

Relinquishment Report PL815

Table of Contents

1 Licence history	1
2 Database	2
2.1 Seismic data	2
2.2 Well Data	3
3 Geological and geophysical studies	4
4 Prospect update	5
5 Technical evaluation	8
6 Conclusion	9

List of Figures

2.1 PL815 seismic common licence database.....	2
4.1 Depth map top reservoir Goddo prospect and discovery.....	5
4.2 CPI reservoir section well 16/5-8 S.....	6

List of Tables

1.1 PL815 overview of meetings held	1
2.1 Seismic database	3
2.2 PL815 key wells table.....	3
4.1 Original Goddo prospect volumes (APA 2015).....	6
4.2 Goddo discovery volumes (16/5-8 S).....	7

1 Licence history

Licence PL815 was applied for in the APA 2015 with the Goddo prospect as the sole prospect identified on the licence. The original licence group consisted of Lundin Norway AS (40% operator), Lime Petroleum Norway AS (20% partner), Concedo ASA (20% partner), Petoro AS (20% partner). The work programme consisted of reprocessing of 3D seismic. A drill or drop decision had to be made within 1-year by the 05/02/2017. After a 2-year extension of the licence original drill or drop decision (05/02/2019), a drill decision was taken on the Goddo prospect. The Goddo well 16/5-8 S was drilled in 2019 and was plugged and abandoned as an oil discovery in the basement. Since the drilling of the Goddo well PL815 has been awarded a 2-year and a 1-year extension on the BOK decision for the licence with a final BOK decision deadline of the 05/02/2024. Among other work to better understand the basement reservoir and the Goddo well results, these extensions were applied for to allow time to incorporate the information from the EWT on the neighbouring Troidhaugen licence (PL338 C). The Troidhaugen discovery is also an oil discovery in the basement. The EWT has allowed for a unique insight into how basement reservoirs react to production. The Goddo discovery has a much thinner proven oil column compared to the Rolvsnes/Troidhaugen discovery, with poorer reservoir quality in the well. All intervals were screened for prospectivity. No valid traps or prospects were identified at the shallow levels (above basement). Therefore, in light of these assessments, the licence group made the decision to drop PL815 at the BOK decision gate. Lundin Energy Norway AS was acquired by Aker BP AS on the 01/10/2022, and therefore the partnership at the time of the writing of this report was Aker BP AS (60 % operator), Concedo ASA (20% partner), Petoro AS (20% partner).

An overview of the meetings held in PL815 is provided in Table 1.1

Table 1.1 PL815 overview of meetings held

Date meeting held	Meeting description
16/03/2016	ECMC
08/11/2016	EC
01/12/2017	ECMC
27/09/2018	ECMC
17/10/2018	EC
13/11/2018	ECMC
02/04/2019	ECMC work meeting
09/08/2019	EC work meeting
12/08/2019	EC work meeting
15/08/2019	EC work meeting
09/10/2019	EC work meeting
08/11/2019	ECMC
15/04/2020	EC work meeting
25/08/2020	EC work meeting
26/11/2020	ECMC
25/11/2021	ECMC
22/03/2022	EC work meeting
24/11/2022	ECMC
10/01/2023	ECMC
22/11/2023	ECMC

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2 Database

2.1 Seismic data

Fig. 2.1 and Table 2.1 shows the seismic common licence database for PL815. The licence has used the LN12M02 broadband 3D seismic survey as the main data set for the licence, with the addition of the LN0902 seismic dataset as an additional reference point. The original LN12M02 data was reprocessed as part of the work programme for PL815 and the resulting reprocessed seismic was named LN12M02 R16.

