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RELINQUISHMENT REPORT

PL 534

Faroe Petroleum plc

Relinquishment Report – PL 534

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PL534 Relinquishment Report

1.1 Introduction

PL534 is located on the Bjarmeland platform in the Norwegian Barents Sea (Fig.1).
In 2014 both BG Norge AS and Statoil Petroleum AS decided to leave the license. After the Ministry approval for an extension, the remaining companies Wintershall Norge AS took over the operatorship along with Faroe Petroleum AS as partner. This in order to secure the upside exploration potential in conjunction with PL611. Both parties have a 50% share in the license. Based on the prospectivity seen by the license group the original PL534 area was partly relinquished.
Well 7224/7-1 has tested the Samson Dome Prospect. Drilled by Statoil in 1988. The well encountered a poorly developed Kobbe Formation reservoir with gas.

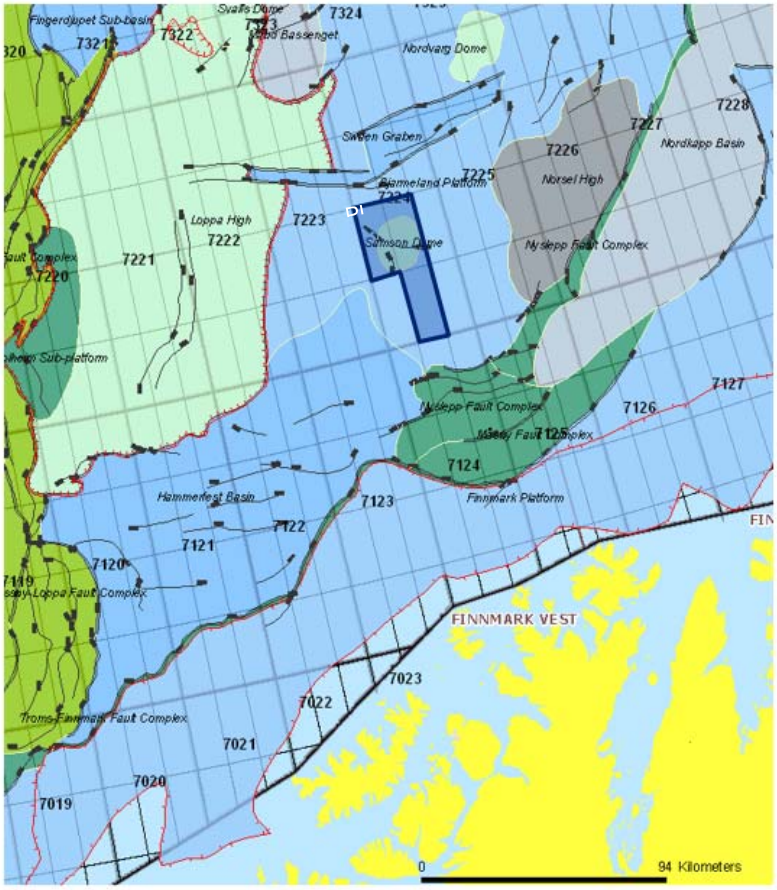

Figure 1*. Location map for PL534. PL534 highlighted by blue polygon.*

1.2 Key license history

PL534 was awarded 15.05.2009 as part of the 20th Licensing Round. BG Norge AS (40%) was the Operator with Faroe Petroleum Norge AS (20%), Statoil Petroleum AS (20%) and Wintershall Norge AS (20%) as partners. The license consisted of blocks 7224/7, 8 and 11 totaling 947.593 km^2.
The initial work program was to acquire minimum 900 km^2 of 3D seismic data and perform geological and geophysical studies. Focusing on the exploration potential of the Triassic, Permian and Carboniferous age sequences.
Initial Key Dates:

- 15th May 2012: Drill-or-Drop decision

- 15th May 2015: End of initial period

Due to time required for optimizing the processing parameters for the acquired 3D seismic dataset a one-year extension of the Drill-or-Drop decision and the initial period was applied for. The latter was granted by the Ministry of Petroleum and Energy.

Updated Key Dates:

- 15th May 2013: Drill-or-Drop decision
- 15th May 2015: End of initial period

As originally processed, the BG1002 3D seismic dataset poorly imaged the prospective parts in the license acreage. The license therefore agreed to do a Pre-SDM reprocessing of the 3D dataset. Full Waveform Inversion (FWI) was to be used for the reprocessing. As the FWI technology was relatively new it became evident at an early stage that additional time was needed to complete the reprocessing. To fully utilize the enhancements from the FWI reprocessing a new one-year extension for the Drill-or-Drop decision deadline was applied for. A one-year extension was approved along with extension of the initial period.

