

PROJECT NAME / CONTRACT NUMBER:

DATE OF CLASSIFICATION:

04.01.2011

DOCUMENT ID:

EPN-EXPLO-G-RG-000977 , HB#110325

TITLE OF DOCUMENT

PL469 Licence Relinquishment Report

	AUTHOR	CHECKED	PASSED
NAME	[REDACTED]		
DATE			
SIGNATURE			

REV.	DATE	REASON FOR ISSUE	PREPARED	VERIFIED	APPROVED
1	04.01.2011	[REDACTED]			

REVISION: 1	This document is the property of GDF SUEZ E&P Norge AS. It must not be disclosed, used or reproduced, in full or in part, without the written authorisation of GDF SUEZ E&P Norge AS.
DATE: 04.01.2011	

Table of Contents

1	Key license history	3
2	Database	4
3	Review of geological framework	5
4	Prospect update	7
5	Technical evaluations	10
6	Conclusions	11

1 Key license history

The Production License PL469 (Figure 1) was awarded on February 28th, 2008 to GDF SUEZ E&P Norge AS (operator, 70%) and Discover Petroleum AS (30%). Since 01.03.2008 until today, the licensees are the operator GDF SUEZ (52.5 %), Det norske oljeselskap ASA (25 %, formerly Aker Exploration AS) and Front Exploration (22.5 %, formerly Discover Petroleum AS). The initial license period was extended by one year and expired February 28th 2011. Reason for the extension was delayed rig availability for well 6407/12-2. The PL469 work commitment was to drill 1 (one) firm exploration well 50m into Cretaceous and this is fulfilled.

Several license meetings were held since the award of PL469: 04/2008 (MC), 06/2008 (EC), 12/2008 (EC/MC), 01/2009 (EC), 03/2009 (EC/MC), 05/2009 (MC), 06/2010 (EC/MC), 12/2010 (EC/MC). A close cooperation between the partners beside the license meetings was existent especially in 2009/2010.