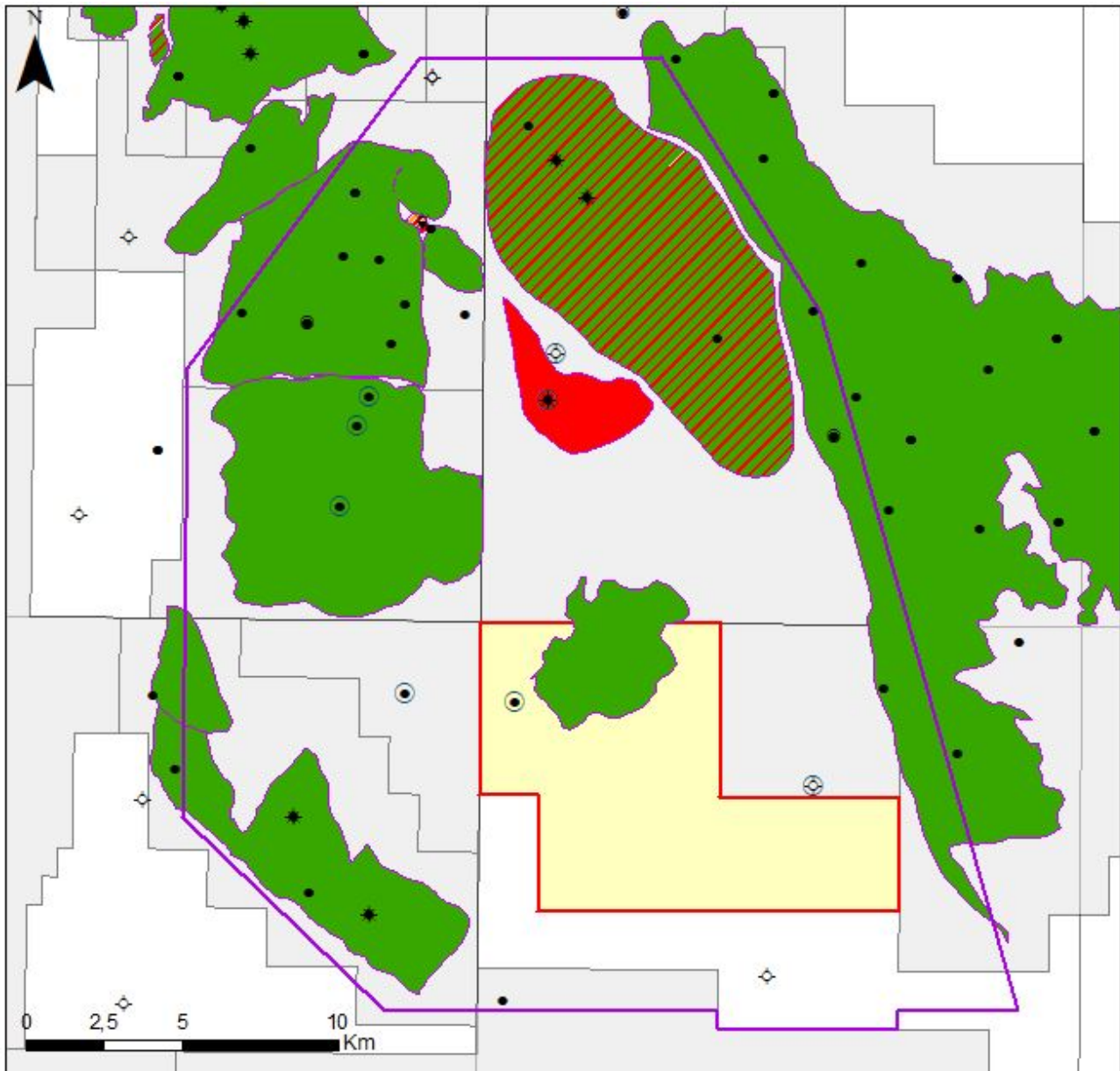


Fig. 2.1 PL815 seismic common licence database *Purple outline is the area covered by the common licence database of PL815. Red outline PL815 licence outline as of 01/09/2023.*

Table 2.1 Seismic database

Seismic survey	NPDID	Area (km ²) used in database	Market available	Acquisition year
LN12M02	7618	620	Yes	2012
LN0902	7004	620	Yes	2009

2.2 Well Data

Key wells relevant to this report and PL815 are shown in dark blue in Fig. 2.1 and listed in Table 2.2. One well was drilled in PL815 and this was the Goddo well 16/5-8 S.

