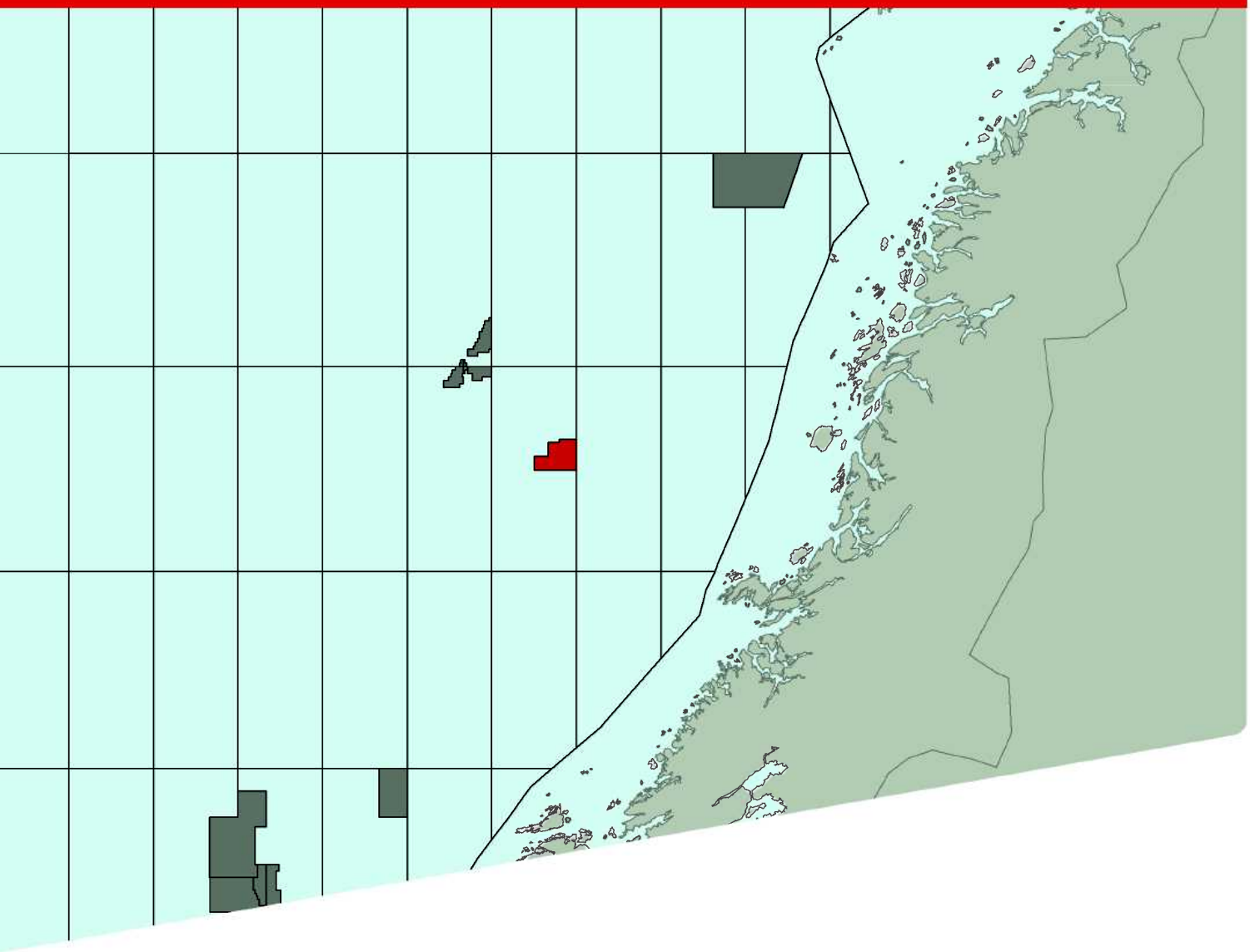
May 2013

PL481
RELINQUISHMENT REPORT



EP-XXXXXX

SKAGEN44

DONG energy

Relinquishment Report

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1 Key Licence History

PL481 is located on the southern flank of the Helgeland Basin on the Trøndelag Platform and comprise part of blocks 6508/5 and 6508/6, Fig. 1.1. Prospects and leads identified in the license are the Jurassic Stortussen, Lilletussen and Storgalten and Cretaceous/Paleocene Trolltinden, see Fig. 1.2.

