PL1100/B/C
Surrender Report

JAPEX Source ENERGY Harbour Energy OMV

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1 Key Licence History

Summary

Production Licence PL1100/B/C is located in the Norwegian North Sea, West of the Oseberg and Tune fields (Figure 1.1). PL1100 was awarded on February 19th, 2021, as part of the process Awards in Predefined Areas (APA) 2020. Subsequent extensions, PL1100 B and PL1100 C, were granted under APA 2021 and APA 2022, and awarded March 11th, 2022, and February 17th, 2023, respectively.

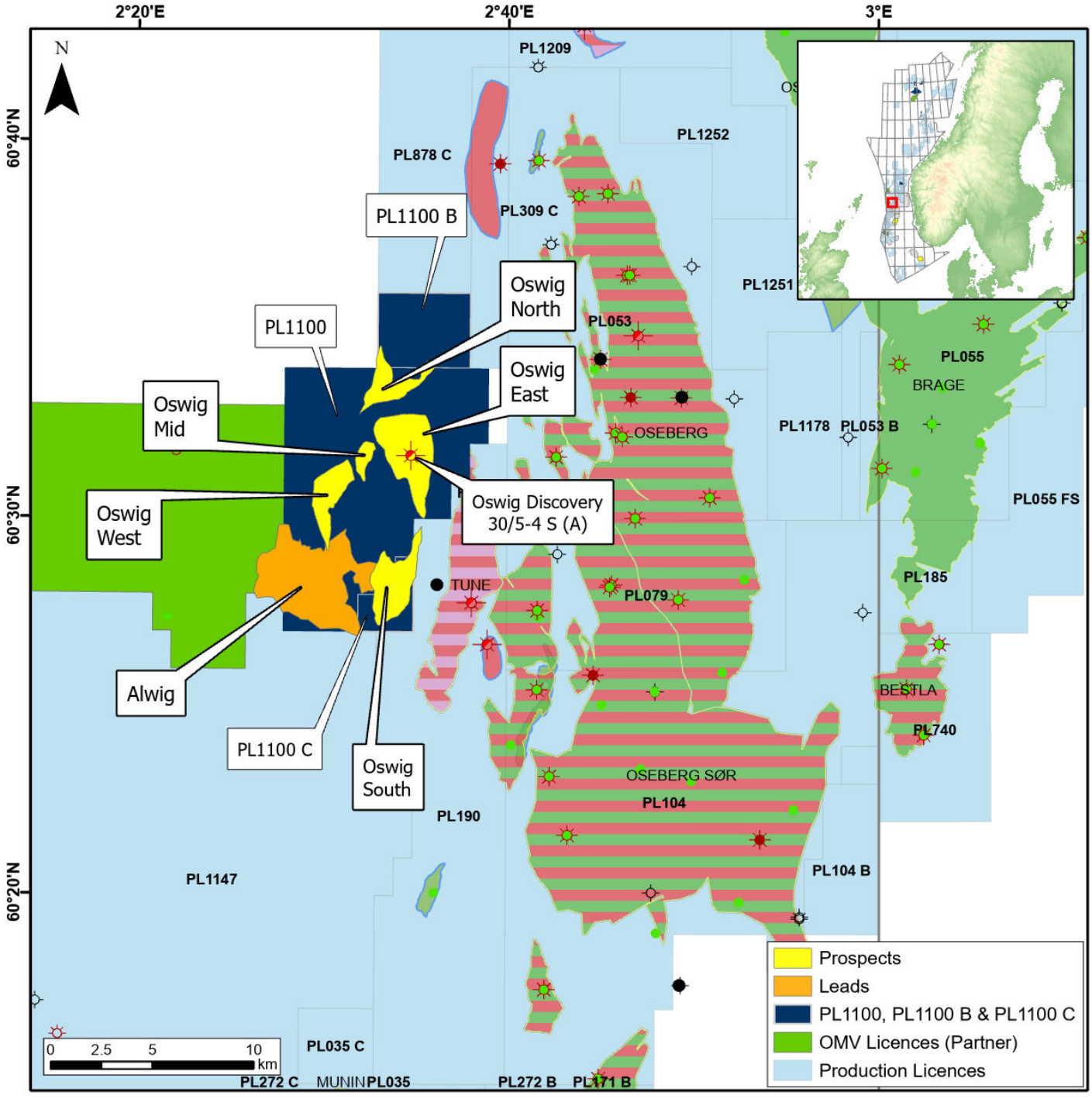


Figure 1.1 PL1100/B/C overview map

The licence active status was valid as follows:

- PL1100: until February 19th, 2025
- PL1100 B: until March 10th, 2025
- PL1100 C: until February 06th, 2025

The current partnership and interests are as follows:

- OMV Norge AS (40%, Operator)
- Harbour Energy Norge AS (20%)
- Source Energy AS (20%)
- Japex Norge AS (20%).

The licence work program for the initial period is as follows:

- Phase 1: Within one year by February 19th, 2022: Undertake studies of Geology and Geophysics leading to make a drill or drop decision (DoD).
- Phase 2: Within three years by February 19th, 2024: Drill exploration well and take decision to concretize (BoK) or drop.
- Phase 3: Within five years by February 19th, 2026: Perform conceptual studies and decide on continuation (BoV) or drop.
- Phase 4: Within six year by February 19th, 2027: Prepare development plan, decide to submit PDO or drop.

The Joint Venture (JV) submitted the applications for the licence extensions with the objective of securing full coverage of the Oswig North and Oswig South prospects, originally identified during APA2020 and APA2021, respectively. Furthermore, it was anticipated that the drilling of well 30/5-4 S in Q3 2022, would help de-risk additional segments of the Oswig structure within the extended area.

In 2024, a 12-months extension to the BoK deadline was requested by the JV and granted by the authorities, resulting in a revised BoK deadline of 19th February 2025, a BoV deadline on 19th February 2027, and PDO on 19th February 2028.

The exploration well 30/5-4 S and the sidetrack 30/5-4 A were spudded on August 1st, 2022, and drilled with the jack-up rig Maersk Intrepid in the PL1100. The wellbores confirmed the presence of a thick reservoir sandstone in the middle Jurassic Tarbert Formation with a hydrocarbon column of 100 meters approximately. On the contrary, a thick heterogenous sequence of good quality sands interbedded with coals layers, shales and limestones from the Ness Formation was concluded to be dry with shows. Core acquisition was carried out in three sections through the Tarbert Formation. Fluid samples were taken in both, Tarbert (gas condensate) and Ness Formation (water). The final TD of the main wellbore was at 5068 m MD RKB in the Middle Jurassic Ness Formation whereas the sidetrack had its TD at 5001 m MD RKB within the Tarbert Formation. An extensive data acquisition program including coring, comprehensive wireline logging, well test and sampling was carried out. The original wellbore was plugged on September 23rd, 2022 whereas the sidetrack well was permanently plugged and abandoned on November 16th, 2022.

The DoD deadline for PL 1100 B and 1100 C coincided with the BoK milestone for PL1100 in Q1 2025. At that time, the JV decided not to proceed with further development in the area. In consequence, and prior the DoD of 1100 B and 1100 C, a decision to relinquish the production licences was made.

Work Commitment

The work program for the Phase 1 and Phase 2 of the initial period was fulfilled by conducting the following:

- Regional and Oswig-specific studies of geology and geophysics (G&G) to improve the understanding of the distribution of the Brent Group.
- Preliminary economic assessment and early appraisal and development studies
- Drilling of the Oswig wellbores 30/5-4 S and the 30/5-4 A, followed by comprehensive post-well studies

Meetings held

Since award of licence PL 1100, 1100 B and 1100 C, a number of meetings took place. The complete list is as the following:

- 2021-02-16 – MC/EC Meeting
- 2021-04-29 – EC Meeting
- 2021-06-22 – EC/MC Meeting
- 2021-10-05 – EC Meeting
- 2021-11-16 – MC Meeting
- 2021-11-22 – MC Meeting
- 2022-03-10 – EC/MC Meeting
- 2022-03-23 – EC/MC Meeting
- 2022-05-31 – EC/MC Meeting
- 2022-09-19 – EC Meeting
- 2022-09-21– EC/MC Meeting
- 2022-09-28 – EC Meeting
- 2022-10-07 – EC Meeting
- 2022-11-22 – EC/MC Meeting
- 2023-01-11 – EC Meeting
- 2023-02-02 – EC/MC Meeting
- 2023-03-30 – EC/MC Meeting
- 2023-06-2 1– EC/MC Meeting
- 2023-10-05 – EC/MC Meeting
- 2023-12-07 – EC/MC Meeting
- 2024-02-12 – EC/MC Meeting
- 2024-05-08 – EC/MC Meeting
- 2024-06-07 – EC/MC Meeting
- 2024-10-31 – EC/MC Meeting
- 2024-12-04 – EC/MC Meeting
- 2025-01-30 – EC/MC Meeting

Reasons for licence surrender

The exploration well 30/5-4 S and sidetrack 30/5-4 A drilled a down-thrown tilted fault block structure (Oswig East) and proved hydrocarbons within wave-dominated deltaic deposits from the Tarbert Formation. A tight gas-condensate discovery was made in a high-pressure high-temperature (HPHT) reservoir with permeabilities in the range of 0.1 mD. The deep burial location of the Oswig discovery was strongly linked to the poor reservoir quality. The post well reservoir characterization studies concluded that the reduced permeability in the reservoir was controlled by diagenetic processes causing extensive quartz cementation and illite precipitation. The recovery factor and estimated recoverable volumes in the Oswig prospects were defined as non-commercial. Therefore, the JV decided to surrender the PL 1100, 1100 B, and 1100 C, as the project's economic potential did not meet the required thresholds for further development.

2 Database

Seismic data

OMV has access to all public data in the area of interest defined for this licence application. All available data from Diskos has been used in the evaluation, supplemented with data from the SODIR fact sheets.

OMV's seismic database contains all full offset publicly available 3D and 2D data. In addition to this, OMV has purchased the CGG17M01 (PSTM) and CGG18M01 (PDSM) 3D seismic surveys, the most recent 3D surveys available for the area. As part of the former PL920 work program, the CGG17M01 was reprocessed, and the resultant survey is called CGG17M01OMV18. Furthermore, high-resolution reprocessing of the CGG18M01 data was done for shallow hazard analysis at the Oswig East well location, undertaken as part of the PL 1100 work program, and the resulting survey is called CGG18M01OMVR22. The prospects in this application are interpreted on the CGG17M01OMV18 and CGG18M01 3D seismic surveys.

The seismic database is listed in Table 2.1 and displayed in Figure 2.1.

