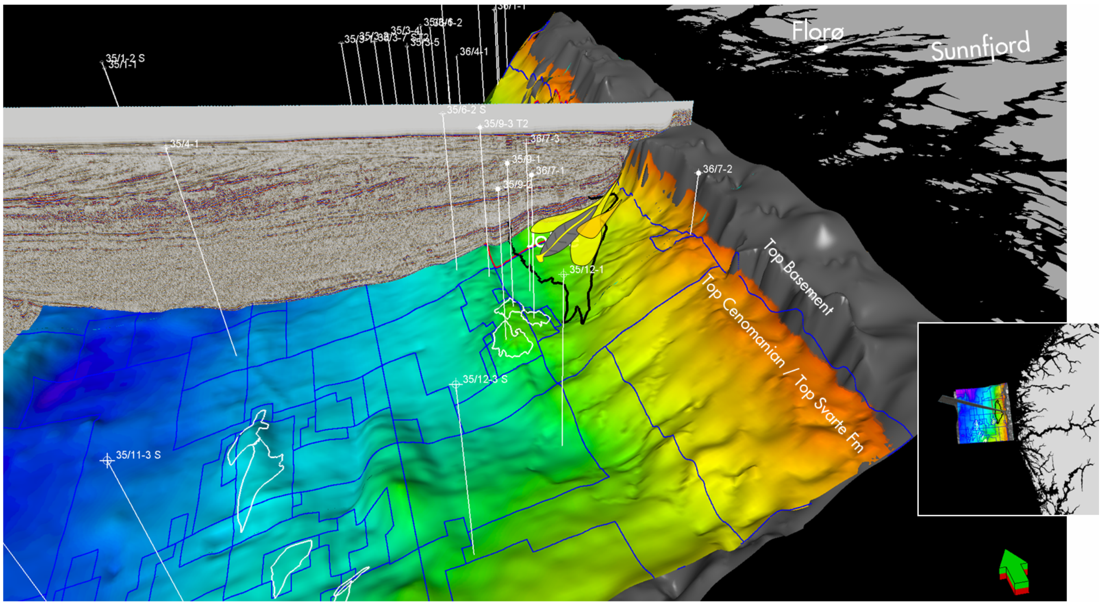


Figure 4.3 Kyrre Fm provenance. The 3D view demonstrates how the Turonian Kyrre Fm reservoir sequence is building up when sediments from east are deposited in the Måløy Slope area as deep marine turbidite fan bodies, and filling accomodation space as the fan is evolving.

translating into areas dominated by stacked lobe complexes in the distal areas to the west. Variable reservoir qualities encountered in wells are attributed to their distal to terminal fan location and an overall improvement in reservoir properties towards the main part of the prospect is expected.
Results from AVO inversion points towards higher probability for cemented sands in the lower half of the Jotne reservoir sequence, whereas there is higher probability for good reservoir sands in the upper half (see example in Figure 2.3).

Charge

Hydrocarbon charge into Kyrre Formation sandstones are proven for the Jotne reservoir fairway (i.e. the 35/9-3 gas accumulation with residual oil). The revised basin model supports a main kitchen area in the Sogn Graben to the west which is present day oil and gas (in its deepest part) mature (Figure 4.4). Migration modelling is history matched to all known accumulations within the greater Sogn Graben-Måløy Slope/Terrace (Figure 4.5) and indicates that HC migration can reach the prospect. Vertical migration between Lower and Middle Cretaceous reservoir units may have been aided by normal faults as there is good correlation of hydrocarbons encountered in the Agat and Kyrre reservoirs in the 35/9-3 well. The 35/9-3 structure is filled to spill at Kyrre reservoir level, with mapped lateral migration routes into the Jotne prospect. Presence of residual oil in the Kyrre Formation sandstones suggest an early phase of oil charge followed by gas charge.
Alternative charge route are discussed via deeper seated (Lower Cretaceous and/or Upper Jurassic) carrier beds and vertical leakage into their eastern pinch-out/truncation lines, with back-filling into the Kyrre formation reservoirs, and hence should not be ruled out.

HC Retention/ Seal

There is poor confidence in the identification and thereby prediction of presence and/or absence of thief sands within up-dip (upslope) feeder canyons. Together with the absence of seismically mappable candidate sealing faults, the potential lack of lateral seal and thereby retention is a major concern for the Jotne prospect. Furthermore, the likely presence of silty or sandier top seal lithologies locally above the eastern (up-dip) pinch-out line of the prospect (Figure 4.6) renders also top seal at risk.

