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TITLE OF DOCUMENT

PL530 Heilo Relinquishment Report

	AUTHOR	CHECKED	PASSED
NAME	[redacted]		
DATE	12.06 2013	12.06 2013	12.06 2013
SIGNATURE			

REV.	DATE	REASON FOR ISSUE	PREPARED	VERIFIED	APPROVED
1	16.04.20123	Final documentation to license partners and NPD	[redacted]		

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1. Key License history

PL 530 was awarded 15.05.2009 to GDF SUEZ E&P Norge AS as operator:

Original licensee; PL530 15.05.2009		Present licensee; PL530 03.12-2012	
GDF SUEZ E&P Norge AS	40 % (Operator)	GDF SUEZ E&P Norge AS	30 % (Operator)
Discover Petroleum AS	20 %	DONG E&P Norge AS	20 %
North Energy AS	20 %	North Energy ASA	20 %
Rocksource ASA	20 %	Rocksource ASA	10 %
		Valiant Petroleum Norge AS	10 %
		Repsol Exploration Norge AS	10 %

20.04.2010: North Energy AS changed name to North Energy ASA
26.05.2010: Discover Petroleum AS changed name to Front Exploration AS
29.07.2011: Transfer of 10 % from GDF SUEZ E&P Norge AS to Repsol Exploration Norge AS
18.09.2011 – 12.10.2011: Drilling well 7124/4-1 S. The well was classified as dry.
24.05.2012: Transfer of 10 % from Rocksource ASA to Valiant Petroleum Norge AS
09.07.2012: NPD confirm fulfilled work commitment
31.10.2012: Transfer of 20 % from Front Exploration AS to DONG E&P Norge AS
18.03.2013: OED approve relinquishment of PL530. Effective from March 12, 2013.

Detailed information on dates and work program is presented in the table below:

Date	License award	End of initial period	Work program
15.05.2009	PL530 award	15.05.2015	Drill 2 exploration wells, the second being contingent upon the results from the first: • First exploration well to be drilled within 3* years from award. 200m into the Havert Formation or 3000m (15.05.2012). • Apply for dispensation for second exploration well within 3 years from award (15.05.2012) • Drill the second exploration well within 5 years from award (15.05.2014) • PDO within 6 years from award (15.05.2015)

**) 1 year extension granted to drill the first exploration well (MPE ref.10/01192-4 dated 3.9.2010)*

Overview of meetings in PL530:

MC no 1: 12/06/2009
WM no 1: 22/06/2009
EC no 1: 03/11/2009
MC no 2: 24/11/2009
EC no 2 & MC no 3: 23/11/2010
WM no 2: 12/04/2011
EC no 3 & MC no 4: 24/06/2011
EC no 4 &MC no 5: 30/11/2011
EC no 5 & MC no 6: 12/04/2012
WM no 3: 05/09/2012

Reason for relinquishment:

The 7124/4-1 S Heilo well was the first exploration well within the 530 license. PL 530 consists of the blocks 7123/6 and 7124/4-4 (parts) (figure 1). The license is surrounded by discoveries (e.g. 7122/6-1 Tornerose, 7125/4-1 (Nucula) and 7124/3-1 (Bamse) (figure 4).

The well 7124/4-1 S was spudded 18th September 2011, and completed 12th October 2011. Top Realgrunnen was encountered at 1259 mRKB and terminated at 2737,5 m RKB, 200m into the early Triassic Havert Formation. The well was dry; no shows observed on cuttings, flex flair gas data or well logs. In addition, Fluid Inclusion test analysis confirmed absence of any hydrocarbon accumulation.

The primary exploration target for the well was to prove hydrocarbons in the Jurassic and Triassic reservoir rocks (Realgrunnen Subgroup and Top Snadd Formation). The secondary exploration target was to prove hydrocarbon in the Middle and Lower Triassic (Kobbe, Klappmyss and Havert formations) (figure 2).

Well 7124/4-1 S encountered very good reservoir quality in the primary reservoir targets of the Jurassic Realgrunnen Subgroup and Triassic Snadd Formation. The three secondary targets in Triassic demonstrated no reservoirs.

The pre-drill geological chance of success was 28%, with migration considered as the main risk factor. The most likely cause of failure is interpreted to be lack of migration into the license area.

The main structure in PL530 is the Heilo structure. The structure is divided into 3 segments; Heilo Head, Heilo North and Heilo South. The first exploration well, 7124/4-1 S was located in the Heilo South segment, but with clear indication of juxtaposition between the segments. No other prospects are identified in PL530 (figure 1).

Based on these results and conclusions, the PL530 partnership decided to relinquish the license.