Table 2.1 Seismic database

Survey Name	2D/3D	Year	Version	Quality	Comments
CGG17M01	3D	2017	Final migration/Angle stacks/Gathers	Moderate to good	Input data for OMV PSDM project
CGG17M01OMVR18	3D	2018	Final migration/Angle stacks/Gathers	Moderate to good	Main survey used for the Oswig prospect evaluation
CGG18M01	3D	2018	Final migration/Angle stacks/Gathers	Moderate to good	Large broadband 3D survey covering North Viking Graben
CGG18M01OMVR22	3D	2022	Final migration stacks/Gathers	Good	Imaging for shallow hazard analysis

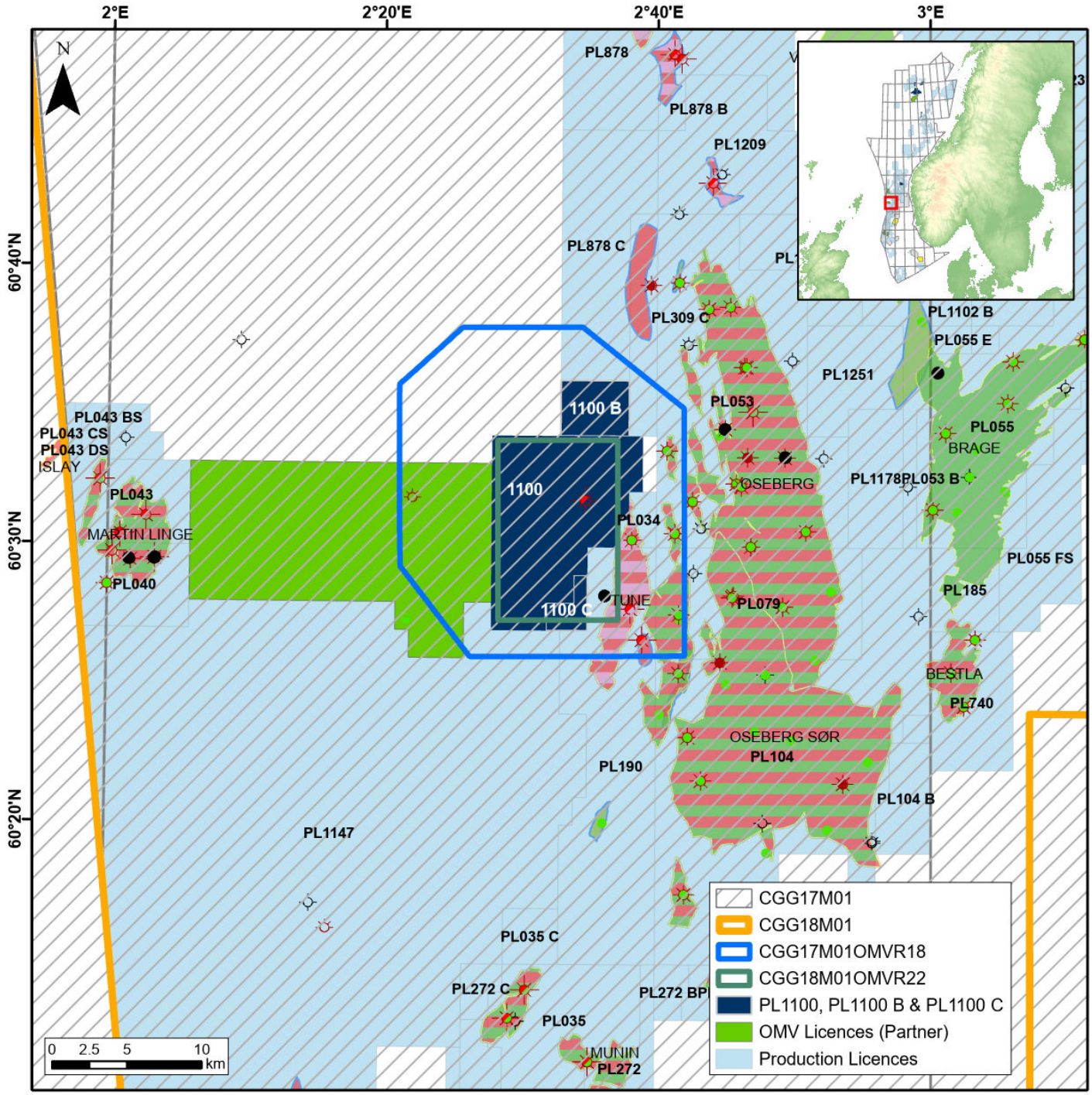


Figure 2.1 Seismic database

Well data

The well database for PL1100/B/C is illustrated in Figure 2.2 and listed in Table 2.2. All wells listed were used to tie the regional and prospect-level interpretations. The wellbore 30/5-4 S was key for the evaluation of Oswig East-South.

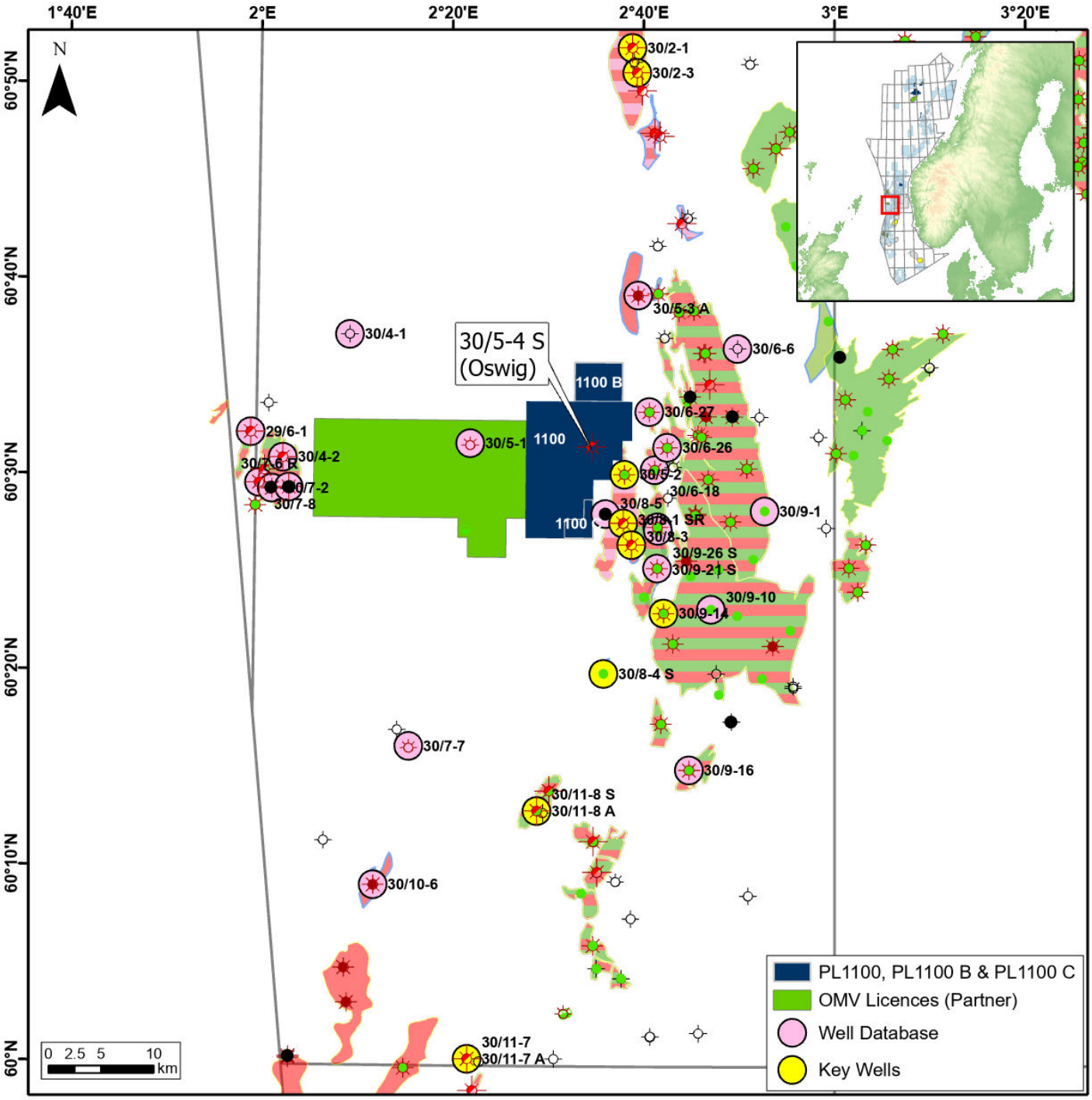


Figure 2.2 Well database

Table 2.2 Well database

Key wells are highlighted in yellow. Oswig disvovery well highlighted in red.