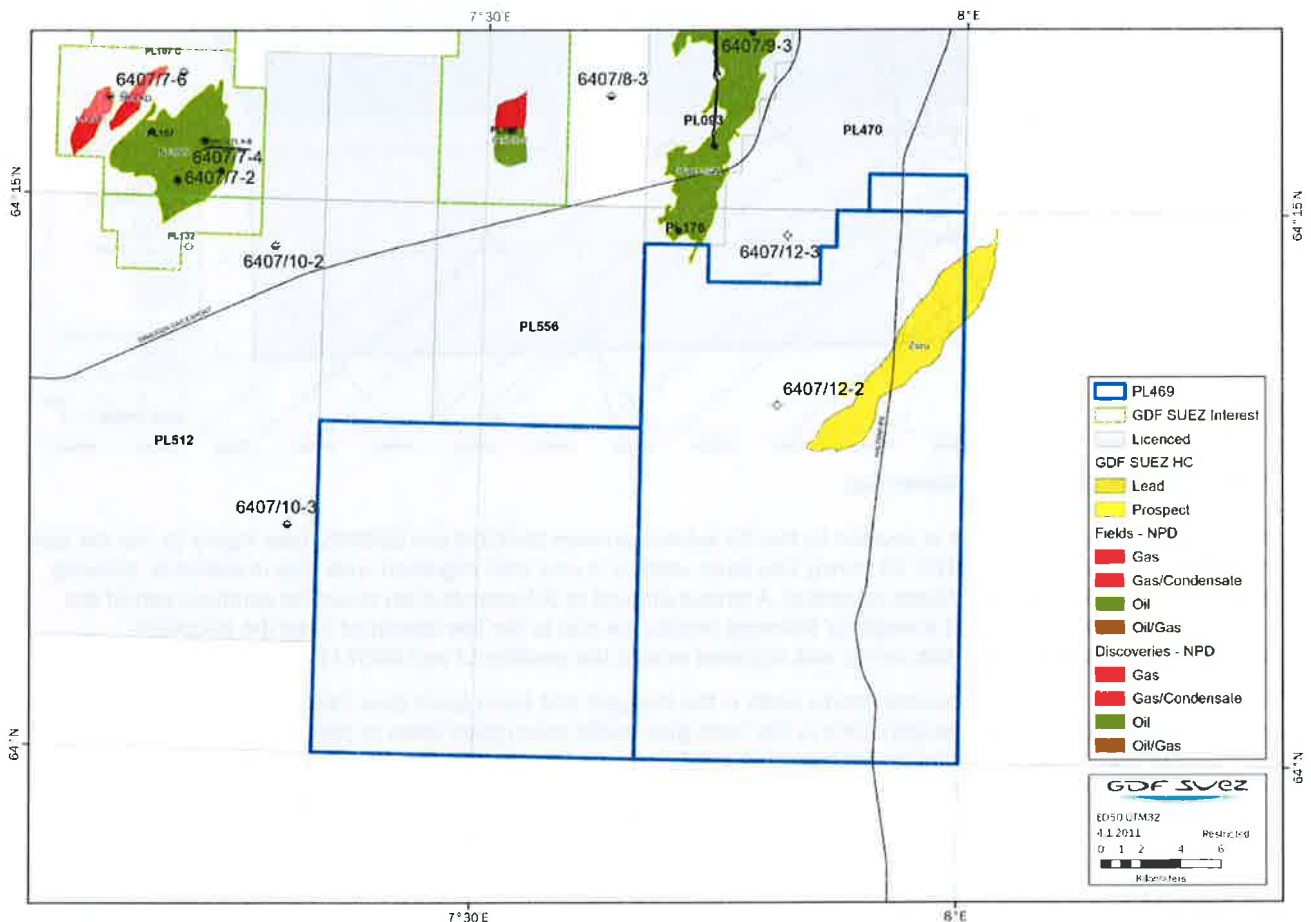


Figure 1: PL469 license overview map, January 2011

The Pumbaa well 6407/12-2 spudded 23.11.2009 and was completed 21.12.2009. The well was dry. Two Jurassic leads: Timon and Zazu were identified within PL469. The Timon lead was partly located within the neighbouring license PL470 and was recently drilled by well 6407/12-3 operated by Centrica (their Careus prospect). The well was dry. The Jurassic reservoirs were present but water-bearing. This underlines the difficulty to migrate hydrocarbons into the area east/southeast of Draugen field. The last remaining lead in PL469, the Jurassic Zazu lead, becomes even more challenging now and is not seen as a viable target for future exploration activities in the license.

Therefore the shareholders of PL469 relinquish the license.