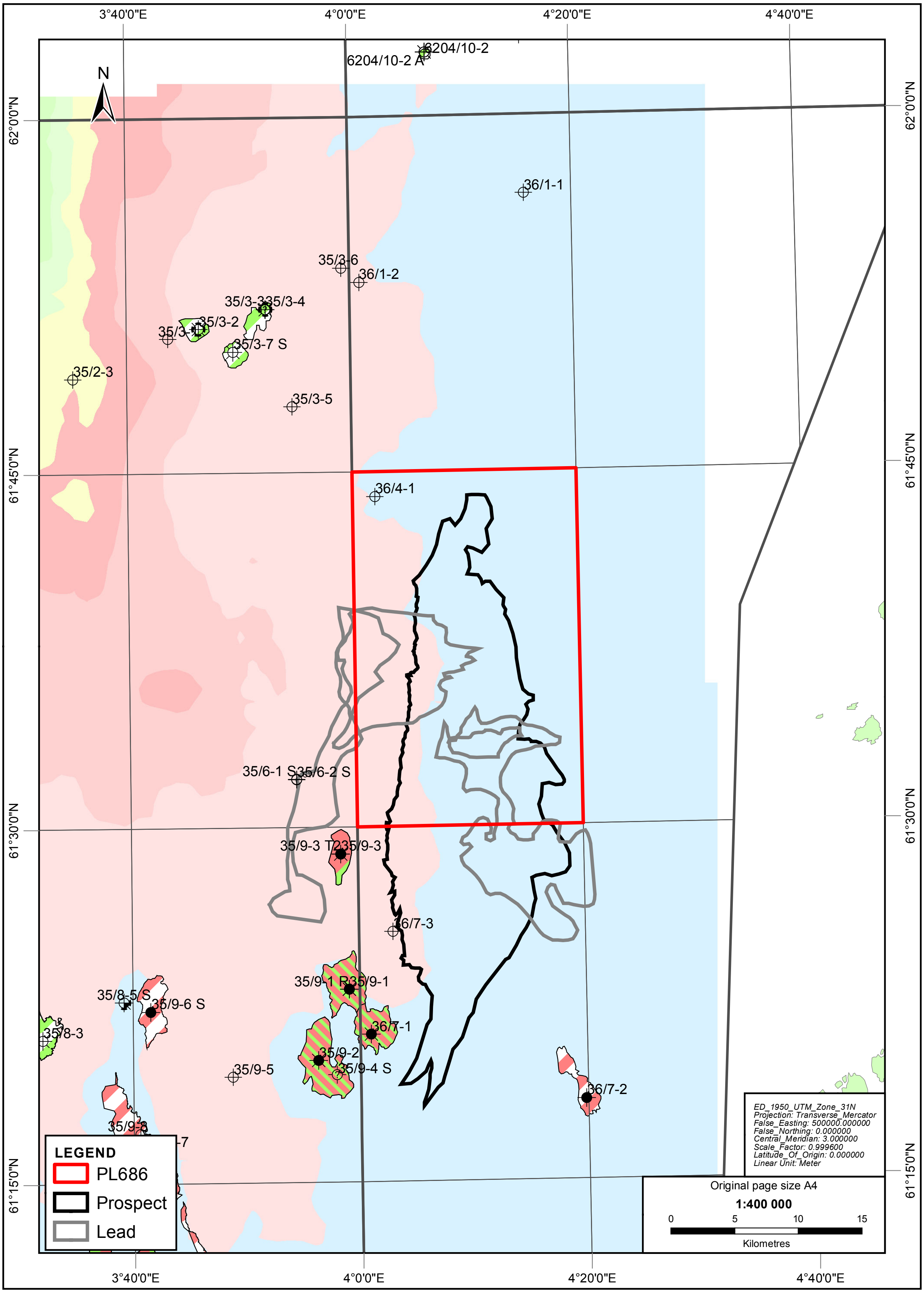


Figure 4.4 Maturation map, Jurassic source rock. Blue is immature source rock, red colors indicate oil-window, and green colors indicate gas-window

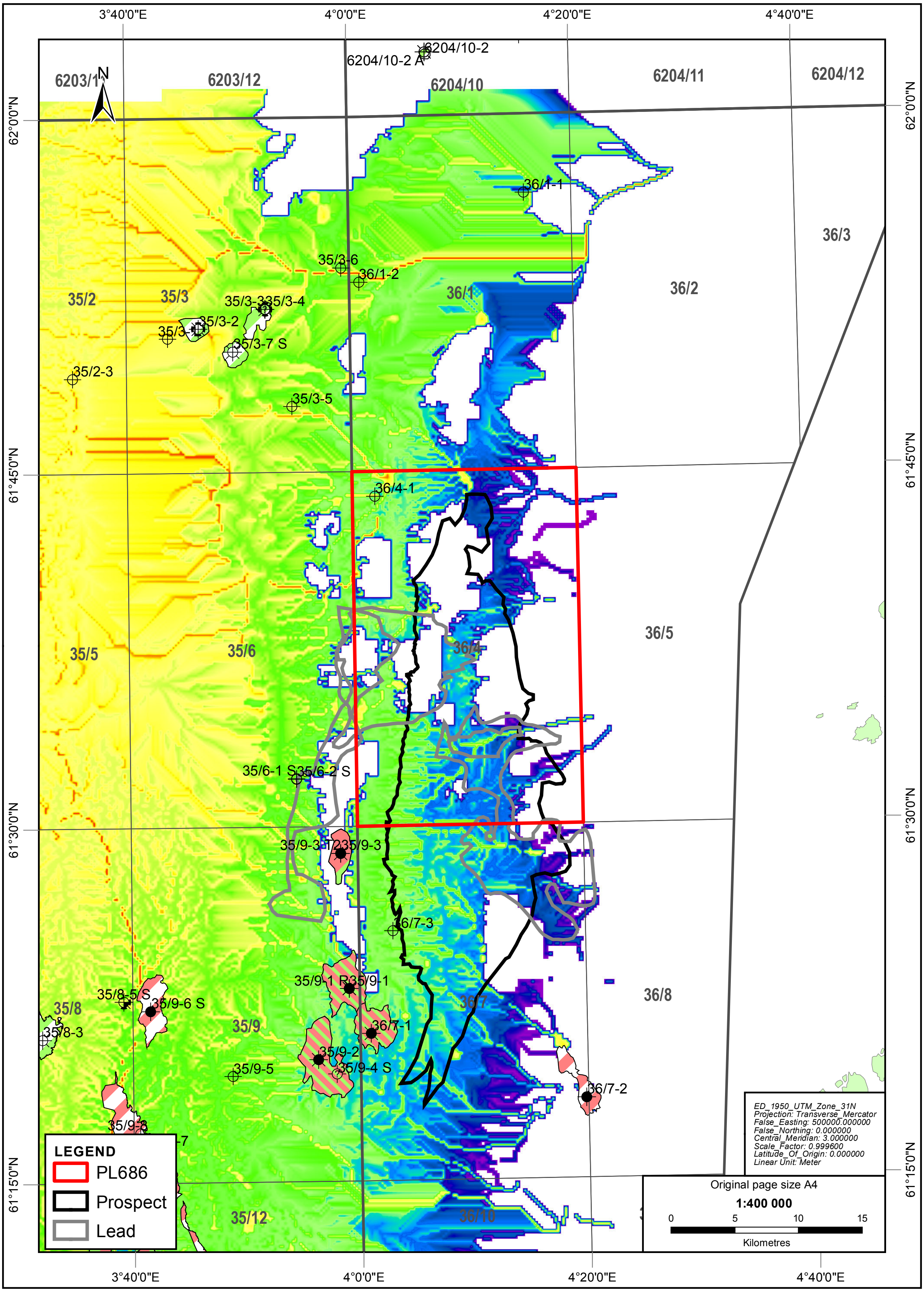


Figure 4.5 Kyrre Fm migration map.

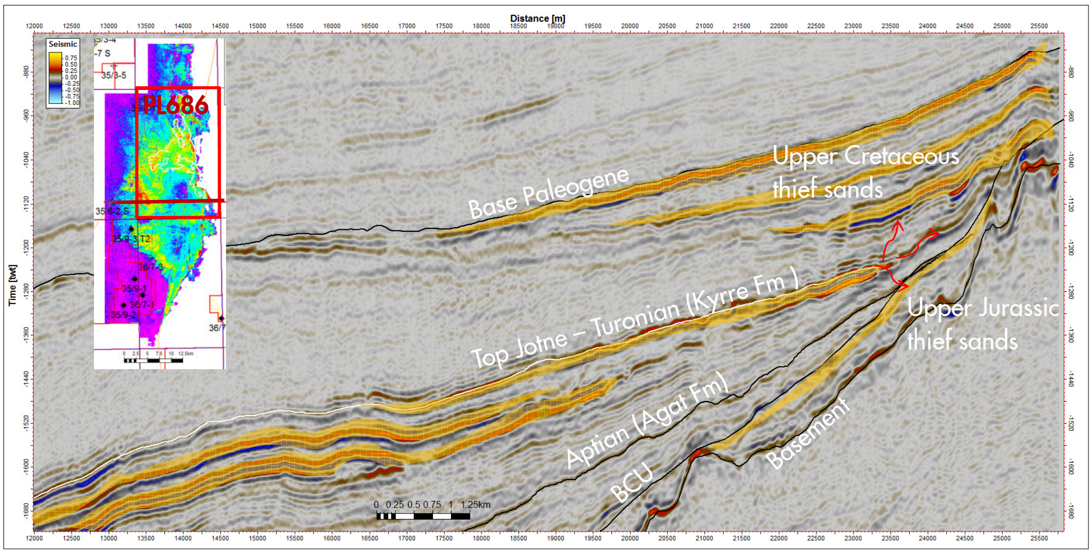


Figure 4.6 Seal issue. The Jotne pinch-out as annotated is appearing very close to possible thief sands, both up towards the Upper Cretaceous clinoform amplitudes and down towards the sand-rich Upper Jurassic successions. The seismic section also demonstrates lack of structural support at the pinch out line, e.g. from faults.