Well	Completion Year	Operator	Informal Name	Target (Pre Drill)	Target (Post Drill)	Well Results	TD formation	TD (MD) [m]	OMV in-house Petrophysics	OMV Access	Comments
29/6-1	1982	BP Norway	Martin Linge	Brent Gp	Brent Gp	Gas/condensate	Lunde Fm	4832	No	Released > 20 Years	Used in regional evaluation
30/2-1	1982	Den norske stats oljeselskap a.s	Huldra	Middle Jurassic age sandstones. Paleocene and Late/Early Triassic	Brent Gp	Gas/condensate	Statfjord Gp	4243	Yes	Released > 20 Years	Used in regional evaluation, key well in pressure study
30/2-3	1992	Den norske stats oljeselskap a.s	Huldra	Brent Gp	Brent Gp	Gas/Condensate	Eiriksson Fm	4325	No	Released > 20 Years	Used in regional evaluation, key well in pressure study
30/4-1	1979	BP Norway		Brent Gp , Paleogene sands, Late Jurassic sands	Brent Gp , Paleogene sands	Dry	Drake Fm	5454	Yes	Released > 20 Years	Used in regional evaluation
A1	1980	BP Norway	Martin Linge	Brent Gp, Paleocene and Eocene sands, Statfjord Fm	Brent Gp	Gas/Condensate	Hegre Gp	4775	Yes	Released > 20 Years	Used in regional evaluation, depositional model, pressure study
30/5-1	1972	A/S Norske Shell		Paleocene and Early Cretaceous sand or carbonate reservoirs. Late Jurassic Chalk.	Paleocene sands	Dry w/ gas shows	Åsgard Fm	4124	No	Released > 20 Years	Used in regional evaluation, seismic to well tie .
30/5-2	1996	Norsk Hydro	Tune	Tarbert Fm	Tarbert Fm	Oil/Gas	Drake Fm	4076	Yes	Released > 20 Years	Key well for Oswig Prospect Evaluation.
30/5-4S	Ongoing	OMV (Norge) AS	Oswig East	Tarbert Fm. (Ness Fm,)							Ongoing Oswig Exploration Well. First well in PL1100
30/5-3A	2009	StatoilHydro Petroleum	Corvus	Cretaceous sands	Draupne Fm	Gas	Intra Draupne Fm sst.	4746	No	Released > 2 Years	Used in regional evaluation
30/6-18	1985	Norsk Hydro	Oseberg (Kappa)	Statfjord Fm	Statfjord Fm	Oil/Gas	Hegre Gp	3690	No	Released > 20 Years	Used in regional evaluation
30/6-26	2001	Norsk Hydro	Oseberg	Statfjord Fm	Statfjord Fm	Oil/Gas	Statfjord Gp	2865	No	Released > 2 Years	Used in regional evaluation
30/6-27	2001	Norsk Hydro	Oseberg	Statfjord Fm	Statfjord Fm	Oil/Gas	Statfjord Gp	3432	No	Released > 2 Years	Used in regional evaluation
30/6-6	1982	Den norske stats oljeselskap a.s	Oseberg	Brent Gp	Brent Gp	Dry	Cook Fm	3225	Yes	Released > 20 Years	Used in regional evaluation
30/7-2	1975	Norsk Hydro	Martin Linge	Eocene and Paleocene	Eocene and Paleocene	Oil/Gas	Jorsalfare Fm	2591	No	Released > 20 Years	Used in regional evaluation
30/7-6R	1978	Nors Hydro	Martin Linge	Early and Middle Jurassic sandstones	Early and Middle Jurassic sandstones	Gas/Condensate	Drake Fm	4115	No	Released > 20 Years	Used in regional evaluation
30/7-7	1979	Norsk Hydro		Late Jurassic, Brent Gp, Statfjord Fm	Cook Fm and Statfjord Fm	Gas Shows	Statfjord Fm	5127	Yes	Released > 20 Years	Used in regional evaluation
30/7-8	1981	Norsk Hydro	Martin Linge	Brent Gp, Cook Fm, Statfjord Fm	Brent Gp	Gas/Condensate	Hegre Gp	4287	Yes	Released > 20 Years	Used in regional evaluation
30/8-1S (R)	1996	Norsk Hydro	Tune	Brent Gp, Statfjord Fm	Tarbert Fm, Ness Fm, Statfjord Fm	Gas/Condensate	Statfjord Gp	5149	Yes	Released > 20 Years	Key Well for Oswig Prospect Evaluation
30/8-3	1998	Norsk Hydro		Tarbert Fm, Intra Draupne Fm sst	Tarbert Fm	Gas/Condensate	Drake Fm	3720	Yes	Released > 20 Years	Used in regional evaluation, depositional model, pressure study
30/8-4S	2009	StatoilHydro Petroleum	Curran	Intra Draupne Fm sst, Tarbert Fm	Tarbert Fm	Oil	Ness Fm	4210	Yes	Released > 2 Years	Used in regional evaluation, depositional model
30/8-5	2018	Statoil Petroleum AS	Tune	Statfjord Fm	Statfjord Fm	Junk	Shetland Gp	3563	No	Traded	Tune Statfjord Fm appraisal well. Closest well to prospect, Junked well and important for well planning
30/9-1	1983	Norsk Hydro	Oseberg	Brent Gp	Brent Gp	Oil/Gas	Drake Fm	2895	No	Released > 20 Years	Used in regional evaluation
30/9-4S	1985	Norsk Hydro	Oseberg Sør	Brent Gp, Statfjord Gp	Brent Gp	Oil/Gas	Eirikson Fm	4303	Yes	Released > 20 Years	Used in regional evaluation, depositional model, fault seal study
30/9-10	1990	Norsk Hydro	Oseberg Sør	Tarbert Fm, Cook Fm, Statfjord Gp	Draupne Fm and Tarbert Fm	Oil	Statfjord Gp	3649	No	Released > 20 Years	Used in regional evaluation
30/9-14	1993	Norsk Hydro Produksjon	Oseberg Sør	Brent Gp, Intra Heather Fm sst	Tarbert Fm, Intra Heather Fm sst	Oil/Gas	Drake Fm	3680	Yes	Released > 20 Years	Used in regional evaluation, depositional model
30/9-16	1994	Norsk Hydro	Oseberg Sør	Brent Gp, cook Fm, Statfjord Gp	Intra Heather Fm sst., Tarbert Fm, Statfjord Gp	Oil/Gas	Eiriksson Fm	3550	No	Released > 20 Years	Used in regional evaluation
30/9-19	1998	Norsk Hydro	Oseberg	Tarbert Fm, Ness Fm	Tarbert Fm, Ness Fm	Oil/Gas	Drake Fm	3560	No	Released > 20 Years	Used in regional evaluation, seismic to well tie .
30/9-19A	1998	Norsk Hydro	Oseberg	Tarbert Fm	Tarbert Fm	Oil/Gas	Tarbert Fm	3775	No	Released > 20 Years	Used in regional evaluation
30/9-21S	2008	StatoilHydro Petroleum AS	Oseberg	Tarbert Fm	Tarbert Fm	Oil/Gas	Ness Fm	4090	Yes	Released > 2 Years	Used in regional evaluation
30/9-26S	2014	Statoil Petroleum AS	Oseberg	Tarbert Fm	Tarbert Fm	Oil appraisal	Tarbert Fm	4568	No	Released > 2 Years	Used in regional evaluation
30/10-6	1992	Elf Petroleum		Brent Gp	Tarbert Fm	Gas	Ness Fm	5248	Yes	Released > 20 Years	Used in regional evaluation, depositional model
30/11-7	2009	Statoil Hydro Petroleum	Fulla	Tarbert Fm	Ness Fm	Gas/Condensate	Drake Fm	4067	No	Released > 2 Years	Used in regional evaluation, depositional model
30/11-7a	2009	Statoil Hydro Petroleum	Fulla	Tarbert Fm	Tarbert Fm	Gas/Condensate	Ness Fm	4250	Yes	Released > 2 Years	Used in regional evaluation, depositional model
30/11-8S	2011	Statoil Petroleum AS	Krafla	Tarbert, Etive, Ness Fm, Sele Fm (Hermod sst)	Heather Fm, Tarbert Fm , Ness Fm	Oil/Gas/Condensate	Drake Fm	4043	No	Released > 2 Years	Used in regional evaluation
30/11-8A	2011	Statoil Petroleum AS	Krafla	Tarbert Fm, Ness Fm	Heather Fm and Tarbert Fm	Oil/Gas/Condensate	Drake Fm	4268	Yes	Released > 2 Years	Used in regional evaluation, depositional model

3 Review of Geological and Geophysical Studies

The risks and uncertainties around Oswig prospect have been recognized and considered from an early stage due to its geological complexity. Ever since the prospect was identified in PL920, the enhancement of seismic imaging has been a priority to solve uncertainties such as fault seal/leakage, where improved imaging on fault boundaries is required. Following the award of PL1100, within the JV, a series of regional and licence-specific G&G evaluations have been carried out. In addition, special studies have been conducted after drilling of the wellbores 30/5-4 S and the 30/5-4 A, aiming to better understand the Tarbert and Ness Formations reservoir properties and the lateral distribution and extent within the licence. Figure 3.1 and Figure 3.2 show the location of PL1100/B/C, along with the main structural elements, in both map view and structural cross section.

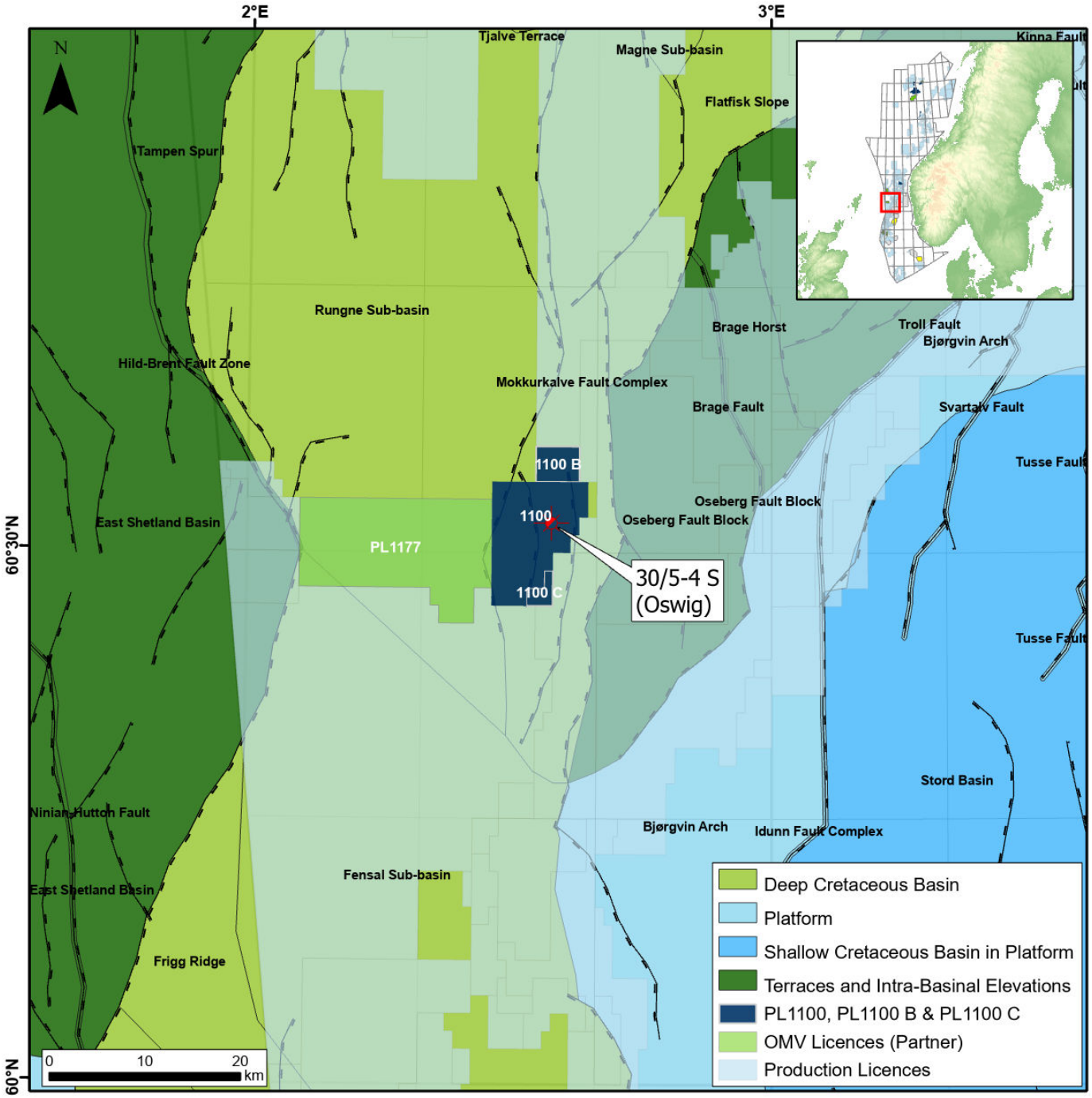


Figure 3.1 Location of PL1100/B/C and the North Viking Graben structural elements.

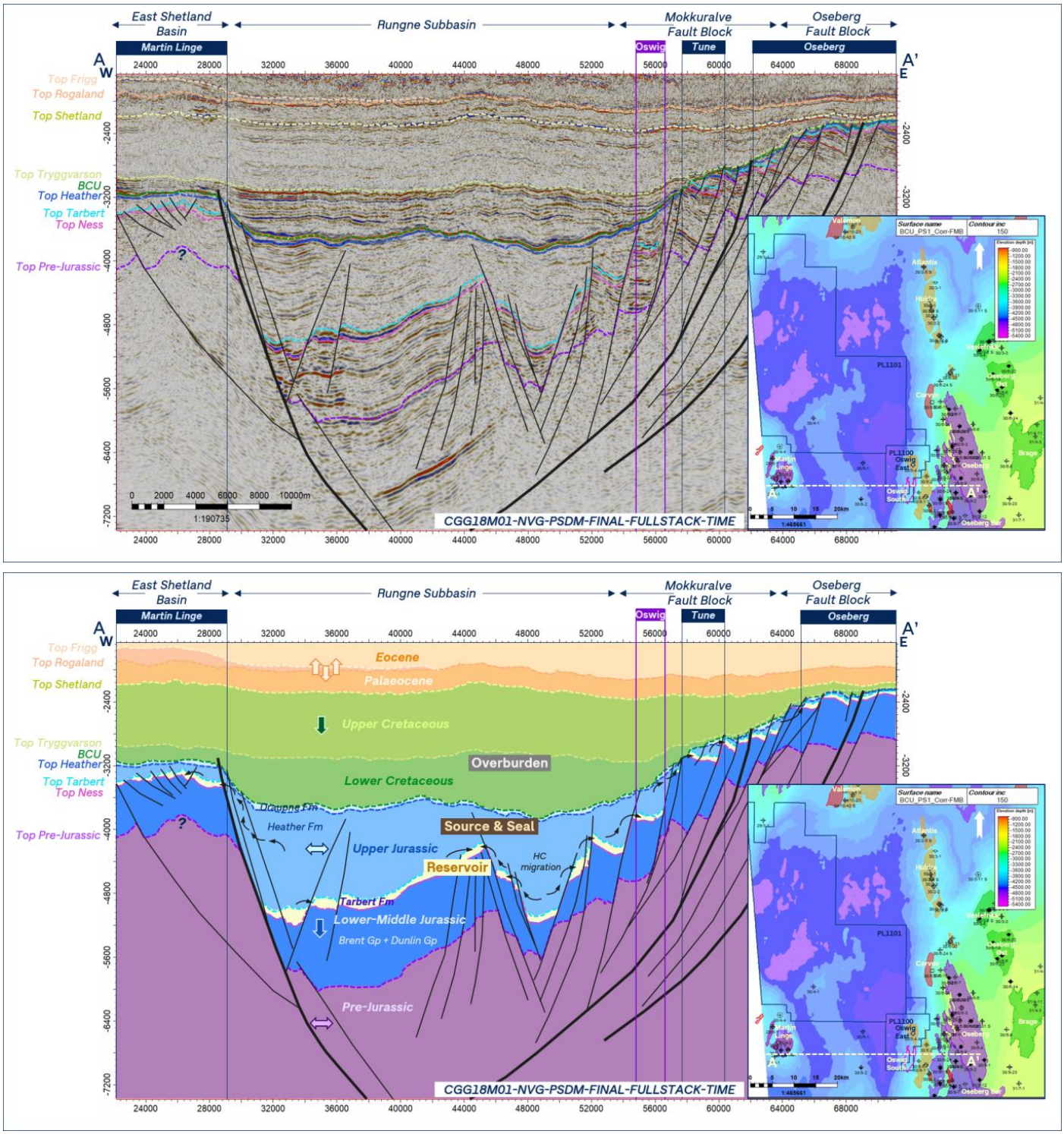


Figure 3.2 Regional geological section showing the Northern Viking Graben overview and the Oswig structures location.

