# PL538 Relinquishment Report

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# PL538 Relinquishment Report


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# 1 Key Licence History

PL538 is located in the Vøring Basin and comprise Block 6705/12 (Figure 1.1).

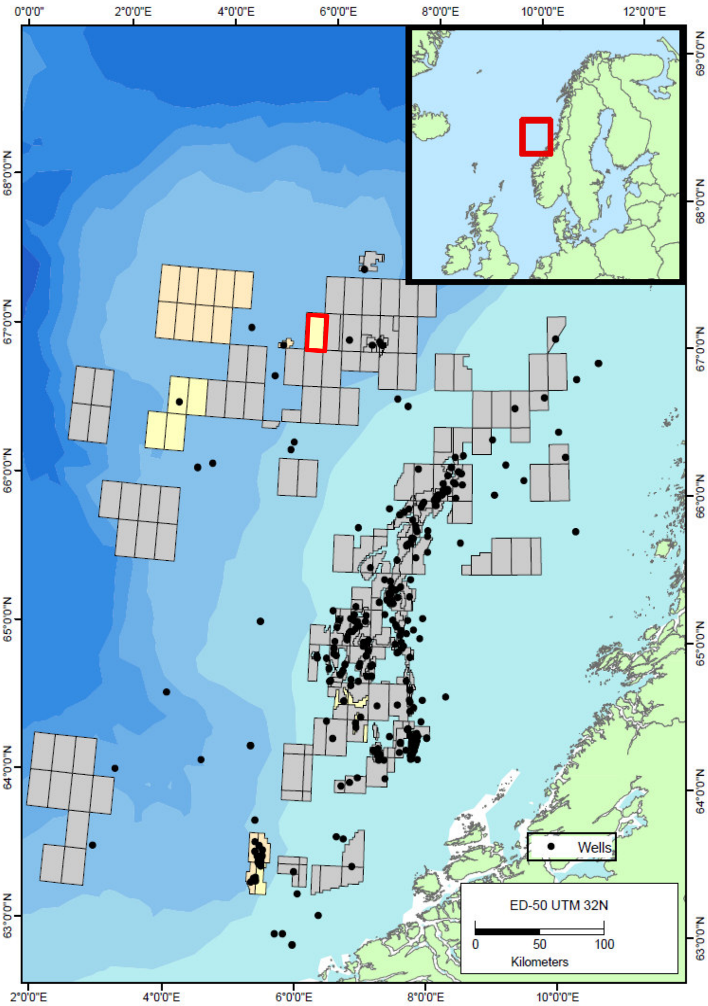



*Figure 1.1 PL538 Location Map. Outline of licence indicated in red box*

**PL538 Partnership and Work Commitment**
PL538 was awarded 27th May 2009 as part of the 20th Licensing Round on the Norwegian Continental Shelf (NCS) with a commitment to acquire a minimum of 350km$^2$ of 3D seismic data within the initial three (3) years of the licence period that expires 27th May 2012.The licence is to make a drill/drop decision by May 27th 2012. In the case of a drill decision, drill one (1) exploration well before May 27th 2015. The initial period expires May 27th 2015, the work program must be completed in entirety by this date. The PL538 partnership consists of A/S Norske Shell (Op, 40%), Det Norske Oljeselskap ASA (30%), Front Exploration AS (10%) and Petoro AS (20%).

**Status on Work Commitment**
1) A total of 705 km$^2$ 3D seismic data was acquired in 2010 - SH1002
2) In December 2011 the partnership unanimously agreed that a prospect of sufficient volume potential and risk profile to warrant an exploration wellbore cannot be identified in the licence

### Licence Meetings

Meetings have been held at regular basis in the licence. A listing of meetings is found in Table 1.1. Documents related to meetings can be found on Licence2Share.

Table 1.1 PL538 Meeting History. Overview of held meetings in PL538.

| Meeting | Date |
|---|---|
| MCM/ECM #1 | June 10th 2009 |
| MCM/ECM #2 | November 11th 2009 |
| Work Meeting #1 | April 28th 2010 |
| MCM/ECM #3 | November 1st 2010 |
| Work Meeting #2 | April 12th 2011 |
| MCM/ECM #4 | November 10th 2011 |

### Reason for Relinquishment

Geological and geophysical evaluations of the Corvus prospect and the Arion lead does not support presence of a drill-worthy prospect (*Figure 1.2)*. No other prospectivity have been identified in the licence acreage.

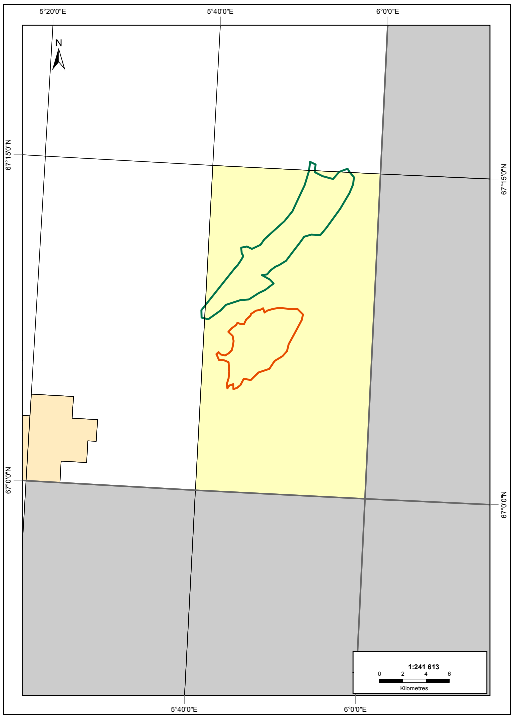



*Figure 1.2 PL538 Prospect and Lead Inventory. Corvus prospect is outlined in red, Arion lead outlined in green.*

| Name | Current Status | Outcome of Technical Evaluation |
|---|---|---|
| Corvus | Prospect | Defined prospect of limited trap size with main risk elements related to hydrocarbon retention and seal. Corvus is not seen as a drill-worthy candidate |
| Arion | Lead | Compartmentalized combined structural - stratigraphic trap with series of small fault bounded gas accumulations |

# 2 Database

The seismic and well database used for PL538 for prospectivity evaluation comprises regional 2D seismic data, 3D seismic data and all relevant wells in the Vøring Basin.

## Seismic Database

The PL538 seismic database is listed in Table 2.1 below. The licence commitment of acquiring a minimum 350km$^2$ 3D seismic data was fulfilled in 2010 upon completion of SH1002. The outline of the acquired 3D data (705km$^2$) is shown in Figure 2.1. SH1002 was merged with 275km$^2$ of ST0410, as shown on the figure, and the resulting merged seismic cube is named SH1002M11. Seismic and well data comprising the PL538 common database is illustrated in Figure 2.2 and listed in Table 2.1

Table 2.1 PL538 Database Overview

| PL538 Database | | | |
|---|---|---|---|
| Well Database | | 2D seismic database | 3D seismic database |
| 6704/12-1 | Gjallar | GJN99 | SH1002 |
| 6706/6-1 | Hvitveis | GMNR-94 | SH1002M11 |
| 6706/11-1 | Luva | GVF2000 | ST9603 |
| 6605/8-1 | Stetind | GVN92 | SG9604 |
| 6607/5-2 | Utgard High | MNR04 | BPN9601 |
| 6607/5-2 | Cygnus | MNR06 | GRE02 (full) |
| 6705/10-1 | Asterix | MNR07 | |
| 6605/1-1 | Obelix | MV2001RE | |
| 6603/12-1 | Gro | NGI98 | |
| | | NH9706 | |
| | | NPD-VOERB-86 | |
| | | NPD-VOERB-87 | |
| | | NPD-VOERB-89 | |
| | | NPD-VOERB-90 | |

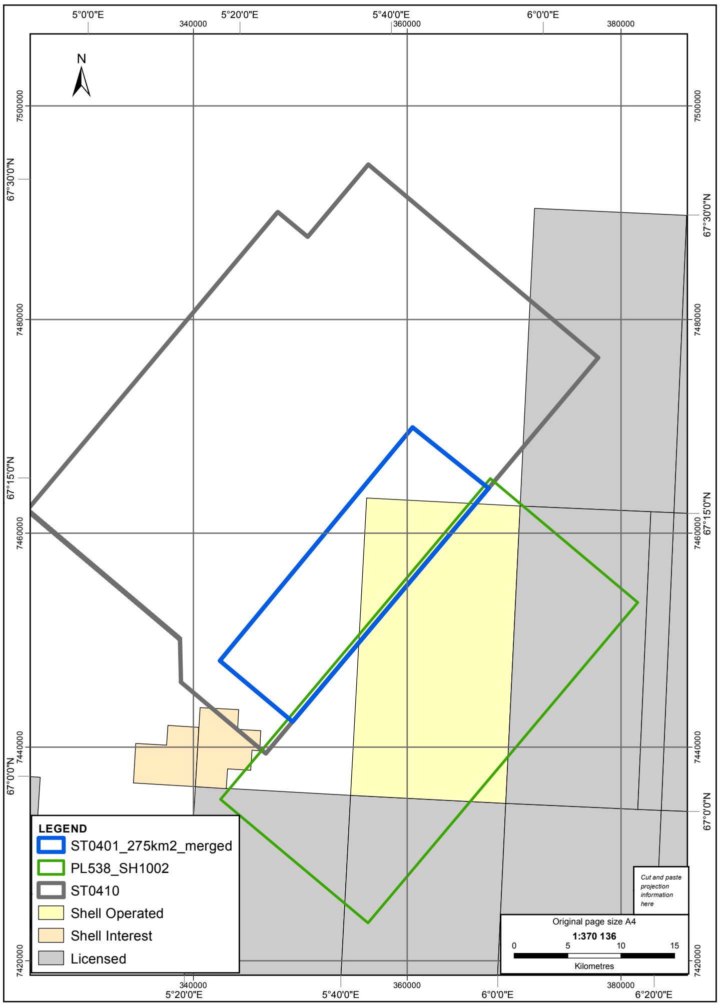



*Figure 2.1 PL538 3D Database*. *SH1002 3D seismic data aquired for the PL538 outlined in green. The acquired dataset was merged with 275 km2 of neighbouring ST0410 to obtain full covereage of PL538 prospectivity.*