The shallow crest of the prospect (1130m TVDSS) suggest a high likelihood of biodegradation of any contained hydrocarbons.

QI and Geophysics

The license initiated an in-depth rock-physics study including 13 wells in the Jotne area. The aim of the study was to establish well-defined rock physic trends for various lithologies, and delineation of how the various lithology-fluid combinations would separate in the AVO domain. From the study it was concluded that there was a clear separation of good sands (high porosity) and cemented sands in AVO domain (see example in Figure 2.3), and that hydrocarbons (gas and light oil) would not easily be differentiated, nor would heavy oil and brine. QI studies further concluded that the only viable hydrocarbon-fill scenario that could be supported by seismic data was heavy (low API) oil in sandstones with intermediate to poor or variable reservoir properties. The presence of a larger accumulation of hydrocarbons within the Jotne prospect was not supported by DNME data. Furthermore, there are several minor 4-way dip closures associated with depth-conform amplitude shut-off, interpreted as GOC or GWC, within PL686 Jotne reservoir fairway. These argue against an updip accumulation along the prospect pinch-out line, where no such amplitudes occur. Identified amplitudes, originally used to delineate the Jotne prospect thus appear to be a combined lithology-porosity effect.

The initial Jotne prospect was entirely based on a Full Impedance Jason Inversion attribute extracted at a specific cut-off which was honoring the amplitude anomaly caused by the Kyrre Fm gas discovery in 35/9-3 T2. This approach resulted in geo-bodies with a certain size and shape, which again was interpreted to be the definition of a gas charged Jotne prospect.

Petroleum System Chart

A revised petroleum systems chart with timing of main events and critical moment for the Jotne prospect is included in Figure 4.7.

Key Risks and Uncertainties

Presence of lateral (up-dip) and top seals and thereby retention are considered the main critical risk elements.

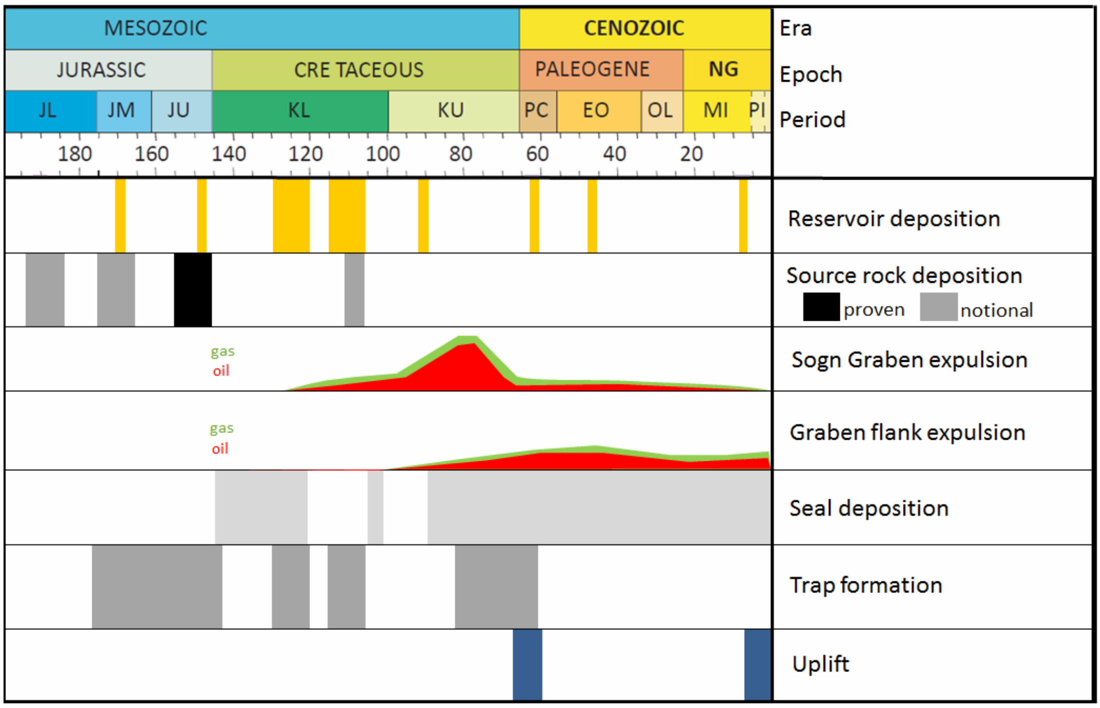


Figure 4.7 Petroleum system chart

Additional Prospectivity

Four opportunities have been identified as leads in PL686; Two Lower Cretaceous leads in Agat Fm (Nose Lead) and Åsgard Fm (Åsgard Fm Lead), one Upper Jurassic Fensfjord Fm lead (Raccoon Lead) an one Middle Jurassic Brent Gp lead (Butterfly Lead), (Figure 1.3 and Figure 4.8).