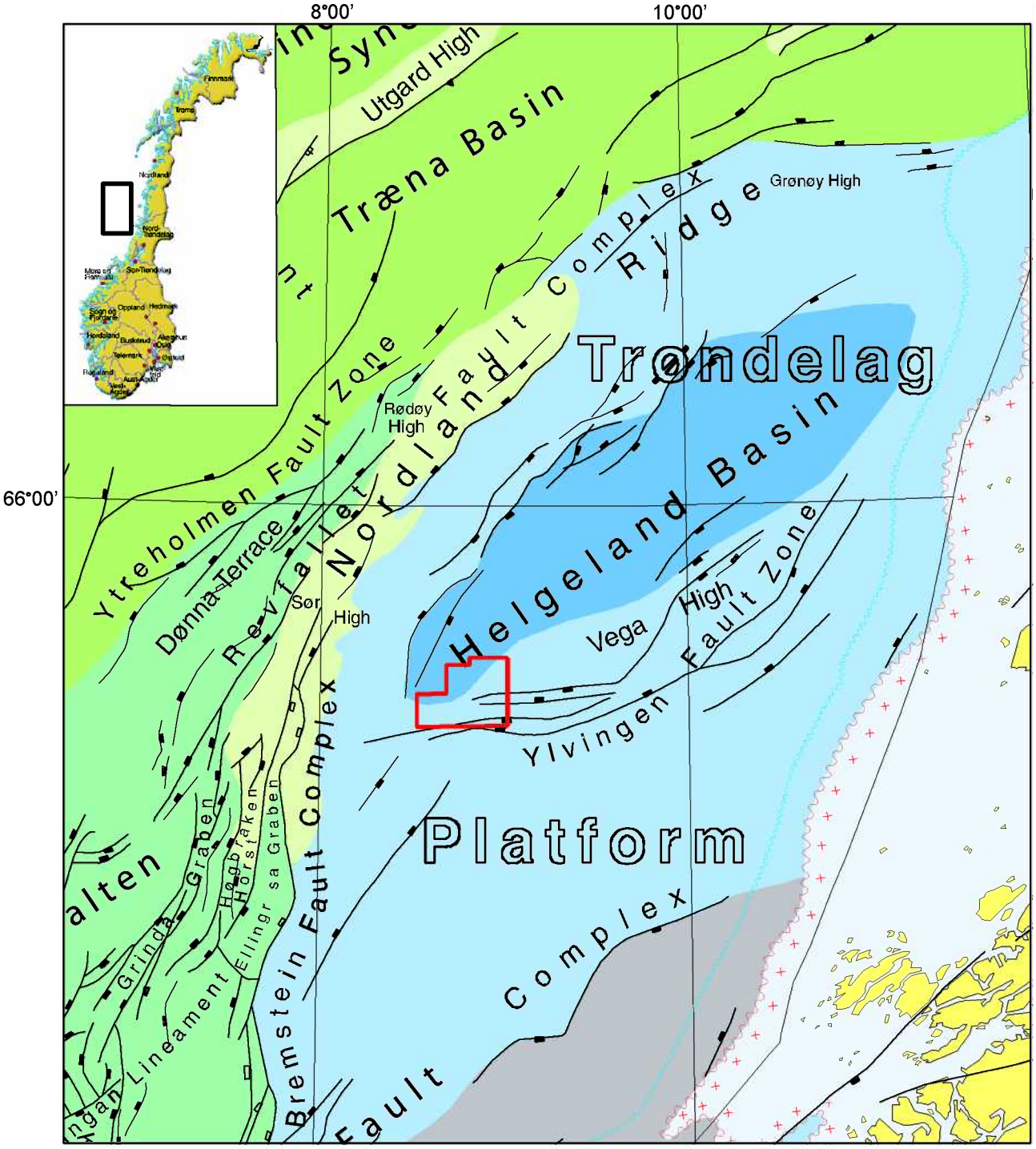

Fig. 1.1 Location map with structural elements

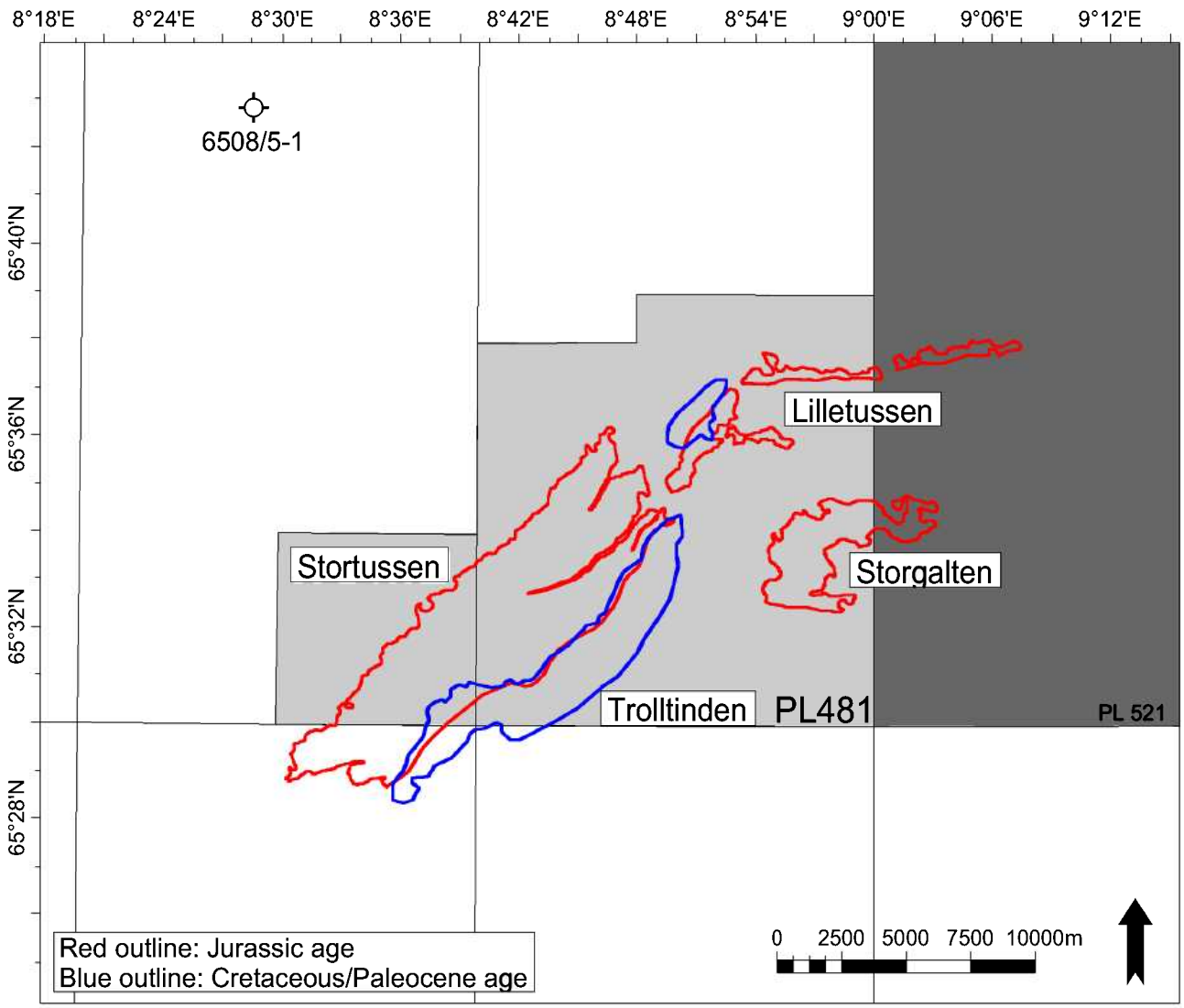

Fig. 1.2 Prospect and lead inventory

PL481 was awarded February 29th 2008 as a result of the APA 2007 application. Discover Petroleum AS was assigned as operator with 50% share and Skagen44 AS partner with 50% share. April 28th 2010 Discover Petroleum AS changed name to Front Exploration AS and July 1st 2012 DONG E&P Norge AS acquired Front Exploration and become the operator with the same share.

Work commitments in the license were to:

- Acquire minimum 300 km^2 3D seismic
- Perform relevant G&G studies

The commitments are fulfilled with the acquisition of 474 km^2 full fold 3D seismic over the license (DP0910M01). The seismic were acquired in two operations due to bad weather. The first 300 km^2 3D seismic were acquired by CGG Veritas in August-September 2009 and named DP0910. In June-July 2010 the remaining 174 km^2 3D seismic were acquired by Petroleum Geo-Services (PGS) in collaboration with Statoil Petroleum AS in the neighbouring PL521. This survey is named ST10013. Geokinetics Processing UK Limited merged and processed DP0910 and parts of ST10013 to the final product called DP0910M01. Relevant G&G studies performed include seismic mapping, prospect evaluation, EM data and biostratigraphy described in 2 Database.

The license conditions were:

- DOD within 3 years (February 28th 2011)
- BOV within 5 years (February 28th 2013)
- Initial period 6 years (February 28th 2014)
- Extended period 25 years

Due to delays with the 3D acquisition the Drill or Drop decision (DoD) were first postponed with one year to February 28th 2012. The second DoD postponement until February 28th 2013 were given due to delays of the Statoil operated 6610/10-1, Lovund well. The condition for this postponement were to pretrade the well. A third postponement of eighth months to October 28th 2013 were also applied for on the same basis along with an application of one year BOV postponement to February 28th 2014. Due to the relinquishment of the license February 25th 2013 these applications fell through.

Table 1.1: License meetings

Meetings	Date	Purpose
MCECM#1	April 24th 2008	Establish the license, Common database, Exploration status
ECMCM#2	December 2nd 2008	3D survey design and tendering, 2008 EM results, Budget and work programme 2009
ECMCM#3	November 3rd 2009	Review of the 3D acquisition, 2009 EM results, Budget and work programme 2010
ECMCM#4	May 31st 2010	Review of the processed 3D seismic and planning 2010 seismic infill
ECMCM#5	November 11th 2010	2010 3D processing status, Postponement of DOD, Budget and work programme 2011
ECM#1	February 4th 2011	Updated prospect evaluation
ECMCM#6	June 9th 2011	Exploration status, Further postponement of DOD
MCM#7	November 2nd 2011	Budget and work programme 2012
MCM#8	June 12th 2012	License update
MCECM#9	November 5th 2012	Further postponement of DOD and BOV, Budget and work programme 2013
MCM#10	February 13th 2013	License relinquishment

Reason for relinquishment

The prospect evaluation revealed a very high risk which does not support drilling an exploration well. The presence of a working source rock is regarded the highest risk factor.

2 Database

All public wells and seismic data in the area have been used in the evaluation in addition to the license acquired DP0910M01 and pre-traded well 6610/10-1 (trade 5250). See table 2.1, Fig. 2.1 and Fig. 3.3.

