PL570 Relinquishment report

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1 DATABASE

The common seismic database (Fig. 1.1) includes:

- MC3D-SVG2011/NCG2010 aquired by the license group in the license extension period.
- 3D_VNG12M01, CBM and Kirchhoff migration. The new cube PL570 PSDM is reprocessed by CGG Veritas for the license group. Parts of ST9105 as the main survey and some of ST9304 is included in the full fold area. Reprocessing parameters similar to MA09M01.
- Reprocessed surveys MA05M01, MA06M02, MA09M1, CNR2593R10 and all released surveys in the area.

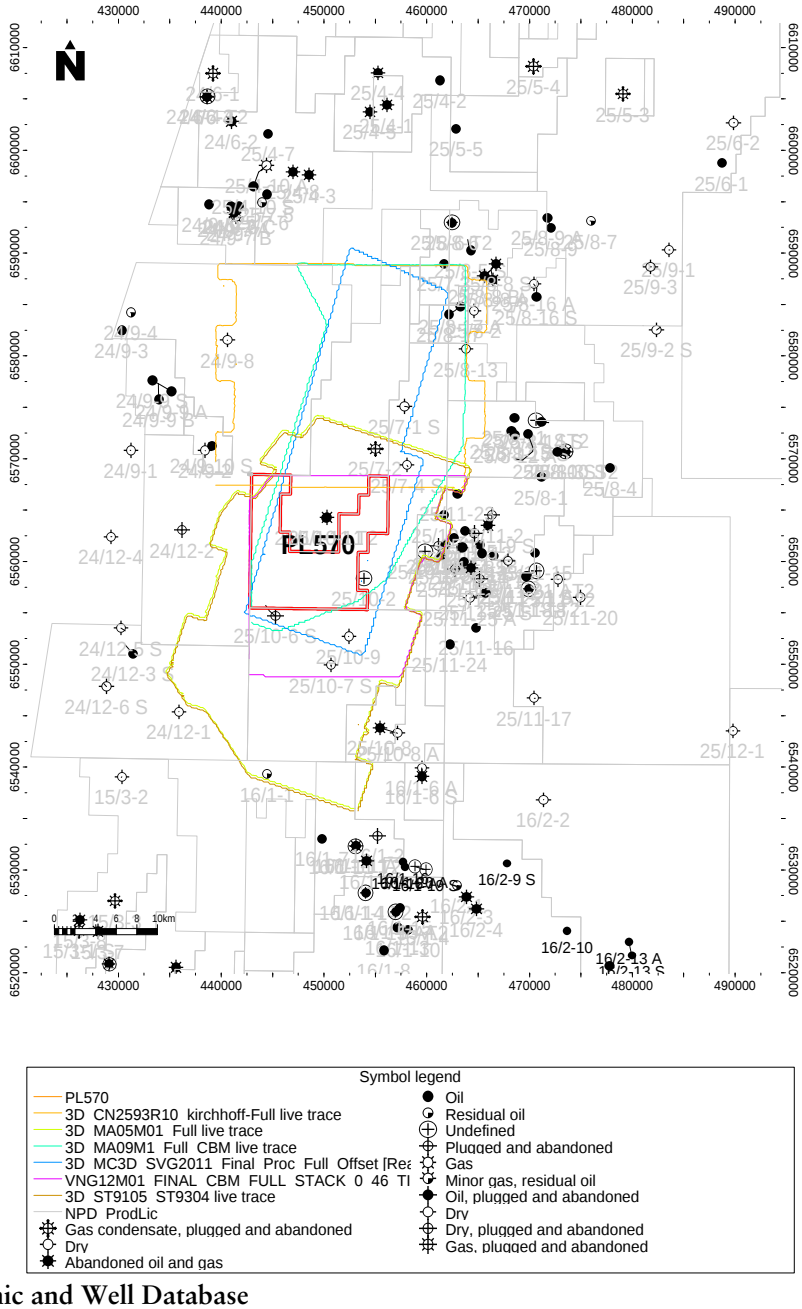

Fig. 1.1 PL570 Seismic and Well Database

The common well database includes all released wells in the area at the time, and in addition wells 25/10-11 and 25/10-11 T2, 25/10-9 and 25/10-10 (Fig. 1.1). On behalf of the partnership PetroStrat Ltd. re-evaluated of the biostratigraphy of well 25/10-2R (Petrostrat report No. PS12-26). The report was sent to NPD in June 2012.