Updated Key Dates:

- 15th May 2014: Drill-or-Drop decision
- 15th May 2016: End of initial period

14th of May 2014 the license were not prepared to make a Drill decision. The Operator BG Norge AS along with partner Statoil Petroleum AS left the license. Faroe Petroleum AS and Wintershall Norge AS wanted to continue with the license provided a further extension of the Drill-or-Drop decision date was granted by the MPE. This was due to prospectivity seen in the Triassic Klappmyss Formation clinoforms present in both PL611 and PL534. A partial relinquishment for the PL534 was also applied for to further define the prospect.

The Ministry approved the applied for extension of the Drill-or-Drop decision along with the partial relinquishment. Wintershall Norge AS took over the operatorship along with Faroe Petroleum AS as partner.

Updated Key Dates:

- 15th May 2016: Drill-or-Drop decision
- 15th May 2018: End of initial period

The 7224/2-1 exploration well drilled in PL611 did not prove the Klappmyss clinoform exploration concept. As a result of this the PL534 decided to relinquish the license having completed the work program.

1.3 **Database**

A 3D seismic dataset was acquired in 2010. Contractor was CGGV and the final BG1002 3D survey size was 1175 km^2.

Due to poor imaging a Full Waveform Inversion (FWI) was performed on the BG1002 survey. The Full Waveform Inversion was performed by CGGV. This reprocessing enhanced the imaging, however it was still difficult to map across the perceived prospective zones. This especially for the Upper Kobbe Formation prospect. The license group had to rely on modelling channel density when doing the volumetric calculations for the Upper Kobbe Formation.
Mapping was conducted using the common database consisting of BG1002, SG9804, NH0608 3D seismic data along with 2D seismic data (Fig.2). Relevant maps were generated and used as part of the G&G prospectivity evaluation of the PL534 license.
All relevant well information from the PL534 common well database was also integrated into the overall prospectivity evaluation along with well result from 7224/2-1 in PL611.