Arbitrary section AA' from Martin Linge field (East Shetland Basin) towards Oseberg Fault block crossing though the northern tip of Oswig South prospect.

3.1 Pre-drill Studies

During operatorship of PL920 and following the award of PL1100 on February 19th, 2021, the JV had conducted a comprehensive series of analysis and special studies to mature the Oswig structure to a drillable prospect. Below is a summary of the pre-drill studies.

Regional Studies

Schlumberger Stavanger Research (SSR) Project

Recognizing the challenges related to exploring for material resources in a mature province whilst utilizing conventional workflows, OMV and Schlumberger Stavanger Research conducted (Q1-Q2 2020) a collaborative regional study of the North Viking Graben. The study delivered a highly detailed tectonic and stratigraphic framework, based upon well control and approximately 22 000 sq. km of the most recent broadband 3D seismic data available in the area, the CGG17M01/ CGG18M01 Horda Tampen surveys (Figure 2.1).

A combination of innovative machine learning and deterministic workflows were tested and applied to deliver a detailed 3D fault framework from the basement to Rogaland Group sediments. In addition, depth structure surfaces (from the top Triassic through to the upper Tertiary sediments), as well as a fault connectivity analysis (from source rocks to potential reservoirs) were delivered. This study allowed OMV to increase confidence in the structural and basin models and underpins OMV's renewed focus on the North Viking Graben. Figure 3.3 shows an example from the regional 3D visualization of the partial results from the SSR study, highlighting the value of quick access to both structural and stratigraphic elements within North Viking Graben.

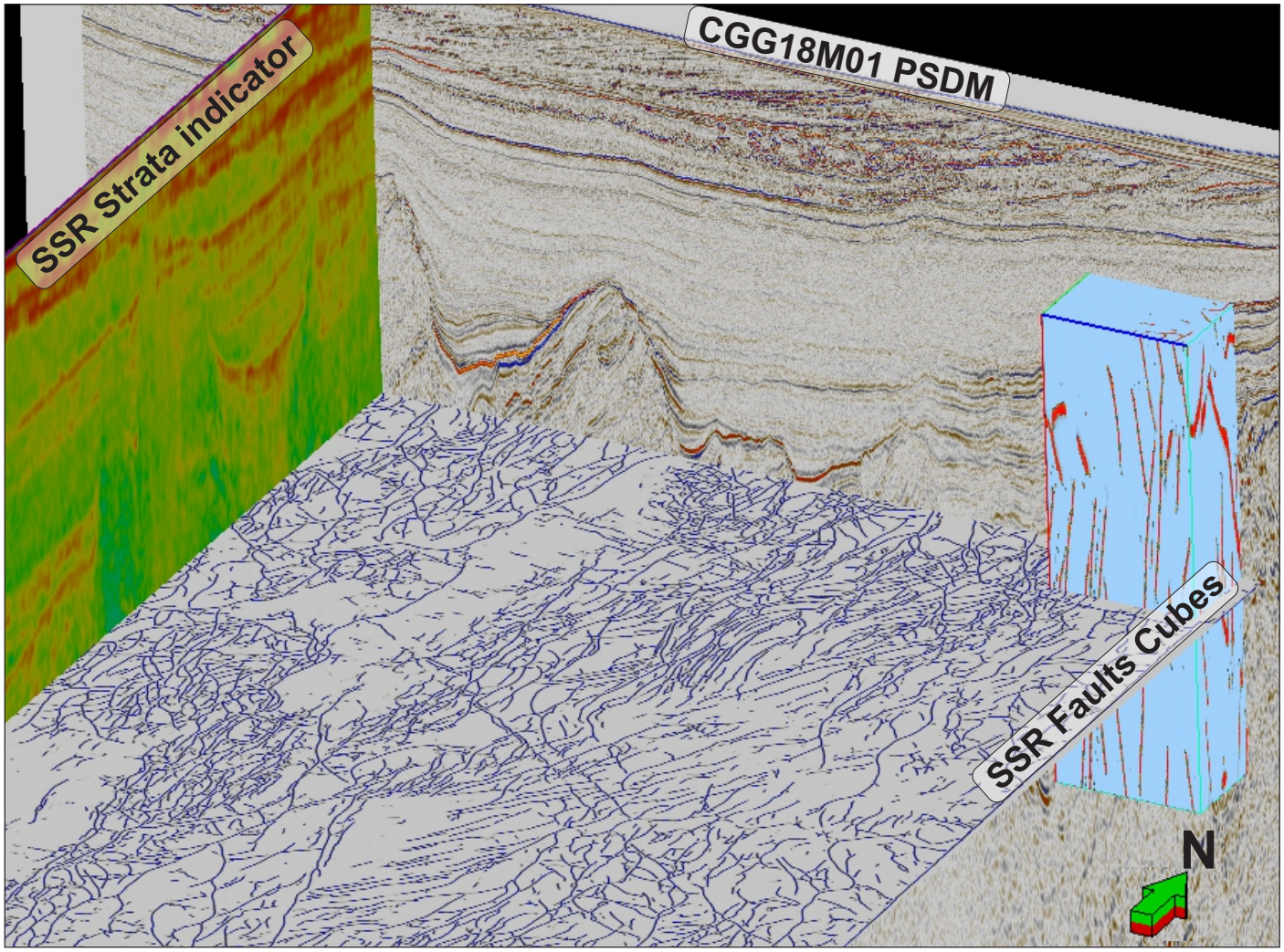


Figure 3.3 Example of 3D display from the Schlumberger Stavanger Research (SSR) project

W-E section from the input seismic; N-S section from the Strata Indicator 3D volume; Examples from regional Faults 3D volume (time slice) and prospect dedicated Faults 3D volume

OMV - North Viking Graben (NVG) Regional Study

From Q4 2020 to Q1 2021, the OMV Norge exploration department carried out an in-house regional study with the aim to better understand the distribution and prospectivity of the different plays present in the North Viking Graben. The mapping was done on the CGG18M01 Mega merge broadband seismic. Alongside regional mapping, seismic attributes were analyzed using horizon-stacks from geomodelling done in PaleoscanTM software. This work was supported and calibrated with post-drill analysis of exploration wells in PlayerTM software and previously mentioned SSR project.

TGS Facies Map Browser

TGS Facies Map Browser (FMB) is an application designed to facilitate analysis of TGS' basin-wide sequence stratigraphic studies, which include lithology and Gross Depositional Environment (GDE) assessment for all wells, GDE mapping and assignment of a robust sequence stratigraphic framework across the basin.

This stratigraphic data was used to constrain the seismic interpretation and guide the regional evaluation at all stratigraphic levels. The GDE maps where used together with internal OMV mapping and literature data to redraw more detailed specific GDE maps.

Geolink: North Sea sedimentology, stratigraphy and GDE maps

OMV has purchased a regional study from Geolink including sedimentology, stratigraphy and Gross Depositional Environment maps. The study includes 100 wells covering a large area of the North Sea.

OMV in collaboration with IGI - North Viking Graben (NVG) Study 2022

A regional integrated source rock, basin modelling and machine learning study was conducted by OMV and IGI in the North Viking Graben Area (OMV-IGI2022). The aim was to understand the provenance of fluids across the North Viking Graben (NVG) by evaluating the temporal and spatial facies/environmental changes in their source rocks (geochemistry) and predicting the timing and phase of hydrocarbon expulsion (basin modelling). The application of machine learning to a top-down modelling workflow within a relatively data-rich area such as the North Viking Graben, helps to place the results into a regional-spatial context. The study utilized a regional geochemical appraisal of source rock, oil and gas samples to constrain both 1D and grid-based 3D basin models.

Oswig PSDM Processing Project

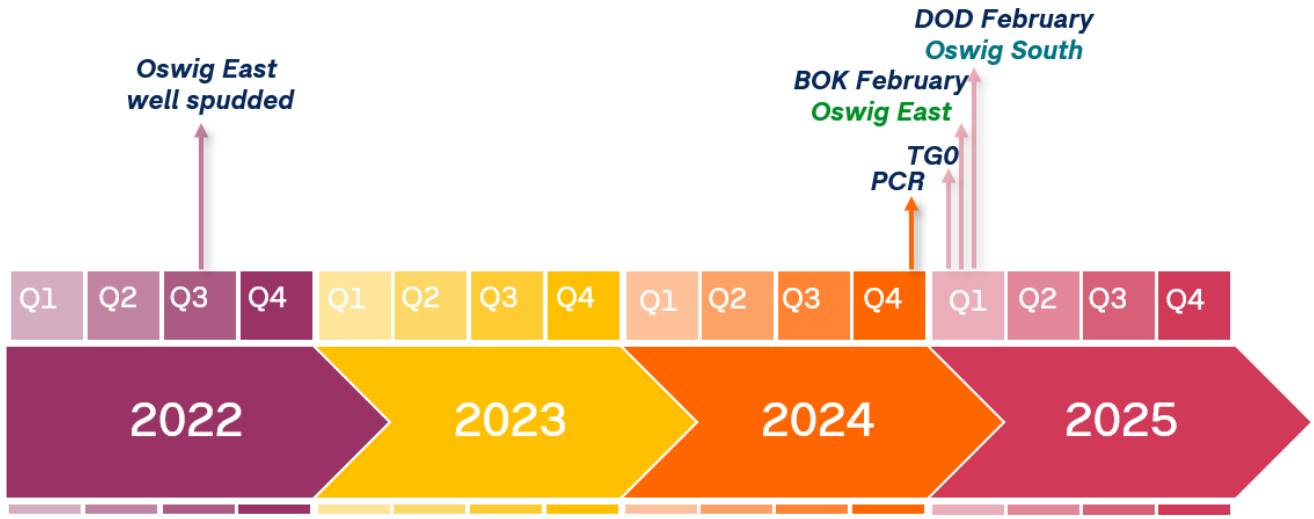
Oswig was described as a geologically complex prospect where seismic imaging and trap definition were identified as the main risk and uncertainty in the project. Therefore, a reprocessing project for seismic survey CGG17M01 (the resultant survey is called CGG17M01OMV18) was considered to better image the bounding faults and layers within the fault blocks in order to de-risk the prospect and make it drillable. The reprocessing removed various seismic artifacts such as faults shadows and improved the imaging of fault planes in the area. It also enhanced the reflectors continuity and the resolution along the survey.