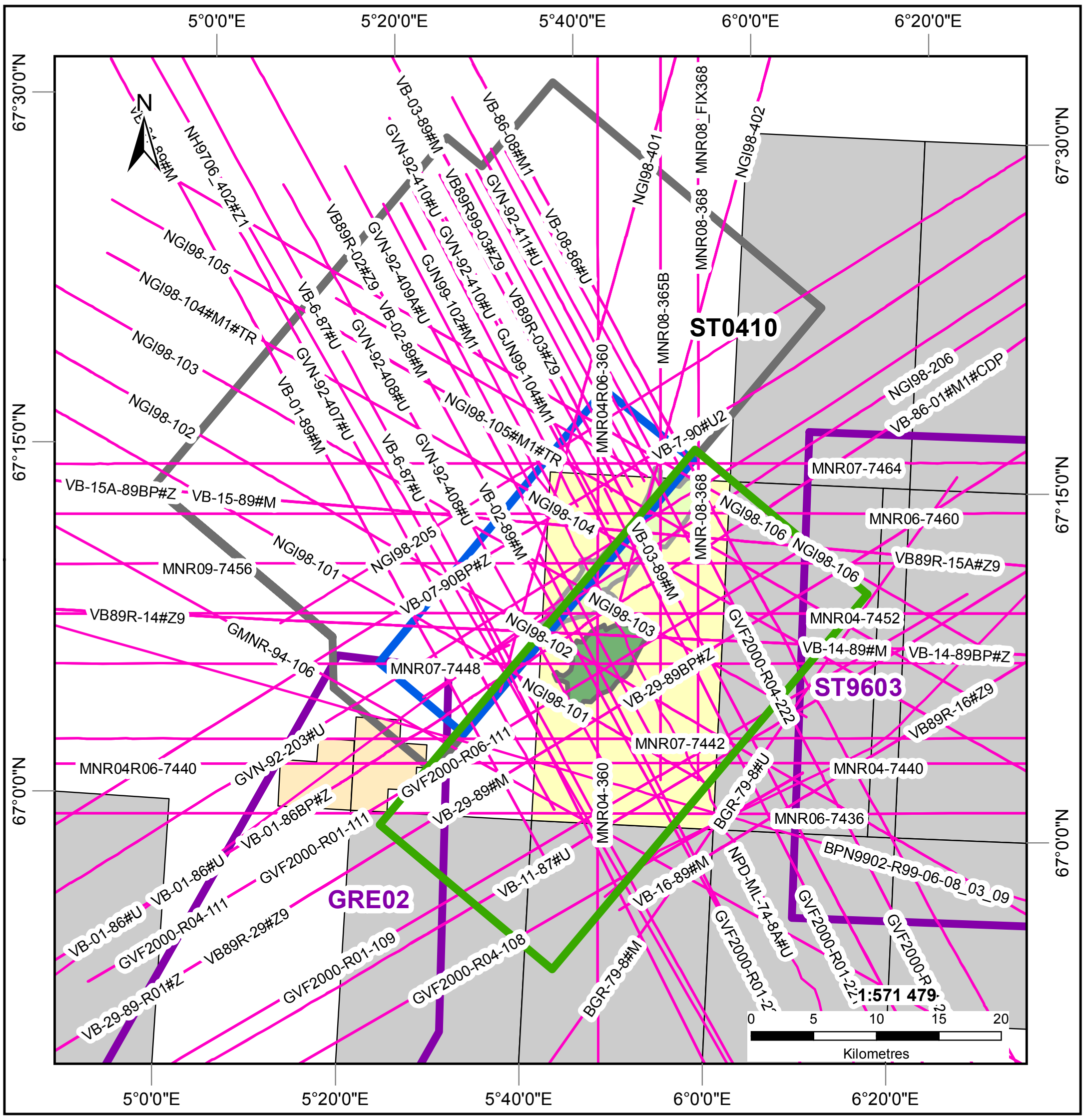



*Figure 2.2 PL538 Full Seismic Database. The 3D surveys in vicinity of PL538 included in the common database are: bpn9601m sg9604 and st9603.*

## Well Database

Relevant wells for PL538 evaluation are listed in Table 2.1.

## Studies

New seismic and well data have been integrated into regional and semi-regional models to form the interpretative framework for the PL538 evaluation. The studies of relevance are:

- Seismic QI Study
- Basin Model Update
- Structural Evolution
- Reservoir Distribution and Characterization

# 3 Review of Geological Framework

**Strucutral Setting**

The licence is located in a synclinal setting in the northern Vøring Basin between the Gjallar Ridge to the north-west and the Vema Dome to the east (Figure 3.1). These two highs are delinated by significant Late Cretaceous to Earliest Eocene faults. The late stage of extensional faults of the Gjallar Ridge linked up to the Nyk High (Figure 3.2). A phase of local inversion and uptake of shortening is observed along the eastern part of the Gjallar Ridge.