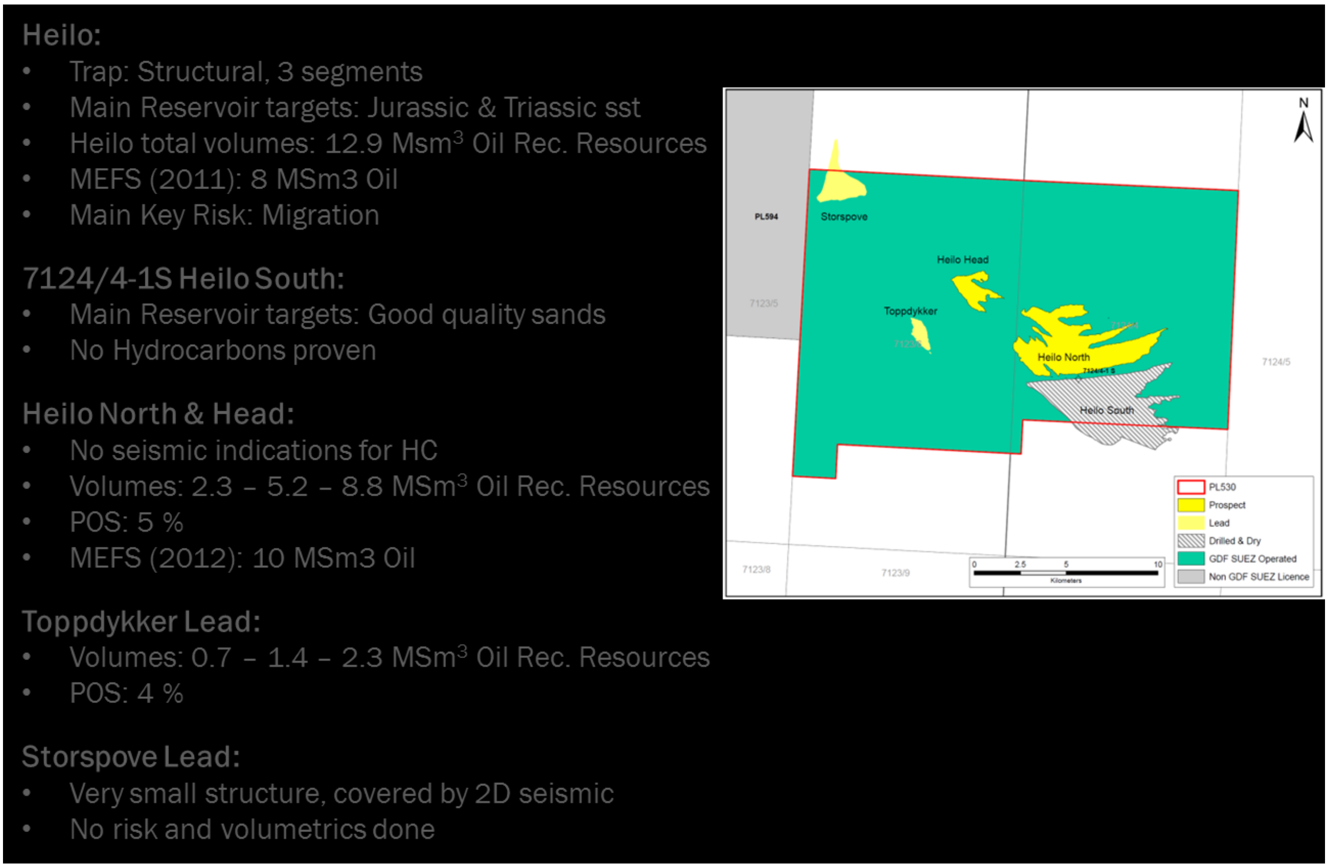

Figure 1: PL530 Prospect and leads

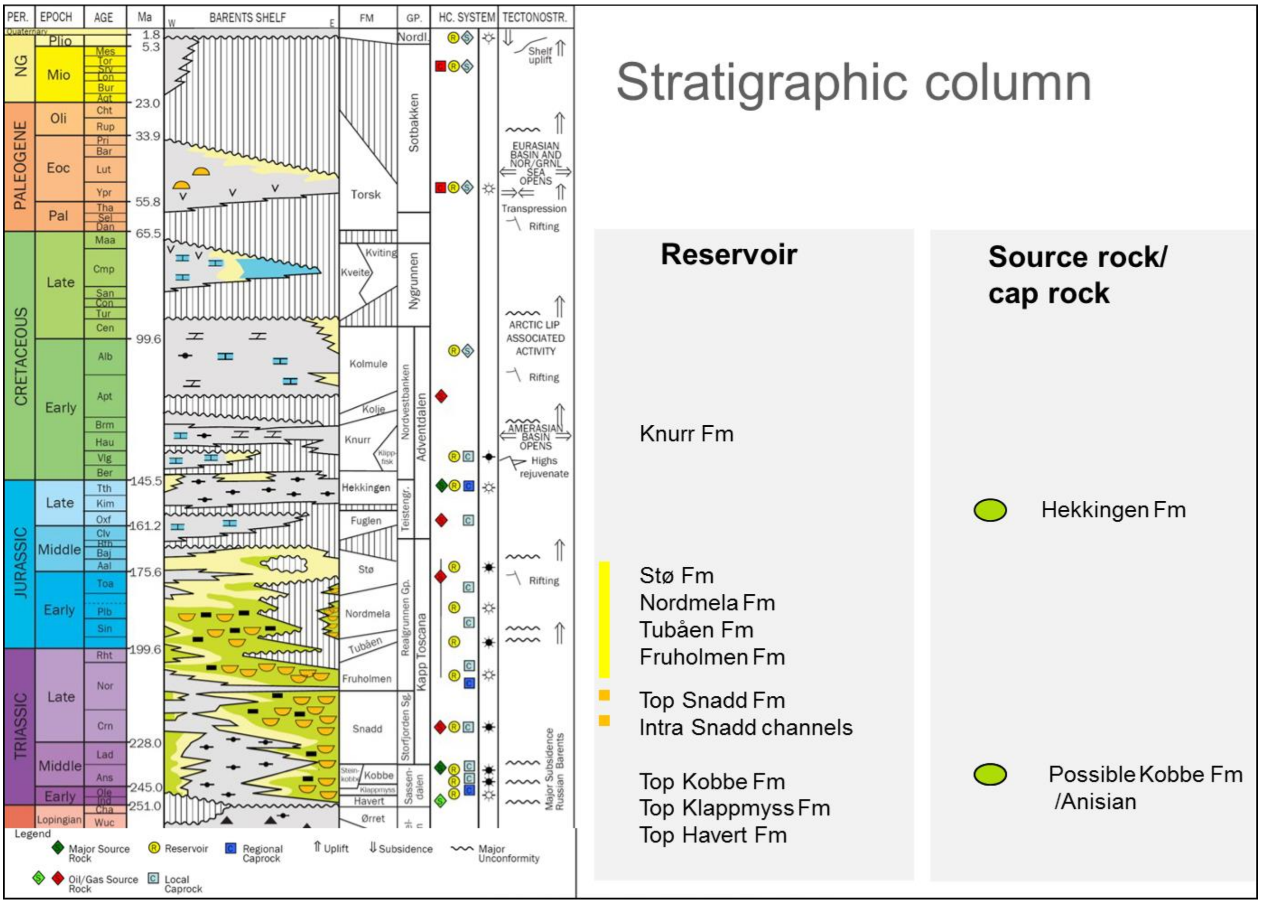

Figure 2: Litostratigraphic column

2. Database

Fruholmen 3D survey covers the main part of PL530 (figure 2). For the areas outside the 3D-coverage, 2D-seismic coverage is about 2x2 km in the SW and 4x2 km in the NW corner. The quality of the Fruholmen 3D survey and 2D-seimic lines are in general good (figure 3, table 1).

Only the nearby wells used to seismic tie of horizons and as input to the volume calculations are included in the well database (table 2).

Seismic Database		Comments
Fruholmen 3D		Cover the main part of PL530 (figure 3). Quality is average.
Fruholmen-2D		Average quality, direct tie to the wells 7124/3-1 and 7122/6-1, and close to the 7121/4-1 S Heilo well.
BSS01-2D		Average quality.
FWGS-84		Average quality.
NPD-FI-84		Low quality.

Table 1: Seismic database

Well Database	Prospect/ discovery name	Year	TD Formation	TD (m TVDRKB)	Content	Operator
7122/6-1	Tornerose	1987	Snadd Fm	2707	Gas/ Condensate	Total
7124/4-1 S	Heilo	2011	Havert Fm	2730	Dry	GDF SUEZ
7124/3-1	Bamse	1987	Ørn Fm	4727	Oil/ Gas	Saga
7125/1-1	Binne	1988	Kobbe Fm	2199	Oil/ Gas	Saga
7125/4-1	Nucula	2007	Klappmyss Fm	1615	Oil/ Gas	Norsk Hydro

Table 2: Well database

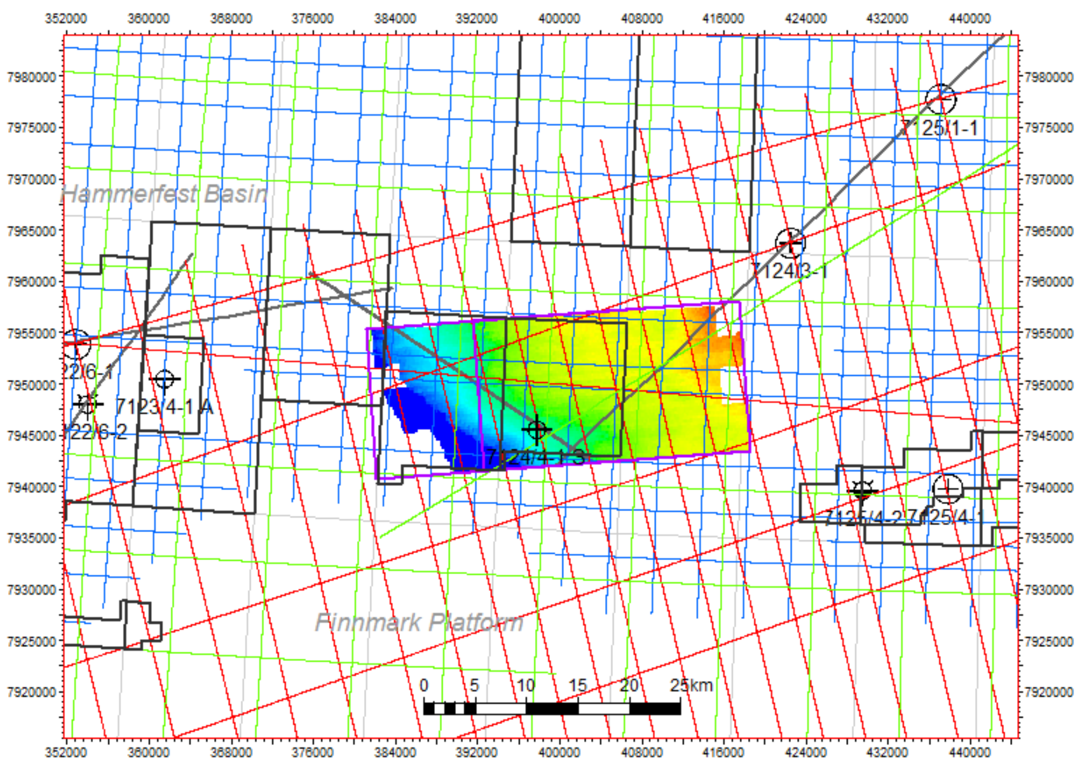

Figure 3: Well and seismic database (2D and 3D) for PL530. Interpreted horizon is seabed.

3. Review of geological framework

3.1 Structural Setting

The license is located within the blocks 7123/6 and 7124/4, in the transition zone between the Hammerfest and the Nordkapp Basins, and is situated about 40 km west of 7125/4-1 Nucula, 30 km southwest of 7124/3-1 Bamse, 45 km east of 7122/6-1 Tornerose discovery and 70 km northwest of 7122/7-1 Goliat (figure 3).

Several studies have been performed within the license, the most important being the “Petroleum systems Modeling, Norwegian Barents Sea, Sub-area C”, (APT 2008), 7124/4-1 S FIS–analyses, Pre-Drill Biostratigraphic review, Fugro Robertson (2011) and 7124/4-1 S: Biostratigraphy of the Interval 829m-2814mTD (Fugro Robertson, 2011)

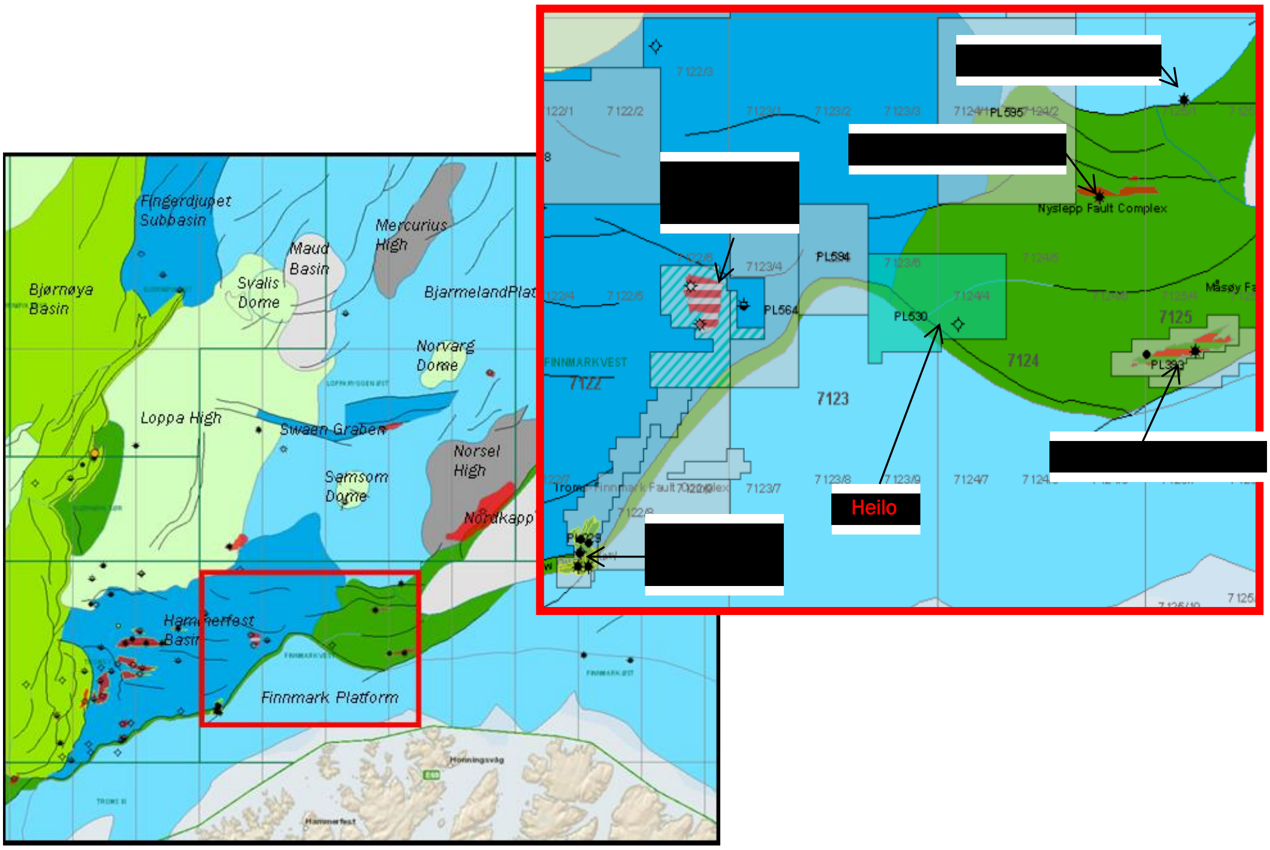

Figure 4: PL530 location map. The license is located within the blocks 7123/6 and 7124/4, in the transition zone between the

3.2 Reservoir

The primary reservoir target was the Triassic-Jurassic Fruholmen Formation of the Realgrunnen Subgroup and Upper Triassic top Snadd Formation. The secondary target was to prove hydrocarbons in the Middle and Lower Triassic (Kobbe, Klappmyss and Havert formations) (figure 2). Top Fruholmen is at 1259 mRKB. The nearby well 7124/3-1, was regarded as the most likely analogy for 7124/4-1 S Heilo.