Seismic reservoir characterization project

This study utilized seismic attributes to predict the presence and lateral continuity of potential Jurassic reservoirs within a series of tilted fault blocks at the Oswig prospect. Identification and characterizations of the Tarbert and Ness formations of the Brent Group are the primary targets, while the discrimination of possible reservoir intervals in the Upper Jurassic form a secondary target. Understanding the relationships between elastic and rock properties was a key ingredient of this project, as the rock physics bridged the gap between the geology encountered at the wells and the facies predicted from seismic inversion. The inherent ambiguity of inferring discrete facies changes from (continuous) band-limited inversion products will be captured and quantified via calibration to the RPM. The three main areas of investigation were (i) rock physics modeling, (ii) pre-stack seismic inversion, and (iii) reservoir facies prediction.

3.2 Post-drill Studies

Following the drilling of the well 30/5-4 S and 30/5-4 A, an extensive series of studies were carried out to analyze the data collected and preliminary results of the Oswig East discovery to evaluate the remaining potential in the licence area. Below is a summary of Oswig studies (Figure 3.4):



G&G STUDIES 2021-2022
- Seismic reservoir characterisation study
- Petrophysical evaluation
- Fault Seal Analysis
- Coarse deterministic static model Oswig East

G&G STUDIES 2023
- Geochemistry evaluation
- Hydraulic Fracturing feasibility study
- SCAL experiments

G&G STUDIES 2024
- Integrated reservoir model Oswig East
- Oswig South evaluation
- Benchmarking study

Figure 3.4 PL1100 studies and milestones- Summary and timeline

Petrophysics update

An update of the petrophysical study done in PL920 was carried out, including review of PL920 study wells, analysis of additional wells including the Oswig East discovery well and sidetrack. The study included a detailed evaluation of the Tarbert and Ness Fm reservoirs to define the input ranges for petrophysical parameters in prospect evaluation and resource estimates. The petrophysical evaluation has also been key input to the seismic reservoir characterization project described below.

Sedimentology & Reservoir Quality Study (CGG)

The study performed by CGG conducted a core analysis to determine the facies and reservoir quality from the Tarbert Formation in the Oswig East discovery wellbore (30/5-4 S). The core facies observations and reservoir quality analysis were used to update the well correlation model, depositional environment maps and the Oswig reservoir characterization and static model (Figure 3.5 and Figure 3.6). For instance, it was concluded that similar depositional facies from Tarbert formation in well 30/5-4 S can be expected in Oswig South prospect, where the presence of quartz overgrowth and illite could be the reason for blocked pore throats and reduced permeability.

Static Model

A static reservoir model including Oswig East Discovery, Oswig South structure and Tune Field has been built in order to capture reservoir complexity due to extended diagenetic processes, to estimate hydrocarbon volumes, support well planning and dynamic modelling, and ultimately to support a possible fast-track development plan (Figure 3.6). The static model contains:

- Structural model including all relevant faults and target horizons (Tarbert/Ness)
- Facies model based on rock typing defined on Oswig well data and regional trends/understanding on reservoir quality observed on offset key wells in the basin with similar Tarbert Fm.

Property models of Total Porosity (PHIT) conditioned by facies, Net-to-Gross (NTG), Permeability (K) and Water Saturation (Sw) - as a function of porosity and height above free water level.

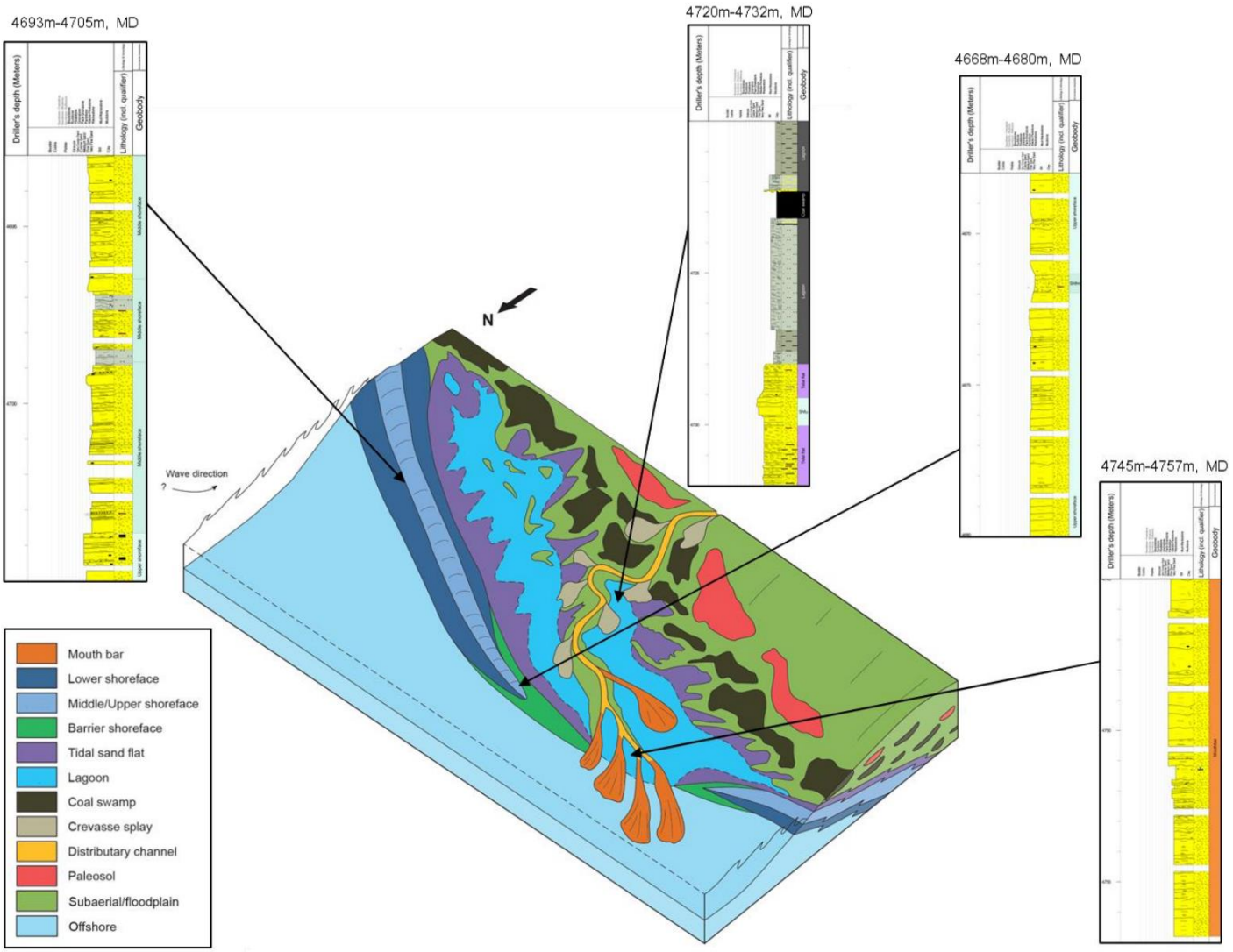


Figure 3.5 Conceptual depositional model of Oswig East and South

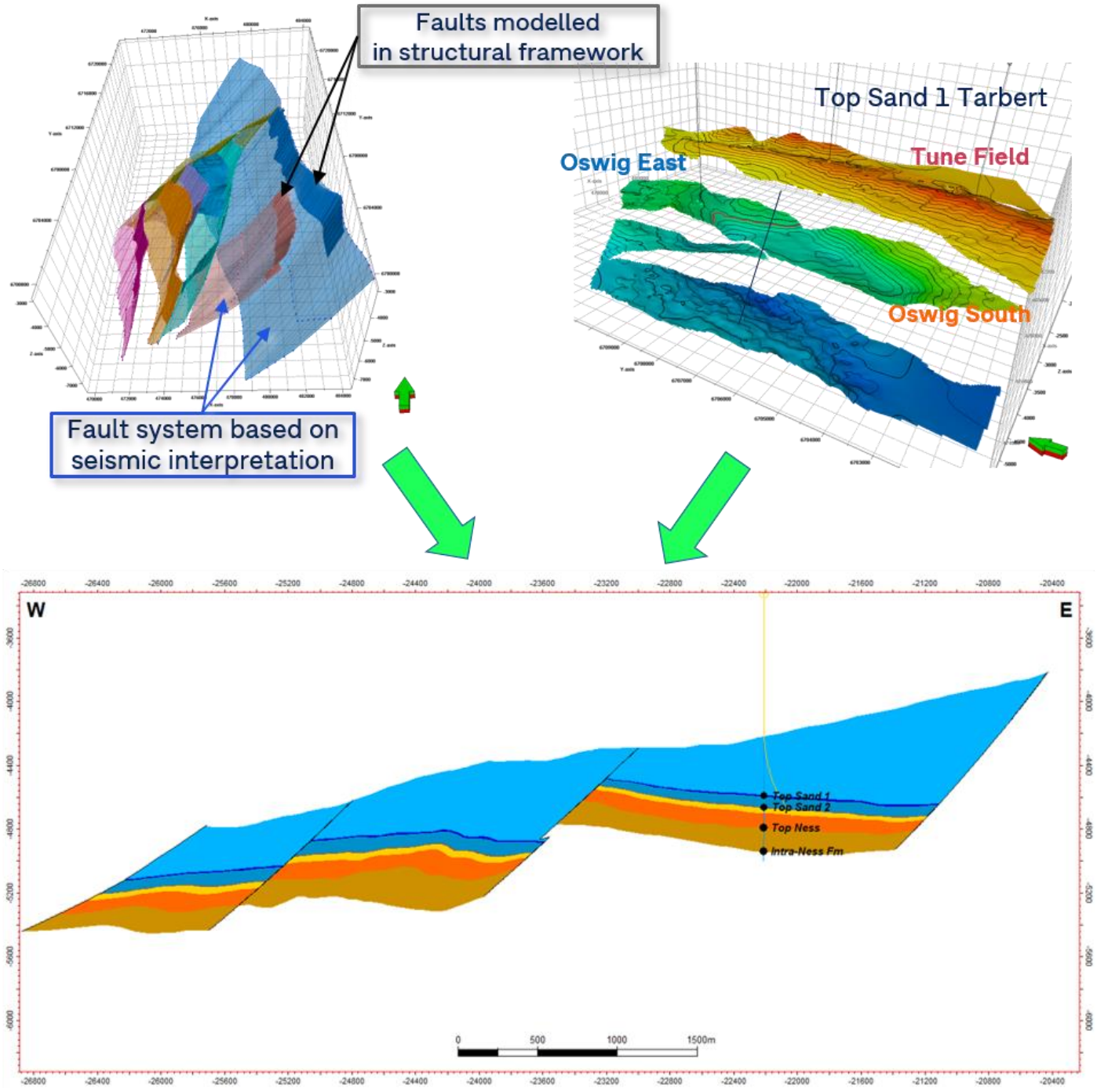


Figure 3.6 Modelled structural and stratigraphic framework of Oswig East and South

Fault Seal Analysis

An in-house fault seal analysis was carried as part of a risk evaluation for top and lateral seal presence in Oswig East and South, considering 2 different fault modeled scenarios (Figure 3.7) . The study revealed that fault throws were greater than reservoir thicknesses, leading to no reservoir juxtaposition present across the eastern and western fault planes. The top seal was interpreted to be Heather Formation with a retention capacity of 118 bars, meaning it could accommodate a gas column in the order of 2000 meters. However, the column heights identified from crest to contact were in the order of 260 to 280 meters.

