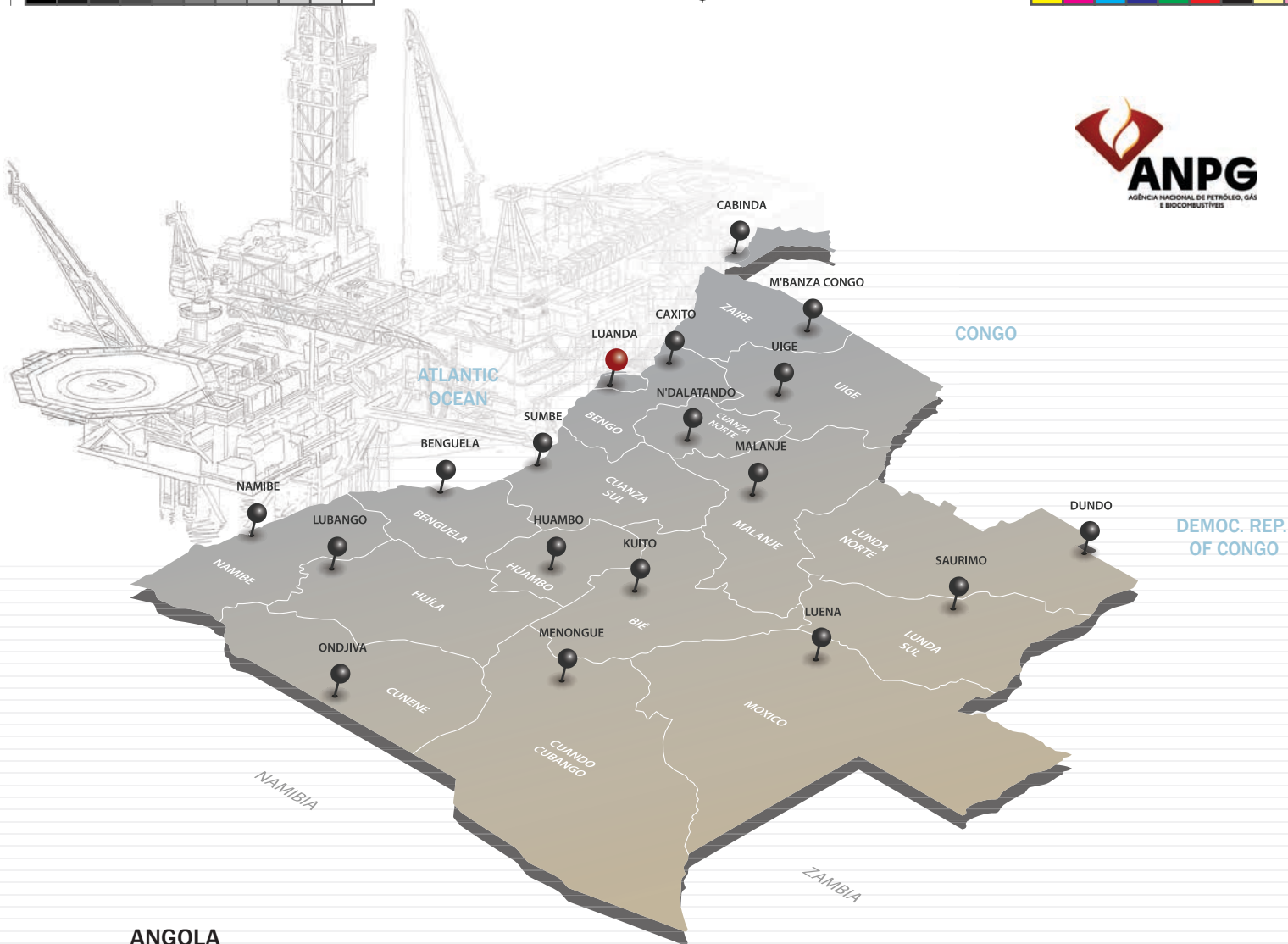


ANGOLA: OIL&GAS POTENTIAL AND BUSINESS OPPORTUNITIES FOR INVESTORS 2024



ANGOLA
Geographic description

Angola is located on the South Atlantic coast of West Africa, between Namibia and the Republic of Congo, also bordering the Democratic Republic of Congo and Zambia, to the east. The country is divided into an arid coastal strip that extends from the Republic of Namibia, practically reaching Luanda.

The Zambezi River and several tributaries of the Congo River have their sources in the country, which has a maritime border of 1,650 km and a land border of 4,837 km.

Angola has an extensive territory, with an area of 1,246,700 km², divided into 18 provinces.

