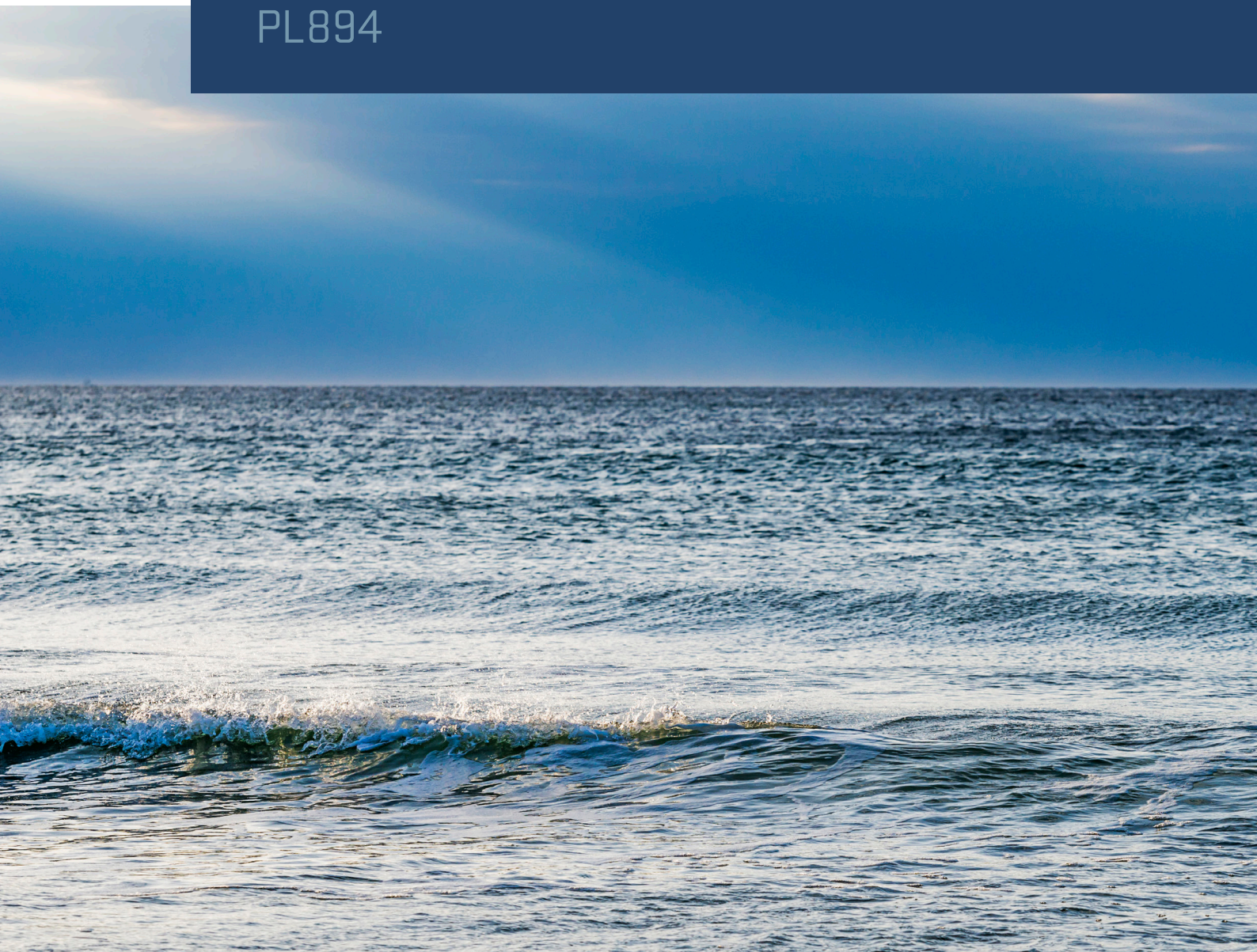




Relinquishment Report

PL894



Licence status report

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1 History of the production licence

<u>Licence:</u>	894	
<u>Awarded:</u>	10.02.2017	
<u>Licence period:</u>	10.02.2017 - 07.10.2025	
<u>Licence group:</u>	Harbour Energy Norge	30% (Operator)
	Equinor Energy AS	40%
	Petoro AS	20%
	AkerBP ASA	10%
<u>Licence area:</u>	63km ²	

General Information

The licence was originally awarded in February 2017 (APA 2016) to a partnership comprising Wintershall Norge AS (Operator, 40%), Statoil Petroleum AS (40%), and Petoro AS (20%). The initial licence period was six years, divided into three phases:

- **Phase 1 (3 years):** drilling a firm exploration well and reprocessing 3D seismic data.
- **Phase 2 (2 years):** conducting concept studies, leading to a continuation or relinquishment decision.
- **Phase 3 (1 year):** preparing and delivering a field development plan (PDO) or relinquishing the licence.

The licence has since been extended twice, first by two years in 2019 (for all decision gates), and later in 2023, with a three-year extension for BoV and a two-year extension for BoK and the PDO.

Over the course of the licence, several changes occurred within the partnership. Wintershall Norge AS merged with DEA Norge AS in 2019 to form Wintershall DEA Norge AS, which was subsequently acquired by Harbour Energy Norge AS in 2024. Statoil Petroleum AS changed its name to Equinor Energy AS in 2018. In 2020, Lundin Norway AS farmed into the licence with a 10% interest; Lundin was later acquired by Aker BP ASA in 2022.

Three wells were drilled during the licence term: two exploration wildcats and one appraisal well. The first, exploration well **6604/5-1**, was drilled in 2018 and resulted in the **Balderbrå** discovery. This was appraised in 2020 by well **6604/5-2 S**, which proved dry. Between these, a second exploration wildcat, **6604/6-1**, was drilled in 2019 targeting the **Gullstjerne** prospect; it also proved dry.

The original licence area covered **1,386 km²**, spanning blocks 6604/6, 6605/4, 6605/5, 6604/5, and parts of 6605/7. Following the drilling campaign, the area was reduced to **63 km²**, retaining only the acreage surrounding the Balderbrå discovery (Fig. 1.1).

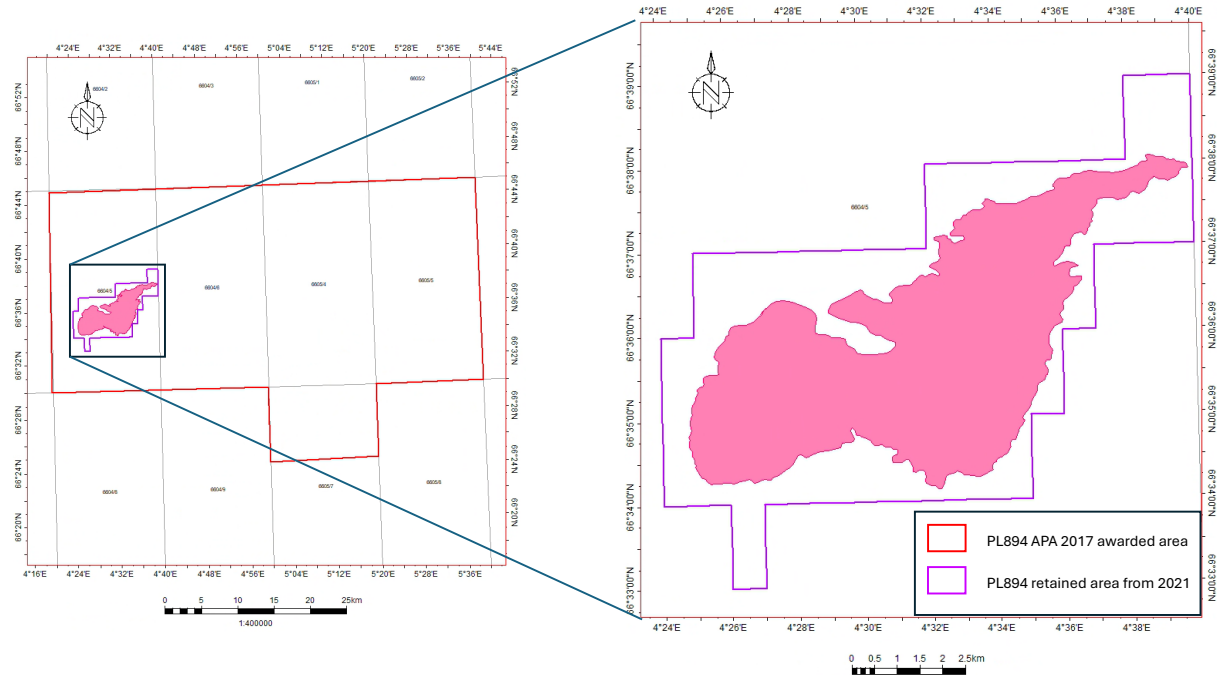


Fig. 1.1 Carved-Out Licence Area Around the Balderbrå Discovery

The original licensed area was reduced in 2021 to retain only the acreage surrounding the Balderbrå discovery.

The PL894 work programme, as presented in Table 1.1, has been fully completed in accordance with the agreed commitments.

Table 1.1 PL894 work programme

Work Obligation	Decision	Task status	Expiry date	Wellbore if drilled
Reprocessing of seismic		Approved		
Drill firm exploration well		Approved	10.02.2022	6604/5-1
	(BoK) Decision to concretize	Dropped	07.10.2025	
Conceptual studies		Dropped		
(PDO) Prepare plan for development		Dropped		
	(BoV) Decision to continue	Dropped	10.02.2027	
	(PDO) Decision to submit plan for development	Dropped	10.02.2027	
	(PDO) Submit plan for development	Dropped	10.02.2027	
	Decision to enter extension period	Dropped	10.02.2027	

Meetings held:

An overview of the meetings held for PL894 is provided in Table 1.2.

Table 1.2 Overview of meetings held in PL894

Date	MC meeting	EC meeting	Work meeting	Description
09.03.2017	x	x		ECMC#1 start up meeting
11.05.2017	x	x		ECMC#2 meeting
14.06.2017	x	x		ECMC#3 meeting
31.08.2017			x	EC work meeting
04.09.2017		x		EC seismic reprocessing
15.11.2017	x	x		ECMC#4 meeting
27.11.2017		x		EC seismic reprocessing
02.02.2018	x			MC West Phoenix PSA Audit
09.02.2018			x	EC work meeting
05.03.2018		x		EC seismic reprocessing
15.05.2018			x	EC Post Balderbrå well work meeting
02.10.2018		x		EC seismic reprocessing
29.10.2018	x	x		ECMC#5 Post well evaluation Balderbrå
17.12.2018		x		EC technical meeting
08.03.2019		x		EC Balderbrå and Gullstjerne well location
29.03.2019		x		EC Balderbrå appraisal well location
10.04.2019		x		EC DST
13.08.2019	x	x	x	ECMC FTWT and DST work meeting
05.11.2019		x		EC Gullstjerne DWOP and WSRA
26.11.2019	x	x		ECMC#6 meeting
04.02.2020		x		EC Balderbrå appraisal DWOP WM
05.02.2020		x		EC Balderbrå TWOP and L2 risk assessment WM
30.11.2020	x	x		ECMC#7
02.12.2021	x	x		ECMC#8
25.11.2022	x	x		ECMC#9
29.11.2023	x	x		ECMC#10
14.11.2024	x	x		ECMC#11

Reason for relinquishment

The partnership has decided to relinquish the licence, as the Balderbrå discovery does not contain sufficient recoverable volumes to support a commercial development. This conclusion applies both to a standalone development and to a subsea template tie-back to Obelix, with onward connection to Irpa.

2 Database Overview

2.1 Seismic data

High-quality 3D seismic data formed the foundation for prospect and lead evaluation within PL894. The primary datasets utilised were BG0904, the reprocessed BG0904R11, and WIN18M01, which together provided improved imaging of both structural and stratigraphic elements. A summary of the seismic datasets applied in the PL894 assessment is provided in Table 2.1, with spatial coverage shown in Fig. 2.1.

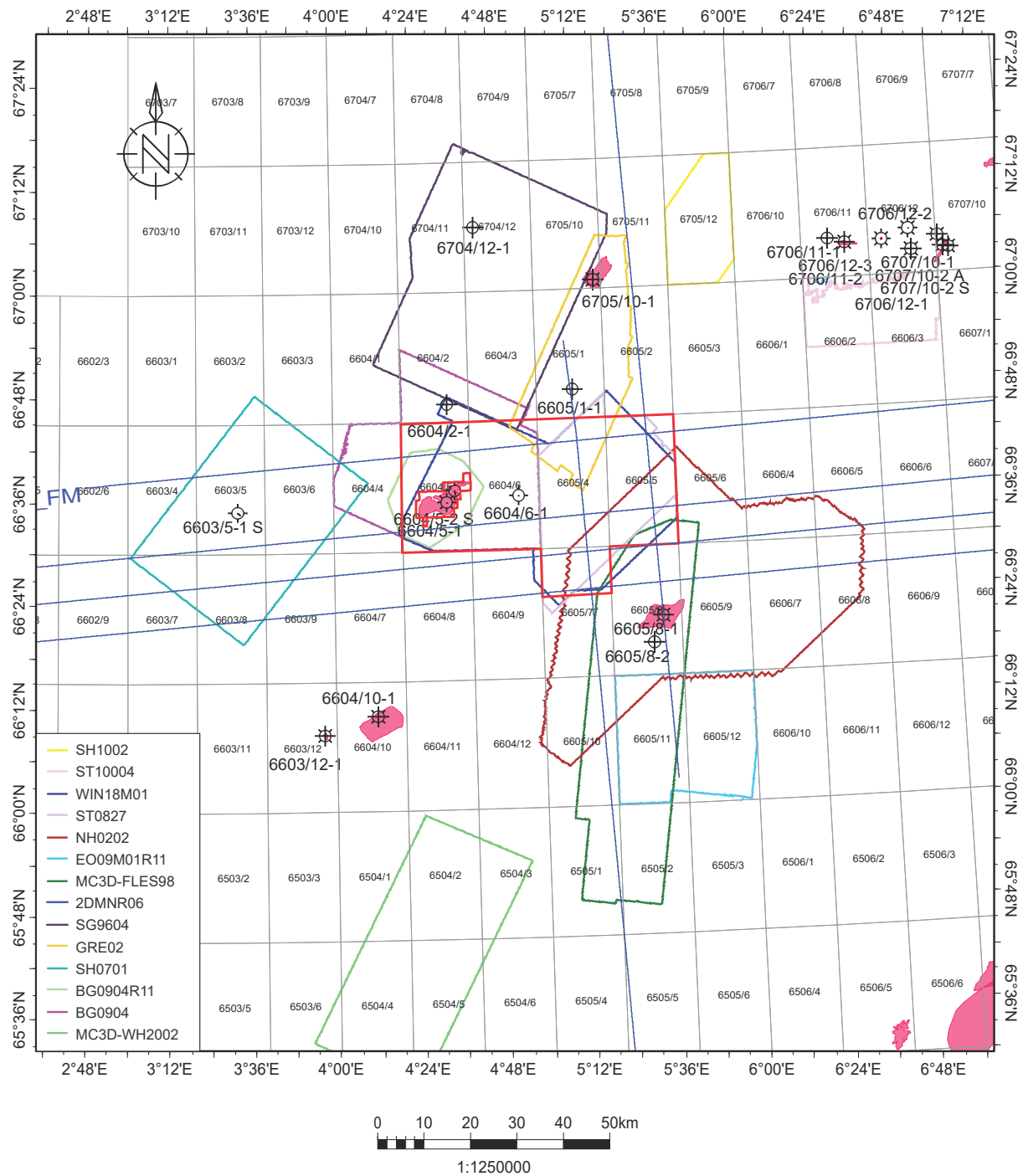


Fig. 2.1 PL894 Seismic and well database

Table 2.1 PL894 seismic common database

Survey	Underlying survey	Type	Domain	Year	NPDID for survey	Company - responsible
BG0904 full and angle stacks		3D	Time	2009	7074	BG Norge AS
BG0904R11	BG0904	3D	Time	2011		BG Norge AS
WIN18M01	BG0904	3D	Time	2009	7074	BG Norge AS
	ST0827	3D	Time	2008	4614	StatoilHydro ASA
	NH0202	3D	Time	2002	4177	Norsk Hydro Produksjon AS
SG9604		3D	Time	1996	3806	Saga Petroleum ASA
EO09M01R11	EO0901	3D	Time	2009	7087	E.ON Ruhrgas Norge AS
GRE02		3D	Time	2002	4159	WesternGeco AS
MC3D-FLES98		3D	Time	1998	3913	PGS NOPEC A/S
MC3D-WHH2002		3D	Time	2002	4173	PGS NOPEC A/S
NH0202		3D	Time	2002	4177	Norsk Hydro Produksjon AS
SH1002		3D	Time	2010	7214	A/S Norske Shell
SH0701		3D	Time	2007	4477	A/S Norske Shell
ST0827		3D	Time	2008	4614	StatoilHydro ASA
ST10004		3D	Time	2010	7234	Statoil ASA
2DMNR06 within licence area		2D	Time	2006	4364	Fugro-Geoteam AS

As part of the committed work programme, a seismic reprocessing project covering **1,597 km²** of the BG0904, ST0827, and NH0202 surveys was executed. The reprocessing, performed by **ION-GXT**, focused on enhancing seismic imaging across key prospective areas and relevant offset wells. The resulting reprocessed dataset is referred to as **WIN18M01**.

2.2 Well data

The wells used in the technical evaluation of the licence area are listed in Table 2.2 and shown in Fig. 2.1.