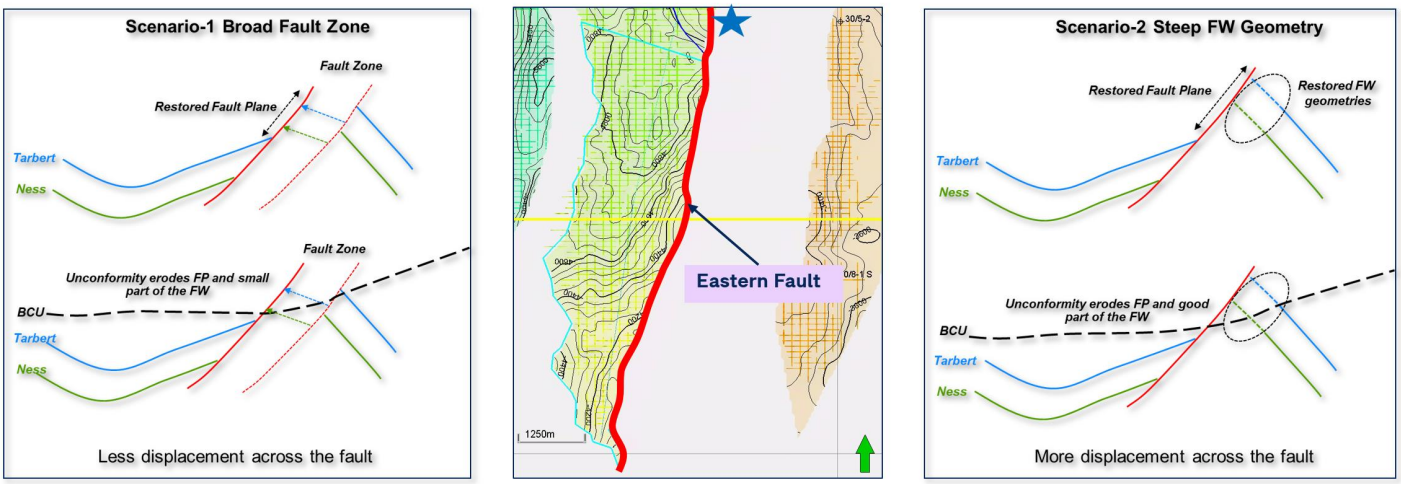


Figure 3.7 Fault sealing analysis – Modelled scenario for Oswig East and South

Hydraulic Fracture Modelling Study– Oswig East

A post well hydraulic fracture study was performed in order to assess the feasibility of a development plan for Oswig East with horizontal wells and multi-stage hydraulic fracturing to improve the potential field performance (Figure 3.8). The input data involved petrophysical and rock mechanical analysis with a complete evaluation of the principal stresses, and the formation pressure in the reservoirs. The study identified the viability to place hydraulic fractures in the reservoir section, without growing out of the pay zone. Based on preliminary permeability simulations, recoverable volumes could be doubled, with an ultimate recovery per well of 10 mnboe and a gas RF of 21% being estimated.

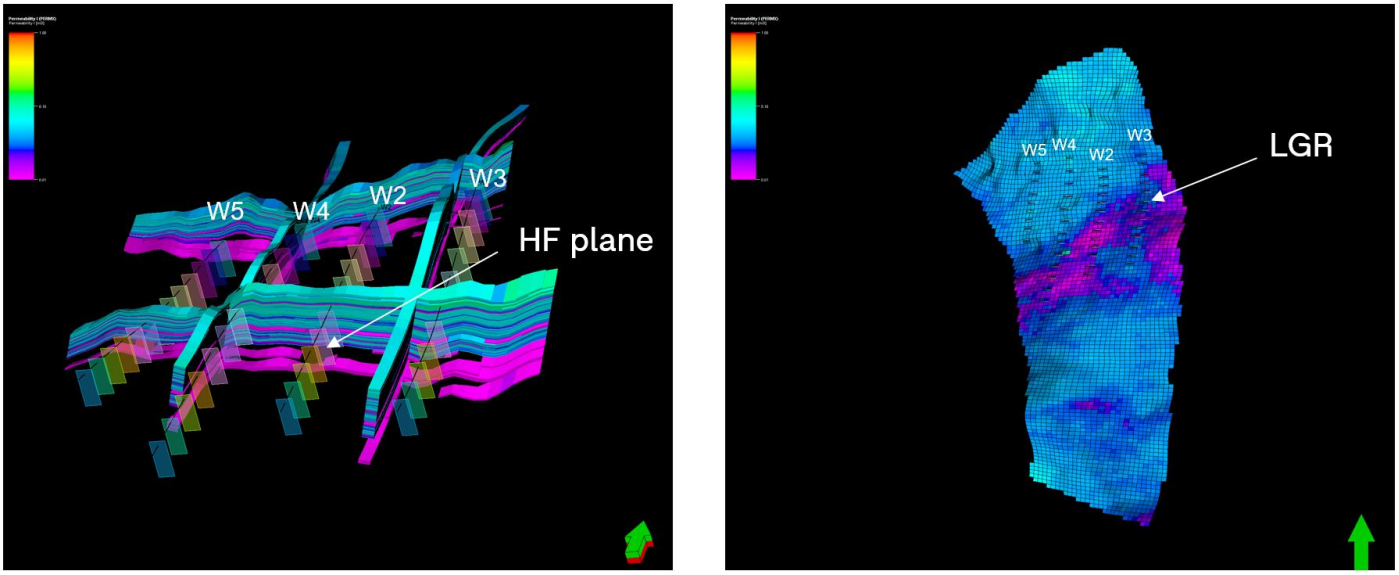


Figure 3.8 Development Plan - Hydraulic fracturing study integration for Oswig East

Integrated Reservoir Model

An updated reservoir model of the Oswig prospect was built integrating input data from DST and RCA/SCAL information collected from the wellbores 30/5-4 S and 30/5-4 A. It also included the proposed development plan for Oswig East discovery based on horizontal wells with multi-stage hydraulic fracturing (Figure 3.9). The simulations performed estimated production rates for longer time and increase in the recoverable volumes.

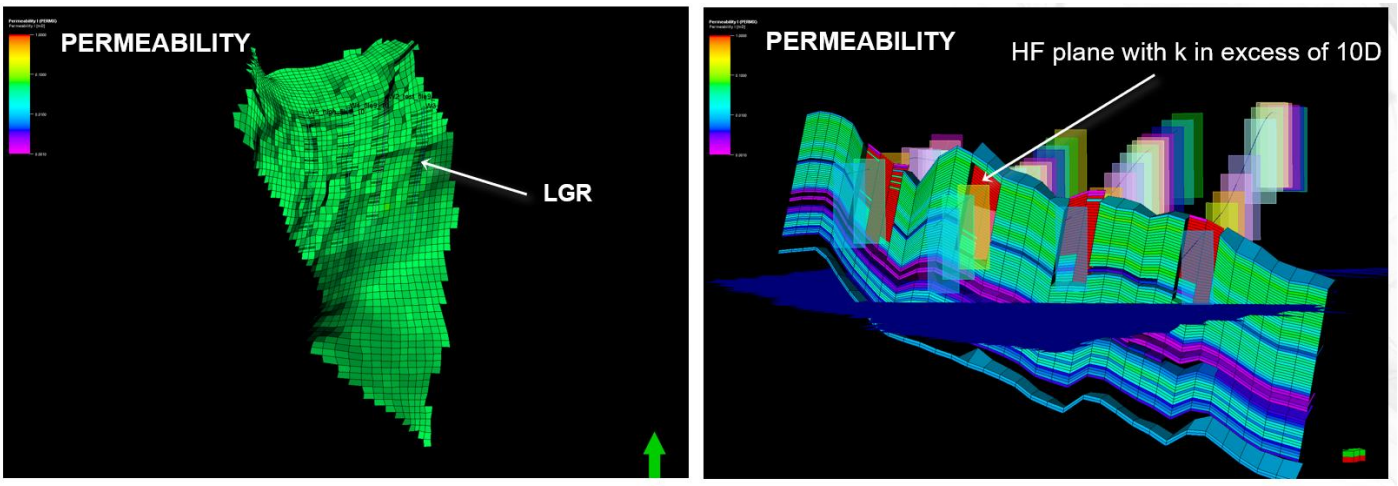


Figure 3.9 Ppermeability property model of Oswig East

Benchmarking Study and economic evaluation

A third-party study made a comparative evaluation of Oswig proposed development plan and projects with analogous reservoir properties, completion approaches and stimulation concepts. For Oswig East Discovery, the study considered developments in tight gas reservoirs (micro-Darcy range 0.010 – 0.20 mD), utilizing conventional large-propped or multi-stage hydraulic fracturing in vertical and horizontal wells, respectively.

The use of the Enverus database and literature review enabled filtering analogous projects to Oswig prospect based on lithology, porosity, permeabilities, Net to Gross (NTG), water saturation and depositional environment. Subsequently, the remaining analogues were validated comparing the reservoir pressure, thickness and depth. Figure 3.10 shows the workflow followed in the project to find projects matching the reservoir properties in the Oswig prospect.

From an economic analysis perspective, the benchmark study recommended to optimize the hydraulic fracturing design regarding the well count and number of fracturing stages along the reservoir. It also identified that the Soehlingen gas field, located onshore Northwest Germany, was a good baseline for a comparative assessment of the completion, stimulation concept and production performance to implement in the potential Oswig development project.

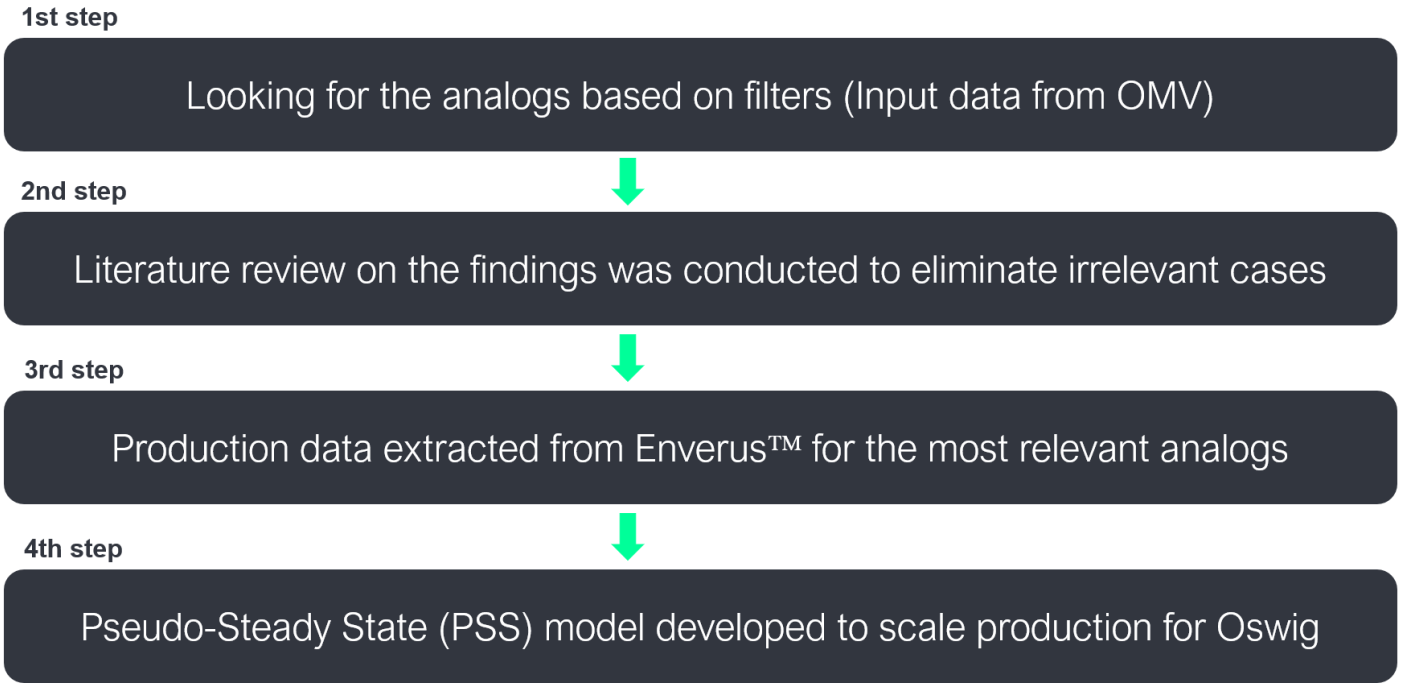


Figure 3.10 Methodology applied in the benchmarking Study for Oswig proposed development plan

4 Prospect Update

4.1 Oswig discovery

The area of interest represented by the Oswig cluster of structures is located in the North Viking Graben, North Sea Basin, Norway, within the Mokkurkalve Fault Complex. This complex is comprised of down-faulted terraces west of the Oseberg Fault Block and east of the Rungne Sub-basin (Figure 4.1). The North Sea Basin has undergone several extensional tectonic phases during Mezosoic times, with initial rifting during Early Triassic and a subsequent Late Jurassic rifting event that led to the development of north-south trending normal faults that bound rotated fault blocks (Jackson et al, 2010 and references therein).

