

PL835 Licence Status Report

Innhold

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1 Key licence history

Licence: PL835 – Parts of blocks 6407/2, 6407/3, 6407/6 and 6507/12 (Figure 1)

Awarded: 05.02.2016 (APA 2015)

Licence period: Expires 05.02.2023 (Initial period: 8 years)

Licence group: Statoil Petroleum AS 60% (Operator)
Point Resources AS 40%

Licence area: 633.036km²

Work programme: Technical G&G work: Fulfilled, confirmed by the NPD
Acquire 3D seismic: Fulfilled, confirmed by the NPD
Drill or drop by 05.02.2018, two years after award

Work performed:

- 2016: Licence awarded and licence start-up. The licence purchased approximately 956.11km² of 3D seismic data covering the greater PL835 licence area and around in 2016, the PGS14002/14005 survey acquired by PGS.
CSEM feasibility study carried out for the Lanterna prospect.
- 2017: Seismic interpretation, evaluation of the licence prospectivity. AVO analysis, PVT evaluation and litho-fluid prediction.

Meetings:

EC/MC - Start-up of licence:	06.04.2016
EC/MC - Status interpretation:	09.11.2016
EC/MC – work meeting:	22.08.2017
EC/MC – work meeting:	31.08.2017
EC/MC – prospect summary:	23.11.2017

Reason for relinquishment

The main prospect within the PL835 licence is Lanterna. This prospect was also shared with the PL796 licence. A drill on this prospect was decided in the PL796 and the Operator proposed to join the PL796 licence to drill the Lanterna prospect as a joint well for the two licences. However, the partnership in PL835 did not agree. The Operator was not willing to take on a 100% share and so it was decided to drop the licence.

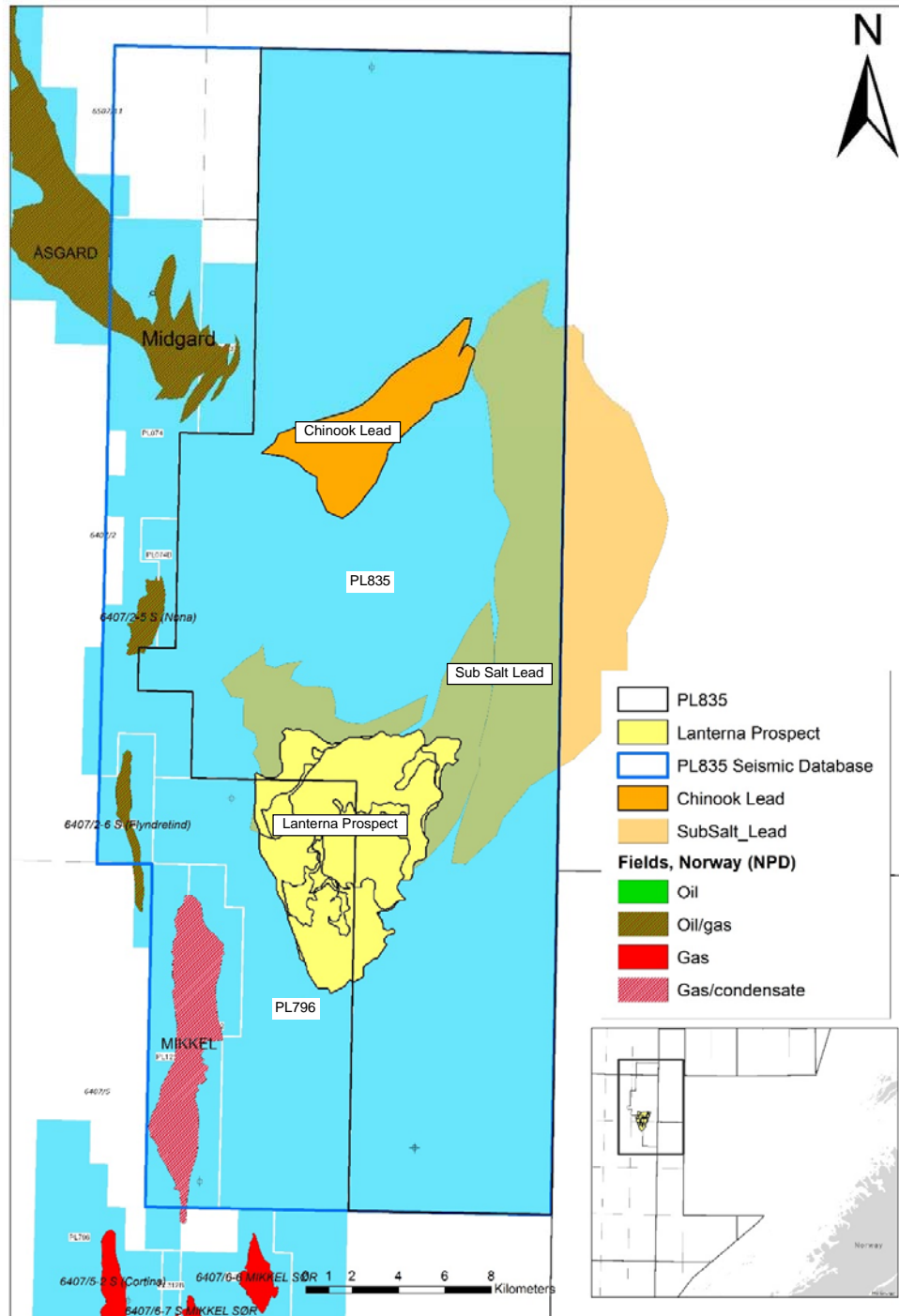


Figure 1: Area map with licences

2 Database

Wells

The well database in PL835 is given in Table 1.