Table 2.2 PL894 common well database

Wellbore name	Content	Total depth (MD) [m RKB]	Oldest penetrated formation	Completed year	NPDID wellbore
6707/10-1 Luva	Gas	5039	Kvitnos Fm	1997	3075
6706/11-1 Ægir	Dry	4317	Lange Fm	1998	3202
6704/12-1 Gjallar	Dry	4103	Nise Fm	1999	3759
6605/8-1 Stetind	Gas	4513	Lange Fm	2005	4984
6605/8-2 Stetind appraisal	Dry	4210	Lange Fm	2008	5812
6706/12-1 Snefrid South	Gas	3950	Kvitnos Fm	2008	5867
6707/10-2S Haklang	Gas	3365	Nise Fm	2008	5918
6707/10-2A Haklang	Gas	4850	Kvitnos Fm	2008	5931
6605/1-1 Obelix	Dry	3947	Nise Fm	2009	5979
6603/12-1 Gro	Gas	3830	Springar Fm	2009	5985
6705/10-1 Irpa	Gas	3775	Lange Fm	2009	6044
6603/5-1S Dalsnuten	Dry	5254	Lange Fm	2010	6348
6604/10-1 Gro	Gas	3715	Springar Fm	2010	6356
6604/2-1Gullris	Dry	3551	Springar Fm	2011	6568
6706/12-2 Snefrid Nord	Oil/Gas	2015	Nise Fm	2015	7651
6706/12-3 Roald Rygg	Gas	3336	Kvitnos Fm	2015	7666
6706/11-2 Gymir	Gas	2596	Nise Fm	2015	7709
6604/5-1 Balderbrå	Gas	3858	Springar Fm	2018	8318
6604/6-1 Gullstjerne	Dry	3640	Springar Fm	2020	8952
6604/5-2S Balderbrå appraisal	Dry	4155	Springar Fm	2020	8988

3 Results of geological and geophysical studies

Pre-well geological and geophysical studies

A comprehensive set of internal and external geological and geophysical studies was undertaken prior to the APA application to assess prospectivity within the PL894 licence area.

Petrophysical analysis (Wintershall in-house, 2016) was performed on relevant offset wells. Vshale and water saturation (S_w) logs were derived, and summary parameters for the Springar Formation sandstones—including reservoir thickness, net-to-gross, porosity, and water saturation—were calculated.

A **semi-regional basin modelling study** (Wintershall in-house, 2016), covering approximately 10,000 km², was completed to evaluate source rock presence, drainage areas, hydrocarbon generation, and migration pathways.

For **stratigraphic framework and correlation**, the Ichron litho- and chronostratigraphic database (Ichron Ltd., 2015) was acquired and applied to well correlation, geological evaluation, and seismic interpretation.

Geophysical modelling (Wintershall in-house, 2016) included fluid-substitution modelling on six wells to investigate seismic AVO responses of gas versus brine within the Springar reservoirs. Sensitivity analyses considered tuning effects, porosity perturbations, and varying gas saturation.

Given the presence of strong seismic amplitude anomalies, a dedicated **DHI (Direct Hydrocarbon Indicator) study** was carried out (Wintershall in-house, 2016). Using SAAM software, the anomalies were analysed and quantified in terms of DHI GPoS uplift following Roden (2005).

Selected **pre-stack seismic lines** were examined to assess seismic quality, stacking velocities, and consistency of observed AVO behaviour with modelled responses (Wintershall in-house, 2016).

Depth conversion parameters were derived using the Pre-SDM migration velocity cube, calibrated with available well data (PrSDMR011, Wintershall in-house, 2016).

Seal integrity was assessed through an in-house **seal capacity study**, based on pressure and leak-off data, while a **fault seal analysis** focused on the sealing potential of faults juxtaposing Springar Formation sandstone reservoirs (Wintershall in-house, 2016).

Throughout the licence period, both prior to and following drilling, the geoscience interpretation was continuously updated on the basis of newly reprocessed seismic data and results from the Balderbrå exploration well (6604/5-1), the Balderbrå appraisal well (6604/5-2S), and the Gullstjerne exploration well (6604/6-1).

Seismic reprocessing

As part of the PL894 work programme, the licence group undertook a seismic reprocessing project covering **1,597 km²**, incorporating data from the BG0904, ST0827, and NH0202 surveys. The reprocessing was executed by ION (London, UK) and covered both the prospect areas and key offset wells.

The reprocessing significantly improved seismic bandwidth and vertical resolution, including attenuation of side lobes and an average six-fold increase in peak-to-trough ratio. Improved survey matching was achieved through removal of amplitude spectrum notches.

Seismic interpretation and mapping

Seismic interpretation was conducted primarily on the BG0904 and BG0904R11 datasets. For detailed overburden mapping around the well locations, the high-resolution 2D survey WIN17301 was utilised. Overall seismic quality is good; however, locally degraded imaging occurs due to the presence of hydrothermal vents often related to sills and dykes, particularly in the western and southern parts of the Balderbrå prospect, where reservoir-level interpretation is affected.

Depth Conversion

The **pre-drill depth conversion model** was based on an 11-layer velocity framework, comprising six layers down to Base Tertiary and five additional layers within and below the reservoir interval. The model was derived using velocity trends from the Gullris well 6604/2-1 (located approximately 22 km from Balderbrå 6604/5-1) and the PSDM velocity cube. Velocity calibration was performed layer-by-layer to the Gullris well down to Base Tertiary.

Vertical trends were defined using a best-fit V0-K function derived from the Gullris well in combination with pseudo-wells extracted from the PSDM velocity cube. Laterally varying V0 grids were generated per layer, based on PSDM velocity trends. Below Base Tertiary and within the reservoir section, constant average velocities from the Gullris well were applied. Below the pre-drill interpreted Base Springar Formation, PSDM velocities were scaled by 96% due to the absence of direct depth calibration.

Post-drill depth conversion was carried out as part of the seismic reprocessing programme to fulfil PL894 licence commitments. An anisotropic pre-stack depth migration (PSDM)-based velocity model was constructed using well marker depths from the Balderbrå wells and the Gullris well. The resulting model provides high-resolution depth imaging and shows good structural conformity in the central and western parts of PL894, where the Balderbrå and Gullstjerne prospects are located. The depth-converted seismic ties well markers typically within less than 10 m and forms the basis for post-drill horizon interpretation.

Post-well studies

A broad suite of post-well studies was completed and is documented in the discovery evaluation reports for wells 6604/5-1 and 6604/5-1 T2, and in the completion reports for the 6604/5-2S Balderbrå appraisal well and the 6604/6-1 Gullstjerne exploration well. These studies include:

- Biostratigraphy
- Stratigraphy and sedimentology
 - Springar Formation core description and interpretation
- Depositional model
- Petrography
- Formation evaluation:
 - Temperature and pressure
 - Fluid sampling
 - PVT analysis
 - Core data analysis
 - Conventional Core analysis (CCA)
 - Special Core analysis (SCAL)
 - Petrophysical evaluation
 - Log Data
 - LWD logs
 - Wireline logs
 - Clay volume
 - Effective porosity
 - Water saturation
 - Saturation-height modelling
 - Core and log permeability
 - Net reservoir and net pay
 - Petrophysical evaluation summary and CPI plots

- Geochemical evaluation
 - Gas source
 - Maturity of the well
 - Source rock potential and characterisation
 - Migrated hydrocarbon source
 - Migrated hydrocarbon maturity
- Discovery evaluation
 - Prospect model and volume potential
 - Gross rock volume
 - Volume parameters
 - Comparison of pre- and post-drill estimates
 - Productivity index and skin factor
 - Static model volumes post wells
 - Reservoir
 - Trap, source and migration
 - Fault seal analysis (post-well)

4 Prospect update report

Both the Balderbrå and Gullstjerne prospects were submitted as fully matured and drill-ready, with no additional pre-drill de-risking measures considered feasible.

Balderbrå Prospect and Discovery

The Balderbrå prospect is defined by a structurally faulted four-way dip closure within the Maastrichtian Springar Formation. Pre-drill evaluation identified two primary reservoir targets, Sandstones 2 and 3, both associated with depth-conformable seismic amplitude anomalies. The tops of these reservoirs were mapped with a high degree of confidence across the main seismic datasets BG0904M and ST0827, although interpretation uncertainty increases towards the western part of the structure due to complex faulting and hydrothermal venting.

The Balderbrå depth structure map was interpreted using the seismic Pre-SDM depth cube (Fig. 4.1), with the corresponding PRE-SDM time map shown in Fig. 4.2. Although the Pre-SDM model is considered sub-optimal for absolute depth prediction, it shows excellent spatial correspondence with the observed seismic amplitude anomalies (Fig. 4.3). For Sandstone 2, the seismic amplitude shut-off aligns closely with the mapped structural closure, supporting the pre-drill interpretation that the reservoir is filled to spill.

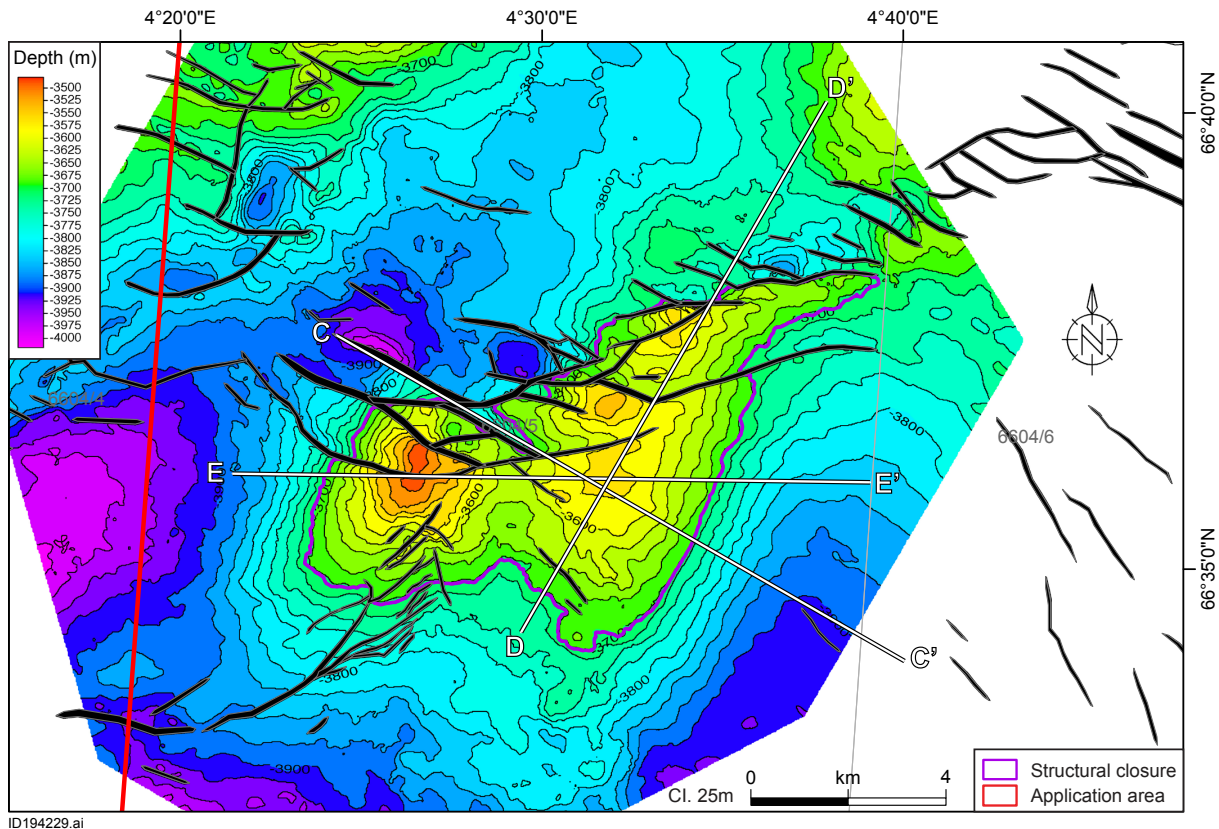


Fig. 4.1 Balderbrå prospect Top Springar Fm. sandstone 2 depth map

Depth converted with velocity model A. Location of seismic lines indicated

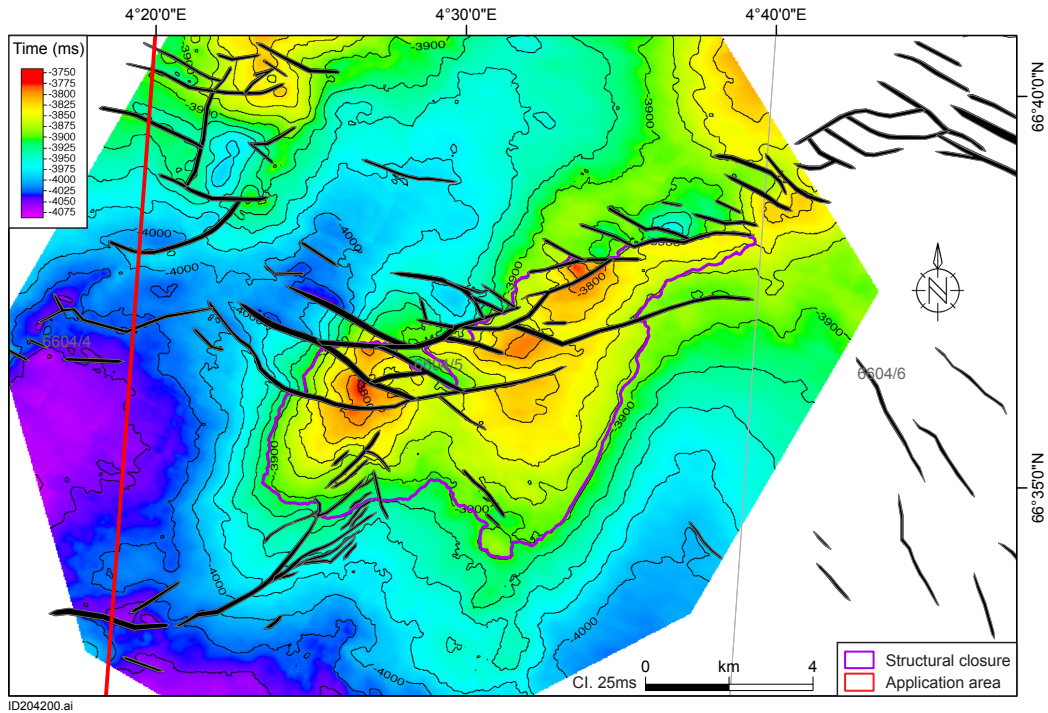


Fig. 4.2 Balderbrå prospect Top Springar Fm. sandstone 2 time map (TWT)

Outline of Balderbrå prospect defined by closure on depth map

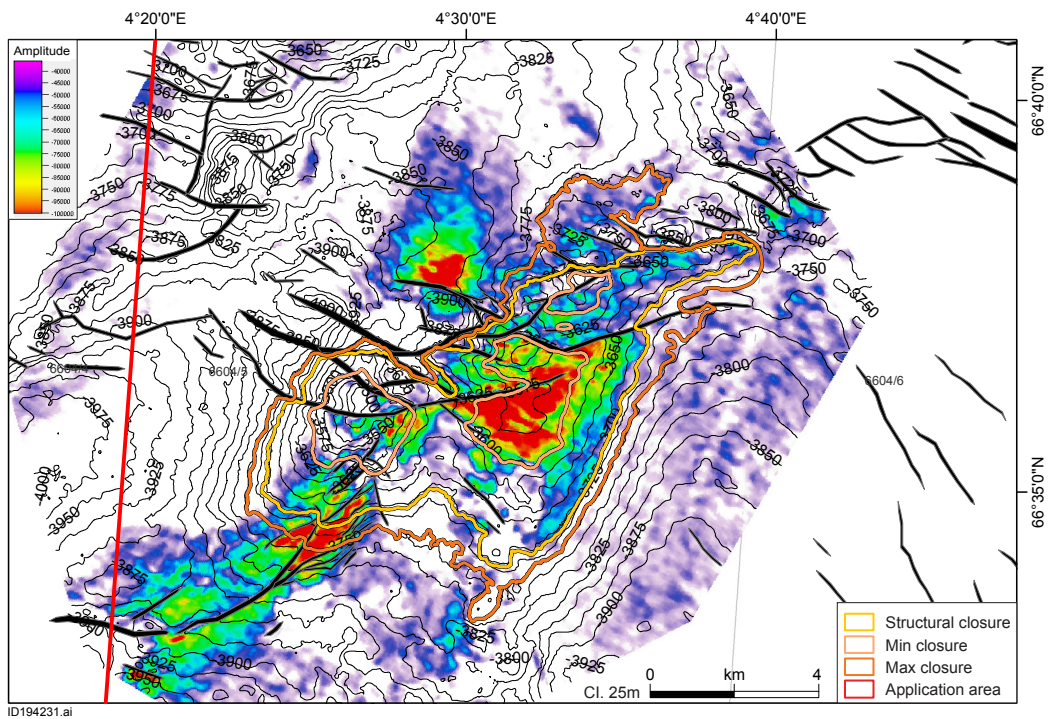


Fig. 4.3 Balderbrå prospect Top Springar Fm. sandstone 2 minimum seismic amplitude -4 to 4 ms depth map

Depth converted with velocity model A. Low minimum amplitude anomalies from BG0904M full-stack, are caused by low acoustic impedance of the reservoir, likely indicating gas-fill. A clear depth-conformable shut-off of the seismic anomaly is seen at the eastern end of Balderbrå. Shut-off coincides with structural spill. Anomaly seen just northwest of the prospect is restricted to a small structural closure. Anomalies seen southwest of the prospect might indicate active gas-charge. Outlines of different GWCs used for volumetric calculations are shown ahead of drilling the 6604/5-1 exploration well.

The direct hydrocarbon indicator (DHI) associated with Sandstone 3 was less robust. The amplitude shut-off was less clearly defined than for Sandstone 2 (Fig. 4.4), and the areal extent of the anomaly suggested that the reservoir is not filled to structural spill. This was interpreted pre-drill to potentially result from vertical and lateral juxtaposition between Sandstones 2 and 3 across the north-western bounding fault, allowing possible gas leakage from Sandstone 3 into Sandstone 2 (Fig. 4.5). An in-house fault seal analysis nevertheless indicated that the north-western bounding fault should be capable of retaining gas columns of at least 100 m (Fig. 4.6). Seismic amplitude anomalies and fault geometries within the trap are shown in Fig. 4.7 and Fig. 4.8.