3.2.2. Stø Formation instead of Fruholmen Formation

Fugro-Robertson performed a biostratigraphic review of nearby wells prior to drilling (Pre-Drill Biostratigraphic review, Fugro Robertson, 2011). The review indicated the presence of the Stø Formation instead of the Tubåen/ Fruholmen formations in the nearby wells, (figure 4, 5).

The well confirmed the presence of the Stø Formation instead of the Fruholmen Formation as reservoir. It proved 52,5 m of Stø Formation and 18 m of marine, shaly Fruholmen Formation (7124/4-1 S: Biostratigraphy of the Interval 829m-2814mTD, Fugro Robertson, 2011). The presence of the good quality Stø Formation upgrades the area.

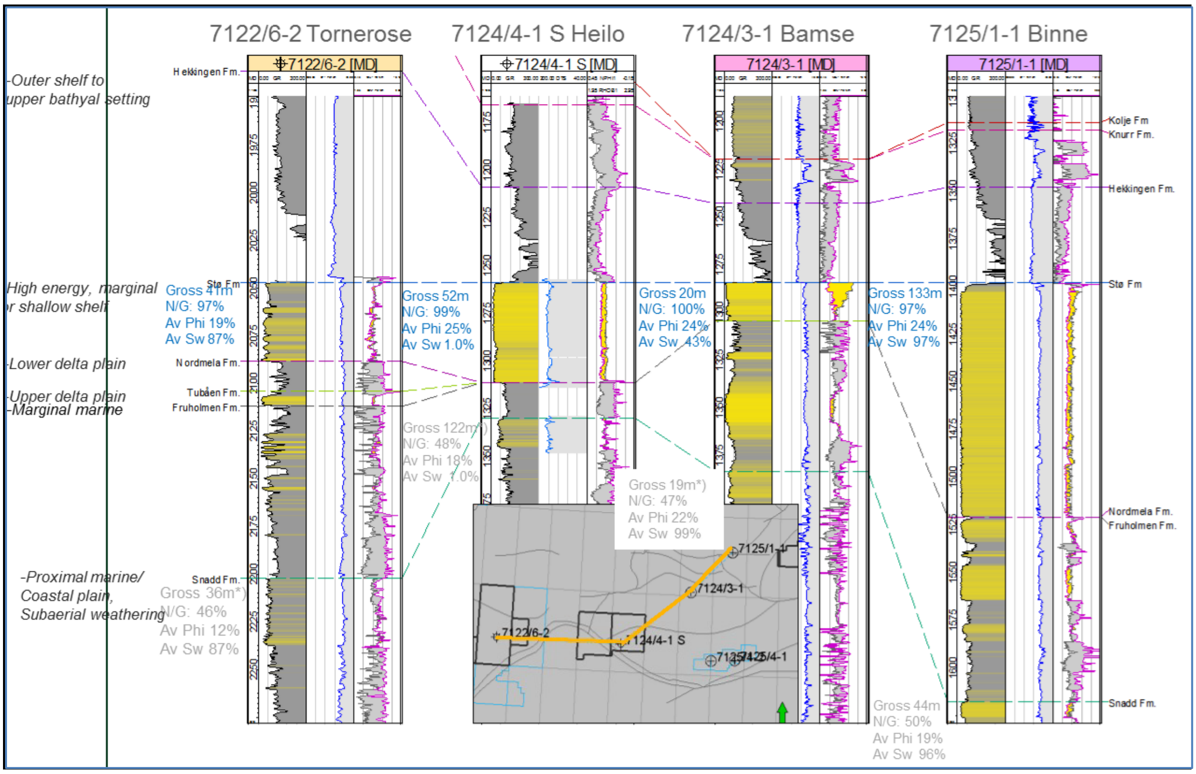

Figure 5: Correlation of 7124/4-1 S Heilo well. The dating of the nearby wells is based on the Pre-Drill Biostratigraphic review (Fugro-Robertson, 2011). Note that Stø Formation is present in all nearby wells.

3.3 Seal

Prior to drilling, seal and retention was regarded as one of the main failure factors due to Cenozoic uplift in the range of 1 – 1,5 km. As no hydrocarbons has been observed in the reservoirs, and no indication of gas escape features has been observed above Heilo, lack of sealing capacity is not regarded as the failure factor.

3.4 Source and Migration

3.4.1. Petroleum systems Modelling

When applying for the Heilo prospect, migration was considered the key risk factor for the prospect, and a study; "Petroleum systems Modelling, Norwegian Barents Sea, Sub-area C", APT 2008" was executed. The source rocks was the Jurassic Hekkingen and the Middle Triassic Kobbe formations (Anisian) in the Hammerfest Basin. Based on this study, the presumptions pre-drilling were:

- Hekkingen Formation: long-range migration of oil from west, and the deeper parts of the Hammerfest Basin.
- Hekkingen and Kobbe formations: migration through the large offset faults north of the Heilo prospect was anticipated possible at the time of major uplift and erosion (modelled as 24-20Ma), allowing Heilo to be charged (red arrows in figure 6). This migration model matches the discovery in 7125/4-1 Nucula, allowing the hydrocarbons in 7125/4-1 Nucula to be sourced via the Heilo structure in a fill-spill manor (red arrows in figure 6).

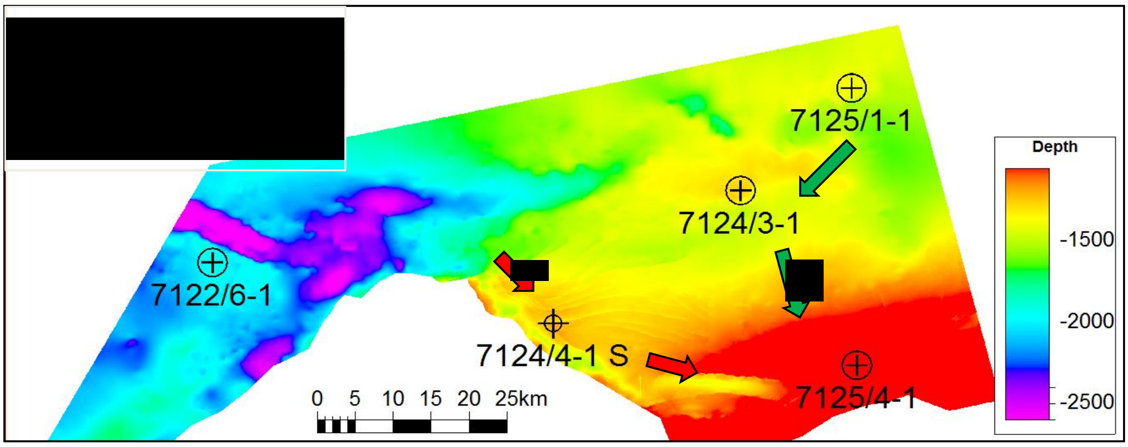

Figure 6: pre-drill (red arrow) and post-drill (green arrow) charge concept.

The well 7124/4-1 S was dry; no shows observed on cuttings, flex flair gas data or well logs, and Fluid Inclusion test analysis confirmed absence of any hydrocarbon accumulation throughout the entire well section. The absence of hydrocarbons is supported by seismic reservoir characterisation modelling (see next section).

The regional uplift in the Heilo area is estimated to be 1-1,5 km in the Heilo area. The succeeding reduction in pressure would have caused gas expansion forcing fluids out of filled traps. Underfilling is seen in wells 7124/3-1 Bamse and 7125/1-1 Binne with paleocolumns down to spill, but only a few meters of oil/ gas at top of structure. Hence, it would be virtually impossible for close by accumulation to exist without leaving any trace in Heilo.

Heilo North and South are separated by an elongated west – east directed fault. Across the fault, the good reservoir sand in Stø and Upper Snadd formations in Heilo North are juxtaposed with the Stø and Upper Snadd Sandstone in Heilo South (figure 14-15). Permeability in the Stø sand is postulated to be between 10 - 10000mD, and indicates very good fluid communication (figure 13, table 3). Hence, fluids of Heilo North are most likely in communication with fluids in Heilo South.

The main migration/ charge obstacles are (figure 4 and 6):

- Post-well results indicate that hydrocarbon migration from the Hammerfest Basin has not managed to pass the basin bounding fault north of PL530. The oil and gas in Nucula (typed as of Triassic origin) is most likely charged form the Nordkapp Basin in the NE.
- 1-1,5 km uplift with corresponding gas expansion makes it virtually impossible to have an accumulation in Heilo North without trace in Heilo South.
- Permeability in sand between 10 – 10000 mD indicates very good fluid communication across fault with sand-to-sand juxtaposition, as is the situation between Heilo South and North.

Based on the negative well results, GDF SUEZ concludes that hydrocarbon migration from the Hammerfest has not managed to pass the basin bounding faults north of the Heilo prospect, leaving PL530 in the migration shadow. GDF SUEZ considers it is unlikely for any hydrocarbon accumulation to exist in the undrilled segments of Heilo North and Head, or other structures within PL530.

3.4.2 Seismic reservoir characterization, Heilo, Barents Sea" (GDF SUEZ 2012)

The modelling of the Amplitude Versus Offset (AVO) response at the Realgrunnen Subgroup level based on the well 7124/4-1 S shows that the presence of hydrocarbon can be detected on seismic data by a slight dimming of amplitudes at the top Stø Formation reservoir and by a large brightening of amplitudes at the base of the Stø Formation reservoir (figure 7). A sensitivity analysis was conducted in order to evaluate the effect of lithology (porosity) and hydrocarbon column height variation on the seismic response.

The modelled AVO response at the well 7124/4-1 S presents a good match with the seismic gathers of the Fruholmen 3D survey and gives a good calibration point for brine-filled Stø Formation reservoir on the 3D data covering the Heilo prospect. The seismic amplitude analysis conducted on the 3D survey at the Realgrunnen Subgroup level concluded that no indication of the presence of hydrocarbon was visible over the Heilo prospect (figure 8). The base of the Stø Formation reservoir presents no brightening. No anomalous points are observed in the Intercept-Gradient crossplots. No positive indicators are observed on the intercept-gradient product or on the fluid factor attribute.

A pre-stack inversion was carried out on the near, mid, far angle stacks of the Fruholmen 3D survey. The results confirmed the AVO observations. There is no Vp/Vs decrease in the target area in comparison to the brine Heilo well, which is a necessary requirement for gas presence.