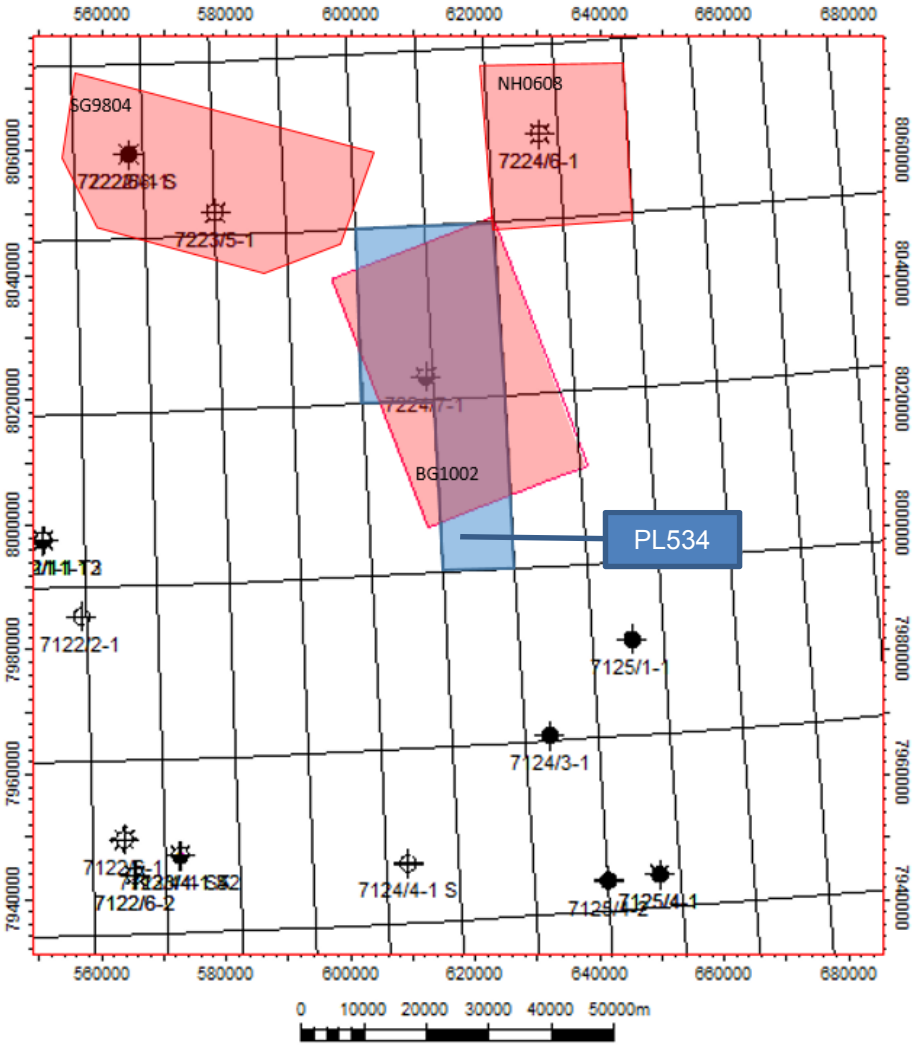

Figure 2. Seismic 3D data coverage.

1.4 **Review of geological framework**

Two main orogenies created the structural grain and foundations of the Barents Sea (Dore, 1991):

1. Caledonian Orogeny, culminating during the Late Silurian – Early Devonian. The orogeny closed the Iapetus Ocean and set up a tectonic framework and structural grain (north to south and northeast to southwest) which later influenced the structural evolution of the western Barents Sea

2. Uralian Orogeny, creating the eastern margin of the Barents Sea by the uplift of the Ural mountains in Late Permian to Early Triassic. The Uralian trend is evident from the orientation of the basins in the eastern Barents Sea

During Paleozoic to Mesozoic era, tectonism in the western Barents Sea was dominated by extension. Extension was induced by the collapse of the newly formed Caledonian orogenic belt, followed by active rifting associated with the break-up of the Pangea super continent. Episodes of rifting are recorded in the Devonian, Carboniferous, Late Jurassic / Early Cretaceous (Johansen et al., 1993). These significant rift events segmented the Barents Sea into the complex rift-basins, highs and platforms that we see today.
During the Mesozoic times the Barents Sea region was a large and relatively shallow epi-continental sea. The Triassic was dominated by transgressive – regressive sequences where sediments were transported from the Urals and the Baltic Shield. Small variations in relative sea-level could relocate the shoreline significantly. Main depo-center shifted westward and northward as the accommodation space filled in.
In Olenekian times in the PL534 area these transgressive – regressive events are seen as shelf margin clinoforms. It is believed that steepness of the clinoforms is indicative of how sandy the clinoform system is. Therefore, gently dipping clinoforms is a muddier clinoform system while steeply dipping clinoforms represent a sandier clinoform system.
In Anisian times it is believed that PL534 was located in a sand depositional fairway as part of a large scale progradational system originating from the south and southeast.
The seismic mapping shows that the structuration – formation of the Samson Dome started in the Middle Triassic period with main structuration occurring during the Tertiary period. Evaporite diapirism is believed to be the cause for this structuration.

1.4.1 Studies performed

In addition to the seismic mapping numerous geological and geophysical studies has been performed for the PL534 license. This includes:

- Full 3D static to dynamic reservoir modelling of the Triassic Kobbe Formation
- Detailed play and resource potential evaluation for Triassic clastics and Permo-Carboniferous carbonate plays
- Seismic forward modelling
- Full petrophysical re-evaluation of the 7224/7-1 well
- Sedimentological and Gross depositional environment evaluations
- Carbonate studies
- Field outcrop studies in Portugal
- Learnings from drilling of well 7224/7-2 in PL611

1.5 Prospect update

In PL534 two main prospects were identified by the license group. In the Triassic Klappmyss Formation shelf margin clinoforms were believed to be sandy and therefore prospective. In the Triassic Kobbe Formation a channel system was seen as prospective (Fig.3).

