

PL 812 License Surrender Report

Parts of blocks 15/8, 15/9, 15/11 and 15/12

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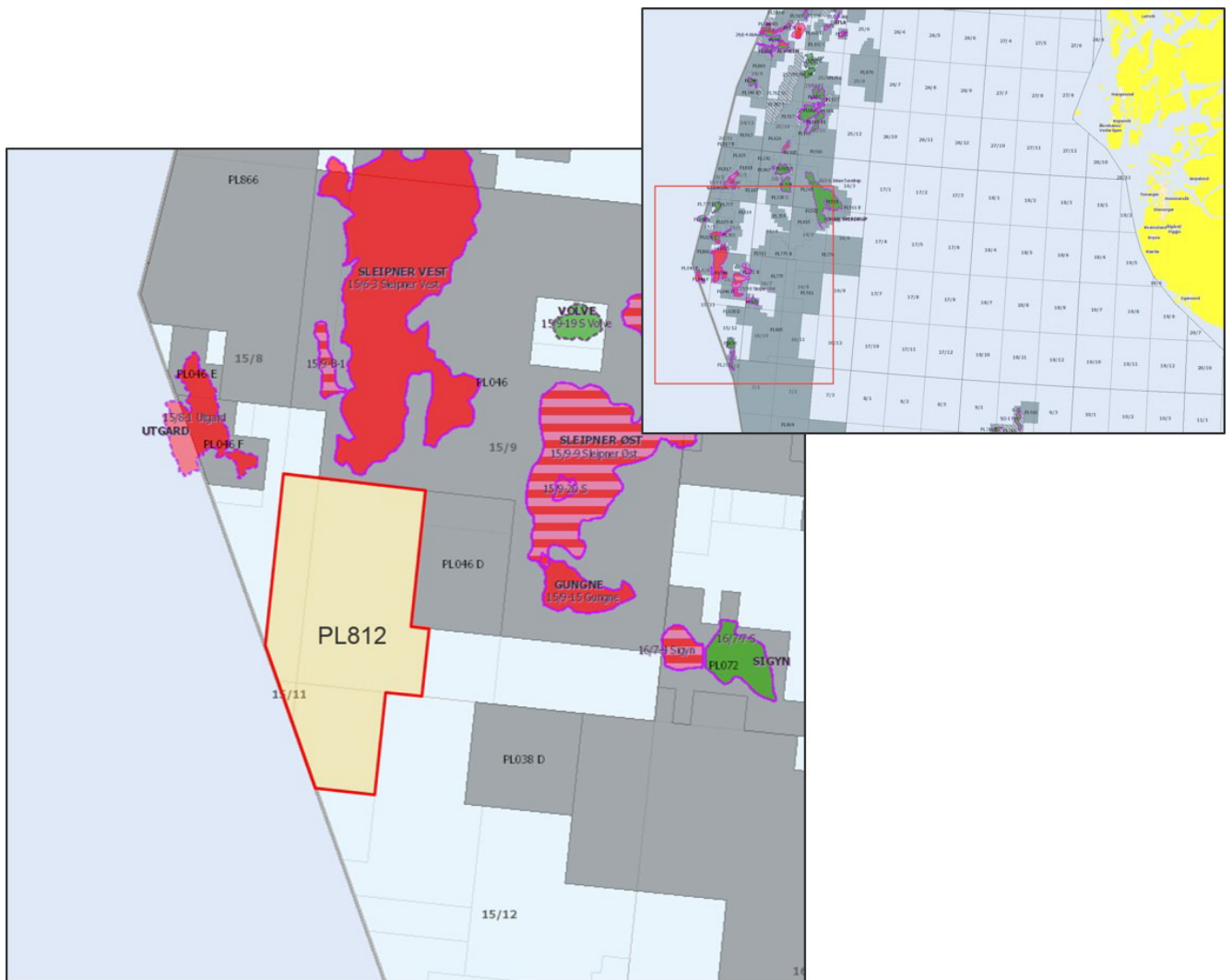
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License surrender report PL812

Reference is made to the letter sent to MPE dated 20.12.2017 (our reference: AU-EXP NUKE ANS-00066) regarding the surrender of production license 812 (PL 812). This report outlines the key license history, database, prospects and evaluations of PL 812 and fulfills the requirement by the NPD for a license status report.