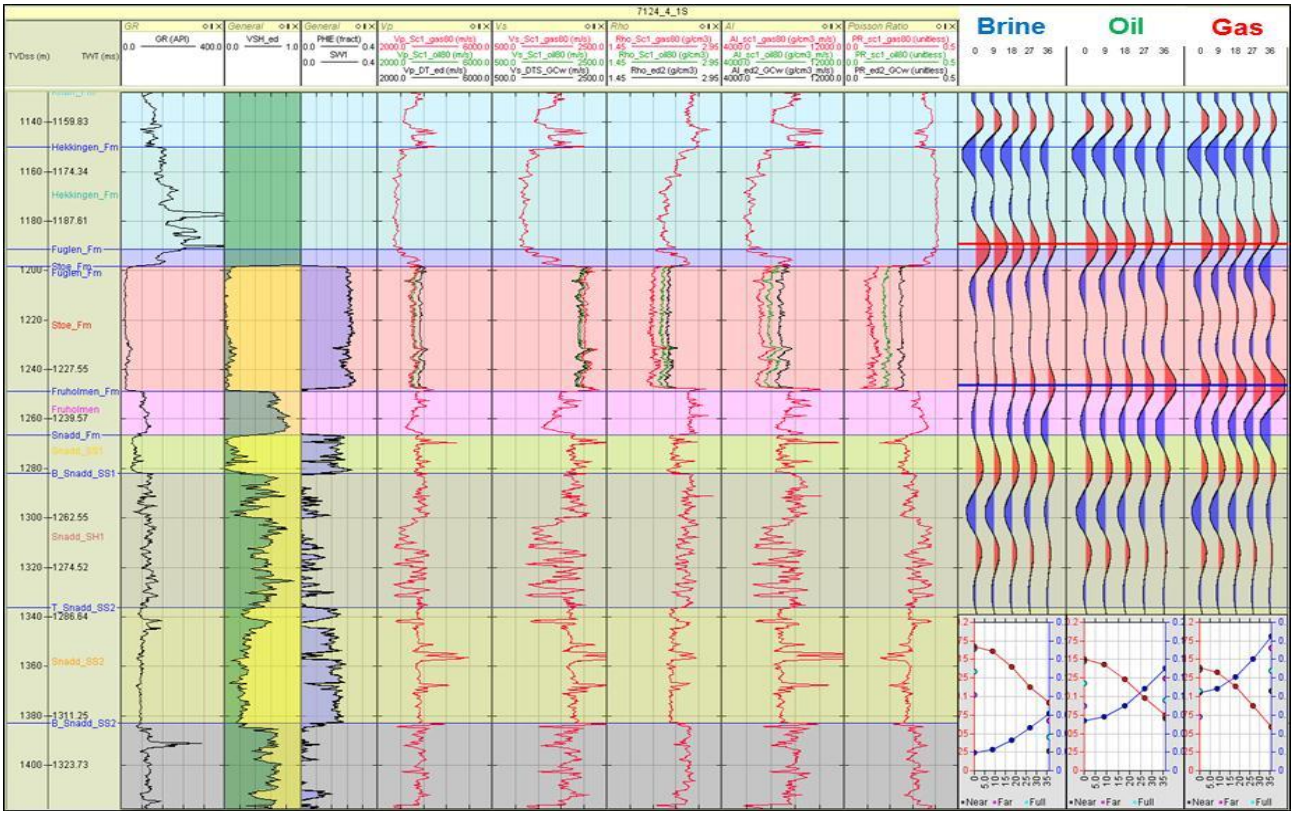

Figure 7. Fluid Substitution modelling for the well 7124/4-1S . The top Stø reservoir (red) has a class I response and presents a dimming of amplitudes from brine to gas. The base Stø reservoir (blue) presents a large brightening of amplitudes from brine to gas.

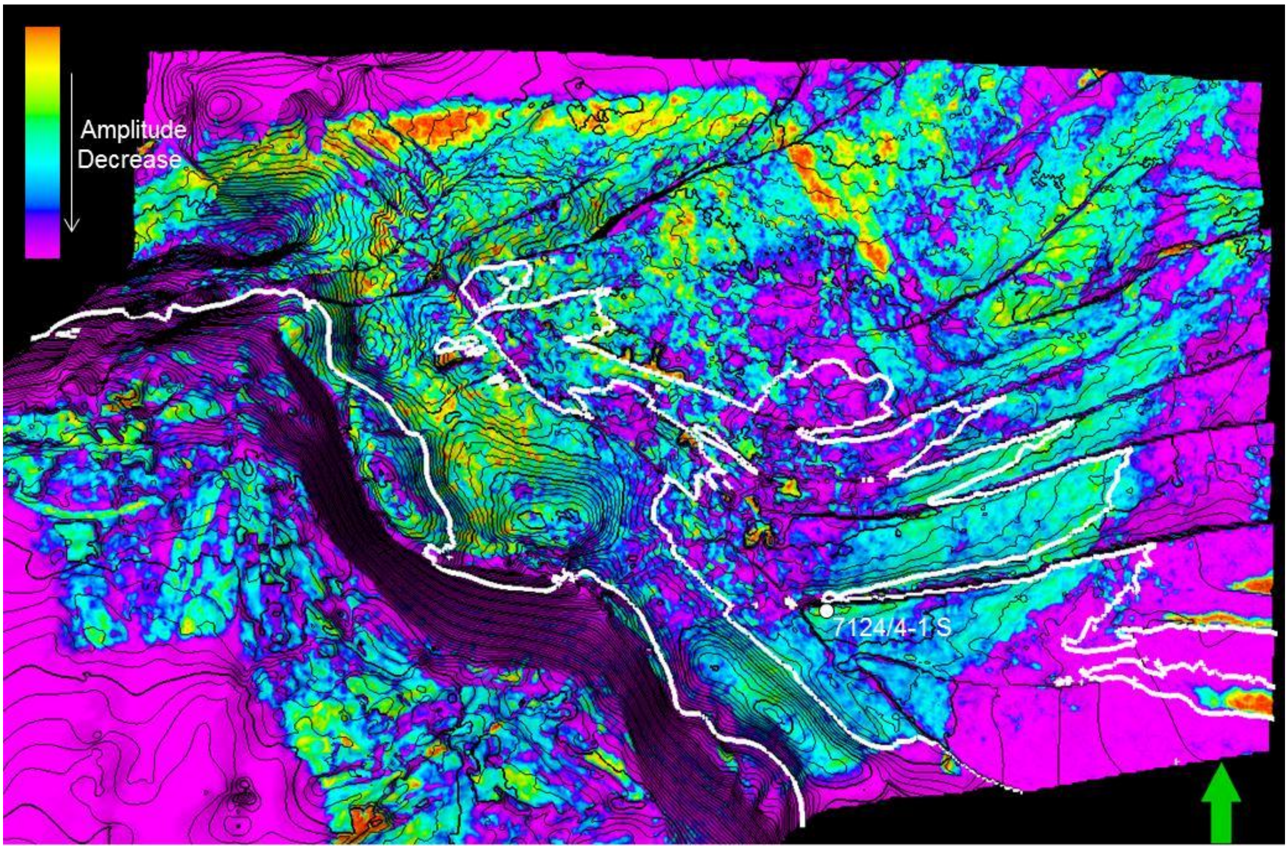

Figure 8. Seismic amplitude extraction at the base Stø reservoir. The amplitude decrease towards the north of the prospect indicates no fluid effect. The amplitude variations are not consistent with depth contours and are interpreted as lithology variations.

3.5 Closure

3.5.1. Structural closure and depth conversion

The structure is very flat, and hence the extent of closure is sensible to depth conversion.

Before drilling the well 7124/4-1 S, the time-to-depth conversion was updated using stacking velocities from the Fruholmen 2D and 3D seismic surveys. Four wells (7125/1-1, 7124/3-1, 7122/6-1 and 7122/7-2), located along the 2D seismic lines, were used to calibrate the stacking velocities. Stacking velocities were extracted along each horizon and transformed into average velocities by a constant scaling factor estimated from well data. The scaling factor is different for each horizon and increases for deeper horizons. This derived velocity model was confirmed by comparing it with more simple global and layer-cake methods using surrounding wells only. The updated depth conversion slightly increased the tilt of the Heilo prospect towards the NW, reducing the closure compared to the application.

4. Prospect update

No further prospectively has been reviewed after the drilling of Heilo South prospect. The remaining prospects and leads within PL530 are according to the 20. Round application (figure 9, 10).

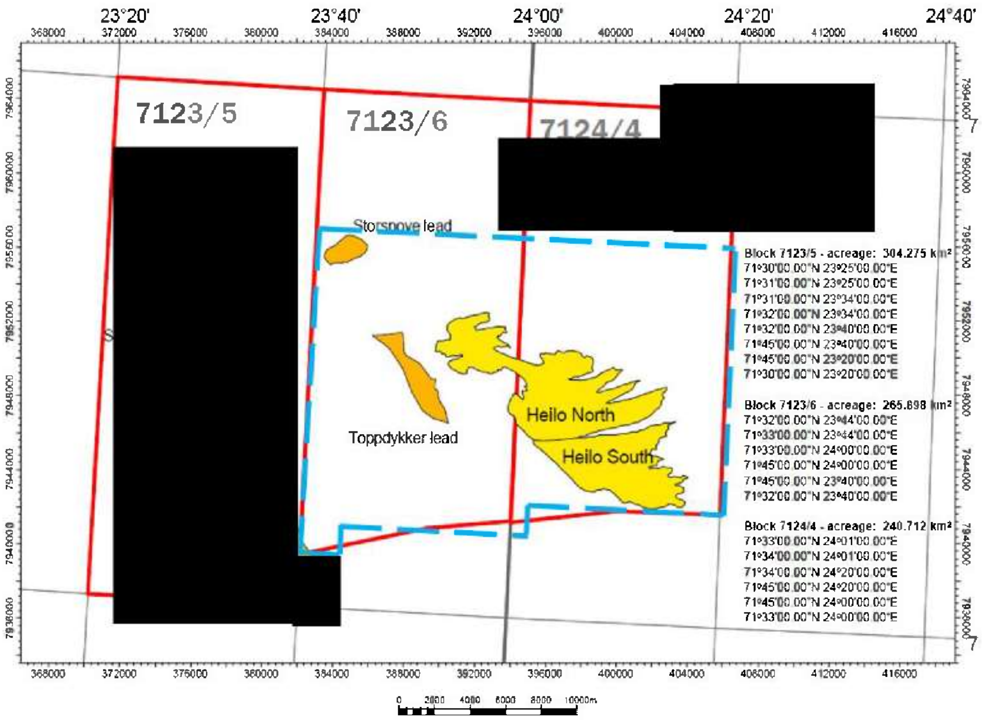

Figure 9: Prospects and leads in parts of blocks 7123/5, 7123/6, 7124/4. Prospects shown in yellow and leads shown in orange. (Figure 2.2.21in 20th Round Application). Awarded PL530 is marked with blue stippled line.