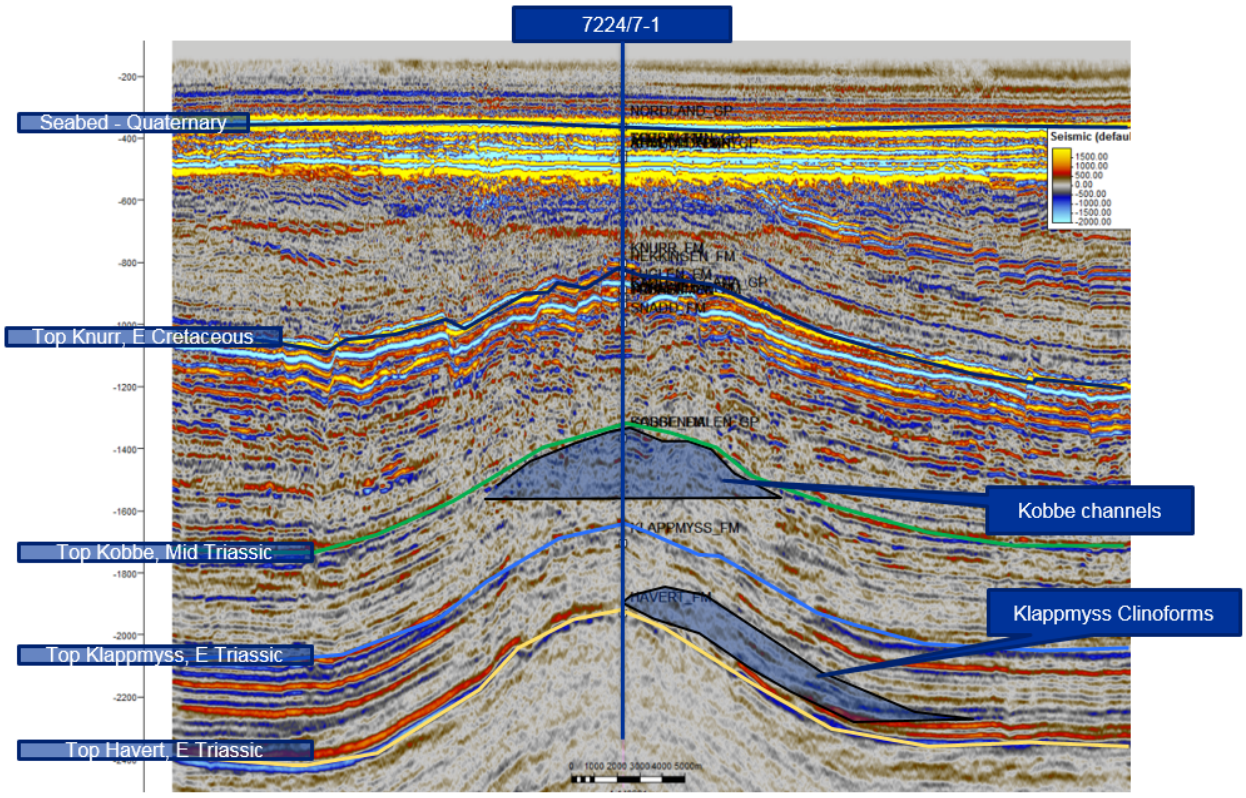

Figure 3. Prospectivity of PL534 as seen by the license group. Two prospects where one is in the Upper Kobbe Formation while the other is in the Klappmyss Formation.

1.5.1 Klappmyss Formation Clinoform Prospect

The recent advances in sequence stratigraphic analysis of progradational systems have improved the prediction of lithology along the shelf margin clinoforms. Based on this knowledge the Klappmyss clinoform prospect was evaluated (Fig.4).
Under the right conditions it became evident that the topset of a clinoform system could store large amounts of sand. If the clastic material influx is larger than rise in sea-level. Although a long transport distance from the Urals it was belied that wave-action along the shelf margin would clean up the clastic material leaving us with mostly fine-grained sands.
In the seismic dataset shelf edge trajectory analysis was used for identifying the topset in the clinoform system.
The evaluation of the Triassic clinoform prospect showed that reservoir presence was believed to be the main risk factor.
After completing the 7224/2-1 Kvalross well in PL611 new knowledge about prospectivity for shelf margin clinoforms was gained. Because of the interplay between the clinoform play seen in both PL611 and PL534 data from the Kvalross well is believed to be representative for the Klappmyss clinoforms seen in PL534.
The Kvalross well proved no reservoir in the Triassic Klappmyss clinoform package identified in the seismic dataset for PL611. For the clinoform concept to work a certain amount of clastic material needs to be in the system. Looking at the adjacent area we see that the Olenekian times is a period where there is little clastic material in the system. You therefore get a much more silty and muddy system as identified in the 7224/2-1 well in PL611. For PL534 the reservoir presence and play chance for the Triassic clinoforms seen here then becomes so low that the prospect is no longer considered valid.