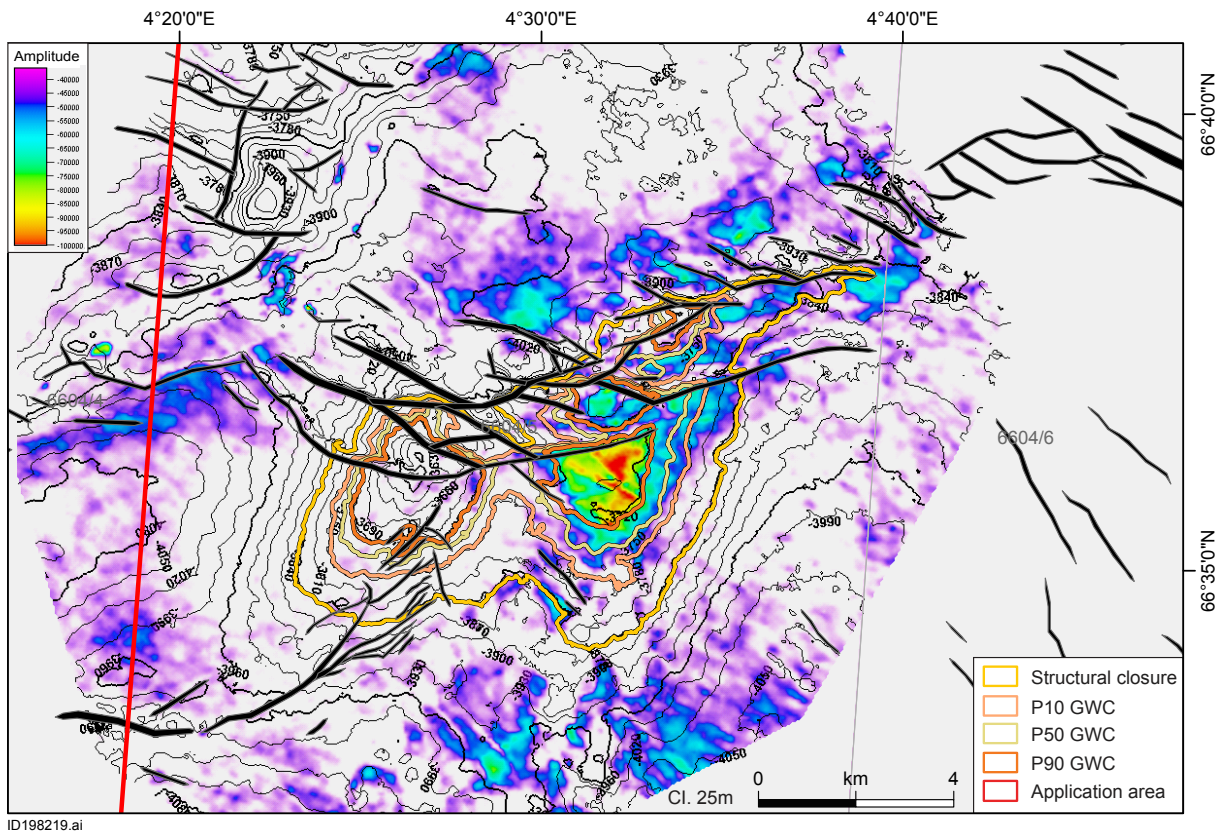


Fig. 4.4 Balderbrå prospect Top Springar Fm. sandstone 3 minimum seismic amplitude -4 to 4 ms depth ma Depth conversion model A. Low minimum amplitude anomalies from BG0904M full-stack are caused by low acoustic impedance of the reservoir, likely indicating gas-fill. The seismic amplitude anomaly might indicate under-fill of sandstone 3. Outlines of different GWCs used for volumetric calculations are shown (pre drill evaluation).

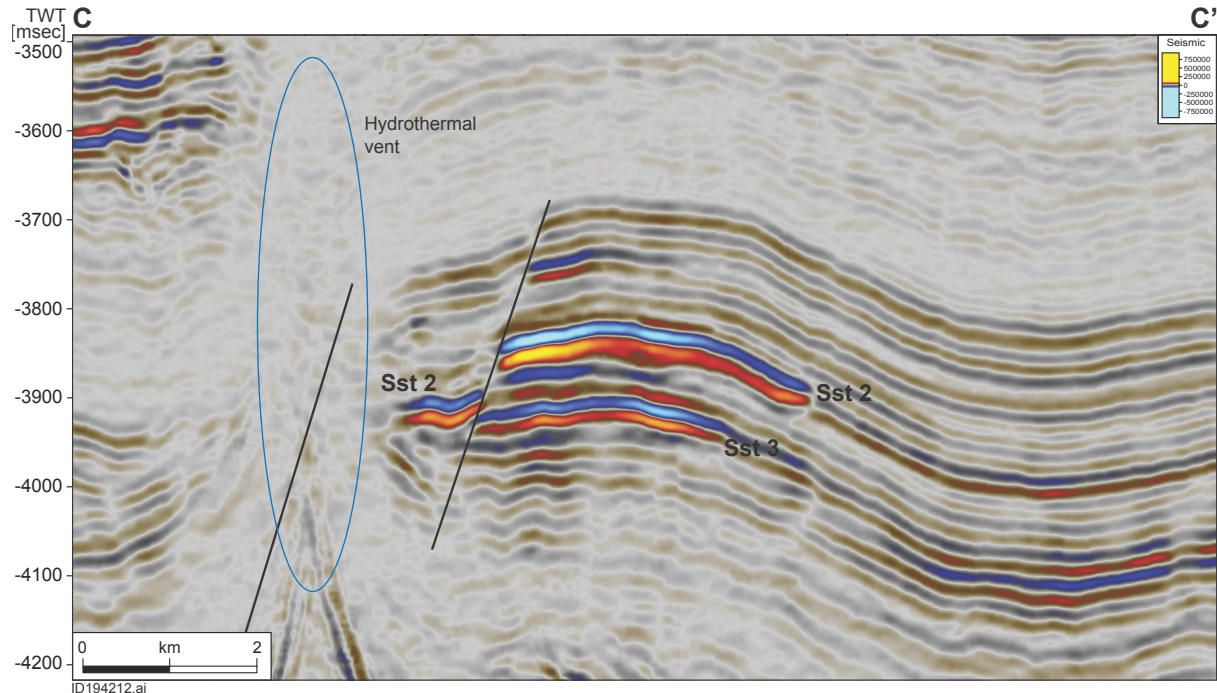


Fig. 4.5 Reservoir juxtaposition in Balderbrå prospect

Seismic line BG0904M full-stack shows clear reservoir juxtaposition across the fault creating a possible leakage for sandstone 3. It also shows the bounding fault as passageway for hydrothermal vents. Location of seismic line shown in Fig. 4.1 (pre-drill evaluation).

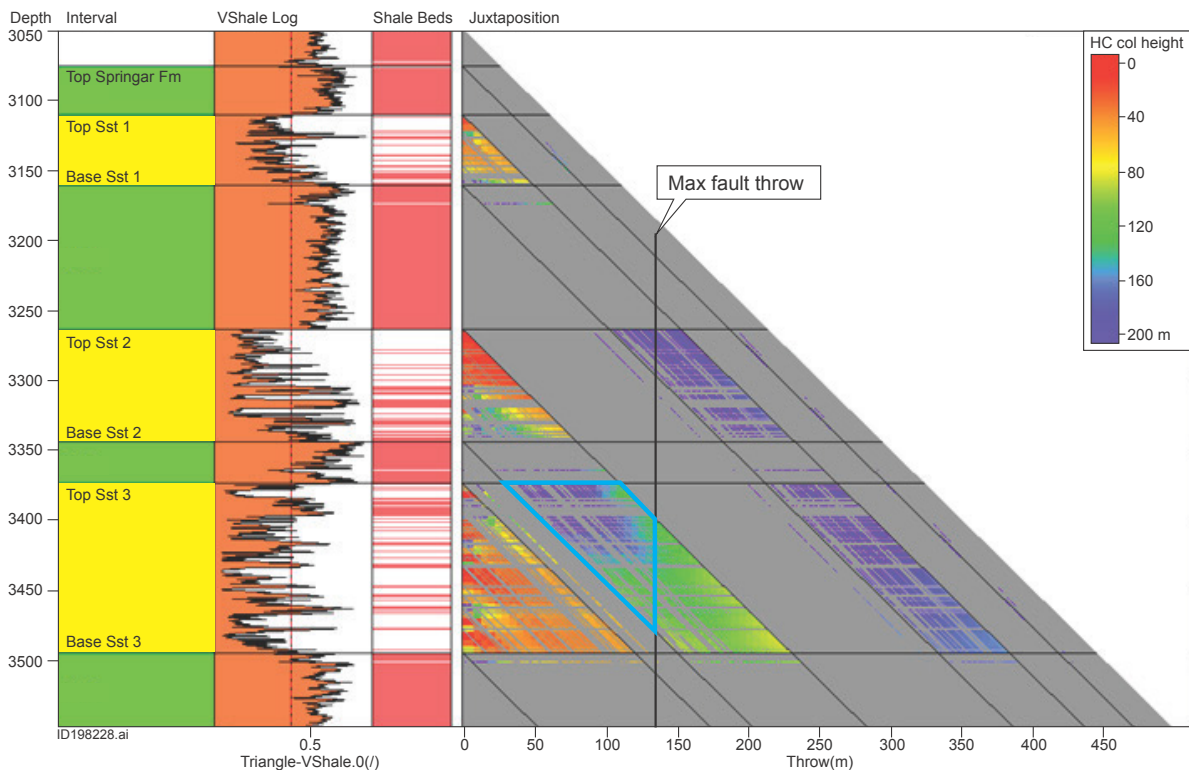


Fig. 4.6 Fault seal diagram

Colors in the diagram indicate the maximum HC column that reservoir juxtapositions are expected to be able to hold. The maximum fault throw is around 140 m. Maximum hydrocarbon column values for sandstone 3 juxtaposed with sandstone 2 are indicated in the high-lighted blue box. Vshale log is derived from a synthetic well based on nearest well 6604/2-1. In the original well, sandstone 1 is the best developed while in the prospects the best developed sand is expected to be sandstone 2. In the synthetic well sandstone 1 and 2 have therefore changed places.

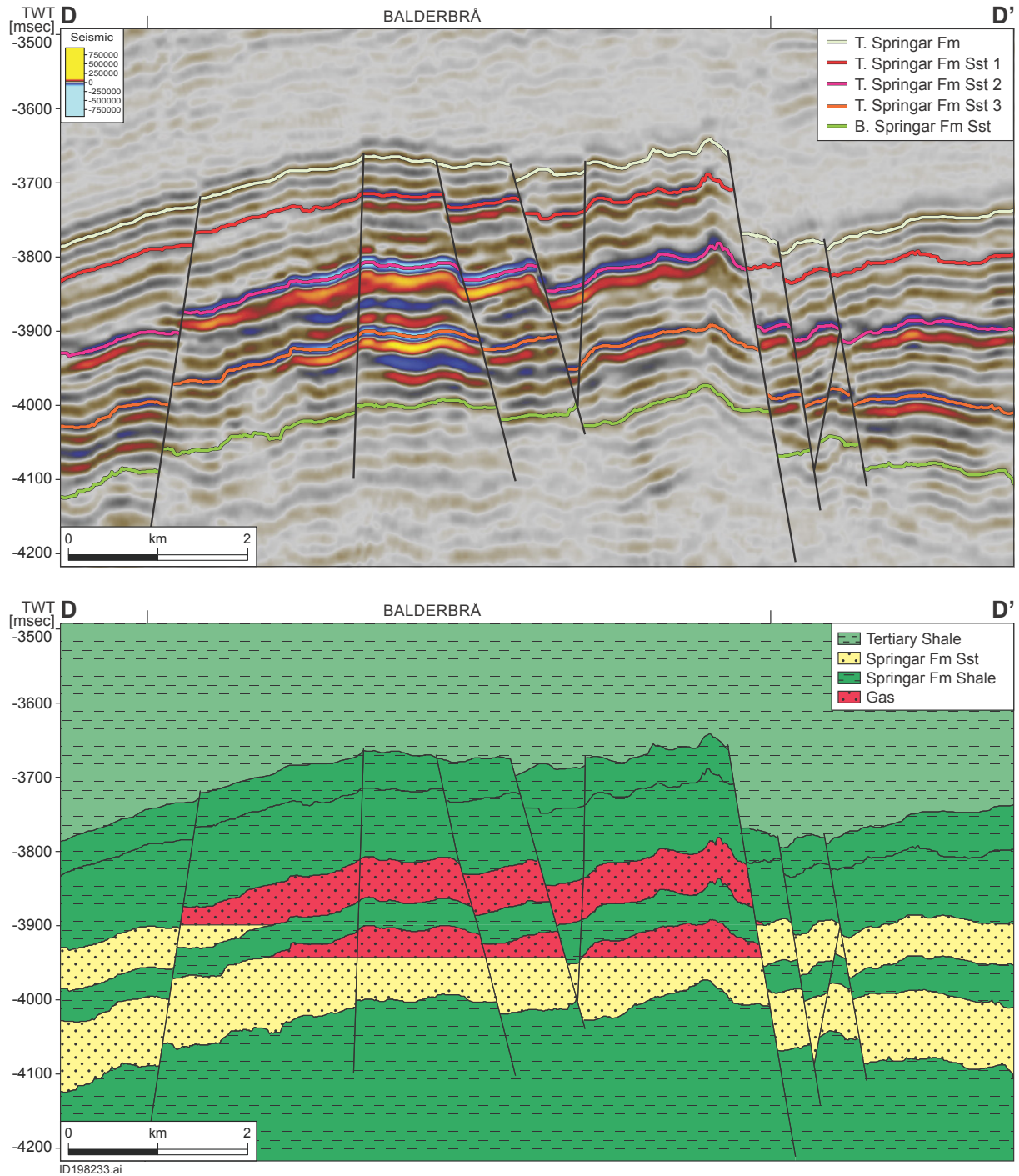


Fig. 4.7 Baldebrå prospect seismic line and geological section

Clear seismic anomalies in Springar Fm. sandstone 2 and 3. Possible leakage due to juxtaposition of sandstone 3 to 2 across the main fault. Location of seismic line BG0904M full-stack shown in Fig. 4.1 (pre-drill evaluation).

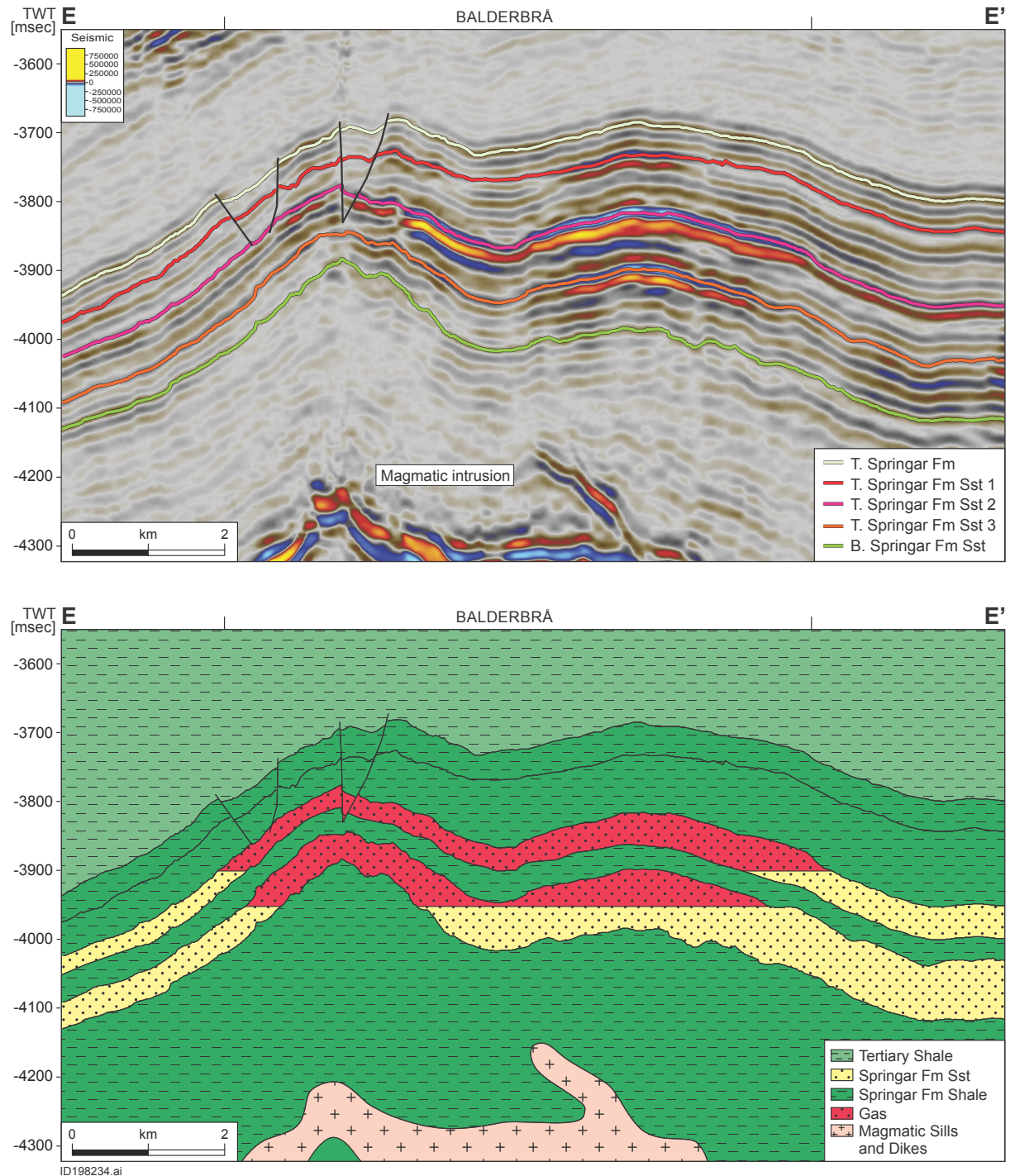


Fig. 4.8 Balderbrå prospect seismic line and geological section

Clear amplitude anomalies in sandstone 2 and 3. Note the possible flat spot on the right-hand side of the sandstone 2 amplitude anomaly. Minor hydrothermal venting in the western crest. Location of seismic line BG0904M full-stack shown in Fig. 4.1 (pre-drill evaluation).

Well 6604/5-1 targeted three Upper Cretaceous deep-marine turbidite sandstone reservoirs within the Springar Formation. The well encountered three pressure-separated, gas-filled reservoir intervals (Sandstones 1, 2 and 3) of which the lowermost two were cored. Prior to drilling, Sandstone 1 was not considered a target interval. Total core coverage comprises **ca. 55m in either core which cover almost entirely the Sandstone 2 succession and approximately the upper half of the Sandstone 3 succession.**

Conventional core analysis (CCA) was conducted on plug samples from both cores. The reservoir units exhibit moderate to good porosity but generally low permeability, primarily due to high detrital clay content and associated microporosity. Cementation is widespread and also affects the cleanest and coarsest sandstone units, resulting in the absence of higher-quality reservoir zones.