2 KEY LICENCE HISTORY

Production license (PL) 570 covers an area of 107.922 km2 located in parts of Block 25/10. The license was awarded to VNG Norge AS (Operator, 40%), Lundin Norway AS (30%) and Marathon Petroleum Norge AS (30%) on February 4th 2011 as part of the awards in predefined areas (APA) 2010. Maersk Oil Norway AS acquired 10% of Marathons interest in effect from June 30th 2011. In November 2012, Marathon withdrew from the license and their remaining 20% interest was equally split between the three remaining partners. When awarded the deadline for the decision to drill or drop (DOD) was 4th of February 2013. The geological model of the prospect applied for was that the thickening mapped in the Mesozoic succession represented feeder systems to the Earb syn-rift fans located down the slope in PL505. The results of the Earb well (25/10-11), drilled in 2011, increased the risk on the main prospect in PL570. The license group decided to reprocess the seismic data to improve the imaging of the complex geology below BCU. In November 2012 the PL570 partnership with the exemption of Marathon, applied for a one year extension of the DOD decision and also committed to purchase parts of the new MC3D-SVG2011/NCG2010 seismic data across the license. This is the same survey that was purchased across PL505. The Ministry of Petroleum and Energy approved the extension in March, 2013. The deadline was extended until 4th of February 2014.

During the life of the license the following meetings took place and is documented:

- 30th March 2011, EC/MC meeting number 1
- 22nd November 2011, EC/MC meeting number 2
- 9th May 2012, EC partner workshop
- 14th September 2012, EC partner workshop
- 20th November 2012, EC/MC meeting number 3
- 20th November 2013, EC/MC meeting nuber 4

PL570 was awarded with the following work program:

- Carry out relevant geological studies within 2 years
- Drill or drop (DOD) within 2 years
- Concretize (BOK) or drop within 4 years
- Continuation (BOV) or drop within 6 years
- PDO (plan for development and operation) within 7 years

Technical evaluations of all stratigraphic levels have not to date matured a drillable prospect in the license. The new seismic has not changed this. The identified opportunities have small volumes and high risk. All license commitments are fulfilled. The license group has decided to relinquish the license. The decision is unanimous.

3 REVIEW OF GEOLOGICAL FRAMEWORK

Upper Jurassic sands eroded off of the exposed Utsira High feeding submarine fan systems down-dip trough feeder channels across PL570 (Fig. 3.1) was the key exploration model in the area applied for in APA 2010. Elongated , anomalous thicks were mapped and interpreted to be feeder channels across the area applied for. However, exploration well 25/10-11T2, drilled after PL570 was awarded, changed the overall understanding of the geology. The Earb prospect was prognosed as an anomalous thickened Upper Jurassic sequence, however post-well studies have confirmed it to be Lower Jurassic in age. Three cores were cut and an intensive wireline program performed. Petrophysical interpretation confirmed the presence of sandstone, all of which displayed poor reservoir qualities (25/10-11 geological end of well report).