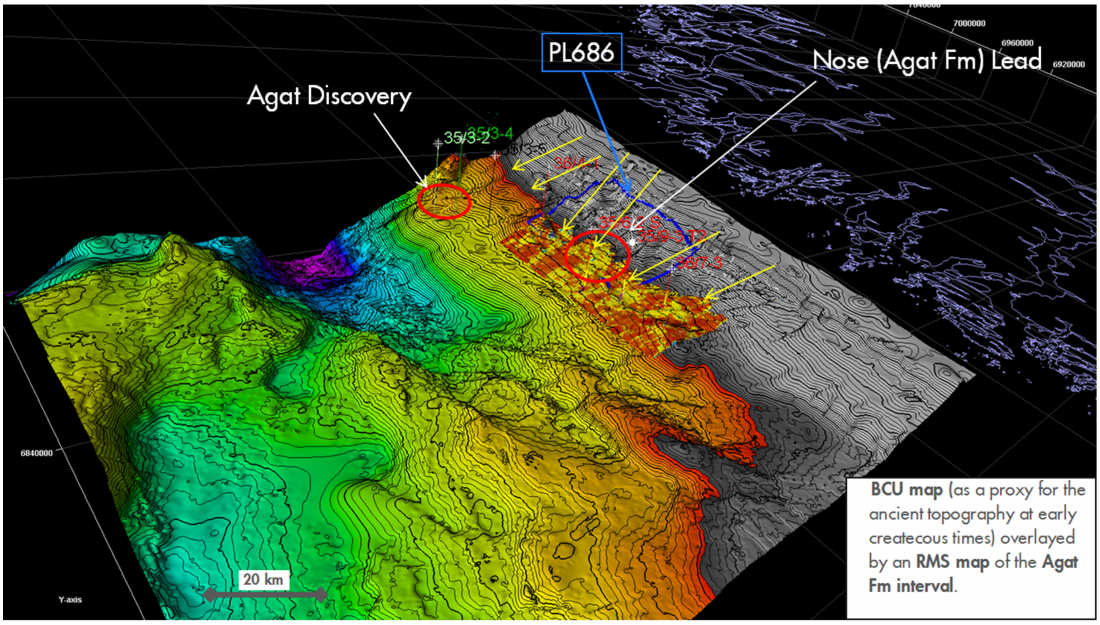
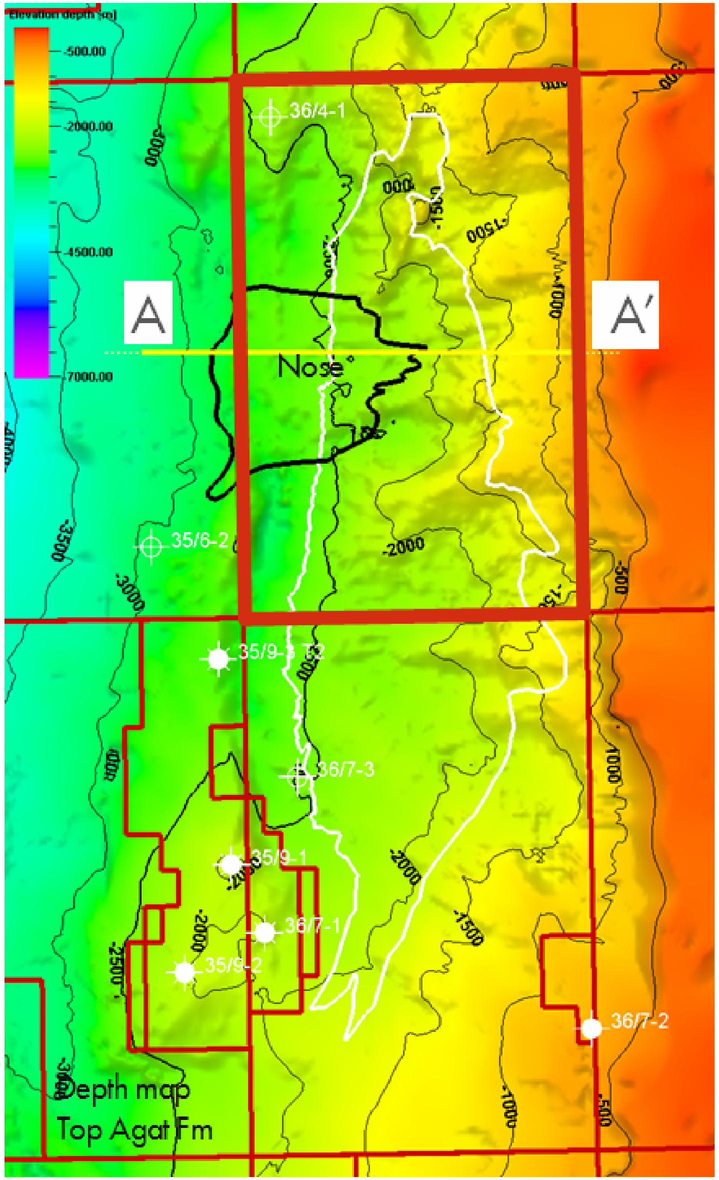


Figure 4.8 Nose Lead 3D view

Nose lead

The Nose lead (Figure 4.9) is a Lower Cretaceous (Barremian-Aptian) opportunity situated in the western part of PL686, partly underlying the Jotne prospect (see Figure 1.1).

<u>Trap:</u> The lead is defined as a proximal onlap stratigraphic trap. It relies on up-dip pinch out of the Agat Formation reservoir units towards the east and lateral shale out/pinch out towards the



NOSE LEAD (Agat Fm)		Norske Shell (O) 40 %	
Water Depth (m)	~250 m	GDF SUEZ 20 %	
Target Depth (m TVDSS)	~2200 m	Idemitsu 20 %	
Prospect Area *)	~88 km^2	Petoro 20 %	
100% Volumes 0-cutoff MMBoe UR (P90 - 50- 10)	1	11	46
POS (Recoverable, %)	13		
Play	Deep marine stacked turbidite		
Objective	Oil in stacked reservoirs - Cretaceous Agat Fm		
Key Risk	Trap		
Business Driver	Heartland rejuvenation NNS (Gjøa NFE)		
Data Coverage	ST0703MR13		

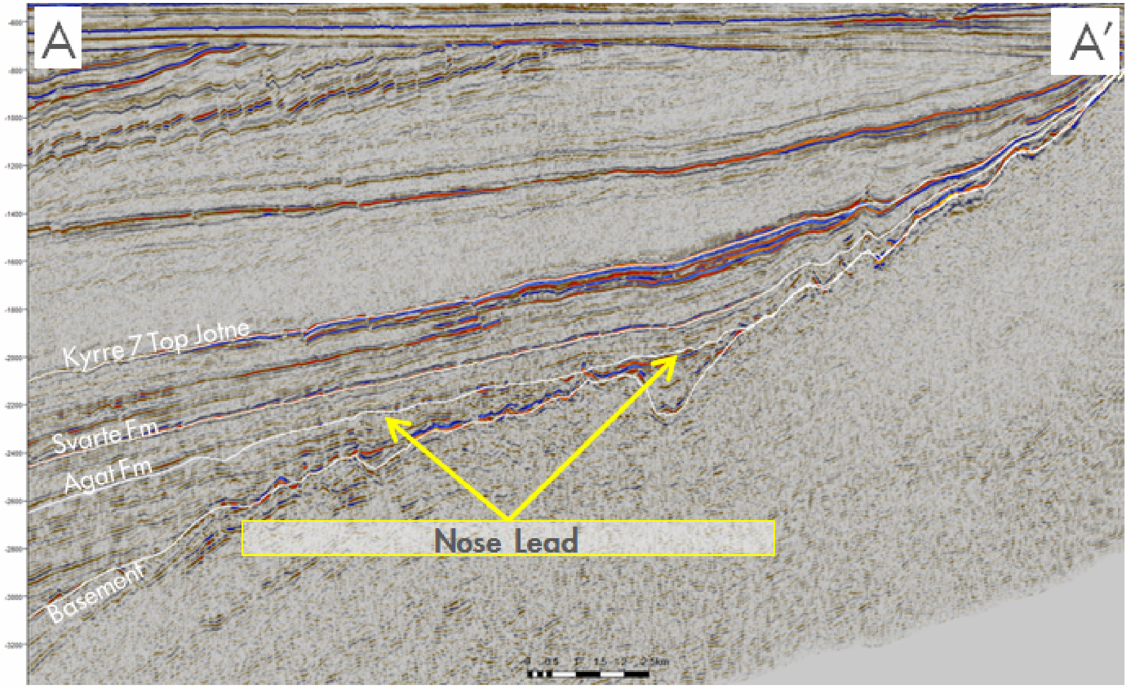


Figure 4.9 Nose Lead Summary Sheet.

north and south (Figure 4.10). The outline of the lead is defined on extracted seismic amplitudes which render trap definition ambiguous as there are no clear lateral amplitude shut-offs.

