Earth Data – Seismic

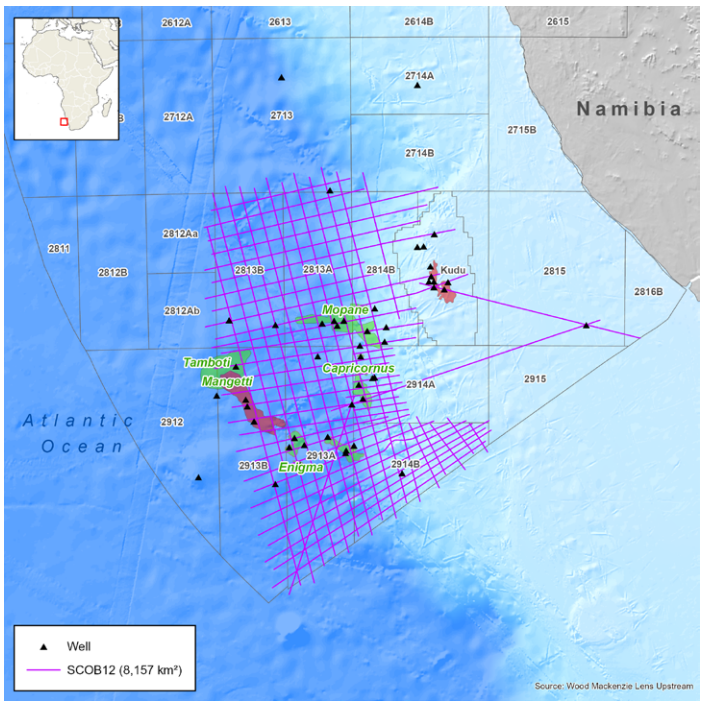
NAMIBIA

Orange Basin 2D

Viridien, in partnership with the National Petroleum Corporation of Namibia (NAMCOR) and TGS, has over 8,000 km of high-quality, regional, long-offset 2D seismic data acquired in 2012 and further reimaged in 2018 to build a regional understanding and de-risk the prolific hydrocarbon margin.

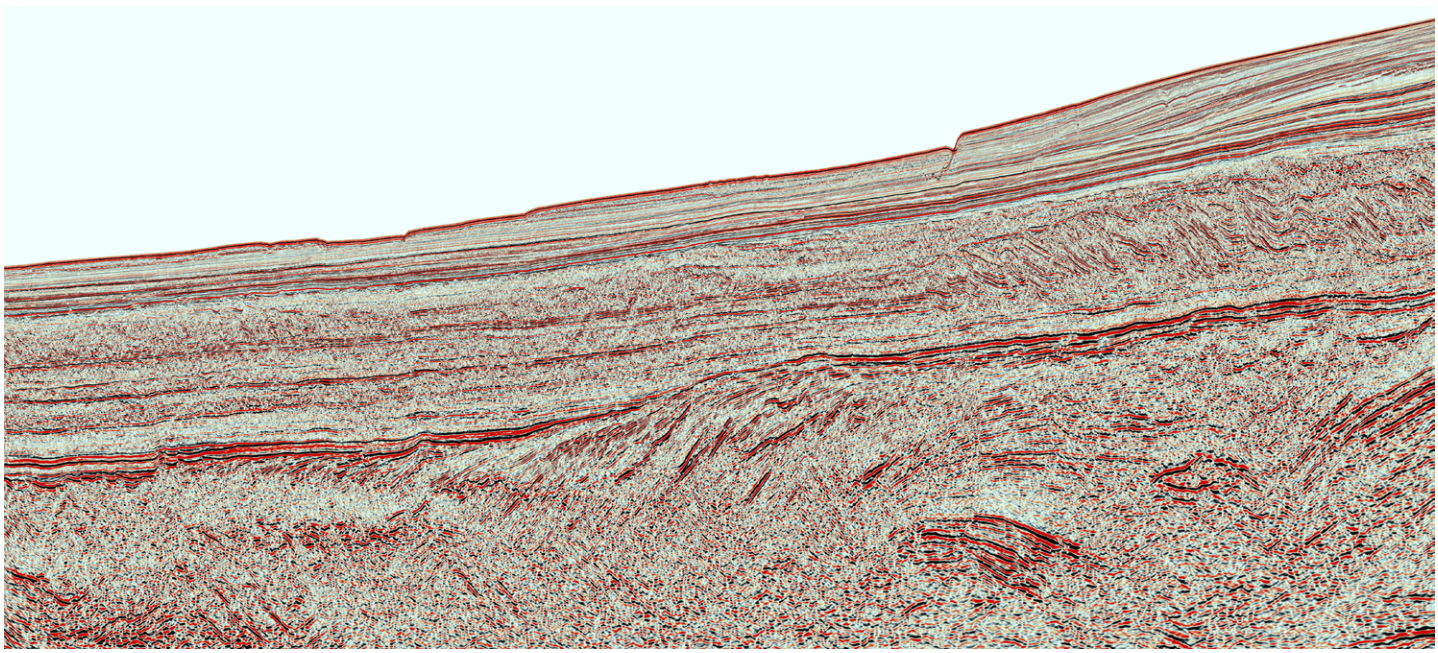
Overview

The play-opening Venus and Graff light oil discoveries in the deepwater Orange Basin have significantly attracted the industry's attention over the last few years. With the discovery of light oil at Mopane-1X, estimated to hold over 10 billion barrels of oil, Namibia is set to be one of the biggest success stories in frontier basin exploration globally.



