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Status Report at License Surrender of PL 798 in Blocks 6506/5, 6, 8 & 9

List of figures

1 Key License History

PL 798 was awarded on the 6th February 2015 following an application made in the APA 2014. The original partnership comprised:

- Centrica Resources (Norge) AS - 40% (operator)
- Explora Petroleum AS - 20%
- Statoil Petroleum AS - 20%
- VNG Norge AS- 20%

In February 2016 Explora Petroleum AS transferred their 20% share to North E&P AS. Then, in April 2016, North E&P AS transferred their 20% share to Statoil Petroleum AS.

The initial license work commitments were 'to acquire and/or reprocess 3D seismic' and to make a 'drill or drop' decision before 6th February 2018. The group fulfilled the seismic commitment by purchasing 1288 sqkm of the HVG2011 (PGS broadband) 3D survey immediately after the license was awarded. The purchased seismic covers most of the license and a significant area outside the license.

The partnership has been able to take the 'drill or drop' decision early because the new seismic data was received immediately after award of the license, which gave more than 18 months for the interpretation work to be undertaken. There have been no extensions to any license deadline.

The area to be relinquished is deemed to have limited exploration potential. In particular the main Lysing Fm prospects are much smaller than the minimum economic field size (MEFS).

The operator's recommendation to surrender PL 798 was presented at an MC Meeting on 6th of September 2016 and is supported by all members of the partnership.

The license prospectivity was presented by the operator and discussed by the group at the following partner meetings

Meeting	Date	Purpose
ECMC	5th May 2015	Agreement of common database and discussion of prospectivity
EC	14th October 2015	Operator's preliminary assesment of Lysing Fm prospectivity (on new seismic data)
ECMC	30th November 2015	Operator's final assesment of Lysing Fm prospectivity
ECMC	6th September 2016	Operator's final assesment of Lysing Fm, Lange Fm and Jurassic level prospectivity. The decision to relinquish the license was agreed via L2S following the meeting

2 Database

Following license award the group purchased a 1288 sqkm area of the PGS broadband HVG2011 survey. The new seismic covers PL 798 and an area to the east of the license. The outline of the seismic area is shown in Fig. 2.1

No new wells were drilled and no unreleased wells were included in the license common database.

To support the seismic interpretation and prospect evaluation the operator undertook an in-house Lysing Fm rock physics study which utilised 11 relevant offset wells. In addition the operator undertook a petrophysical analysis of the Lysing and Lange Fms in 25 relevant offset wells to understand reservoir distribution and quality on the Dønna Terrace and the northern part of the Halten Terrace (see table below)

The operator also undertook in-house pre-stack gather conditioning of the HVG2011 3D seismic in order to create bespoke angle stack cubes and to remove noise.

Well	Petrophysics	Rock Physics
6505/10-1	Yes	No
6506/11-3	Yes	No
6506/3-1	Yes	Yes
6506/6-1	Yes	Yes
6506/6-2	Yes	Yes
6506/9-1	Yes	Yes
6506/9-2S	Yes	No
6507/1-1	Yes	Yes
6507/2-1	Yes	No
6507/2-2	Yes	Yes
6507/2-3	Yes	Yes
6507/2-4	Yes	Yes
6507/3-9S	Yes	Yes
6507/5-1	Yes	No
6507/5-3	Yes	Yes
6507/5-4	Yes	No
6507/5-5	Yes	No
6507/5-6S	Yes	No
6507/7-1	Yes	No

Well	Petrophysics	Rock Physics
6507/7-11S	Yes	No
6507/7-12	Yes	No
6507/7-14S	Yes	Yes
6507/7-15S	Yes	No
6605/8-2	Yes	No
6605/8-1	Yes	No