Table 2.2 PL815 key wells table

Well name	NPDID	Comment
16/5-8 S	8704	Goddo exploration well on PL815
16/5-7	8762	Klaff exploration well east of PL815
16/4-5	6216	Basement well poor reservoir quality
16/1-25 S	7775	Rolvsnnes/Troldhaugen well
16/1-12	6166	Rolvsnnes/Troldhaugen well
16/1-28 S	8357	Rolvsnnes/Troldhaugen well
16/2-5	6042	P-Graben well 1
16/2-23 S	9698	P-Graben well 2

3 Geological and geophysical studies

The following studies were carried out in PL815, relevant to the evaluation of prospectivity in the licence:

- Seismic reprocessing
- 16/5-8 S well and post well analysis
- Eriksfiord: Basement harmonisation study, catalogue of fracture classes and image facies types
- Bømlo well park project
- Old oils study
- Mineralogical studies (thin sections, XRD)
- Field work (Drammen area +)
- Petrophysical work: Panterra processed NMR data (matrix vs fracture porosity), MICP lab measurements (water saturation model)
- Well-ties
- Wedge models
- Model guided post-stack interpretation
- Seismic attributes
- FWI interpretation
- Information from EWT on Rolvsnes/Troldhaugen

As a result of the initial studies, a drill decision was taken to test the Goddo prospect with well 16/5-8 S. The basement reservoir is a relatively poorly understood reservoir compared to the traditional siliciclastic, conventional NCS reservoirs. Through the many studies that have been carried out on PL815 and the surrounding licences for the basement reservoir, some conclusions can be drawn. Firstly seismic data quality is one of the key components to predicting basement quality. The quality of the basement reservoir can change very quickly laterally over very short distances. Basement reservoir quality is a combination of three main interacting elements: mineralogy, weathering and fractures. The information from the EWT on the Rolvsnes/Troldhaugen discovery has allowed for a unique insight into the producibility of the basement reservoir. However, despite extensive work on the basement play regionally the reservoir is still less well understood compared to classical siliciclastic reservoirs, and therefore predictability, producibility and lateral variability remain elements that are hard to predict for basement reservoirs.

4 Prospect update

One prospect was originally defined in PL815 and can be seen in Table 4.1 . The original outline of the Goddo prospect can be seen on the depth map in Fig. 4.1. The Goddo prospect was drilled in 2019 with well 16/5-8 S. The Goddo prospect was defined by a low seismic refraction velocity anomaly. Well 16/5-8 S (Fig. 4.2) found a limited oil column of around 20-25m with a FWL estimated to be present at 1887m TVD msl. The 100m uppermost zone of basement was interpreted as moderately weathered regolith. Below this regolith, most of the rock was interpreted as unaltered. The FWL was much shallower than the OWC found in the Rolvsnes discovery wells, and also the basement reservoir quality was not as good as seen in the good basement reservoir of Rolvsnes, but was better than the very poor reservoir quality seen in the basement of well 16/4-5. A summary of the discovery can be seen in Table 4.2. The new mode case outline for the Goddo discovery can be seen on the depth map in Fig. 4.1. No other remaining prospectivity is defined on the licence.