Highlights

- SCOB-12 survey acquired in 2012 and reimaged in 2018
- 8,157 km of 2D seismic data, over both held and open acreage and covering the recent Venus-1 and Graff-1 wells
- Full imaging of the syn-rift and post-rift structures enables the identification, mapping, and de-risking of prospects
- Provides complete imaging over the gravitational collapse system of the Paleo-Orange Delta



Sample seismic line from the reimaged SCOB-12 2D survey showing the volcanic nature of the margin seaward dipping reflectors (SDRs), deepwater sedimentation, and Cretaceous mega-slides.

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Geological setting

The Orange Basin is one of four basins along the Namibian margin. The basin extends from Lüderitz Arch in Namibia to the Agulhas Fracture Zone in South Africa, covering approximately 160,000 km^2. The basin is fed by Africa's largest Cretaceous drainage system with more than 7 km of Cretaceous sediments deposited from Paleo Orange and Oliphants rivers.

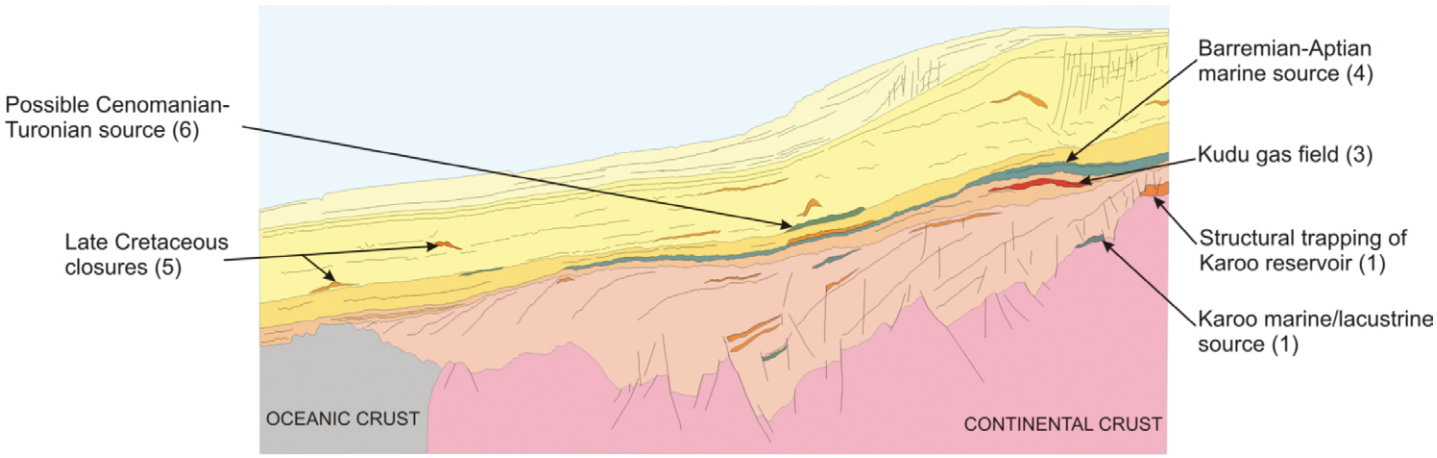
Rifting associated with the breakup of South American and African continental plates occurred during the Late Jurassic/ Early Cretaceous and was accompanied by significant volcanism resulting in extensive SDR development which trends parallel to the coast and can be observed in the seismic data. Aeolian sandstones were interbedded with basaltic lavas and were deposited during the early Barremian, forming the primary reservoir in the Kudu gas field.

The Aptian was marked by the first marine incursion across the restricted Orange Basin, resulting in the widespread deposition of marine shales. The thick marine oil-prone Aptian source rocks have been proven in the Kudu discovery and have also been well penetrated at Kabeljou, Moosehead, and DSDP well 361.

Mid-Aptian marks the initial progradation of the Proto-Orange delta system, which feeds the primary Apto-Albian deepwater turbidite reservoir targets at Venus-1 well. These Aptian sands are also encountered at the Kudu field.

Open marine shales were deposited during the Cenomanian-Turonian and encountered in wells Moosehead, Kabeljou, and 2815/15-1. Progradation of the Paleo-Orange Delta continued during the Late Cretaceous. A Santonian uplift event caused tilting of the African margin – destabilizing the shelf and triggering high erosion rates in the hinterland. The Santonian is a crucial interval for clastic reservoir deposition and was the primary reservoir target of the Graff-1 well.

Rates of sedimentation increased dramatically in the Late Cretaceous. In the Campanian, growth faulting near the shelf edge resulted in the development of toe thrusts down dip to accommodate the extension. By the end of the Cretaceous, sediment input was drastically reduced; tertiary reservoirs are negligible and do not form a primary play.



Geological section of the Orange Basin.

Acquisition parameters

- Survey size: 8,157 km
- Streamer length: 10,050 m
- Record length: 10 seconds

Deliverables

- Final PSTM (Pre-Stack Time Migration)
- Stacking and migration velocities
- Acquisition and processing reports
- Gravity data
- Four angle stack volumes (Near, Mid, Far, Ultra Far)

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