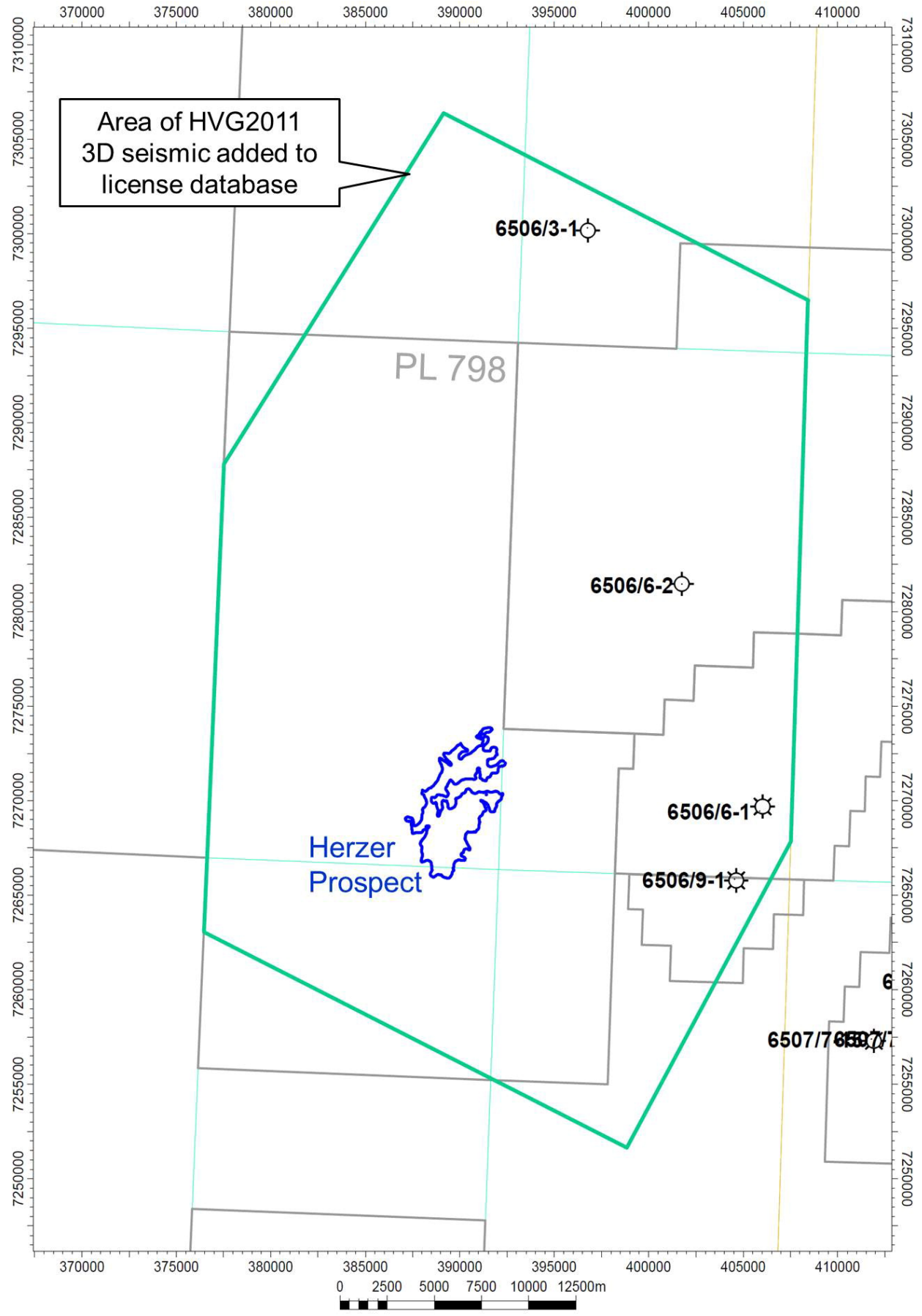
Area of HVG2011
3D seismic added to
license database
6506/3-1
PL 798
6506/6-2
6506/6-1
Herzer
Prospect
6506/9-1
370000
375000
380000
385000
390000
395000
400000
405000
410000
7310000
7305000
7300000
7295000
7290000
7285000
7280000
7275000
7270000
7265000
7260000
7255000
7250000
0 2500 5000 7500 10000 12500m

Fig. 2.1 PL 798.

3 Review of Geological Framework

During the evaluation of PL 798 the operator was evaluating the same prospective levels in the neighbouring PL 757, which had a similar partner grouping. The operator undertook significant regional scale work to support the evaluation of both PL 798 and PL 757.