Well	Year	Operator	Status	Purpose
NO 6407/1-6 S	2013	Wintershall Norge AS	G/C	
NO 6407/2-1	1982	Saga Petroleum ASA	S	DC
NO 6407/2-2	1983	Saga Petroleum ASA	G/C	PE/DC
NO 6407/2-3 T2	1987	Saga Petroleum ASA	G/C	PE
NO 6407/2-4	2009	Det norske oljeselskap ASA (old)	D	DC
NO 6407/2-5 S	2009	StatoilHydro Petroleum AS	O/G	PE/PVT
NO 6407/2-6 S	2010	Statoil Petroleum AS	O/G	PE/DC/PVT
NO 6407/3-1 S	2011	Statoil Petroleum AS	D	PE/DC
NO 6407/5-1	1988	Mobil Exploration Norway INC	S	DC
NO 6407/5-2 S	2011	OMV (Norge) AS	G	PE/DC
NO 6407/6-1	1984	Den norske stats oljeselskap a.s	D	PE/DC/WT
NO 6407/6-3	1987	Den norske stats oljeselskap a.s	G/C	PE/DC
NO 6407/6-4	1990	Mobil Exploration Norway INC	OS	PE/DC
NO 6407/6-5	1999	Den norske stats oljeselskap a.s	G	PE/DC/PVT
NO 6407/6-6	2008	StatoilHydro ASA	G	PE/DC
NO 6407/6-7 S	2009	StatoilHydro ASA	G	PE/DC
NO 6407/9-2	1985	A/S Norske Shell	O	PVT
NO 6407/9-4	1985	A/S Norske Shell	O	PVT
NO 6407/9-7	1988	A/S Norske Shell	D	
NO 6408/4-1	1988	Conoco Norway Inc.	D	PE/DC
NO 6507/11-1	1981	Saga Petroleum ASA	G/C	PE/DC
NO 6507/11-2	1982	Saga Petroleum ASA	D	DC
NO 6507/11-3	1985	Saga Petroleum ASA	O/G	PE
NO 6507/11-4	1987	Saga Petroleum ASA	D	PE
NO 6507/11-5 S	1997	Den norske stats oljeselskap a.s	O/G	
NO 6507/11-6	2001	Norsk Hydro Produksjon AS	G/C	
NO 6507/11-8	2007	Statoil ASA (Old)	G	PE/DC
NO 6507/12-1	1980	Saga Petroleum ASA	D	PE/DC
NO 6507/12-2	1981	Saga Petroleum ASA	S	PE/DC/WT
NO 6507/12-3	1985	Saga Petroleum ASA	D	PE/DC

Table 1 Common well database for PL835 licence. Purpose: DC: depth conversion, PE: Petrophysical evaluation, PVT: PVT data, WT: Well Tie.

Seismic

The common licence database was approved at the ECMC meeting No 1. The seismic data that was utilized in the technical evaluation of PL835 is shown in Table 2 and comprises the PGS14002 dataset that was later merged with the PGS14005 dataset.

Survey name	NPDID	Survey year	Seismic type	Seismic operator	Market available
PGS14002	7993	2014	3D	PGS	Yes

Table 2 List with seismic datasets used in PL835 licence

3 Review of the geological framework

The detailed regional geological framework is described in the APA 2015 application for parts of blocks 6407/2, 6407/3, 6407/6 and 6507/12. The PL835 licence is located along the western margin of the Trøndelag Platform and towards the east and southeast of the Mikkjel and Midgard fields respectively.

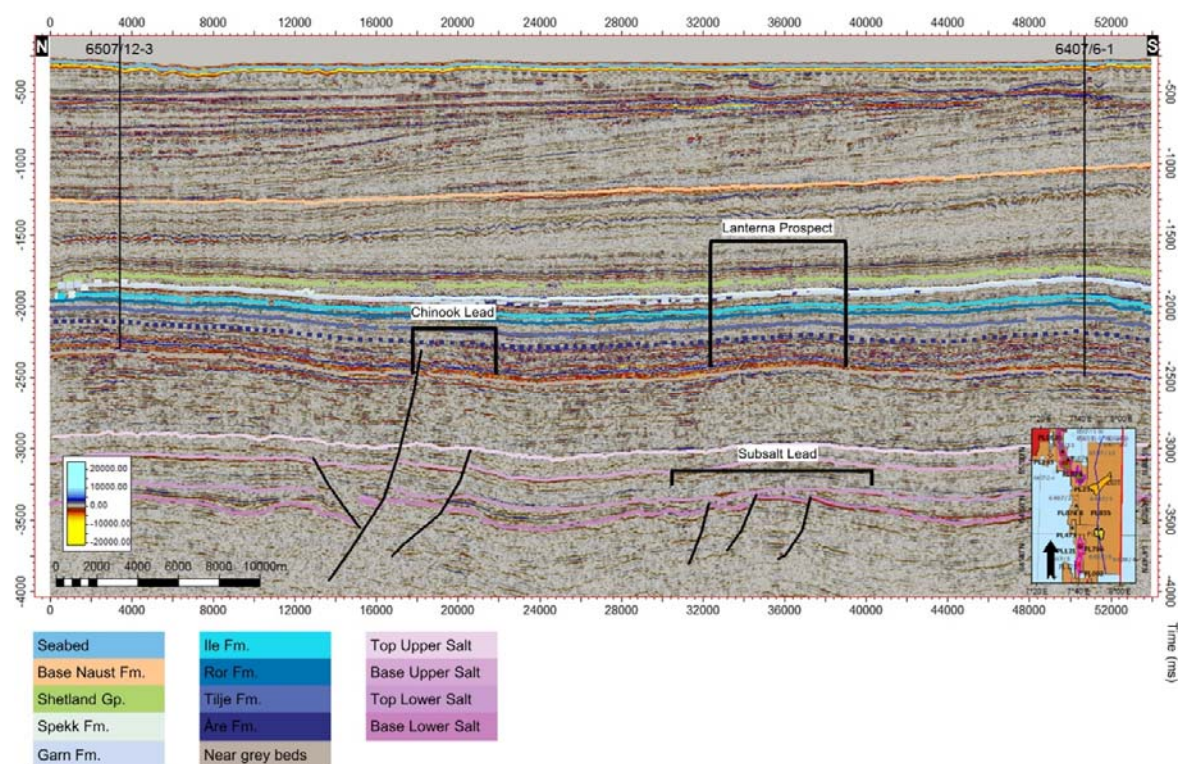


Figure 2 N-S seismic profile (random line PGS14005) showing key wells, horizons and evaluated prospects and leads.

