

PL 579 Relinquishment Report

November 2017



Contents

1.	Summary and Conclusion	3
2.	Introduction	3
3.	License award	4
	Completed work program and special studies	
5.	Pre-drill prospectivity evaluation	6
	Well results	
7.	Remaining prospectivity evaluation	13



1. Summary and Conclusion

The Morkel prospect was mapped as the main prospectivity in PL 579. The Morkel prospect was located in the hangingwall on the southeast flank of the Makrell Ridge and was expected to comprise an upper Jurassic shallow-marine reservoir. The prospect was drilled in spring 2015. The well 33/2-2 S encountered oil in a poor quality Triassic reservoir. The resource volume potential describes much smaller volumes than pre-drill expectations and is not considered commercially interesting. The remaining prospectivity in PL 579 is assessed to be poor, hence a decision to relinquish the license was made by the partnership in December 2016.



2. Introduction

The PL579 license is located in the western part of the northern Norwegian North Sea and located on the Makrell Horst. The original license area covers of 179 km² in blocks 33/2 and 33/3. In the APA 2014 additional 16,8 km² of the northern part of block 33/5 were added to the license to the south (Figure 5) as PL579B.

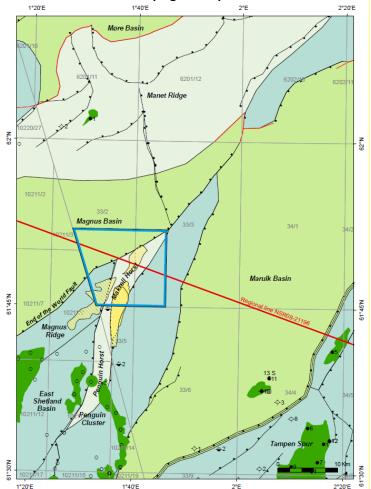


Figure 1: PL 579 original license location with main structural elements.

3. License award

PL579 was awarded as part of TFO 2010 on 4th February 2011, with eights year initial license period to Lundin (50% and operator) and Bayerngas (50%). From the 1st July 2014 Bayerngas transferred 20% of their part to Fortis Petroleum.



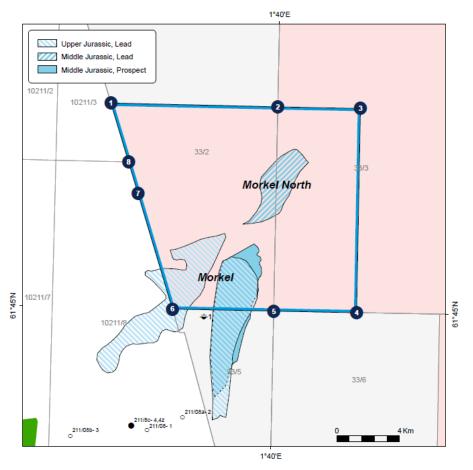


Figure 2: Prospectivity portfolio at APA 2010.

4. Completed work program and special studies

The TFO 2010 work commitment was to reprocess and merge 3D seismic and decide on seismic acquisition within 1 Year and then Drill or Drop within 3 years.

In 2013 the Decision to Drill was extended by one year to 4th February 2015.

The 3D seismic survey EOTW11 were acquired by the license as older seismic did not have sufficient resolution and quality. Geophysical studies utilized this survey in evaluation in addition to older seismic surveys (figure 3).

The well 33/2-2S on the Morkel prospect was spudded in March 2015.



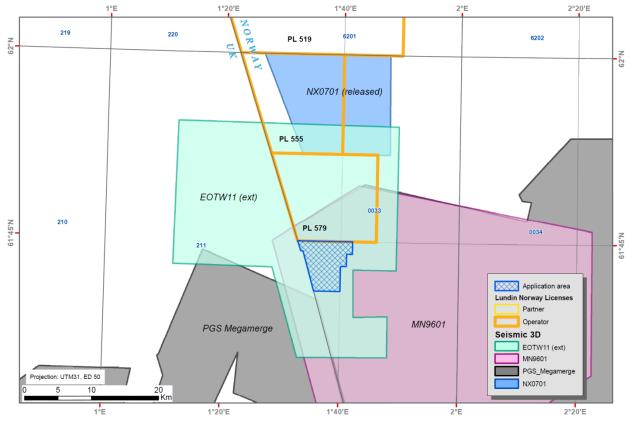


Figure 3: 3D seismic coverage

5. Pre-drill prospectivity evaluation

The Morkel prospect was located on the eastern down faulted terrace of the Makrell Horst.