2 Database

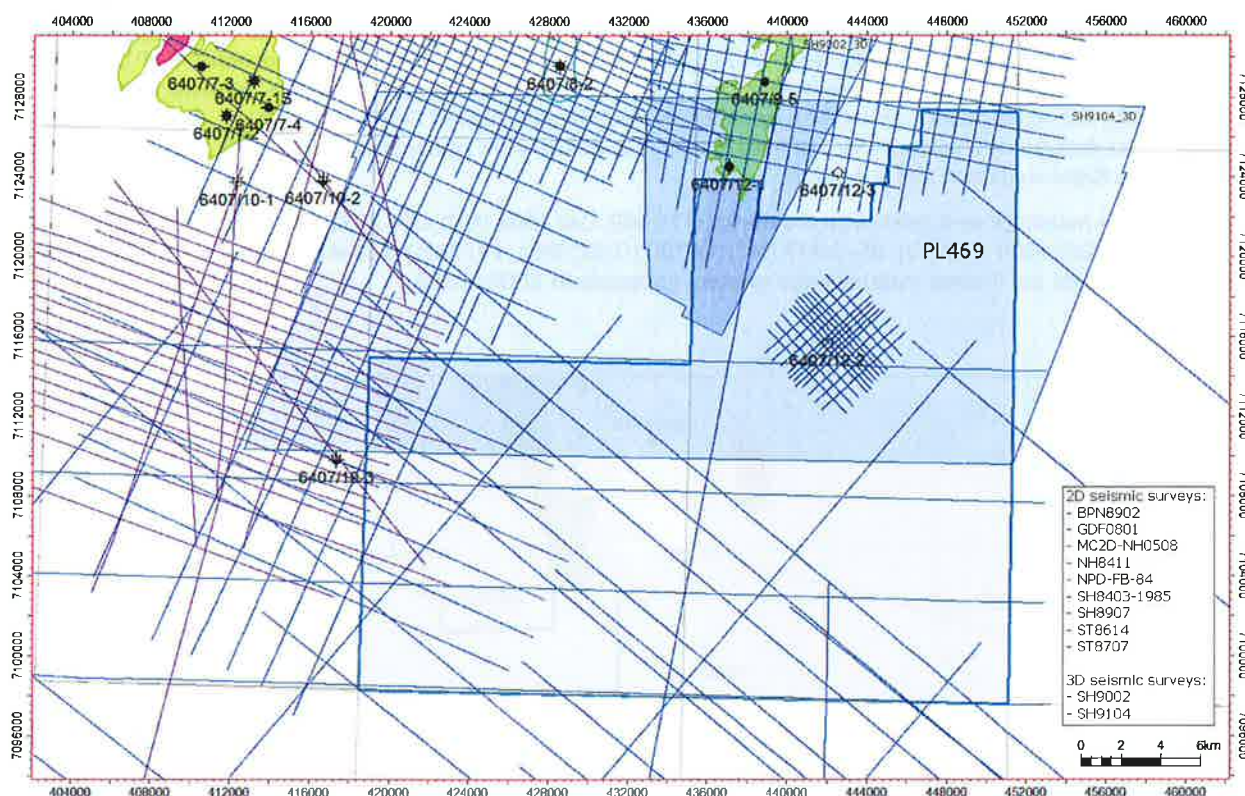


Figure 2: Seismic and well database map

The northern part of the license is covered by the 3D seismic surveys SH9104 and SH9002 (see Figure 2). For the license evaluation it is mainly the SH9104 3D survey has been used. It is only final migration cube that is available, allowing seismic interpretation and amplitude extraction. A limited amount of 2D-seismic lines cover the southern part of the license. The 2D seismic is good enough for following trends, but due to the low density of lines the structural interpretation is limited. A well site survey was acquired around the position of well 6407/12-2 in 2008.

The well database consists of several nearby wells in the Draugen and Njord fields (see Table 1); they are all located west and north of the license. The Draugen wells in the north give useful information down to the Middle/Early Jurassic, whereas the Njord wells are useful for calibration of the Triassic/older successions. The well 6407/12-2 was drilled within the license in 2009. The well 6407/12-3 was drilled in 2010 and is not part of the well database for license PL469.

Well	Year	Deepest Formation	TD (m TVD)	Contents	Operator
6406/8-1	1988	Åre Formation	4910	Shows	Elf Petroleum Norge
6407/8-2	1994	Grey Beds	1950	Oil/Gas	BP
6407/8-3	1997	Åre Formation	1960	Shows	BP
6407/9-1	1984	Rogn Formation	2500	Oil	A/S Norske Shell
6407/9-3	1985	Rogn Formation	1868	Oil	A/S Norske Shell
6407/9-5	1985	Middle Jurassic	1819	Oil	A/S Norske Shell
6407/9-8	1992	Tilje Formation	2126	Shows	A/S Norske Shell
6407/9-9	1999	Tilje Formation	1919	Oil/Gas	A/S Norske Shell
6407/10-1	1987	Grey Beds	3346	Gas shows	Norsk Hydro
6407/10-2	1990	Tilje Formation	3824	Shows	Norsk Hydro
6407/10-3	1992	Basement	2972	Shows	Norsk Hydro
6407/12-1	1999	Garn Formation	1803	Oil	A/S Norske Shell
6407/12-2	2009	Lange Formation	1481	dry	GDF SUEZ E&P Norge AS

Table 1: Well database used for the evaluation of license PL469

3 Review of geological framework

Objects of investigations were the Tertiary sediments and the conventional Jurassic play.

The Tertiary sediments are part of a column that has no structural closures within the license area. All layers have a relatively constant dip towards the northeast and are truncated by the seabottom in the southeast. A possible stratigraphic trap at the base of the Brygge formation / top of the Tare formation was investigated by the well 6407/12-2 (see Figure 3). The well was dry. There are no additional leads or prospects left within the Tertiary stratigraphic level.