The focus of the licence was the prospectivity along the western margin of the Trøndelag Platform with the Lanterna prospect, a subtle four-way closure, as a driving opportunity. A lower Jurassic lead (Chinook) was originally identified in the northern part of the licence, and was to be verified on newly acquired 3D dataset.

All key horizons were mapped out for regional and prospect evaluations (Figure 2). In the new 3D dataset, the change in structural style between the middle Jurassic, lower Jurassic and Triassic becomes apparent (Figure 3). The deeper horizons clearly show the impact of the Triassic rifting phase while, especially along the margin (i.e. footwall block of the Bremstein Fault Complex), while the effect of the late Jurassic rift phase is minor.

During the late Jurassic rifting phase some of the main Triassic faults were reactivated which resulted in a low relief topography which the Lanterna prospect is a part of.

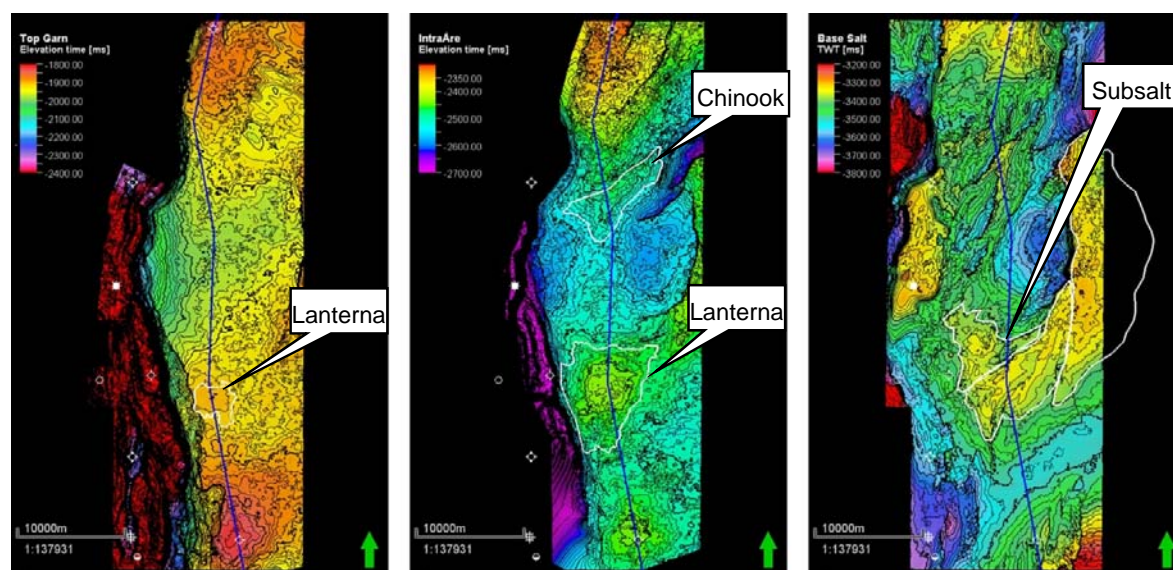


Figure 3 Key stratigraphic horizons (time, ms) in the PL835 licence with prospect/lead outline. From left to right: top Garn Fm., Intra Åre coal, Base Salt. The blue line indicates the location of the seismic section (Figure 2).

The impact of a different structure is seen in the Lanterna prospect (Figure 3, Figure 5), where in the present-day configuration the spill point is towards the 6407/6-1 well within the lower to middle Jurassic strata (upper Åre, Tilje, Ile and Garn fms) whilst a spill towards the NE is seen in the late Triassic to lower Jurassic strata (Grey Beds and lower Åre Fm.). This implies that a different petroleum system may be seen within the deeper stratigraphy. It should be noted that along the Bremstein Fault Complex the deepest fault juxtapositions occur between the Garn carrier bed on the hanging wall side and the lower Åre on the footwall side.

Below the Lanterna prospect, underneath the base of the lower Carnian aged salt, large permo-triassic fault blocks were mapped out that may include elements of a deeper petroleum system including a Permian or Triassic source, sealed by the Triassic Salt.

4 Prospect update

The Lanterna prospect is the main driving opportunity within the licence. The premise for the northern end of the licence was to screen the area for additional prospectivity and upsides in the new 3D seismic dataset. The lower Jurassic lead (Chinook) that was mapped out on an older 2D dataset was not confirmed in its full extent on the 3D seismic dataset. Hence those volumes were reduced. An updated overview of the volumes is presented below (Table 3).

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 license [%] ⁶ (0.0 - 100.0)	Reservoir	
			Oil [10 ⁶ Sm ³] (>0.00)			Gas [10 ⁹ Sm ³] (>0.00)					Litho-/ Chrono- stratigraphic level ⁷	Reservoir depth [m MSL] (>0)
			Low (P90)	Base (Mean)	High (P10)	Low (P90)	Base (Mean)	High (P10)				
Lanterna	P	Oil	1,27	8,22	19,30	0,03	0,66	1,49	0,32	50,0	Båt and Fangst Gp./ Lower-Middle Jurassic	1929
Chinook	L	Oil	0,20	0,88	1,78	0,02	0,11	0,22	0,17	100,0	Åre Fm./ Hettangian	2763

Table 3 Volume overview of the Lanterna prospect and Chinook lead

4.1 Lanterna Prospect

The Lanterna prospect consists of six vertically stacked reservoir intervals forming four-way dip closures at all Triassic to middle Jurassic levels (*Figure 4, Figure 5*). The shallow marine reservoir sections within the Garn, Ile and Tilje Fms, are separated and sealed by regional flow barriers from the Melke, Not and Ror Fms (*Figure 4*). The fluvial reservoir sections within the Lower Åre Fm. and Grey Beds require internal shale barriers to seal. The updated prospect evaluation includes the upper Åre Fm. as an additional reservoir segment. The upper Åre Fm. marks the transition from a fluvial system to a marginal marine bay fill succession. The latter is sealed by a semi regional shale. The extent and seal capacity of this shale within the Lanterna area is however uncertain. All prospect segments have small changes in volumes compared with the cases described in the APA application. Updated prospect details for all segments are grouped in the appendix at the end of the report.