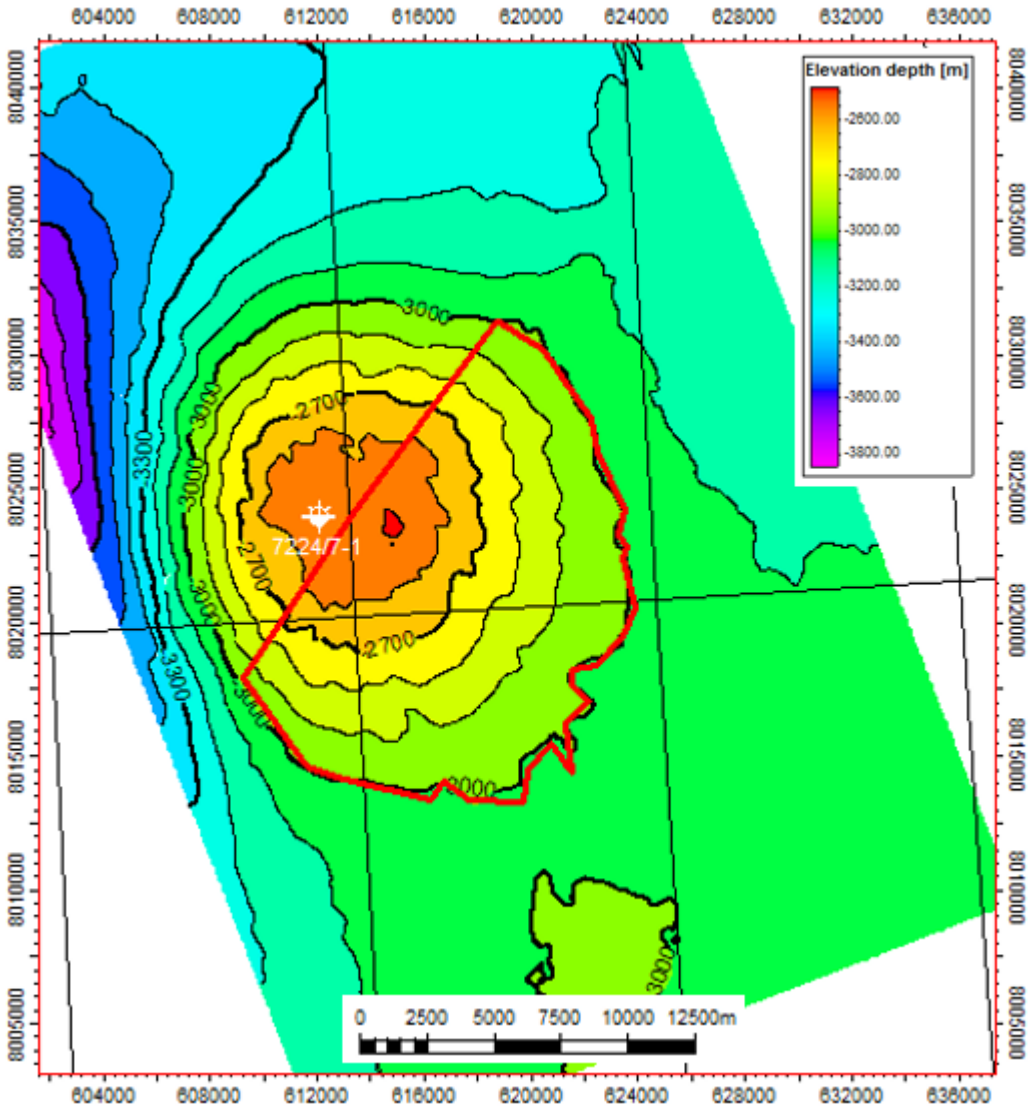

Figure 4. Top Klappmyss clinoform depth map. Klappmyss Formation clinoform prospect represented by lowest closing contour highlighted in red.