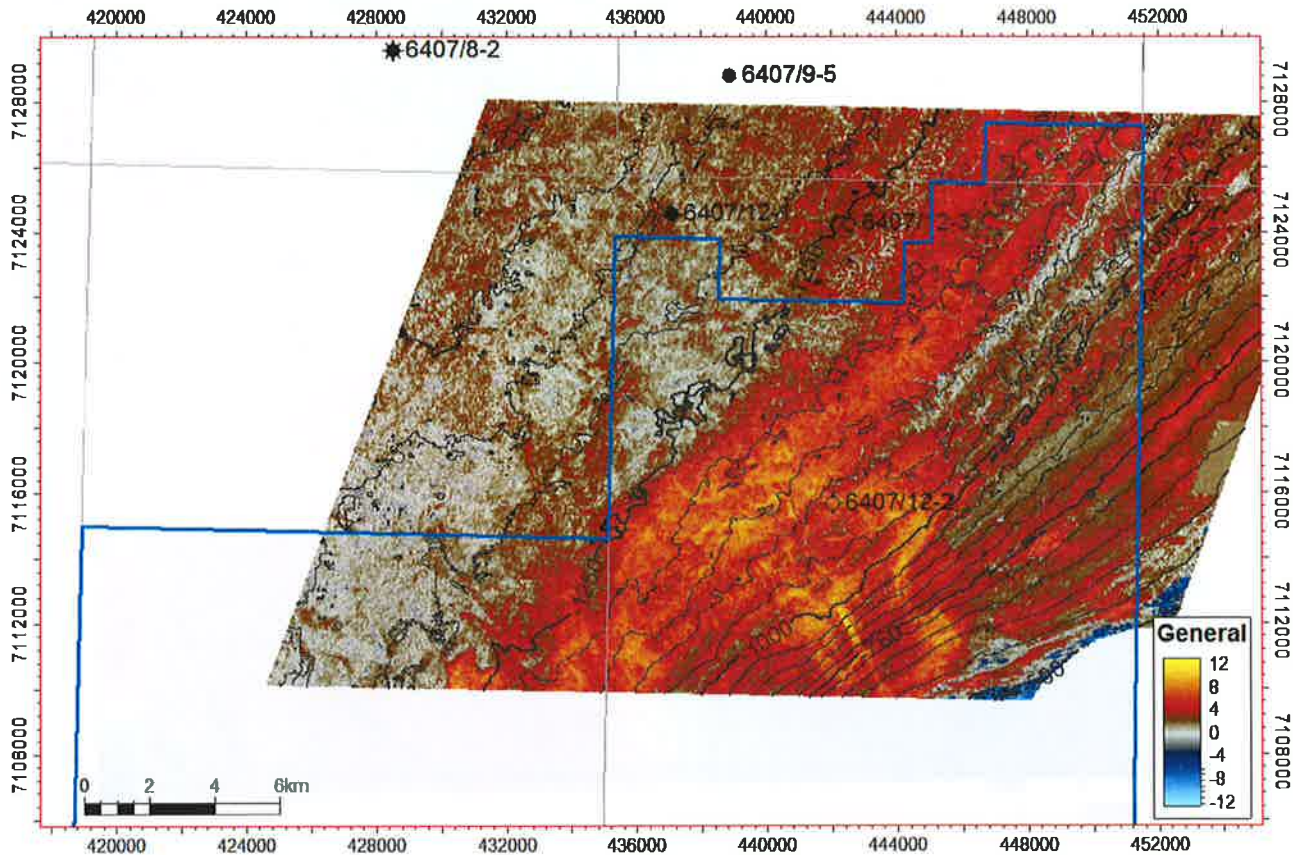


Figure 3: Seismic amplitude map, Base Brygge Formation (TWT). Location: Northern part of PL469

The Jurassic and deeper sections are showing more structuration than the overburden sediments. Within the license, there is a southwest-northeast trending syncline, gently dipped towards the southwest (see Figure 4). The north-western flank of the syncline is partly eroded by the Base Cretaceous Unconformity (BCU). Unfortunately there are no stratigraphic traps developed in relation to this truncation. The south-eastern flank of the syncline goes up to the seabottom, but is faulted. One fault system is forming a hanging-wall closure – the Zazu lead. A more detailed description of the lead can be found in Chapter 4: Prospect update.