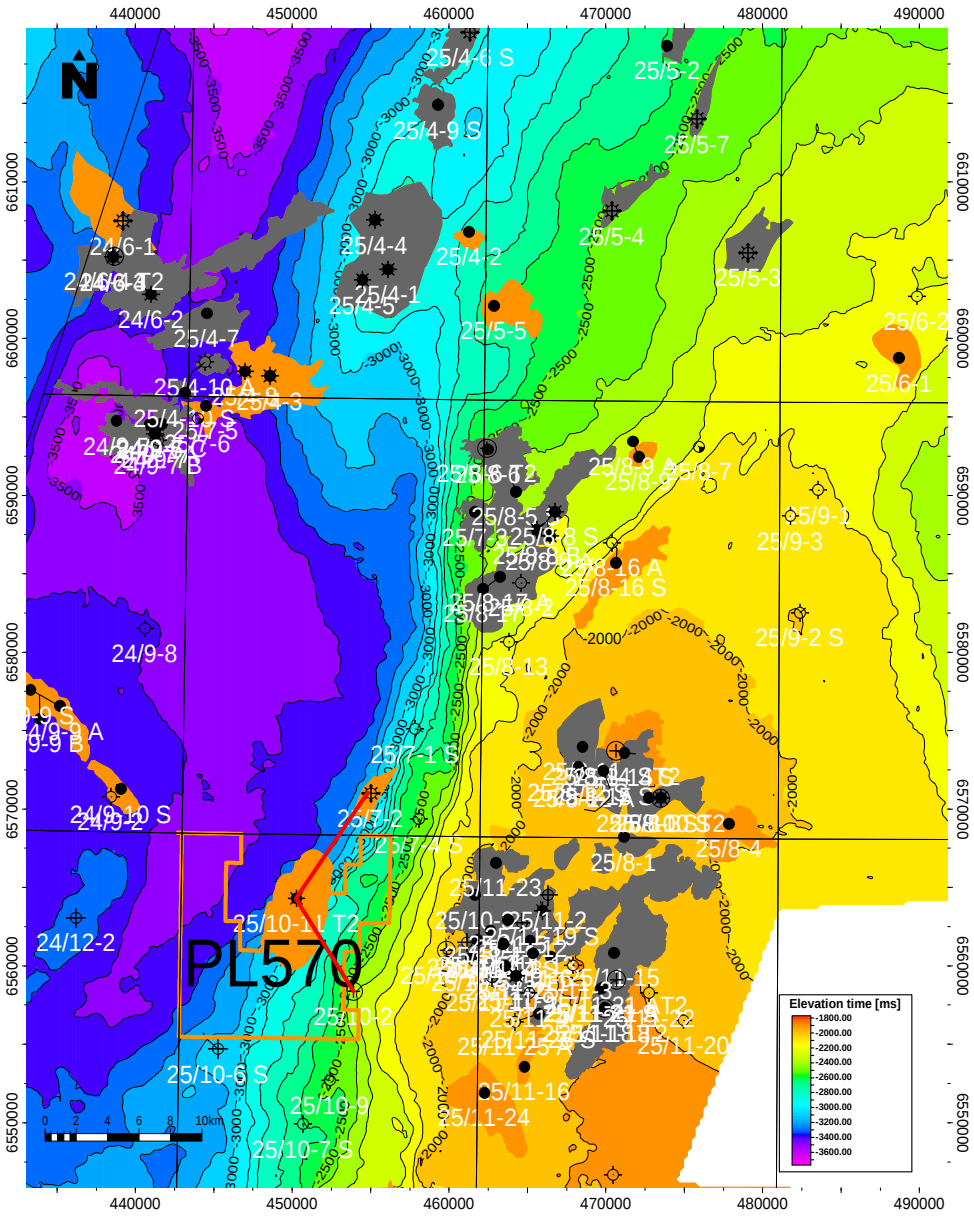

Fig. 3.1 PL570 Geological setting on BCU time map. *Well correlation (Fig. 3.2) line in red. Prospects and leads defined within PL570 are illustrated in Fig. 4.1. Discoveries in orange polygons, fields in grey polygons.*

Detailed correlations between wells 25/7-2, 25/10-11, 24/12-2, 24/9-1 (Petrostrat/ report for PL505 (Petrostrat report No. PS11-80b) support a theory of complex slumping / sliding events (graben shoulder collapse) during the Late Jurassic within the area that directly effects PL505 Earb discovery and adjacent NE part of PL570. The current understanding of the local geological development during the synrift to postrift Late Jurassic times changed (Fig. 3.2). There are most likely no feeder channels across PL570 and no sand-filled fan-systems were drilled down-dip. In short, the key elements of the geological development effecting the northwestern flank of the Utsira High throughout this period can be summarized as follows:

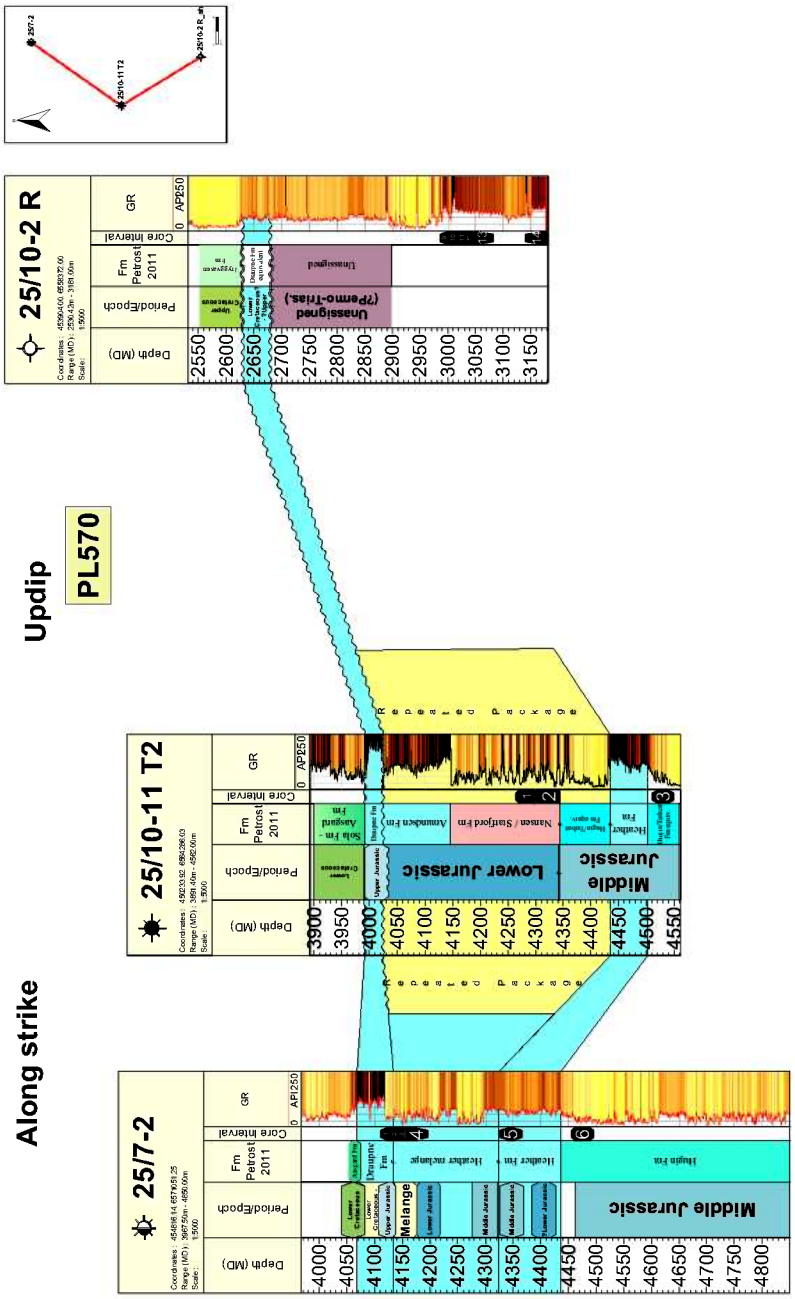

Fig. 3.2 PL570 Well correlation. *The repeated package in 25/10-11T2 is considered a mass transportation complex, alternatively but less likely, reverse faulting. The correlative section in 25/7-2 along depostional strike is characterized by a combination of slumped and in situ material. The biostratigraphy of the updip well 25/10-2R was re-visited for the pre-Draupne section as a Jurassic interpretation could have implications for PL570 but no such correlation could be made. Draupne shales rests unconformably on top, a marine onlap surface developed as sea level rised during Volgian time.*