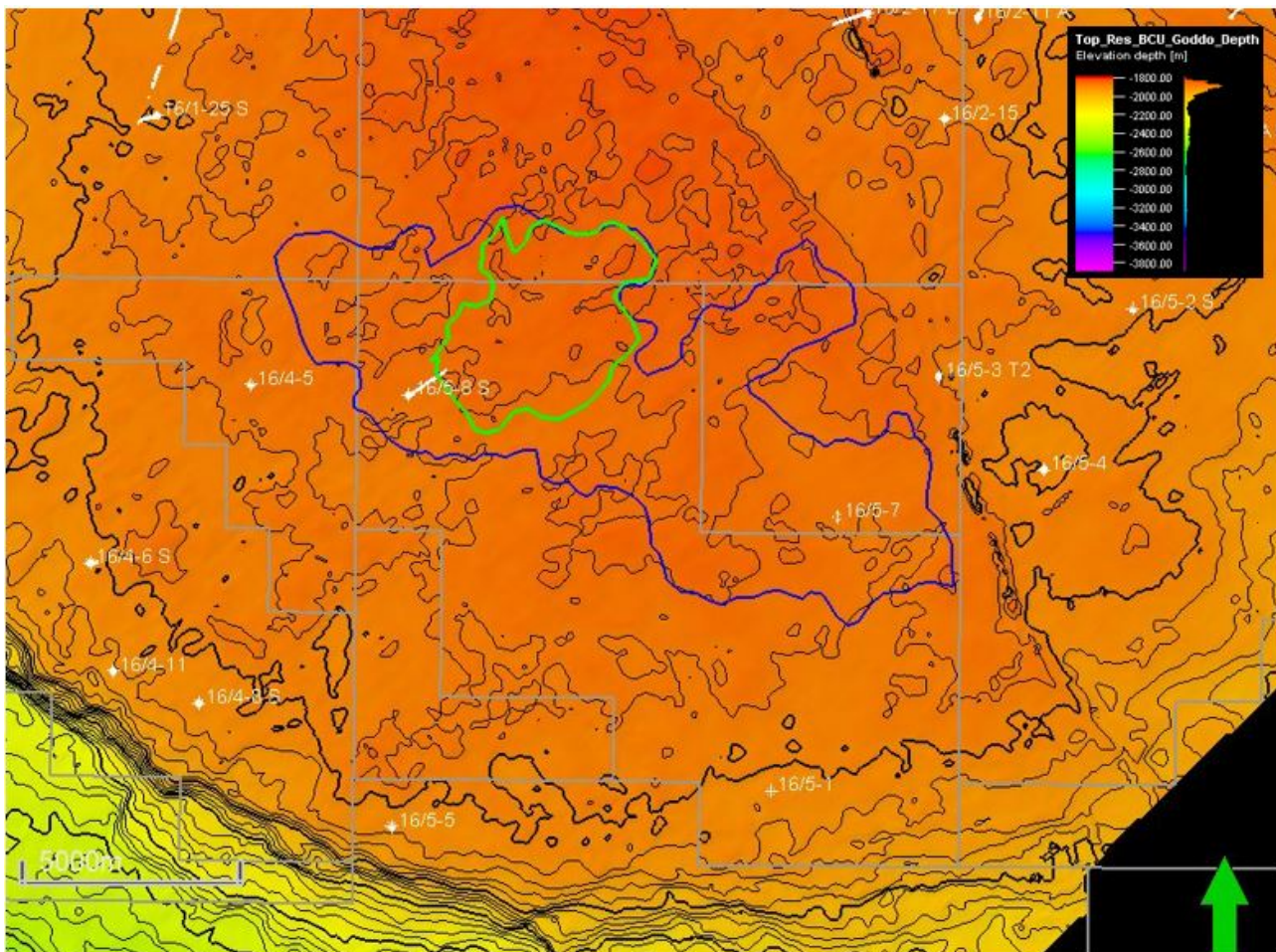


Fig. 4.1 Depth map top reservoir Goddo prospect and discovery *Depth map with original Goddo prospect outline (blue) and Goddo discovery outline (green)*