2 Key license history

Production license 812 is located in block 15/8, 15/9, 15/11 and 15/12, south of the Sleipner Vest field. (Figure 2.1). The license was awarded on 05.02.2016 through the 2015 APA award. Statoil Petroleum AS was awarded the operatorship with 40 % equity, with MOL Norge AS, Fortis Petroleum Norway AS DNO Norge AS with 20% share per company. Work obligations were G&G work and decide on a Drill or Drop within 05.02.2018.



Work commitment

Work obligations were to:

- Re-processing seismic data: 05.02.2018
- Drill or Drop Decision: 05.02.2018
- BoK: 05.02.2020
- BoV: 05.02.2022
- PDO: 05.02.2023

Management and Exploration committee meetings

The following Management and Exploration committee meetings have been held:

- 14.04.2016: MC/EC meeting
- 28.09.2016: MC/EC meeting
- 01.11.2016: MC meeting
- 08.02.2017: EC workshop including core viewing
- 08.11.2017: MC/EC meeting

Reasons for license surrender

The Ziggy and Stardust prospects are the main prospects identified in the license. The prospects are rotated fault blocks. The chance of success is good (0.28; 0.39), but have low volumes. The volumes were decreased by the additional work carried out on the new PGS seismic survey. The new seismic dataset gave a clear uplift to the interpretation. A reservoir study was carried out, increasing the reservoir risk.

3 Database

3.1 Seismic data

The work program for PL812 was to reprocess seismic data. In 2016, the investigation of potential reprocessing showed most available surveys were not covering the license area fully. In addition, the Stardust prospect was not covered fully by any survey of the surveys. It was agreed in the license to purchase recent acquired multiclient data by PGS, PGS 15002. PSDM was conducted and angle stacks were made available to Equinor. The overall quality is good and the structural image of the target is improved in comparison with the legacy data. Figure 3.1