The poor reservoir permeability significantly hindered acquisition of reliable formation pressure data and fluid samples in the middle and lower parts of the reservoir units. However, reliable gas gradients were determined in the uppermost parts of Sandstone 2 and Sandstone 3. As no clear indication of water-filled reservoirs was observed in this well and the available regional water gradients from wells 6604/2-1 (Gullris) and 6605/1-1 (Obelix) suggested a possibly relatively deep gas water contact (Fig. 4.9), the traps for Sandstone 2 and Sandstone 3 were believed to be filled to spill after drilling the first well.

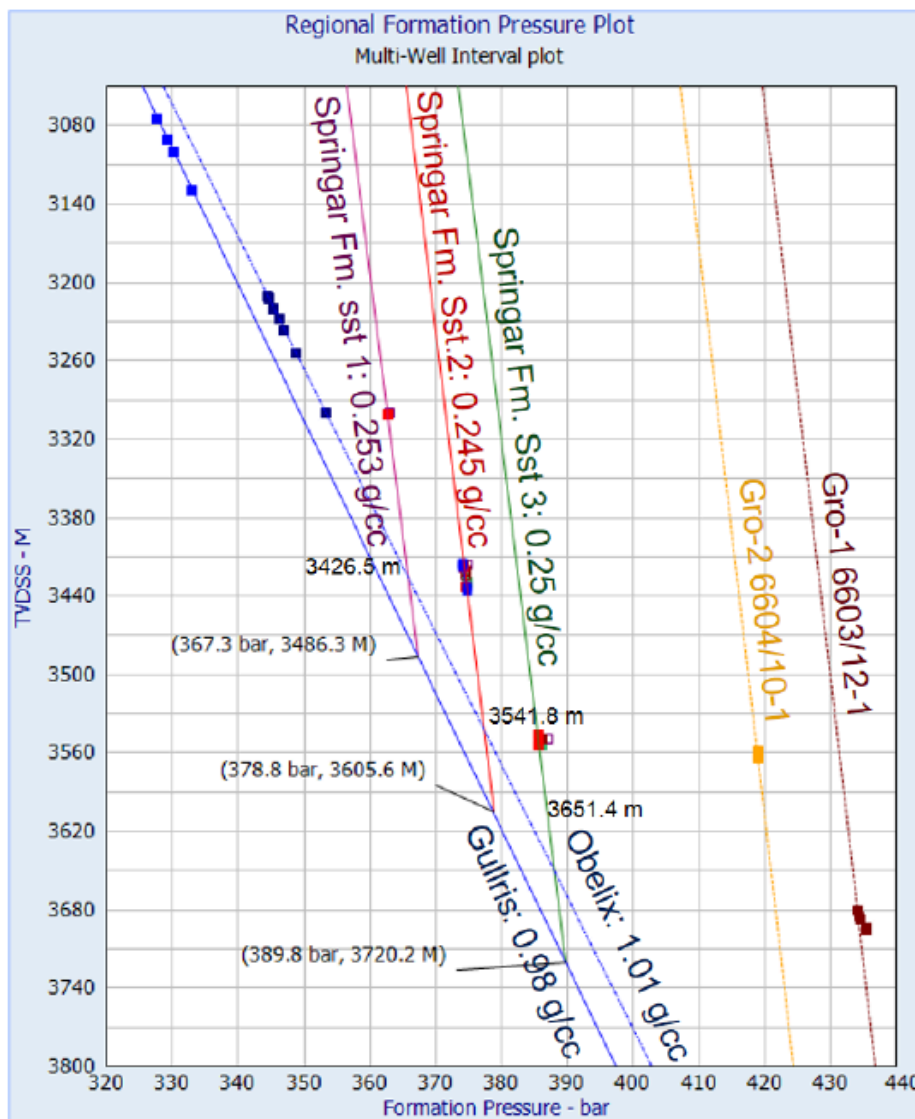


Fig. 4.9 Regional Formation pressure plot

All Springar Fm. Sst reservoirs as well as reservoirs in the Gro wells have different pressure regimes. The Gullris water gradient of 0.98 g/cc (lower blue line) would indicate a deeper FWL than the Obelix gradient of 1.01g/cc (upper blue line). FWL for each Springar Fm. Sst is given in m TVDSS (crossings of 3 gas gradients in Springar Fm. Sst. intervals with the two water gradients).

Sandstone 1 turned out to be much thinner compared to the deeper reservoir intervals and exhibits weaker seismic amplitudes. As a result, both the areal extent of the reservoir and the interpreted fluid fill remain more uncertain. A comparison of pre and post-drill petrophysical parameters is provided in Table 4.1.

Drilling results do not contradict the fill-to-spill scenario for sandstone 2 and remains consistent with the pre-drill interpretation (Fig. 4.10, Fig. 4.11). Although the seismic DHI for Sandstone 3 proved weaker and less distinct than expected, MDT gas samples acquired below the interpreted amplitude shut-off suggest that this reservoir is also likely filled to spill (Fig. 4.12, Fig. 4.13).

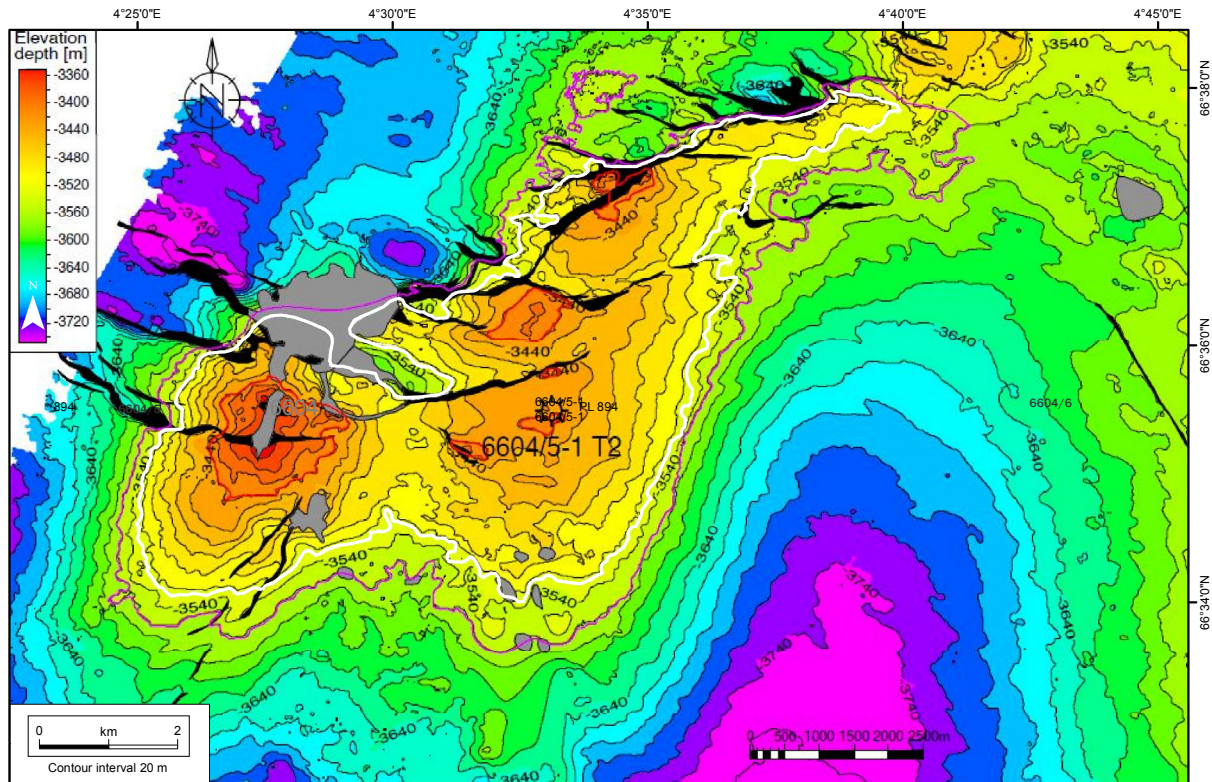


Fig. 4.10 Top Springar 2 sandstone post drill exploration well depth map

The red contour is MDT depth of a sample believed to be moveable gas in the Balderbrå exploration well. The white contour is the last closing contour mapped (spillpoint) and the purple contour is the maximum extent of updip amplitude brightening. The grey polygons indicate areas of lower mapping confidence due to poor imaging. The coordinate reference system for the map is UTM31-ED50.

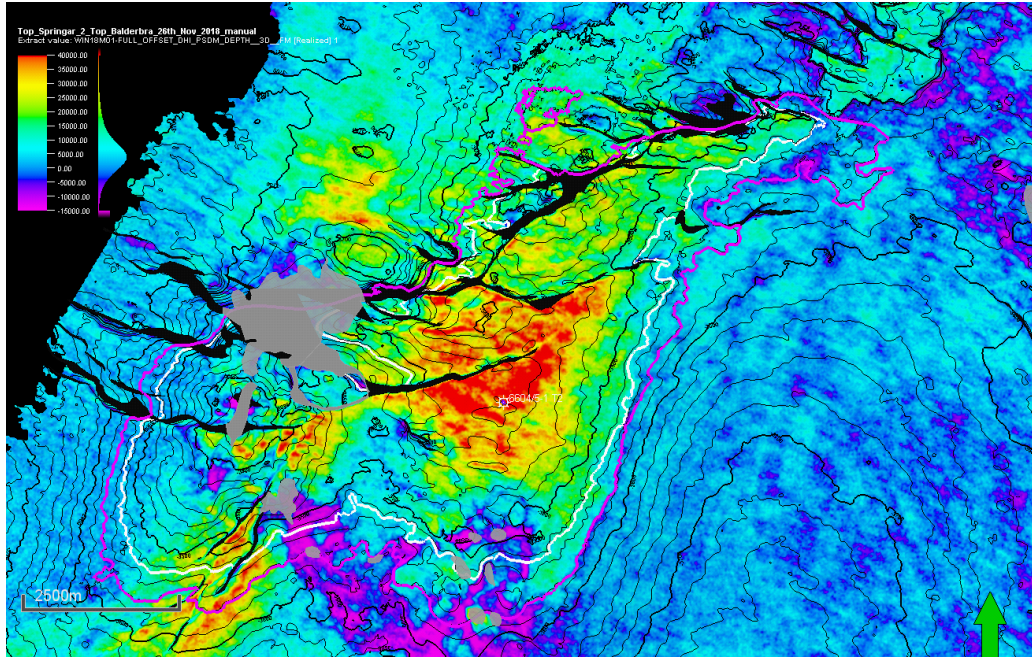


Fig. 4.11 Top Springar 2 Formation sandstone seismic amplitude depth map

The white line is the interpreted spillpoint of the structure. The grey polygons are areas with lower interpretation confidence. Note the amplitude downdip depth conformance in the SE part of the structure. The black polygons are faults. The well indicated with a white well symbol is the 6604/5-1 T2 Balderbrå discovery. The amplitude extraction was measured on the picked event with a window of ± 4 milliseconds. Post exploration well.

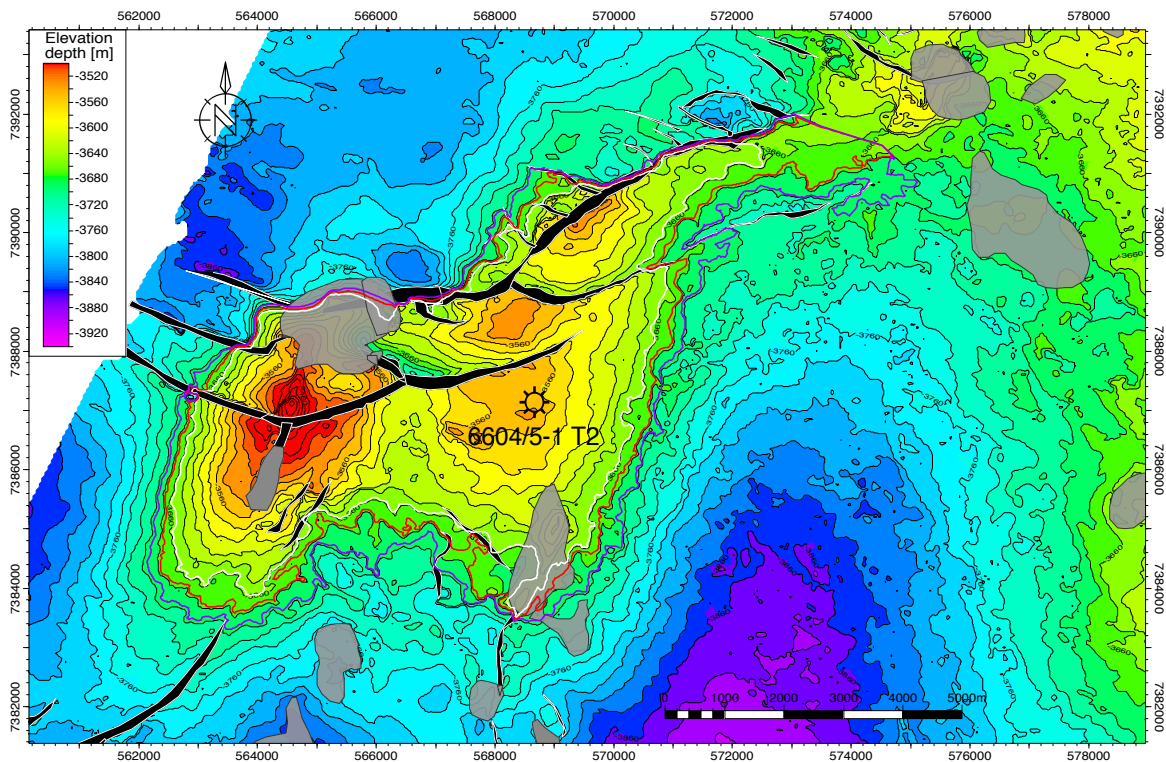


Fig. 4.12 Top Springar 3 sandstone post exploration well depth map

The red contour is the believed gas down to the base of the regional water pressure gradient discovered in the Balderbrå exploration well. The white contour is the last closing contour mapped (spillpoint) and the purple contour is the maximum expected extent of hydrocarbon fill. The grey areas indicated areas of lower mapping confidence due to imaging. The coordinate reference system for the map is UTM31-ED50.

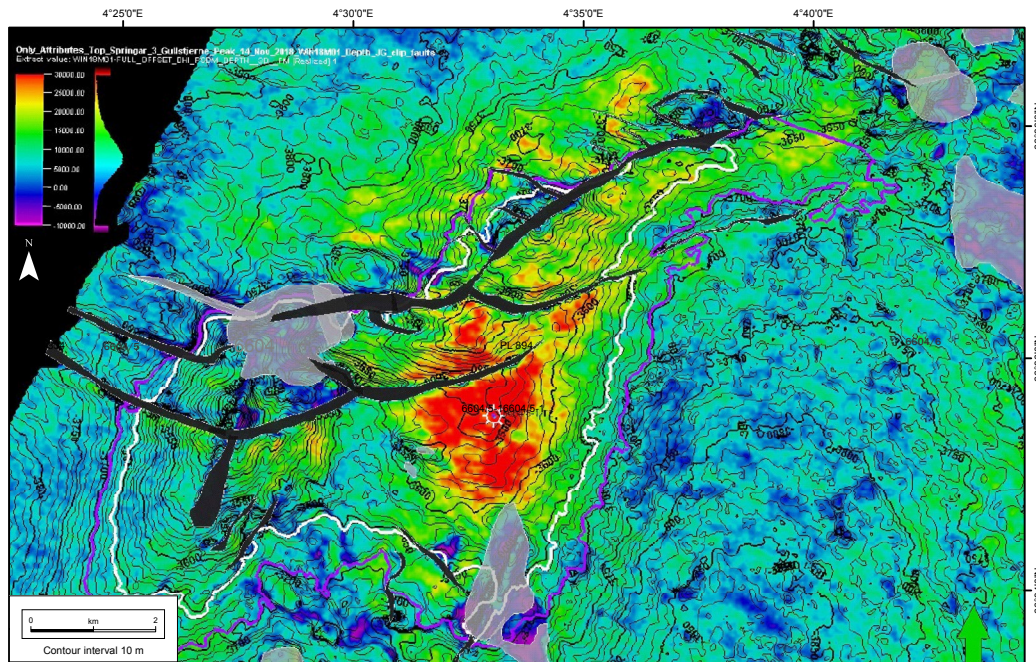


Fig. 4.13 Top Springar 3 Formation amplitude map

The structural spillpoint is indicated with a white line on the map. The mapped faults are shown in black polygons. The contour interval is 10m. The grey polygons indicate areas of low confidence interpretation due to poor imaging from hydrothermal vents. The well located in the centre of the map is 6604/5-1 T2 Balderbrå. The amplitude extraction was measured on the picked event with a window of ± 4 milliseconds.

Table 4.1 Pre- versus post-drill estimates, Springar Formation sandstone

Parameter	Pre-drill mean	Post-drill mean		
	sst 2 & 3	sst 1	sst 2	sst 3
Reservoir thickness (m TVD)	77	8.13	57.1	129.8
Net to gross (decimal)	0.769	0.731	0.855	0.752
Porosity (decimal)	0.19	0.174	0.171	0.154
Gas saturation in pay (decimal)	0.66	0.623	0.557	0.524
Wet gas shrinkage factor (decimal)	1	1	1	1
GOR (Sm^3/Sm^3)	33731	8568	8668	8668
Bg (Sm^3/Sm^3)	0.0037	0.0037	0.0037	0.0037
Recovery factor gas (decimal)	0.5	0.542	0.483	0.386
Recovery factor condensate (decimal)	0.41	0.435	0.385	0.309

Table 4.2 compares the statistical pre- and post-drill volumes.