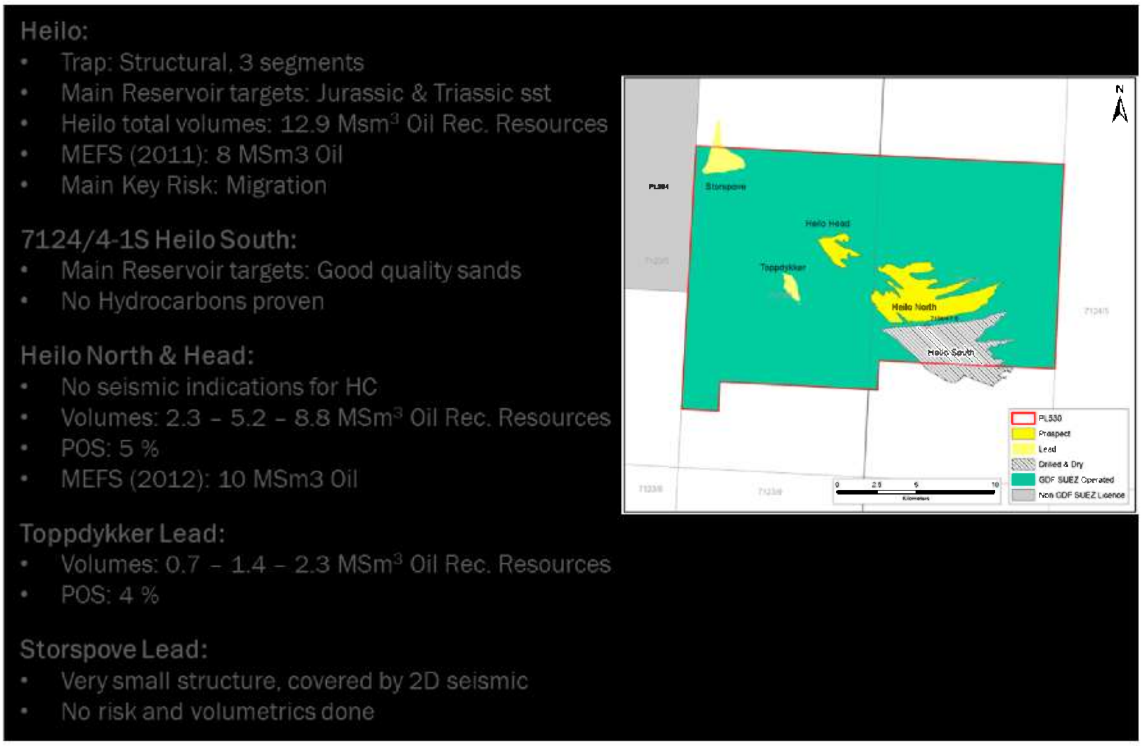

Figure 10: Updated prospect and leads map.

4.1 Heilo North prospect

Heilo North and Head are the remaining prospects (figure 11, 12). Heilo Head has minor volumes and due to this Heilo Head is regarded as part of the Heilo North prospect. The main reservoir target is the Jurassic Stø Formation in the Realgrunnen Subgroup.

The closure is structural, and the prospect is tilted towards the east and limited by faults towards the south and partly towards the west. The closure is about 5 km wide and 8 km long.

Recoverable resource are 5,2 MSm³ oil, and geological risk is 5%, with migration being the key risk (10 %) (table 4).

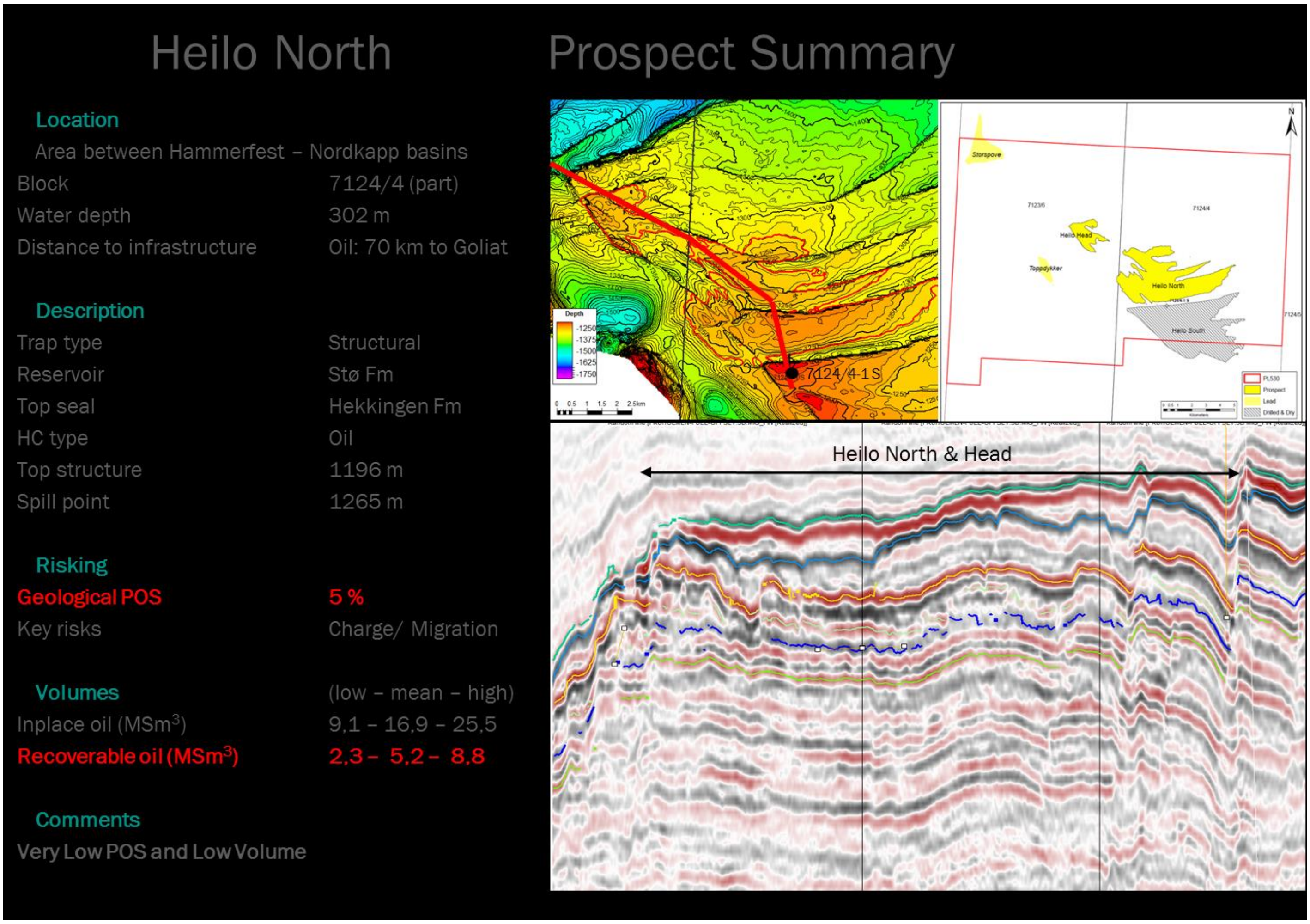

Figure 11: Updated prospect summary for Heilo North (and Head)

4.1.1 Volume estimation

The apex of the structure is 1196 m and is located at the southern part of Heilo North. The structural spill is at 1265 m, and it coincides with spill from the Stø Formation in Heilo North towards the Heilo South (figure 12).

The main differences in the GeoX-evaluation after drilling well 7124/4-1 S are related to increased reservoir quality. Well 7124/4-1 S proved 52,5 m gross Stø sand with 99 % net to gross and average porosity of 25 %.

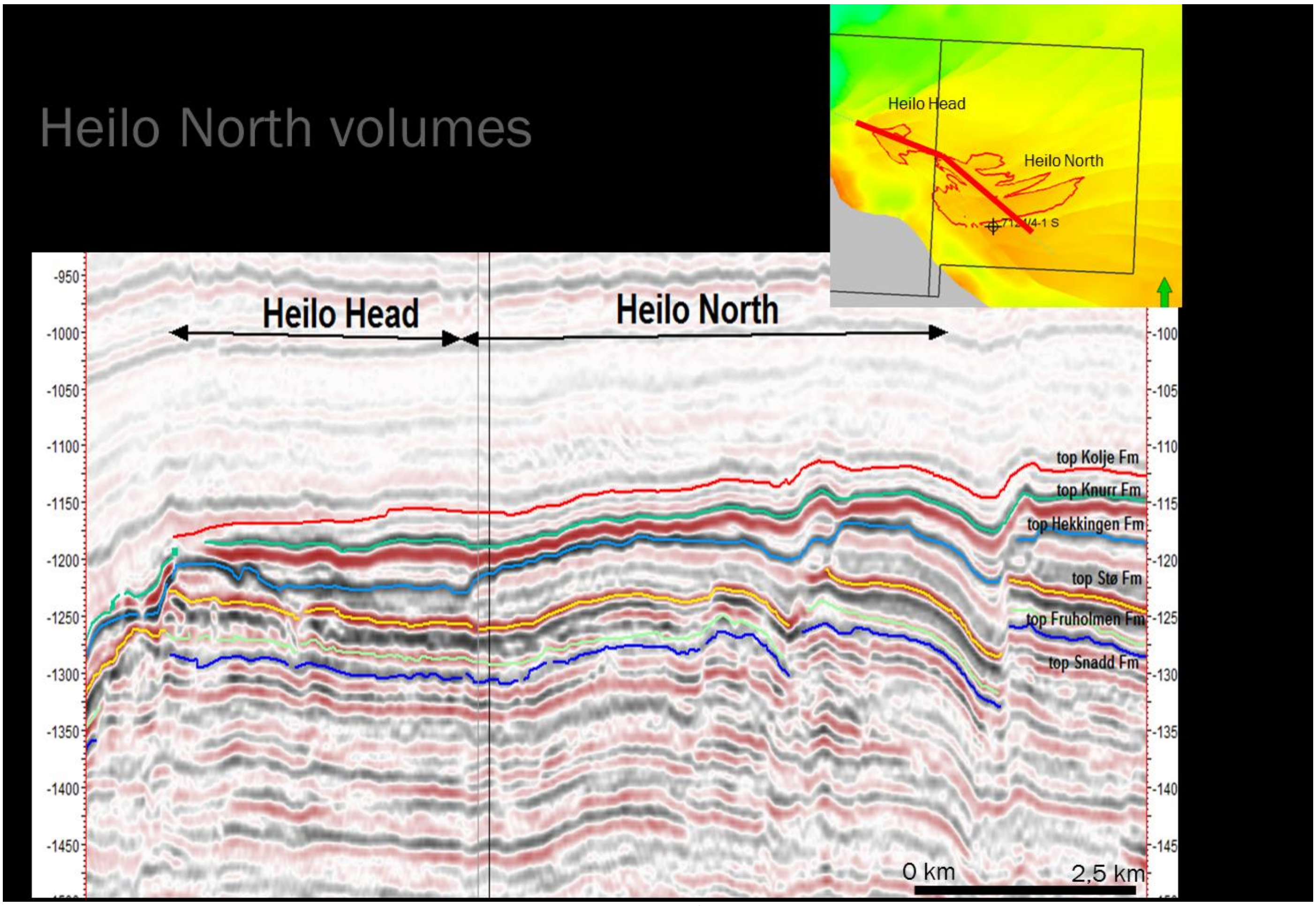

Figure 12 : Heilo North prospect. Structural spill at 1265 m coincide with spill from Stø Formation towards the Heilo South. NB! Vertical scale of this figure is in time.