The Morkel prospect comprised a 8 km² fault dependent 2 way dip closure. The interpretation was further supported by significant AVO anomalies on the far trace data throughout the prospect.

The main target of the Morkel well was the Upper Jurassic and underlying Middle Jurassic, Brent Group sandstones. Deeper sandstones of the Statfjord Group (Lower Jurassic to Triassic age) were also planned to be penetrated to assess their reservoir potential.

Trap definition and updip seal to east were regarded the highest risk factors before drilling.

Predrill resource volume expectation: 2,1-29,7-54,5x10⁶ Sm³ recoverable oil (P90-Mode-P10)



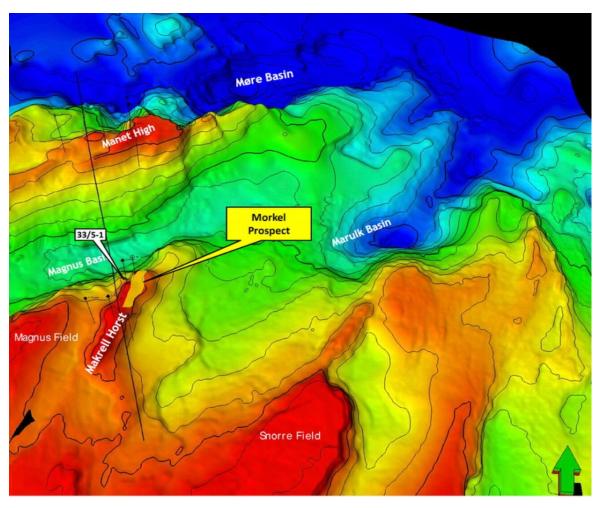


Figure 4: Regional 3D perspective of Base Cretaceous



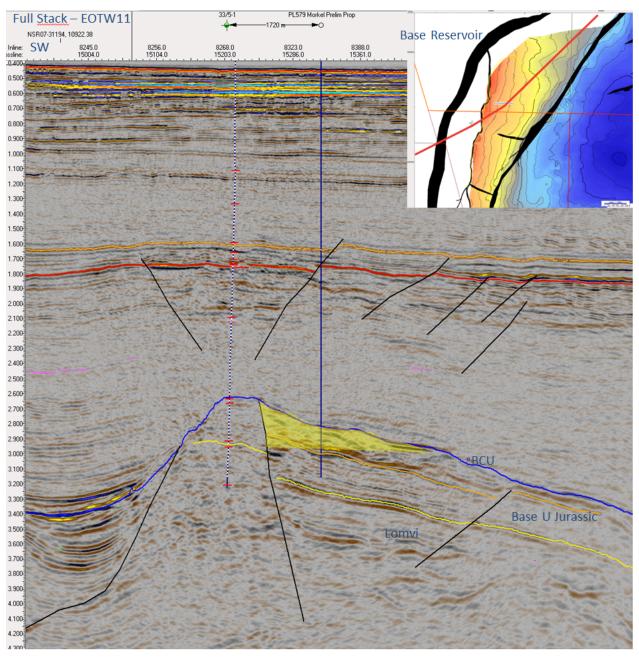


Figure 5: SW-NE trending seismic line over the Morkel prospect

6. Well results

The 33/2-2S well was drilled as at the following location:

X: 426 672.39 m E	Y: 6 874 511.71 m N	UTM Zone 31N
Lat: 61° 45' 07.576" N	Long: 01° 36' 40.595" E	ED-50