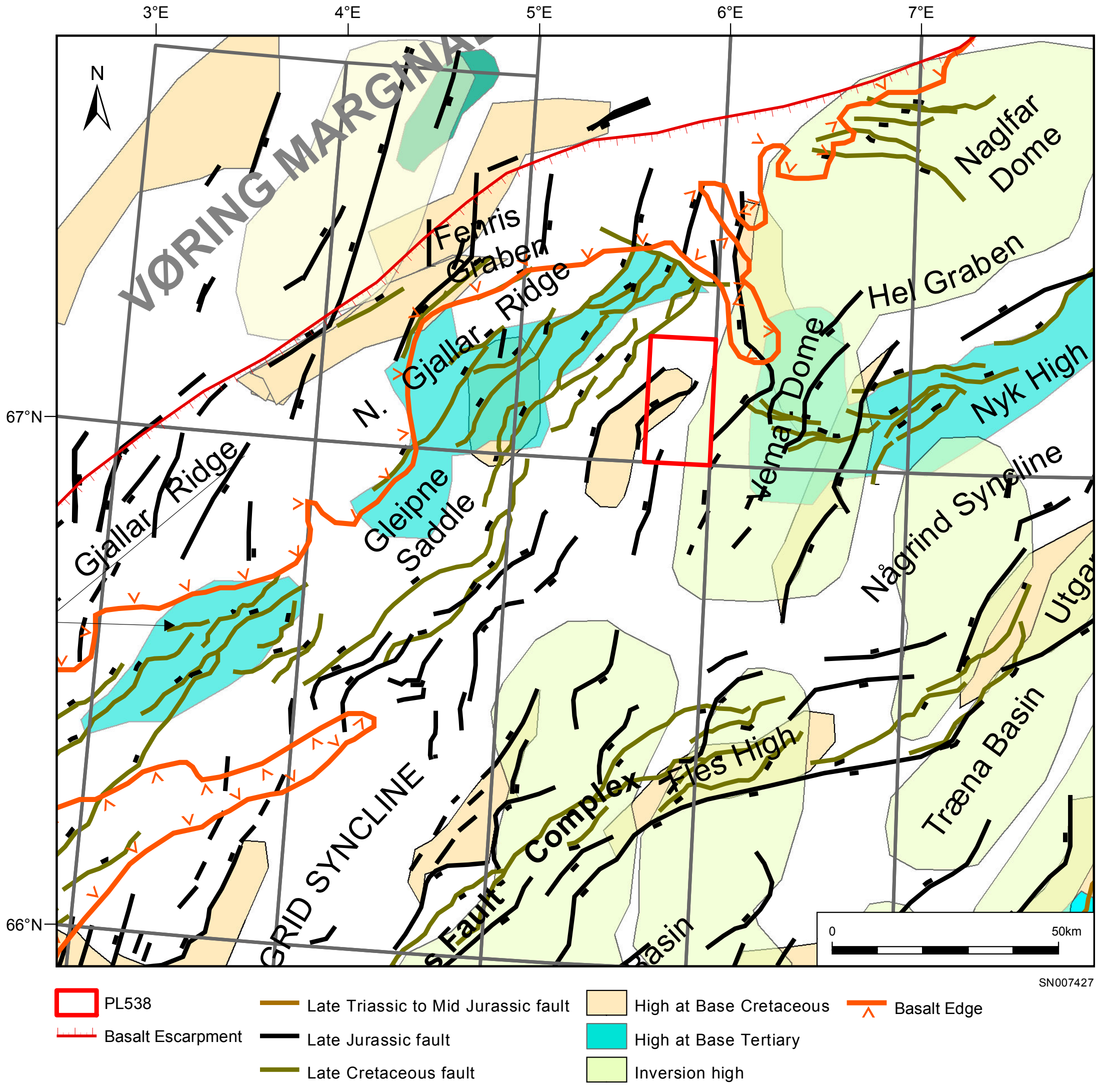



*Figure 3.1 PL538 Semi Regional Structural Setting*

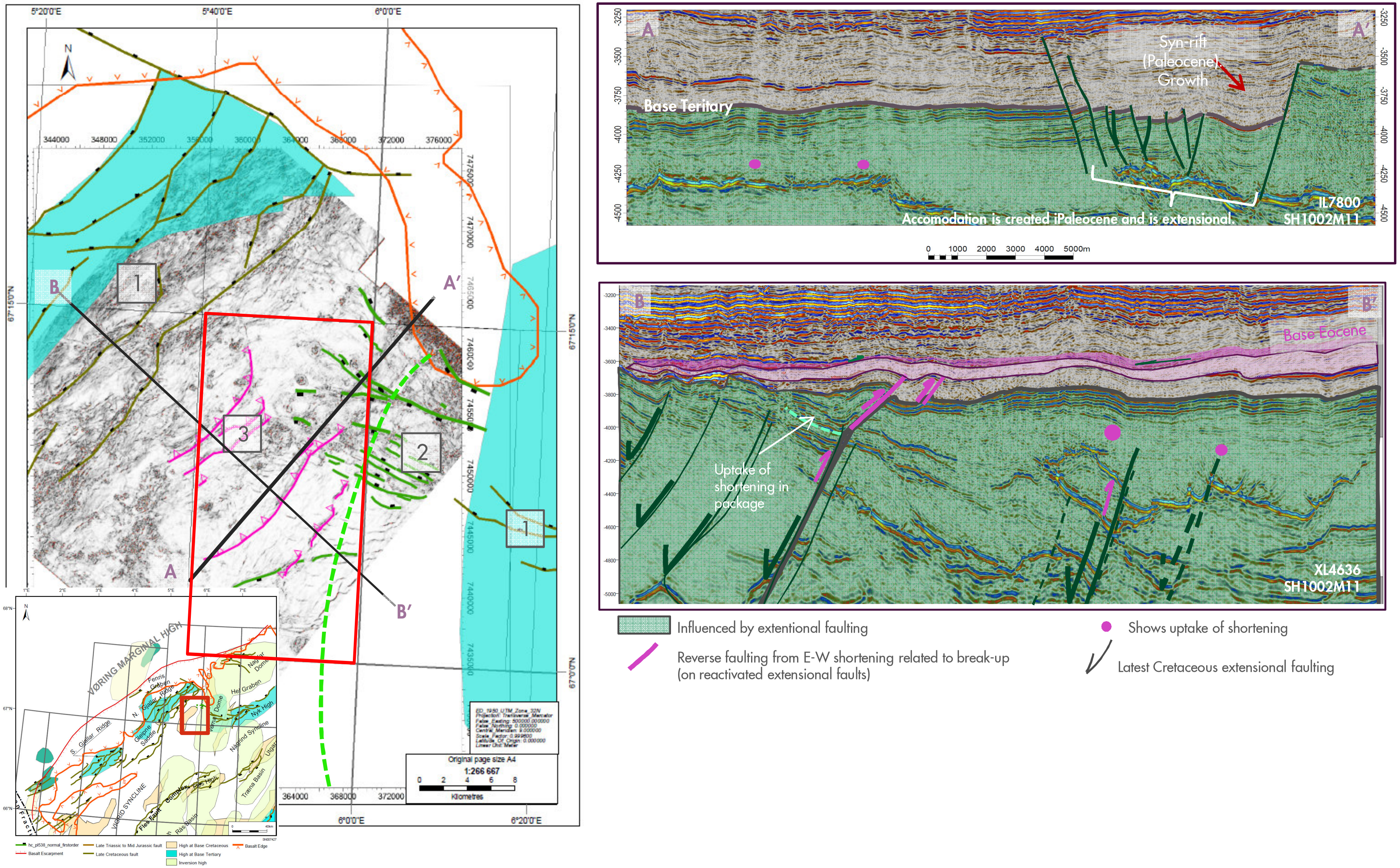



*Figure 3.2 Structural Events of PL538. Left: Observed faults in Licence: 1. Latest Cretaceous to Earliest Tertiary extension in brownish-green 2. Paleocene extensional faulting linking up Nyk and Gjallar area in green. 3. Thrusts related to shortening in pink.*
*Right: Uptake of localised shortening manifested as reverse faults and thin skinned imbricate faults and thrusts.*

## Distal/ Marginal Turbidite Reservoirs

The Vøring Basin recieved abundant sediment supply throughout the Upper Cretaceous. The observed variations in rifting rates controlled the presence and distribution of sandy intervals within the Upper Cretaceous, where the sandier intervals appear correlatable with rift minima or relative tectonic quiescence. The stratigraphic levels of interest for PL538 are the Lower and Upper Maastrichtian (Figure 3.3). Wells in the Vøring Basin have encountered several turbidite sands of Maasticthican age, both in the Lower and Upper Maastrichtian (Figure 3.4). The Maastrichtian reservoirs in PL538 are interpreted to represent the development of distal/marginal turbidite systems sourced from N-NW. (Figure 3.5). Santonian (Nise) turbidite systems are also likely to be present. The Campanian Nise sands are, however, expected to have shaled out to the east of PL538.

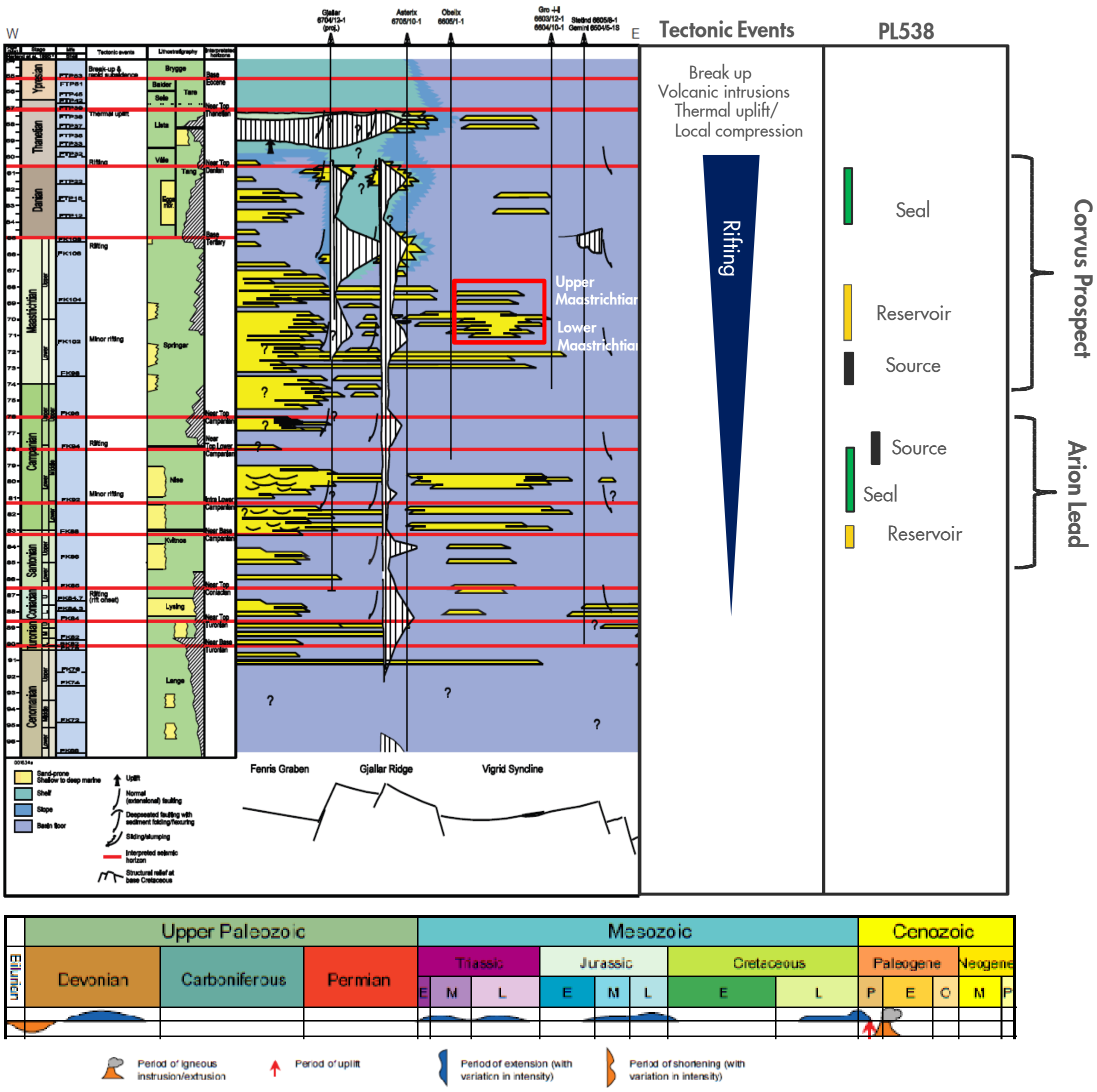



*Figure 3.3 Vøring Basin Stratigraphic Column*

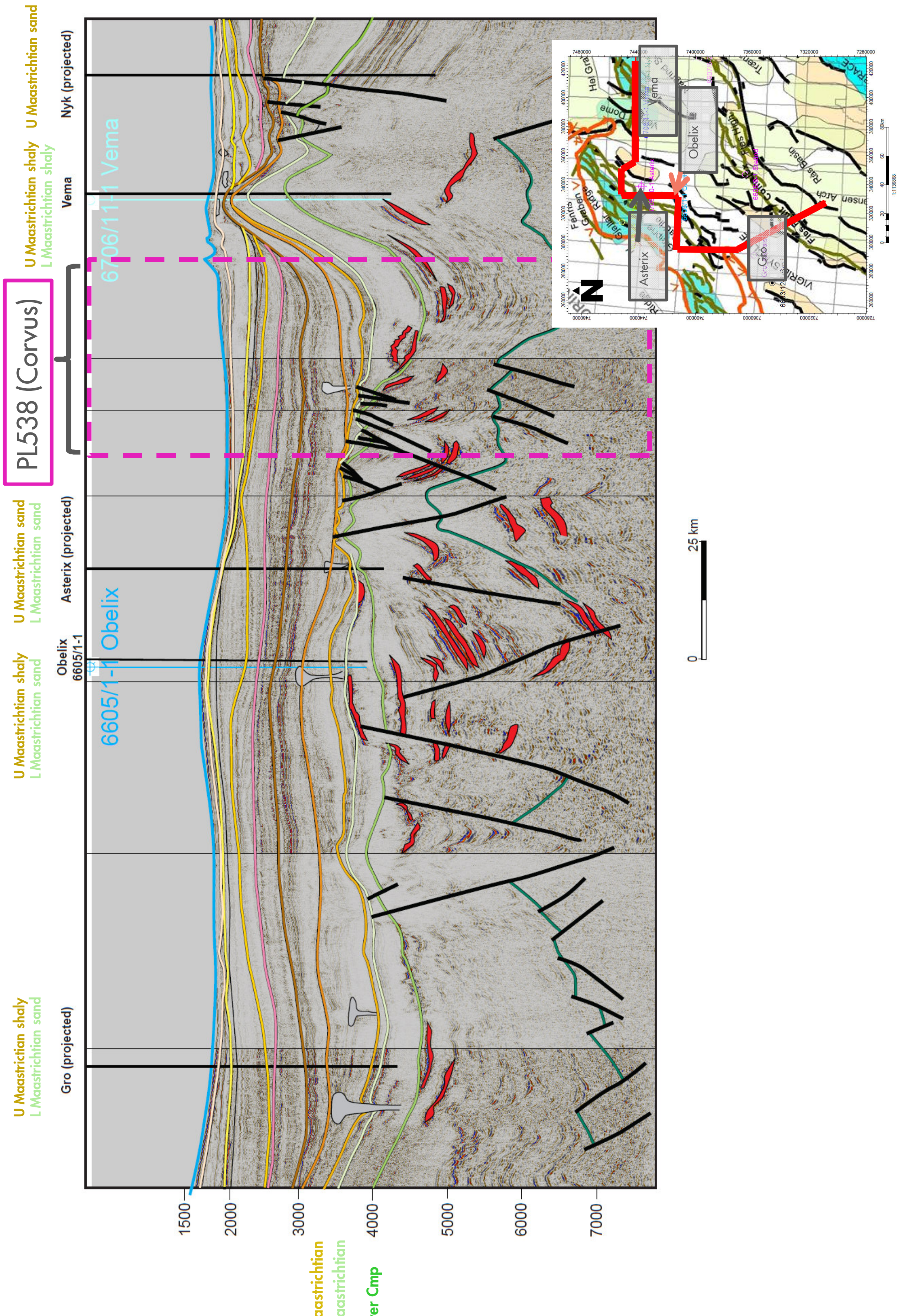



*Figure 3.4 Regional Transect for the Vigrid Syncline. Key Vøring Basin wells from south to north showing well calibration of the Lower and Upper Maastrichtian unit.*