Table 4.2 Pre- versus post-drill Balderbrå exploration well volume estimates

Reservoir	Pre-drill		Post- drill	
	Mean InPlace	Mean Rec.	Mean InPlace	Mean Rec.
Sandstone 1				
Gas (GSm ³)	-	-	2.25	1.22
Condensate (MMSm ³)	-	-	0.26	0.112
Sandstone 2				
Gas (GSm ³)	41.7	20.8	17.3	8.36
Condensate (MMSm ³)	1.23	0.5	1.99	0.77
Sandstone 3				
Gas (GSm ³)	9.33	4.96	22.6	8.74
Condensate (MMSm ³)	0.29	0.12	2.61	0.81
Combined consolidated				
Gas (GSm ³)	48.4	24.2	42.4	18.5
Condensate (MMSm ³)	1.42	0.58	4.87	1.69

The total expected **GeoX statistical hydrocarbons initially in place (HCIIP)** for the Balderbrå discovery are estimated to range from **23.9 million Sm³ oe (P90)** to **75.1 million Sm³ oe (P10)**, with a **P50 estimate of 44.2 million Sm³ oe.**, post exploration well.

The corresponding **GeoX statistical recoverable volumes** are estimated at **9.5 million Sm³ oe (P90)**, **18.6 million Sm³ oe (P50)**, and **33.0 million Sm³ oe (P10)**, post exploration well.

Static-Dynamic Model Volumes (Post-Well)

A coupled static–dynamic reservoir model was constructed to estimate recovery factors based on results from wells 6604/5-1 and 6604/5-1 T2, interpreted fluid contacts from seismic data, and modelling of the free-water level (FWL) informed by well log data. Three volume cases were defined to reflect key subsurface uncertainties.

The **low case** is constrained by the gas–down-to (GDT) contacts observed in the wells. The **medium case** is defined by the last closed contour representing structural spill on recently reprocessed PSDM seismic data. The **high case** reflects the maximum interpreted contacts based on a depth conversion derived from a PSDM velocity model.

The volumetric estimates derived from the static model are considered more robust than the statistical volume estimates presented earlier, and therefore form the primary basis for post-well volume assessment.

For the **medium case**, total gas initially in place (GIIP) is estimated at **46.4 GSm³**, with an associated **5.1 MMSm³ of condensate**. Corresponding **recoverable volumes** are estimated at **22.3 GSm³ of gas** and **1.8 MMSm³ of condensate**. The total recoverable volumes expressed in oil-equivalent terms are estimated at **19.3 MMSm³ oe (low case)**, **24.1 MMSm³ oe (medium case)**, and **28.3 MMSm³ oe (high case)**.

The spread between the statistical P10 and P90 outcomes remains significant, indicating material remaining uncertainty in reservoir volume and performance. At least one appraisal well was therefore deemed to be required to reduce volumetric uncertainty and to support further development evaluation.

Balderbrå appraisal well 6604/5-2S

The appraisal drilling program was designed to delineate gas initially in place (GIIP) and to assess reservoir producibility. The appraisal well encountered three distinct water-filled reservoir intervals in the Springar Formation, of which the lowermost two were cored. Total core coverage comprises ca. 73 m in each core. Similarly to the Discovery well, Core 1 covers almost the entire Springar Formation Sandstone 2 interval, while Core 2 covers approximately the upper half of Springar Formation Sandstone 3. Also for this well, Conventional core analysis (CCA) was conducted on plug samples from both cores which confirmed the general poor reservoir quality of the local Springar Formation sandstones, with common low permeability due to high detrital clay content.

The low reservoir permeability significantly hindered acquisition of reliable formation pressure data. In total, **35 formation pressure measurements (XPT)** were attempted, of which only **five** were considered valid. Despite the limited number of reliable pressure points, the interpreted pressures align with the formation pressure measured in the newly-drilled nearby well 6604/6-1 (Gullstjerne) and define a regional, near-hydrostatic water gradient. The established water gradient allowed accurate determination of the gas-water contact depths in each reservoir unit of Balderbrå Discovery, which are ca. 3329m, 3453.5m and ca. 3568m TVDSS respectively for Sandstone 1 Sandstone 2 and Sandstone 3 (Fig. 4.14). This contact assessment is supported by the reasonably good correspondence with the rapid downward increase in the calculated Water Saturation visible in the CPIs of each reservoir unit of the Discovery well at these depths (Fig. 4.15 and Fig. 4.16).

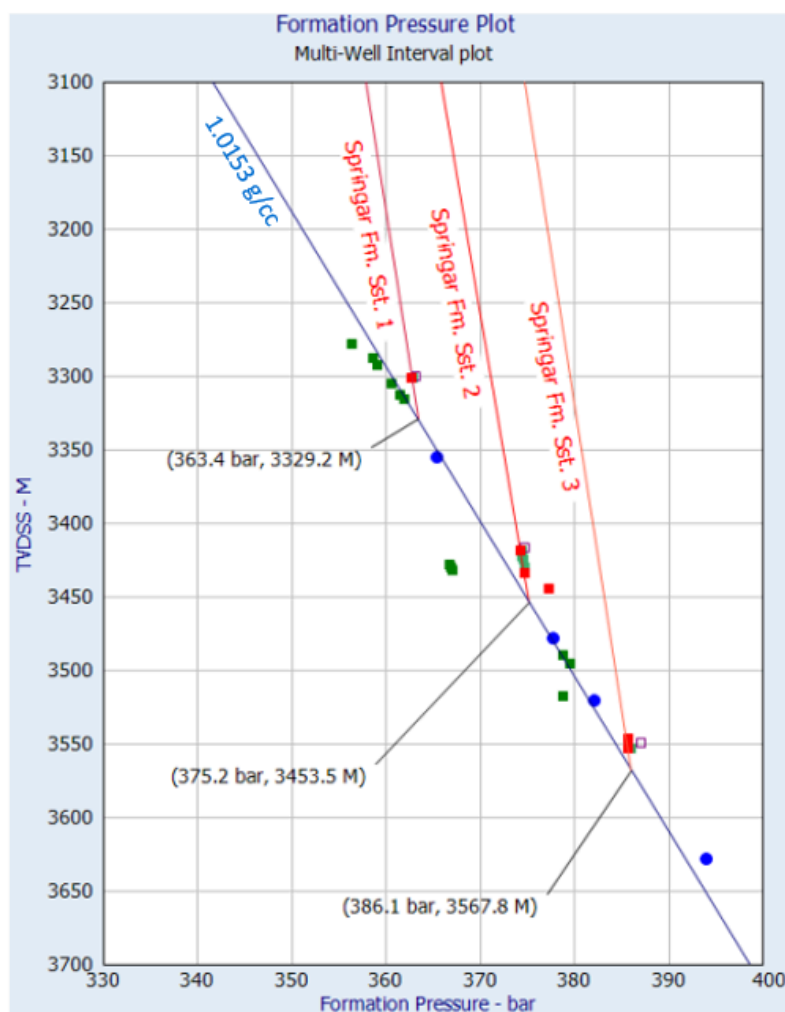


Fig. 4.14 Formation pressures plot after appraisal well

Blue dots: Balderbrå appraisal well 6604/5-2; red dots: exploration well 6604/5-1; green dots: Gullstjerne well 6604/61

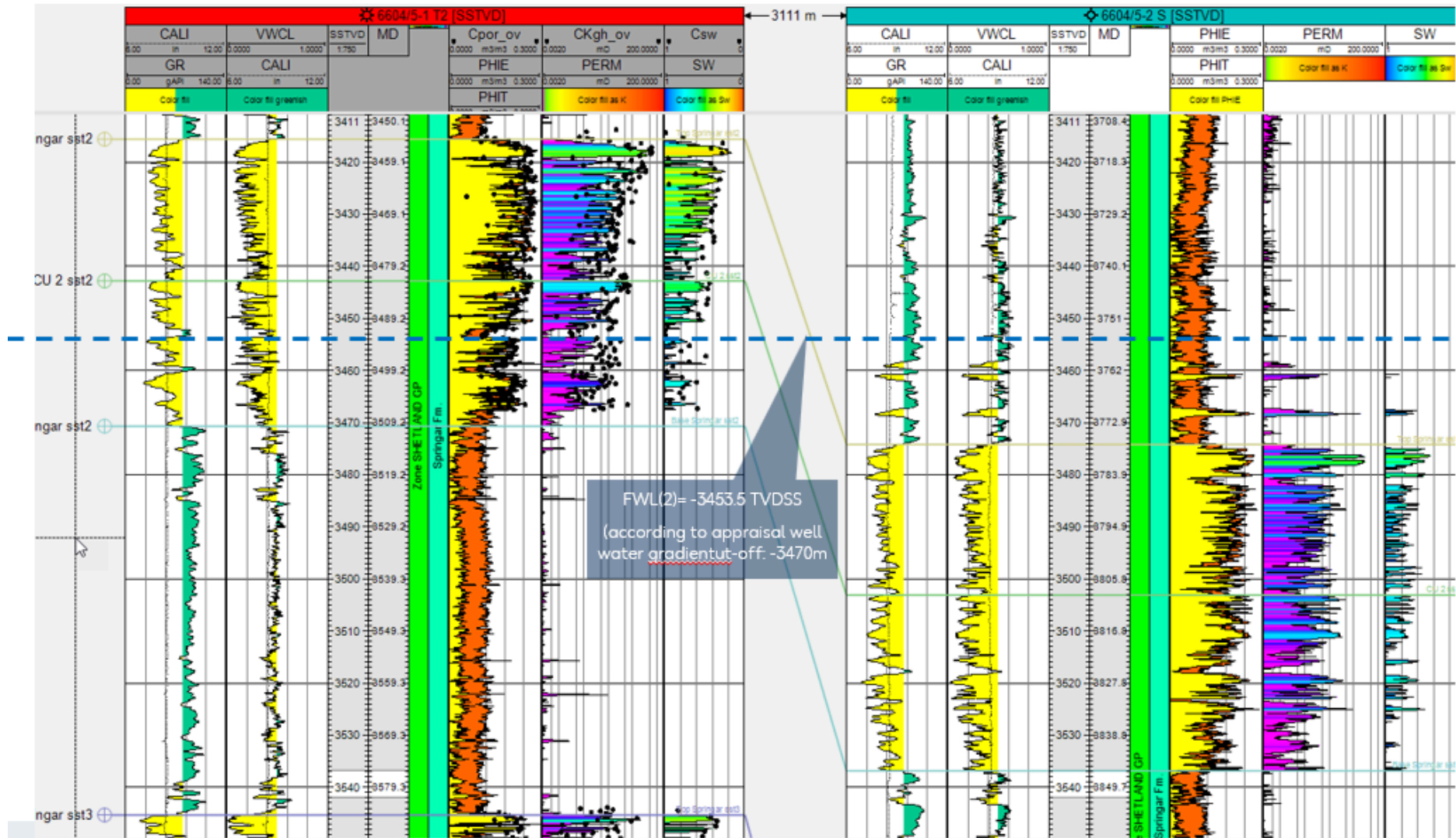


Fig. 4.15 Sandstone 2 CPI

Well section is displayed in TVDSS (Unflattened). The calculated gas-water contact corresponds to a drop in the measured gas saturation in well 6604/5-1.

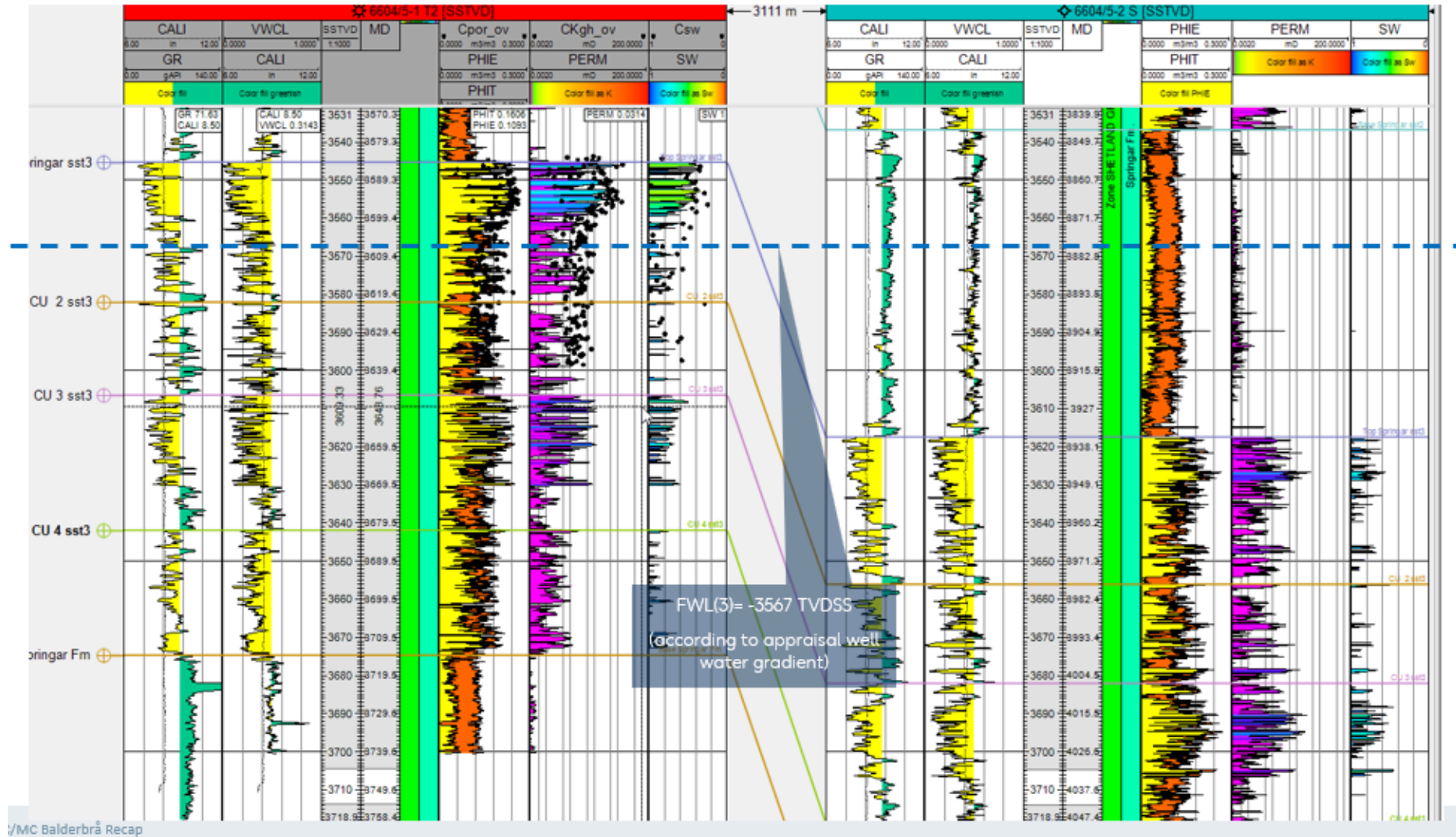


Fig. 4.16 Sandstone 3 CPI

Well section is displayed in TVDSS (Unflattened). The calculated gas-water contact corresponds to a drop in the measured gas saturation in well 6604/5-1.

The original Balderbrå prospect was defined by a depth-conformable seismic amplitude shut-off (Fig. 4.17, red outline). Post-drill evaluation of the 6604/5-2S appraisal well indicates that the observed seismic amplitudes instead represent a palaeo-fluid contact related to residual or “fizz” gas, rather than an active gas–water contact. However, the presence of movable gas is still possibly indicated by the highest seismic amplitudes of the CHI 60-40 degrees cube (“DHI cube”). Amplitude extractions at the top of the two main reservoir unit show low, dim amplitudes in the low-gas saturation area of the appraisal well and high, bright ones at the exploration well, where movable gas is present. In the latter area, these bright amplitudes actually pass into much dimmer ones at depths close to those indicated by the pressure gradient intersections (ca. -3455/3460m vs. 3453.5m TVDSS for Sandstone 2 and ca. 3575/3585m vs. 3568m TVDSS for Sandstone 3; Fig. 4.18 and Fig. 4.19), supporting the use of this cube as DHI.

