



NORGE
MEMBER OF MOL GROUP

PL 539 Relinquishment Report

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1 History of the Production Licence

License owners

Production Licence 539 (Figure 1.1) was awarded 19th of February 2010 as part of the APA 2009 licence round to the following partnership.

- Nexen Exploration Norge AS (40% and operator)
- RWE Dea Norge AS (20%)
- Dana Petroleum Norway AS (20%)
- Petro-Canada Norge AS (20%)

A transaction between Petro-Canada and Suncor Energy was approved 28th February 2011 and a transaction between Nexen and Premier Oil was finalized 31st of January 2012 where Premier Oil took over as operator. The drill decision on the Myrhauk Prospect was approved in December 2012.

On November 28th 2014 8% of Dana Petroleum interest was transferred to Ithaca Petroleum. Ithaca Petroleum was later (9 July 2015) acquired by MOL Group which changed name to MOL Norge AS. Statoil acquired 20% from Dea 30th september 2015. After two licence extensions of the Decision to continue (BoV), mainly due to delay incurred by the contracted drilling unit, the 3/7-10S well on the Myrhauk Prospect was drilled 3Q 2015 with the following partnership.

- Premier Oil Norge AS (40% and operator)
- Dea Norge AS* (20%)
- Suncor Energy Norge AS (20%)
- Dana Petroleum Norway AS (12%)
- MOL Norge AS (8%)

*Statoil Petroleum from 30.09.15

After post evaluation of the 3/7-10 S well the Operator (Det norske Oljeselskapet, took over as Operator on 6th of January 2016 after acquiring Premier Oil Norge) recommended to relinquish the licence, which was supported by all partners except MOL Norge. MOL Norge considered the licence as an attractive exploration opportunity in several stratigraphic levels.

MOL Norge was approved as Operator 15th of December 2016 with 100% interest. A 20% interest transfer to Fortis Petroleum was approved 18th of April 2017 and a partial relinquishment of the licence was approved 23rd of March 2017 (Fig. 1.1). Two licence extensions of the Decision to continue (BoV) were approved to establish of a new partnership and time to further evaluate the exploration potential in the licence. Based on these evaluations a drill decision to drill the second exploration well in the licence was taken 29th of Juni 2017, with the following partnership.

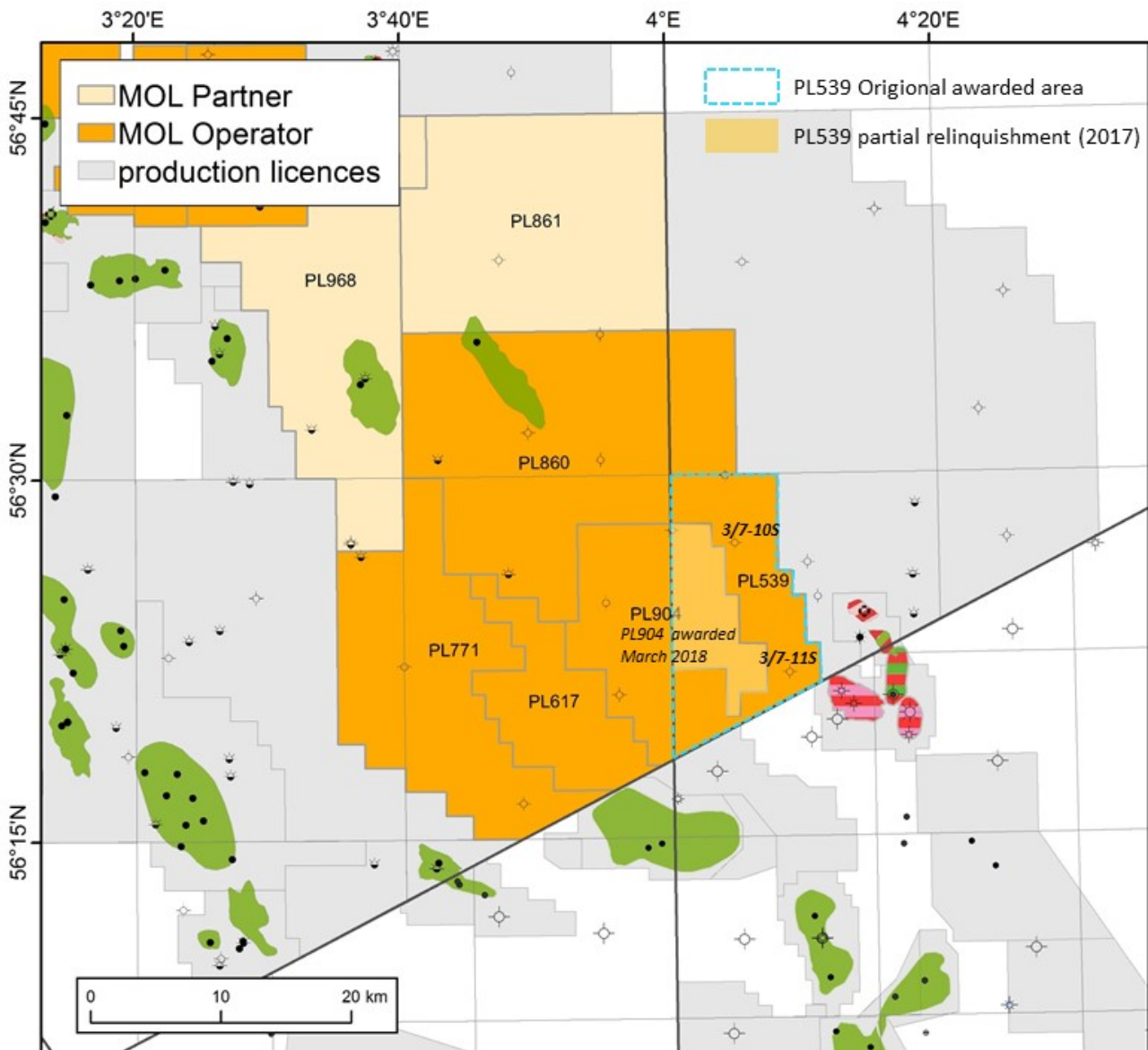


Fig. 1.1 Licence location map

- MOL Norge AS (80% and operator)
- Fortis Petroleum* (20%)

* Lundin Norway AS 20% interest from 15 February 2018.

The Otta/Vinstra exploration well was drilled 2 Q 2019 with the following partnership after a interest transfer of 20% from MOL Norge to Wintershall Norge. Additional two extensions of the Decision to continue (BoV) were approved to be able to finalize the planning, drilling the well and evaluate the results. The new BOV deadline is 19th of February 2020, the same date as the maximum 10 year exploration period.

- MOL Norge AS (60% and operator)
- Lundin Norway AS (20%)
- Wintershall Norge AS (20%)

Award and Work Program

The licence was awarded with a firm work commitment to acquire 3D seismic and conduct geological and geophysical studies leading to a drill or drop decision after 3 years (19.02.2013). The drill decision was taken December 2012 and the first exploration well was drilled 3Q 2015. After change in partnership during 2016 (explained above) and further geological and geophysical studies a drill decision for the second exploration well was taken 29 June 2017, This well was drilled 2Q 2019.

During the 10 year exploration period 21 ECOM committee meetings and 7 WM (work meetings) have been arranged by the operator to share and discuss prospectivity evaluations with the licence partners. The main prospects in the licence were the Middle Jurassic prospects Myrhaug and Otta and the Permian (Rotligend Gp) Vinstra prospect.

Originally the licence had identified the Upper Jurassic Sjøsand Prospect on top on the Mandal basement high itself (now included in the PL904) and the Paleocene Dvergfolk lead in addition to the Myrhaug Prospect. After MOL Norge took over the operatorship additionally two Upper Jurassic prospects were identified, the Berkåk and Hunderfossen prospects in addition to the Vinstra and Otta prospects. Fig. 1.2 shows the main prospects evaluated in PL539.