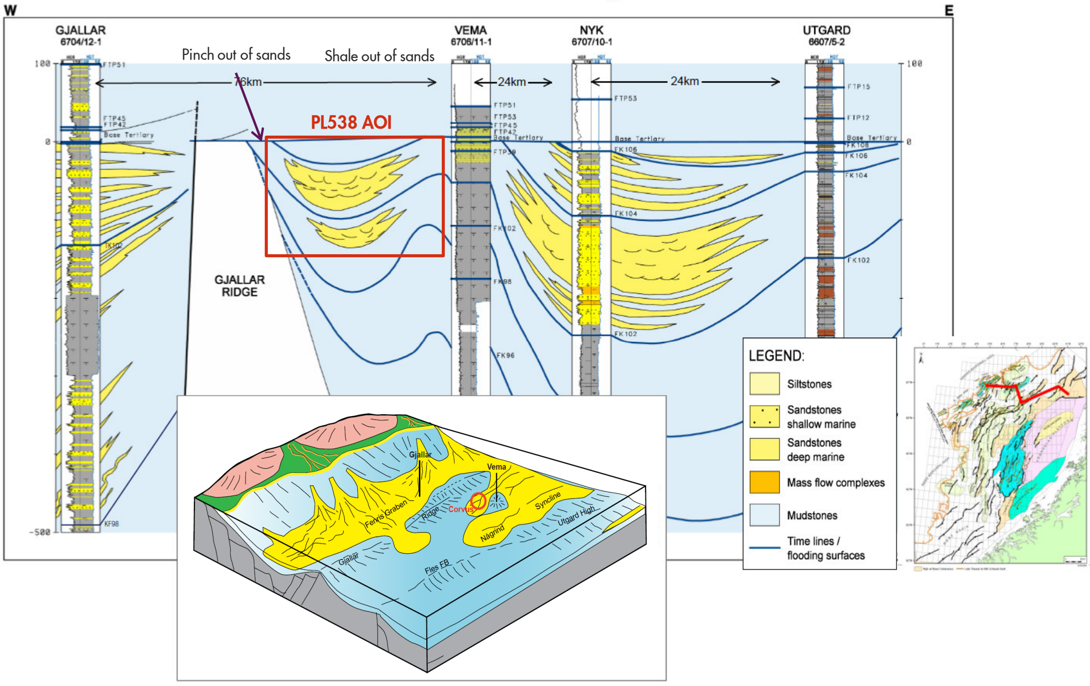



*Figure 3.5 Depositonal Model of Upper Maastrichtian*

## Volcanic Intrusions Related to Break-Up

Pre break-up volcanic activity in the Paleocene resulted in numerous volcanic intrusions masking the geology within the deeper intervals of the licence. New seismic- and well data have increased knowledge on the importance of hydrothermal vent complexes (HTVC) as potential charge routes as well as thief sands or escape routes for hydrocarbons. Within PL538 the presence and distribution of large and abundant HTVC appear to negatively impact seal and retention. New seismic data covering the PL538 area shows presence of a vast amount of sills and HTVC which are of major concern (Figure 3.6 and Figure 4.1).

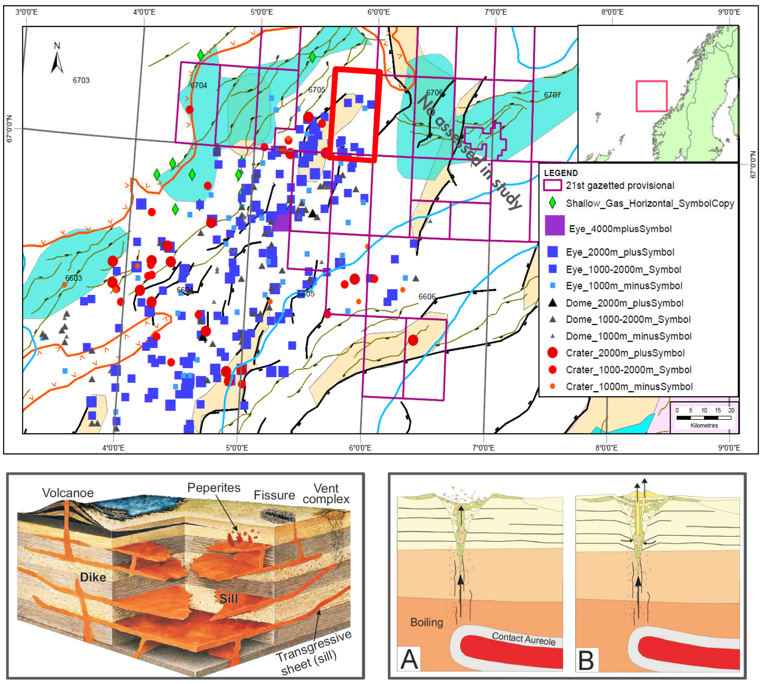



*Figure 3.6 HTVC in Vøring. Numerous Hydrothermal Vent Complexes (HTVC) are present across the basin. These pierce through reservoirs and represent leak risk. The size and frequency of the HTVC impact the significance and threat to seal breach.*

### Lean Mudstone Charge Model

Prospects within PL538 rely on charge from presumed lean Cretaceous mud- and claystones. Based on calibration to the Dalsnuten well, potential Jurassic source rocks are most likely buried too deep and have exceeded maturity before the deposition of Maastrichtian reservoirs. Well-results and basin modelling studies suggest charging from reservoir-embedding lean Cretaceous claystones as a viable alternative. However, the Upper Cretaceous lean source rocks are expected to expel poorly and therefore large drainage cells along with high quality carrier beds are required for sufficient charge access and focus (Figure 4.1).

# 4 Prospect Update

The PL538 prospect and lead inventory consist of one (1) prospect (Corvus) and one (1) lead (Arion).

**Corvus Prospect**

The Maastrichtian Corvus prospect is located in the syncline between the Vema High and the Gjallar Ridge. It is a four way dip-closure, with crest mapped at 3453m TVDSS (Figure 4.1). The volume base for this prospect is estimated to be 23 $*10^9$ $Sm^3$ of gas in place.

### Trap

The trap formed in response to local shortening, initially in the Paleocene and subsequently enhanced through Eocene - Miocene regional inversion.
The core structure is evaluated as robust, and is present on all versions of depth conversion. Any upside potential created by stratigraphic trapping mechanisms to the south and onto the Vema dome has been discarded by the 3D seismic evaluation.

### Reservoir

Expected reservoir is an Upper Maastrichtian turbidite unit (see Figure 3.3), observed on seismic as a single loop within a series of reflectors of the Maastrichtian megasequence (Figure 4.2). The Corvus reservoir is interpreted to be distal/marginal turbidite lobes and channels, comprising an thin, few ten's of metres, reservoir package. Reservoir development may range from high Net-to-Gross sand packagess in an overall shaly setting to a layered, thin-bedded unit.

### Charge

Corvus relies on charge from Upper Campanian to Maastrichtian lean clay- and mudstones. The additional possibility of migration from Campanian claystones exists, either via HTVCs or through faults, vertically or assisted by fractures generated by volcanic intrusions. A large fetch area is required to fill the structure if reliant on charge such a lean Cretaceous source rock. Present day configuration suggests that the Maastrichtian lean claystones provide a moderately sized fetch area only, hence the resulting risk of underfilling of large traps is high. (Figure 4.4).

### HC Retention/ Seal

Numerous hydrothermal vents (HTVC) add risk to seal integrity, by acting as thief sands and/or controlling the spill point of the structure. The mapped presence of HTVCs is outlined in Figure 4.1 and there are numerous of vents also within the closure of the Corvus prospect.

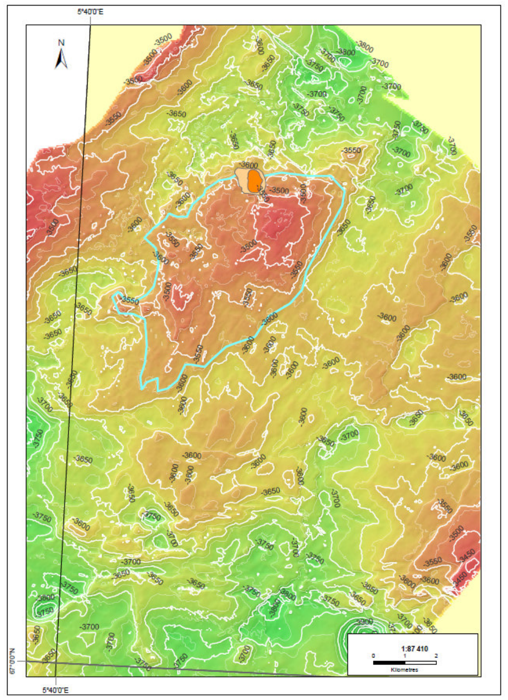
Daninan mudstones constitute the top seal. However, the possibility exist that the lithological unit above the inferred reservoir package, i.e Uppermost Maastrichtian, is silty and thus has the potential of forming a waste zone controlling the spill-point for the Corvus prospect. This uncertainty in hydrocarbon trapping and retention is recognised and has been accounted for in the prospect risking.

### QI Geophysics

QI scenario modelling predicts that a detectable amplitude difference should exist between gas and brine filled reservoirs. Such an effect is present in all modelled scenarios with varying but high reservoir thickness, Net-to-Gross and porosity. Amplitude maps for Corvus do not display the expected responses for a gas filled reservoir (Figure 4.3). Therefore, QI scenario modelling of moderate to high N/G sand package with hydrocarbons are not supported. However, a poor or thin reservoir cannot be excluded.