The Lysing Fm Sst fairway was the primary target level in PL 798. The Lysing Fm in this area is a widespread turbidite facies. Petrophysics and regional mapping work undertaken by the operator confirmed the pre-award model that there is a broad trend of deteriotating reservoir quality (porosity, NG and permeability) from NE to SW across the Dønna Terrace and the northern part of the Halten Terrace. The Lysing Fm also shows a trend of gradual thickening from NE to SW, the thickening becomes more noticeable at the western edge of the Halten and Dønna Terraces.

Some of the best quality Lysing reservoir is seen at the Marulk Discovery on the Dønna Terrace, which is believed to be sitting in the proximal part of the fairway. An examination of the 3D seismic surveys in the vicinity of Marulk showed that there are smaller scale variations in the distribution of reservoir quality that result from depositional heterogeneity. In addition there are smaller scale thickness changes that appear to be linked to the underlying Jurassic topography. The reservoir quality appears to be better where the top Lysing seismic reflector indicates a decrease in acoustic impedance. This empircal observation is supported by rock physics modelling, which shows that the best Lysing Ssts have a class IIP or III AVO response that becomes brighter with the presence of gas. It was also noted that relatively thin Lysing Ssts can be observed on seismic, for example the 8 m Lysing Sst seen in the 6507/2-2 well (Marulk Field) generates a seismic reflector. This conclusion was supported by the operator's in-house wedge modelling, which indicates that 5-10 m thick Lysing Sst layers should be detectable on seismic.

The claystones of the lower Shetland Group provide a competent top seal to the underlying Lysing Sst.

The main source rock in the area is the deeply buried Spekk Fm, which went through peak gas expulsion in the Late Cretaceous and is now considered to be over mature. This introduces a potential migration timing risk, with respect to trap formation. However this risk is easily mitigated because the gas accumulations on the main part of the Lysing fairway in PL 798 have bright, structurally conformable DHIs. There are numerous small traps in the vicinity of the 6506/6-2 well, where these bright DHIs can be seen.

4 Prospect Update

At the time of license application the two main prospects were Riesling and Herzer, both in the Lysing Fm.

Herzer Prospect

At the time of application the Herzer Prospect was evaluated as a 4-way dip closure sitting in a relatively thick part of the Lysing Sst fairway. The main volumetric uncertainties were due to the depth conversion and the definition of the top Lysing Sst reflector on the vintage seismic. A medium quality DHI was observed on the vintage seismic data.

Following the award of PL 798, the Herzer Prospect was re-interpreted on the newly purchased, HVG2011 broadband 3D seismic and was found to have a significantly smaller 4-way dip closure of around 15 sqkm and a maximum vertical relief of around 35 m. The trap spills to the NE, into the large structure that was drilled by the dry 6506/6-2 (Albert) well. The area of closure at Herzer coincides with a high quality DHI, which indicates the trap is full to spill with gas. In this area the Lysing Fm is criss-crossed by a network of 'polygonal' style faults, which probably create a number of separate compartments at Herzer.

The top of the Lysing Sst, in the vicinity of the Herzer Prospect and the 6506/6-2 well, is interpreted to have a class IIP AVO response when water bearing and a class II AVO repsonse when gas bearing. These responses have been observed on the seismic gathers and are supported by AVO and fluid replacement modelling (FRM) at the 6506/6-2 well and other nearby wells. Most interpretation work for Herzer has been undertaken on the far stack HVG2011 cube, which has clearer reflectors at Lysing level and less noise when compared to the full stack and near stack cubes. Based on the 6506/6-2 well tie, the actual top Lysing Sst is 5-10 m above the apex of the obvious 'soft' reflector that has been used to define the shape of the trap at Herzer on the far stack HVG2011 3D seismic. The FRM modelling shows that the 'soft' reflector lies parallel to the actual top of the Lysing Sst, even at the boundary between water and gas bearing zones.

Herzer is located 15 km SW of the 6506/6-2 (Albert) well, which encountered 70 m of water bearing Lysing Sst with 63% NG and 18% porosity. Seismic mapping indicates that the Lysing Sst is thinner at Herzer (40-60 m thick), but there is no significant change in seismic facies and therefore Herzer is expected to have similar reservoir properties to the 6506/6-2 well and the wells just to the east (in the Victoria Field), which drilled the Lysing fairway in a similar position.

