Earth Data - Seismic

ANGOLA

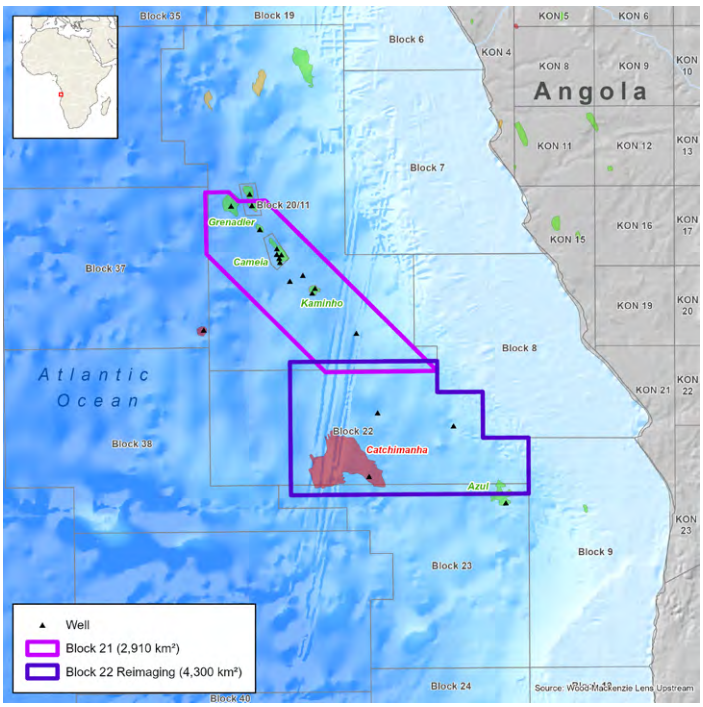
Kwanza Basin 3D broadband surveys

Viridien, in association with Agência Nacional de Petróleo, Gás e Biocombustíveis (ANPG), acquired broadband data in the highly prospective pre-salt zone covered by Blocks 21 and 22.

Exploring for opportunities in deepwater Outer Kwanza Basin - Blocks 21 and 22

Both surveys are pre-stack depth-imaged and cover approximately 2,915 km^2 and 4,300 km^2, respectively.

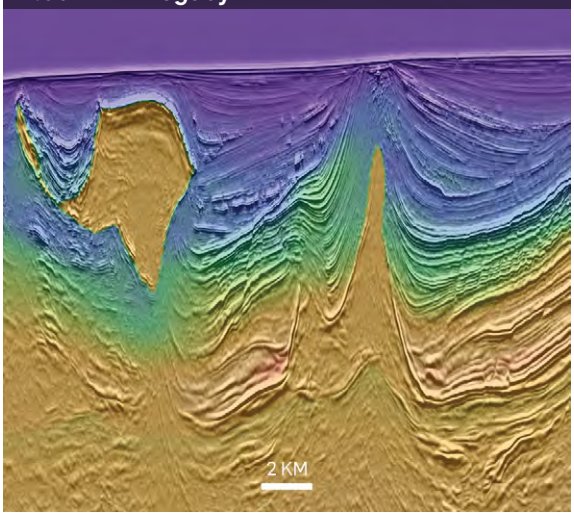
A sub-set of the Block 21 dataset has been recently reimaged using Viridien's latest proprietary advanced imaging technologies. The main aims of reimaging the survey were to enhance fault delineations, deliver superior mapping of facies distribution and characterization, enhance salt and mini-basin velocities, and improve definition of inherent heterogeneities. This was achieved by updating the velocity model using time-lag full-waveform inversion (TLFWI), a technique effective in areas with salt and carbonate structures. Using RTM VOO (Vector Offset Output) with 3D Q compensation resulted in a cleaner image, boosting the continuity and resolution of the base salt interval.



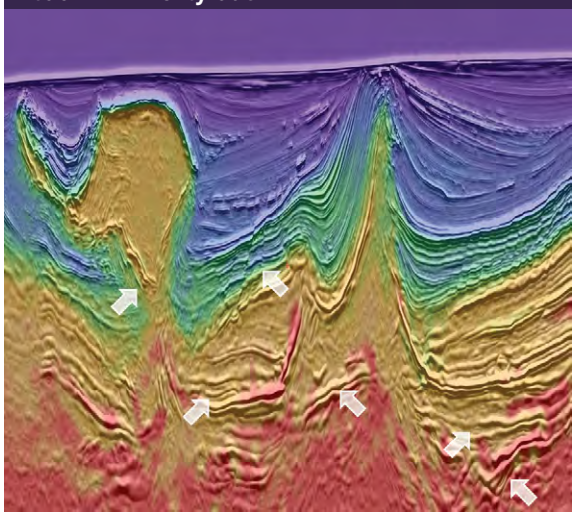
Highlights

- Total data coverage of 7,215 km^2
- Covers the Cameia discovery with billion-barrel potential
- Block 21 subset data reimaged in 2021 and Block 22 reimaging commencing Q3 2025

Block 22 - Legacy



Block 22 - Early out



In 2025, Viridien conducted a pilot test over a designated area of its Block 22 3D survey to assess potential imaging improvements within the pre-salt section. The updated velocity model using TLFWI effectively addressed geological complexity in the selected area. Results from the pilot showed a greater level of uplift than previously expected.