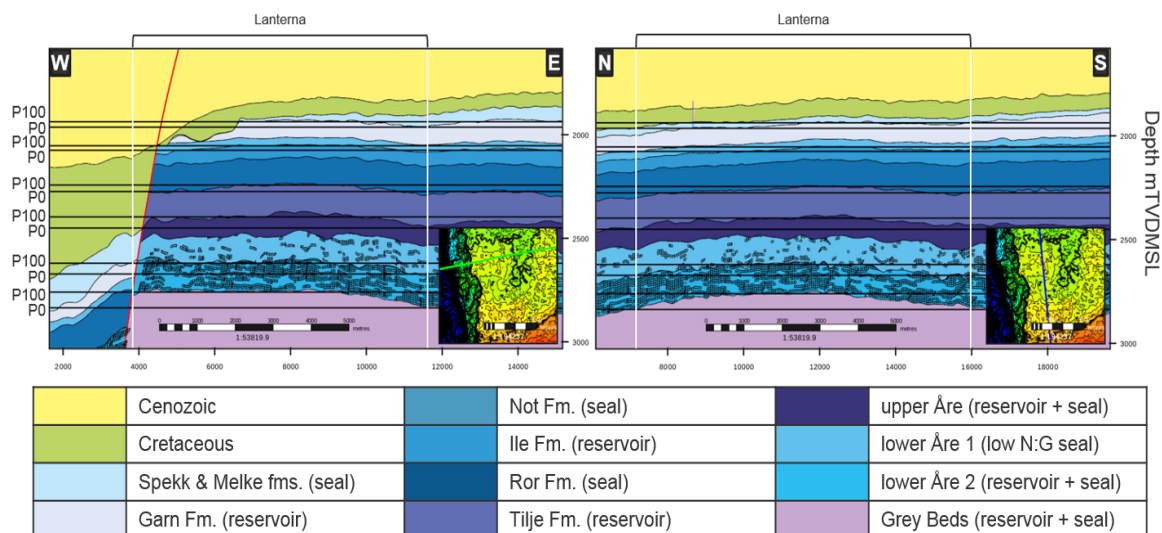


Figure 4 W-E and N-S geo-seismic section across the Lanterna prospect (see maps for location). Solid lines show minimum and maximum contact in each reservoir segment. See *Figure 5* for structural maps of the six reservoir segments.

Migration is the main risk since the prospect is located on the platform area near several dry wells. Structural seismic mapping (TWT) is of high confidence because of Lanterna being a simple structure with reasonably good seismic imaging. However, depth-conversion is uncertain due to the relative flat structure and moderate uncertainties in the velocity field. This uncertainty in depth-conversion has a large impact on defining the structural closure of the prospect and the Gross Rock Volumes (GRV) at all six reservoir intervals.