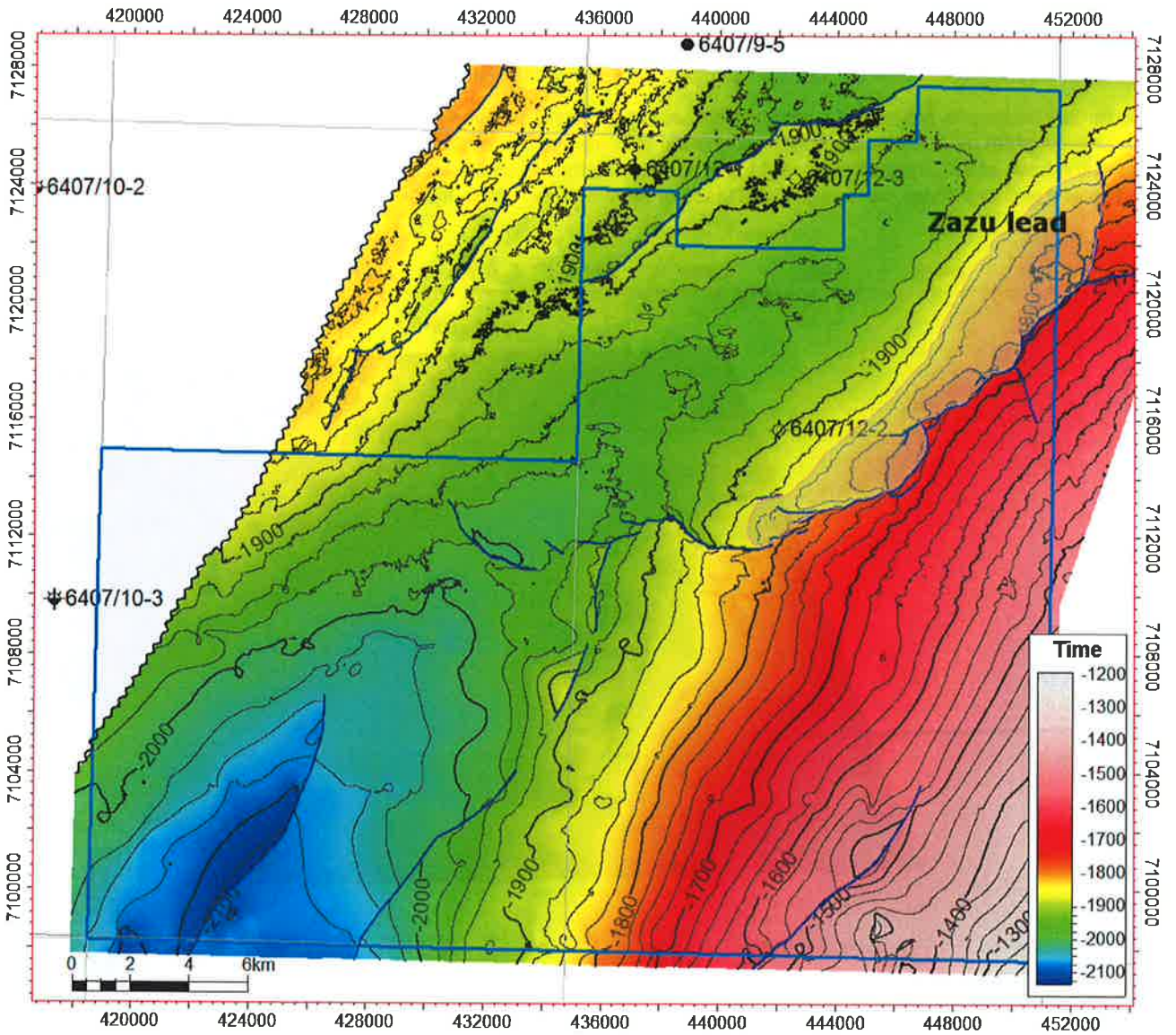


Figure 4: PL469, Near Top Ile map (TWT) with the Zazu lead. Erosion by Base Cretaceous Unconformity is indicated in the west.

4 Prospect update

The application for license PL469 has contained one prospect (Pumbaa) and two leads (Timon and Zazu) (Figure 5). Finally, the Timon lead was outside the awarded PL469 license so there were one prospect and one lead left.

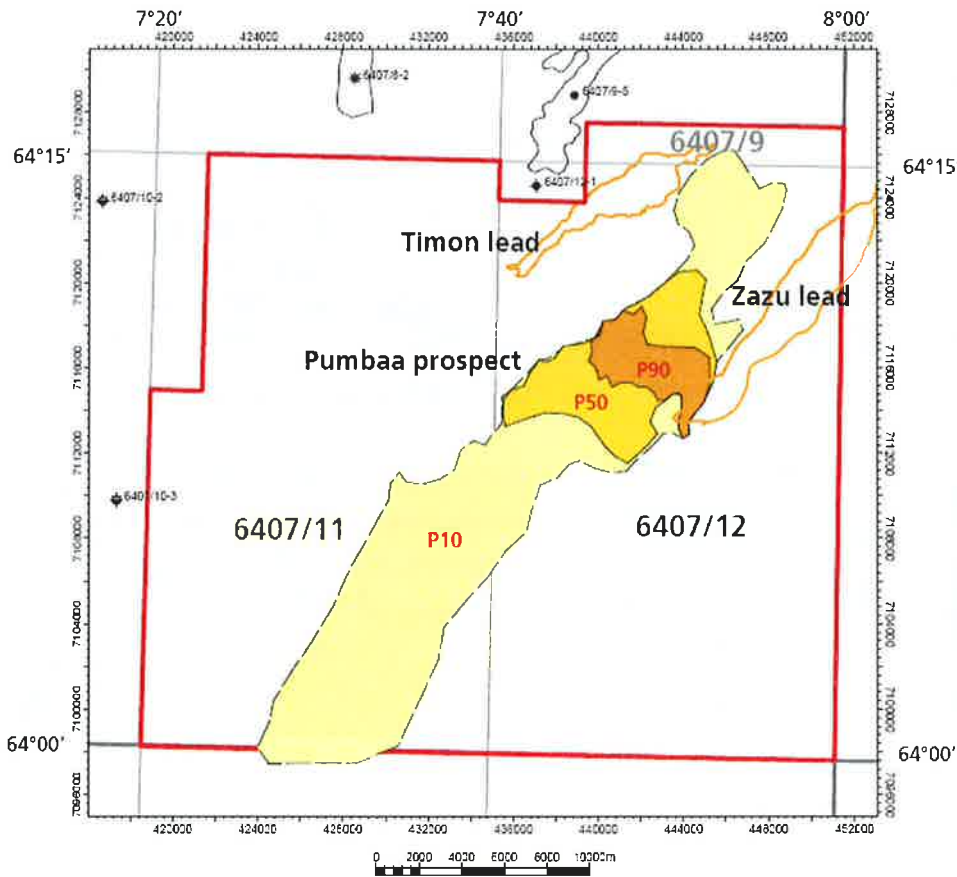


Figure 5. Location map showing the area that was applied for in APA2007 with the red outline. The former Pumbaa prospect P50 resource case is filled with solid yellow, P90 is filled with orange and P10 is filled with light yellow. Timon and Zazu leads are shown with orange outline.