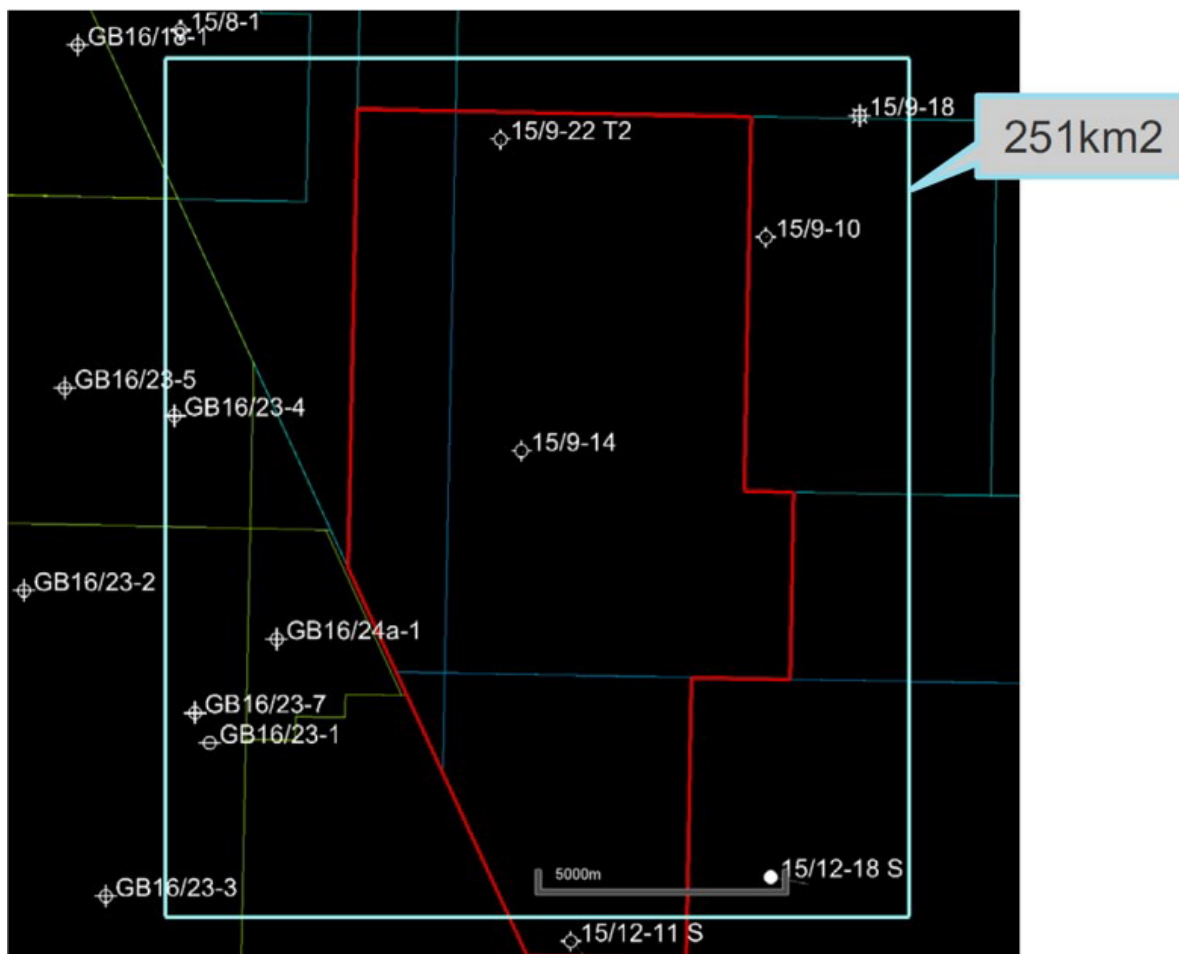


Figure 3.1 Seismic database. Seismic database, outline of PL812 is showed in red, seismic coverage marked light blue

3.2 Well data

The well database used in the evaluation of PL812 is given in Table 3.1.

Table 3.1 Well database. Well database for PL812

Well name	License	Key well	Drilling operator	TD (m) MDRKB	Completion year	Raw data released	Well result	Field	Important input
NO 15/8-1	PL046	x	Statoil	4300	1982	07.01.1984	gas/condensate	Alpha	Petrophysics, depth conversion, well tie
NO 15/8-2	PL303		Statoil	4386	2011	21.10.2013	dry		Petrophysics, well tie
NO 15/9-7	PL046	x	Statoil	3776	1981	29.04.1983	gas/condensate	Sleipner Vest	Petrophysics, depth conversion
NO 15/9-10	PL046	x	Statoil	3289	1981	07.11.1983	dry		Depth conversion, well tie
NO 15/9-14	PL047	x	Statoil	3563	1982	27.06.1984	dry		Depth conversion, well tie
NO 15/9-18	PL048	x	Statoil	3622	1984	02.03.1986	shows		Petrophysics, biostrat
NO 15/9-22 T2	PL241	x	Exxon	3923	2006	13.03.2008	dry		Petrophysics, depth conversion, well tie
NO 15/12-1	PL038	x	Statoil	3269	1975	06.09.1977	oil shows		
NO 15/12-11S	PL116	x	Saga	3597	1997	19.05.1999	dry		
NO 15/12-18S	PL773	x	Det norske	3520	2007	07.11.2009	oil	Storskrymten	
UK 16/18-2	P2035		BP	5124	1989	1993	gas/condensate	Alpha	Petrophysics
UK 16/23-1	P103	x	Conoco	3865	1972	1976	dry		Petrophysics
UK 16/24a-1	P1777	x	Phillips	3255	1980	1984	dry		Petrophysics, depth conversion
UK 16/23-3	P103	x	Conoco	3531	1977	1981	oil shows		

4 Review of geological and geophysical studies

The following work have been performed since the license was awarded:

- Evaluation of uplift from reprocessing vintage seismic prior to licensing PGS broadband survey
- Remapping of key horizons and faults, first on vintage and later on PGS data
- Well ties
- Depth Conversion model
- Biostratigraphy in main interval
- Sedimentology study
- Fault seal study
- Pressure study
- Well failure analysis
- Migration study update

The middle Jurassic play was the focus of the carried out license work, given the proximity with the Sleipner Vest, Sleipner Øst and Utgard discoveries. Most of the Jurassic 4-way closures or rotated fault blocks identified within PL812 have been drilled and found dry. The remaining rotated fault block is the Stardust prospect, whereas the Ziggy prospect is the remaining potential upidp of well 15/9-22T2. Well 15/9-22T2 has good shows within the Hugin Formation. The Bora Bora prospect to the southwest of the license is another untested rotated fault block, but apex and mean area lies mostly outside the license area. The Stardust and Ziggy prospects are located close to the kitchen in the NW, which is the same kitchen as for the Sleipner Vest field. Being located at the triple junction of South Viking Graben, Moray Firth and Central Graben, the middle Jurassic Hugin reservoir is in transition to the Ula sandstone of late Jurassic age towards the south. The Hugin formation within the license area is deposited as shallow marine, tidal flats and fluvial sandstones. In addition to the large variety of facies, the new seismic shows thinning of the Middle Jurassic package towards the apex of the rotated fault blocks.