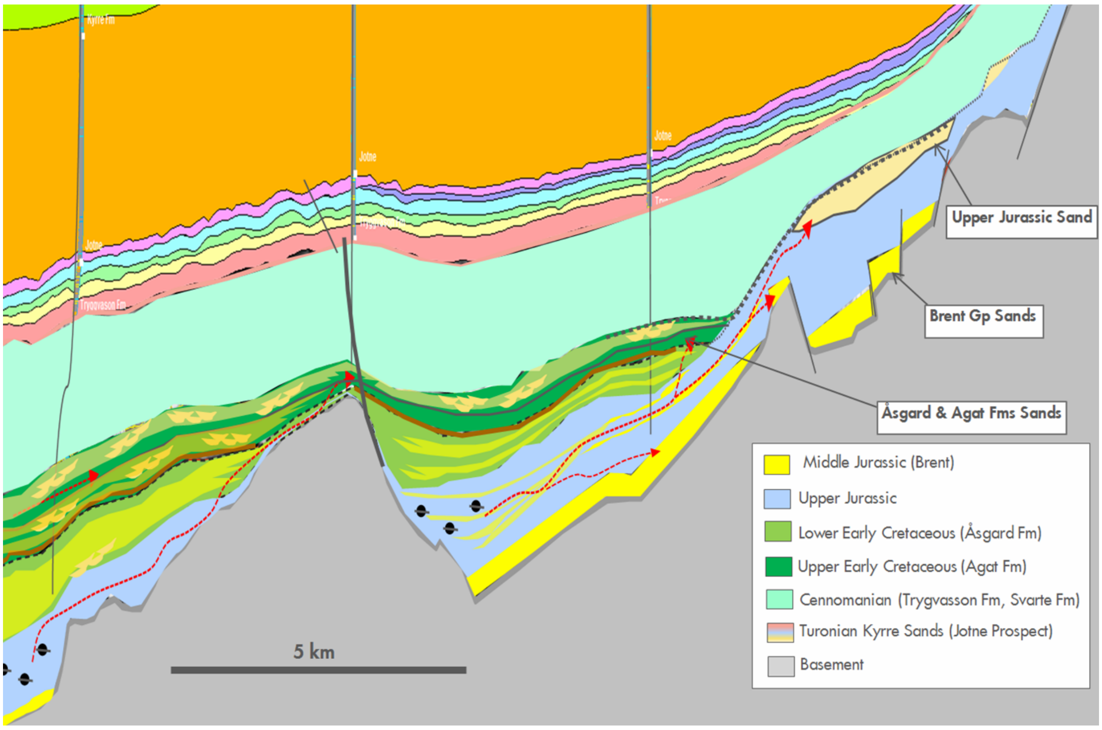


Figure 4.10 Nose Lead Agat Fm conceptual geosection

Reservoir: Agat Formation slope channel complexes and base-of-slope lobe complexes constitute the reservoirs. The reservoir distribution and layered architecture is extracted form seismic facies and amplitude analysis of the Barremian-Aptian interval, calibrated to wells (35/6-2, 35/9-3 and 36/7-3) and the nearby Agat discoveries (block 35/3). Reservoir properties are expected to be fair to good, similar to those of the Agat discovery wells.

Charge & HC-phase: Charge is modelled from the Upper Jurassic in the Sogn Graben to the west, with the lead located in a favourable position to receive charge and at a similar distance from the kitchen area as the oil-bearing 35/9-3 structure. Oil is accordingly considered the main phase.

HC Retention/Seal: Poor confidence in prediction of presence/absence of thief sands within up-dip (upslope) feeder conduits together with absence of candidate sealing faults, render lateral seal and thereby retention a major concern.

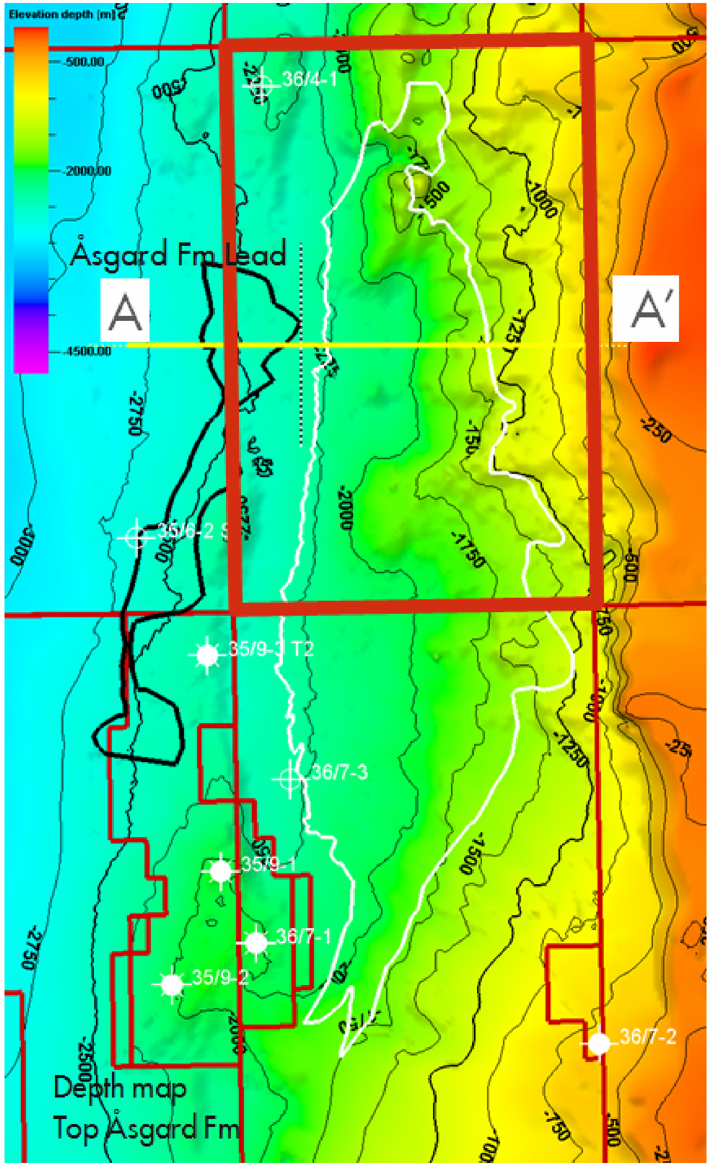
QI and Geophysics: No geophysical special studies were performed specifically targeting derisking of the Nose lead.

Petroleum System Summary: Similar timing for charge and main tectonic events as listed for the Jotne prospect (see Figure 4.7; note, however, older reservoir unit and thereby earlier timing for competent top seal formation).

Key Risk(s): Seal and Trap are the key risk elements.

Åsgard lead

The Åsgard lead (Figure 4.11) is another Lower Cretaceous (Valanginian-Hauterivian) opportunity situated in the western part of PL686, extending outside the license acreage to the west. It partly underlies the Nose lead (see Figure 1.1).