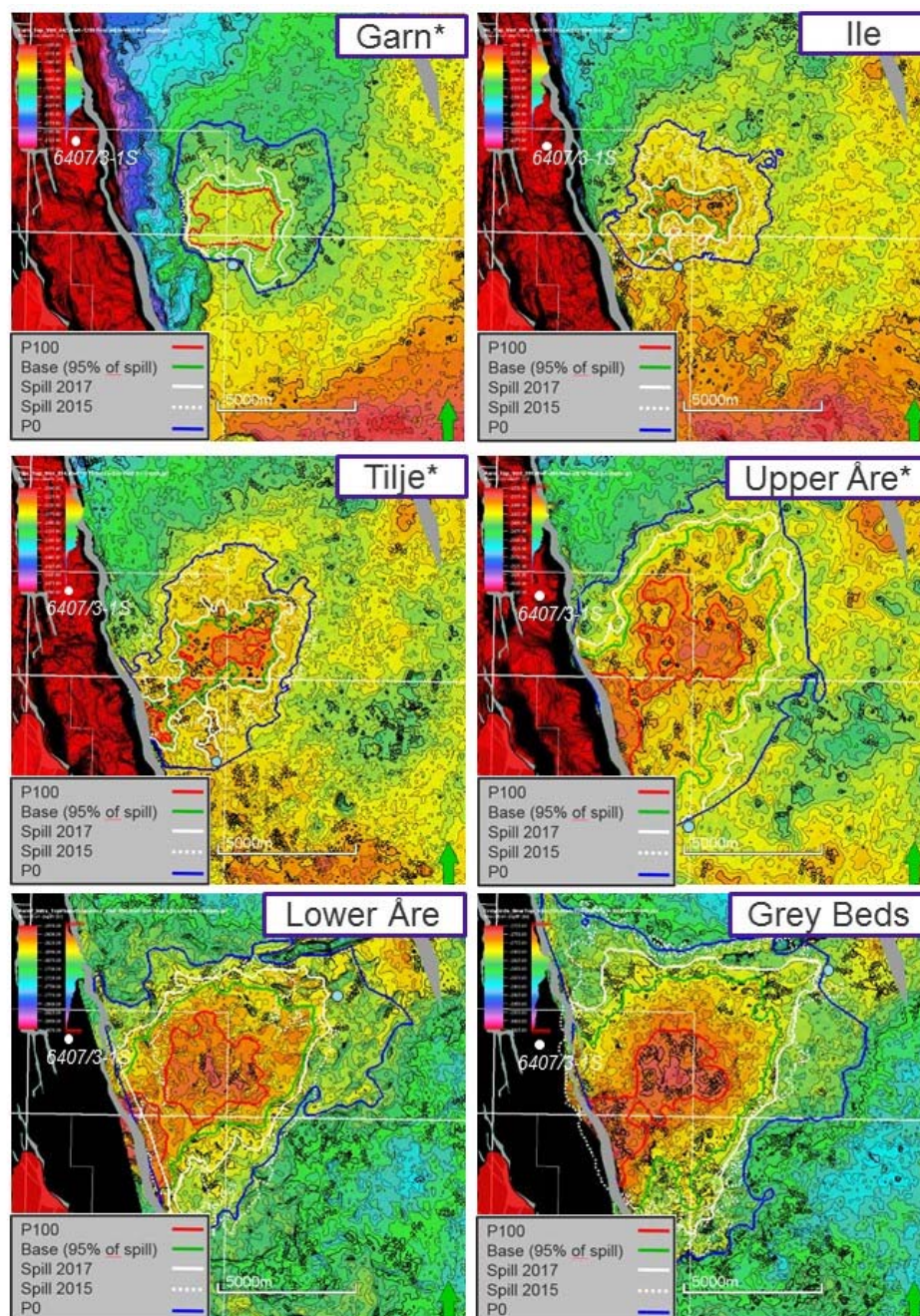


Figure 5 Top reservoir depth maps of the Lanterna prospect with contact polygons for P100 (red solid), base case (green solid), spill point 2017 (white solid), spill point 2015 (white dashed), spill point 2017 (white solid) and P0 (blue solid). The mapped spill point for the structure is marked by a blue dot. Reservoir segments included in business cases for economical evaluation are marked with an asterisk.

The Lanterna prospect is not supported by DHI observations as no clear AVO responses indicating presence of hydrocarbons were observed. One of the main arguments to why a strong fluid indicator is lacking is the presence of a relatively heavy oil type with lower GOR. Based on these assumption, the PVT parameters for the prospect were revised and synthetic modelling of the expected AVO responses indicates that: (i) brine and heavy oil with low GOR are difficult to differentiate since both phases would produce similar responses on real seismic data, and (ii) potential AVO effects will be difficult to observe due to thin oil columns.

A CSEM feasibility study was carried out to verify if the Lanterna prospect is visible on a CSEM survey. The results of the study showed that for most cases (individual filling of segments and multiple segments filled), only the P10 cases will be detectable with a sufficient degree of confidence. As columns would be relatively thin, there is a high chance that the minimum economic cases still would not be detectable.

4.2 Chinook Lead

The Chinook lead as mapped on the acquired 3D dataset is defined as a small fault bounded dip closure (*Figure 2, Figure 3*). The previously mapped lead indicated a potential large closure that was dependent on the presence of a large fault to seal it from the dry 6507/12-3 well. Such a fault was not confirmed on the newly acquired 3D seismic dataset. As such, the size of the lead was significantly reduced.

4.3 Lanterna Subsalt Lead

During the mapping process of the PL835, a fault bounded dip closure was mapped out at the top and base of the Triassic evaporite sequence underneath the Lanterna structure (*Figure 2, Figure 3*). The filling of such a structure is strongly depended on the presence and maturity of a deeper, tentative Permian or Triassic aged source rock. The depth of this structure is similar to the same Triassic interval in the 6507/12-2 well. Petrographical evaluations indicate presence sandstones underneath the evaporites with almost no porosity due to abundant cementation (quartz and carbonate). This implies that despite the existence of a large subsalt closure, the presence of sand with reservoir quality is highly uncertain.

5 Technical evaluations

The Lanterna prospect is located c.45km north of Draugen and c.62km north-east of Njord. The technical economical evaluation contains multiple segments with the Garn, Tilje and Upper Åre Fms. The segments are vertically stacked. Only pure oil cases are possible scenarios. The valuation is performed on a segment level to cover the wide span of outcomes. The field development solution is a subsea tie-back directly to the Draugen platform. The drainage strategy is water injection and the number of production wells vary from 2–7 depending on the number of hydrocarbon-bearing formations that are encountered. With an exploration well in 2019, the production start is assumed in 2025. As the Draugen field is in the tail production, no major topside modifications are assumed to be necessary to produce Lanterna.

6 Conclusions

The Lanterna prospect was looked at as the main drilling candidate for the PL835 licence. The prospect is shared with the neighbouring PL796 licence, where a positive decision towards a drill has been taken. The absence of a clear DHI in the prospect and high migration risk regarding the prospect's locations made the partnership not reaching a consensus on how to distribute the financial exposure.

Both partners in PL835 are also represented in PL796 and since a drill decision on the Lanterna prospect was taken in the PL796 licence, one of the prerequisites for dropping the PL835 licence will be to apply for a PL796 licence extension covering the Lanterna prospect in the forthcoming APA round.

7 References

Statoil 2015. Application for Part of blocks 6407/2, 6407/3, 6407/6 and 6507/12. APA2015 Application, 61 pp.

8 Appendix: Table 5: Prospect details

Field	NO 64721/NO 14073	Prospect name	NO 64721/NO 14073	Car	Discovery	Prospect	Prospect (P1)	MFC at base	MFC at top	MFC at top	MFC at top
Oil case or O&G case	Oil	Reported by	Statoil	Structure	AS	Structure	AS	AS	AS	AS	AS
Resources in PLACE and RECOVERABLE	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Volume, this case	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Resources in place	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Recoverable resources	0.97	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Reservoir Chrono (form)	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Reservoir Chrono (to)	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Probability (fraction)	0.97	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Total oil + gas + oil & gas case	1.071	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Reservoir (P1) (0.00-1.00)	0.97	Structure	AS	Structure	AS	Structure	AS	AS	AS	AS	AS
Parameters:											
Depth to top of prospect [m WSE] (> 0)	1917										
Area of closure [km²] (> 0)	6.0										
Reservoir thickness [m] (> 0)	60										
HC column in prospect [m] (> 0)	9										
Gross rock vol. [10 ⁶ m³] (> 0.000)	0.029										
Nkr / Gross fraction] (0.00-1.00)	0.80										
Porosity [fraction] (0.00-1.00)	0.29										
Permeability [mD] (> 0)	354.1										
Water Saturation [fraction] (0.00-1.00)	0.17										
Bq [mD/Sm²] (< 1.0000)	0.78										
1/Bq [Sm²/mD] (< 1.000)	1.28										
GOR, free gas [Sm³/Sm³] (> 0)	68										
GOR, oil [Sm³/Sm³] (> 0)	0.25										
Recov. factor, oil main phase [fraction] (0.00-1.00)	0.25										
Recov. factor, gas ass. phase [fraction] (0.00-1.00)	0.25										
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.25										
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.25										
Temperature, top res [°C] (> 0)	72										
Pressure, top res [bar] (> 0)	203										
Cur. off credits for MIG calculation	1. VSH - < 0.4										

Table 4 Lanterna prospect data of the Garn Fm.