Postulated Permeability in PL530

No cores were taken in well 7124/4-1 S (Heilo). As the reservoir sands in Heilo South and North are juxtaposed, it was advantageous to get an estimate of the permeability in the sands (figure 14, 15).

Core data from the nearby 7124/3-1 (Bamse) well may be used as an analogue to Heilo since the cored Realgrunnen reservoir in Bamse is at similar depth and has similar reservoir properties. Hence, reservoir permeability at the Heilo well location was estimated by comparing CPI-plots from both wells (table 3, figure 13). For the interval of interests, cores from 7124/3-1 S shows reservoir permeability values in the interval 10-10000mD (bulk permeability 500 – 1000 mD).

The very good reservoir quality indicates fluids circulation between Heilo North and Heilo South when juxtaposed.

Table 3: Permeability comparison 7124/4-1 S and 7124/3-1 (se figure 13).

7124/4-1 S (Heilo) and 7124/3-1 (Bamse): Upper Realgrunnen Subgroup Reservoir Quality Comparison
7124/3-1 (Bamse): • Porosity ~24% (log & core data) • Permeability ~10 – 10000 mD (log & core data) 7124/4-1 S (Heilo): • Porosity ~25% (log data) • Permeability N/A (no core data), but expected to be in the same range as the Bamse well

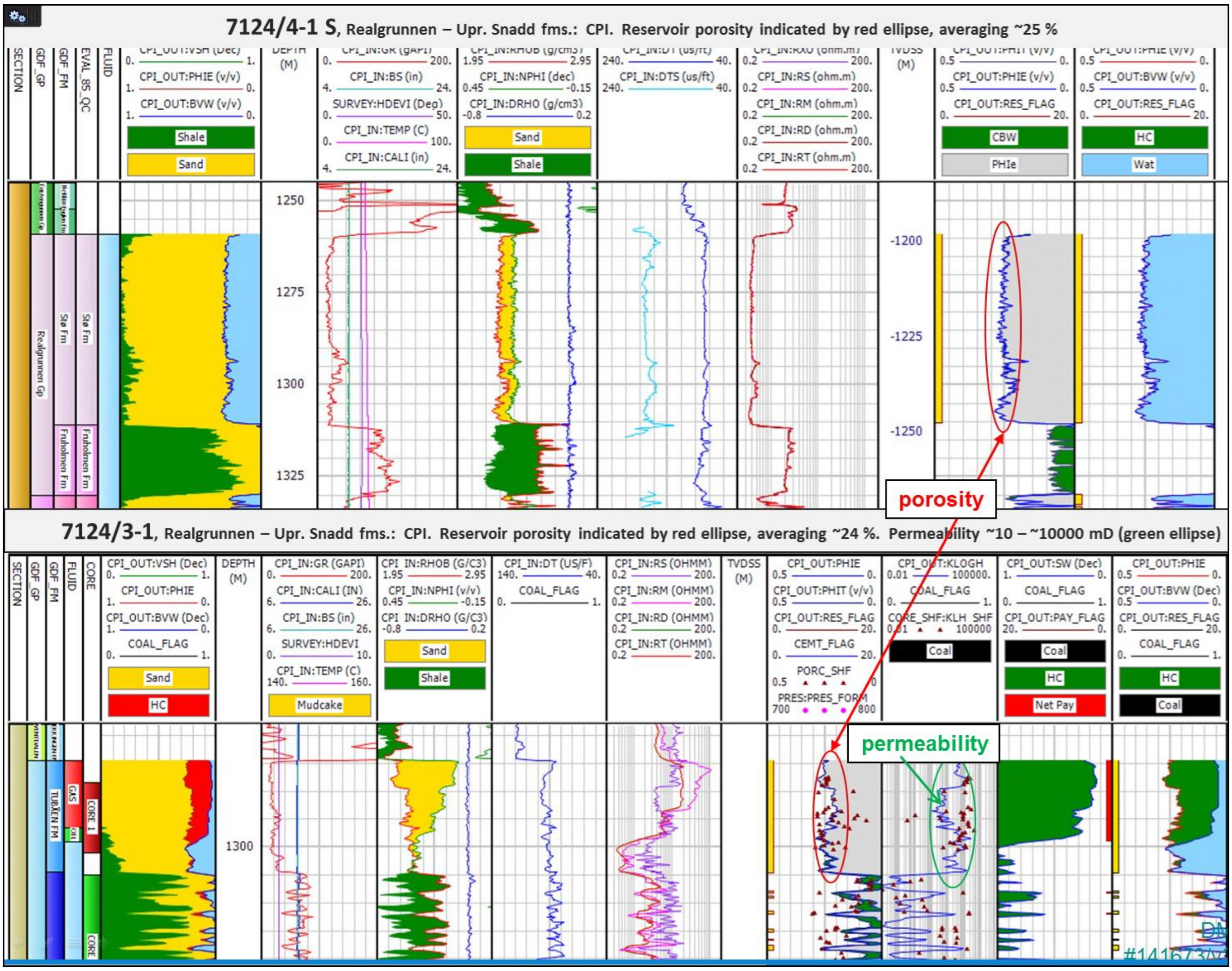

Figure 13: Reservoir porosity in 7124/4-1 S Heilo compared with reservoir porosity in 7124/3-1 Bamse (red ellipse). Porosity values are similar, and permeability data from cores in 7124/3-1 Bamse (green ellipse) is supposed to be similar in 7124/4- S Heilo.

4.1.2 Risking - Heilo North

Table 4: Risk Parameter Heilo North

Risk Factor	P(play)	P(segment | play)
P1 Reservoir Facies	1.000	
P2 Source Rock	1.000	
P3 Seal	1.000	
P4 Effective Reservoir		1.000
P5 Closure		0.800
P6 Charge/Migration		0.100
P7 Local Seal / Retention		0.650
> Marginal play probability	1.000	
> Conditional segment probability		0.052
> Unconditional probability		0.052
> Dry hole risk		0.948

P4 Effective reservoir: Proven by well 7124/4-1 S Heilo

P5 Closure: As for Heilo prior to drilling. The structure is flat and easily affected by changes in depth conversion

P6 Charge/ Migration: Source rock,
The presence of both the Jurassic Hekkingen Formation and the Triassic Anisian Kobbe Formation are proven.
Migration:
Is interpreted to be the failure cause. It is considered unlikely that Heilo North is charged with hydrocarbons when there are no indications of hydrocarbons in Heilo South.
Good reservoir quality in Stø and Snadd formations in Heilo well indicates that fluid circulation would had exist through juxtaposed Stø/ Snadd formations separating Heilo South and North (figure 14, 15).

Prior to drilling Charge and Migration was identified as the main risk factor (0.65) for the Heilo prospect. In the renewed risking assessment Charge/ Migration is down to 0.10.

P7 Retention: As for Heilo prior to drilling. Uncertainty related to reactivation of faults due to erosion and uplift (1 – 1,5 km). Paleocolumn to spill in nearby wells 7123/4-1 Bamse and 7125/1-1 Binne.

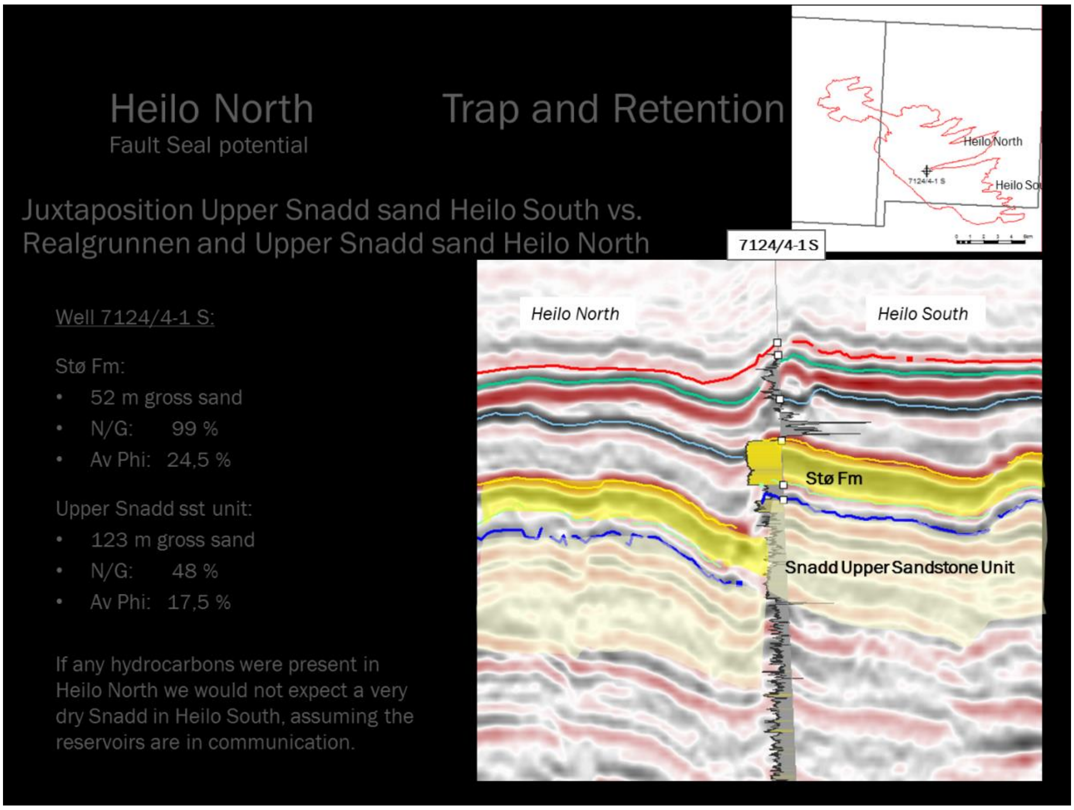

Figure 14: Upper Snadd sand Unit in Heilo South juxtaposed versus Stø Formation and Upper Snadd sand Unit Heilo North. Very good reservoir quality indicates fluid circulations through fault.