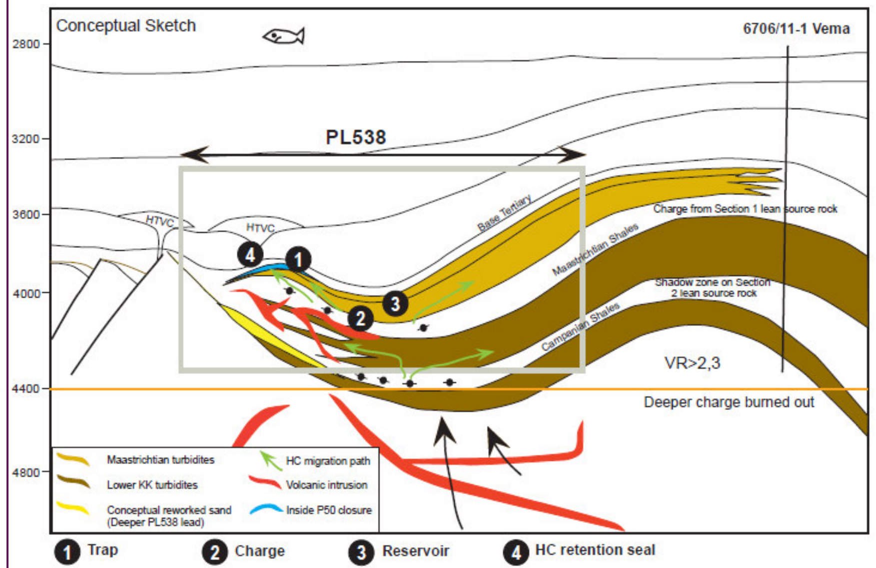
# Corvus Key Issues

## 1. Trap

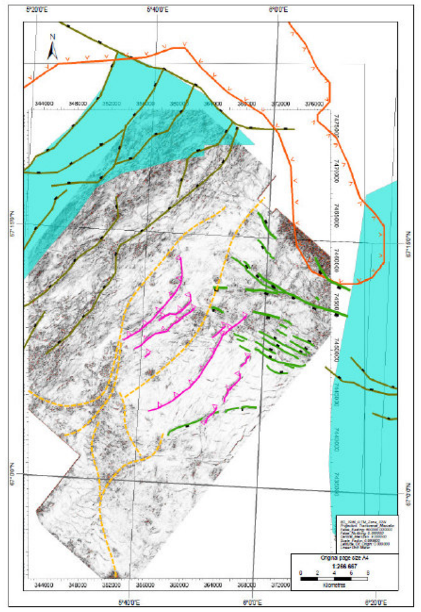


•Robust but small four way closure

•Formed in response to local shortening and enhanced through Eocene – Miocene regional inversion




## 2. HC Retention and seal

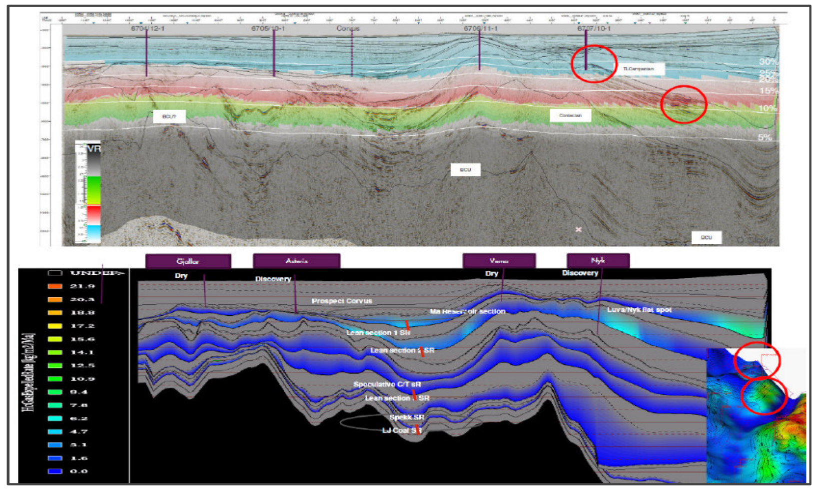


Numerous hydrothermal vents (HTVC) present and pose a significant risk to the HC retention. HTVC can act as thief sands and create issues with the top seal. In addition, HTVCs appear to control the spillpoint.

Daninan mudstones constitute the top seal

Package above Corvus has chance of being a waste zone for hydrocarbons

## 2. Charge



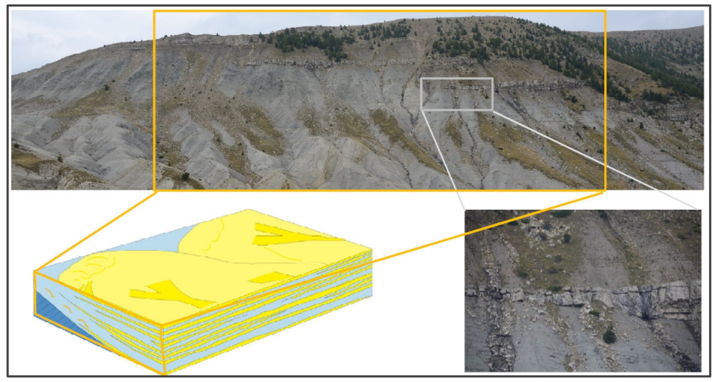
•Reliant on charge from Cretaceous lean shales as deep source rocks are modelled to be burned prior to main trap formation

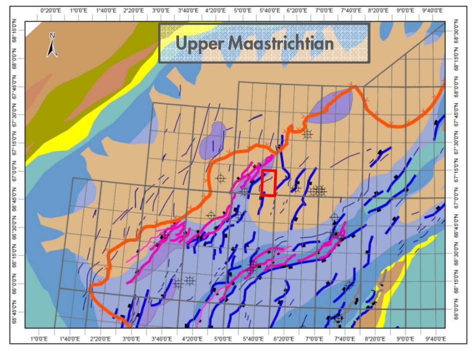
• Lean Cretaceous shales have possibility to expel sufficient charge to explain gas accumulations in the Vøring Basin. However, the expulsion efficiency remain largely uncertainty thus increasing risk for underfill of large structures. A large fetch area is needed to any fill upside potential of structure

•Furthermore, the expulsion rate for all modeled source rocks are on a decline when the trap starts to be formed.

**The risk of underfill is high for reasons 1) expulsion efficiency of lean shales and 2) timing of trap creation vs. timing of expulsion**

## 4. Reservoir






• Reservoir is interpreted to be Upper Maastrichtian distal/marginal turbidites

•Seen on seismic as a single loop.

*Figure 4.1 Overview of key elements for Corvus prospect. Figure illustrates key elements for the Corvus prospect.*

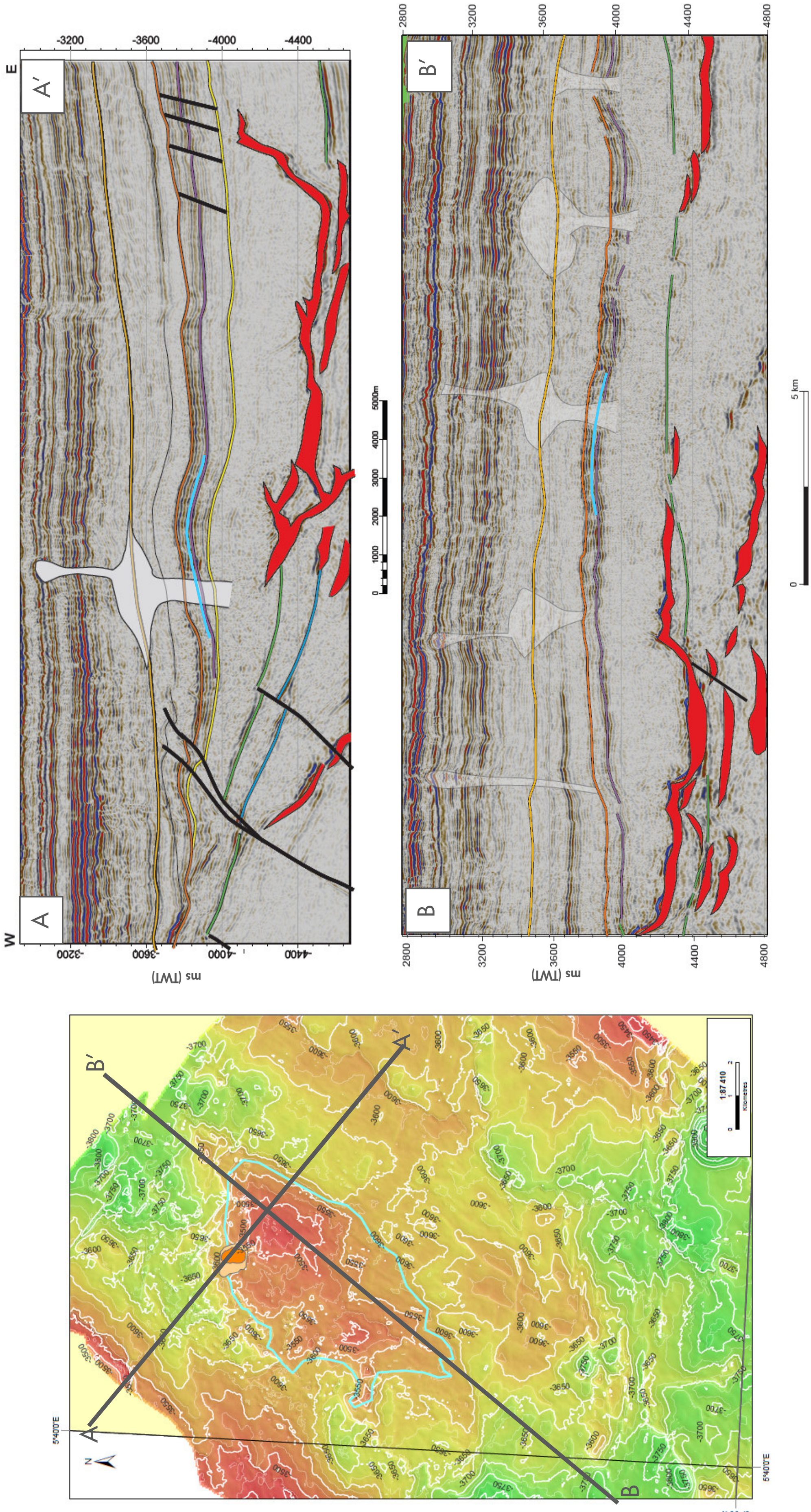
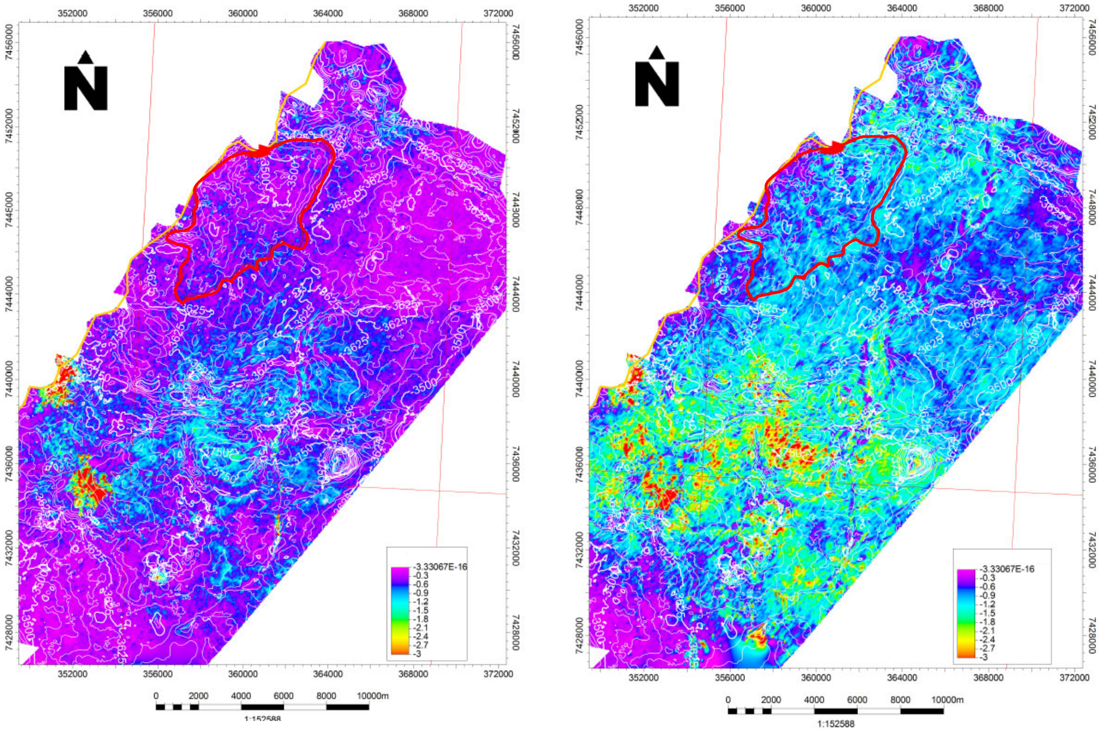