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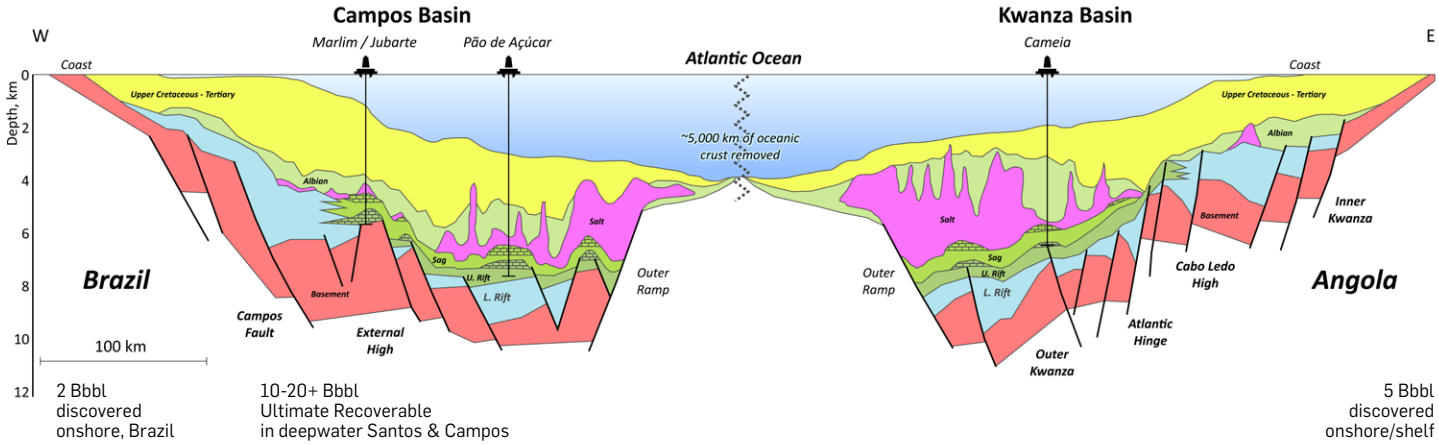
Geological setting

The Kwanza Basin forms part of the salt-influenced passive margin of offshore Angola. Early Cretaceous rifting in the Kwanza Basin is associated with the opening of the South Atlantic Ocean. A thick layer of Aptian salt was deposited shortly after this initial rifting event. The salt in the Kwanza Basin was deposited in two sub-basins – the inner and outer Kwanza Basin. Viridien's Block 21 and Block 22 surveys are located in the Outer Kwanza Basin.

The Miocene uplift also led to a supply of massive clastic sedimentation, further enhancing hydrocarbon maturity and resulting in the formation of turbiditic and channel traps in the Outer Kwanza Basin.

The primary exploration and development focus is on the pre-salt plays in Blocks 21 and 22 in the Outer Kwanza Basin. The pre-salt source rocks were deposited during the Barremian to Early Aptian. They are type I oil-prone source rocks with TOC content of up to 5%. Proven reservoirs are within carbonate mounds (Cameia field – Block 21) and syn-rift sands (Bicuar-1 well – Block 21). The secondary plays are post-salt plays consisting of Pinda reservoirs. The Pinda carbonates appear as rafts and provide numerous untested leads and prospect analogues to producing fields of the Sendji carbonate play in the Lower Congo Basin.

Brazil Pre-Salt - Campos and Santos Basins | **West Africa Pre-Salt - Kwanza Basin, Angola**



Geological section highlighting the geological similarities between the conjugate Angolan and Brazilian margins (image courtesy of Cobalt International Energy).

Acquisition parameters

- Survey size: 7,215 km^2 (combined)
- Data type: PSDM
- Streamer length: 8,100 m
- Record length: 9 seconds

Deliverables

- PSDM Kirchhoff & RTM (Blocks 21 & 22)
- PSDM CBM (Block 21)
- Stacking and migration velocities
- Velocity model
- Four angle stacks (Near, Mid, Far, Ultra-Far)
- Acquisition and imaging reports

Local contact

Simon Cheesley – Earth Data datalibrary.eame@viridiengroup.com Tel: +44 7584 211920

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