Depth conversion was undertaken using a well-based velocity model. Depth conversion using seismic stacking velcities was also tested. Depth conversion became a less significant uncertainty once the partnership had purchased the HVG2011 data because it revealed obvious DHI's, which define the lateral extent of gas accumulations at Lysing level.

The mean volume for Herzer is now around five times lower than it was at the time of application. The updated volumes optimistically assume that Herzer is a single accumulation, however the trap might be divided into a number of smaller, fault bounded compartments. The chance of geological success has increased to 72% from 27% as a result of the improved trap

definition and the high quality of the DHI. The Herzer prospect summary is shown below (Fig. 4.1). The Lysing Fm depth, thickness and amplitude maps are shown in Fig. 4.2 and an example seismic line is shown in Fig. 4.3.

Riesling Prospect

At the time of application the structurally high area in the northern part of PL 798 was evaluated as the Riesling Prospect at Lysing Sst level. It was not possible to confidently map the Lysing Sst on the 'Riesling High' using the vintage 3D seismic data. It was not understood if the lack of an obvious reflector was the result of poor seismic imaging (due to a complex overburden) or if it was simply due to the complete absence of the Lysing Sst on the 'Riesling High'. As a result of this uncertainty three different trap models were evaluated for the Riesling Prospect, each having a different volume range. Two of the models assumed a thin (38 m thick +/-) Lysing Sst covering the High and the third model had a stratigraphic trap with the Lysing Sst pinching-out on to the south eastern flank of the Riesling High.

Following license award, the Riesling High was evaluated on the new HVG2011 3D seismic and no Lysing reflector was observed. It was concluded that this was due to the absence of the Lysing Fm on the Riesling High. In addition the new data shows no evidence for a wholesale degradation of the seismic image that could be masking the presence of a Lysing Sst layer. On the contrary the seismic clearly shows that the Lysing Fm thins and pinches out onto the Riesling High. The Uppermost Lange Fm shows no thinning onto the Riesling High, therefore the High probably formed between deposition of the Lange and Lysing Fms. It was probably part of a regional structural event that also rejuvenated the Cretaceous hinterland, triggering the basinal influx of Lysing Sst following relatively quiescent conditions during the deposition of the Upper Lange Fm.

Based on the new seismic observations the prospect models that invoke a thin Lysing Sst on the Riesling High can now be discounted. There is still a valid trap, with 3-way dip closure and stratigraphic pinchout on to the SE flank of the high. However it appears to contain a number of small, fault- and dip-closed 'sub-traps', each having a separate DHI and there are significant areas of the closure that lack a DHI. The patchy nature of the DHI could be due to areas of thin or low quality sst close to the pinchout. However, this seems unlikely given that there are small 'sub-traps' with bright DHIs which are very close to the mapped pinchout. As a result of these observations the Riesling Prospect Stratigraphic trap model has also been discounted. None of the small 'sub-traps' are big enough to warrant further investigation.

Lange Fm Prospectivity

In the southern part of PL 798 there is a bright amplitude anomaly in the mid Lange Fm covering around 75 sqkm. Based on the operator's regional seismic mapping it is at the same level as the Lange Fm gas discovery in the 6507/2-2 well (Marulk Field). The operator's seismic modelling indicates that the amplitude is a result of lithoogy, most likely representing thin ssts. There is 4-way dip closure of 5-10 sqkm within the anomaly, but it has a maximum vertical relief of only 10-20 m. The feature was not evaluated further due to the small trap and the expected poor reservoir properties.

Jurassic and Triassic Prospectivity

At the time of application Jurassic and Triassic leads were identified. These have been discounted due to the low potential for effective reservoir at depths of 5000-5500 m.