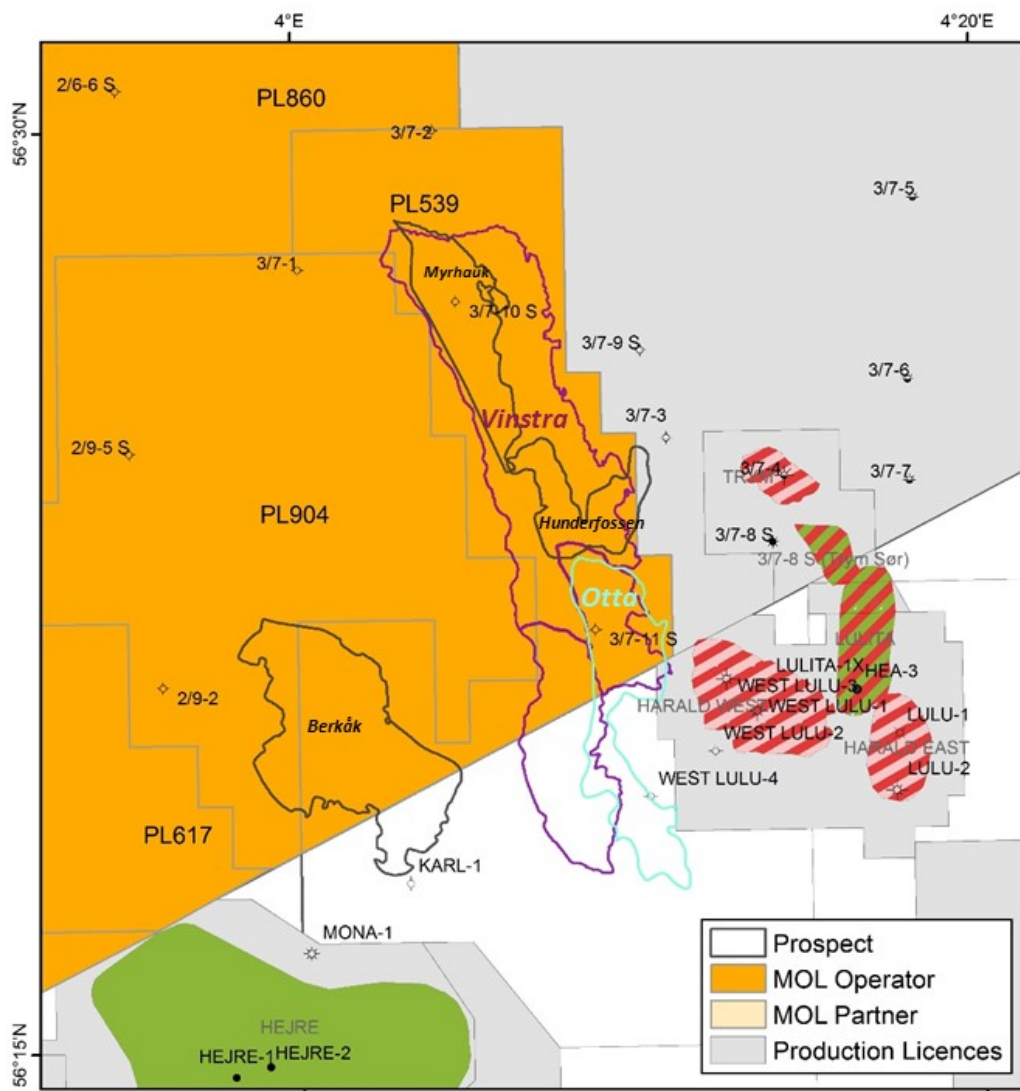


Fig. 1.2 Outline of the main prospectivity in PL539

Based on the negative results in the two exploration wells and that the remaining prospectivity in the licence is immature the partnership has agreed to fully relinquish the licence. The licence is valid until 19th of February 2020 and the remaining prospectivity is too immature to apply for an extension with a robust work program beyond the maximum 10 year exploration period.

2 Database Overviews

2.1 Seismic Data

The seismic database for the licence at time of application consisted of the PGS Megamerge, G9603, SH9003 and ST9602. Subsequent the award of PL539, the partnership agreed to acquire part of the PGS MC3D-CGR2010. The partnership was involved in planning, acquisition and processing of the survey. The MC3D-CGR2010 was later reprocessed for multiple removal and de-noising by Sharp reflections. As described above (1 History of the Production Licence) the new partnership established in 2016/2017 agreed that the PGS MC3D-CGR2013 RM, (a merge and reprocessing of MC3D-CGR2010 and 2011) survey should comprise the seismic database, see Fig. 2.1. Gather conditioning on part of this survey was performed in 2018 (3 Results from Geological and Geophysical Studies).

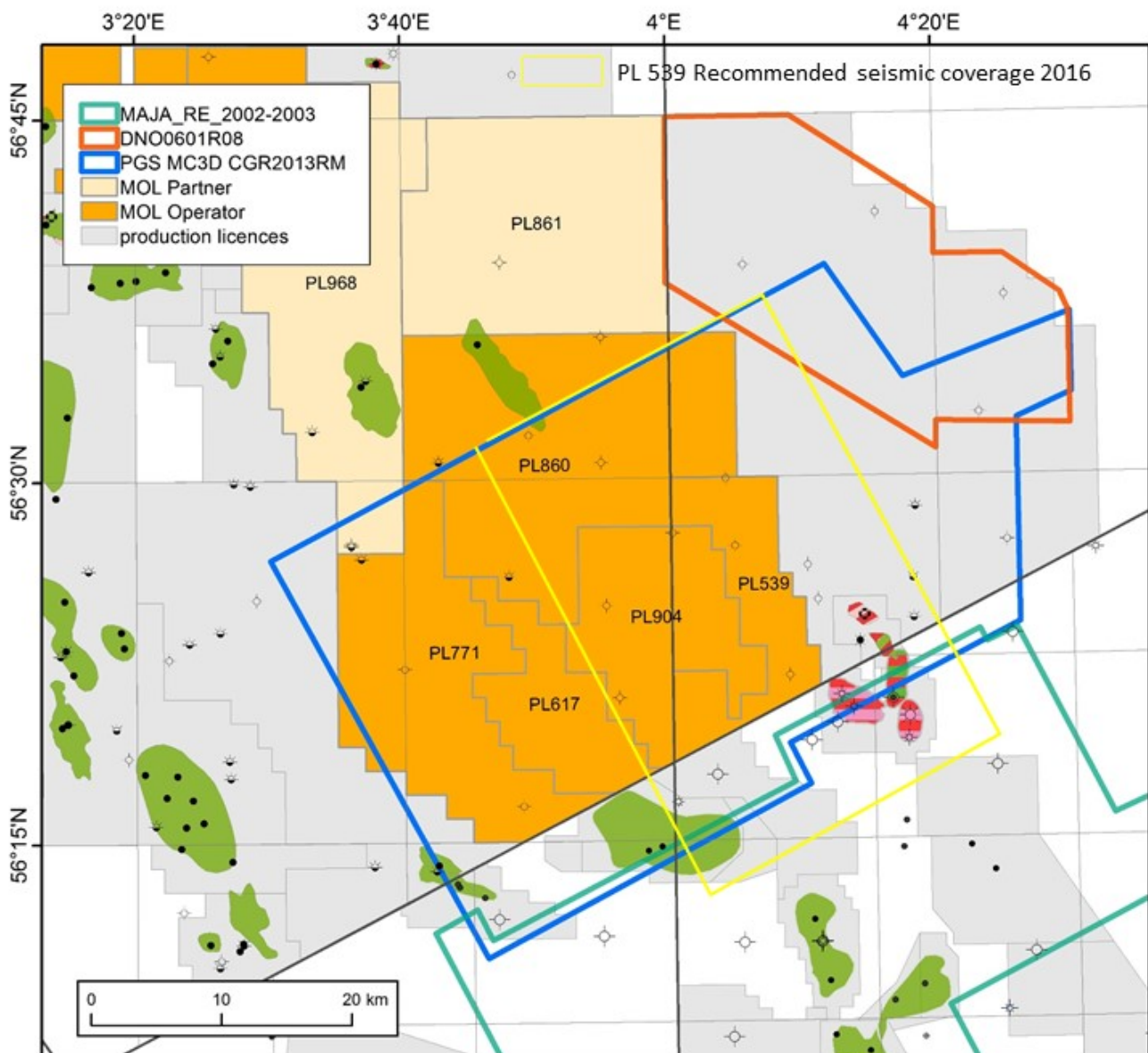


Fig. 2.1 Seismic database

2.2 Well Data

The Well database consisted of all released NCS wells in the area. In addition data from 16 DK wells have been used. Several studies have been performed on selected wells from the database as shown in Fig. 2.2.