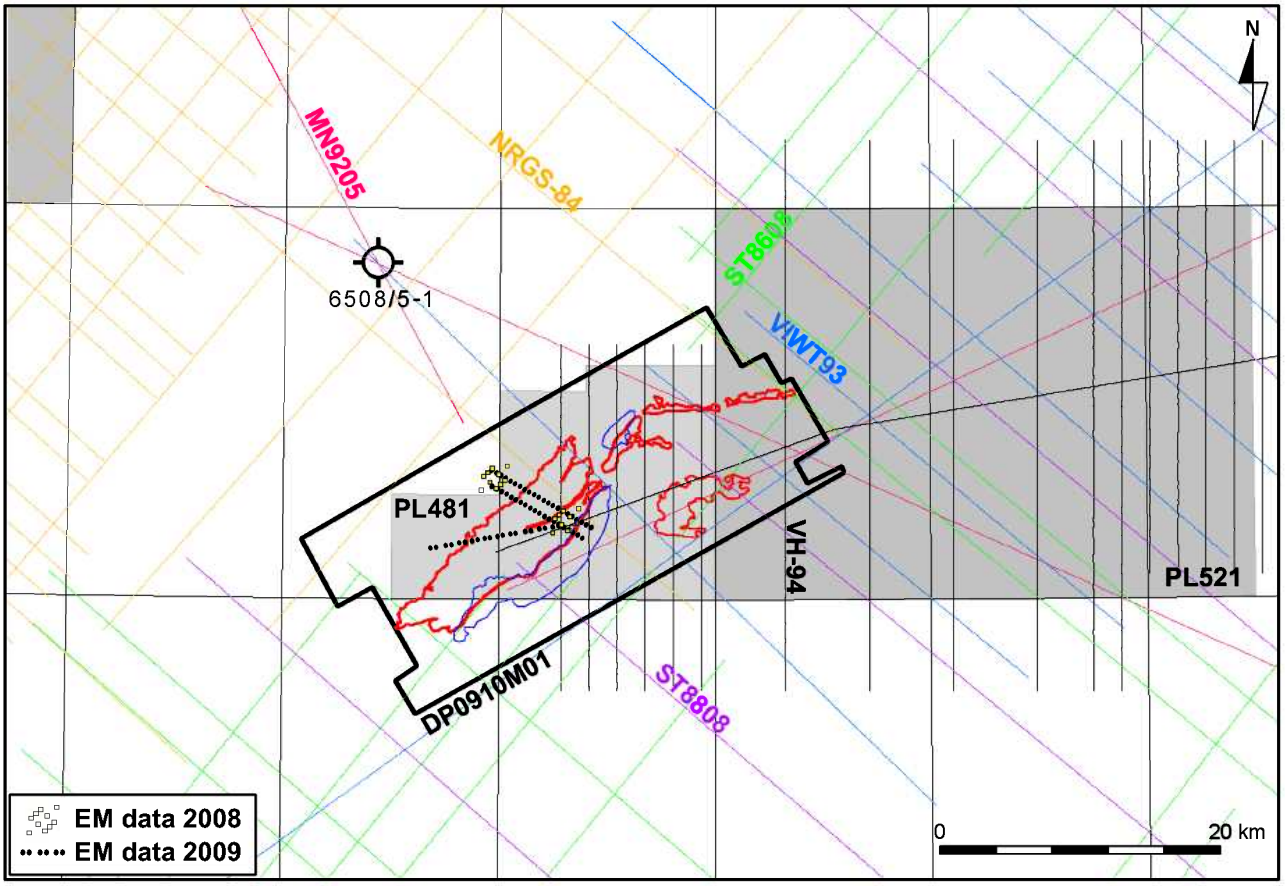

Fig. 2.1 Data base of seismic, wells and EM data

Table 2.1 Common database

Well data	2D seismic	3D seismic
6508/5-1	MN9205	DP0910M01
6510/2-1R	VIWT93	
6609/10-2	VH-94	
6609/11-1	NRGS-84	
6610/7-1	ST8608	
6610/10-1	NPD-NR-83	
	NPD-NR-85	
	ST8808	

Well data	2D seismic	3D seismic
	B-83	
	B83R98	

3D seismic

The quality of DP0910M01 is regarded as good, but SVI Pro noise reduction filters (SOFMH and TDiffusion) were used on the section from BCU and below.

EM data

EM data was acquired by Petromarker AS summer 2008 as part of the license database, see Fig. 2.1. A point layout acquisition was used along with a first generation vertical antenna. The results were inconclusive due to inconsistent data (direction dependency results) and difficulties creating a correct resistivity background model due to uncertainties regarding presence and thickness of salt underneath the prospect. Based on this, Petromarker AS acquired new EM data summer 2009 on behaf of the Operator. This survey had a line layout and used a tripod antenna with tilt control. This gave a better data coverage and more consistent data quality with less noise. The 2009 EM data is not part of the license database but is included due to conclusive results, see 4 Prospect Update, Stortussen prospect.

Other studies

- Biostratigraphy of well 6508/5-1 performed by Ichron ltd.
- PSQL (Petroleum System quick look) done in Petrel using Åre Fm., Triassic (Wordie Creek) and Permian (Ravnefjeld Fm.) source.
- Rock physics modelling and AVO analysis performed in Hampson-Russell by Skagen44 AS on Stortussen. Since DP0910M01 is a merge between two surveys acquired with sligthly different parameters the results were inconclusive.
- AVO screeing of Stortussen, Lilletussen and Trolltinden. Using SEISMOD and a conceptual three layer model (shale-sand-shale) a fluid substitution modelling was done on the top Ile Formation predicting the amplitude vs. offset.
- EM feasibility modelling of Trolltinden and Grey Beds reservoir at Stortussen. The background resistivity model was based on up-scaled and extrapolated resistivities from adjacent wells, and the reservoir resistivities were based on "best-guess" assumptions. Only isotropic models have been simulated. A 2.5D modelling code was used. The EM modelling was done for frequency-domain (EMGS setup) using 0.25, 0.75 and 1.25Hz where air waves have not been taken into account.
- Reservoir characterisation, CPI, of well 6508/5-1and 6510/2-1R.

3 Review of Geological Framework

Structural framework

The license is located on the southern flank of the Helgeland basin in the southwestern part of the Ylvingen Fault Zone (Fig. 1.1). The Helgeland Basin was formed during a late stage of the Late Middle Jurassic-Early Cretaceous rifting episode by weak normal faulting in the northwest and down-wrapping in the southeast (Blystad et al. 1995). The Ylvingen fault zone consist of a complex pattern of tilted blocks, horsts, grabens and half grabens which was formed during a late phase of the Late Middle Jurassic-Early Cretaceous rifting episode. The prospects were initially developed during this stage and further evolved during gentle passive subsidence and infill in the Cretaceous.

Statigraphic framework

A well correlation of the Jurassic and Late Triassic section from key wells on the rim of the Helgeland Basin is shown in Fig. 3.1. PL481 is located just east of the 6508/5-1 well where sand of the Jurassic Ile Formation is very well developed. A CPI of this well show excellent reservoir properties with average porosities of 29%, N/G of 70% and permeability of 321 mD. Sealing lithologies of Not and Melke Formations are also present with thicknesses over 100 meters. Tilje and Åre Formations are present and holds thick sandstone packages of excelent quality along with coal layers which may act as sealing lithologies. The Garn Formation which is present in well 6510/2-1R is not thought to be present in the license area. Triassic Grey beds are also present in the area but with a somewhat poorer reservoir quality. CPI of Grey beds in well 6508/5-1 show porosity of 26%, N/G of 37% and permeability of 161 mD. Two Triassic salt layers (upper and lower) is also encountered on the Trøndelag Platform and they may act as a seal for potential deeper targets.

The Cretaceous Lysing Formation is penetrated in well 6510/2-1R with porosties between 17-24% and permeabilities between 14-502 mD. The Lysing Formation is not present in well 6508/5-1. Tight shales of the Cromer Knoll and Shetland Group act as seal. See Fig. 3.2 for lithostratigraphic column.

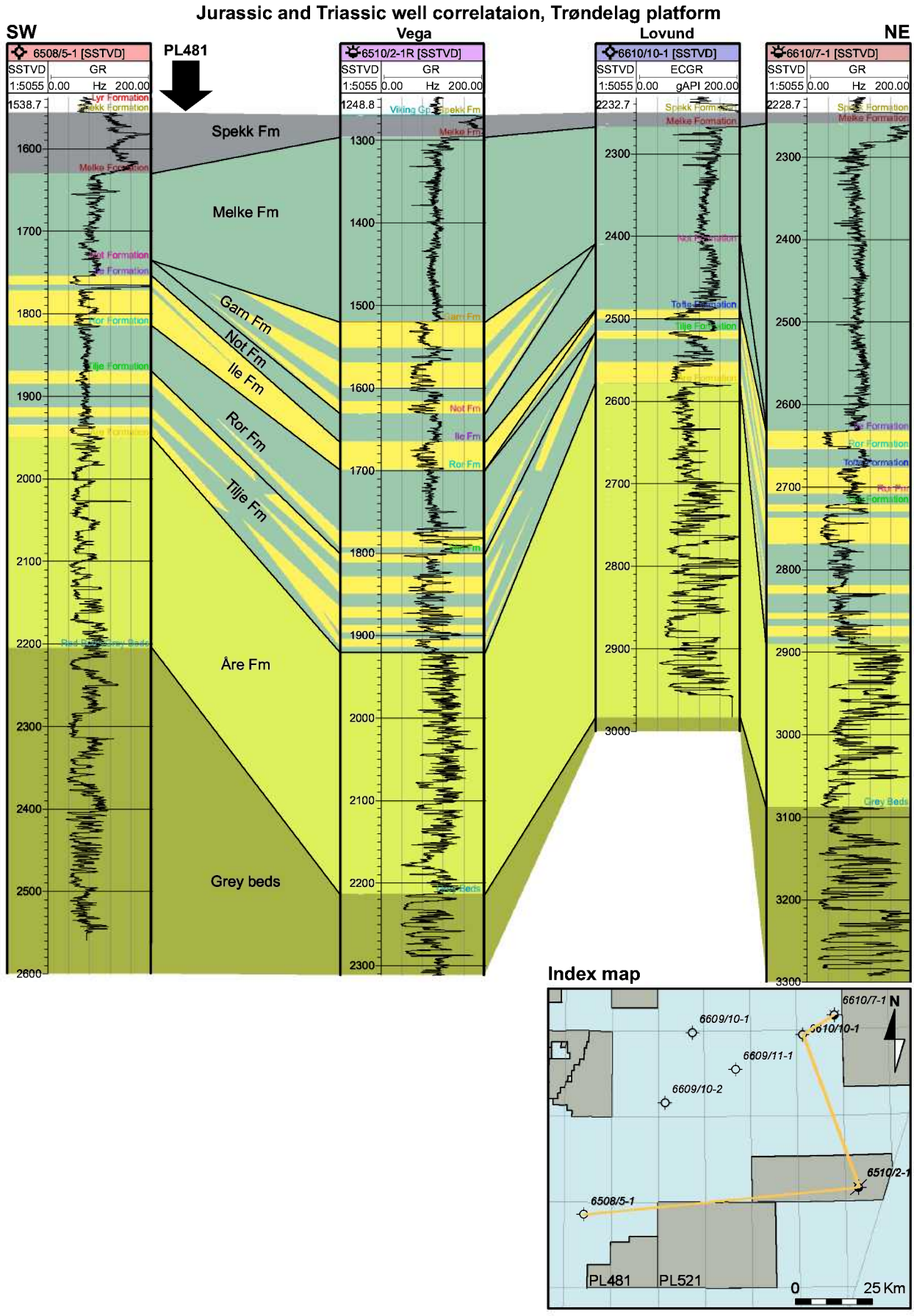

Fig. 3.1 Well correlation of the Jurassic and Triassic section on the Trøndelag Platform.