Table 5: Prospect data (Enclose map)

Block	6506/5	Prospect name	Herzer	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)	No	Outside play (Y/N)	No				
Oil, Gas or O&G case:	Gas	Reported by company		Reference document				Assessment year	2016
This is case no.:		Structural element	Dønna Terrace	Type of trap	4-way dip closure	Water depth [m MSL] (>0)	400	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)								
	Gas [10^9 Sm^3] (>0.00)	1.16	2.14	3.68	6.99				
Recoverable resources	Oil [10^6 Sm^3] (>0.00)					0.05	0.09	0.23	0.49
	Gas [10^9 Sm^3] (>0.00)	0.65	1.14	2.35	4.67				
Reservoir Chrono (from)	Upper Turonian	Reservoir litho (from)	Lysing Fm.	Source Rock, chrono primary	Late Jurassic	Source Rock, litho primary	Spekk Fm.	Seal, Chrono	Coniacian
Reservoir Chrono (to)	Lower/Middle Coniacian	Reservoir litho (to)	Lysing Fm.	Source Rock, chrono secondary	Callovian	Source Rock, litho secondary	Melke Fm.	Seal, Litho	Kvitnos Fm.
Probability [fraction]									
Technical (oil + gas + oil & gas case) (0.00-1.00)	0.72	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	0.90	Trap (P2) (0.00-1.00)	1.00	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	0.80		
Parametres:	Low (P90)	Base	High (P10)	*Changes vs application prospect summary:*					
Depth to top of prospect [m MSL] (> 0)	3000	3000	3000	*-Crest 25m deeper*					
Area of closure [km^2] (> 0.0)	11.7	16.9	22.5	*-Area of closure decreased from range: 13.4 - 17.6 - 48.2*					
Reservoir thickness [m] (> 0)	40	50	60	*-Thickness decreased from constant 100m*					
HC column in prospect [m] (> 0)	30	35	40	*-HC column decreased from constant 95*					
Gross rock vol. [10^9 m^3] (> 0.000)	0.070	0.162	0.313	*-GRV decreased from range: 1.242 - 1.384 - 1.526*					
Net / Gross [fraction] (0.00-1.00)	0.40	0.65	0.90	*-NG decreased from range0.61 - 0.73 - 0.84*					
Porosity [fraction] (0.00-1.00)	0.15	0.18	0.21	*-Porosity decreased from range 0.18 - 0.22 - 0.25*					
Permeability [mD] (> 0.0)	4.5	45.0	450.0	*-Permeability unchanged*					
Water Saturation [fraction] (0.00-1.00)	0.20	0.35	0.50	*-Sw decreased from range 0.22 - 0.31 - 0.40*					
Bg [Rm3/Sm3] (< 1.0000)	0.003774	0.0033484	0.003226	*-Fluid parameters and RFs - no significant changes*					
1/Bo [Sm3/Rm3] (< 1.00)				*-Technical probability: 0.27 (res 0.8; trap 0.8; charge 0.6; ret 0.7)*					
GOR, free gas [Sm^3/Sm^3] (> 0)	7194	10204	15385						
GOR, oil [Sm^3/Sm^3] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.50	0.64	0.80						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.45	0.60	0.75	For NPD use:					
Temperature, top res [°C] (>0)	94			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)	390			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. porosity >= 10 %	2. VClay <= 50 %	3.					Kart nr	NPD will insert value

Fig. 4.1 Herzer Prospect Summary Sheet.