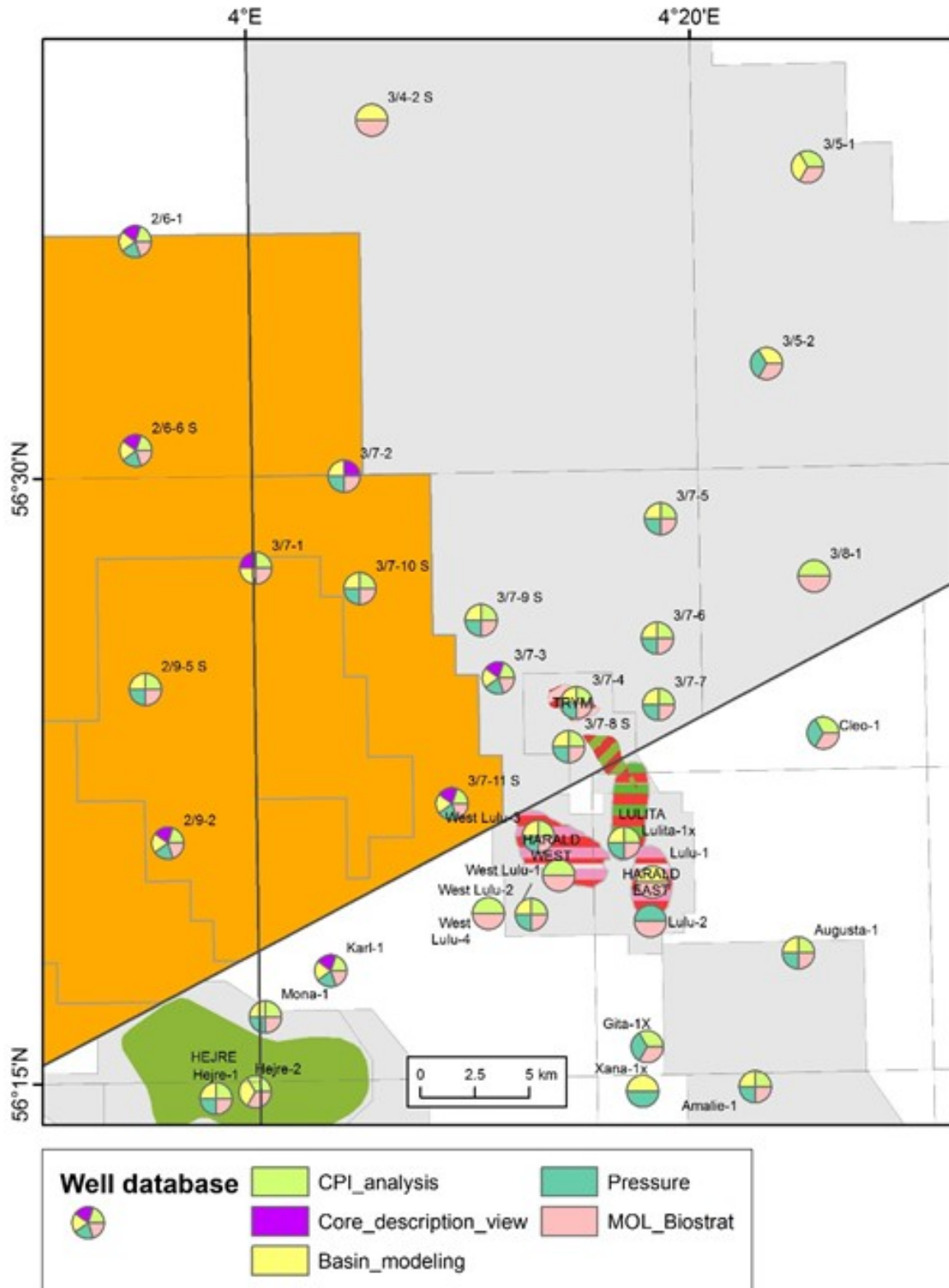


Fig. 2.2 Well database

The most important wells for the evaluation of the Rotliegend Vinstra Prospect are the 3/5-1, 2/4-17 and 23S. The most important wells for the evaluation of the Middle Jurassic Myrhauk and Otta prospects are the 3/7-3, 4, 8S, 9 and 10S and the West-Lulu 1,2,3,4.

An overview of the wells used in the evaluations is shown in Table 2.1 .

Table 2.1 Well used in evaluation

Wellbore	NPDID	Field/Discovery	Content	Age / Fm at TD	Fm with HC
2/4-17	1792		Gas/condensate	Rotliegend Gp	Late Jurassic, Ula Fm
2/4-22S	7535		Oil	Rotliegend Gp	Jurassic (Bryne and Ula fms and Rotliegend GP
2/6-6S	8560		Dry	Rotliegend Gp	
2/9-2	283		Dry	Rotliegend Gp	
2/9-5S	7502		Dry	Basement	
3/5-1	290		Dry	Rotliegend Gp	
3/7-1	292		Dry	Basement	
3/7-2	220		Dry	Rotliegend Gp	
3/7-3	293		Dry	Zechstein Gp	
3/7-4	1467	Trym	Gas/condensate	Zechstein Gp	Middle Jurassic Sandnes and Bryne Fms
3/7-8S	7058	Trym South	Gas/condensate	Zechstein Gp	Middle Jurassic Sandnes and Bryne Fms
3/7-9S	7137		Dry	Smith Bank Fm	
3/7-10S	7749		Dry	Smith Bank Fm	
3/7-11S	8705		Dry	Rotliegend Gp	
Karl-1	DK well		Dry	Rotliegend Gp	
West-Lulu 1	DK well	Harald West	Gas/condensate	Triassic	Middle Jurassic Sandnes and Bryne Fms
West-Lulu 2	DK well		Dry	Triassic	
West-Lulu 3	DK well	Harald West	Gas/condensate	Triassic	Middle Jurassic Sandnes and Bryne Fms
West-Lulu 4	DK well		Dry	Triassic	
Lulita-1	DK well	Lulita	Dry	Triassic	Middle Jurassic Sandnes and Bryne Fms

3 Results from Geological and Geophysical Studies

PL539 (part of block 3/7) is located in the Norwegian North Sea mainly on the southeastern flank of the Mandal High in the Søgne Basin (Fig. 3.1). A small part of the licence is located on the southwestern side of the Mandal High on the Piggvare Terrace. The licence border to Denmark and is located in the vicinity of the Trym and Harald (West and East) Fields.

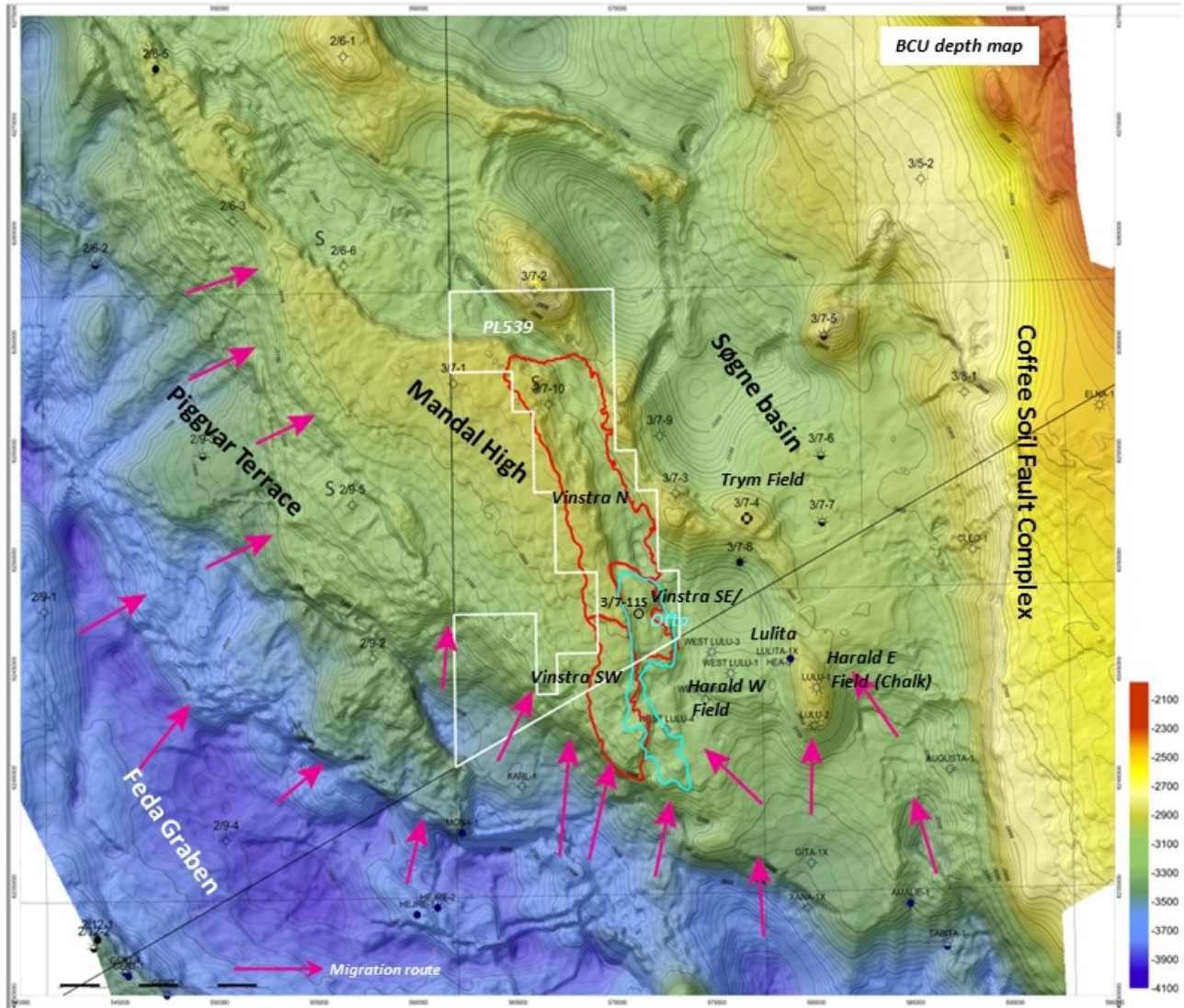


Fig. 3.1 Semi-regional Base Cretaceous structural depth map Overall hydrocarbon migration pathways are driven by buoyance and potentiometrically as indicated by arrows from the deep prolific source kitchen in the graben system to the shallower Mandal High area.