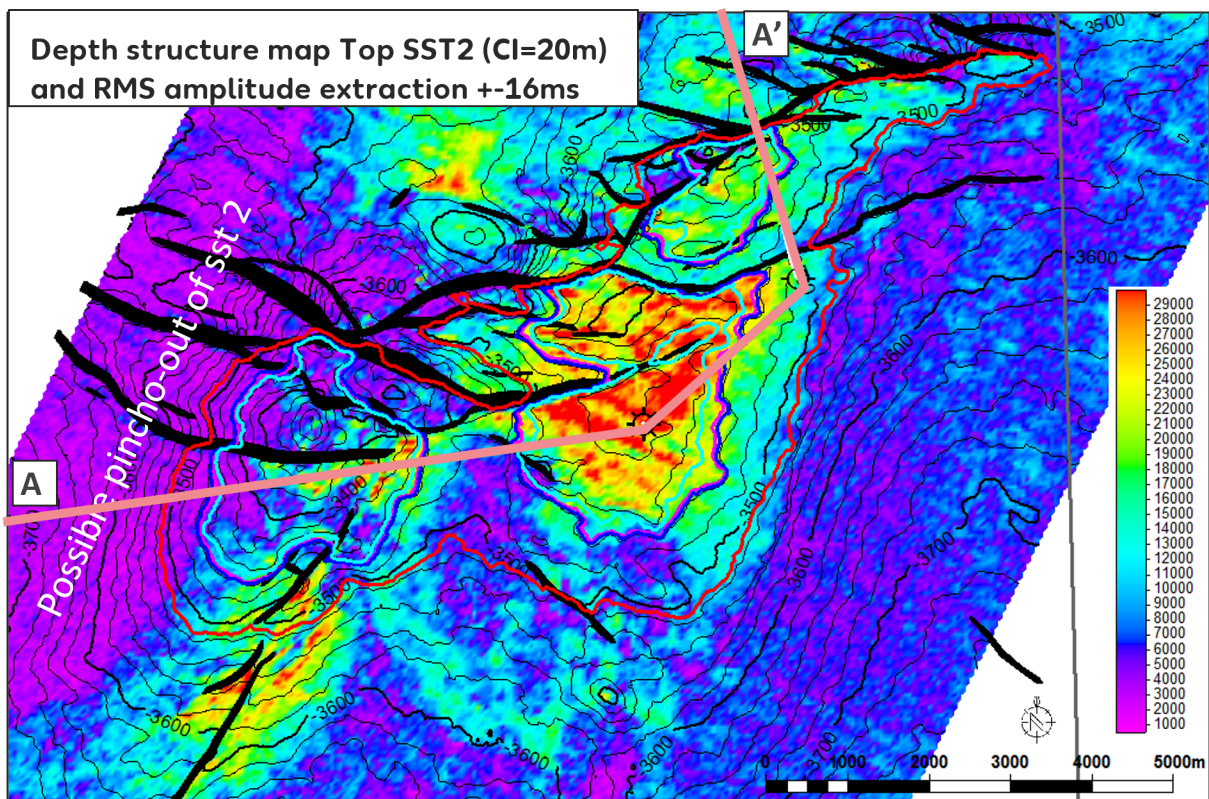


Fig. 4.17 Top Springar 2 Formation sandstone seismic amplitude map

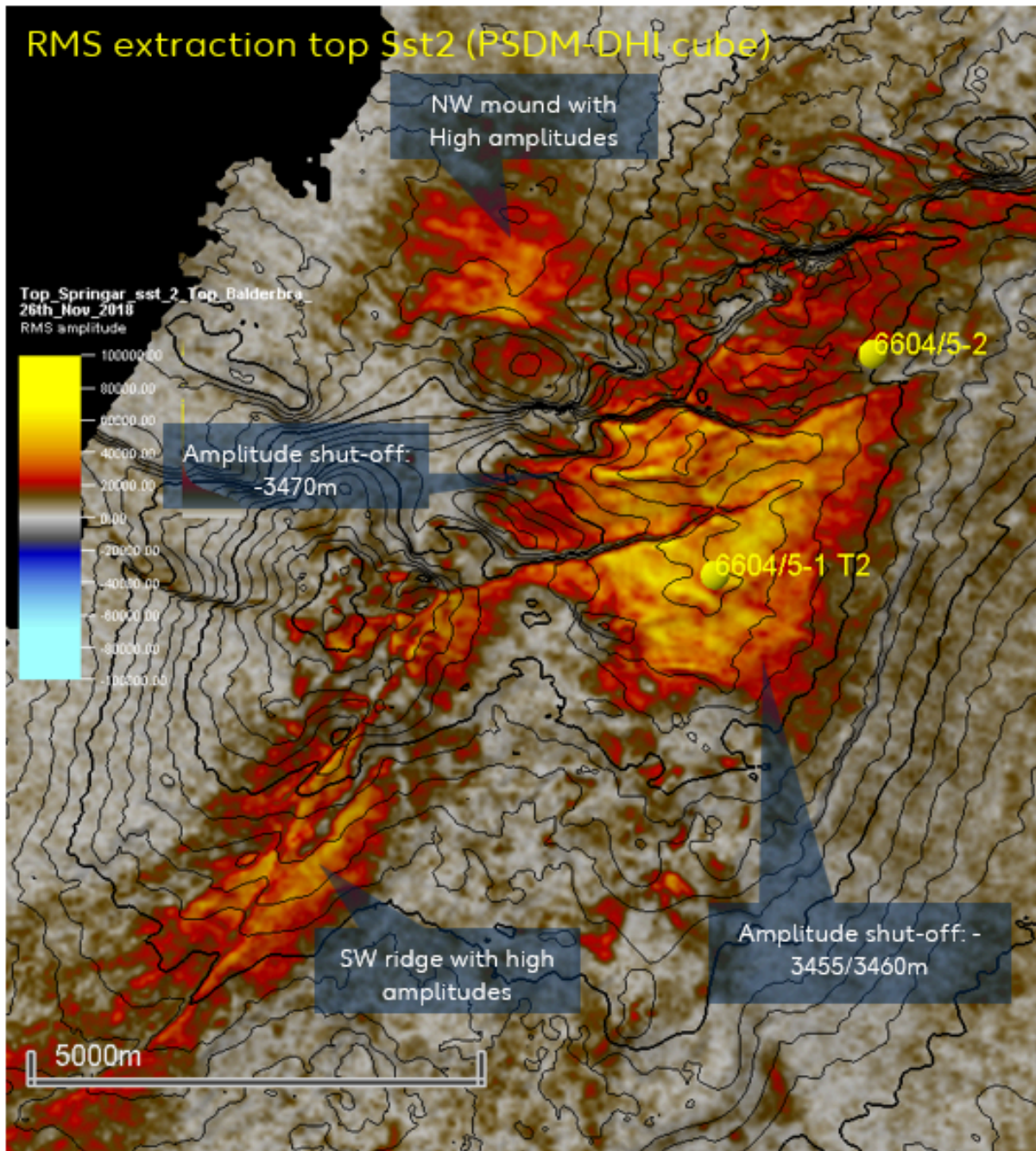


Fig. 4.18 Amplitude extraction at Top Sandstone2

Large amplitude variation is visible between the exploration well area and the appraisal well one. The fluid contact depth indicated by the formation pressures coincides with good approximation with a change in seismic amplitudes, from dim red to bright orange.

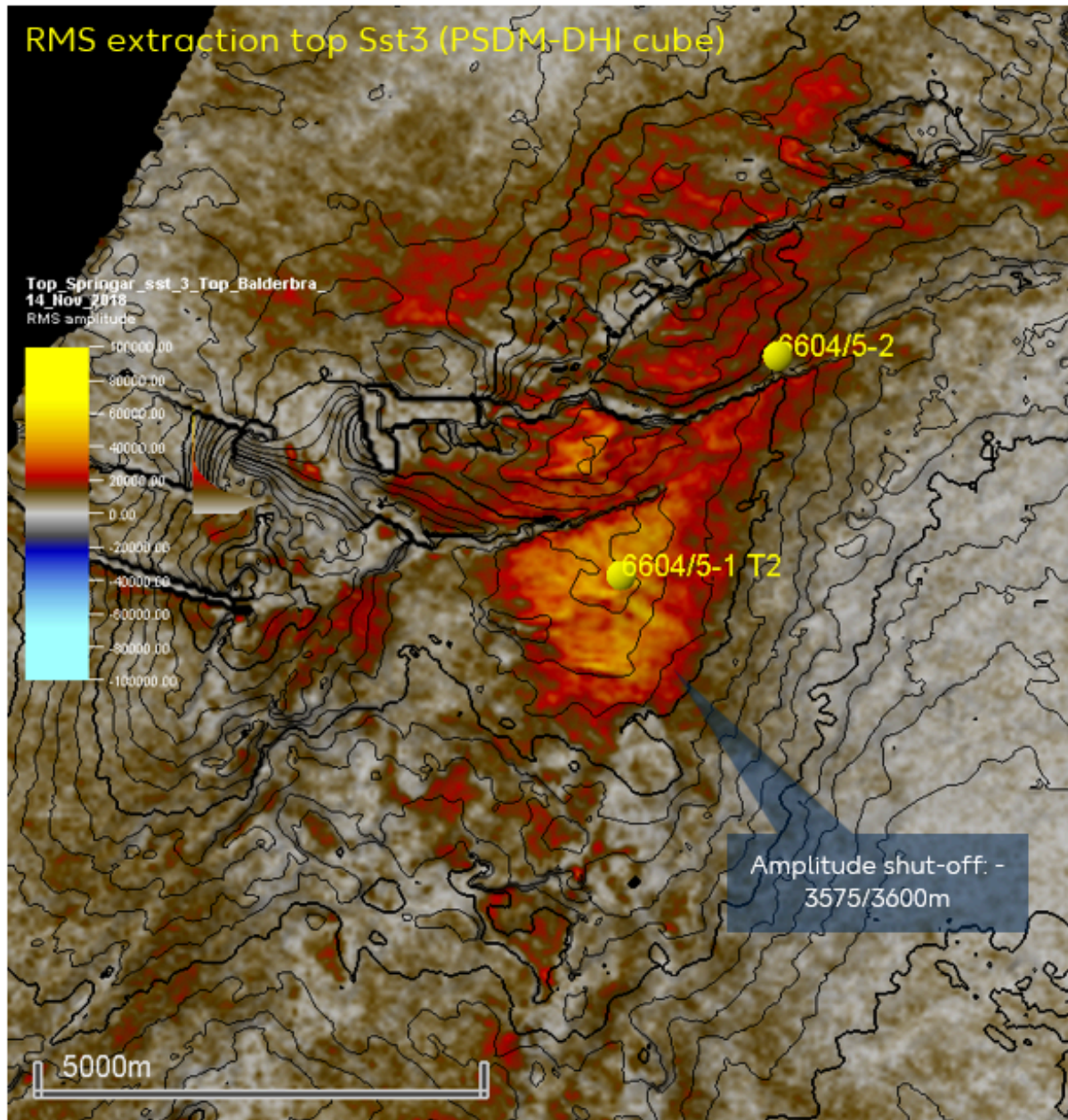


Fig. 4.19 Amplitude extraction at top Sandstone 3

Large amplitude variation is visible when moving away from the exploration well area. The fluid contact depth indicated by the formation pressures coincides with good approximation with a change in seismic amplitudes, from dim red to bright orange. In the central segment, only the crest of the structure appears very bright and therefore possibly gas-saturated

The stacked traps of the Springar Fm. tested by the exploration well, are therefore not filled to the spill-point but only in their uppermost, crestal, part. The most likely failure mechanisms are interpreted to be local seal breach, potentially associated with structurally weak zones linked to hydrothermal venting (Fig. 4.20). The location of the fractures associated with the hydrothermal vents determined whether the traps were emptied completely or only partially. The appraisal well segment was cross-cut by a vent in a crestal position and was almost completely emptied. The discovery well segment instead was cross-cut by a vent located relatively down-dip with respect to the trap crest which emptied only the underlying part of the structure (Fig. 4.20).

Scattered elevated amplitudes occur north of the appraisal well and on the ridge south-west of the discovery well at the level of Sandstone 2, potentially indicating additional movable gas accumulations

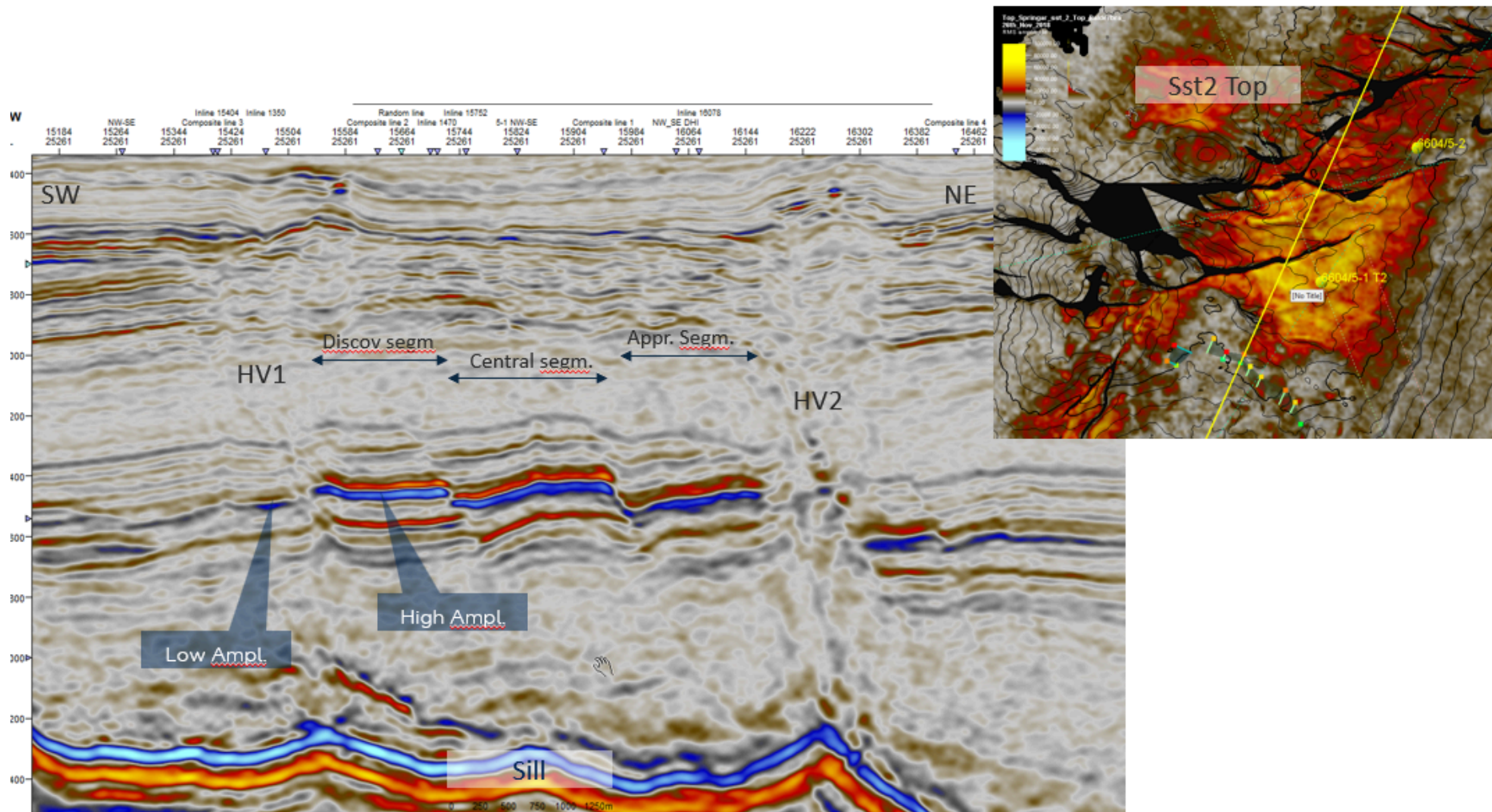


Fig. 4.20 SW-NE seismic line

The trap tested by the exploration well was dissected by an hydrothermal vent (HV1) in a downdip location. Therefore movable gas was preserved updip of this disruption zone. The appraisal well structure was breached by another hydrothermal vent (HV2) approximately at its crest, with consequent complete gas escape.

(Fig. 4.18). However, their amplitudes are not as high as in the discovery well area, are not conform to the contours and do not seem to correspond to any clear trap geometry. Their in-place volumes would be anyway very small and therefore not considered in the volumetric calculation.

Following the appraisal well results, the Balderbrå prospect/discovery was subdivided into three segments: **Balderbrå Central** (discovery well 6604/5-1), **Balderbrå North** (appraisal well 6604/5-2S), and **Balderbrå West** (undrilled) (Fig. 4.21). Post-drill contingent resources are primarily concentrated within the Central segment, with additional volumes interpreted up-flank in the North segment. Table 4.3 summarises contingent resource estimates for the pre-drill Balderbrå exploration case, the post-drill Balderbrå exploration case, and the post-drill Balderbrå appraisal case (Central segment only).

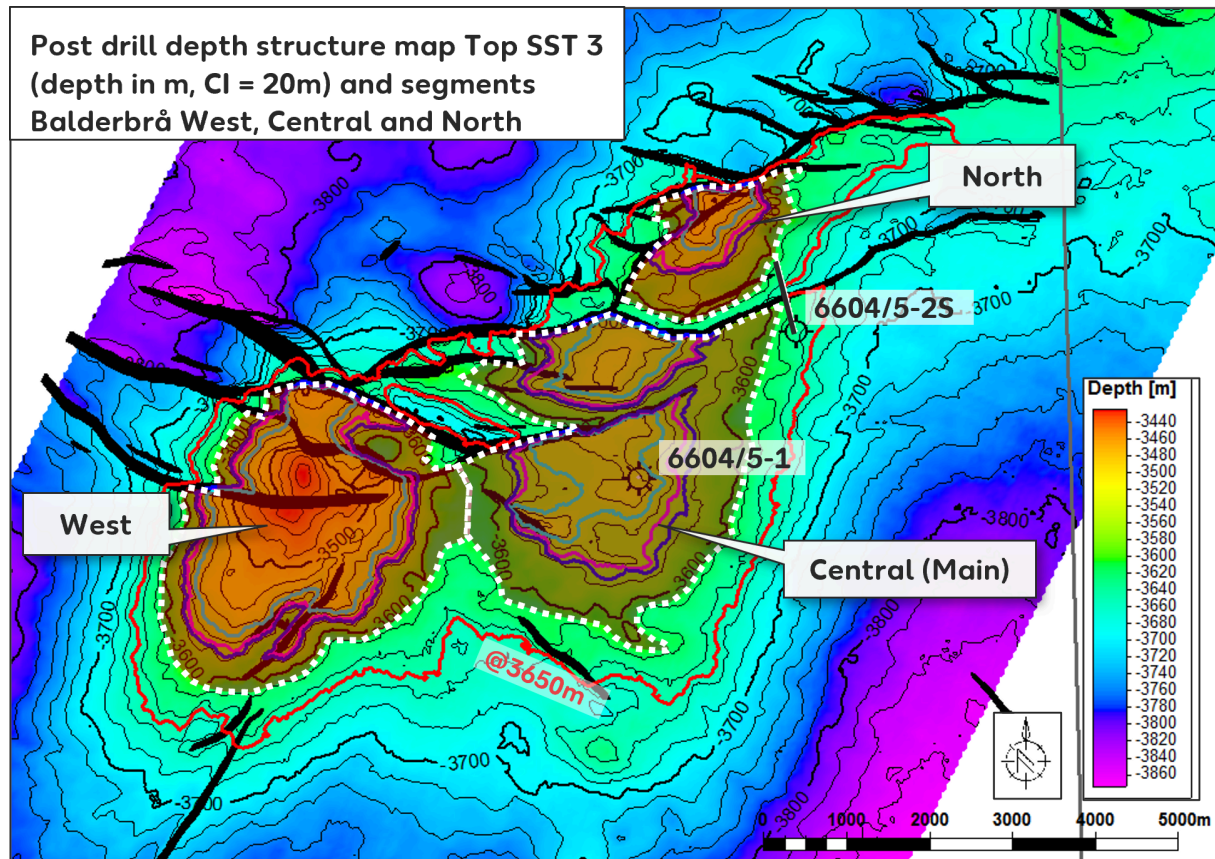


Fig. 4.21 Post-drill depth structure map Top Springar Fm sandstone 3

Table 4.3 Contingent resources for the pre-drill Balderbrå exploration well, post-drill Balderbrå exploration well and post-drill Balderbrå appraisal well

Reservoir	Pre-drill		Post-drill exploration well		Post-drill appraisal well central segment	
	Mean InPlace	Mean Rec	Mean InPlace	Mean Rec.	Mean Inplace	Mean Rec.
Sandstone 1						
Gas (GSm ³)	-	-	2.25	1.22	3.29	1.78
Condensate (MMSm ³)	-	-	0.26	0.112	0.38	0.17
Sandstone 2						
Gas (GSm ³)	41.7	20.8	17.3	8.36	2.99	1.44
Condensate (MMSm ³)	1.23	0.5	1.99	0.77	0.35	0.13
Sandstone 3						
Gas (GSm ³)	9.33	4.96	22.6	8.74	0.97	0.38
Condensate (MMSm ³)	0.29	0.12	2.61	0.81	0.12	0.03
Combined consolidated						
Gas (GSm ³)	48.4	24.2	42.4	18.5	7.26	3.61
Condensate (MMSm ³)	1.42	0.58	4.87	1.69	0.83	0.33

Balderbrå Static–Dynamic Model Volumetric Update (Post-Appraisal Well)

An updated static–dynamic reservoir model has been developed to re-assess in-place volumes and recovery factors following the drilling of the Balderbrå 6604/5-2 S appraisal well. The updated geocellular model was built to evaluate whether the remaining Balderbrå reserves are sufficient to support a subsea tie-back to the nearby Obelix Upflank discovery operated by Equinor and drilled in 2023.