The Pumbaa prospect was drilled by the well 6407/12-2 end of 2009. The well was a firm license commitment (one firm well down to 50m into Cretaceous sediments). The prospect was defined by large amplitude brightening on Base Brygge / Top Tare sediments (see Figure 3, page 5). The brightening was interpreted as a gas- or oil filled shallow marine fan system, fed from eroded Jurassic sediments. Figure 6 shows a flattened seismic section (flattened on Top Tare formation) that illustrates the model. The well has proven the sedimentation model, but not the hydrocarbon filling. The Pumbaa prospect was not successful because of the lack of migration into the reservoir and the lack of seal – the hydrostatic pressure of the reservoir indicates direct connection to the seabottom.

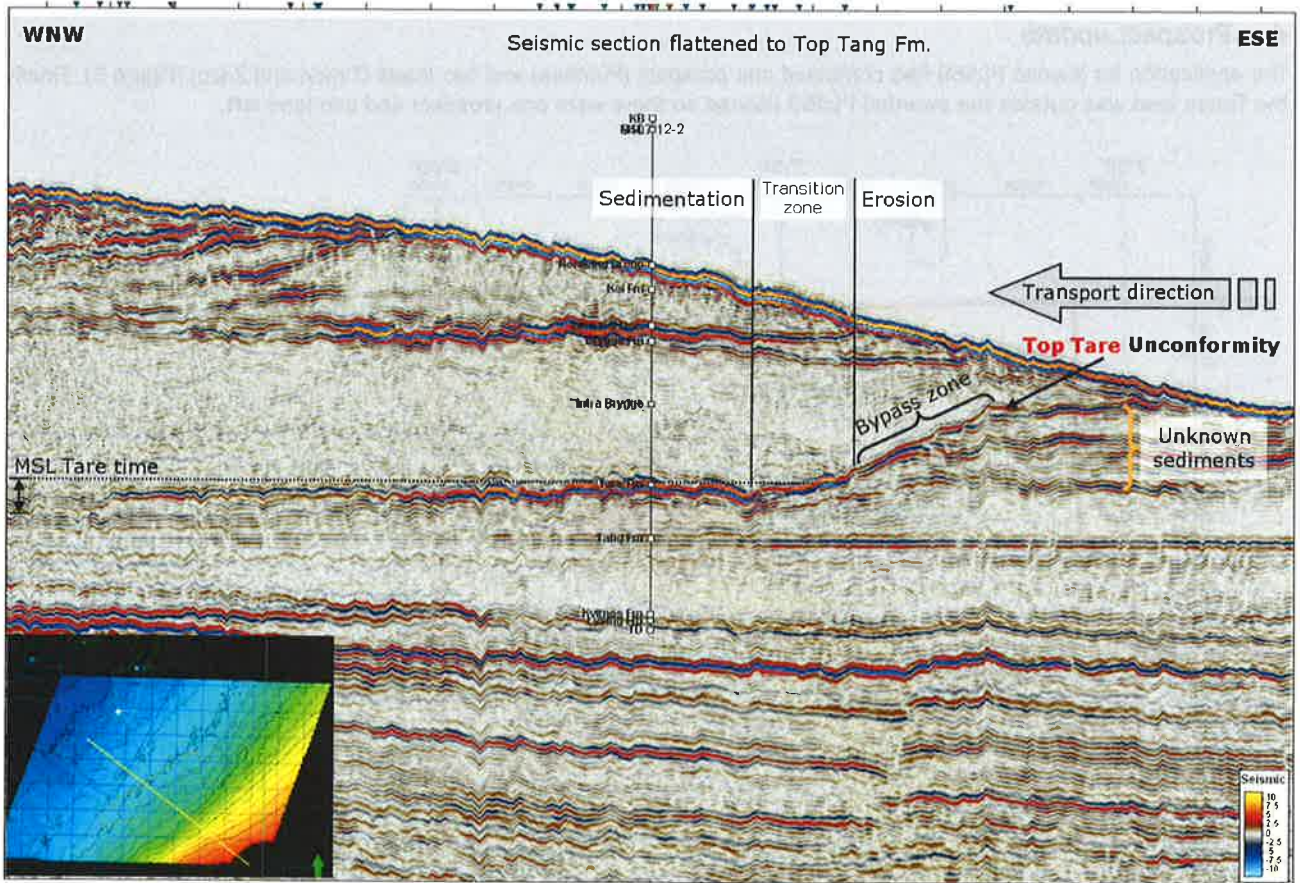


Figure 6: Flattened seismic section illustrating the sedimentation model of the Pumbaa reservoir

The Jurassic Zazu lead has the classical sequence of Garn, Ile, Tilje and Åre as reservoirs. The lead is located northeast of the former Pumbaa prospect and extends into block 6408/10 (see Figure 4, page 6). Zazu is a structural three-way dip closure combined with faults to the southeast and with an area closure of 24 km². Depth to the crest of the lead is 1743 m.