ÅSGARD FM LEAD (Åsgard Fm)		Norske Shell (O) 40 %	
Water Depth (m)	~250 m	GDF SUEZ 20 %	
Target Depth (m TVDSS)	~2700 m	Idemitsu 20 %	
Prospect Area *)	~95 km^2	Petoro 20 %	
100% Volumes 0-cutoff MMBoe UR (P90 - 50- 10)*	2	14	28
POS (Recoverable, %)	Not assessed due to materiality in PL686		
*) Only approx 15% of the lead is located in PL686			
Play	Deep marine stacked turbidite		
Objective	Oil in stacked reservoirs - Cretaceous Åsgard Fm		
Key Risk	Trap		
Business Driver	Heartland rejuvenation NNS (Gjøa NFE)		
Data Coverage	ST0703MR13		

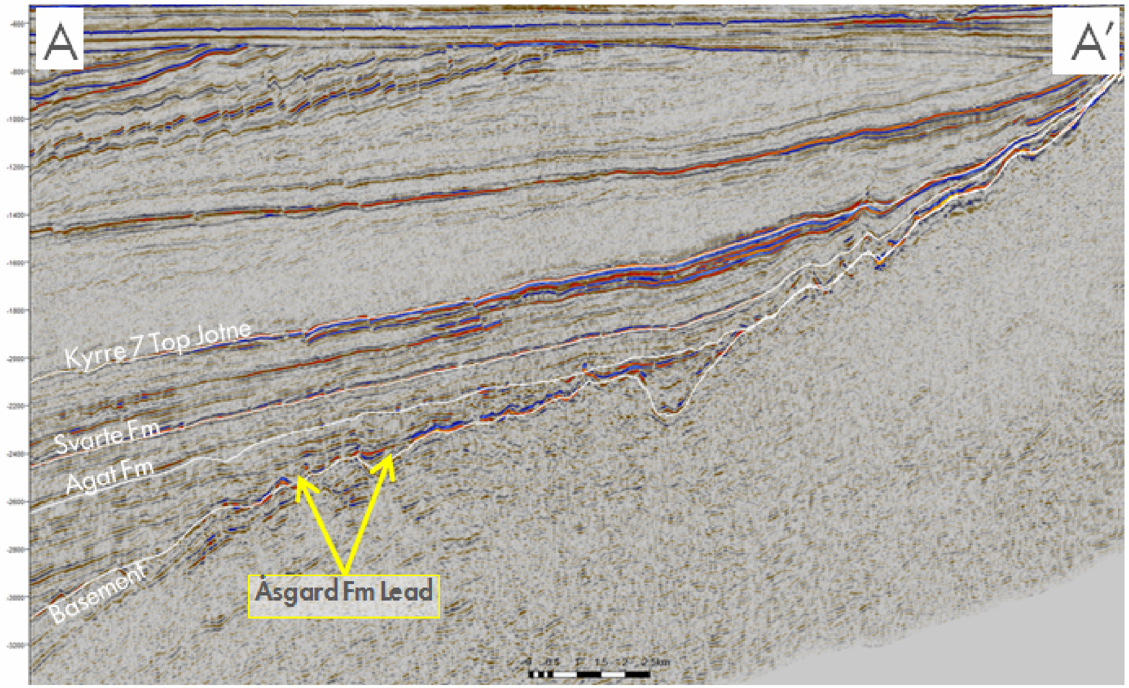


Figure 4.11 Åsgard Fm Lead Summary Sheet.

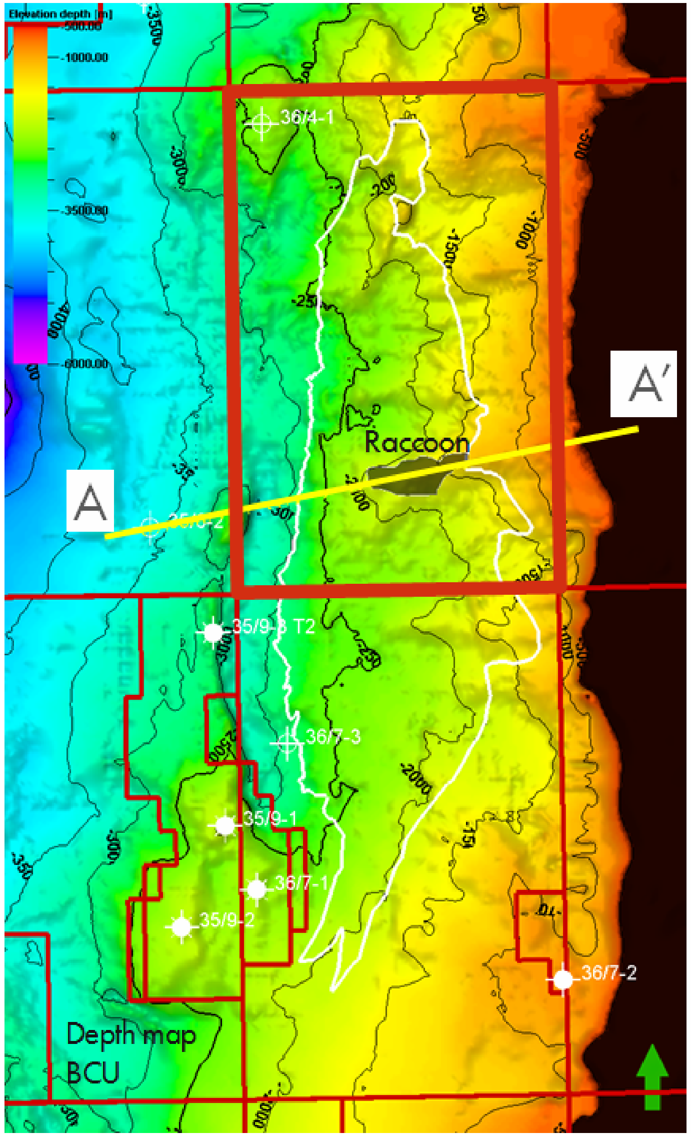
Trap: The lead is defined as a proximal onlap stratigraphic trap. It relies on up-dip pinch out of the Åsgard Formation reservoir units towards the east (Figure 4.10). The outline of the lead is defined based on poorly delineated seismic amplitudes which render trap definition ambiguous.
Reservoir: Åsgard Formation ponded channel- and lobe complexes constitute the reservoirs, the distribution assumed to be partly controlled by the Base Cretaceous basin topography. Reservoir is proven in nearby wells (35/6-2 and 36/7-3) which represent analog reservoir settings and thereby provide direct calibration points for expected reservoir properties.
Charge & HC-phase: Charge is modelled from the Upper Jurassic in the Sogn Graben to the west, with the lead located in a favourable position to receive charge via direct migration in Åsgard Formation sands. Oil is modelled to be the main phase.
HC Retention/Seal: Poor confidence in prediction of presence/absence of thief sands within up-dip (upslope) feeder conduits together with absence of candidate sealing faults, render lateral seal and thereby retention a major concern. There are additional uncertainties relating to the distribution of top seal as it locally may be eroded by the overlying Agat Formation sandstones.
QI and Geophysics: No geophysical special studies were performed specifically targeting derisking of the Åsgard lead.
Petroleum System Summary: Similar timing for charge and main tectonic events as listed for the Jotne prospect (see Figure 4.7; note, however, older reservoir unit and thereby earlier timing for competent top seal formation).
Key Risk(s) and Uncertainties: Seal and Trap are both poorly defined and remain key risk elements.

Racoon lead

The Racoon lead (Figure 4.12) is an Upper Jurassic (Callovian or Oxfordian-Kimmeridgian) opportunity situated in the eastern part of PL686. The lead has limited areal extent and provides a low-volume opportunity.
Trap: The lead is a stratigraphic subcrop trap defined by the erosional relief of the Base Cretaceous Unconformity.
Reservoir: Fensfjord and/or Sognefjord Formation fluviodeltaics constitute potentially a sequence of stacked reservoir-seal pairs. Similar reservoir facies and properties as in the analog Gjøa Field are expected.
Charge & HC-phase: Requires charge via Middle Jurassic (Brent Gp) or Lower Cretaceous (Åsgard-Agat formations) carrier beds. Remain a critical uncertainty.
HC Retention/Seal: Rely on presence of competent Cenomanian-Turonian top seal, which is often sand-/silt-bearing in surrounding wells. There also is a high potential for thief sands in Lower Cretaceous (Åsgard and Agat formations).
QI and Geophysics: No geophysical special studies were performed specifically targeting derisking of the Racoon lead.
Petroleum System Summary: Similar timing for charge and main tectonic events as listed for the Jotne prospect (see Figure 4.7; due to late timing of competent top seal formation).
Key Risk(s) and Uncertainties: Seal and Charge remain key risk elements.