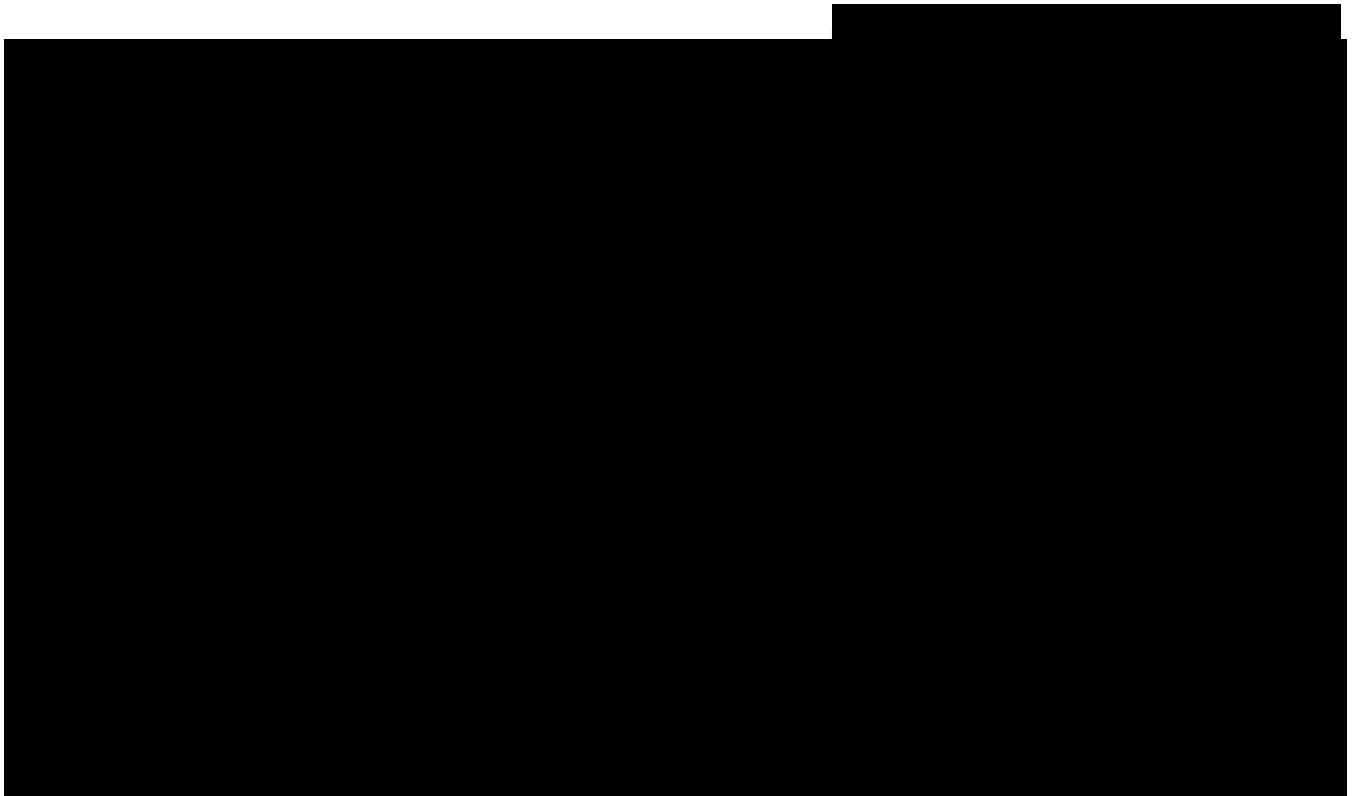
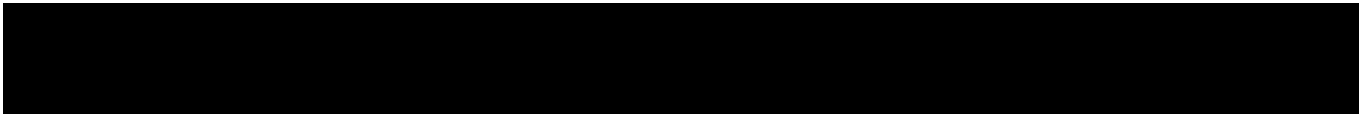