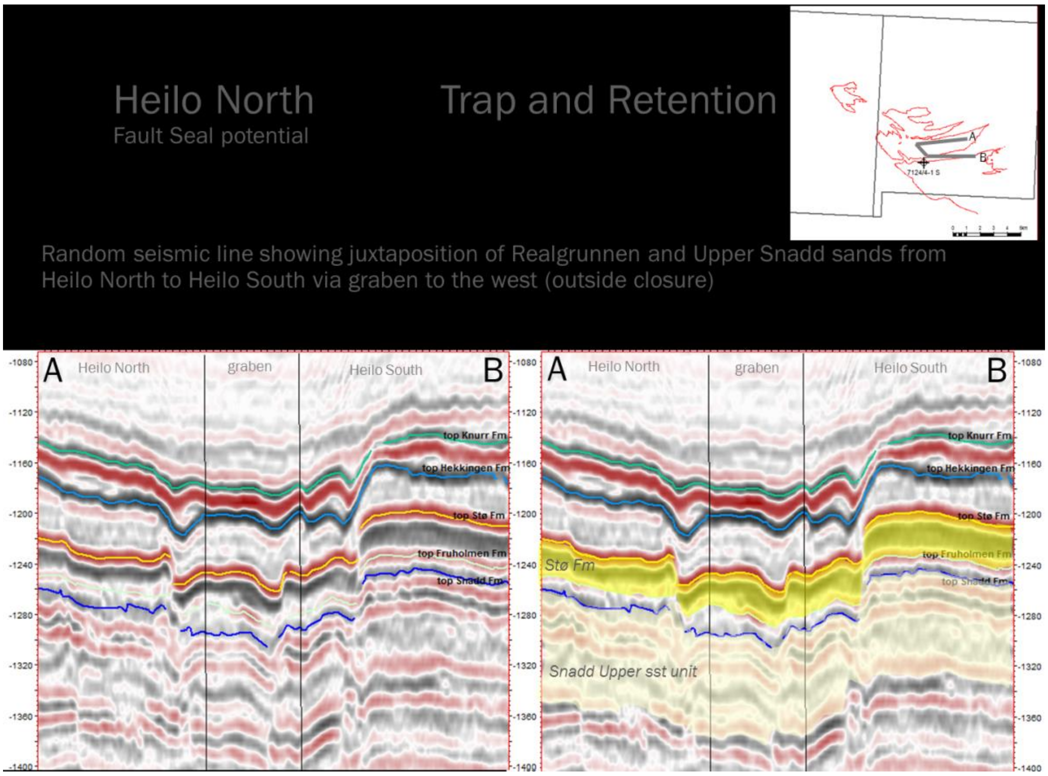

Figure 15: Random line showing juxtaposition of Stø and Snadd Upper sand Unit from Heilo North to Heilo South via graben to the west (outside structural closure)

Block	Prospect name	Disc/Prosp/Lead	Prosp ID (or New!)	NPD approved?
7123/6-7124/4	Heilo North	Prospect	Fylles ut av OD	Fylles ut av OD

Play (name / new)	Struct. element	Company reported by / Ref. Doc. / Year	
Fylles ut av OD	Hammerfest/Nordkapp Basins	Gas de France, 20. Concession round	

Oil/Gas case	**1.1.1.1.1.1 Resources IN PLACE**					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	9.2	16.9	25.5			
Gas 10^9 Sm^3				0.6	1.3	2.1
1.1.1.1.2	1.1.1.1.3 Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	2.1	4.8	8.0			
Gas 10^9 Sm^3				0.2	0.4	0.6

Probability of discovery: -Technical prob. (oil+gas case)		-Commercial prob. (oil+gas case)		-Prob for oil/gas case	
	0.05				50/50
Which fractiles are used as Low & High?				Low: P90	High: P10

Type of trap	WaterDepth(m)	Reservoir Chrono (from - to)	Reservoir Litho (from - to)
Structural	302	Early-Middle Jurassic	Stø Formation

SourceRock, Chrono	SourceRock, Litho	Seal, Chrono	Seal, Litho
Kimmeridgian, Anisian	Hekkingen, Kobbe fms	Kimmeridgian	Hekkingen

Seismic database (2D/3D):	**2D**: BSS01, NPD-F1-84, FWGS-84, NA9701, SG8737, GFW3-85-R04, NPD-TR-7301, NPD-FIOE2-86, **3D**: Fruholmen 3D-survey

Probability –Reservoir (P1)	- Charge (P3)	- Trap (P2)	- Retention (P4)
1.0	0.1	0.8	0.65

Parametres:	Low	Base	High
Depth to top of prospect (m)		1196	
Area of closure (km^2)	5.5	9	11
Gross rock vol. (10^9 Sm^3)	85	145	205
HC column in prospect (m)	44	54	60
Reservoir thickness (m)	46	52.5	59
Net / Gross	0.85	0.9	0.95
Porosity (fraction)	0.18	0.24	0.3
Water Saturation	0.2		0.45
Bg. NB !(fraction)	0.04	0.05	0.07
1/Bo. NB !(fraction)	0.77		0.83
Recovery factor, main phase	0.2		0.35
Recovery factor, ass. phase	0.2		0.35
GOR, free gas (Sm^3 /Sm^3)			
GOR, oil (Sm^3 /Sm^3)	50		100
Temperature, top res (deg C) :		Pressure, top res (bar) :	

4.2 Leads

4.2.1 Toppdykker Lead

The Toppdykker Lead is situated in block 7123/6, at the western margin of the Fruholmen 3D-survey, along the eastern flank of the Finnmark Platform. The structure has apex at 1159 m and spill at 1235 m. The main reservoir target is the Jurassic Stø Formation in the Realgrunnen Subgroup (figure 16).

The trap is a hanging wall structural closure with both a structural and fault-depending closure. The pure structural closure defines minimum closure, while maximum closure is decided by the fault-depending closure.

Efficient reservoir is proved by well 7124/4-1 S.

Recoverable resources are 1,4 MSm^3 oil. Geological risk is 4%, with migration being the key risk (10 %) (table 5).

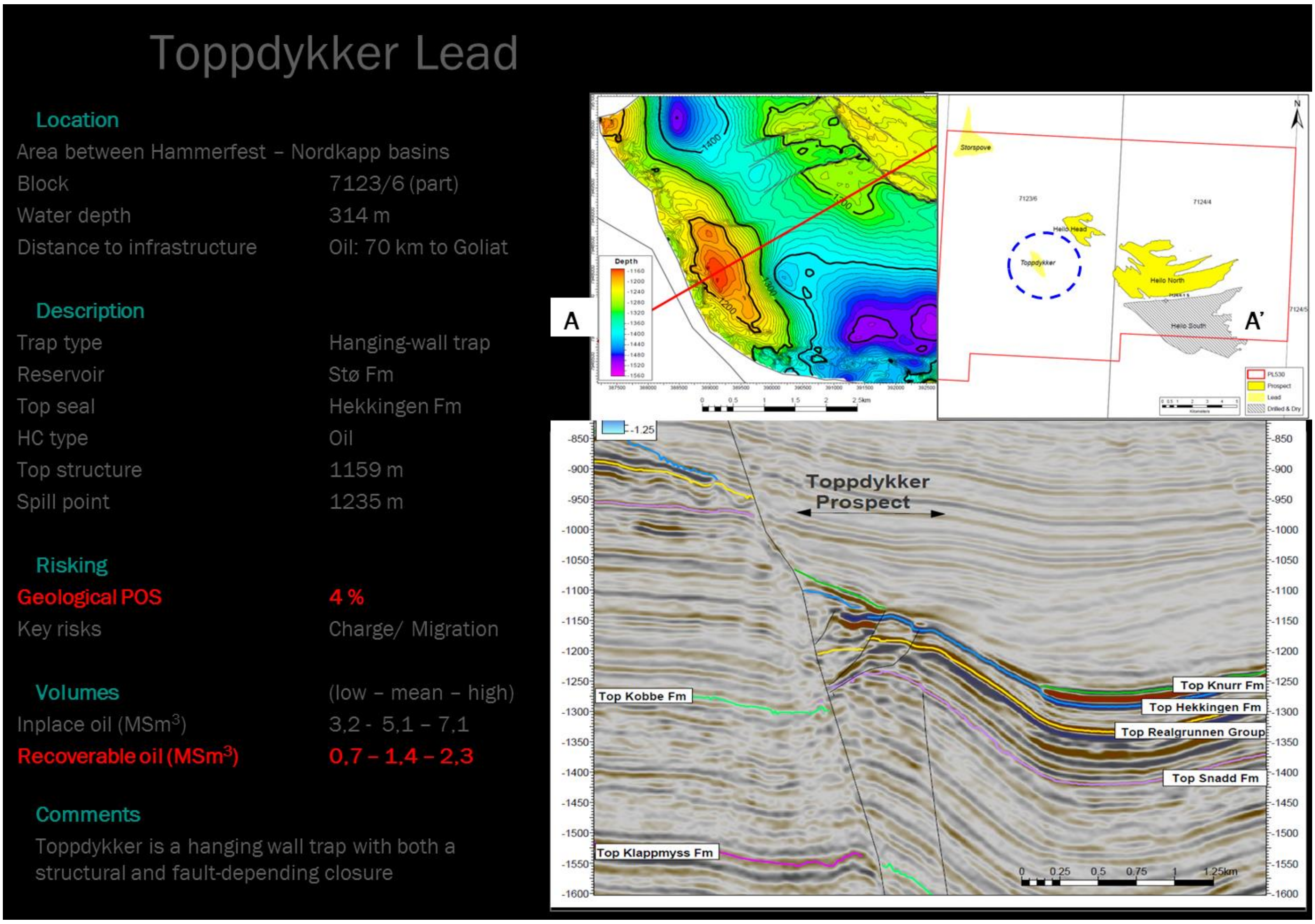

Figure 16: Updated lead summary for the Toppdykker Lead

Table 5: Risk Parameters Toppdykker Lead

Risk factor	P(play)	P(segment | play)
P1 Reservoir Facies	1.000	
P2 Source Rock	1.000	
P3 Seal	1.000	
P4 Effective Reservoir		1.000
P5 Closure		0.600
P6 Charge/Migration		0.100
P7 Local Seal / Retention		0.650
> Marginal play probability	1.000	
> Conditional segment probability		0.039
> Unconditional probability		0.039
> Dry hole risk		0.961