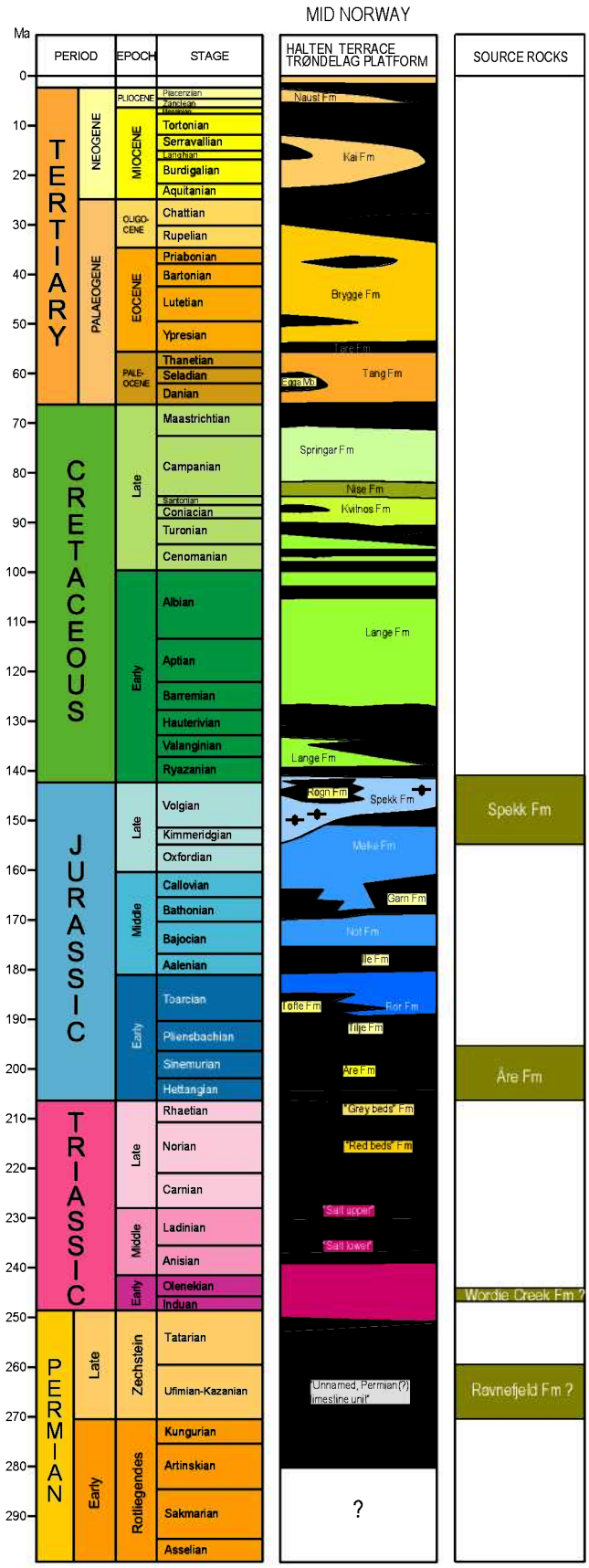

Fig. 3.2 Lithostratigraphic column

Hydrocarbon system

Eighth exploration wells have been drilled on the rim of the Helgeland Basin and on the surrounding Platform without finding commercial hydrocarbon accumulations Fig. 3.3 . Shows is however detected in five wells indicating that hydrocarbons have been generated. Poor potential of the source rocks and/or leaking traps might be the cause for encountering only shows. Well 6610/7-2 encountered free hydrocarbons in siltstone in the Tilje Fm. 6610/7-1 has oil shows in cores and cuttings from early Jurassic sandstones. Well 6609/11-1 has shows as fluorescense in core from the Early Jurassic reservoir. Dark bitumen is also proven at 2561 meters which can be residues from a palaeo column or a possible migration rote of hydrocarbons. The composition suggest a terrestic source of Triassic or Permian age (Karlsen *et al.* 1995). In well 6510/2-1 weak shows were found in Early Jurassic sandstone. Well 6508/5-1 encountered minor cut fluoresence on a side wall core in Spekk and Melke Fm. Shallow stratigraphic core 6611/9-U-1 and 6611/9-U-2 revealed two Permian organic rich mudstone intervalls at 13 and 6 meters thickness (type II and II/III) in the early oil window. Also several cm thick organic rich mudstones of Lower Triassic age were detected. They may thicken basinwards and function as a source rock (such a source is yet to be found in East Greenland). Several non biodegraded oil stained intervals of Permian and Triassic age were also detected in the cores and the geochemical composition suggest a Permian source (Bugge et al. 2001).

Regional 3D basin modelling performed by Applied Petroleum Technologies (apt) in connection with the APA 2007 application work, indicates that both Spekk and Åre Formations are immature in the southern part of the Helgeland Basin. Inhouse PSQL done in Petrel indicate a mature Permian (Ravnefjeld Fm.) and Triassic (Wordie Creek) source where hydrocarbons migrates into Grey beds closures including Stortussen. Charge from a Permian source

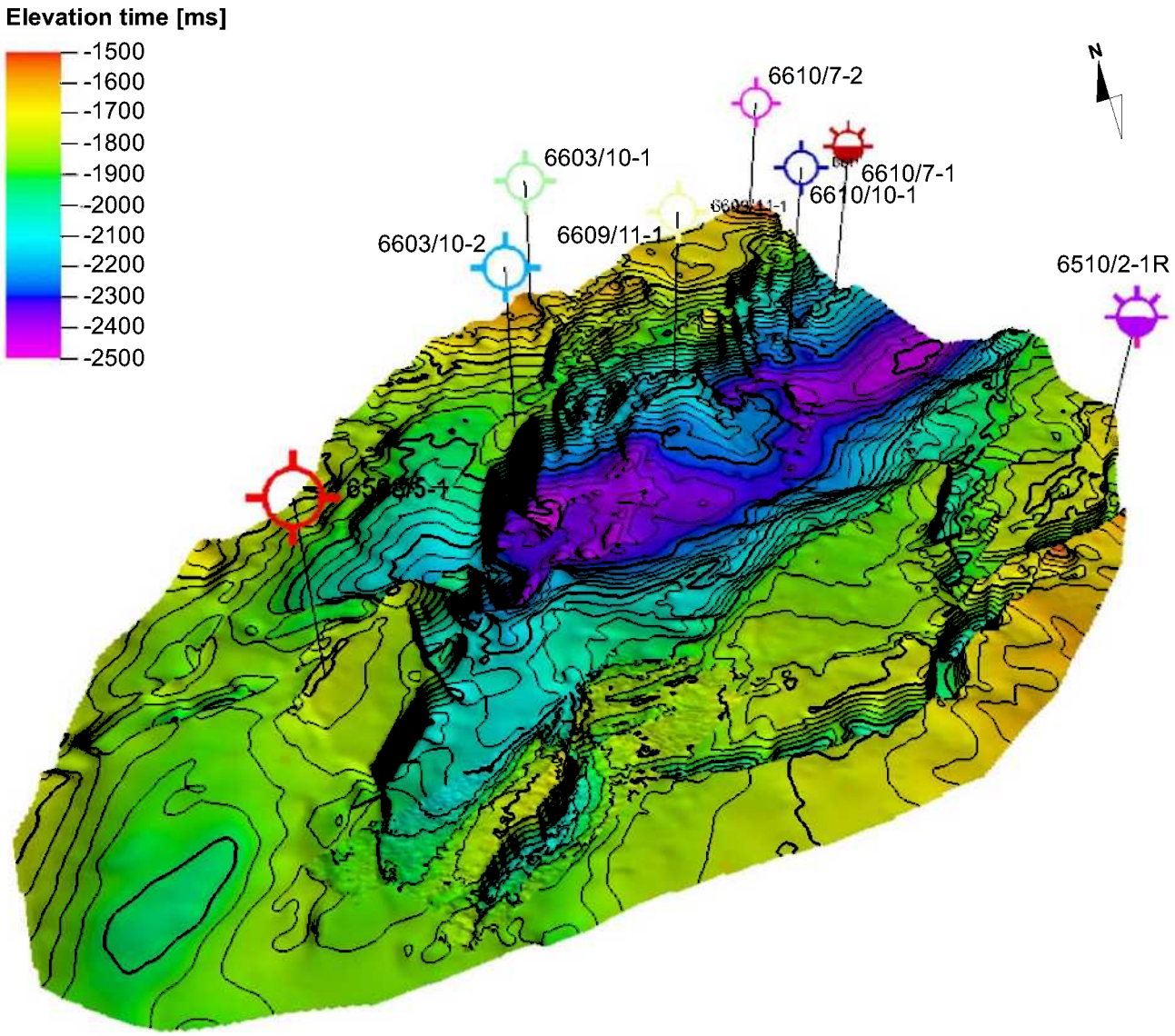

Fig. 3.3 Exploration wells on the rim of the Helgeland Basin

does require leakage through the salt where offset by faults. The modelling show that PL481 is well located compared to some of the other prospects drilled on the Trøndelag Platform when it comes to migration.