The well 30/5-4 S drilled the structure Oswig East and confirmed the presence of Middle Jurassic sandstones from the Tarbert and Ness Formation from the Brent Group (Figure 4.2). The Tarbert Formation sandstones were interpreted as wave-dominated deltaic deposits whereas Ness Formation as a thick heterogenous sequence of good quality sands interbedded with coals layers, shales and limestones.

A tight gas-condensate discovery was made in a HPHT reservoir (Tarbert Formation) at 4573.39 m TVDSS. The well revealed a sequence of sandstones with a hydrocarbon column of 100 meters approximately and a gas-water contact (GWC) at 4663.5 m TVDSS, interpreted by logs. Post-drilled core analysis confirmed reservoir permeabilities in the range of 0.1 mD. The post well reservoir characterization studies concluded that the deep burial location of the Oswig reservoir had a major impact in the reservoir quality found, caused mainly by diagenetic processes such as extensive quartz cementation and illite precipitation. The estimated recoverable volumes in the Oswig structures were defined as non-commercial.

The results from the Oswig East prospect discouraged further evaluation of the remaining Oswig segments. Additionally, the Oswig South prospect was downgraded in value due to the poor reservoir quality interpreted from the CGG sedimentological study, as well as its deeper burial depth. As a result of these outcomes, the JV made a unified decision to surrender the licence, as the area was considered to hold non-commercial potential.

For volumetric evaluation the prospects have been divided into five segments namely Oswig East, Oswig Middle, Oswig West, Oswig South and Oswig North (Figure 4.3). Nevertheless, estimation of in-place and recoverable resources were made in Oswig East and Oswig South as they were the main structures of interest during the licence work.

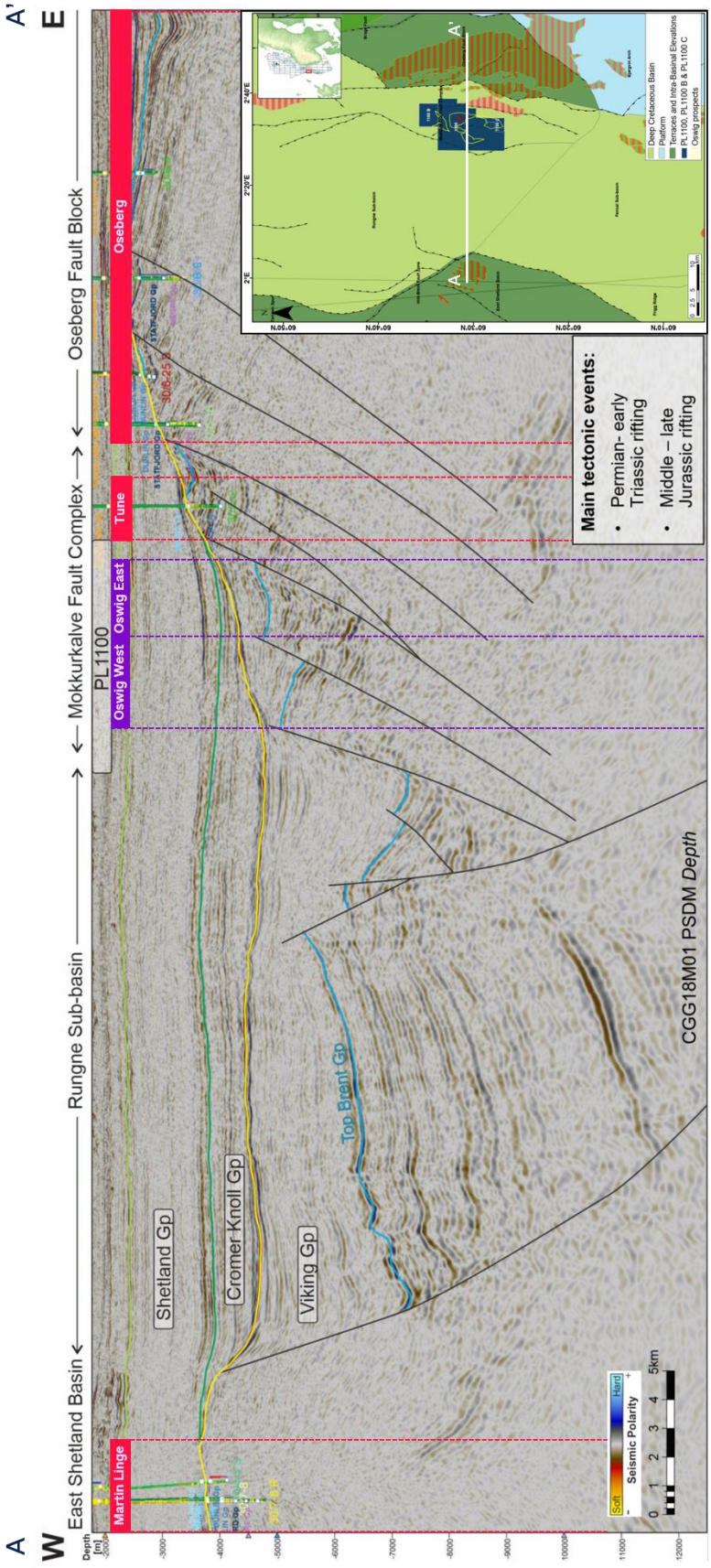


Figure 4.1 Location of the Oswig West and Oswig East structures.

Arbitrary seismic section AA' from the Martin Linge field n in the west towards the Oseberg field in the East crossing through Oswig East and Oswig South rotated fault blocks.

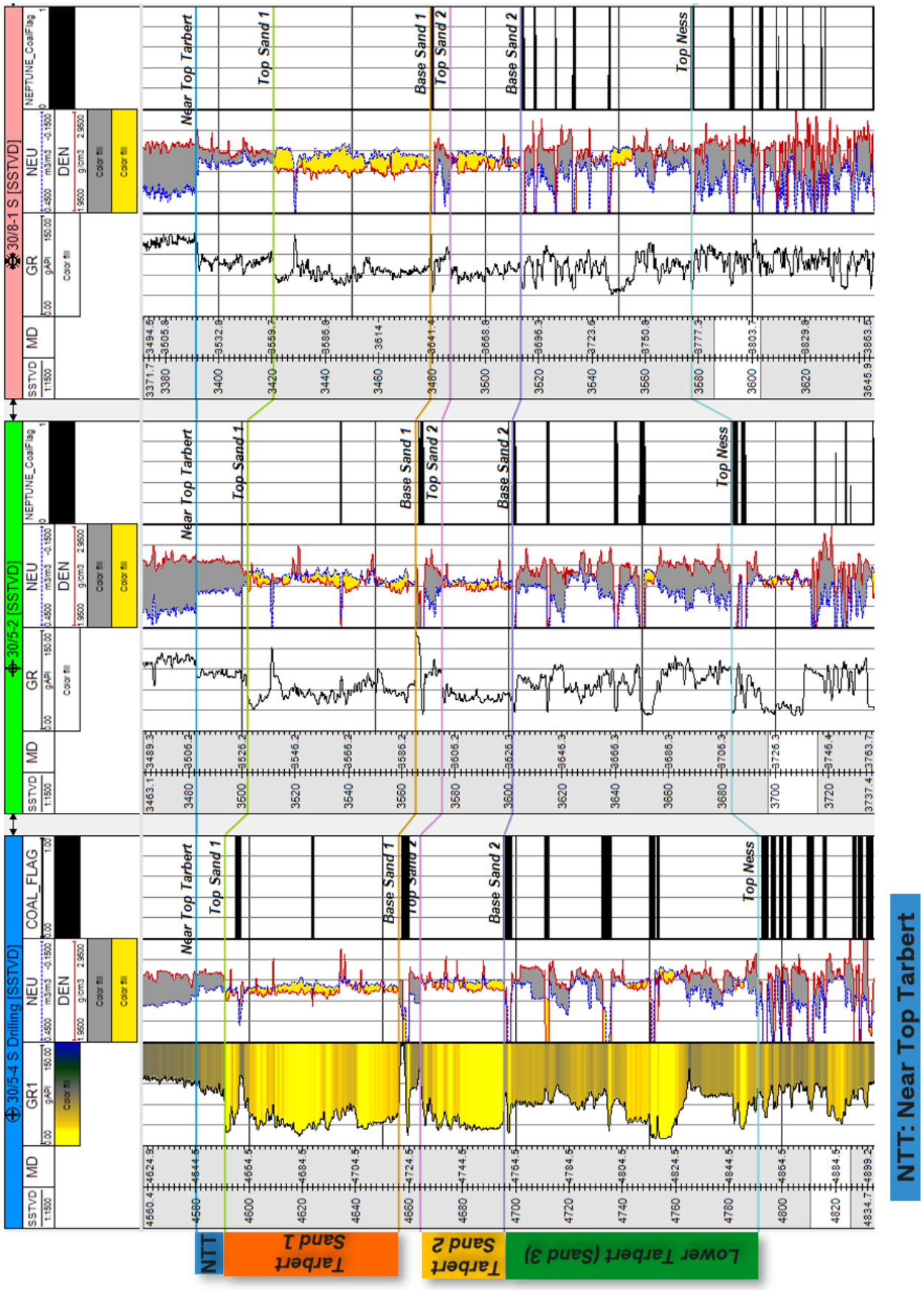


Figure 4.2 Well correlation of Oswig discovery well (30/5-4 S) with key neighboring wells 30/5-2 (Tune) and 30/8-1 S (Oseberg) at Near top Tarbert (surface flattened).