The stratigraphic level focused on in the APA 2009 application was the Mesozoic sedimentary wedge truncated against the eastern flank of the Mandal High. The stratigraphy expected to be encountered range from Lower Cretaceous to Upper Jurassic, Middle Jurassic and/or Triassic due to no direct tie to any of the offset wells.

After change of partnership in 2016 with MOL Norge as operator the main stratigraphic focus have been on the Middle Jurassic fluviially-dominated costal plain deposits overlain by sandy shoreface deposits and the Permian Aeolian sandstone deposits.

Studies

Biostratigraphy study

A biostratigraphy study has been performed by Merlin using the J sequence scheme of Partington et al. (1993). The study include a biostratigraphic review interpretation and correlation of nearby wells, and has resulted in the definition of new well tops, wheeler diagrams and GDE maps for the Jurassic reservoir intervals. MOL Norge has obtained data from public NCS wells, DK wells (acquired from GEUS), Robertson Research and APT (Applied Petroleum Technology). A well correlation panel is shown in Fig. 3.2, and illustrate the variety in the distribution and thickness of the Lulu Fm (J36) and Bryne Formation (J34). In conjunction with evaluation of the Myrhaug prospect Robertson performed Biostratigraphy and Quemsan studies with focus on mainly Upper Jurassic reservoir.

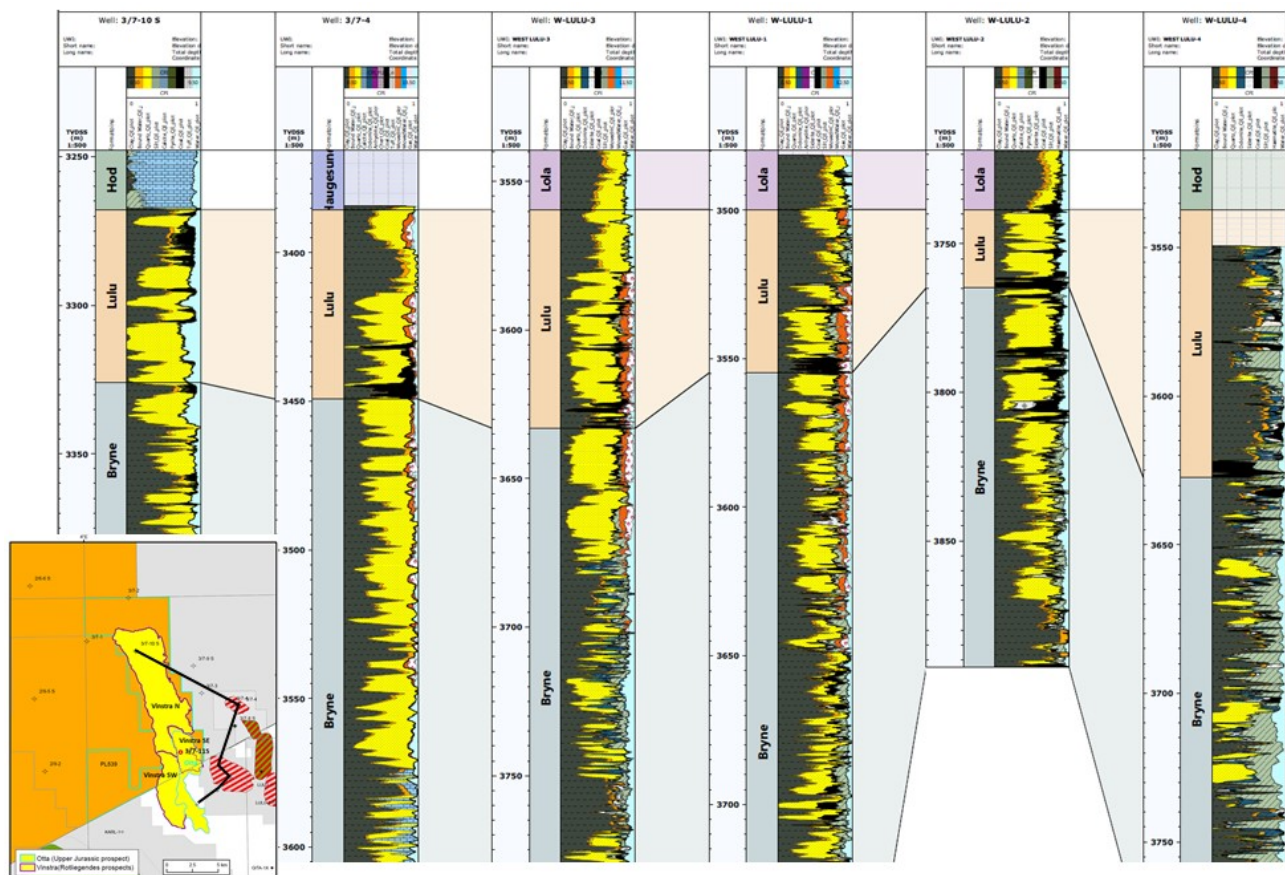


Fig. 3.2 Well correlation Well correlation of Lulu (Sandnes) and Bryne formations based on updated biostratigraphic interpretation

Evaluation of the Rotliegend Group in nearby wells (MOL Norge In-house)

The early Permian Rotliegend succession comprises syn-rift volcanics and volcanoclastic sediments of the Karl Formation, followed by the younger post-rift Auk Formation dominated by aeolian and/or wadi facies sediments, commingled with sabkha/desert lake shales and siltstones. A reservoir quality study of the Permian Auk Formation sandstone was performed inhouse. The offset wells with good reservoir sandstone were analysed and described (both cores and cutting samples). Based on this study and evaluation of all wells penetrated a Rotliegend GDE map was established. A well correlation from 2/4-17, across the Mandal High and east to the footwall of the Coffee Soil Fault Complex (well 3/5-1) is shown in Fig. 3.3.