New wells in the area

Well 6610/10-1, Lovund, was drilled in the Statoil operated PL386 and completed January 28th 2013. The objective was to prove hydrocarbons in Lower Jurassic reservoir rocks (Båt Gp.). The well was dry but encountered reservoir rocks with expected quality. TD were 2988 meters in Grey beds. The Lovund structure is favourably located for hydrocarbon charge northwest in the Helgeland Basin where both Spekk and Åre Formations are regarded mature, see Fig. 3.3.

4 Prospect Update

Original resource calculations performed for the APA 2007 application were carried out in GeoX on separate oil and gas cases (associated phases not included) due to uncertainties regarding the hydrocarbon phase. The leads were assumed fill to spill. Recoverable resources for for the entire licence was originaly 299x10^6 Sm^3 oil or 94x10^9 Sm^3 gas. The new resource calculations in GeoX based on DP0910M01 interpretation were performed on both separate oil and gas cases and a multi-phase case.

Stortussen prospect (Jurassic)

The main Stortussen structure was originally defined on 2D seismic as a Jurassic lead with Ile, Tilje and Åre Formations as reservoir levels. Recoverable resources were estimated to 170x10^6 Sm^3 oil or 52x10^9 Sm^3 gas. Interpretation of the new 3D seismic survey DP0910M01 confirmed the presence of the robust structure with closure on every key horizon from Triassic to Paleocen. On the main reservoir, Ile Formation, the Stortussen prospect is defined as a combination of a fault bonded horst in the east and a three way structural closure (Fig. 4.1 and Fig. 4.2). Stortussen spills to the south at 1792 meters which gives a column high of 215 meters. It covers an area of 66.7 km^2. The new mean recoverable resources are 193x10^6 Sm^3 oil or 48x10^9 Sm^3 gas or as a multi-phase 99x10^6 Sm^3 oil and 24x10^9 Sm^3 gas. The input values used in the resource calculations are slightly stricter than found in the 6508/5-1 well, see Table 4.1. Inversion of the 2009 EM data showed no indications of increased resistivity in the Jurassic reservoirs, see Fig. 4.3. The geological chance of success is set to 10% due to the large uncertainty regarding source rock.

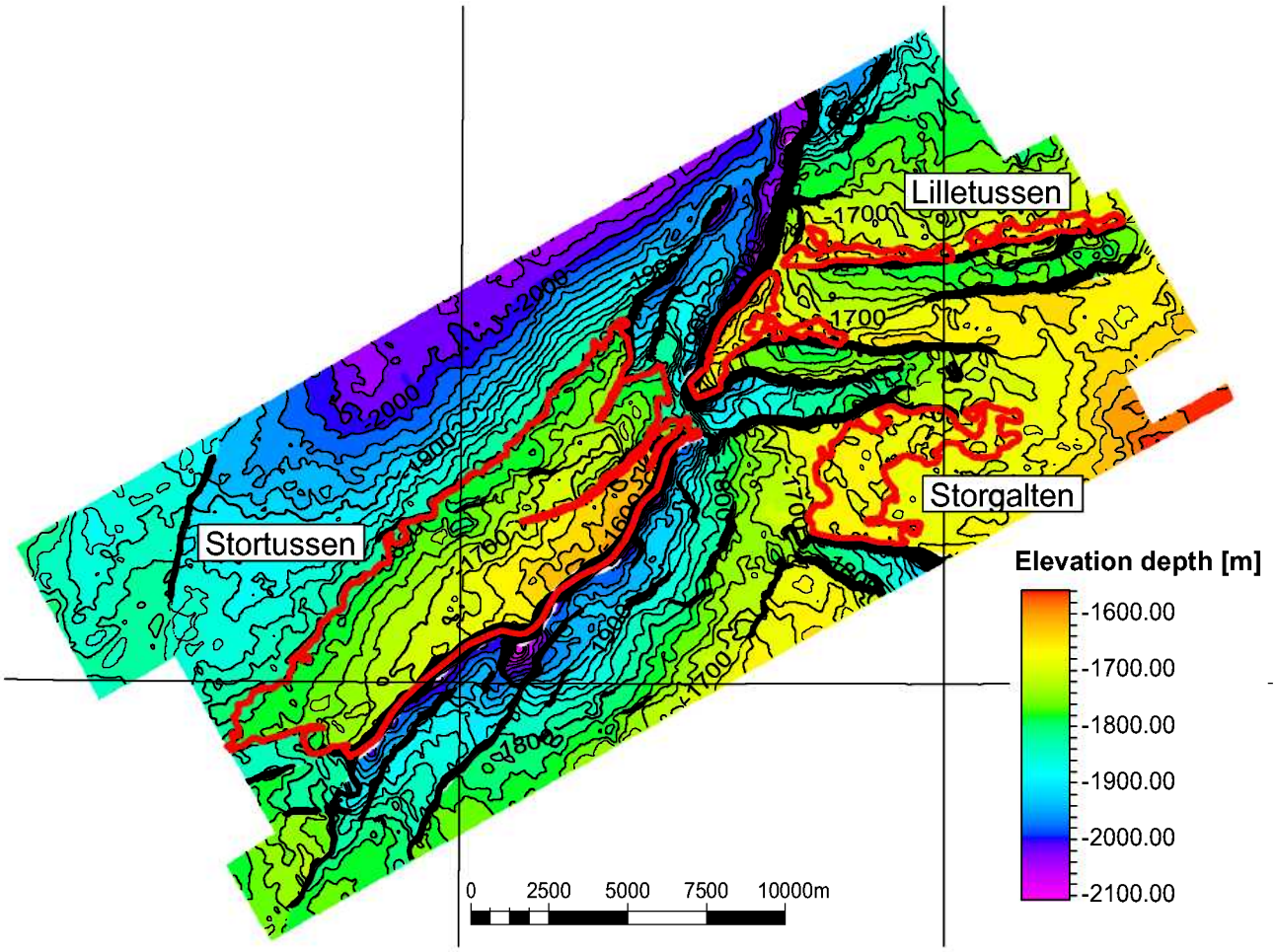

Fig. 4.1 Top Ile Formation depth map with 20 meter contours.