Property Name	Value	Unit	Source	Notes
Oil Gas or O&G case:	Oil			
This is case no in the prospect:	1 of 1			
Reservoir in PLACE and RECOVERABLE				
Volume, this case	Oil (0.00-1.00)	1.00		
in place resources	Oil (0.00-1.00)	1.00		
Recoverable resources	Oil (0.00-1.00)	0.98		
Reservoir Chrom (form)				
Reservoir Chrom (ID)				
Probability (fraction)	0.16			
Zone (oil + gas + oil & gas case)	Oil case (0.00-1.00)	1.00		
Reservoir (P1) (0.00-1.00)	0.70			
Parameters:				
Depth to top of prospect (in MSL) (> 1)	20.00	m		
Area of closure (km²) (> 0.0)	3.0	km²		
Reservoir thickness (m) (> 0)	64	m		
HC column in prospect (m) (> 0)	8	m		
Gross rock vol. [10³ m³] (> 0.000)	0.014	10³ m³		
Net / Gross (fraction) (0.00-1.00)	0.60			
Porosity (fraction) (0.00-1.00)	0.28			
Permeability (mD) (> 0.0)	2497.2	mD		
Water Saturation (fraction) (0.00-1.00)	0.11			
Bq [Rn³/Sms] (< 1.0000)	0.77			
1Bg [Sm³/Sms] (< 1.00)	0.80			
GOR, free gas [Sm³/Sm³] (> 0)	51			
GOR, oil [Sm³/Sm³] (> 0)	75			
Recov. factor, oil main phase (fraction) (0.00-1.00)	0.28			
Recov. factor, gas ass. phase (fraction) (0.00-1.00)	0.28			
Recov. factor, gas main phase (fraction) (0.00-1.00)	0.28			
Recov. factor, liquid ass. phase (fraction) (0.00-1.00)	0.28			
Temperature, top gas (°C) (> 0)	215	°C		
Pressure, top gas (bar) (> 0)	215	bar		
Cut off criteria for NG calculation:				
1. VSH < 0.1	2	Porosity > 0.1	3	

Table 5 Lanterna prospect data of the Ile Fm.

Oil, Gas or O&G case	Block NO 64073, LIC 64073, Prospect name	64073, Lanarna Tilje Discovery/Prospect and	Prospect	WPD oil case value	WPD prospect (7/00)
This is case no.	1 of 1	New Block (YN)	EL 835 Licence status report	WPD oil case value	WPD oil case value
Resources IN PLACE and RECOVERABLE	Oil (10 ⁹ Sm ³) (0.0)	Reported by	Structural elements	WPD oil case value	WPD oil case value
Volume, this case	Oil (10 ⁹ Sm ³) (0.0)	Main phases	Oil (P20)	WPD oil case value	WPD oil case value
Recoverable resources	Oil (10 ⁹ Sm ³) (0.0)	Base Mean	15.54	WPD oil case value	WPD oil case value
Reservoir Chena (form)	Jurassic, EPT, Permian, Reservoir (thg) (th)	Base Min	4.60	WPD oil case value	WPD oil case value
Reservoir Chena (ID)	Jurassic, EPT, Permian, Reservoir (thg) (th)	Base Max	21.92	WPD oil case value	WPD oil case value
Recovery function	Jurassic, EPT, Permian, Reservoir (thg) (th)	Source Rock (thg) (th)	Source Rock (thg) (th)	WPD oil case value	WPD oil case value
Reservoir (P1) (0.00-1.00)	0.25	Oil cases (0.00-1.00)	Oil cases (0.00-1.00)	WPD oil case value	WPD oil case value
Reservoir (P2) (0.00-1.00)	0.30	Trap (P2) (0.00-1.00)	Trap (P2) (0.00-1.00)	WPD oil case value	WPD oil case value
Parameters:		Oil cases (0.00-1.00)	Oil cases (0.00-1.00)	WPD oil case value	WPD oil case value
Depth to top of prospect [m (MS)] (> 0)	22.2	Base	22.2	WPD oil case value	WPD oil case value
Area of closure [km ²] (> 0)	5.4	Top (P2)	7.0	WPD oil case value	WPD oil case value
Reservoir thickness [m] (> 0)	58	High (P1)	22.8	WPD oil case value	WPD oil case value
HC column in prospect [m] (> 0)	17	High (P2)	21.8	WPD oil case value	WPD oil case value
Gross rock vol. [10 ⁶ m ³] (> 0.000)	0.027	High (P3)	7.3	WPD oil case value	WPD oil case value
Net / Gross fraction] (0.00-1.00)	0.64	High (P4)	0.30	WPD oil case value	WPD oil case value
Porosity [fraction] (0.00-1.00)	0.25	High (P5)	0.03	WPD oil case value	WPD oil case value
Permeability [mD] (> 0)	1636.5	High (P6)	0.29	WPD oil case value	WPD oil case value
Water Saturation [fraction] (0.00-1.00)	0.20	High (P7)	0.35	WPD oil case value	WPD oil case value
1/B0 [Sm ³ /Sm ³] (< 1.0000)	0.75	High (P8)	0.81	WPD oil case value	WPD oil case value
GOR, free gas [Sm ³ /Sm ³] (> 0)	55	High (P9)	1.10	WPD oil case value	WPD oil case value
Recovery factor, oil main phase [fraction] (0.00-1.00)	0.25	High (P10)	0.35	WPD oil case value	WPD oil case value
Recovery factor, gas ass. phase [fraction] (0.00-1.00)	0.25	High (P11)	0.35	WPD oil case value	WPD oil case value
Recovery factor, gas main phase [fraction] (0.00-1.00)	0.25	High (P12)	0.35	WPD oil case value	WPD oil case value
Recovery factor, liquid ass. phase [fraction] (0.00-1.00)	0.25	High (P13)	0.35	WPD oil case value	WPD oil case value
Temperature, top res [°C] (> 0)	35	High (P14)	0.35	WPD oil case value	WPD oil case value
Pressure, top res [bar] (> 0)	234	High (P15)	0.35	WPD oil case value	WPD oil case value
Cut off criteria for NIG calculation	1. VSH < 3.4	High (P16)	0.35	WPD oil case value	WPD oil case value
	2. Porosity > 0	High (P17)	0.35	WPD oil case value	WPD oil case value
	3	High (P18)	0.35	WPD oil case value	WPD oil case value

Table 6 Lanterna prospect data of the Tilje Fm.