The geomodel uses stair-stepped faults and unsmoothed horizons. The grid cell size is in average 100x100x50m in the three reservoir zones. The area of interest was subdivided into the following fault-bounded compartment (Fig. 4.22): Discovery; Central, Appraisal, South West, South, West Slice and North-West. Gas-water contacts were set as indicated by the fluid pressure analysis, with movable gas present only in Central and Discovery segments. These two segments are possibly connected with sand juxtaposition on the eastern flank, as their bounding fault offset decreases in this direction. However, because of the very shallow gas-water contact, their gas accumulations are hardly in communication and would require two wells or a multilateral well for their production (Fig. 4.23). The western segment is not expected to be hydrocarbon filled, it would require a separate well to verify a discovery. The western segment has been excluded from the discovery outline.

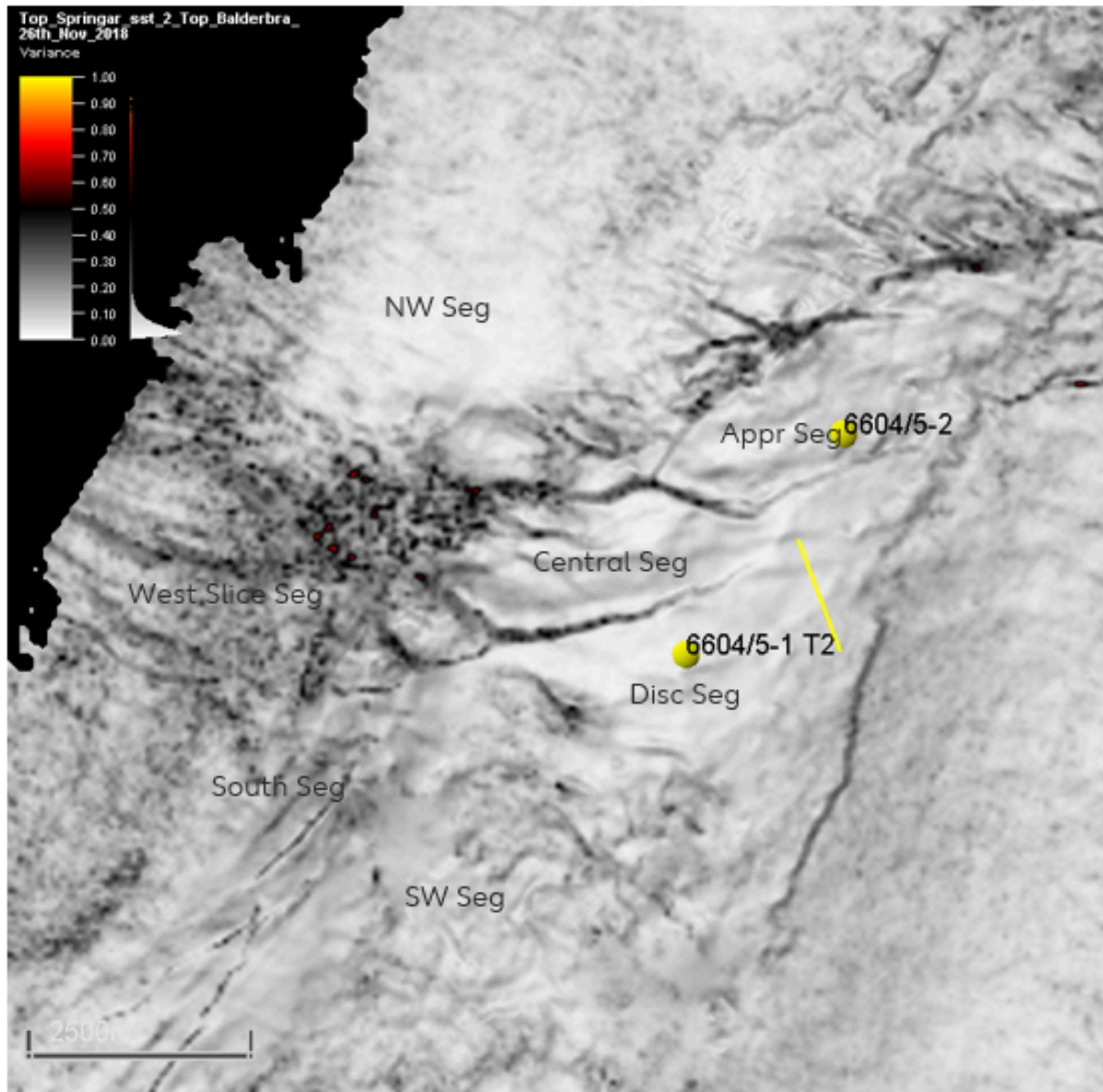


Fig. 4.22 Variance extraction at top Sandstone 2

Variance attribute highlights the fault-bounded segments of the Balderbrå Discovery

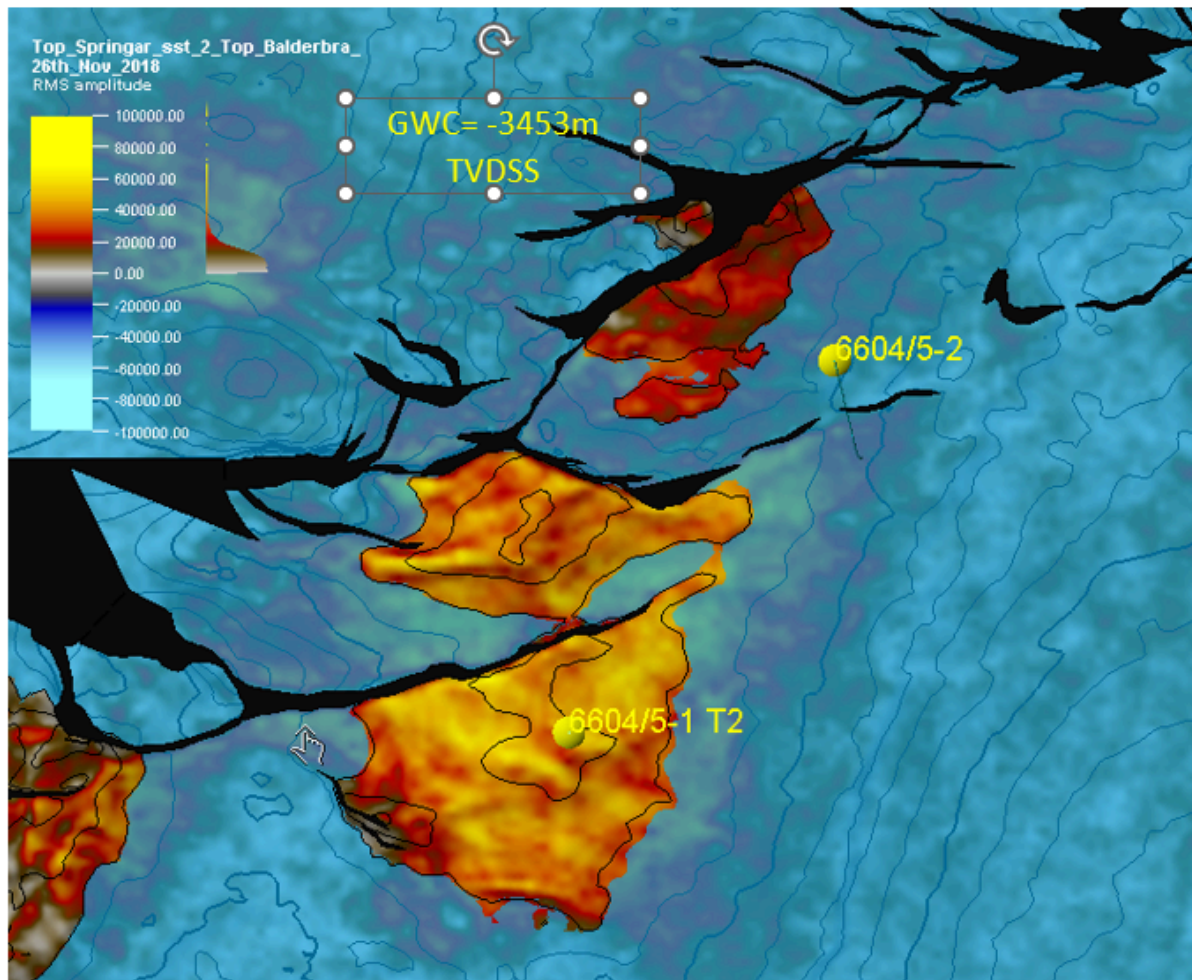


Fig. 4.23 Amplitude extraction at top Sandstone 2

The semi-transparent overlies simulates the GWC at -3453m TVDSS, relative to the Sandstone 2 unit. The relative gas accumulations in the Central and Discovery segments are hardly connected and extremely difficult to drain with a single well.

A new Porosity -Permeability regression function, extracted from the measured CCA plugs, was implemented. Properties (PHIT, PHIE, PERM) were distributed in various realizations using simple interpolation methods (Kriging and Moving average). (Fig. 4.24). Gas saturation was calculated using a saturation-height function based on MICP data (Fig. 4.24). A relatively optimistic realisation of the property distribution, but still realistic, was selected for the best technical estimate (BTE) case, with the intention of stress-testing the business case.

The total probabilistic (GeoX) **mean gas initially in place (GIIP)** is estimated at **4.47 GSm³**, with associated **condensate volumes of 0.52 MMSm³**. For the mean case, **recoverable volumes** are estimated at **1.93 GSm³ of gas and 0.11 MMSm³ of condensate**.

A dynamic model was developed using PVT model based on gas samples from the Springar 1 and 2, alongside SCAL properties derived from analogous reservoirs. After evaluating multiple well concepts, a single multilateral slanted well with branch control was identified as the most suitable solution for developing the two gas accumulations. The minimum production rate was set at 0.8 MSm³/d.

Balderbrå was connected to a simple network model that links to Obelix Upflank discovery via a 36 km pipe-in-pipe system, which then extends to Irpa and ultimately to Aasta Hansteen. Sensitivity analyses were conducted on network assumptions, as well as dynamic and static properties, resulting in uneconomic recoverable volumes.

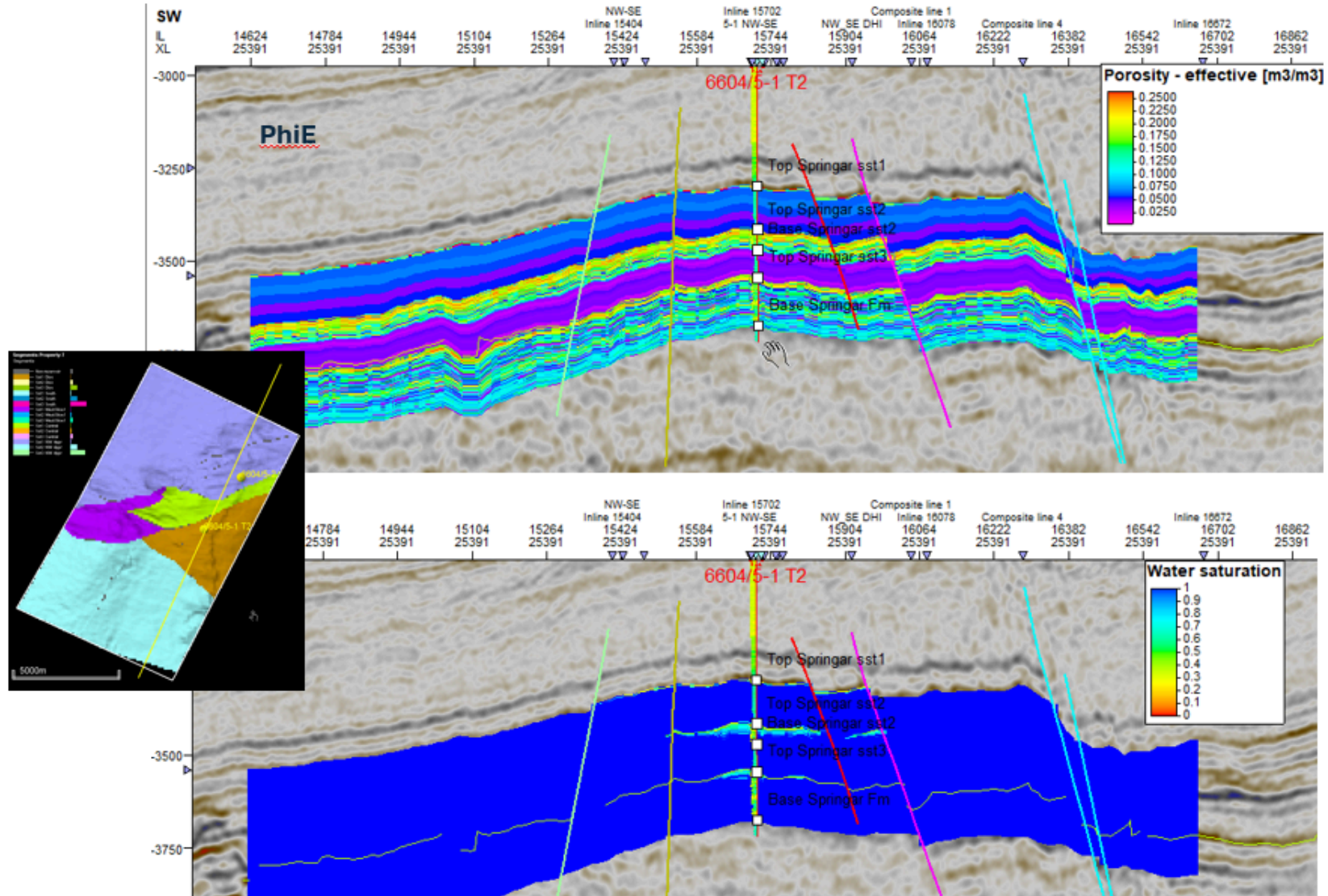


Fig. 4.24 Geomodel section

SW-NE sections of new Balderbrå geomodel passing through well 6604/5-1, which show porosity (PHIE) and water saturation (SW) distribution. The gas accumulations at Sandstone 2 and Sandstone 3 levels are quite small.

The total probabilistic (GeoX) **recoverable volumes expressed in oil-equivalent terms** are estimated at **1.45 MMSm³ oe (P90)**, **2.02 MMSm³ oe (P50)**, and **2.70 MMSm³ oe (P10)**.

The final SODIR discovery data for the Balderbrå Central segment Springar Sandstone 1, 2, 3 and consolidated case are presented below in Table 4.4, Table 4.5, Table 4.6 and Table 4.7.

The final SODIR prospect data for the Balderbrå West segment Springar Sandstone 1, 2, 3 and consolidated case are presented below in Table 4.8, Table 4.9, Table 4.10 and Table 4.11.