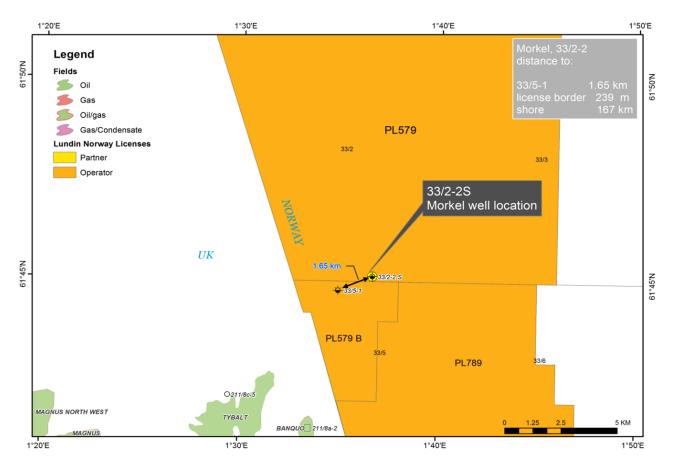


Figure 6: The 33/2-2S Well location

The well was spudded on the 23th March 2015 and reached TD at 3530 m MD RKB (2523.8 m TVD RKB) in Triassic age formation. The well was drilled as a slightly deviated 'S' well due to the presence of a pockmark on the seabed vertically above the main target location. The wellhead was therefore relocated to an adjacent site survey line-cross. The horizontal distance from the wellhead to the target position was 110 m. The well was plugged and abandoned on the 10th June 2015.

The well proved a 175 m oil column in the Triassic Lunde Formation. A well test (DST) was performed which confirmed that the reservoir properties were poor with limited producibility.

Results versus prognosis

The well 33/2-2 S encountered the Base Cretaceous unconformity at the hard seismic event as expected, albeit 20 m deeper than the pre-well prognosis. This was due to slightly higher velocities in the overburden than prognosed.

The most significant error in the prognosis was revealed following biostratigraphic dating of the core which showed that the expected pre-Cretaceous target section was actually of Triassic age and not Upper or Middle Jurassic as prognosed. Hence, although the target section was correctly identified from the seismic, it was of a different age and reservoir quality than expected. The Triassic reservoir section was indeed oilbearing but the reservoir section was subsequently revealed to have low Net/Gross with poor reservoir properties.



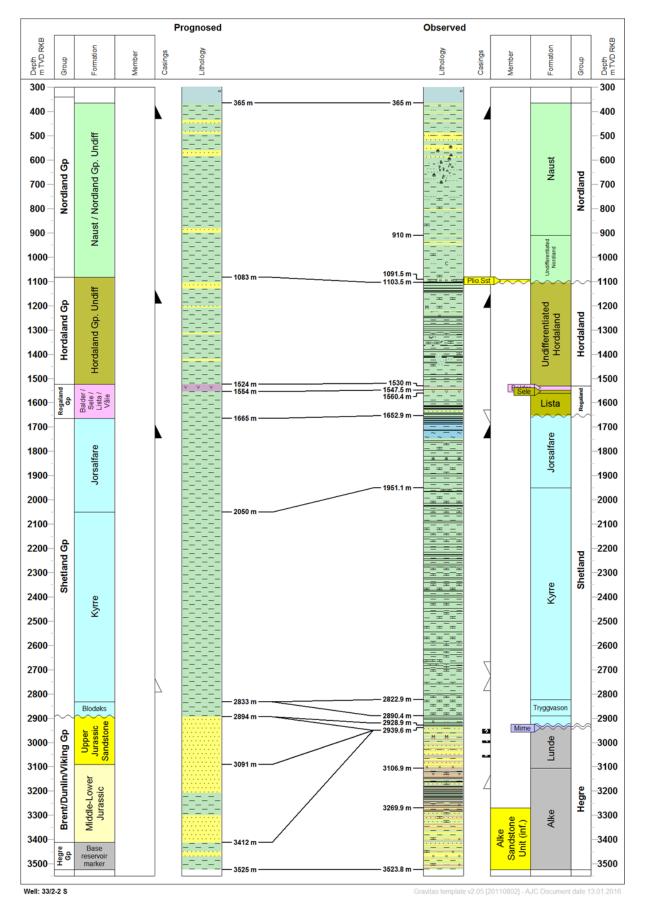


Figure 7: Well 33/2-2S, pre and post drilling correlation.