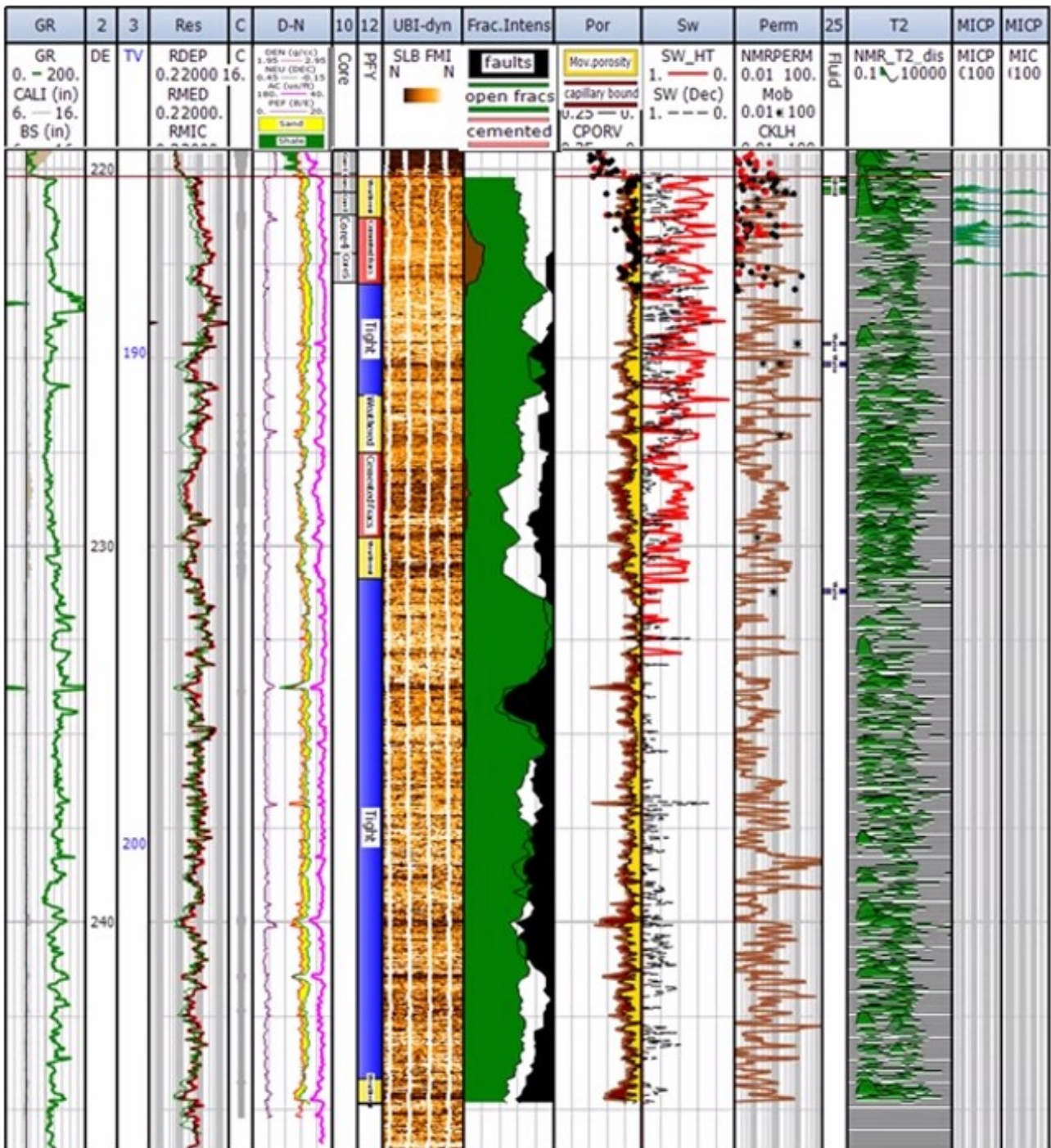


Fig. 4.2 CPI reservoir section well 16/5-8 S

Table 4.1 Original Goddo prospect volumes (APA 2015)

Discovery/ Prospect/ Lead name ¹	D/ P/ L ²	Case (Oil/ Gas/ Oil&Gas) ³	Unrisked recoverable resources ⁴						Probability of discovery ⁵ (0.00 - 1.00)	Resources in acreage applied for [%] ⁶ (0.0 - 100.0)
			Oil [10 ⁶ Sm ³] (>0.00)			Gas [10 ⁹ Sm ³] (>0.00)				
			Low (P90)	Base (Mean)	High (P10)	Low (P90)	Base (Mean)	High (P10)		
Goddo	P	Oil	9,00	17,90	19,58	0,99	1,97	2,15	0,32	56,0

Table 4.2 Goddo discovery volumes (16/5-8 S)

Discovery name	Phase	Inplace resources (10 ⁶ Sm ³ OE) P90-P50- P10-Mean	Recoverable resources (10 ⁶ Sm ³ OE) P90-P50- P10-Mean	% within PL815
Goddo (well 16/5-8 S)	Oil	8,8 - 15,5 - 26,9 - 16,9	0,76 - 1,51 - 2,86 - 1,7	72

5 Technical evaluation

The Goddo discovery is a basement discovery which is estimated to be approximately 5 times smaller in both recoverable resources and areal extent than the Rolvsnes/Troldhaugen discovery. Better reservoir properties have been proven in Rolvsnes compared to Goddo, and a thinner hydrocarbon column is present in Goddo compared to Rolvsnes. These elements combined with the current economical marginality of the Troldhaugen discovery means that Goddo with the current understanding and technological capabilities is not economical. If the Goddo discovery was to be developed in the future, the natural tie-back solution would be towards Edvard Grieg in the northwest, either directly or via a future Troldhaugen development.

6 Conclusion

In light of the work carried out on the licence and the results of the Goddo discovery well (16/5-8 S) the decision has been taken by the licence partnership to drop the licence at the BOK decision gate. No remaining prospectivity has been identified on the licence.