Table 4.4 Balderbrå Central Springar Sandstone 1 Discovery Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå Central , s	Discovery/Prosp/Lead	Discovery	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigrød Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁶ Sm ³] (>0.00)					0.02	0.04	0.06	0.11
	Gas [10 ⁹ Sm ³] (>0.00)	0.36	0.52	0.53	0.74				
Recoverable resources	Oil [10 ⁶ Sm ³] (>0.00)					0.01	0.01	0.02	0.03
	Gas [10 ⁹ Sm ³] (>0.00)	0.22	0.32	0.33	0.46				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastric	Source Rock, litho secondary	Kvitnos, Nise, Spring	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	1.00	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	1.00	Trap (P2) (0.00-1.00)	1.00	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	1.00		
Parametres:									
	Low (P90)	Base	High (P10)	Comments					
Depth to top of prospect [m MSL] (> 0)			3275						
Area of closure [km ²] (> 0.0)	4.5	6.1	7.7						
Reservoir thickness [m] (> 0)	6	6	6						
HC column in prospect [m] (> 0)	52	56	61						
Gross rock vol. [10 ⁹ m ³] (> 0.000)	0.025	0.034	0.044						
Net / Gross [fraction] (0.00-1.00)	0.48	0.55	0.62						
Porosity [fraction] (0.00-1.00)	0.18	0.18	0.18						
Permeability [mD] (> 0.0)	1.0		10.0						
Water Saturation [fraction] (0.00-1.00)	0.30	0.40	0.51						
Bg [Rm3/Sm3] (< 1.00000)	0.0035	0.0037	0.0040						
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)	5328	8658	20243						
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.57	0.63	0.70						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.29	0.31	0.34						
For NPD use:									
Temperature, top res [°C] (>0)	110			Innrappr. av geolog-init:	NPD will insert value	Registrert - init:	Innrappr. av geolog-init:	NPD will insert value	Kart oppdatert
Pressure, top res [bar] (>0)	363			Dato:	NPD will insert value	Registrert Dato:	Dato:	NPD will insert value	Kart dato
Cut off criteria for N/G calculation	1. Phie:0,1	2. Vcl:0,5	3.					NPD will insert value	Kart nr

Table 4.5 Balderbrå Central Springar Sandstone 2 Discovery Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå Central , s	Discovery/Prosp/Lead	Discovery	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigrd Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁹ Sm ³] (>0.00)					0.14	0.27	0.35	0.58
	Gas [10 ⁹ Sm ³] (>0.00)	2.22	2.94	2.99	3.80				
Recoverable resources	Oil [10 ⁹ Sm ³] (>0.00)					0.03	0.06	0.08	0.14
	Gas [10 ⁹ Sm ³] (>0.00)	0.81	1.30	1.36	1.97				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastricht	Source Rock, litho secondary	Kvitnos, Nise, Springar	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	1.00	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	1.00	Trap (P2) (0.00-1.00)	1.00	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	1.00		
Parameters:		Low (P90)	Base	High (P10)	Comments				
Depth to top of prospect [m MSL] (> 0)			3390						
Area of closure [km ²] (> 0.0)	5.4		6.1	6.8					
Reservoir thickness [m] (> 0)	55		62	69					
HC column in prospect [m] (> 0)	59		64	65					
Gross rock vol. [10 ⁹ m ³] (> 0.000)	0.122		0.145	0.168					
Net / Gross [fraction] (0.00-1.00)	0.77		0.82	0.86					
Porosity [fraction] (0.00-1.00)	0.17		0.17	0.18					
Permeability [mD] (> 0.0)	1.0			10.0					
Water Saturation [fraction] (0.00-1.00)	0.25		0.45	0.56					
Bg [Rm3/Sm3] (< 1.00000)	0.0035		0.0037	0.0040					
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)	5328		8658	20243					
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.30		0.46	0.60					
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.15		0.23	0.30					
For NPD use:									
Temperature, top res [°C] (>0)	115				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert
Pressure, top res [bar] (>0)	374				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato
Cut off criteria for N/G calculation	1. Phie:0.1	2. Vci:0.5	3.					NPD will insert value	Kart nr

Table 4.6 Balderbrå Central Springar Sandstone 3 Discovery Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå Central , s	Discovery/Prosp/Lead	Discovery	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigrød Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁶ Sm ³] (>0.00)					0.04	0.07	0.11	0.20
	Gas [10 ⁹ Sm ³] (>0.00)	0.61	0.96	0.97	1.36				
Recoverable resources	Oil [10 ⁶ Sm ³] (>0.00)					0.01	0.01	0.01	0.03
	Gas [10 ⁹ Sm ³] (>0.00)	0.14	0.21	0.24	0.35				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastric	Source Rock, litho secondary	Kvitnos, Nise, Spring	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	1.00	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	1.00	Trap (P2) (0.00-1.00)	1.00	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	1.00		
Parameters:									
	Low (P90)	Base	High (P10)	Comments					
Depth to top of prospect [m MSL] (> 0)			3515						
Area of closure [km ²] (> 0.0)		3.2	4.1	5.0					
Reservoir thickness [m] (> 0)		129	131	133					
HC column in prospect [m] (> 0)		44	50	56					
Gross rock vol. [10 ⁹ m ³] (> 0.000)		0.056	0.086	0.107					
Net / Gross [fraction] (0.00-1.00)		0.56	0.61	0.66					
Porosity [fraction] (0.00-1.00)		0.13	0.14	0.15					
Permeability [mD] (> 0.0)		1.0		10.0					
Water Saturation [fraction] (0.00-1.00)		0.36	0.48	0.58					
Bg [Rm3/Sm3] (< 1.0000)		0.0035	0.0037	0.0040					
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)		5328	8658	20243					
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)		0.20	0.25	0.30					
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)		0.10	0.13	0.15					
For NPD use:									
Temperature, top res [°C] (>0)	120				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert
Pressure, top res [bar] (>0)	385				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato
Cut off criteria for N/G calculation	1. Phie:0,1	2. Vcl:0,5	3.					NPD will insert value	Kart nr

Table 4.7 Balderbrå Central Springar Consolidated Discovery Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå Central co	Discovery/Prosp/Lead	Discovery	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigråd Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁹ Sm ³] (>0.00)					0.30	0.46	0.52	0.77
	Gas [10 ⁹ Sm ³] (>0.00)	3.61	4.51	4.47	5.36				
Recoverable resources	Oil [10 ⁹ Sm ³] (>0.00)					0.06	0.11	0.09	0.18
	Gas [10 ⁹ Sm ³] (>0.00)	1.36	1.87	1.93	2.54				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turonian	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastrichtian	Source Rock, litho secondary	Kvitnos, Nise, Springar	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	1.00	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	1.00	Trap (P2) (0.00-1.00)	1.00	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	1.00		
Parameters:		Low (P90)	Base	High (P10)	Comments				
Depth to top of prospect [m MSL] (> 0)									
Area of closure [km ²] (> 0.0)									
Reservoir thickness [m] (> 0)									
HC column in prospect [m] (> 0)									
Gross rock vol. [10 ⁹ m ³] (> 0.000)									
Net / Gross [fraction] (0.00-1.00)									
Porosity [fraction] (0.00-1.00)									
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)									
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)									
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)									
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)									
For NPD use:									
Temperature, top res [°C] (>0)				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

Table 4.8 Balderbrå West Springar Sandstone 1 Prospect Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)										
Block	6604/5	Prospect name	Balderbrå West , sst	Discovery/Prop/Lead	Prospect	Prospect ID (or New!)	NPD will insert value	NPD approved (Y/N)		
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)						
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025	
This is case no.:	1 of 1	Structural element	Vigrd Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D	
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase					
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)	
In place resources	Oil [10 ⁶ Sm ³] (>0.00)					0.00	0.01	0.02	0.05	
	Gas [10 ⁹ Sm ³] (>0.00)	0.05	0.13	0.19	0.36					
Recoverable resources	Oil [10 ⁶ Sm ³] (>0.00)					0.00	0.00	0.01	0.02	
	Gas [10 ⁹ Sm ³] (>0.00)	0.02	0.07	0.10	0.20					
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene	
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastricht	Source Rock, litho secondary	Kvitnos, Nise, Springar	Seal, Litho	Springar Fm -Tang Fm	
Probability [fraction]										
Total (oil + gas + oil & gas case) (0.00-1.00)	0.16	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00			
Reservoir (P1) (0.00-1.00)	0.50	Trap (P2) (0.00-1.00)	0.80	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	0.40			
Parametres:		Low (P90)	Base	High (P10)	Comments					
Depth to top of prospect [m MSL] (> 0)			3240							
Area of closure [km ²] (> 0.0)	0.6		2.1	3.8						
Reservoir thickness [m] (> 0)	6		6	6						
HC column in prospect [m] (> 0)	39		65	91						
Gross rock vol. [10 ⁹ m ³] (> 0.000)	0.003		0.012	0.022						
Net / Gross [fraction] (0.00-1.00)	0.48		0.55	0.62						
Porosity [fraction] (0.00-1.00)	0.18		0.18	0.18						
Permeability [mD] (> 0.0)	1.0			10.0						
Water Saturation [fraction] (0.00-1.00)	0.30		0.40	0.51						
Bg [Rm ³ /Sm ³] (< 1.00000)	0.0035		0.0037	0.0040						
1/Bo [Sm ³ /Rm ³] (< 1.00)										
GOR, free gas [Sm ³ /Sm ³] (> 0)	5328		8658	20243						
GOR, oil [Sm ³ /Sm ³] (> 0)										
Recov. factor, oil main phase [fraction] (0.00-1.00)										
Recov. factor, gas ass. phase [fraction] (0.00-1.00)										
Recov. factor, gas main phase [fraction] (0.00-1.00)	0.40		0.54	0.66						
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)	0.32		0.43	0.53						
Temperature, top res [°C] (>0)	110				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)	363				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1. Phie:0.1	2. Vcl:0.5	3.						Kart nr	NPD will insert value

Table 4.9 Balderbrå West Springar Sandstone 2 Prospect Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå West , sst	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigrid Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁹ Sm ³] (>0.00)					0.02	0.01	0.19	0.45
	Gas [10 ⁹ Sm ³] (>0.00)	0.18	0.05	1.62	3.71				
Recoverable resources	Oil [10 ⁶ Sm ³] (>0.00)					0.01	0.00	0.07	0.17
	Gas [10 ⁹ Sm ³] (>0.00)	0.08	0.02	0.78	1.80				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turonian	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastrichtian	Source Rock, litho secondary	Kvitnos, Nise, Springar	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.16	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	0.50	Trap (P2) (0.00-1.00)	0.80	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	0.40		
Parametres:		Low (P90)	Base	High (P10)	Comments				
Depth to top of prospect [m MSL] (> 0)			3320						
Area of closure [km ²] (> 0.0)		0.6	2.5	4.9					
Reservoir thickness [m] (> 0)		55	62	69					
HC column in prospect [m] (> 0)		49	88	129					
Gross rock vol. [10 ⁹ m ³] (> 0.000)		0.009	0.079	0.180					
Net / Gross [fraction] (0.00-1.00)		0.77	0.82	0.86					
Porosity [fraction] (0.00-1.00)		0.17	0.17	0.18					
Permeability [mD] (> 0.0)		1.0		10.0					
Water Saturation [fraction] (0.00-1.00)		0.35	0.45	0.56					
Bg [Rm3/Sm3] (< 1.0000)		0.0035	0.0037	0.0040					
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)		5328	8658	20243					
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)		0.33	0.48	0.62					
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)		0.26	0.39	0.58					
Temperature, top res [°C] (>0)	115				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert
Pressure, top res [bar] (>0)	374				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato
Cut off criteria for N/G calculation	1. Phie:0,1	2. Vcl:0,5	3.					Kart nr	NPD will insert value

Table 4.10 Balderbrå West Springar Sandstone 3 Prospect Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå West , sst	Discovery/Prop/Lead	Prospect	Prospect ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norge	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigrid Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁹ Sm ³] (>0.00)					0.02	0.02	0.18	0.43
	Gas [10 ⁹ Sm ³] (>0.00)	0.19	0.17	1.56	3.59				
Recoverable resources	Oil [10 ⁹ Sm ³] (>0.00)					0.00	0.00	0.06	0.13
	Gas [10 ⁹ Sm ³] (>0.00)	0.06	0.05	0.60	1.40				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Maastrichtian - Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastricht	Source Rock, litho secondary	Kvitnos, Nise, Springar	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.16	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)	0.50	Trap (P2) (0.00-1.00)	0.80	Charge (P3) (0.00-1.00)	1.00	Retention (P4) (0.00-1.00)	0.40		
Parametres:		Low (P90)	Base	High (P10)	<i>Comments</i>				
Depth to top of prospect [m MSL] (> 0)			3425						
Area of closure [km ²] (> 0.0)		0.8	3.1	6.0					
Reservoir thickness [m] (> 0)		129	131	133					
HC column in prospect [m] (> 0)		53	99	145					
Gross rock vol. [10 ⁹ m ³] (> 0.000)		0.016	0.131	0.304					
Net / Gross [fraction] (0.00-1.00)		0.56	0.61	0.66					
Porosity [fraction] (0.00-1.00)		0.13	0.14	0.15					
Permeability [mD] (> 0.0)		1.0		10.0					
Water Saturation [fraction] (0.00-1.00)		0.37	0.48	0.58					
Bg [Rm3/Sm3] (< 1.0000)		0.0035	0.0037	0.0040					
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)		5328	8658	20243					
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)		0.25	0.39	0.50					
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)		0.20	0.31	0.40					
Temperature, top res [°C] (>0)	120				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert
Pressure, top res [bar] (>0)	385				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato
Cut off criteria for N/G calculation	1. Phie:0.1	2. Vcl:0.5	3.					NPD will insert value	Kart nr

Table 4.11 Balderbrå West Springar Consolidated Prospect Summary (SODIR Table 5)

Table 5: Prospect data (Enclose map)									
Block	6604/5	Prospect name	Balderbrå West cons	Discovery/Prosp/Lead	Prospect	Prosp ID (or New!)	NPD will insert value	NPD approved (Y/N)	
Play name	NPD will insert value	New Play (Y/N)		Outside play (Y/N)					
Oil, Gas or O&G case:	Gas	Reported by company	Harbour Energy Norg	Reference document				Assessment year	2025
This is case no.:	1 of 1	Structural element	Vigråd Syncline	Type of trap	Structural 4 way	Water depth [m MSL] (>0)	1219	Seismic database (2D/3D)	3D
Resources IN PLACE and RECOVERABLE		Main phase			Associated phase				
Volumes, this case		Low (P90)	Base, Mode	Base, Mean	High (P10)	Low (P90)	Base, Mode	Base, Mean	High (P10)
In place resources	Oil [10 ⁹ Sm ³] (>0.00)					0.01	0.01	0.15	0.41
	Gas [10 ⁹ Sm ³] (>0.00)	0.09	0.12	1.30	3.42				
Recoverable resources	Oil [10 ⁹ Sm ³] (>0.00)					0.00	0.00	0.05	0.14
	Gas [10 ⁹ Sm ³] (>0.00)	0.04	0.06	0.57	1.49				
Reservoir Chrono (from)	Maastrichtian	Reservoir litho (from)	Springar Fm. Sst	Source Rock, chrono primary	Cenomanian-Turon	Source Rock, litho primary	Lange Fm	Seal, Chrono	Maastrichtian - Paleocene
Reservoir Chrono (to)	Campanian	Reservoir litho (to)	Springar Fm. Sst	Source Rock, chrono secondary	Coniacian-Maastricht	Source Rock, litho secondary	Kvitnos, Nise, Spring	Seal, Litho	Springar Fm and Tang Fm
Probability [fraction]									
Total (oil + gas + oil & gas case) (0.00-1.00)	0.41	Oil case (0.00-1.00)	0.00	Gas case (0.00-1.00)	1.00	Oil & Gas case (0.00-1.00)	0.00		
Reservoir (P1) (0.00-1.00)		Trap (P2) (0.00-1.00)		Charge (P3) (0.00-1.00)		Retention (P4) (0.00-1.00)			
Parametres:		Low (P90)	Base	High (P10)	Comments				
Depth to top of prospect [m MSL] (> 0)									
Area of closure [km ²] (> 0.0)									
Reservoir thickness [m] (> 0)									
HC column in prospect [m] (> 0)									
Gross rock vol. [10 ⁹ m ³] (> 0.000)									
Net / Gross [fraction] (0.00-1.00)									
Porosity [fraction] (0.00-1.00)									
Permeability [mD] (> 0.0)									
Water Saturation [fraction] (0.00-1.00)									
Bg [Rm3/Sm3] (< 1.0000)									
1/Bo [Sm3/Rm3] (< 1.00)									
GOR, free gas [Sm ³ /Sm ³] (> 0)									
GOR, oil [Sm ³ /Sm ³] (> 0)									
Recov. factor, oil main phase [fraction] (0.00-1.00)									
Recov. factor, gas ass. phase [fraction] (0.00-1.00)									
Recov. factor, gas main phase [fraction] (0.00-1.00)									
Recov. factor, liquid ass. phase [fraction] (0.00-1.00)									
For NPD use:									
Temperature, top res [°C] (>0)				Innrapp. av geolog-init:	NPD will insert value	Registrert - init:	NPD will insert value	Kart oppdatert	NPD will insert value
Pressure, top res [bar] (>0)				Dato:	NPD will insert value	Registrert Dato:	NPD will insert value	Kart dato	NPD will insert value
Cut off criteria for N/G calculation	1.	2.	3.					Kart nr	NPD will insert value

5 Technical assessment

The Balderbrå discovery could, in principle, be developed via a gas tie-back to Equinor’s Obelix Upflank discovery, with onward transport to Irpa and production through Aasta Hansteen. The evaluated development concepts comprise one or two gas producers connected by a 36 km MEG pipeline to Obelix Upflank (Fig. 5.1). However, both development options are currently uneconomic.

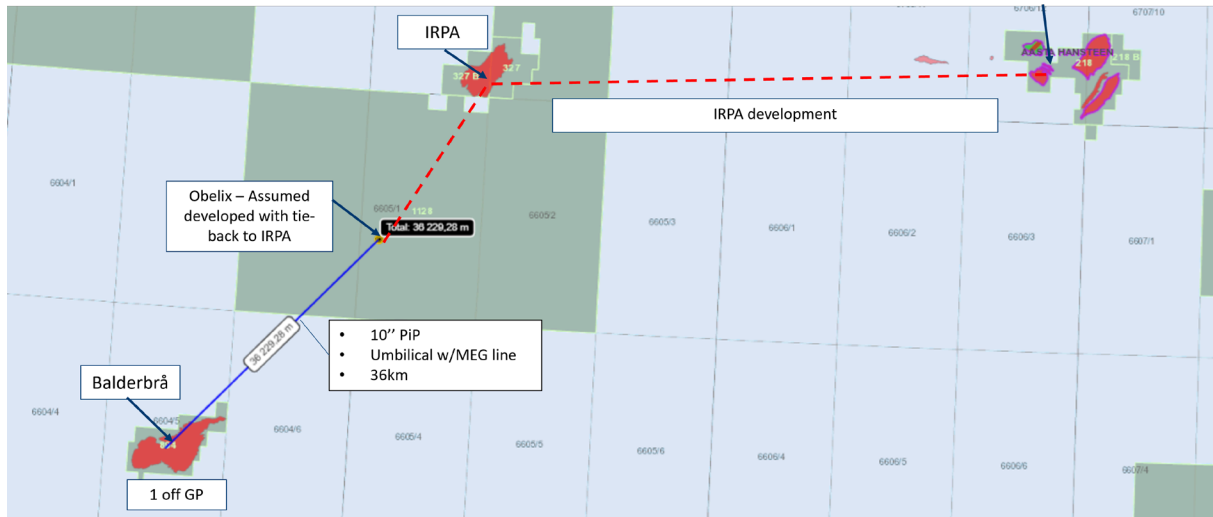


Fig. 5.1 Balderbrå development with tie-back to Obelix

The figure is showing the baldebrå development concept with one gas producer and a tie-back to the Obelix Upflank discovery

6 Conclusion

Completion of the static and dynamic modelling for the Balderbrå discovery demonstrates that the volumes are uncommercial under development concepts with either one or two vertical gas producers. The estimated recoverable volumes of 1.45–2.65 MMSm³ are insufficient to generate a positive NPV and do not justify a 36 km standalone tie-in to the Obelix Upflank discovery.

Based on these results, the licence partnership has unanimously decided to surrender the licence due to the uncommercial volumes identified.