Sheet	NO 640737 NO 54073 Prospect name	64073 54073 Area	Discussed/Producing	Proposed	Prop ID (if field)	NP0 approved (Y/N)
Oil Gas or O&G case	NP0 oil 1111111111	64073 54073 Area	Discussed/Producing	Proposed	Prop ID (if field)	NP0 approved (Y/N)
This is case no.	1 of 1	Structure of prospect	Structure of prospect	Structure of prospect	Structure of prospect	Structure of prospect
Resources IN PLACE and RECOVERABLE		State Reservoir AS	State Reservoir AS	State Reservoir AS	State Reservoir AS	State Reservoir AS
Volumes, this case		Temp. regime	Temp. regime	Temp. regime	Temp. regime	Temp. regime
In place resources		Main phase	Main phase	Main phase	Main phase	Main phase
Recoverable resources		Oil (P50)	Oil (P50)	Oil (P50)	Oil (P50)	Oil (P50)
Research Chrono (fm)		Oil (P10)	Oil (P10)	Oil (P10)	Oil (P10)	Oil (P10)
Research Chrono (to)		Oil (P20)	Oil (P20)	Oil (P20)	Oil (P20)	Oil (P20)
Probability (fraction)		Oil case (0.01-0.01)	Oil case (0.01-0.01)	Oil case (0.01-0.01)	Oil case (0.01-0.01)	Oil case (0.01-0.01)
Gas (oil + gas + oil & gas case) (0.00-1.00)	0.06	Gas case (0.01-0.01)	Gas case (0.01-0.01)	Gas case (0.01-0.01)	Gas case (0.01-0.01)	Gas case (0.01-0.01)
Parameters:		Top (P20) (0.01-1.0)	Top (P20) (0.01-1.0)	Top (P20) (0.01-1.0)	Top (P20) (0.01-1.0)	Top (P20) (0.01-1.0)
Depth to top of prospect [m MS.L] (> 0)	256	Base	Base	Base	Base	Base
Reservoir thickness [m] (> 0)	26.0	Height (P50)	Height (P50)	Height (P50)	Height (P50)	Height (P50)
HC column in prospect [m] (> 0)	78	Retention (P10) is included in Trap (P2)	Retention (P10) is included in Trap (P2)	Retention (P10) is included in Trap (P2)	Retention (P10) is included in Trap (P2)	Retention (P10) is included in Trap (P2)
Gross rock vol. [10 ⁶ m ³] (> 0.000)	22					
Net / Gross fraction (0.00-1.00)	0.41					
Porosity (fraction) (0.00-1.00)	0.17					
Permeability (mD) (> 0.0)	192.7					
Water Saturation (fraction) (0.00-1.0)	0.30					
Bq [RnO/SnO] (< 1.0000)	0.75					
186 [SnO/RnO] (< 1.00)	61					
GOR, free gas [Sm ³ /Sm ³] (> 0)	0.17					
GOR, oil [Sm ³ /Sm ³] (> 0)	0.17					
Recov. factor, oil main phase (fraction) (0.00-1.00)	0.21					
Recov. factor, gas ass. phase (fraction) (0.00-1.00)	0.21					
Recov. factor, gas main phase (fraction) (0.00-1.00)	0.21					
Recov. factor, liquid ass. phase (fraction) (0.00-1.00)	0.21					
Temperature, top gas (°C) (> 0)						
Pressure, top gas (bar) (> 0)						
Cut. off criteria for NLG calculation:						
	1. VSH < 0.1	2. Porosity < 0.1	3.			