Middle to early Late Jurassic:
- thick Hugin Formation shallow marine sand and shale deposits in present day graben and on Utsira High
- transgression and subsidence of area lead to deposition of Heather Formation shales
- initiation of main rifting phase during Callovian
- eastern graben margin developed regional dip towards west
- rapid faulting lead to exposure of un-supported fault scarp

Late Jurassic:
- graben shoulder collapse starts
- large blocks sliding and slumping
- development of fault scarps due to rapid faulting
- repeated slumping and sliding of older succcessions - slope failure

Post-collapse conditions:
- rising sea level during Volgian lead to Draupne Formation deposition throughout entire area

The Late Jurassic structural evolution of the western flank of the Utsira High influenced the deposition and marked differences is observed along strike from 25/7-2 to 25/10-11T2 (Fig. 3.2). A mixed deposit of in situ Heather and slumped deposits in 25/7-2 correlates with a mass transportation complex preserving original stratigraphy in 25/10-11T2. Up-dip, the section is thinning and at the 25/10-2R well location the pre-Draupne section cannot be correlated due to lack of comparability, new biostratigraphy was carried out by Petrostrat on behalf of the license group and this section is tentatively regarded as Permo-Triassic (Petrostrat report No. PS12-26).

4 PROSPECT UPDATE

The main prospective interval in the license is the Upper Jurassic, where prospects and leads (Fig. 4.1) were defined based on the concept that anomalous thickness represents sandstone deposited in the feeder system providing sand to the Earb fans in PL505. The drilling of the 25/10-11 Earb well falsified the interpretation of fan systems down-dip, hence the well results had a strong impact on the prospect evaluation. The observed thickening was caused by a Jurassic mass transportation complex. Hydrocarbons were encountered by the well, proving that the petroleum system works. However, it did not flow to surface in a drill stem test. The risk on reservoir increased. Slumped deposition had to be considered also for the updip part, the PL570 area. Along the margin of the Utsira High the impact of potential re-sedimented packages has been assessed and mass transportation complexes is the likely cause of other mapped anomalous thick packages (Earb Central and Earb North prospects in PL505). The 25/7-2 is positioned on a relative thin along depositional strike where the section is characterized by a mixture of slumped material and in situ Heather Formation. Core porosity and permeability from the two wells, for this interval, are presented in the reservoir effectiveness plot (Fig. 4.2).