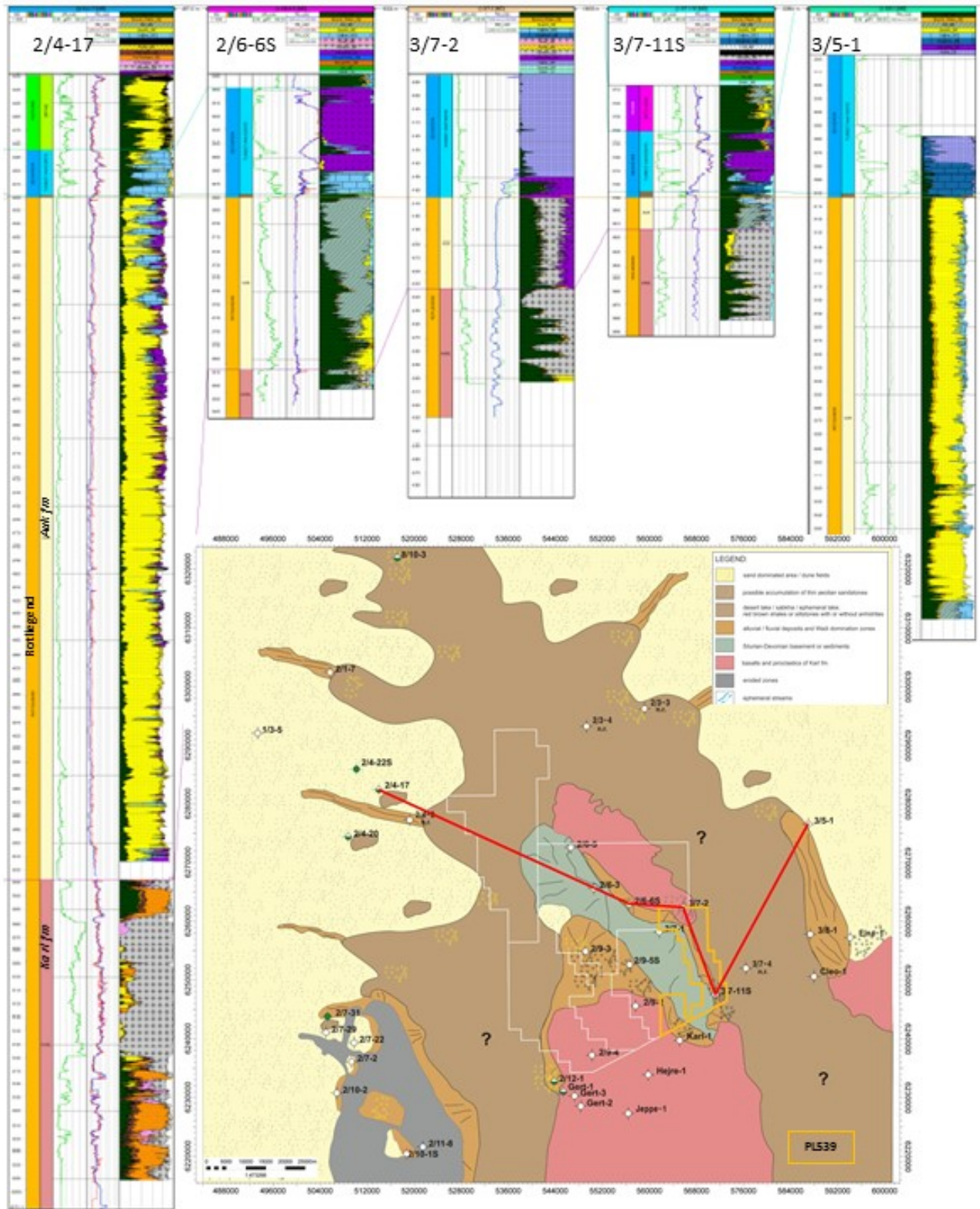


Fig. 3.3 Well correlation and Zechstein subcrop map Well correlation of the Rotliegend Group from west over the Mandal High and to the footwall of the Coffee Soil Fault Complex

Petroleum System Analysis

The Mandal High is surrounded to the west and south by prolific hydrocarbon kitchen, (see Fig. 3.1) containing source rocks in several stratigraphic levels. MOL Norge has performed an in-house basin and petroleum systems modelling, using Zetaware Trinity T3 and Schlumberger PetroMod software and include evaluation of the source potential in the Mandal, Farsund and Bryne formations.

The basin modelling predicted for condensate (critical fluid) at reservoir conditions for the Otta Prospect which would flash into two phases at surface location. Charge of the Vinstra Prospect was interpreted to be from the Mandal and Farsund formations updip from deep source kitchen in the south and through fractures (and weathered?) basement in West. The basin modelling predicted oil at reservoir conditions.

In 2011 Integrated Geochemical Interpretation (IGI Ltd.) performed a combined basin modelling-geochemistry study (Nexen operator) which predicted oil in the Myrhauk Prospect (well 3/7-10S).

Pressure

A Pore pressure study was completed in 2012 by Ikon GeoPressure prior drilling the Myrhauk well. MOL Norge performed in-house pressure evaluation (complimented the database with relevant data from the Pegis Pressure Database) and established a Jurassic overpressure map. In addition, AGR performed a geo-mechanics and pore pressure modelling based on seismic velocity data prior to drilling the 3/7-11S Otta/Vinstra well.

Petrophysical Analysis

In-house CPI's are available for all relevant wells surrounding PL539, including DK wells.

Gather conditioning

After observing flat events on the seismic in the Vinstra prospects it was decided to try to de-risk this observation and to further understand the amplitude anomaly present on the top reservoir.

1. Rock Physics Modelling

2D synthetic modelling has been performed by adding the expected sand elastic parameters to the Rotliegend interval: Oil is assumed above the depth of the observed flat events and water is assumed below. The result shows that in case of gas/light oil a well visible flat spot is identified on the modelled full stack seismic indicating that the flat event is feasible in the expected reservoir, see Fig. 3.4

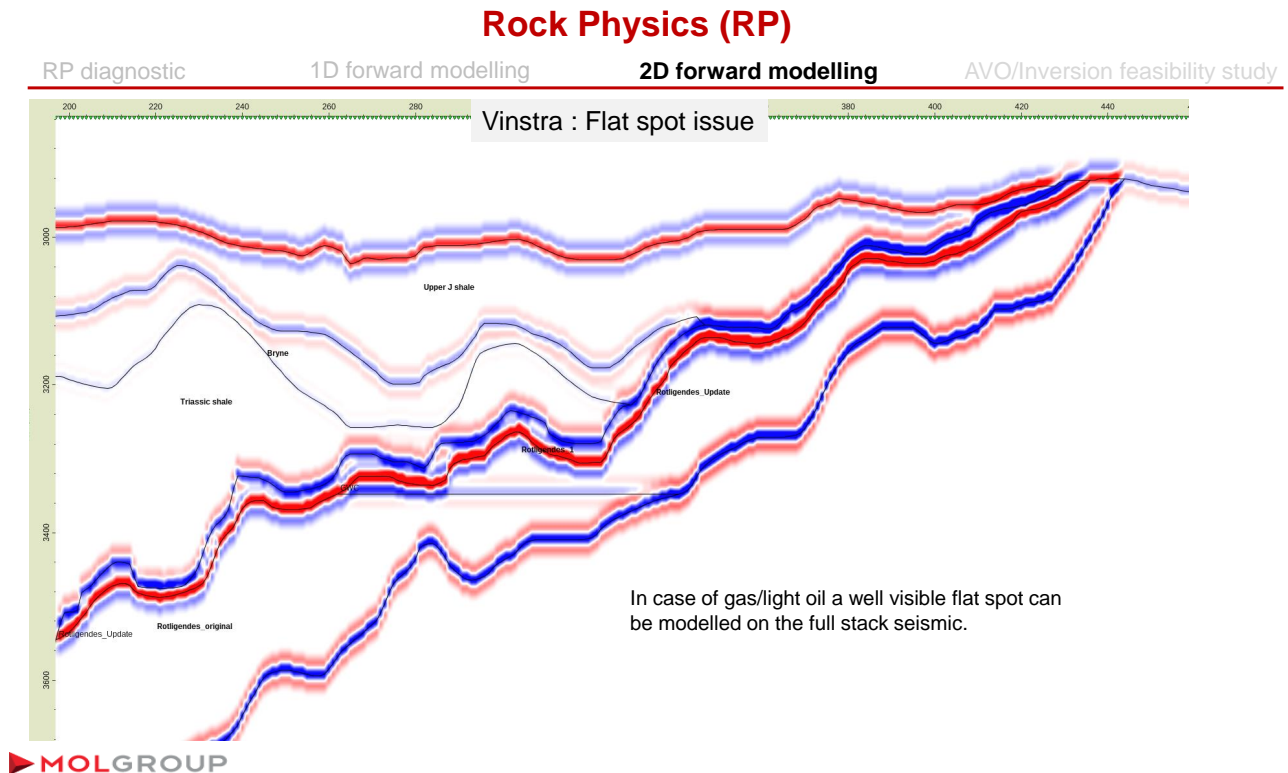


Fig. 3.4 2D modelling of Vinstra flat spot

1D modelling of several elastic parameters were performed to investigate the expected fluid effect on the top reservoir. For acoustic impedance (AI) and EEI Chi10 (extended elastic impedance with coordinate rotation angle 10) a small separation is observed between the water and oil bearing scenarios in case of all hydrocarbon scenarios but for EEI Chi 20 (coordinate rotation angle 20), a reasonable separation is observed for Base Case Oil. Along the EEI 20 axis, hydrocarbon filled sand provides approximately 20% separation from the water bearing sand in case of an assumed hard overburden that is being present in the analogue wells see Fig. 3.5.