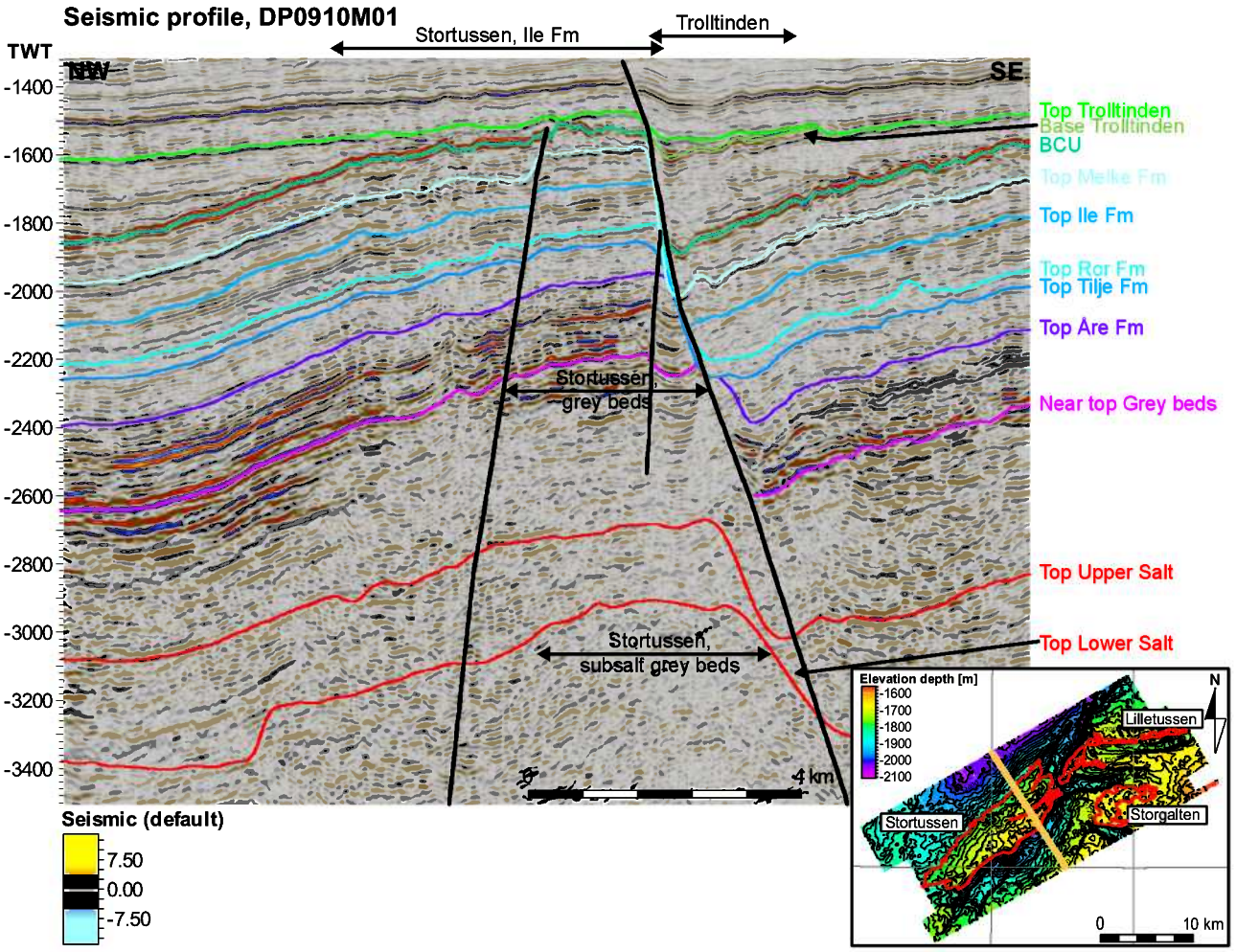

Fig. 4.2 Seimic profile DP0910M01, Stortussen prospect

Table 4.1. Prospect data Stortussen Ile Formation, multi phase.

Block	Prospect name		Discovery/Prosp/Lead		Prosp ID (or New!)	NPD approved?
6508/5,6 & 8	Stortussen				*NPD will insert data*	*NPD will insert data*
Play (name / new)	Structural element		Company/ reported by / Ref. doc.			Year
NPD will insert data	Trøndelag Platform/Helgeland Basin		Dong E&P Norge AS			2013
Oil/Gas case	**Resources IN PLACE**					
	Main phase			Ass. phase		
	Low	Base (mean)	High	Low	Base (mean)	High
Oil 10^6 Sm^3	77	179	288	0	0	0
Gas 10^9 Sm^3	16	37	61	4	9	15
	Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base (mean)	High	Low	Base (mean)	High
Oil 10^6 Sm^3	42	98	159	0	0	0
Gas 10^9 Sm^3	10	24	40	2	5	8
	Which fractiles are used as:		Low:	P90	High:	P10
Type of trap	Water depth (m)		Reservoir Chrono (from - to)		Reservoir Litho (from - to)	
Structural	340-420		172-176		Ile Formation	
Source Rock, Chrono	Source Rock, Litho		Seal, Chrono		Seal, Litho	
245-260 Ma	Wordie Creek/Ravnefjeld Fm.		145 - 175 Ma		Not og Melke Fm.	
Seismic database (2D/3D):	3D seismic survey DP0910M01					
Probability of discovery:						
Technical (oil+gas case)	10 %			Prob for oil/gas case		50-50
Probability (fraction):	Reservoir (P1)	Trap (P2)	Charge (P3)	Retention (P4)		
	0,9	0,8	0,14	1		
Parametres:	Low	Base (mode)	High	Comments		
Depth to top of prospect (m)	1577	1577	1577			
Area of closure (km^2)		67				
Reservoir thickness (m)		-				
HC column in prospect (m)		215				
Gross rock vol. (10^9 m^3)	4,3	4,97	5,6			
Net / Gross (fraction)	0,42	0,55	0,65			
Porosity (fraction)	0,26	0,27	0,28			
Water Saturation (fraction)	0,22	0,3	0,4			
Bg. (<1)	0,0054	0,0055	0,0057			
1/Bo. (<1)	0,847	0,87	0,892			
GOR, free gas (Sm^3 /Sm^3)						
GOR, oil (Sm^3 /Sm^3)	47	50	53			
Recovery factor, main phase	0,52	0,55	0,58			
Recovery factor, ass. phase	0,52	0,55	0,58			
Temperature, top res (deg C) :		Pressure, top res (bar) :				

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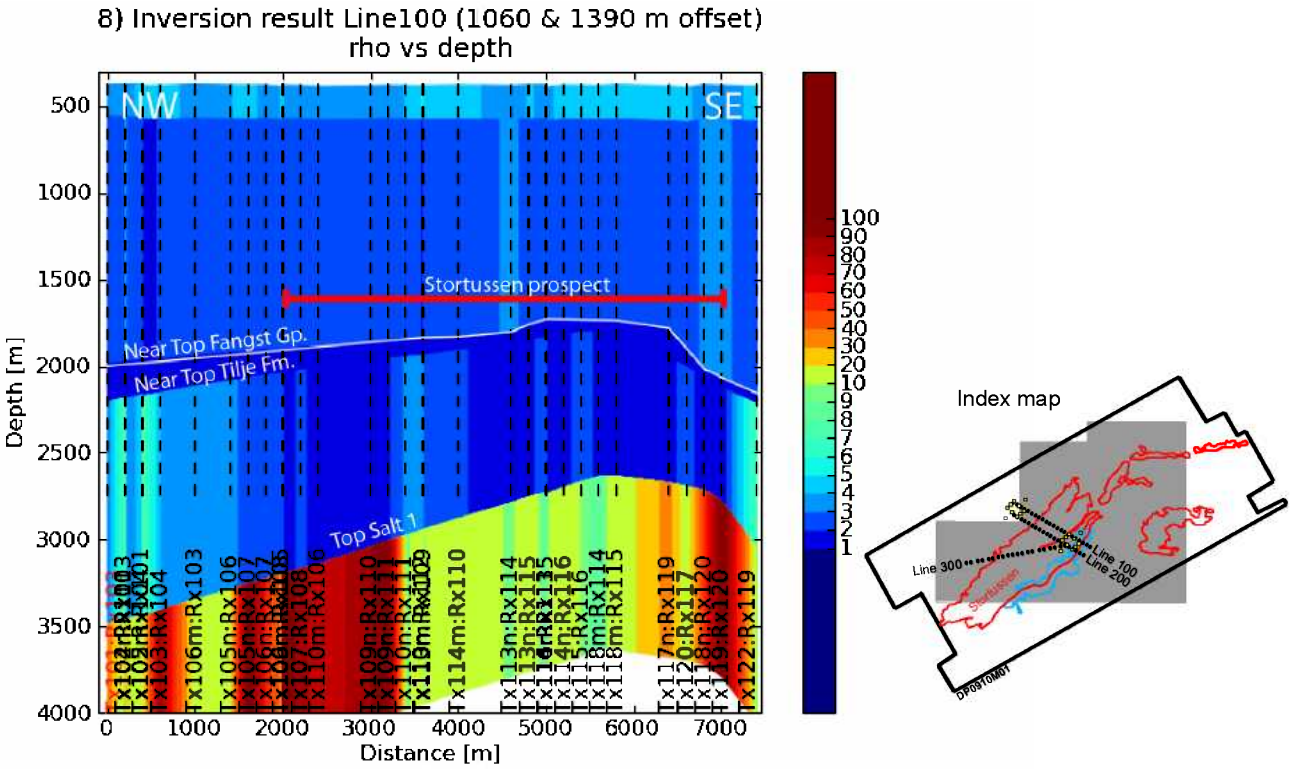


Fig. 4.3 2009 EM data. Inversion results for line 100 crossing Stortussen prospect

Stortussen prospect (Triassic)

The 3D seimic evaluation also revealed closure on the near top Grey beds horizon where Triassic sandstones is the reservoir. It is defined as a fault bounded three way structural closure spilling to the east at 2363 meters. It covers an area of 42 km^2 with apex of the structure at 2085 meters. See Fig. 4.4. Mean recoverable resourses is calculated to 44x10^6 Sm^3 oil or 18x10^9 Sm^3 gas or as multi-phase 22x10^6 Sm^3 oil and 9x10^9 Sm^3 gas. The geological chanse of sucess is set to 9%. EM modelling was also conducted showing that the Grey beds sandstones is a feasible target and that the 2009 EM data could be used if it is possible to create a correct background model. No inversion was performed.

A third opportunity is sub lower salt sandstones of the Triassic Grey beds where the salt act as a top seal for the hydrocarbons. On this level there are two four way structural closures covering an area of 42 km^2. The largest one has a spill point at 3537 meters to the southwest. Apex is at 3175 meters which gives a colum height of 582 meter. Resource calculations for this interval is not carried out. See Fig. 4.5.