Butterfly lead

The Butterfly lead (Figure 4.13) is a Middle Jurassic (Brent Group) opportunity situated in the southeastern part of PL686. It underlies the Jotne prospect and extends outside the license acreage to the south.
Trap: The lead is defined as a fault-compartmentalized, stratigraphic subcrop trap. It comsists of a series of fault-bounded 3-way dip closures underneath the Base Cretaceous Unconformity. Lateral connectivity between compartments remain uncertain.



RACCOON LEAD (Fensfjord Fm)			Norske Shell (O) 40 % GDF SUEZ 20 % Idemitsu 20 % Petoro 20 %
Water Depth (m)	~250 m		
Target Depth (m TVDSS)	~1200 m		
Prospect Area *)	~6 km^2		
100% Volumes 0-cutoff MMBoe UR (P90 - 50- 10)	0.3	0.6	1.8
POS (Recoverable, %)	Not assessed due to materiality		
Play	Fluvial to shallow marine reservoirs		
Objective	Oil in Upper Jurassic Fensfjord Fm		
Key Risk	Charge		
Business Driver	Heartland rejuvenation NNS (Gjøa NFE)		
Data Coverage	ST0703MR13		

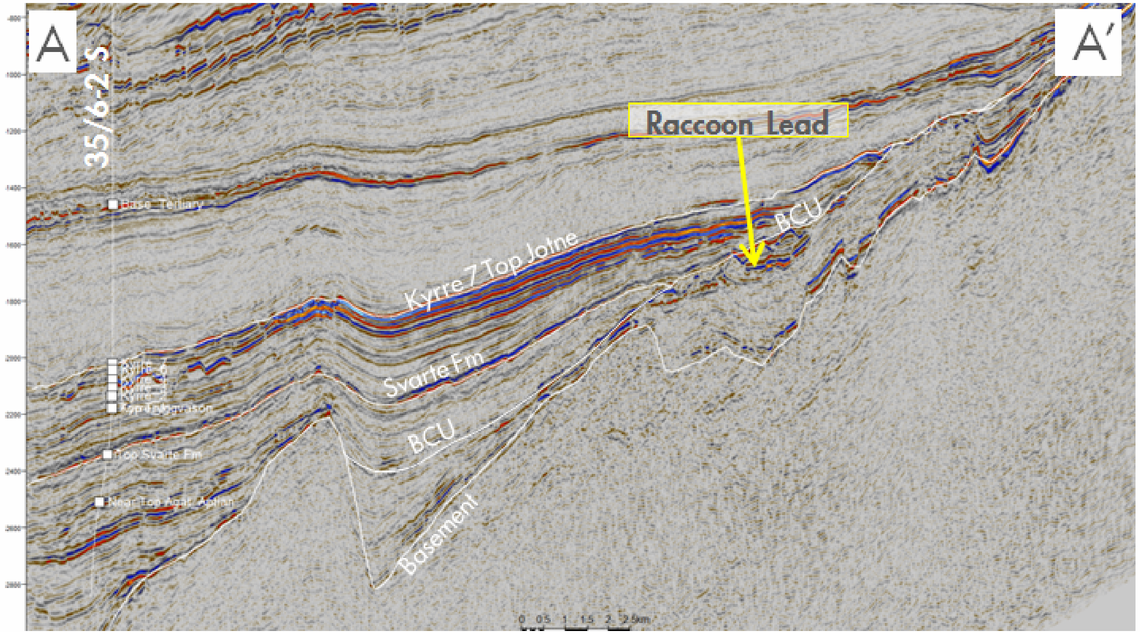
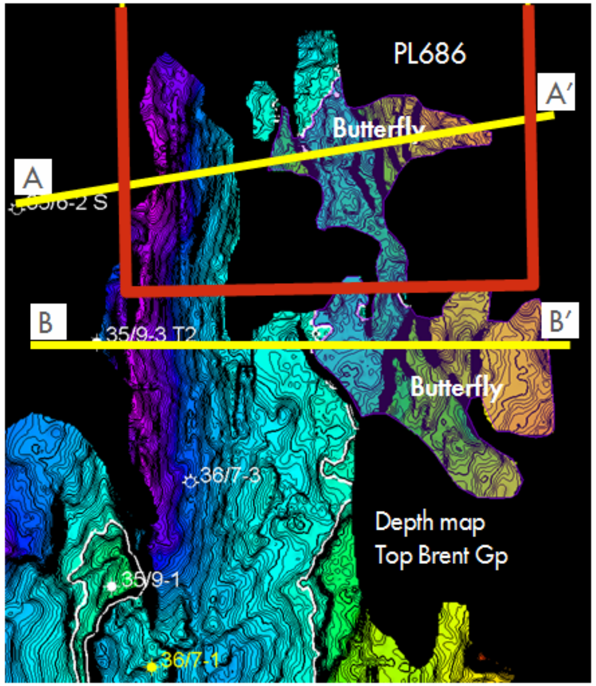


Figure 4.12 Raccoon Lead Summary Sheet.



BUTTERFLY LEAD (Brent Gp)		Norske Shell (O) 40 % GDF SUEZ 20 % Idemitsu 20 % Petoro 20 %	
Water Depth (m)	~250 m		
Target Depth (m TVDSS)	~1100 m		
Prospect Area *)	~115 km^2		
100% Volumes 0-cutoff MMBoe UR (P90 - 50- 10)*	6	11	18
POS (Recoverable, %)	3		
*) About 2/3 of the lead is located in the neighbouring license PL636			
Play	Fluvial to shallow marine reservoirs		
Objective	Oil in Jurassic Brent Gp		
Key Risk	Charge		
Business Driver	Heartland rejuvenation NNS (Gjøa NFE)		
Data Coverage	ST0703MR13		