Figure 7 is a seismic line showing the location of Zazu in relation to the Draugen field and the recently drilled well 6407/12-3 (Careus prospect). The Careus prospect is located along the migration pathway of Zazu. The absence of hydrocarbons in the Jurassic section of Careus dramatically decreases the chance of charge and migration into Zazu.

The northeast-southwest trending faults bounding the Zazu lead in the east have the throw of approximately 20 m. The small fault displacement on the northernmost part of Zazu gives a high chance of sand juxtapositions. It makes a sealing fault plane necessary. This is not likely. Hence, in case of a leaking northern fault, the Zazu lead disappears. Due to the high risk which has increased after the drilling of Careus well 6407/12-3, there is no volume calculation and no detailed risking done.

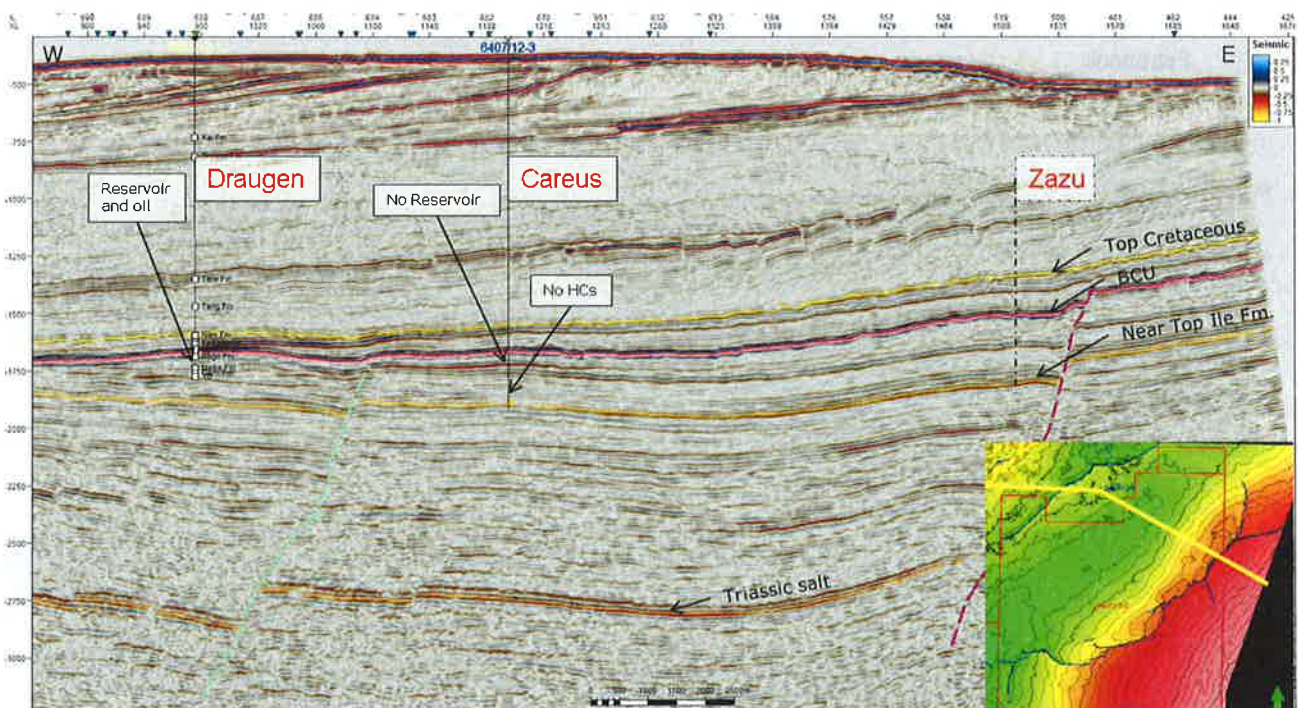


Figure 7: The Zazu lead in relation to the next relevant wells; interpreted seismic section (SH9104_3D)

During the technical evaluation of the license PL469, there was no additional prospect or lead identified within the license area.

5 Technical evaluations

Beside the seismic interpretation the technical evaluation was strongly focused to the drilling of well 6407/12-2.