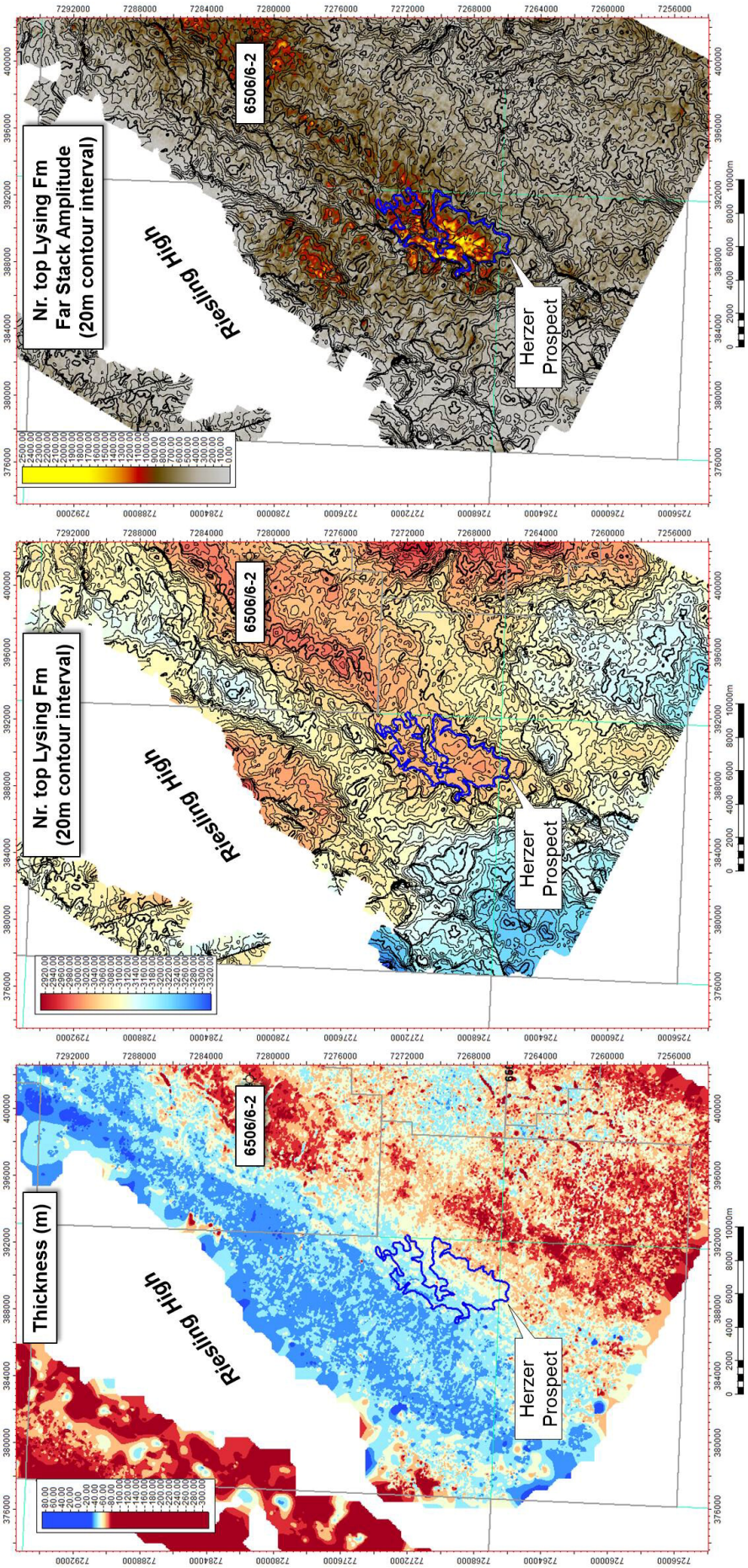

Fig. 4.2 Lysing Fm Thickness, Depth and Amplitude Maps. *The thickness map shows that the Lysing Fm thins to the NW of the Herzer Prospect and the 6506/6-2 well and eventually pinches out on to the 'Riesling High'. The Depth map shows the low relief closure of the Herzer Prospect, which spills to the NE. The amplitude map shows a convincing DHI at the Herzer Prospect. To the North of Herzer there is a 3-way dip closed stratigraphic closure with a weaker DHI, which is all that remains of the Riesling Prospect.*