Rock Physics (RP)

RP diagnostic 1D forward modelling 2D forward modelling AVO/Inversion feasibility study

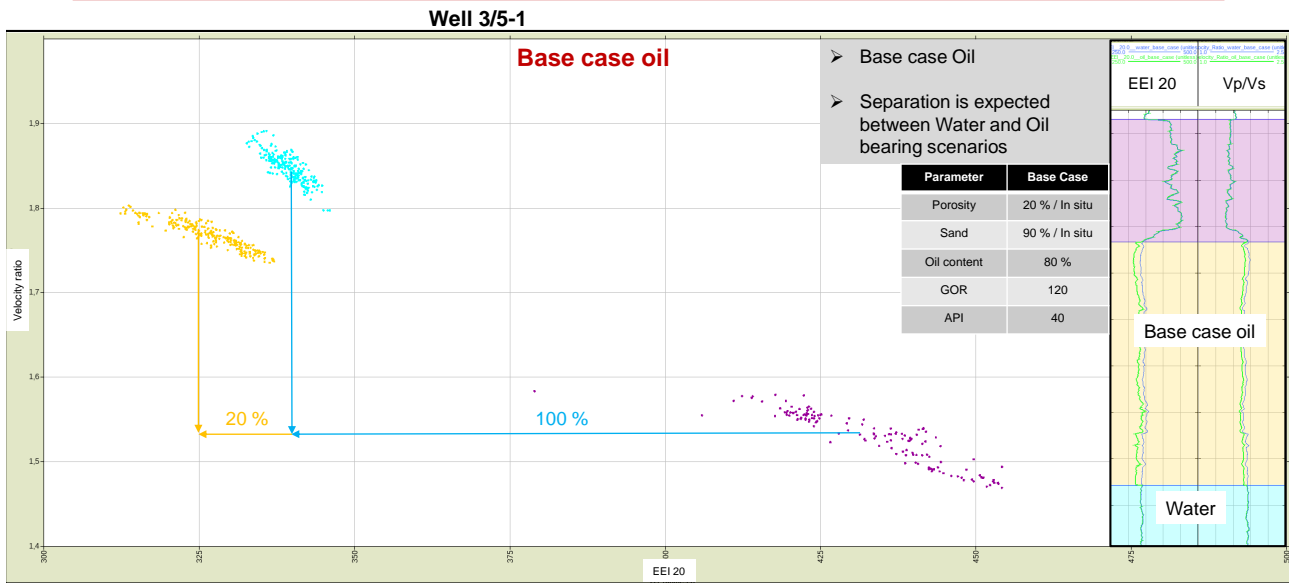


Fig. 3.5 1D modelling of top reservoir

2. Seismic gather conditioning

As a consequence of Rock Physics modelling it became very important to pay special attention of creating EEI Chi 20 seismic cube to investigate the fluid effect of top reservoir. The inputs of EEI Chi 20 are the AVO Intercept and Gradient attributes which require very accurate conditioning of the seismic gathers. The conditioning workflow had to focus on the areas where the flat events are observed to evaluate the gathers in detail and confirm that the flat events are not processing artefacts.

A comprehensive conditioning workflow resulted in less noisy seismic gathers, appreciable multiple energy has been removed and the alignment tools ensure that the seismic gathers are more easy and reliable to interpret in the pre-stack and post-stack domain as well. The effect of the gather conditioning workflow is shown in the picture below (Fig. 3.6).

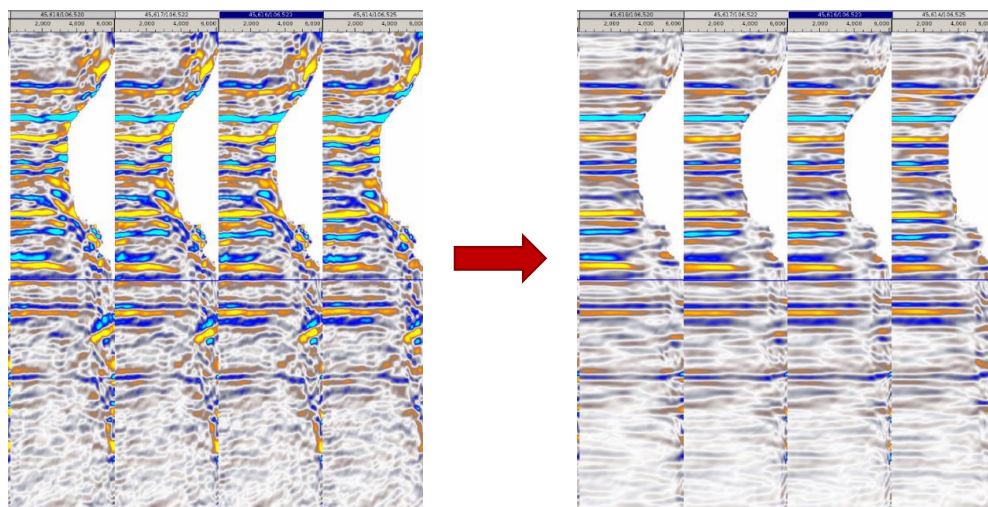


Fig. 3.6 Gather conditioning

3. EEI mapping and Fluid contact finder

EEI maps have been created in Pre-Stack Pro for different Chi angles and the EEI Chi 20 map extracted on Top Rotliegend shows a sharp seismic anomaly. The dimming of amplitudes indicates very similar pattern which was estimated by the Rock Physics modelling.

To further evaluate this observation and investigate how the observed amplitude effect fits with the flat events the Fluid Contact Finder plug-in of OpendTect software was applied which is a common contour bidding algorithms: seismic traces that penetrate a top reservoir at the same depth encounter identical fluid columns. Consequently stacking along contour lines should highlight HC anomalies on the top reservoir and at the same pin-point fluid contacts.

Fluid Contact Finder has been applied on the southern part of the Prospect using EEI 20 seismic as input data. Higher Amplitudes are observed on the highest part of the Prospect and a significant drop of amplitudes can be seen at appr. 3250 ms contour line.

4. Conclusions

The detailed seismic conditioning work provided good enough quality for pre-stack de-risking tools while the rock physics modelling showed us the best elastic parameter to work with as well as ensured the reasonable evaluation of the results.

The main result of the work - visualized by the Fluid Contact Finder plug-in of OpendTect - indicates that the two independent seismic observations show towards the same depth. According to the rock physics it is in the same order of magnitude that could be produced by hydrocarbon.

The main uncertainties to the conclusions stated above are:

- Rock physics work uses wells which are not from the Prospect are as lacking of close analogues. No measured shear wave velocity in these wells.
- Despite the comprehensive seismic conditioning, seismic quality in the Permian is still a risk factor.
- The observed and highlighted coherence between the two seismic observations is very encouraging. However this work assumes sand present in the reservoir but provides no direct proof for this, consequently reservoir presence is still a significant risk for the Vinstra prospects.

4 Prospect Update Report

Myrhauk Prospect - exploration well 3/7-10 S

The 3/7-10 S Myrhauk well was drilled with Maersk Guardian July-September 2015 to test the hydrocarbon potential of a Mesozoic sedimentary wedge truncated against the eastern flank of the Mandal basement High. Uncertainty was related to the stratigraphy expected to be encountered between the BCU and Top Rotliegend Group, ranging from Lower Cretaceous, Upper and Middle Jurassic and/or Triassic. This is due to the difficulty in well ties from the crest of salt structures along the salt wall to the flank. In the Søgne Basin nearby offset wells have encountered Lower Cretaceous/Upper Jurassic (Vyl/Ula age equivalent; e.g. 3/7-3, 2/6-4 S, 3/7-6) and Middle Jurassic reservoirs (3/7-4, 3/7-9 S, 3/7-8 S). The expected hydrocarbon phase was oil or gas condensate generated from Upper Jurassic Mandal and Farsund Fm or the Middle Jurassic Bryne Fm.

Well 3/7-10 S was dry but encountered reservoir sand in the Bryne Formation. Fig. 4.1 shows a West to East seismic line over the Myrhauk Prospect.