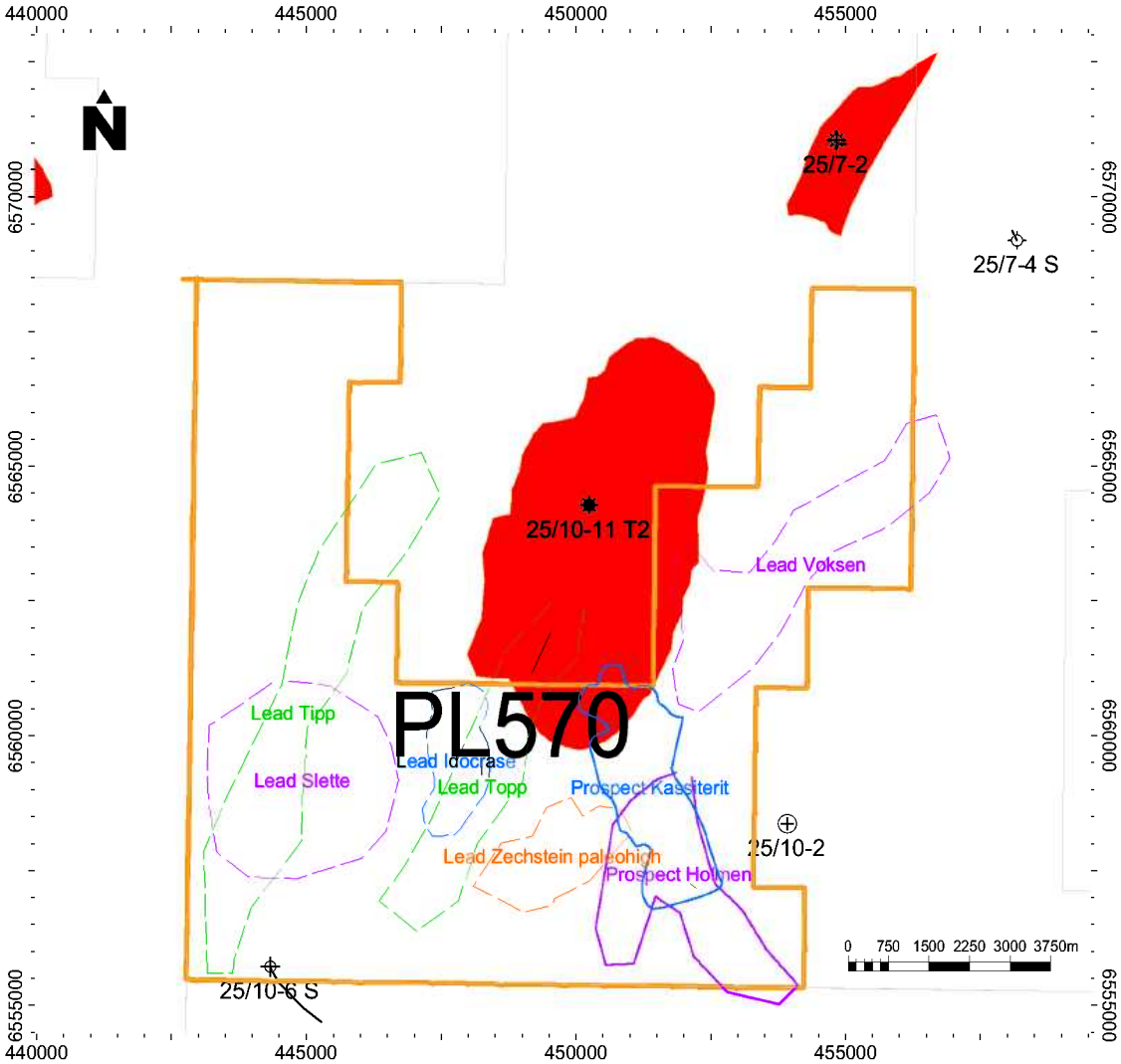

Fig. 4.1 PL570 Prospects and leads

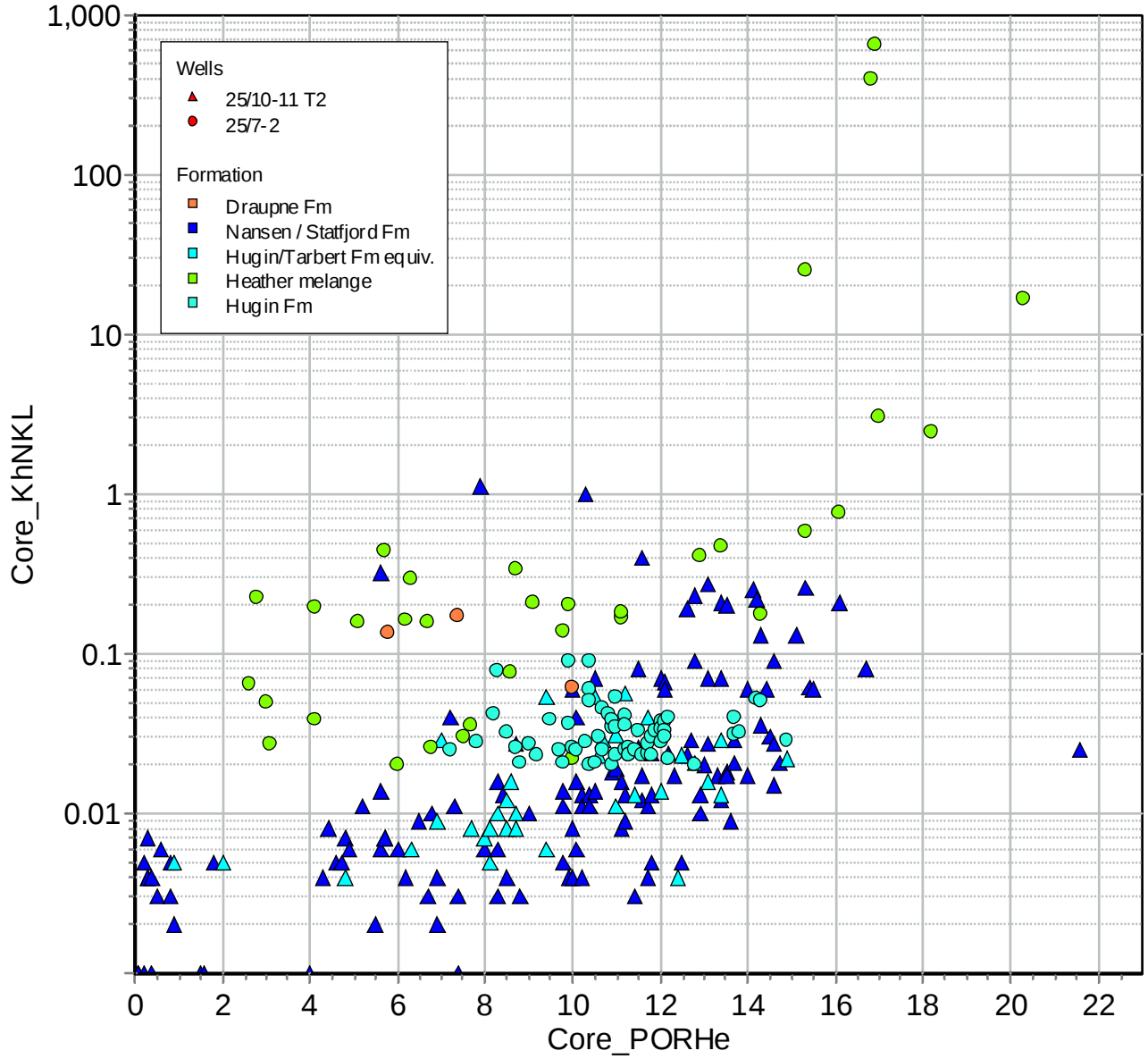

Fig. 4.2 PL570 Reservoir effectiveness plot

Prospect Holmen was defined in the APA application. What was originally interpreted as Jurassic feeder channels to the Earb prospect is more likely Triassic in age, hence has an increased risk on reservoir quality and trap. The re-processed seismic data improved the imaging quality beneath BCU. The CBM improved the connectivity of the reflectors. However, due to the structural setting a correlation of Jurassic horizons throughout the area is extremely difficult. The Top Hugin, Top Sleipner, Top Statfjord and Top Triassic horizons are highly interpretive. Prospect Holmen and two leads, Voksen and Sletten, are based on thickness anomalies between Top Triassic and Top Zechstein reflectors and represent Permian age depressions with Triassic filling. Detailed seismic mapping on re-processed data identified and high-graded prospect Kassiterit and lead Idocrase interpreted as Upper Jurassic thickness anomalies between BCU and Top Sleipner Fm. Several possible explanations are suggested to explain the development of these anomalies: sliding/slumping related to graben shoulder collapse, Brae type / fault aprons and Hugin anomaly. All three options leave high uncertainty regarding trap definition, reservoir and fault seal. Combined with limited volume potential it is not recommended to propose to drill a well on prospect Kassiterit (Table 4.1). The remaining opportunities from the APA application are all still defined as leads.

Table 4.1 PL570 License inventory table

Name	Reservoir	Status	Recoverable resources MMSm3 OE			COS (%)	HC type
			P90	P50	P10		
Kassiterit	Upper Jurassic	prospect	0.45	2.05	9.85	11.5	Gas/Condensate
Holmen (100%)	Triassic	prospect	1.99	5.12	13.6	13.9	Gas/Condensate
Idocrase	Upper Jurassic	lead					
Voksen	Triassic	lead					
Kollen	Triassic	lead					
Sletten	Triassic	lead					
Zechstein paleohigh	Permian	lead					
Tipp	Cretaceous	lead					
Topp	Cretaceous	lead					

In addition to the evaluations of the Jurassic / Triassic section, a thorough evaluation is made of:

- Palaeogene
- Cretaceous
- Permian

Injectites within the Eocene stratigraphic interval was mapped without identifying prospects or leads.