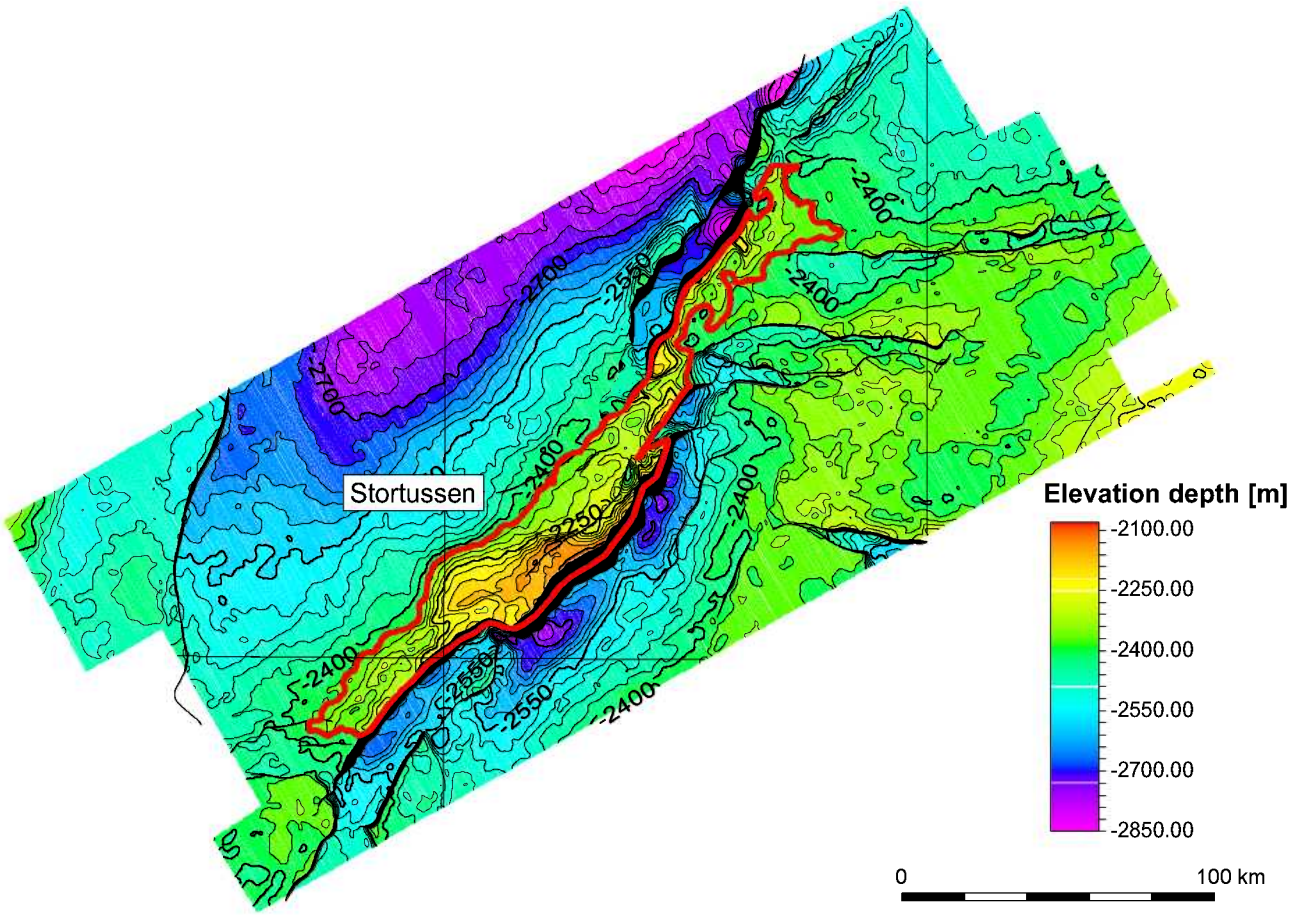


Fig. 4.4 Near top Grey beds depth map with 30 meter contours

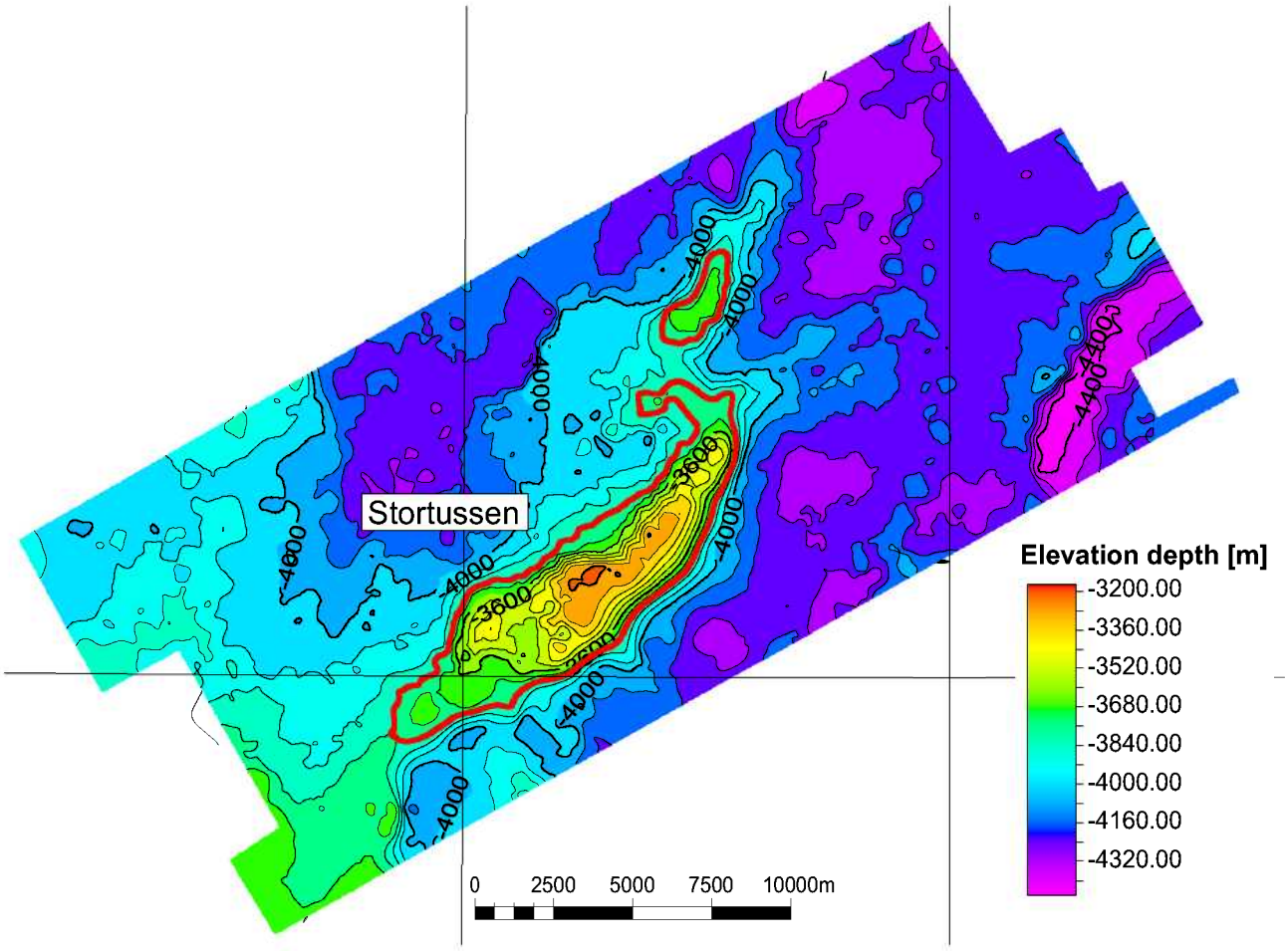


Fig. 4.5 Grey beds subsalt depth map with 80 meter contours

Lilletussen (Jurassic)

In the APA2007 application the Lilletussen lead was defined as a northwest-southeast oriented horst spilling to the east. The resource potential was estimated to 71x10^6 Sm^3 oil or 24x10^9 Sm^3 gas. New 3D interpretation show that Lilletussen consists of four separete fault bonded three way structural closures with a spilling to the east at 1672 meter. Combined they cover an area of 8.5 km^2, see Fig. 4.1. Updated mean recoverable resources are downsized to 4x10^6 Sm^3 oil or 1x10^9 Sm^3 gas or as multi-phase 2x10^6 Sm^3 oil and 0.5x10^9 Sm^3 gas. The geological chance of success is set to 13% due to a somewhat easier hydrocarbon migration route. AVO screening of the Ile Formation indicates a possible AVO response, but the results are inconclusive

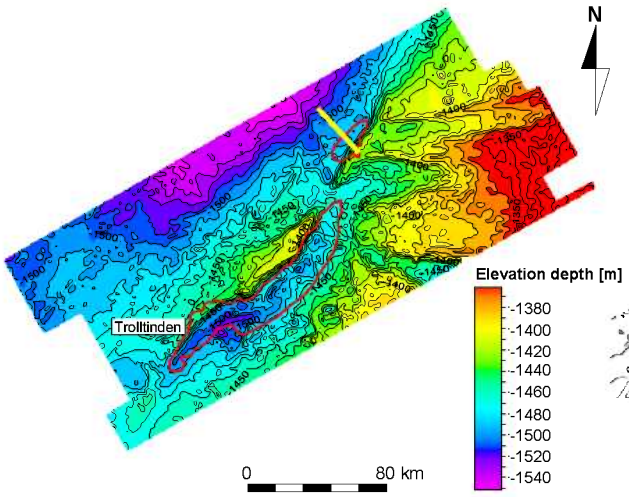
Storgalten (Jurassic)

The original resource potential from the APA2007 application were 58x10^6 Sm^3 oil or 18x10^9 Sm^3 gas. The new 3D seismic evaluation revealed a very flat structure so no new resource calculations or risking were performed (Fig. 4.1).