1.5.2 Kobbe Formation Prospect

In PL534 the prospective part in the Kobbe Formation consist of a complex interplay of marine – marginal marine – fluvial environment. There is a general trend of progradation over time but this was interrupted by a number of minor marine incursions. It is believed that the best quality sands are likely deposited in small tidal channels and then reworked along the bay margins and across the tidal flats. Two prospective channel zones were identified in the Upper Kobbe Formation (Fig.5).
After completion of the seismic interpretation it was still challenging to image the fluvial Upper Kobbe Formation channels properly. Due to the data limitation and high complexity quantification of the Upper Kobbe Formation prospect was done using computer modelling. For the modelling, background facies were held constant and combined with a low-case, base-case and high-case channel density. This produced a range of Net-to-Gross systems that were used for the quantification of the reservoir quality.
For the Samson Dome prospect most of the risk factors in the Kobbe Formation have already been proven by the 7224/7-1 well. In both the Samson Dome prospect and the Upper Kobbe Formation the main risk is reservoir effectiveness.

Based on the reservoir modelling even the high-case channel density and permeability model will struggle to make this a viable commercial standalone project. P50 porosity is 16%, P50 Net-to-Gross is 31% and Recovery factor is 49%.
Surfaces that was mapped in PL534 is seen in figure 6 (Fig.6).

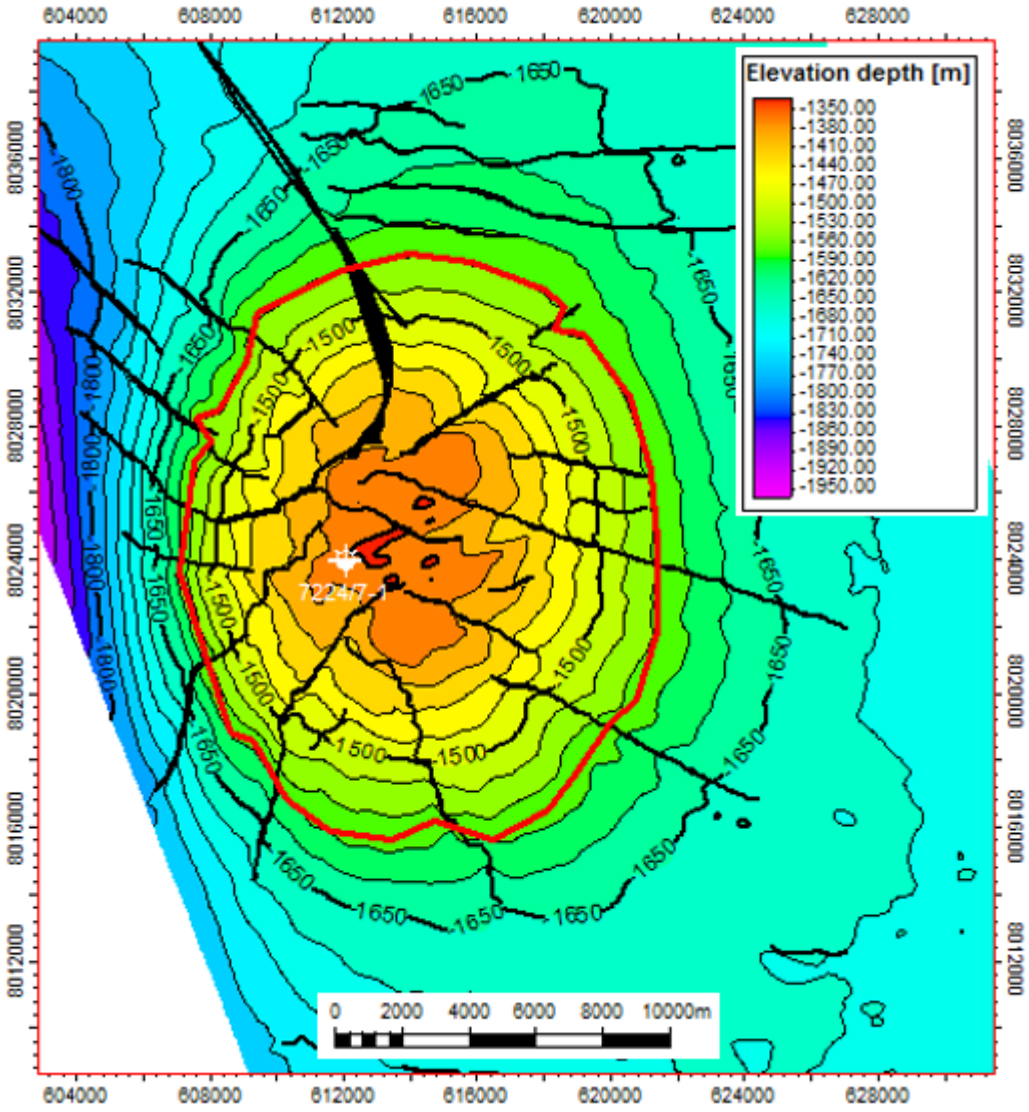

Figure 5. Top Kobbe Formation depth map. Upper Kobbe Formation prospect represented by lowest closing contour highlighted in red.