*Figure 4.2 Corvus Cross Sections.*



**SH1002 Near** **SH1002 Far**

*Figure 4.3 Corvus Amplitude Response. AVO is observed within the Corvus closure (marked in red). The amplidude response with offset does not have a updip/downdip change; the observed seismic response does not meet expectations for reservoir with gas.*

## Petroleum System

Timing of charge relative to trap formation and seal/retention is evaluated as the critical risk elements. The risk of underfill is high due to late timing trap formation relative to peak hydrocarbon expulsion (Figure 4.4). Further risk is added by the presumed low expulsion efficiency of lean source rocks.

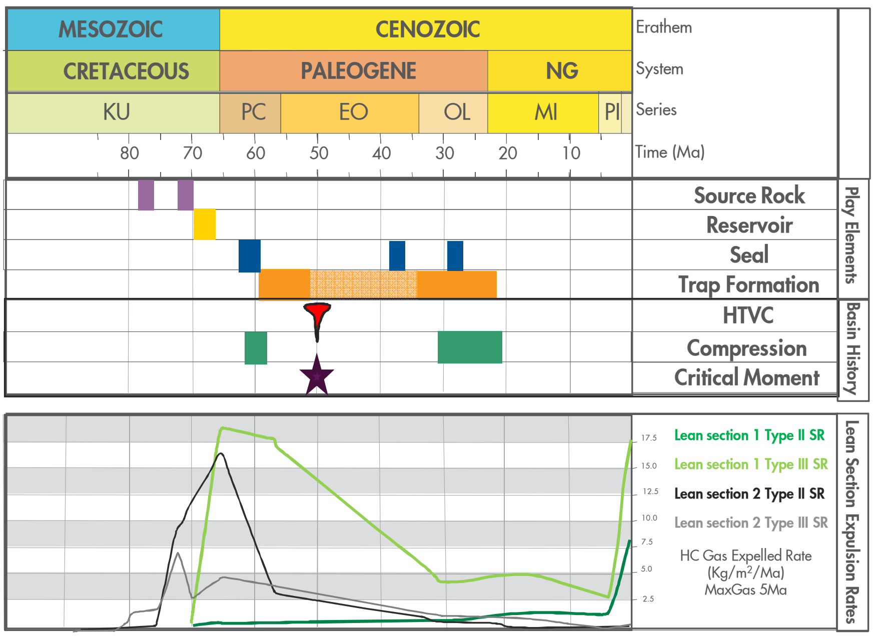



*Figure 4.4 Petroleum System - Corvus*

**Arion Lead**

The Santonian Arion Lead is located on the eastern flank of the Gjallar Ridge. It is defined as a combined structural-stratigraphic (onlap/shale-out and subcrop) trap, partly delineated by amplitude.

**Trap**

The Arion Lead is structurally compartementalized, defined by a series of smaller fault-block structures. Reservoir is expected present only across parts of the structures, the stratigraphic component of the lead defined by a combination of reservoir pinch-/shale-out and truncation. A 13km truncation/erosion along the Gjallar Ridge defines the updip closure of the trap. The small fault block compartments within the lead outline appear to define separate accummulations with individual spill-points (Figure 4.5).

**Reservoir**

Reservoir development within the Santonian to Lower Campanian remains challenged and poorly calibrated in this part of the Vøring Basin, resulting in poorly constrained depositional models. The reservoir is interpreted to be a Lower Nise equivalent, with the turbidite sandstones of expected to form a separate, relatively high Net-to-Gross submarine fan, sourced from the NW (Figure 4.5). The time equivalent stratigraphy in the Vema well is represented by a silty interval with only thin-bedded turbidite sandstone, suggesting shale-out of the Santonian-Lower Campanian onto the Vema structure.

**Charge**

Lean Coniacian to Lower Campanian claystones are modelled as source for hydrocarbons charging the lead (Figure 4.5 and Figure 4.4).

**HC Retention/ Seal**

The sealing capacity of the 13km stratigraphic (subcrop) trapping component carries considerable risk, manifested by 1) variations in termination style and 2) ability of seal to retain a 800m+ column length required to account for the observed amplitude distribution (Figure 4.5). Based on this, the chance of preservation of seal integrity along the stratigraphic component is expected to be low.

**Compart-mentalization**

E-W trending faults create smaller traps withing the larger area of amplitude response, and these are evaluated to have potential to trap smaller gas accumulations.

**QI Geophysics**

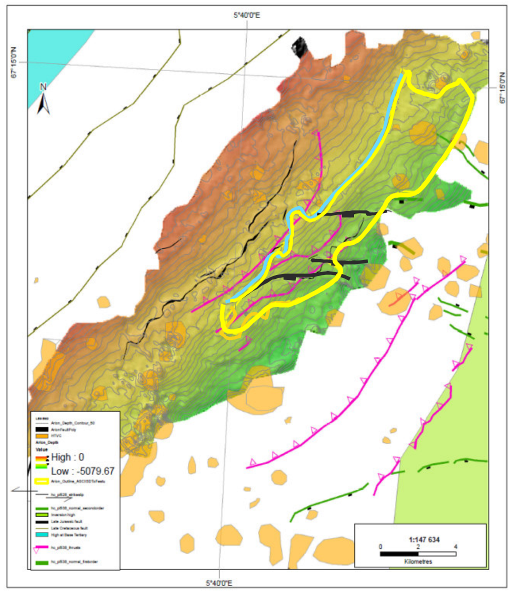
QI scenario modelling for the Arion lead supports potential for localised hydrocarbon accumulations in the structurally defined closures only, wheras brine-fill is supported within the larger stratigraphically-defined lead area. The QI scenario modelling favours a medium to high N/G sand present in the lead (Figure 4.6). Amplitudes are not conformable to structure, but appear to be more prominent along identified small scale faults, in turn supporting the presence of a series of smaller structurally-controlled, hydrocarbon accummulations, potentially along migration fairways.

**Petroleum System**

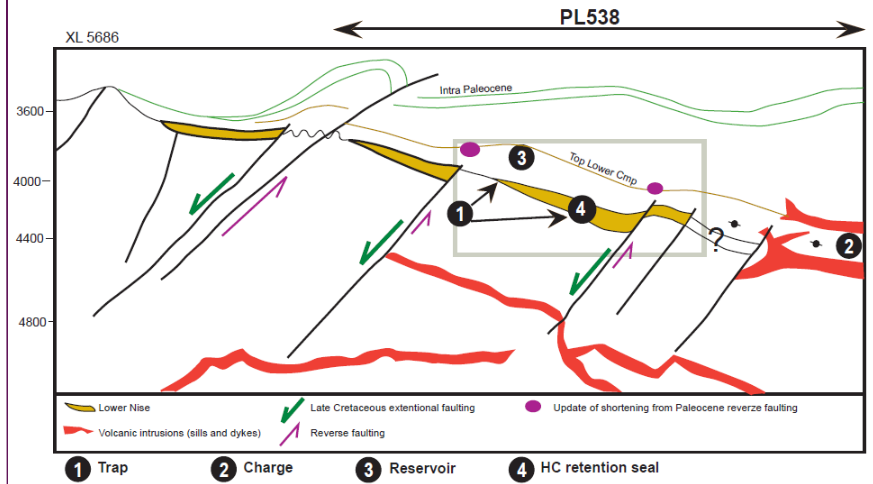
The main concerns for the Arion lead revolve around sealing capacity of the stratigraphic trapping mechanism and hydrocarbon retention issues related to faults and HTVCs present within the lead area. Furthermore, the expulsion rate from the Coniacian to Lower Campanian claystones are modelled to rapidly decline upon onset of trap formation thereby imposing an additional risk on underfilling (Figure 4.7).

# Arion Key Issues

## 1. Trap




•Combined stratigraphic/structural trap. Upflank truncation/erosion (blue line)
Series of small fault block compartments
•Lead outlined in yellow



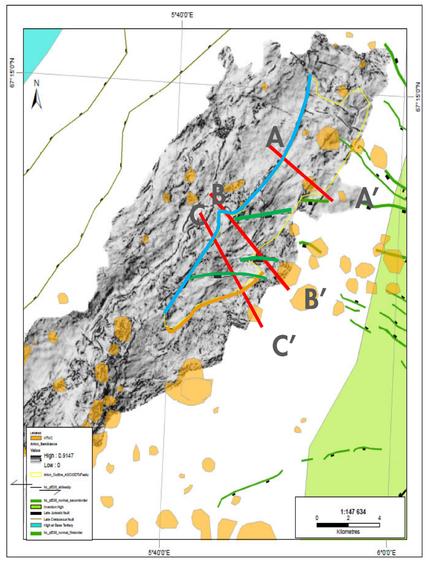

## 2. Charge

Charge is not proven for this stratigraphic level of the Vøring Basin. However, basin modeling show that charge can be received from Cretaceous claystones.