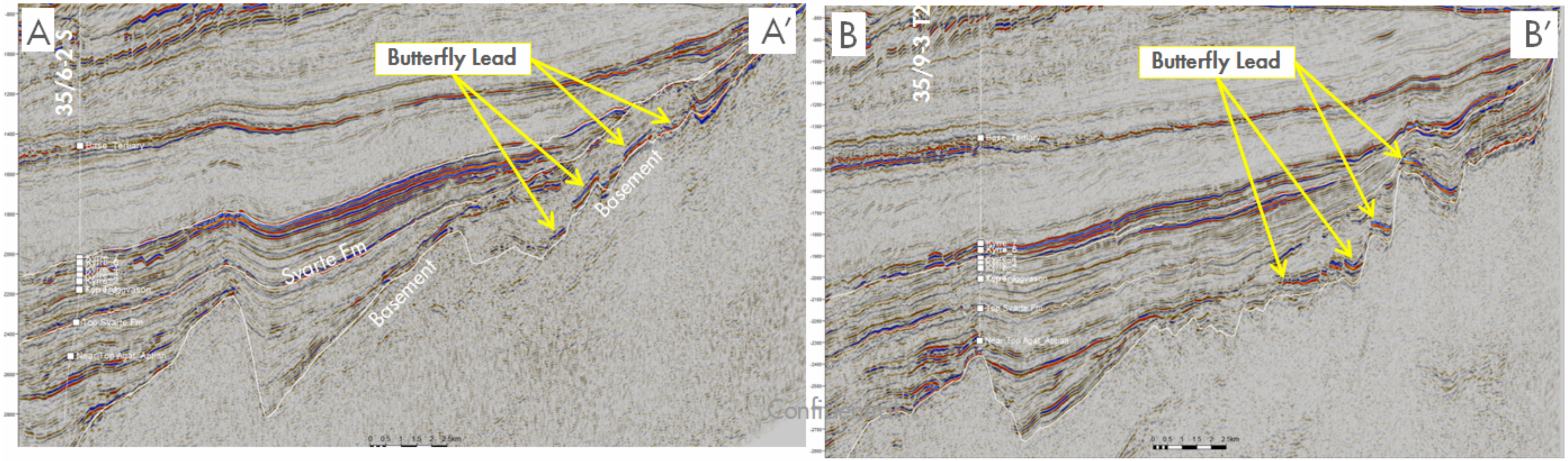


Figure 4.13 Butterfly Lead Summary Sheet.

Reservoir: Brent Group shoreline and fluviodeltaic sandstones constitute the reservoirs, potentially including Rannoch-Etive, Ness and Tarbert formations. Similar to slightly poorer reservoir facies and properties as in the analog Gjøa Field are expected.
Charge & HC-phase: Requires a tortuous migration route from the Sogn Graben kitchen area or alternatively rely on charge from isolated 'back-basin' kitchens. Accordingly, charge remain a key risk.
HC Retention/Seal: The lower Heather claystones are proven as an effective seal across the Gjøa (and other nearby) fields; its likely presence across the Butterfly lead suggest a high likelihood of competent top seal.
QI and Geophysics: No geophysical special studies were performed specifically targeting derisking of the Butterfly lead.
Petroleum System Summary: Trap formation took place in the Late Jurassic. Similar timing for charge and other post-Jurassic tectonic events as listed for the Jotne prospect (see Figure 4.7).
Key Risk(s) and Uncertainties: Charge and Trap compartmentalization/connectivity are both poorly defined and remain key risk elements.

5 Technical Evaluations

PL686 contains around 55% of the Jotne prospect. In addition four leads have been evaluated (Nose, Åsgard Lead, Butterfly and Raccoon). The Turonian Jotne prospect formed the basis for the APA2012 application, and has been carried forward as the main prospect for PL686 technical evaluations.

The technical evaluations conclude that:

1. Jotne is not a drill-worthy candidate due to the high risk associated with the trapping configuration
2. The lead status of any of the additional opportunities cannot be upgraded to prospect
3. None of the opportunities identified can contribute positively together with Jotne in a dual target well that makes the combined opportunity a drill-worthy candidate

These conclusions are based on a thorough technical evaluation, which entails seismic interpretation, integration with well results, new basin modelling studies and quantitative geophysics (rock physics and AVO inversion). The revised Jotne prospect data is listed in Table 5.1.

The outcome of these technical evaluations are outlined in Chapter 4 and can be summarized as follows:

- Stratigraphic trap without support from structural components imply significant risks related to retention and seal integrity
- A fluid contact supporting a big oil case cannot be observed, though expected if present
- Rock physics study and AVO inversion indicates that Jotne seismic amplitudes are related to lithological effects

Development Scenarios

The current view on the PL686 portfolio warrants no further studies regarding possible development for the remaining prospects.

Table 5.1. NPD Table 4 Jotne Prospect.

Block	Prospect name		Discovery/Prosp/Lead		Prosp ID (or New	NPD approved?
36/4	Jotne		Prospect		NPD will insert data	NPD will insert data
Play (name / new)	Structural element		Company/ reported by / Ref. doc.			Year
NPD will insert data	Måløy Terrace		A/S Norske Shell			2015
Oil/Gas case	**Resources IN PLACE (Jotne 100%)**					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	2.9	71	375			
Gas 10^9 Sm^3						
	Resources RECOVERABLE (Jotne 100%)					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	1.2	25	145			
Gas 10^9 Sm^3						
	Which fractiles are used as:		Low:	P90	High:	P10
Type of trap	Water depth (m)		Reservoir Chrono (from - to)		Reservoir Litho (from - to)	
Stratigraphic	290		Turonian		Kyrre Fm	
Source Rock, Chrono	Source Rock, Litho		Seal, Chrono		Seal, Litho	
	Heather/Draupne		Upper Cretaceous, Coniacian		Kyrre Fm	
Seismic database (2D/3D):						
Probability of discovery:						
Technical (oil+gas case)		0.09 (after QI downgrade)		Prob for oil/gas case		
Probability (fraction):		Reservoir (P1)	Trap (P2)	Charge (P3)	Retention (P4)	
		0.9	1	0.8	0.2	
Parametres:		Low	Base	High	Comments	
Depth to top of prospect (m)			1100		For Reservoir Thickness and N/G we are only considering best sand extracted from AVO inversion hence thickness follows from Area vs. Depth Table, and N/G=1 for all scenarios. Varying N/G throughout the prospect area is accounted for by lumping thicknesses of all Best Sand together and then subtracting that sum from the top reservoir map (Kyrre 7).	
Area of closure (km^2)		0		360		
Reservoir thickness (m)		From Area vs. Depth Table				
HC column in prospect (m)		59	225	428		
Gross rock vol. (10^9 m^3)		N/A	N/A	N/A		
Net / Gross (fraction)		1	1	1		
Porosity (fraction)		0.25	0.27	0.3		
Water Saturation (fraction)		0.20	0.26	0.34		
Bg. (<1)						
Bo. (>1)		1.19	1.36	1.52		
GOR, free gas (Sm^3 /Sm^3)						
GOR, oil (Sm^3 /Sm^3)		24	54	101		
Recovery factor, main phase		0.24	0.39	0.50		
Recovery factor, ass. phase						
Temperature, top res (deg C) :			Pressure, top res (bar) :			

For NPD use:

Innrapp. av geolog:		Registrert:		Map OK:		Nr:
Dato:		Dato:		Dato:		

6 Conclusions

The prospectivity in PL686 has been evaluated and concluded based on licence specific studies. In summary, the Jotne prospect is considered to have limited volumes and a very low probability of finding commercial hydrocarbons. It is likely, however, to find minor gas accumulations in the small 4-way closures in the area.

Main aspects influencing the overall probability of success (POS) for the Jotne prospect are:

- Low POS on seal due to lack of structural support, only onlap stratigraphic trap present
- No apparent depth conform fluid contact visible in the seismic data which could support a large HC fill scenario, other than around the small 4-way closures
- Little to no support from rock physics and AVO inversion for the large HC fill scenario
- No support in the DNME data for a large HC fill scenario

The PL686 partnership has therefore unanimously agreed that a drill worthy prospect cannot be identified in the licence, and that PL686 therefore should be relinquished.

7 References

- APA2012 Application Document
- Hand-out material from all relevant meetings - Work meetings, Exploration Committee and Management Committee Meetings available on "Licence to Share"