Table 7 Lanterna prospect data of the Upper Åre Fm., New Evaluation

Field	NO 640711 NO 640712	Prospect name	540713	Discovery/Field/line	Prospect	Prop. ID (if field)	540714	540715	540716	540717
Oil Gas or O&G case	Oil	Reported to property	Step 1	Outcrop 426 (M74)	PL835 licence has no effect	PL835 licence has no effect	426 (M74)	426 (M74)	426 (M74)	426 (M74)
Reservoir IN PLACE and RECOVERABLE Volumes, this case	Oil (11) [0.00-1.00]	Main phase	Base	Base Near	Base	Base	Base	Base	Base	Base
Oil (11) [0.00-1.00]	2.16	2.16	2.20	1.02	2.13	2.13	2.13	2.13	2.13	2.13
Gas (11) [0.00-1.00]	0.44	0.44	0.49	2.0	0.48	0.21	0.93	0.93	0.93	0.93
Gas (12) [0.00-1.00]						0.04	0.14	0.20	0.20	0.20
Recoverable resources										
Reservoir Chrono (form)	Jurassic Early/Highgate	Reservoir (M74) (15)	BA1	SP-148 Fm Low Source Rock, Highgate primary	ARABIAN USER, NO SOURCE ROCK, HIGH GATE	ARABIAN USER, NO SOURCE ROCK, HIGH GATE	YOUNG SP-148 Fm	YOUNG SP-148 Fm	YOUNG SP-148 Fm	YOUNG SP-148 Fm
Reservoir Chrono (to)	Jurassic Early/Highgate	Reservoir (M74) (15)	BA1	SP-148 Fm Low Source Rock, Highgate primary	ARABIAN USER, NO SOURCE ROCK, HIGH GATE	ARABIAN USER, NO SOURCE ROCK, HIGH GATE	YOUNG SP-148 Fm	YOUNG SP-148 Fm	YOUNG SP-148 Fm	YOUNG SP-148 Fm
Probability (fraction)	0.08	Oil case (0.01-1.00)	0.00	Gas case (0.01-1.00)	0.10	Oil & Gas case (0.01-1.00)	0.00	0.00	0.00	0.00
Reservoir (P1) (0.00-1.00)	0.01	Trap (P2) (0.01-1.00)	0.35	Charge (P3) (0.01-1.00)	0.35	Retention (P4) (0.01-1.00)	0.00	0.00	0.00	0.00
Parameters:		Base	Base	Base	Base	Base	Base	Base	Base	Base
Depth to top of prospect: (m MSL) (> 0)	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590
Area of closure (km²) (> 0.0)	17.7	17.7	32.2	48	17.7	32.2	48	17.7	32.2	48
Reservoir thickness (m) (> 0)	1.35	1.35	1.48	1.61	1.35	1.48	1.61	1.35	1.48	1.61
HC column in prospect (m) (> 0)	25	25	38	53	25	38	53	25	38	53
Gross rock vol [10³ m³] (> 0.000)	0.095	0.095	0.125	0.173	0.095	0.125	0.173	0.095	0.125	0.173
Net / Gross (fraction) (0.00-1.00)	0.21	0.21	0.26	0.31	0.21	0.26	0.31	0.21	0.26	0.31
Porosity (fraction) (0.00-1.00)	0.15	0.15	0.19	0.21	0.15	0.19	0.21	0.15	0.19	0.21
Permeability (md) (> 0.0)	385.2	385.2	472.1	769.2	385.2	472.1	769.2	385.2	472.1	769.2
Water Saturation (fraction) (0.00-1.00)	0.39	0.39	0.38	0.45	0.39	0.38	0.45	0.39	0.38	0.45
Bq [Rn3/Sm3] (< 1.0000)	0.74	0.74	0.78	0.82	0.74	0.78	0.82	0.74	0.78	0.82
GCR free gas [Sm³/Sm³] (> 0)										
GCR oil [Sm³/Sm³] (> 0)	75	75	98	123	75	98	123	75	98	123
Recover. factor, oil main phase (fraction) (0.00-1.00)	0.17	0.17	0.21	0.25	0.17	0.21	0.25	0.17	0.21	0.25
Recover. factor, gas ass. phase (fraction) (0.00-1.00)	0.17	0.17	0.21	0.25	0.17	0.21	0.25	0.17	0.21	0.25
Recover. factor, liquid ass. phase (fraction) (0.00-1.00)										
Temperature, top gas (°C) (> 0)	101	101	101	101	101	101	101	101	101	101
Pressure, top gas (bar) (> 0)	274	274	274	274	274	274	274	274	274	274
Cut off criteria for N/G calculator	1	VSH = < 0.4	2	Posity > 0.1	3					

Table 8 Lanterna prospect data of the Intra Lower Åre Fm.

Block	NO 64073 / NO 64077	Prospect name	64073 Lanterna T/	Discovery/Prospect	Prospect	Prospect ID (if level)	NPD approved (Y/N)
Oil, Gas or O&G case	Oil	New Play (NM)	Swail Petroleum	Outside Plat. (H)	PL835 Licence status report		Assessment year
This is case no.	1 of 1	Structural element	Trap/Hill Platform	Type of trap	Far-spread fault	Water depth in US: 14-0	3-D
Resources in PLACE and RECOVERABLE Volumes, this case		Main phase			Associated phase		High (P10)
In place resources	Oil [10 ⁹ Sm ³] (<0.00)	Low (P90)	11.67	Base, Mean	High (P10)	32.71	High (P10)
Recoverable resources	Gas [10 ⁹ Sm ³] (<0.00)	2.96		15.57	Low (P90)	0.29	Low (P90)
Recoverable resources	Gas [10 ⁹ Sm ³] (<0.00)	0.67	2.76	3.73	High (P10)	11.17	High (P10)
Recoverable resources	Trassic Late-Rhaelian	Reservoir litho (from)	Grey beds	Source Rock, thoro. estimate	Jurassic Upper-M	0.07	0.39
Recoverable resources	Trassic Late-Rhaelian	Reservoir litho (to)	Grey beds	Source Rock, thoro. estimate	Jurassic Upper-M	0.07	0.39
Total oil + gas + oil & gas case	0.02	Oil case (0.00-1.00)	1.00	Gas case (0.00-1.00)	Oil & Gas case (0.00-1.00)	0.00	0.00
Recovery (P10) (0.00-1.00)	0.15	Trap (P2) (0.00-1.00)	0.35	Charge (P2) (0.00-1.00)	Retention (P4) (0.00-1.00)	0.00	0.00
Parameters:		Base	2738	High (P10)	2748		
Depth to top of prospect (m NSL) (< 0)			29		49.8		7.1
Area of closure (km ²) (< 0)			95		100		105
Reservoir thickness (m) (< 0)			35		56		77
HC column in prospect (m) (> 0)			0.133		0.691		1.445
Gross rock vol. [10 ⁹ m ³] (> 0.000)			0.2		0.26		0.33
Net/Gross (fraction) (0.00-1.00)			0.16		0.18		0.21
Porosity (fraction) (0.00-1.00)			1855.6		4596.0		7737.3
Permeability (mD) (> 0)			0.30		0.38		0.45
Water Saturation (fraction) (0.00-1.00)			0.73		0.76		0.79
B _g [Rm3Sm3] (< 1.0000)			80		103		129
GOR, free gas [Sm ³ /Sm ³] (> 0)			0.19		0.24		0.30
GOR, oil [Sm ³ /Sm ³] (> 0)			0.19		0.24		0.30
Recov. factor, oil main phase (fraction) (0.00-1.00)			0.19		0.24		0.30
Recov. factor, gas ass. phase (fraction) (0.00-1.00)			0.19		0.24		0.30
Recov. factor, gas main phase (fraction) (0.00-1.00)			0.19		0.24		0.30
Recov. factor, liquid ass. phase (fraction) (0.00-1.00)			0.19		0.24		0.30
Temperature, top res (°C) (> 0)	107						
Pressure, top res (bar) (> 0)	290						
Cut-off criteria for NG calculation	1. USH < 0.4	2. Porosity > 0.1	3				

Table 9 Lanterna prospect data of the Grey Beds