P4 Effective Reservoir: Proven by well 7124/4-1 S Heilo
P5 Closure: Hanging wall trap with both a structural and fault-depending closure.
P6 Charge/ Migration: See discussion for Heilo North. In addition, no indications of hydrocarbons in overburden
P7 Local seal/ Retention: As for Heilo pre-drilling

Block	Prospect name	Disc/Prosp/Lead	Prosp ID (or New!)	NPD approved?
7123/6	Toppdykker	Lead	Fylles ut av OD	Fylles ut av OD
Play (name / new)		Struct. element	Company reported by / Ref. Doc. / Year	
Fylles ut av OD		Hammerfest/Nordkapp Basins	Gas de France, 20. Concession round	

Oil/Gas case	1.1.1.1.3.1 Resources IN PLACE					
oil	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	3.2	5.1	7.1			
Gas 10^9 Sm^3				0.2	0.4	0.6
1.1.1.1.4	1.1.1.1.5 Resources RECOVERABLE					
	Main phase			Ass. phase		
	Low	Base	High	Low	Base	High
Oil 10^6 Sm^3	0.7	1.4	2.3			
Gas 10^9 Sm^3				0.1	0.1	0.2

Probability of discovery: -Technical prob. (oil+gas case)		-Commercial prob. (oil+gas case)		-Prob for oil/gas case	
	0.04				50/50
Which fractiles are used as Low & High?				Low: P90	High: P10

Type of trap	WaterDepth(m)	Reservoir Chrono (from - to)	Reservoir Litho (from - to)
Hanging-wall trap	314	Early- Middle Jurassic	Stø Fm

SourceRock, Chrono	SourceRock, Litho	Seal, Chrono	Seal, Litho
Kimmeridgian, Anisian	Hekkingen, Kobbe fms	Kimmeridgian	Hekkingen

Seismic database (2D/3D):	**2D**: BSS01, NPD-F1-84, FWGS-84, NA9701, SG8737, GFW3-85-R04, NPD-TR-7301, NPD-FIOE2-86, **3D**: Fruholmen 3D-survey

Probability –Reservoir (P1)	- Charge (P3)	- Trap (P2)	- Retention (P4)
1.0	0.1	0.6	0.65

Parametres:	Low	Base	High
Depth to top of prospect (m)		1159	
Area of closure (km^2)	1.3	1.6	2.2
Gross rock vol. (10^9 Sm^3)	30	42	55
HC column in prospect (m)	51	61	71
Reservoir thickness (m)	46	52.5	59
Net / Gross	0.85	0.9	0.95
Porosity (fraction)	0.21	0.24	0.27
Water Saturation	0.2		0.45
Bg. NB !(fraction)			
1/Bo. NB !(fraction)	0.77		0.83
Recovery factor, main phase	0.2		0.35
Recovery factor, ass. phase	0.2		0.35
GOR, free gas (Sm^3/Sm^3)			
GOR, oil (Sm^3/Sm^3)	50		100
Temperature, top res (deg C) :		Pressure, top res (bar) :	

4.2.2 Storspove Lead

Storspove is a small lead situated outside the 3D-survey in the north – western corner of PL530. The outline of the structure is based on a few 2D-lines with grid about 2 x 2 km, and the closure is very uncertain.

Due to the lead being very small and very poor defined, no resource evaluation or risking has been performed for the Storspove Lead (figure 17).

The structure has apex at 1770 m, and the main reservoir target is the Jurassic Stø Formation in the Realgrunnen Subgroup. Efficient reservoir is proved by well 7124/4-1 S.

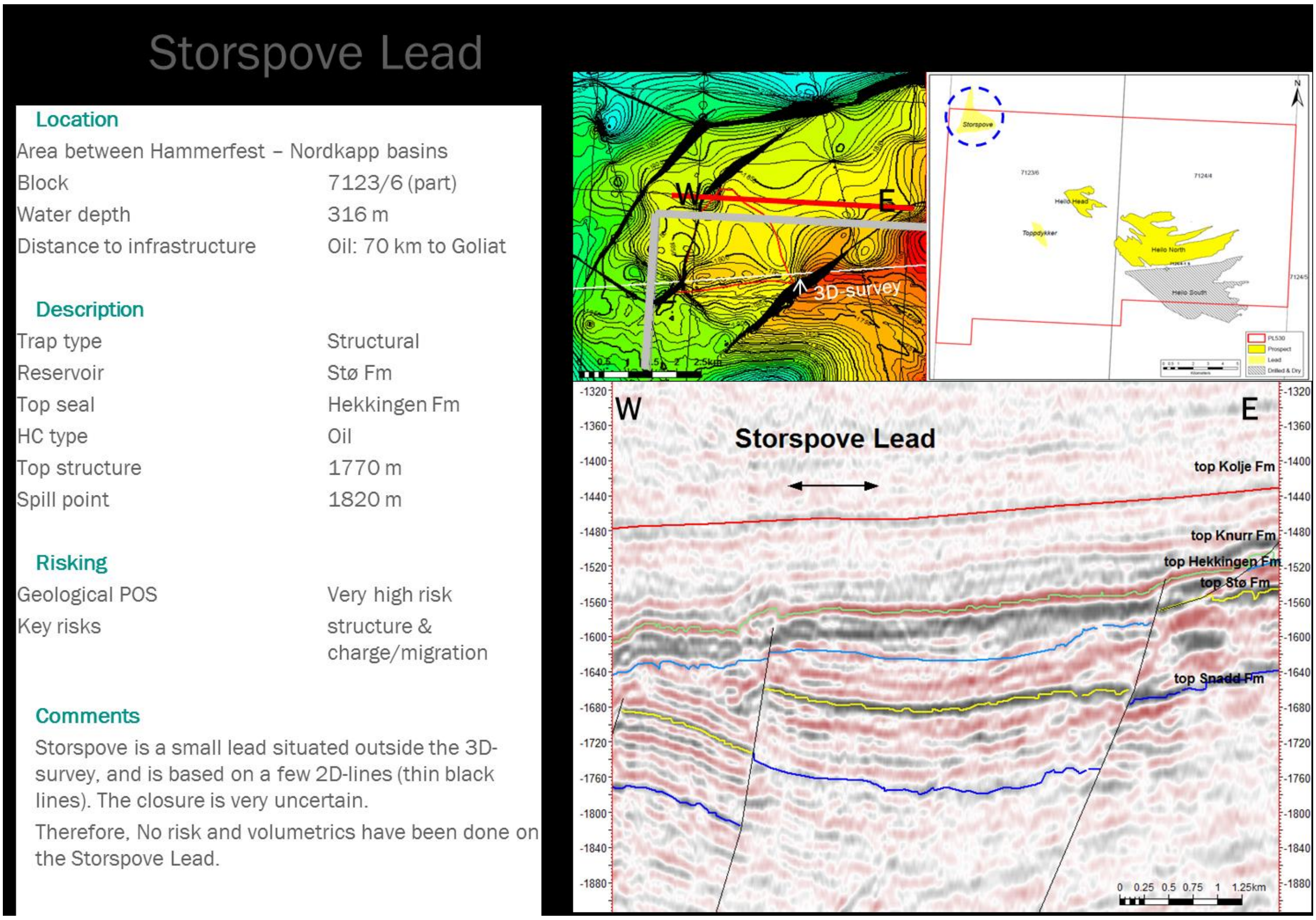

Figure 17: Updated lead summary for the Storspove Lead

5. Technical evaluations

5.1 Reservoir Engineering – Facilities - Economics

Heilo Nord Oil Case - MEFS development assumption:

FPSO stand-alone development with 4 OP + 1 GI + 1 WI at 420 MNOK/well
Total development capex of 17 Bn NOK
Annual Opex of 940 MNOK

Premises for valuation:

Hydrocarbon pricing: Oil valued at 100 USD/bbl real, while gas is not valued.
Exchange rate: 6.0 NOK/USD
Inflation: 2.0 % per year
Discount rate: 8.0 %

The development assumption results in a minimum economic field size (MEFS) of around 10 MSm^3 of oil

The MEFS of 10 MSm^3 makes only 8 % of the discovery cases economic to develop, giving an ePOS as low as 0,4 %.

In MNOK post tax		NPV	
	0,4 %	435	Success
EMV			
-95			
	99,6 %	-97	Failure

The expected break-even oil price of 550 USD/bbl for Heilo Nord illustrates the negative value of the prospect fairly good.

All remaining prospectivity in the license falls under the MEFS.

6. Conclusions

PL 530 was awarded 15.05.2009 to GDF SUEZ E&P Norge AS as operator. The work commitment was to drill two exploration wells, the second being contingent upon the result of the first.

The well 7124/4-1 S was spudded 18th September 2011, and completed 12th October 2011. It terminated 200m into the early Triassic Havert Formation.

Well 7124/4-1 S encountered very good reservoir quality in the primary reservoir targets of the Jurassic Realgrunnen Subgroup and Triassic Snadd Formation. The three secondary targets in Triassic demonstrated no reservoirs.

The well was dry; no shows observed on cuttings, flex flair gas data or well logs. In addition, Fluid Inclusion test analysis confirmed absence of any hydrocarbon accumulation. The absence of hydrocarbons is supported by seismic reservoir characterisation modelling.

Remaining prospectively is one prospect, Heilo North (including Heilo Head), and two leads; Toppdykker and Storspove.

Heilo North is separated from Heilo South by an elongated west- east-directed fault. Both Stø and top Snadd formations are juxtaposed across this fault. Permeability in the Stø Formation is postulated to be between 10-10000 mD, and indicated very good fluid communication. Hence, potential fluids in Heilo North are expected to flow into Heilo South.

The complete absence of hydrocarbons indicates that no hydrocarbons have migrated into the license area, and that the basin bounding faults north of the structure have acted as migration barriers, thus leaving Heilo in a migration shadow.

Economical evaluation shows that none of the remaining prospects in the PL530 licence is economical for GDF SUEZ E&P Norge

Based on these results and conclusions, the PL530 partnership decided to relinquish the license.