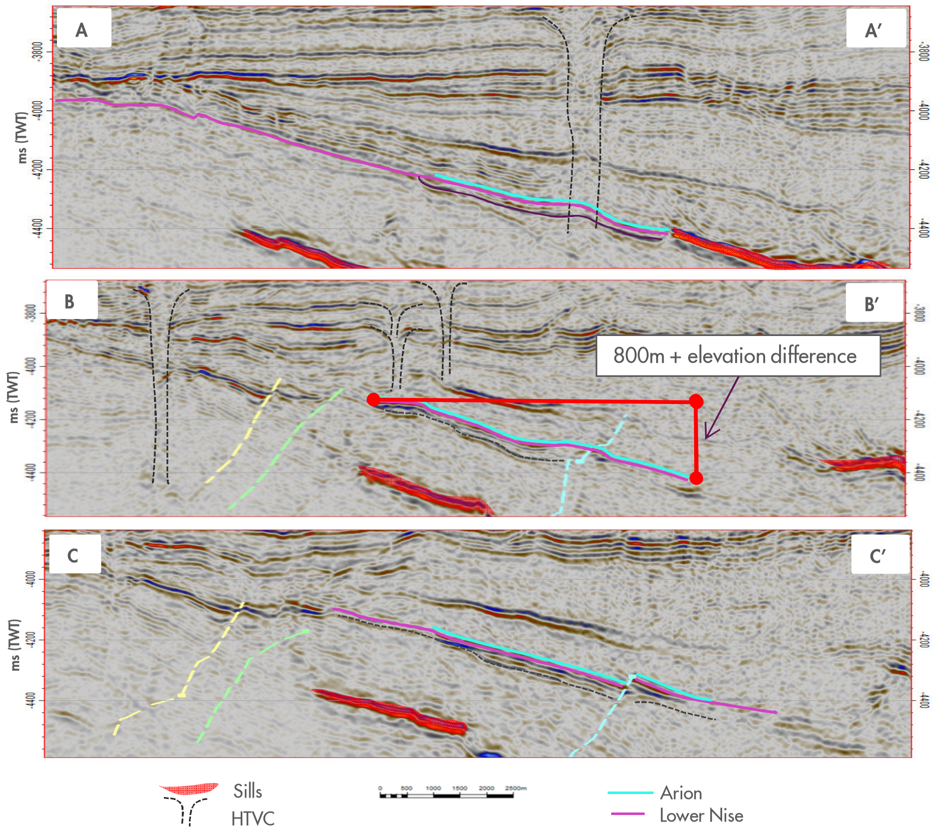
Expulsion efficiency of claystones remain uncertain.

See Corvus description for further detail.

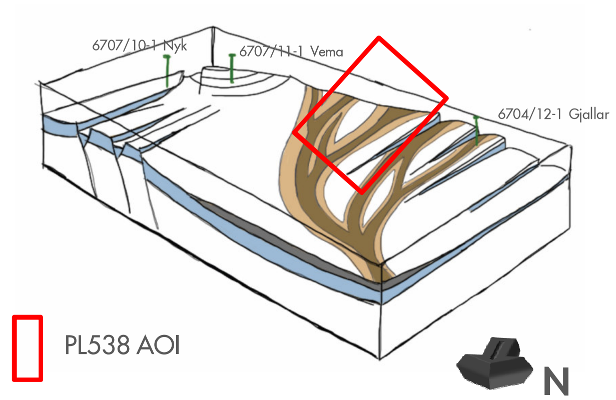
## 3. HC Retention and seal




•Lean relies on a 13km stratigraphic mechanism updip trapping mechanism (marked by blue line above). Seal breach is a concern.
•Fault seal create small compartments of possible localized gas accumulations (green lines). Hints of flatspot development encourage that faults are sealing.
•Risk of leakage through faults
•HTVCs are considered a risk for hydrocarbon retention, especially in the north and along updip boundary of lead (marked on seismic section and outlined in orange).




## 4. Reservoir




Lack of calibration give inherent uncertainty to depositional models.

Marine sand sequences are sourced from NW (Greenland). The conceptual block diagram above is interpreted Santonian denpostional environment, with deep water marine deposits developed in the Gjallar fault blocks and in PL538 area.

*Figure 4.5 Key Elements Arion Lead.*

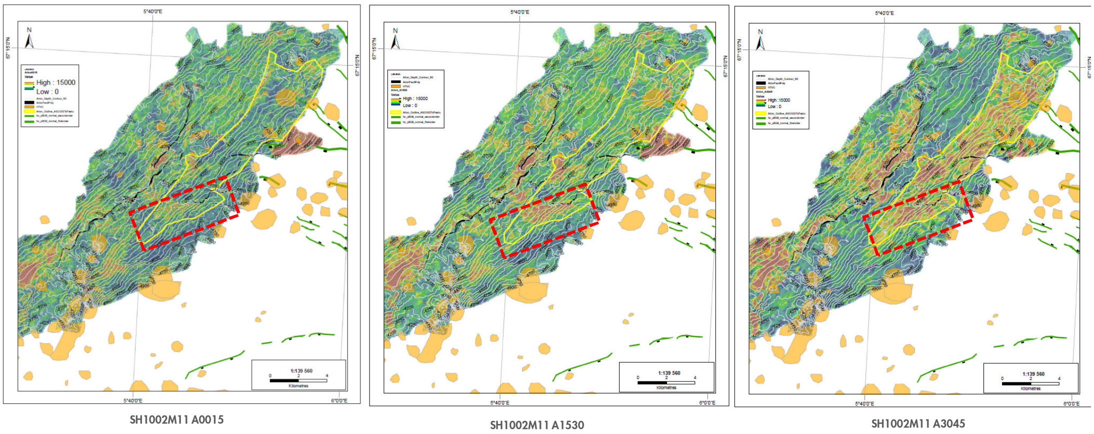



*Figure 4.6 Arion Amplitude Response. QI studies predict a medium to high net-to-gross sand with positive AVO behavior for gas/brine. Amplitudes are not conform to structure, and are more prominent along small scale faults (in red box) Localized gas accumulations are thus considered likely.*

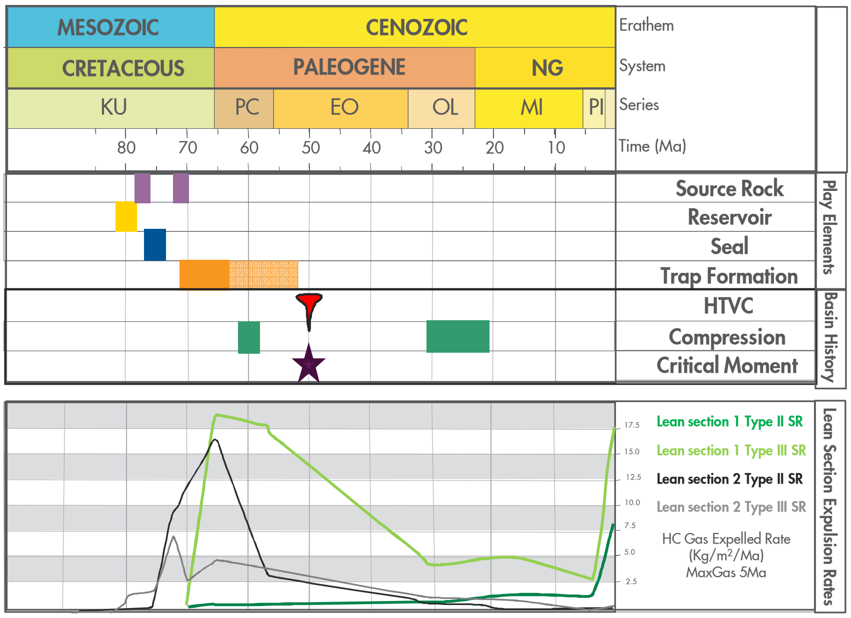



*Figure 4.7 Arion Petroleum System*

# 5 Technical Evaluations

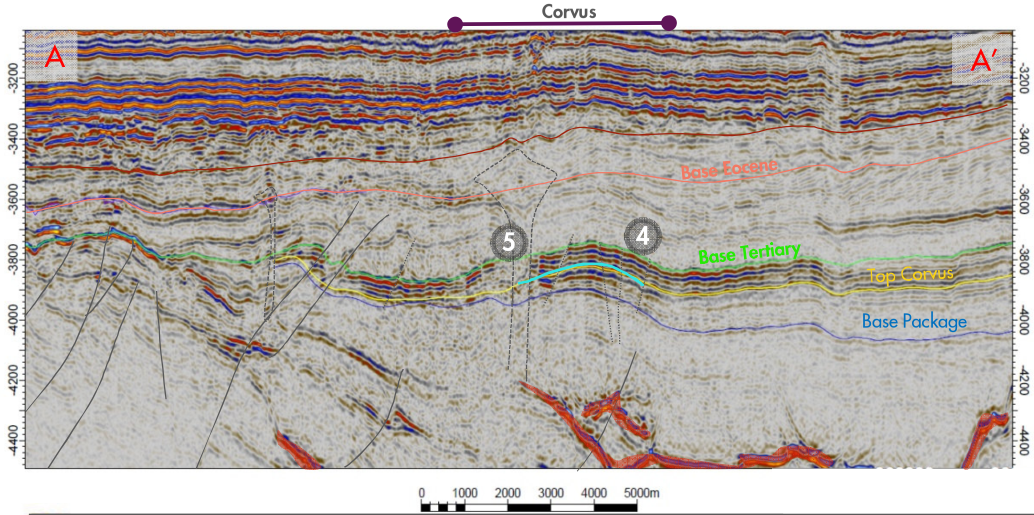
PL538 contains one prospect, **Corvus**, and one lead, **Arion**. The Maastrichtian Corvus prospect formed the basis for the 20th Round Application and has been the main target for PL538 technical evaluations. The stratigraphically deeper, presumed Santonian Arion lead was identified as part of the prospectivity evaluation of PL538.