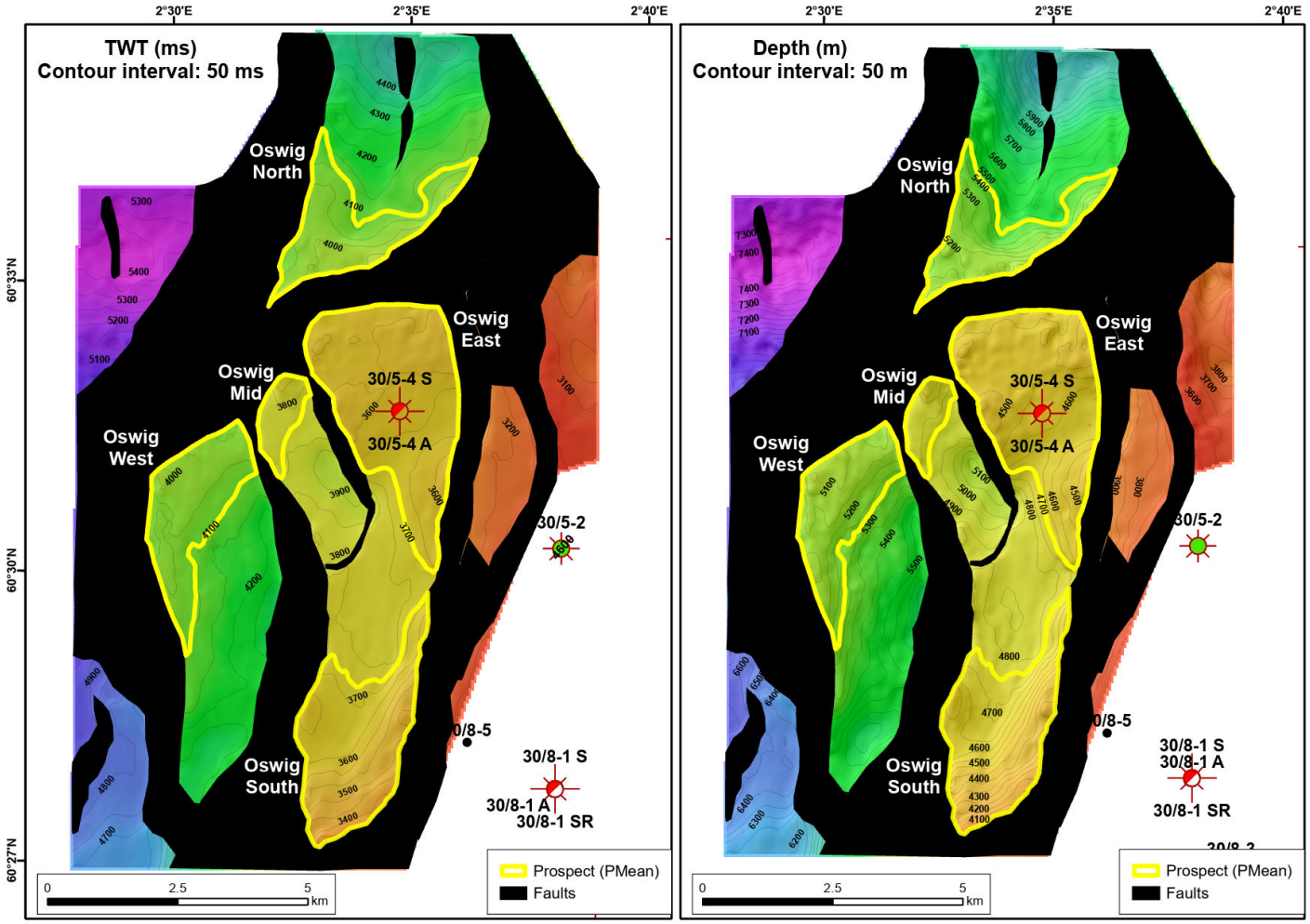


Figure 4.3 Time (TWT) and Depth (TVDSS) structure map of Top Tarbert Formation with Oswig prospects outlined

The estimated in-place resources for Oswig East are presented in the Table 4.1. The well has proven in-place resources between 16,2 and 27,4 MSm³.

Table 4.1 In-place resources for Oswig East

Resource Type [Units]	Mean	P90	P50	P10
Accumulation size Non Assoc. Gas [1e9 scf]	13.3	10.1	13.1	16.8
Accumulation size Condensate [1e6 STB]	9.12	6.81	8.96	11.6
Accumulation size Total Resources [1e6 STB OE]	**133.7**	**101.7**	**133.7**	**172.1**
Accumulation size Total Resources [1e6 Sm³ OE]	**21.6**	**16.2**	**21.3**	**27.4**

The estimated recoverable resources for Oswig East are shown in Table 4.2. The well has proven recoverable resources between 3,13 and 6,39 MSm³.

Table 4.2 Recoverable resources for Oswig East

Resource Type [Units]	Mean	P90	P50	P10
Accumulation size Non Assoc. Gas [1e9 scf]	3.24	1.97	3.2	4.59
Accumulation size Condensate [1e6 STB]	1.66	0.95	1.63	2.4
Accumulation size Total Resources [1e6 STB OE]	**29.5**	**19.7**	**29**	**40.2**
Accumulation size Total Resources [1e6 Sm³ OE]	**4.7**	**3.13**	**4.61**	**6.39**

The estimated in-place resources for Oswig South are presented in the Table 4.3.

Table 4.3 In-place resources for Oswig South

Resource Type [Units]	Mean	P90	P50	P10
Accumulation size Non Assoc. Gas [1e9 scf]	4.46	0.95	3.64	9.05
Accumulation size Condensate [1e6 STB]	3.09	0.65	2.5	6.28
Accumulation size Total Resources [1e6 STB OE]	**46**	**9.81**	**37.2**	**93.8**
Accumulation size Total Resources [1e6 Sm^3 OE]	**7.26**	**1.55**	**5.89**	**14.7**

The estimated recoverable resources for Oswig South are shown in Table 4.4.

Table 4.4 Recoverable resources for Oswig South

Resource Type [Units]	Mean	P90	P50	P10
Accumulation size Non-Assoc. Gas [1e9 Sm3]	1.09	0.21	0.84	2.3
Accumulation size Condensate [1e6 Sm3]	0.56	0.10	0.43	1.19
Accumulation size Total Resources [1e6 STB OE]	**9.97**	**2.03**	**7.87**	**20.6**
Accumulation size Total Resources [1e6 Sm3 OE]	**1.58**	**0.32**	**1.25**	**3.28**

4.2 Remaining prospectivity

The remaining prospectivity in PL 1100, 1100 B and 1100 C has been significantly downgraded following detailed geological and geophysical evaluations and special studies conducted after the well results. The assessments revealed high geological risks mainly driven by the poor reservoir quality strongly controlled by the deep burial location of potential findings, particularly in the Tarbert and Ness Formation. Despite extensive efforts by the PL 1100 joint venture to understand the remaining prospectivity, the findings highlight limited potential for further exploration in the licence.

5 Technical Evaluations

The Oswig East HPHT prospect is located 15 km west of the Oseberg field at about 100 m of water depth. The pre-drilled development strategy for Oswig East considered four vertical wells drilled from a single four-slot template integrated to a subsea tie back to the Oseberg D facilities for processing and export (Figure 5.1).

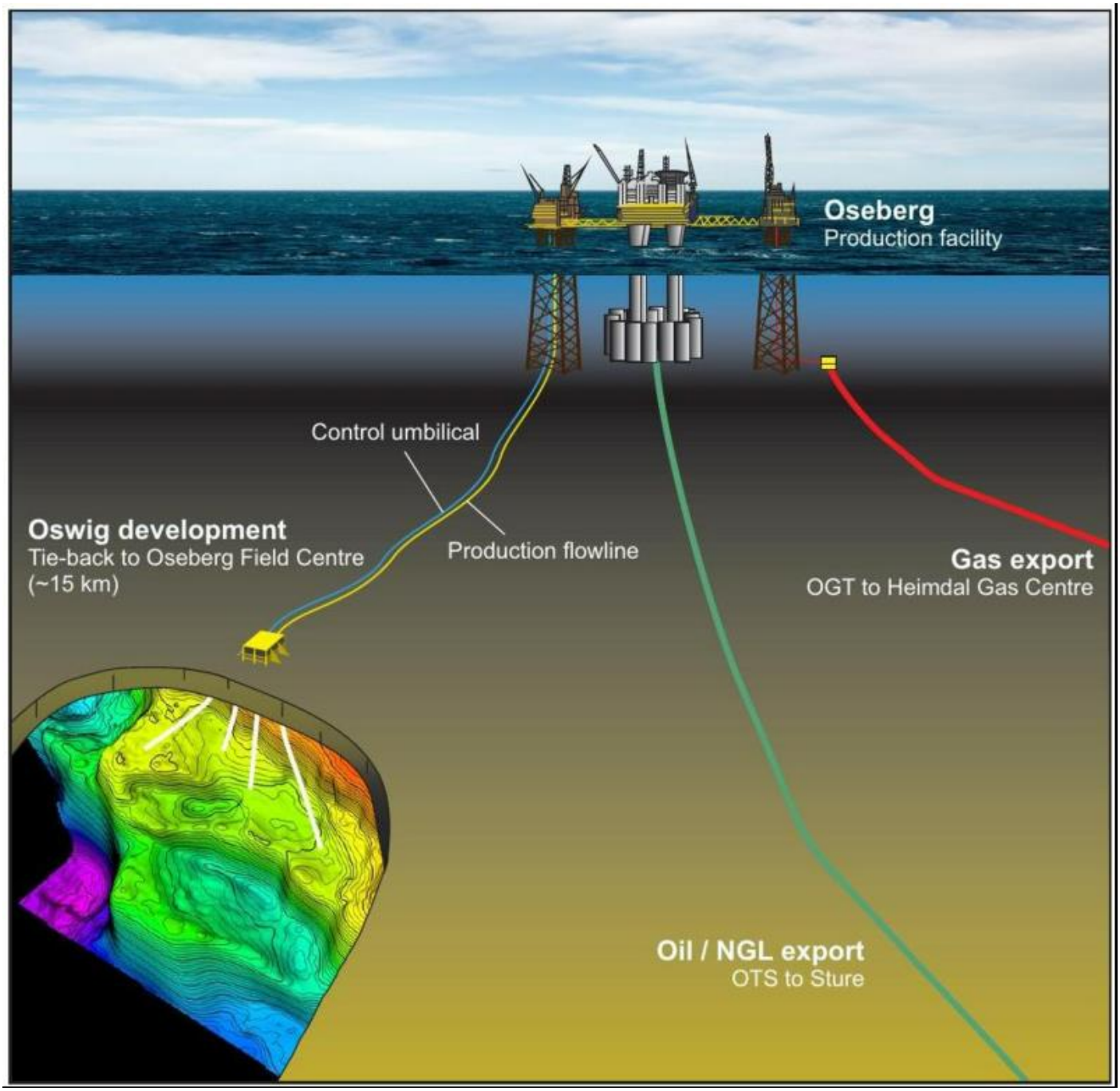


Figure 5.1 Development concept of Oswig East: Tie back to Oseberg facilities.

6 Conclusions

The joint venture of production licences 1100, 1100 B and 1100 C has invested significant effort in the evaluation of the prospectivity within the licences area, with a primary focus on the Oswig prospects in the Mid-Jurassic Tarbert Formation. Through the execution of a comprehensive and committed work program, the partnership has substantially advanced in its understanding of the Tarbert Formation in the North Viking Graben.

In addition to fulfill all licence commitments, key technical achievements were accomplished by the JV. The acquisition of new seismic data and a dedicated seismic reprocessing project, which enhanced substantially the imaging quality and definition of faults in the Oswig area. The interpretation and integration of these datasets together with a suite of G&G studies, contributed to de-risk the Oswig prospect. As a result, OMV and its partners proceeded to drill the Oswig East prospect (well 30/5-4 S) following a technical and commercial analysis.

Although exploration well 30/5-4 S confirmed a gas-condensate discovery, post-well analysis revealed poor reservoir quality, which made a significant impact on the recoverable volumes. The post well findings, combined with the high geological risks associated with the remaining potential in the Tarbert Formation and deeper stratigraphic intervals, led to an unfavorable economic valuation of the project.

Consequently, due to the limited recoverable volumes, elevated geological risks and the non-commercial valuation of the discovered hydrocarbons, the licence partners reach a mutual decision to surrender the production licences 1100, 1100 B and 1100 C.