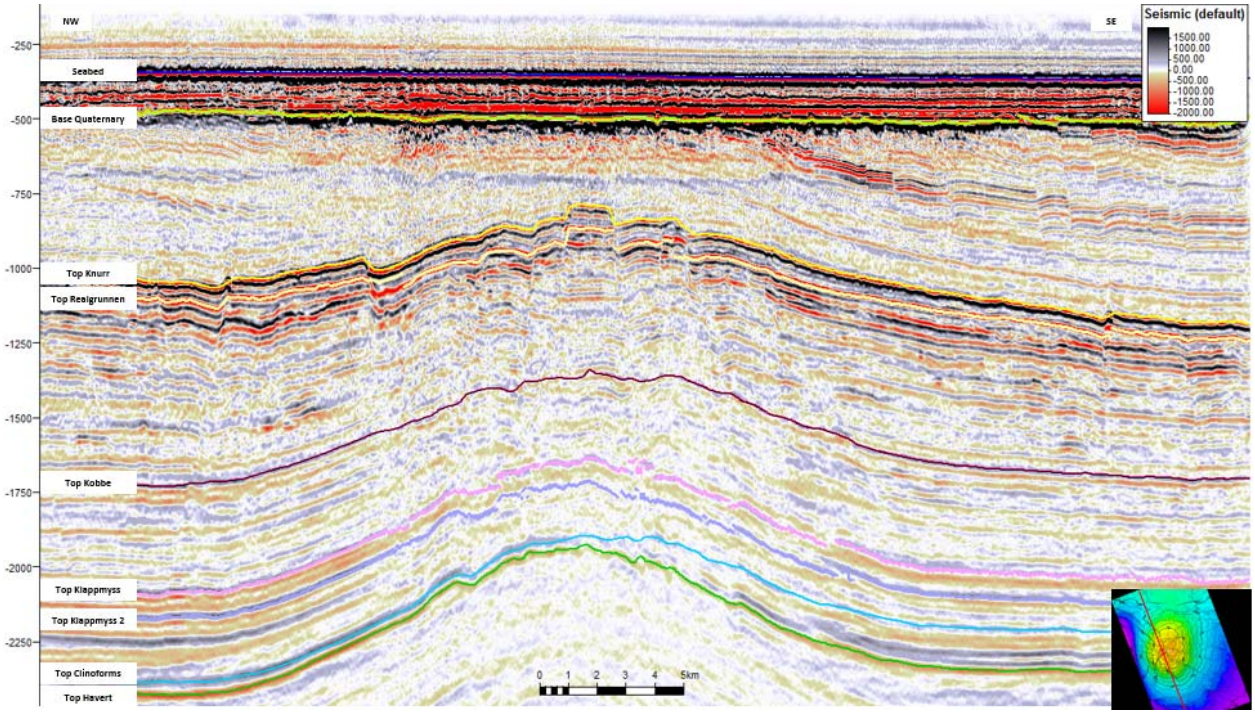

Figure 6. Inline 1780 of the BG1002 3D seismic survey with interpreted surfaces.

1.6 Technical evaluations

Although having a high GPOS (70%) the Triassic Kobbe Formation prospect showed that too many wells were needed to drain the hydrocarbon filled channel zones already proved by the 7224/7-1 well. As a standalone case the prospect would not be a commercial success and was therefore dependent upon the Klappmyss clinoform prospect. After completing the 7224/2-1 well, prospectivity of the Klappmyss clinoforms were significantly reduced with a GPOS of less than 10%.
P50 technical volumes for the Kobbe Formation prospect is 16.5 Sm^3.

1.7 Conclusion

The 7224/2-1 well in PL611 did not encounter any reservoir rock in the main Klappmyss clinoform target. This implies that for this region the Triassic Klappmyss clinoforms play is not valid as a hydrocarbon target.
The Triassic Kobbe gas volumes are not commercially viable as a standalone case, Wintershall therefore recommend to relinquish PL534. This recommendation has been accepted unanimously by partner Faroe Petroleum AS.

1.8 References

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