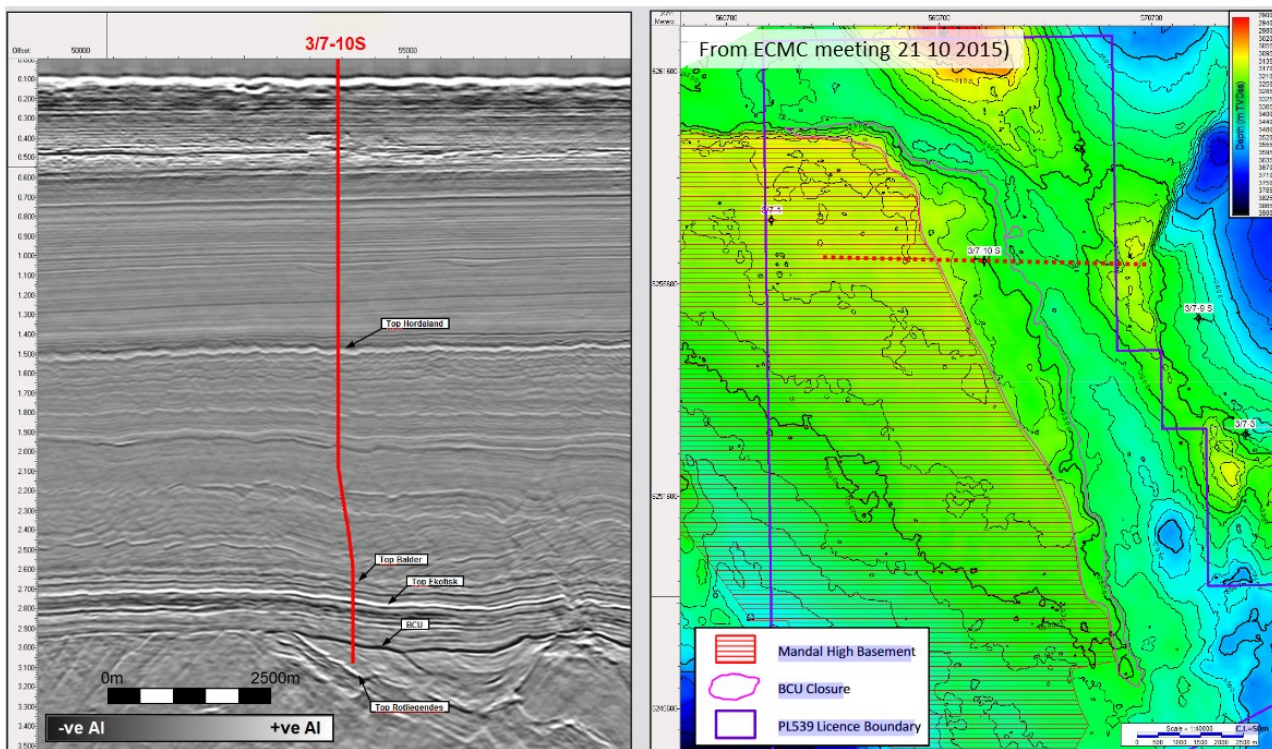


Fig. 4.1 Seismic line across the Myrhauk Prospect. The Myrhauk Prospect, exploration well 3/7-10S was drilled July-September 2015

Otta/Vinstra prospects-exploration well 3/7-11 S

The 3/7-11 S well was drilled with Rowan Viking April to May 2019. The well was drilled to test the hydrocarbon potential in the Middle Jurassic Otta reservoir (Bryne and Lulu formations) and the Permian Aeolian reservoir (Auk Formation).

The Otta Prospect is a combined structural and stratigraphic trap on the eastern side of the Mandal High, updip of the West Lulu-4 well on the Danish side. The reservoirs are the Middle Jurassic coastal plain Bryne Formation and the marine shoreface and stacked estuary Lulu Formation. Several wells

in the area have penetrated good reservoir properties in both the Bryne and Lulu Formations and the Trym and the Harald West fields are producing from these reservoir intervals. In well 3/7-4 (The Trym Field discovery well) 26m of net sand is encountered with a net/gross ratio of 0.64 and an average porosity of 23% in the Lulu Formation and 49m of net sand with a net/gross ratio of 0.49 and an average porosity of 16% in the Bryne Formation. The West Lulu wells except the West-Lulu 4 well show similar reservoir parameters. The Lulu Formation has generally better reservoir parameters compared to the Bryne Formation. The seal is provided by Upper Jurassic shale and Cretaceous chalk.

The Vinstra prospect is part of a very large Top Rotliegend Group structural closure around the Mandal High. The reservoir was assumed the Upper Rotliegendes aeolian desert sandstone. These aeolian sandstones make up the Auk Formation. In well 3/5-1 to the east, 288 m of net sand is encountered with a net/gross ratio of 0.94 and an average porosity of 21%. In well 2/4-17 to the west, 471 m of net sand is encountered with a net/gross ratio of 0.77 and an average porosity of 21%. The seal is provided by Zechstein salt and /or Triassic shales. The Vinstra prospect is divided into three compartments, west, east and north. The east and west segments are separated by a huge north northwest–south southeast trending fault. The Vinstra west segment is truncated by BCU.

Well 3/7-11 S was dry and encountered only thin tight sand layers in the Middle Jurassic Otta and no reservoir rocks in the Auk Formation. Due to the negative results regarding reservoir development in the Vinstra SE and Otta the probability of finding reservoir in Vinstra SW was considered very low and the partnership decided not to drill two optional sidetracks to further test the Otta and Vinstra SW prospects. Fig. 4.2 shows a southwest to northeast seismic line across the Otta and Vinstra prospects

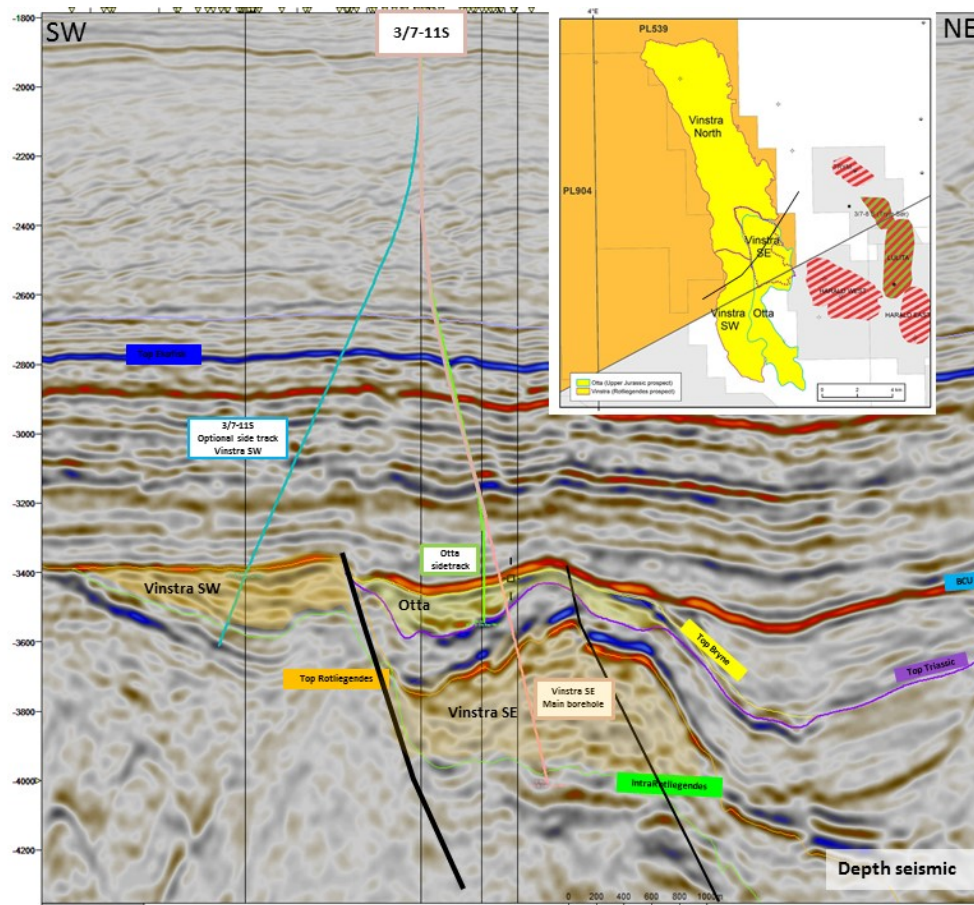


Fig. 4.2 Seismic line across the Otta and Vinstra prospects The Otta and Vinstra prospects, exploration well 3/7-11S was drilled April-May 2019

Berkåk

The Upper Jurassic Berkåk Prospect is located on the western flank of, and juxtaposed against, the Mandal High. It is located mainly in the south western part of PL539, but parts also extend in to PL904 and Danish sector. The reservoir is thought to be sand eroded from the Mandal High located in an incision in the uppermost Jurassic (uppermost part of the Base Upper Jurassic Unconformity J73 to BCU interval). The trapping mechanism is therefore both structural and stratigraphic, with pinchouts in all directions except towards the Northeast where seal is provided by the fault bounding the Mandal High. Top seal is provided by Lower Cretaceous shales and/or chalk. The prospect is located within mature Upper Jurassic source rock and adjacent to the Feda Graben where large volumes of hydrocarbon have been generated. The prospect outline is shown by blue polygon in the BCU (top reservoir) depth map in Fig. 4.3