A summary of the results of the petrophysical evaluations in the Mime and Eriksson intervals are presented in figure 8 and 9. Key input parameters are presented in Table 1 and a summary of the results and averages is shown in the same table. Table

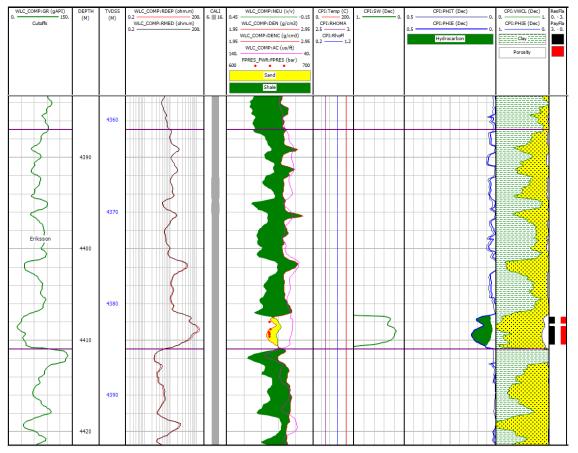


Figure 8: Petrophysical interpretation CPI Eriksson interval.



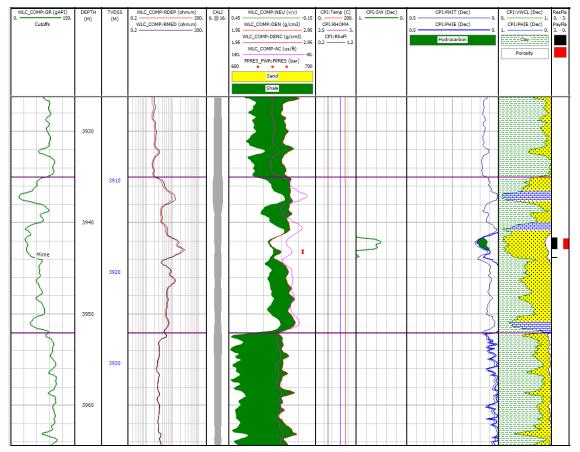


Figure 9: Petrophysical interpretation CPI Mime interval.

	ervoir Summar								
		v							
n Zo	one Name	Тор	Bottom	Gross	Net	N/G	Av Phi	Av Sw	Av Vcl Ari
	ime	3935.00	3952.10	17.10	1.50	0.088	0.101	0.653	0.147
Er	riksson	4387.00	4411.00	24.00	2.60	0.108	0.104	0.265	0.143
AI	11 Zones	3935.00	4411.00	41.10	4.10	0.100	0.103	0.404	0.144
	one Name	Тор	Bottom	Gross	Net	N/G	Av Phi	Av Sw	Av Vcl Ari
	ime	3935.00	3952.10	17.10	1.10	0.064	0.106	0.575	0.129
Er	riksson	4387.00	4411.00	24.00	2.60	0.108	0.104	0.265	0.143
AI	11 Zones	3935.00	4411.00	41.10	3.70	0.090	0.105	0.358	0.138
	offs Used	Тор	Bottom	Min. Height	Phi CPI:PHIE	Sw CPI:SW	Vcl CPI:VWCL		
	eservoir			nergiic	CF1.FIIIB	CF1.5#	CF1.VWCL		
Mi	ime	3935.00	3952.10	0	>= 0.08		<= 0.7		
	riksson ay	4387.00	4411.00	0	>= 0.08		<= 0.7		
	ime	3935.00	3952.10	0	>= 0.08	<= 0.7	<= 0.7		
	riksson	4387.00	4411.00	0	>= 0.08		<= 0.7		
	Units : m								

Table 1: Petrophysical results and averages



7. Remaining prospectivity evaluation

The remaining leads Morkel north and Morkel West was thought to have upper Jurassic Reservoir which was not encountered in the well. The remaining prospectivity is therefore considered low.

There are consequently no discoveries in the PI579 licence to take a DG2 (BOV) on or future prospects to drill within the licence acreage.

Due to this a decision to relinquish the license has been made by the partnership.