Bengo Capital: Caxito Área: 33.016 km ²	Área: 199.049 km² Cunene Capital: Ondjiva Área: 87.342 km ²	Capital: N'Dalatando Área: 24.110 km² Luanda Capital: Luanda Área: 2.257 km ²	Moxico Capital: Luena Área: 223.023 km ²
Benguela Capital: Benguela Área: 31.788 km ²	Huambo Capital: Huambo Área: 34.270 km ²	Lunda Norte Capital: Lucapa Área: 103.000 km ²	Namibe Capital: Namibe Área: 58.137 km ²
Bié Capital: Cuito Área: 70.314 km ²	Huíla Capital: Lubango Área: 75.002 km ²	Lunda Sul Capital: Saurimo Área: 77.637 km ²	Uíge Capital: Uíge Área: 58.698 km ²
Cabinda Capital: Cabinda Área: 7.270 km ²	Cuanza Sul Capital: Sumbe Área: 55.660 km ²	Malanje Capital: Malanje Área: 97.602 km ²	Zaire Capital: M'Banza Congo Área: 40.130 km ²
Cuando Cubango Capital: Menongue	Cuanza Norte		





ABOUT ANPG

The National Agency for Oil, Gas and Biofuels, referred to in short as “Agência” or “ANPG”, was created in 2019 by means of Presidential Decree No. oilfield in Angola. Among the actions taken to restructure the sector, the transfer of the Concessionaire function, previously held by Sonangol E.P., to the newly created Agency was approved, in order to ensure greater political coordination, increase the effectiveness of processes and create conditions for private investment activities in the national oil industry.

ANPG became the National Concessionaire with the specific attributions of regulating, supervising and promoting the execution of petroleum activities in the field of operations and contracting of the oil, gas and biofuels sector.

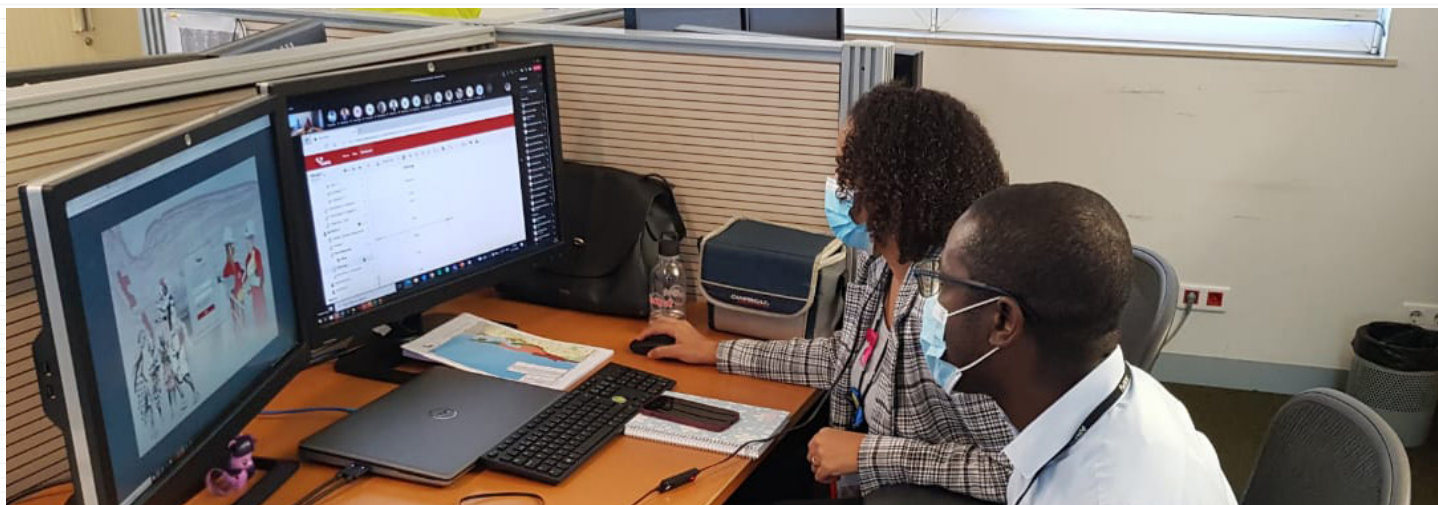
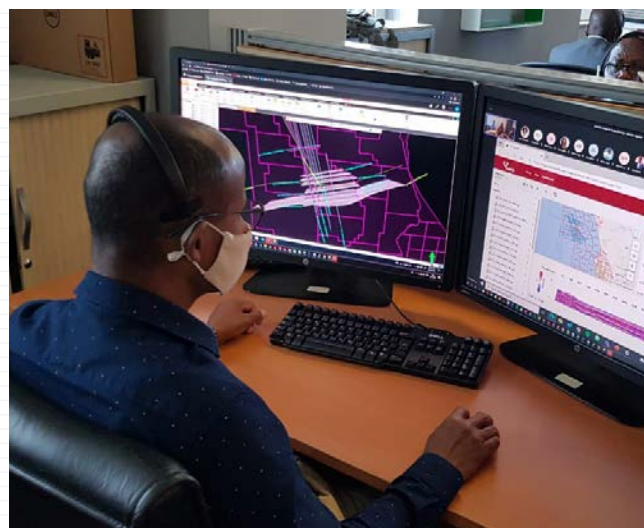
Through Presidential Decree No. 52/19, of February 18, the General Strategy for the Allocation of Petroleum Concessions for the period 2019-2025 was approved.