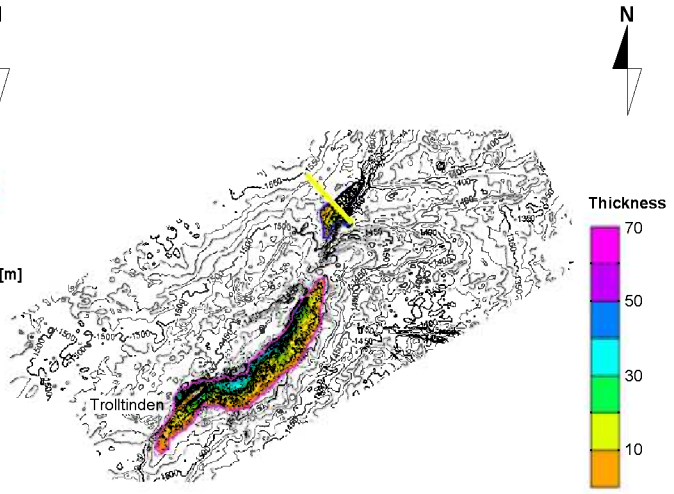
Trolltinden (Cretaceous/Paleocene)

The Trolltind prospect was identified on the DP0910M01 seismic survey as a wedge shaped body deposited along the down-thrown eastern side of Stortussen, see Fig. 4.6. This interval is not

Late Cretaceous, top Trolltinden dept map



Trolltinden thickness map



Trolltinden

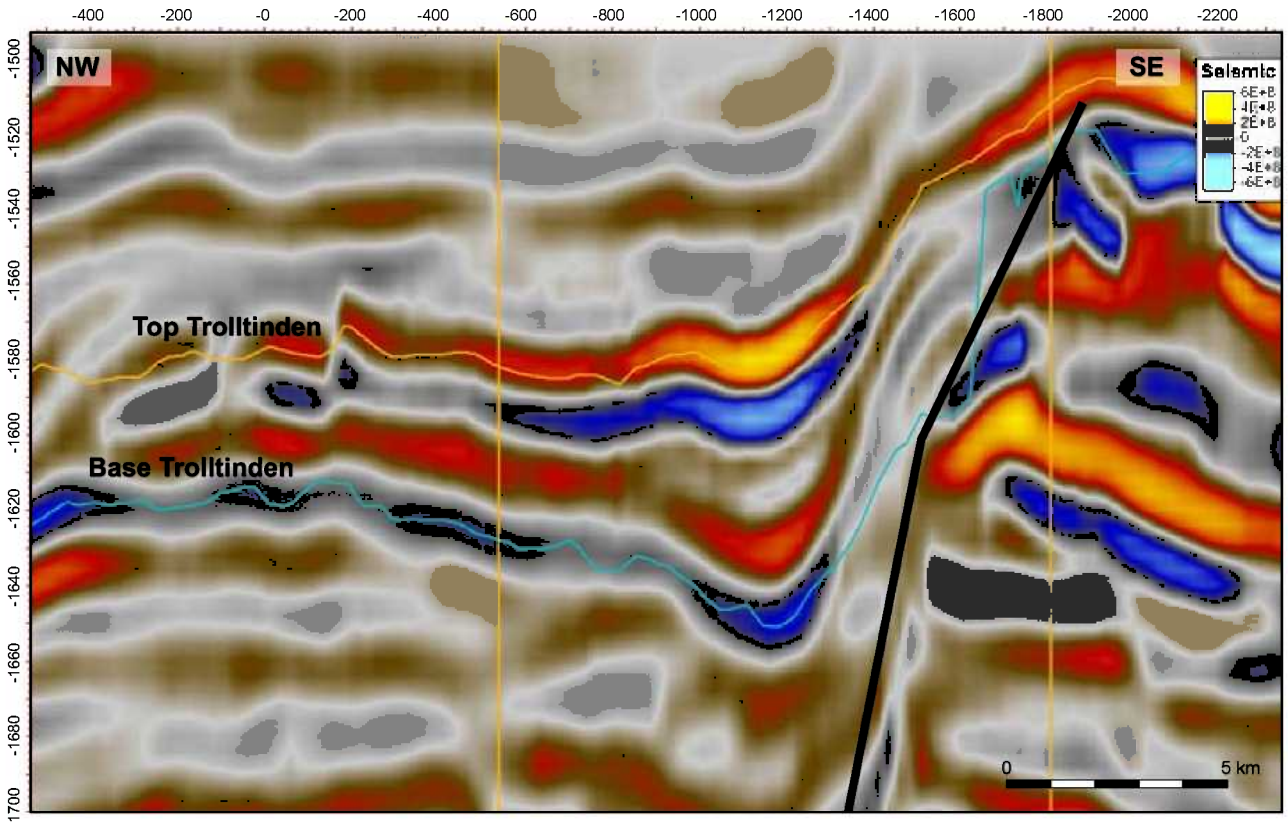


Fig. 4.6 Top Trolltinden depth map, thickness map and seismic profile DP0910M01, Trolltinden

penetrated in any nearby wells, but is thought to be of Late Cretaceous or Paleocene age. The prospect is described as a tree way stratigraphical pinchout bounded by a sealing fault to the west. It covers an area of 30 km^2 and has a column high of 105 meter. Apex of the structure is at 1410 meter and the reserovir thickness varies up to 50 meters. Mean recoverable resources is 15x10^6 Sm^3 oil or 2x10^9 Sm^3 gas or as multi-phase 10x10^6 Sm^3 oil and 2x10^9 Sm^3 gas. Input values are based on parameters from Lysing Formation in several wells in the Norwegian Sea. The geological chance of success is set to 2% due to large uncertainties in the presence of both source rock and reservoir rock

and a complicated migration route. Fluid prediction modelling done in SEISMOD using input data from the Egga Formation in well 6610/7-2 show a small negative increase on top reservoir in a gas filled reservoir compared to a brine filled reservoir. AVO screening indicates no AVO response on top reservoir compared to the above shale trend.

Table 4.2: Prospect and lead summary

Prospect/Lead	Formation	Recoverable oil ($x10^6$ Sm^3)	Recoverable gas ($x10^9$ Sm^3)	COS (%)
Stortussen oil or gas phase	Ile	193	48	10
Stortussen multi-phase	Ile	99	24	
Stortussen oil or gas phase	Grey beds	44	18	9
Stortussen multi-phase	Grey beds	23	9	
Lilletussen oil og gas phase	Ile	4	1	13
Lilletussen multi-phase	Ile	2	0.5	
Trolltinden oil or gas phase	Lysing	15	2	2
Trolltinden multi-phase	Lysing	10	0	

5 Technical Evaluation

Updated technical and economical evaluations was performed based on the new prospect evaluations of the Stortussen prospect on the Top Ile Formation reservoir unit and the Near top Grey Beds reservoir unit. For both reservoir units calculations was performed for an oil case, gas case and oil with gas cap case, all calculations showing positive NPV. Field development considered was FPSO and subsea wells, gas and water injection, and any gas export through Åsgard Transportation pipeline.

Although a positive outcome for the calculated business cases, the technical evaluation concluded that the Stortussen prospect is not drill worthy due to the low geological chance of success.

6 Conclusions

The main geological risk in the Helgeland Basin is the presence of a working source rock. The dry Lovund well (6610/10-1) has not reduced the risk but rather, along with all the other wells drilled on the rim of the basin, further substantiated it. Acquired EM-data showed no indications of increased resistivity in the Ile Formation and contributed to the decision to surrender the license. On the positive side PL481 has a very roboust and large trap with several good quality reservoirs and a positive business case.

The high geological risk does not support drilling an exploration well and the license were relinquished March 1st 2013.