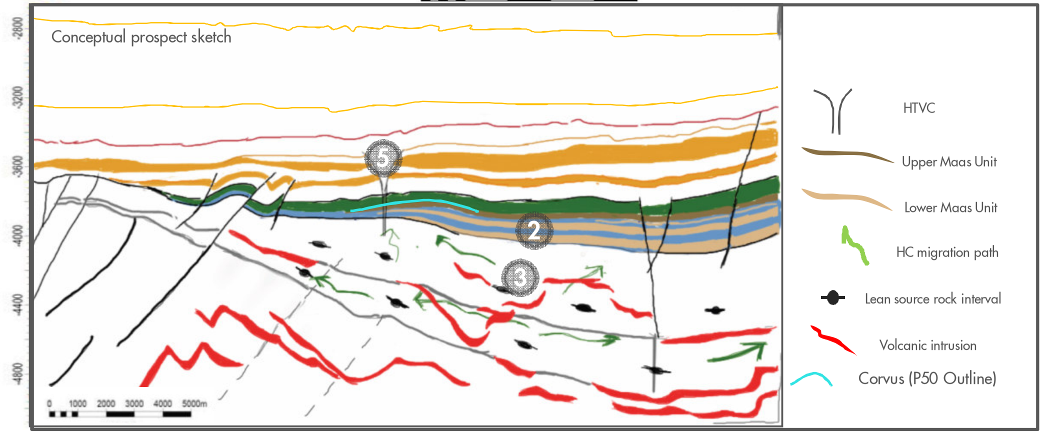
The technical evaluations conclude that:

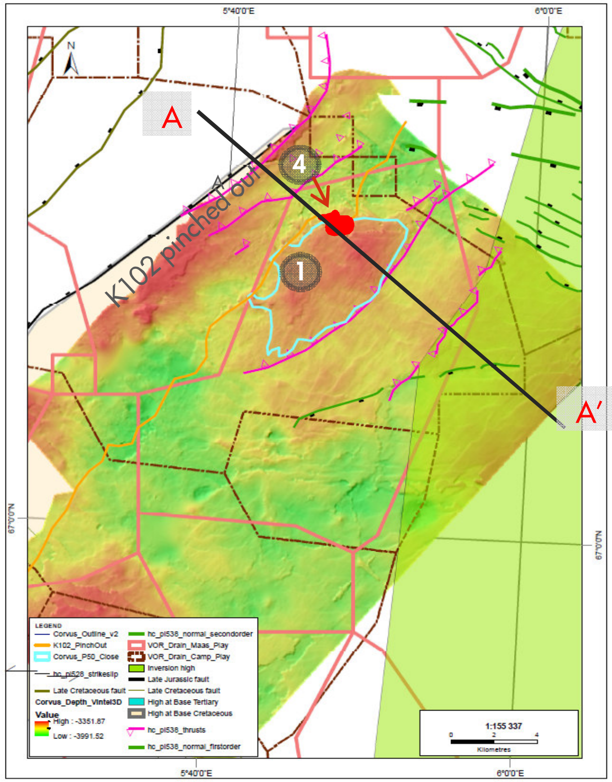
1. Corvus is not a drill-worthy candidate
2. The lead status of Arion cannot be upgraded to prospect
3. The Campanian interval which has been carried as potentially interesting for hydrocarbon accumulations is difficult to define due to the impact of vast amount of volcanic intrusions present within PL538

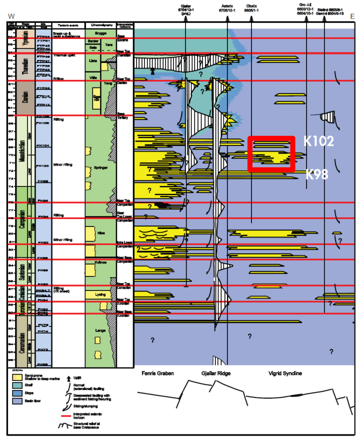
An updated Corvus prospect sheet is found in Figure 5.1 with Corvus prospect data listed in Table 5.1.Table 5.1
These conclusions are based on a thorough technical evaluation, which entails seismic interpretation, integration with well results, new basin modelling studies and quantitative geophysics. The impact of these technical evaluations are outlined in Chapter 4 (4 Prospect Update) and can be summarized as follows:

- Presence of numerous hydrothermal vents (HTVC) throughout PL538 area add significant risk to both hydrocarbon retention and seal integrity
- Jurassic source rocks not considered relevant for PL538
- Modelled Cretaceous lean source rocks requires large fetch areas expelling hydrocarbons over a considerable time period subsequent to trap formation. Present day configuration of potential Cretaceous source rocks have only moderate fetch areas resulting in an increased risk related to underfilled trap
- Seismic forward modelling does not support presence of hydrocarbons within the assessed Corvus prospect




| Scoping Volumes (subject to change in Step 3 discussions) | | | | |
|---|---|---|---|---|
| | P90 | P50 | Mean | P10 |
| GIIP [$10^9$ $m^3$] | 7.7 | 17 | 23 | 39.7 |
| UR [$10^9$ $m^3$] | 1 | 7 | 8 | 13.8 |
| | | | | |

**Play: Upper Maastrictian**

**Trap:** Four way dip closure (1)

**Reservoir:** Upper Maastrichtian turbidites (K102 eq) (2)

**Charge:** Embedded lean Type II/III shale (3)

**Seal:** Danian mudstones (4)

**Other:** Infected by HTVC and sill intrusion (5)

**Main Risks:** Charge and retention

4

*Figure 5.1 Corvus Prospect Summary Sheet.*

Table 5.1. Corvus Prospect Data.

## Table 1: Prospect data

<table>
<tr><td>Block</td><td colspan="2">Prospect name</td><td colspan="2">Discovery/Prosp/Lead</td><td>Prosp ID (or New!)</td><td>NPD approved?</td></tr>
<tr><td>6705/12</td><td colspan="2">Corvus</td><td colspan="2">Prospect</td><td>NPD will insert data</td><td>NPD will insert data</td></tr>
<tr><td>Play (name /new)</td><td colspan="2">Structural element</td><td colspan="3">Company/ reported by / Ref. doc.</td><td>Year</td></tr>
<tr><td>NPD will insert data</td><td colspan="2">Vigrid Syncline</td><td colspan="3">Shell / Relinquishment Report</td><td>2012</td></tr>
<tr><td>Oil/Gas case</td><td colspan="6">Resources IN PLACE</td></tr>
<tr><td>Gas</td><td colspan="3">Main phase</td><td colspan="3">Ass. phase</td></tr>
<tr><td></td><td>Low</td><td>Base</td><td>High</td><td>Low</td><td>Base</td><td>High</td></tr>
<tr><td>Oil $10^6$ $Sm^3$</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Gas $10^9$ $Sm^3$</td><td>7.7</td><td>23</td><td>39.7</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td></td><td colspan="6">Resources RECOVERABLE</td></tr>
<tr><td></td><td colspan="3">Main phase</td><td colspan="3">Ass. phase</td></tr>
<tr><td></td><td>Low</td><td>Base</td><td>High</td><td>Low</td><td>Base</td><td>High</td></tr>
<tr><td>Oil $10^6$ $Sm^3$</td><td>-</td><td>-</td><td>-</td><td>0.16 (cond)</td><td>0.7 (cond)</td><td>1.3 (cond)</td></tr>
<tr><td>Gas $10^9$ $Sm^3$</td><td>1.15</td><td>7</td><td>13.8</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td></td><td colspan="2">Which fractiles are used as:</td><td>Low:</td><td>P90</td><td>High:</td><td>P10</td></tr>
<tr><td>Type of trap</td><td colspan="2">Water depth (m)</td><td colspan="2">Reservoir Chrono (from - to)</td><td colspan="2">Reservoir Litho (from - to)</td></tr>
<tr><td>Structural</td><td colspan="2">1390</td><td colspan="2">Maastrichtian</td><td colspan="2">Springar</td></tr>
<tr><td>Source Rock, Chrono</td><td colspan="2">Source Rock, Litho</td><td colspan="2">Seal, Chrono</td><td colspan="2">Seal, Litho</td></tr>
<tr><td>U.Cretaceous</td><td colspan="2"></td><td colspan="2">Early Tertiary/Danian</td><td colspan="2"></td></tr>
<tr><td>Seismic database (2D/3D):</td><td colspan="6">SH1002 and SH1002M11</td></tr>
<tr><td colspan="7">Probability of discovery:</td></tr>
<tr><td>Technical (oil+gas case)</td><td colspan="3">12.6</td><td colspan="2">Prob for oil/gas case</td><td>0/100</td></tr>
<tr><td rowspan="2">Probability (fraction):</td><td>Reservoir (P1)</td><td colspan="2">Trap (P2)</td><td colspan="2">Charge (P3)</td><td>Retention (P4)</td></tr>
<tr><td>0.6</td><td colspan="2">1</td><td colspan="2">0.6</td><td>0.35</td></tr>
<tr><td>Parametres:</td><td>Low</td><td colspan="2">Base</td><td colspan="2">High</td><td>Comments</td></tr>
<tr><td>Depth to top of prospect (m)</td><td></td><td colspan="2">3450</td><td colspan="2"></td><td></td></tr>
<tr><td>Area of closure ($km^2$)</td><td>-</td><td colspan="2">30</td><td colspan="2">-</td><td></td></tr>
<tr><td>Reservoir thickness (m)</td><td>20</td><td colspan="2">35</td><td colspan="2">48</td><td></td></tr>
<tr><td>HC column in prospect (m)</td><td>-</td><td colspan="2">120</td><td colspan="2">-</td><td></td></tr>
<tr><td>Gross rock vol. ($10^9$ $m^3$)</td><td>1.5</td><td colspan="2">3.5</td><td colspan="2">4.7</td><td></td></tr>
<tr><td>Net / Gross (fraction)</td><td>0.33</td><td colspan="2">0.6</td><td colspan="2">0.8</td><td></td></tr>
<tr><td>Porosity (fraction)</td><td>0.16</td><td colspan="2">0.2</td><td colspan="2">0.25</td><td></td></tr>
<tr><td>Water Saturation (fraction)</td><td>-</td><td colspan="2">0.25</td><td colspan="2">-</td><td></td></tr>
<tr><td>Bg. (<1)</td><td>0.0035781</td><td colspan="2">0.0037996</td><td colspan="2">0.0039142</td><td></td></tr>
<tr><td>Bo. (>1)</td><td>-</td><td colspan="2">-</td><td colspan="2">-</td><td></td></tr>
<tr><td>GOR, free gas ($Sm^3$ /$Sm^3$ )</td><td>-</td><td colspan="2">-</td><td colspan="2">-</td><td></td></tr>
<tr><td>GOR, oil ($Sm^3$ /$Sm^3$ )</td><td>-</td><td colspan="2">-</td><td colspan="2">-</td><td></td></tr>
<tr><td>Recovery factor, main phase</td><td>0.1</td><td colspan="2">0.3</td><td colspan="2">0.6</td><td></td></tr>
<tr><td>Recovery factor, ass. phase</td><td>-</td><td colspan="2">-</td><td colspan="2">-</td><td></td></tr>
<tr><td>Temperature, top res (deg C):</td><td>90°C</td><td colspan="2">Pressure, top res (bar) :</td><td colspan="2"></td><td></td></tr>
</table>

**Develeopment Scenarios**
The current view on the PL538 portfolio warrants no further studies regarding possible development for the remaining prospects.

# 6 Conclusions

The prospectivity of PL538  has been evaluated and concluded based on licence spesific studies incorporated into the overal regional evaluation of the Vøring Basin:

In summary, the Corvus Prospect is regarded to have limited volumes and a relatively low probability of finding hydrocarbons.

The limited volume base is a result of:

- Limited size of trap
- Charge of underfilling

Main risk elements resulting in the low probability of success (POS) for the Corvus prospect are:

- Possibility of seal breach at first hydrothermal vent
- Expulsion rate for all modelled source rocks are on a decline when the trap starts to form

The PL538 partnership has therefore unanimously agreed that 1) a drillworthy prospect cannot be identified in the licence, and 2) that PL538 should be discontinued.

# 7 References


- 20th Round Application Document
- Hand-out material from all relevant meetings - Work meetings, Exploration Committee and Management Committee Meetinhs available on "Licence to Share"