- The site survey GDF0801 was acquired in August 2008 (see Figure 5 for quality and Figure 2, page 4 for position).
- A Habitat Investigation Report with focus on coral occurrence was done by Fugro Survey Limited.
- Because of registration of deep water corals in the License area a monitoring of the drilling activities was carried out by Det Norske Veritas. Objective was to assess effects from the drilling on the corals near the drilling location.
- SINTEF has done a cutting spread analysis on the basis of documented current conditions before the well 6407/12-2 was drilled and delivered an update after drilling, based on actual measurements of current and sedimentation around the well location.
- The well 6407/12-2 was drilled in December 2009. All related technical documentation was published via Petrobank.

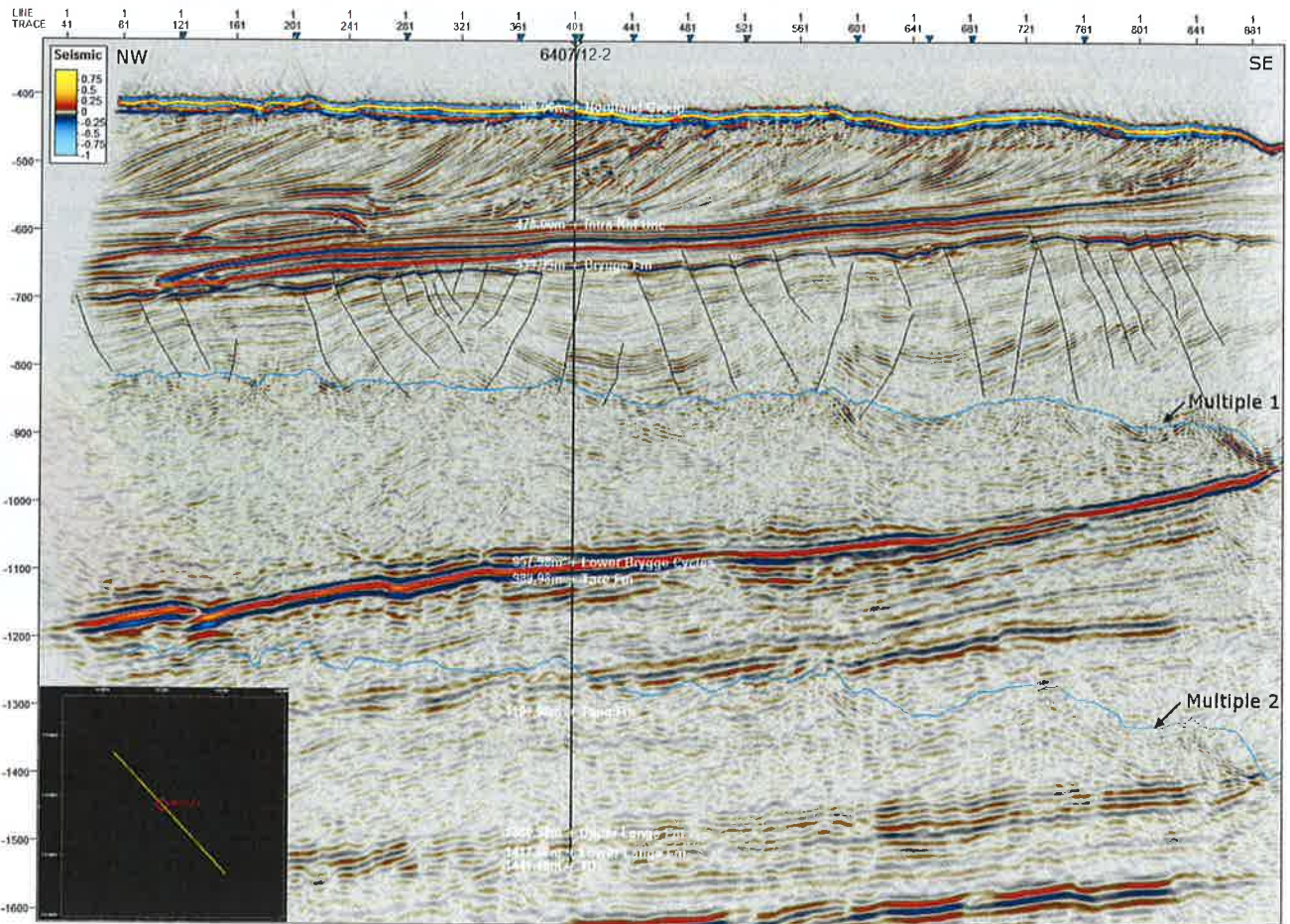


Figure 8: Site-survey GDF0801, line 405 (Time domain), with connection to well 6407/12-2

6 Conclusions

The well 6407/12-2 was dry. The remaining lead has, with high confidence, no chance of success. No additional prospects or leads were identified.

Therefore the shareholders of PL469 relinquish the license.