Figure 4.1 Stardust fault seal analysis. Stardust fault seal analysis

5 Prospect update

The Stardust prospect is sitting at 3200 m depth, within a rotated fault block. It has a medium risk ($P_g = 28\%$) where reservoir quality is the main risk (0.5). Trap seal has been reduced by setting the minimum contact above the area for fault seal (Figure 4.1) and is set to 0.7. Charge from the northwest is seen as low risk (0.8) due to the proven accumulation in Sleipner Vest and Utgard. However, the expelled volumes towards southeast might be insufficient to charge the trap. Assumed phase is gas. The re-assessment of the reservoir as well as the lower mean contact reduced the volumes significantly (Mean in-place volumes: 1.22 MSm³ o.e.)

The Ziggy prospect is sitting at 3285 m updip of the 15/9-22T2. It is a low risk prospect ($P_g = 39\%$). Eventhough reservoir is proven in the downdip well, the broadband seismic shows thinning and potential erosion at the crest. Therefore risk is set to 0.7. The prospect relies on a membrane seal and trap seal is set to 0.7. Migration risk is assessed similar as the Stardust prospect.

The prospects are summarized in Figure 5.1 and Figure 5.2.

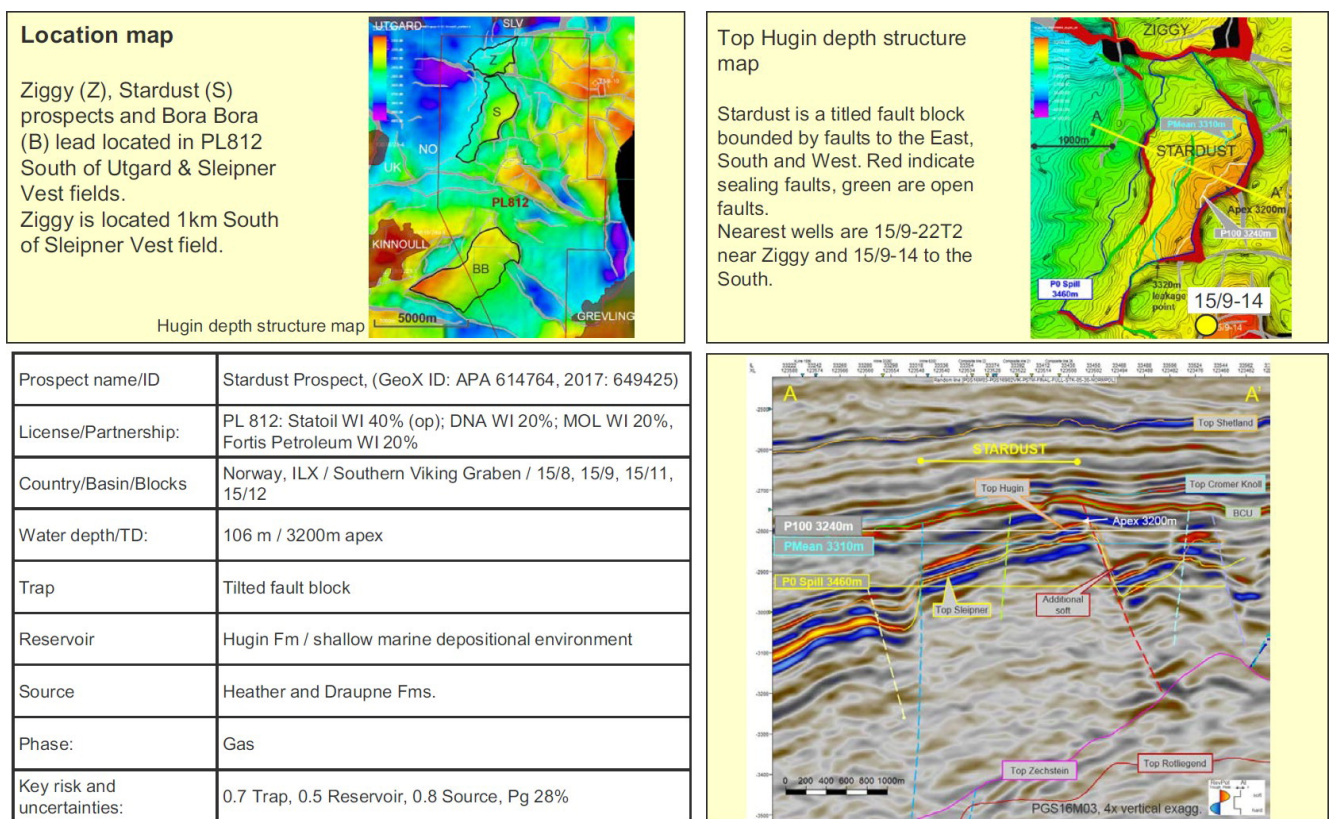


Figure 5.1 Stardust prospect summary. Stardust prospect summary

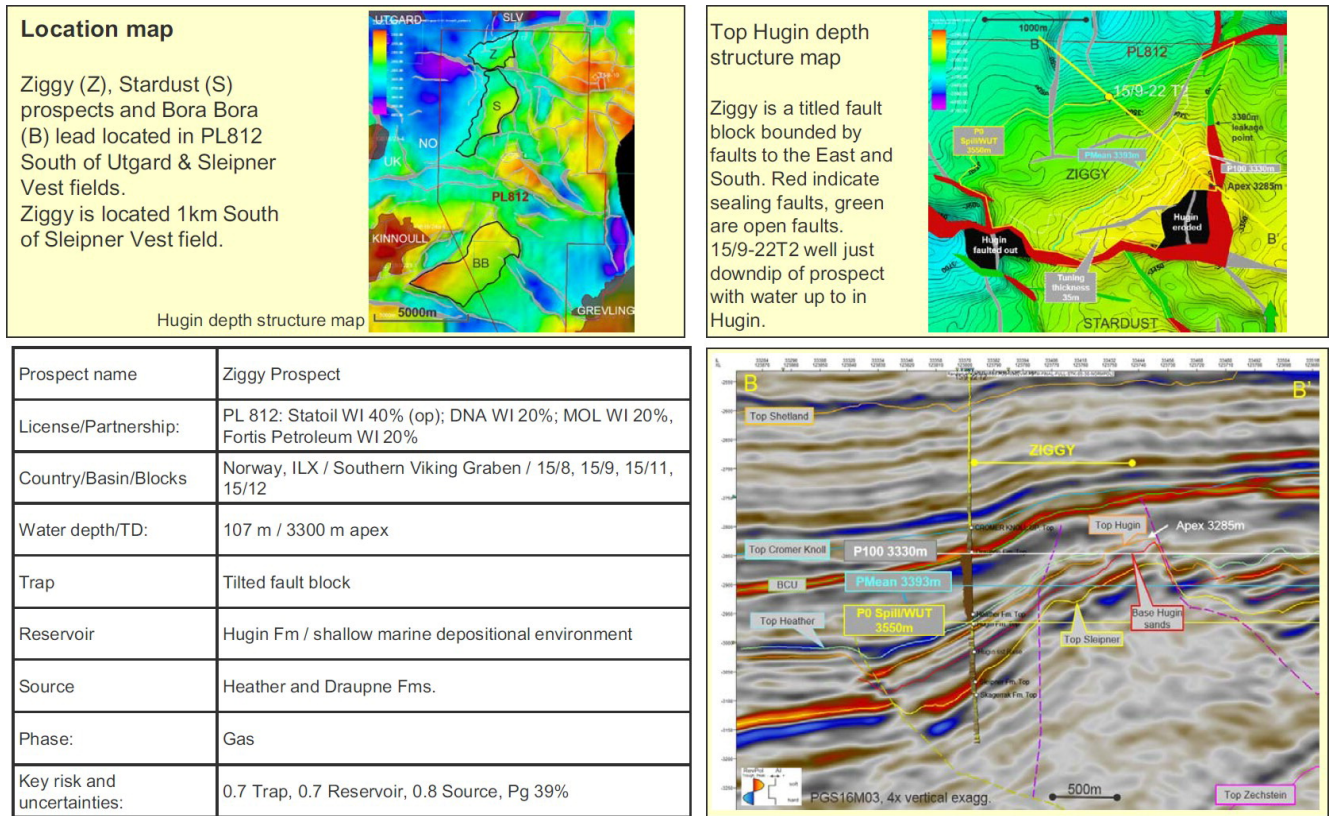


Figure 5.2 Ziggy prospect summary. Ziggy prospect summary

6 Technical evaluation

Due to the significant decrease of volumes, only a technically screening was carried out. The screening showed a negative business case with no upside.

7 Conclusions

The identified prospects in PL812 show attractive probability of success but have very low volumes. Equinor does not see enough value in the license to continue with a drill decision in 2018, the license is consequently dropped.