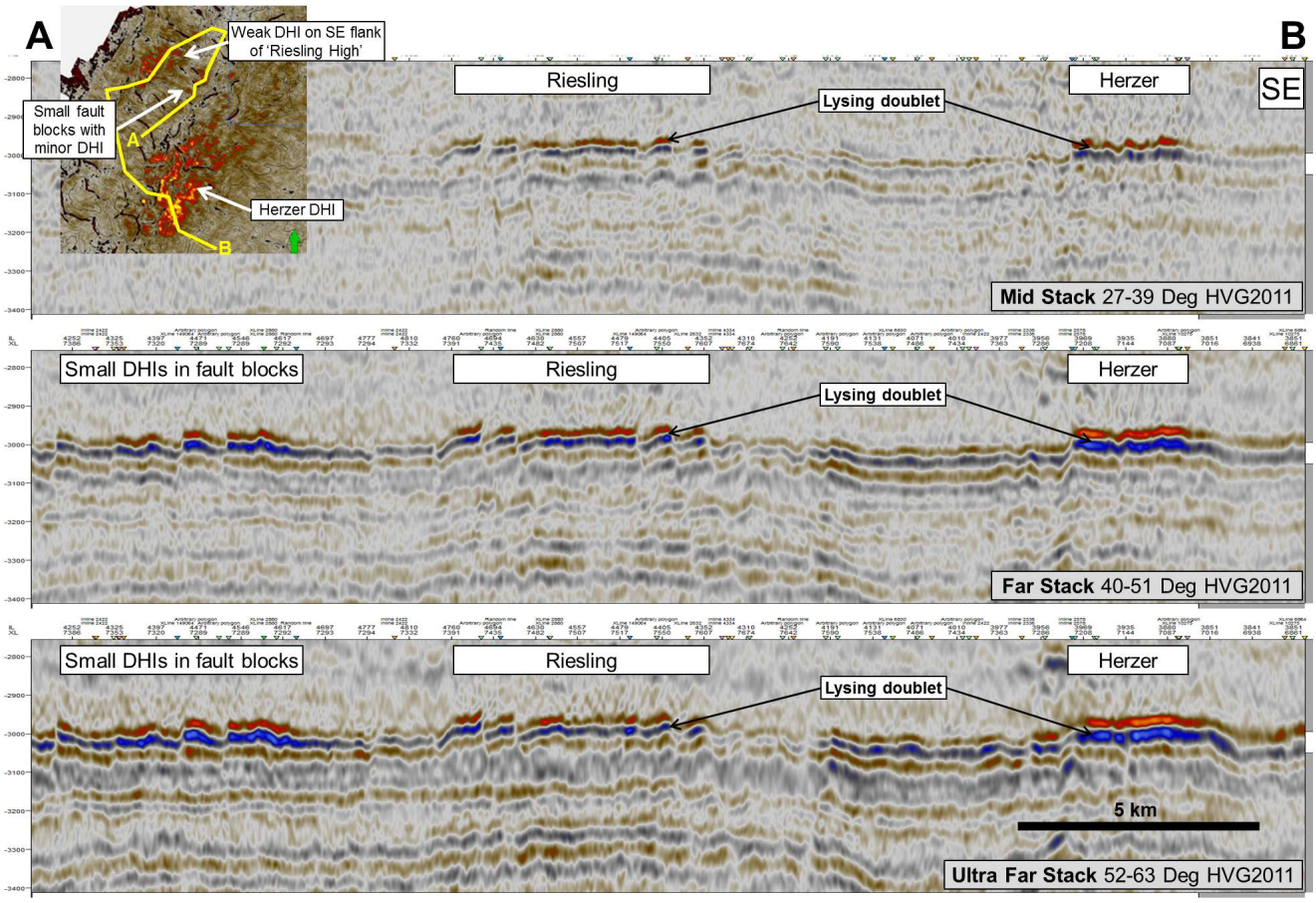

Fig. 4.3 Seismic Line Through Herzer and Riesling DHIs. *The Lysing Fm and its DHIs are clearly imaged on the HVG2011 seismic data. A red event represents an increase in acoustic impedeance. The Lysing is a soft-topped doublet that is best interpreted on the far stack due to the class IIP to II AVO response in this part of the fairway. There are obvious amplitude increases within the structural closures at Herzer, Riesling and in many other tiny traps that are interpreted as high quality DHIs.*

5 Technical Evaluations

It is assumed that a gas discovery in PL 798 would be developed as a subsea tieback to one of the main gas hubs on the Halten Terrace e.g. Heidrun. The operator's technical and economic evaluation of PL 798 showed that the minimum economic field size (MEFS) is around 31 GSm3 of gas. The MEFS estimate is based on a set of generic volume cases because there is not a prospect in the license with volumes that are close to being economic. The following assumptions were used:

- 2018 exploration well
- 2024 first production
- horizontal gas production wells (due to low relief of structures)
- gas price of NOK 1.75 /Sm3
- 2% inflation

6 Conclusions

The main prospects identified pre-award are significantly less attractive following the evaluation of new seismic data. The Herzer Prospect is much smaller and far below the MEFS for this area. There is strong evidence that there is no Lysing Fm reservoir within closure at the Riesling Prospect.

There are indications on seismic that the mid-Lange Fm turbidite sst play extends into the area, but there are no significant closures at this level in PL 798

The Triassic and Jurassic formations are believed to be too deeply buried for commercial reservoir to be present.