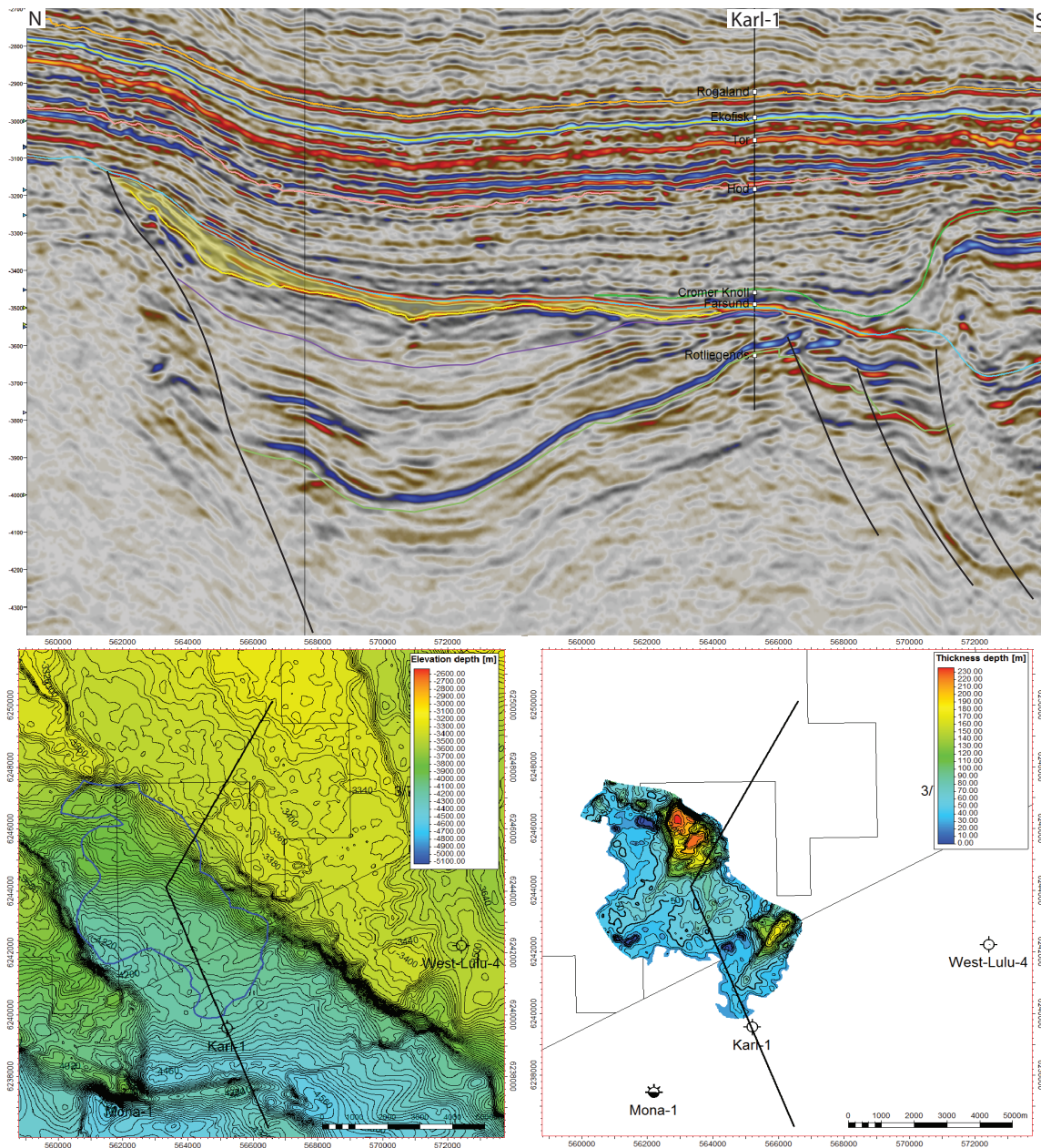


Fig. 4.3 The Berkåk Prospect N-S trending seismic composite line across the Upper Jurassic Berkåk prospect (highlighted in yellow). Base J73 unconformity is indicated by purple line. The prospect outline is given by blue polygon projected on the BCU (top reservoir) depth map to the lower left. The lower right map shows the prospect thickness (m).

Hunderfossen

The Base Upper Jurassic Unconformity (J73) has been interpreted regionally in the Mandal High area. West of the Mandal High, this horizon can be interpreted continuously across large areas. East of the Mandal High however, the horizon is truncated by the BCU and only present in isolated, incised "pockets". Well 3/7-3 penetrates water wet, good quality reservoir rock in such an incision. The Hunderfossen Prospect is a neighbouring "pocket" located directly to the West of 3/7-3. However, these incisions are isolated from each other and it is believed they are not in communication. Fig. 4.4 shows a seismic profile through the prospect, its location, thickness and how the "incised and/or truncated" pockets of J73 sand in the area are located relative to each other. Top seal is provided by Lower Cretaceous shales and/or chalk. Mature Upper Jurassic shales in the basin to the south are considered the main hydrocarbon source.

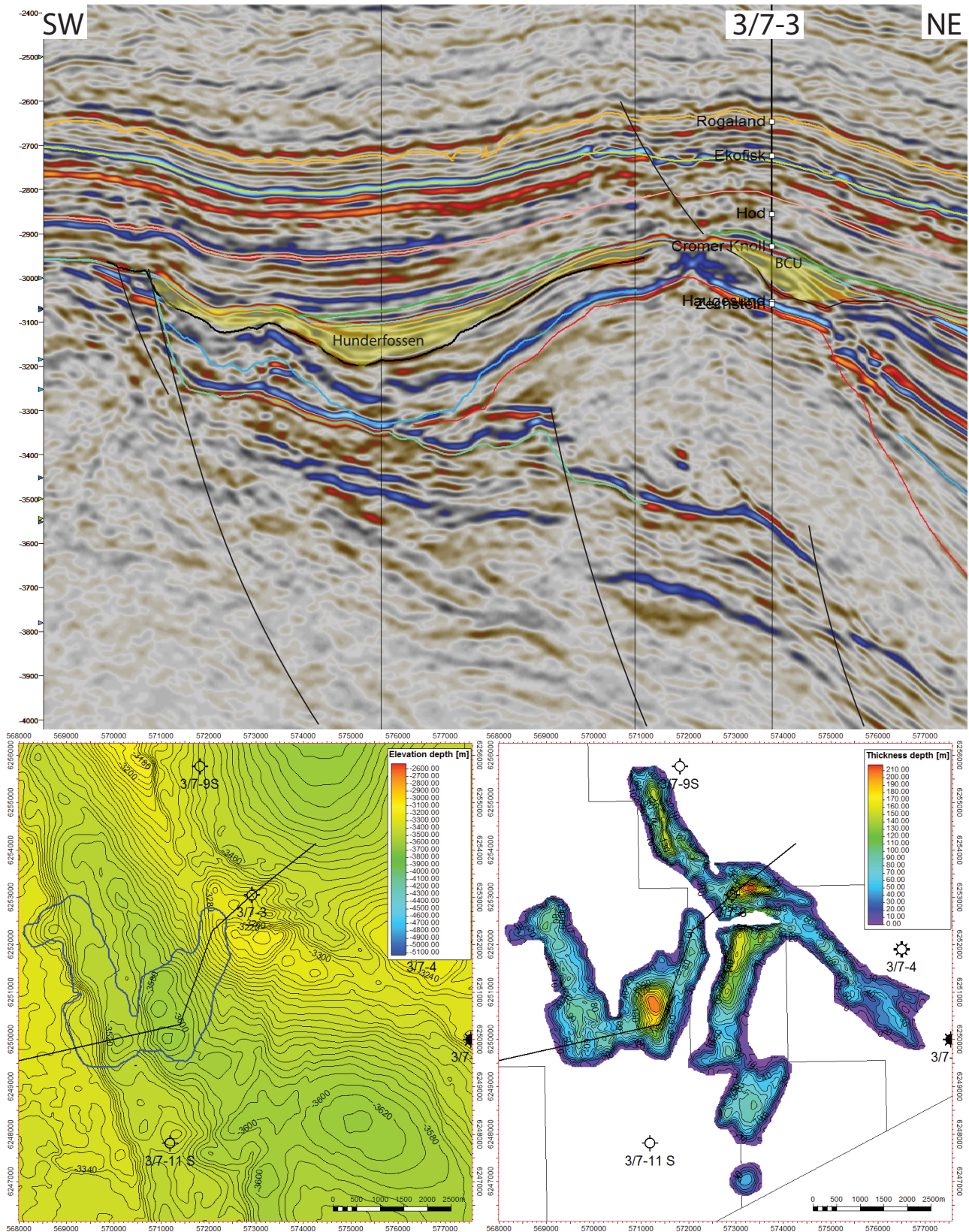


Fig. 4.4 The Hunderfossen Prospect SW-NE seismic composite line through the Upper Jurassic Hunderfossen Prospect. The location and outline of the prospect is shown on the lower left BCU depth map. The thickness map to the lower right shows the thickness (m) of the Base J73 to BCU interval in the area, The prospect sand is isolated from the sand penetrated in 3/7-3. This can also be seen on the seismic profile. Black line indicates seismic profile location on maps.

5 Conclusion

Based on the negative results in the two exploration wells and as the remaining prospectivity in the licence is considered immature the partnership has agreed to fully relinquish the licence. The licence is valid until 19th of February 2020 and the remaining prospectivity is too immature to apply for an extension with a robust work program beyond the maximum 10 year exploration period. A relinquishment notification was sent to the Ministry of Petroleum and Energy via the SMIL portal on the 25th of September 2019 that a unanimous Steering Committee has decided for full relinquishment of PL539 effective 31.12.2019. The relinquishment of PL539 was approved by the authorities 25 November 2019, effective from 25 December 2019.