A subdivision of the Palaeocene section into two packages is based on the depositional pattern and resultant seismic character. The lower interval (Sequence T1-T3 representing chronostratigraphic stages Danian to Selandian, Aceca (TGS)) has low to moderate reflection continuity, chaotic reflection configuration and low amplitude strength that might be indicative of the high degree of compensational stacking of channel/lobe complexes. The upper interval (Sequence T4-T7 representing mainly chronostratigraphic stage Thanetian, Aceca (TGS)) has good reflection continuity, parallel to sub-parallel reflection configuration and moderate to high amplitude strength that may indicate sheet-like deposition of sand debrites in a low-to-no-relief basin floor setting. Within the Palaeocene section two small closures on the Sele and Lista levels are defined, but only minor amplitude anomalies and no identified structural trapping mechanism leaves the two opportunities as too small and risky to go forward with. Other pinch-out possibilities within successions of interest lie outside the PL570 acreage.

Some potential exists for development of both shallow and deep marine sandstones of the Asgård formation and Ran member in the Cretaceous section in the area, but the well encounters are sparse and more likely to occur a little further north. The Cretaceous leads Tipp and Topp (APA application 2010) are likely to be limestones with no identified reservoir potential, the same interval was drilled by the Earb well (25/10-11T2). No other prospects or leads are identified within the license area for the Cretaceous.

Within the Permian succession a Zechstein palaeohigh is mapped on licensed area. Dolomitized and karstified Zechstein carbonates are tested by offset wells. The high is small

and no updip closure is mapped. A stratigraphic trapping mechanism is required, such as abrupt facies change or diagenesis (ex anhydrite plugging) but no indications of this are demonstrated. This is not recommended to go forward with.

5 TECHNICAL EVALUATIONS

No technical evaluations are performed regarding possible development. No drillable prospects are currently identified.

6 CONCLUSIONS

Production license PL570 was originally applied for as protection acerage, by the licensees in PL505, prior to drilling of the 25/10-11 exploration well in 2011. The geological model for the area was tested by this well. The well encountered hydrocarbons, however the geological model proved to be structurally and stratigraphically more complex than expected.

After the well the partners in PL570 re-processed existing 3D seismic across the license to improve the imaging. Although two new opportunities were identified based on the re-processed seismic (VNG12M01), no drillable prospect was defined. With the exception of Marathon Oil Norge AS, the partners agreed that the potential was not fully explored and agreed to purchase new seismic. Marathon Oil Norge AS withdrew from the license and their share was split equally between the remainging partners.

Thorough interpretation of the new 3D seismic data (MC3D-SVG2011/NCG2010) has not matured a drillable prospect. Despite modern seismic data the imaging of the subsurface in the area is very influenced by the complex graben-shoulder collapse situation. Below BCU the seismic imaging is challenging with chaotic and discontinuous reflections. Correlations across the area are highly interpretive. What was originally interpreted as Jurassic feeder channels to the Earb prospect (25/10-11; APA 2010) is more likely thickness anomalies of Triassic age, with increased risk on reservoir and trap. A thorough evaluation of Palaeocene, Cretaceous and Permian intervals has not either resulted in the definition of drillable propsects.

The license group has unanimously decided to relinquish the license. OED is informed in a letter. The reprocessed seismic data have been sent to Petrobank.

7 REFERENCES

APA (2010) - Application for part of block 25/10

CGG Veritas processing report

FMB3.3 NW Europe, Aceca (TGS)

Marathon Oil Norge AS, 25/10-11T2 Geological final well report

Petrostrat report No. PS11-80b

Petrostrat report No. PS12-26

Relinquishment letter to OED