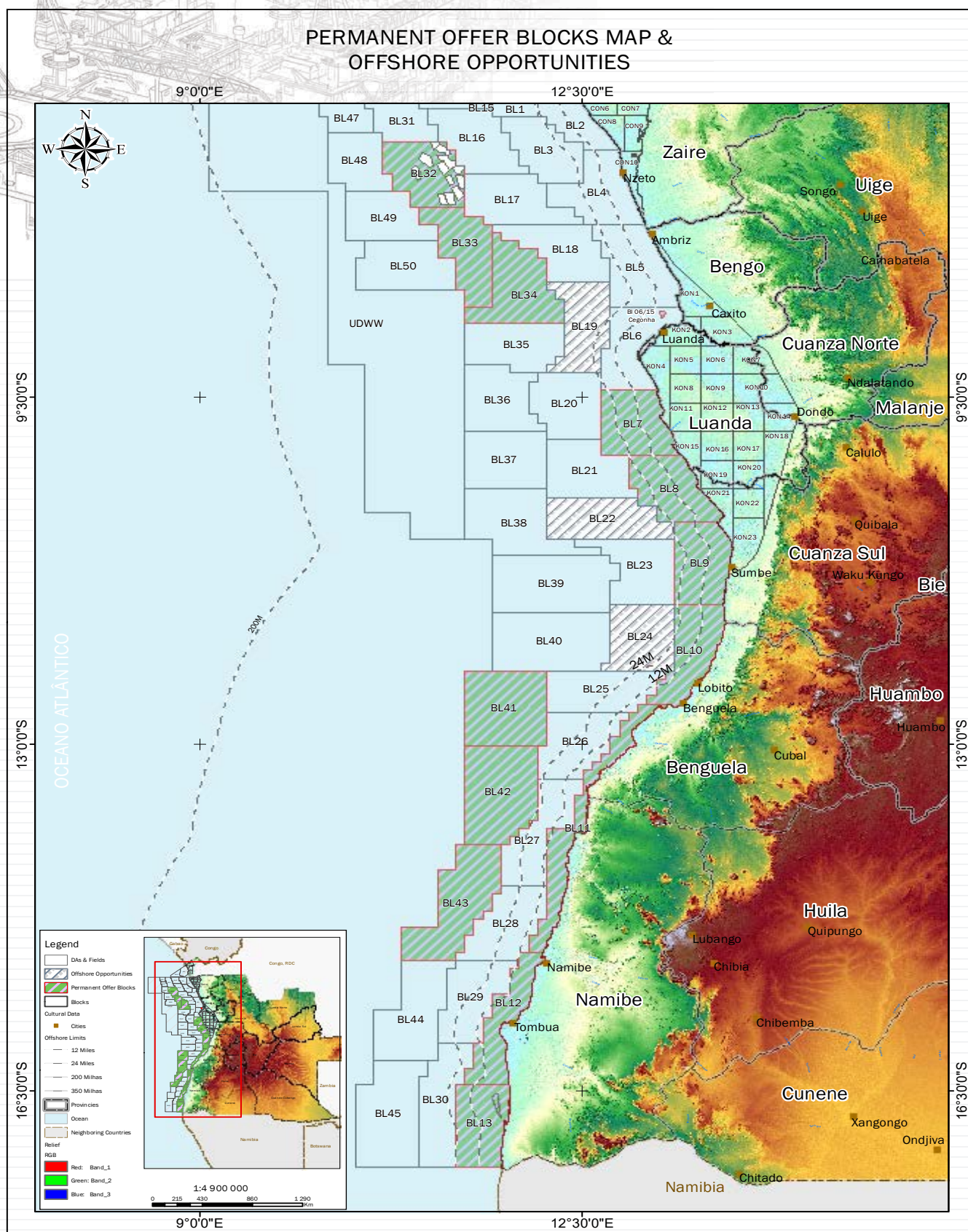


DATA CENTER AND TECHNICAL INFORMATION

In ANPG's organizational framework, the data management function represents careful planning, control, storage and availability of Exploration and Production assets. The Centre, guarantees the management and archiving, as well as the execution of geological and cartographic mapping and the subsequent availability of this data to internal and external customers.

The Data Center's role also includes disciplines for the development, execution and supervision of plans, policies, projects, processes and procedures aimed at adopting market practices and maximizing the use of the specialized information collection.





DATUM WGS84

6707-AGO-23-GIS-GAD



ABOUT THE PERMANENT OFFER REGIME

Presidential Decree n.º 249/21, of October 5, approves the rules and procedures for the continuous offer of oil concessions, aiming to streamline access to Areas and Blocks in an uninterrupted manner, in order to attract potential investors and promote the expansion of the geological knowledge the oil potential of Angola.

Through the Permanent Offer Regime, it is possible to assign Free Areas in Concession Blocks, concessions that are not part of the General Strategy for the Allocation of Concessions 2019-2025, Concessions Assigned to the Concessionaire, as well as those that, arising from bidding processes, do not have received proposals.

In order to qualify for the mentioned regime, the investor must submit to the National Concessionaire the proposal for the award of the block of interest, and must prove the technical capacity of his company to associate as an

Operator, upon presentation of a set of information to indicate the its structure of human resources with professional experience in the management and execution of petroleum operations.

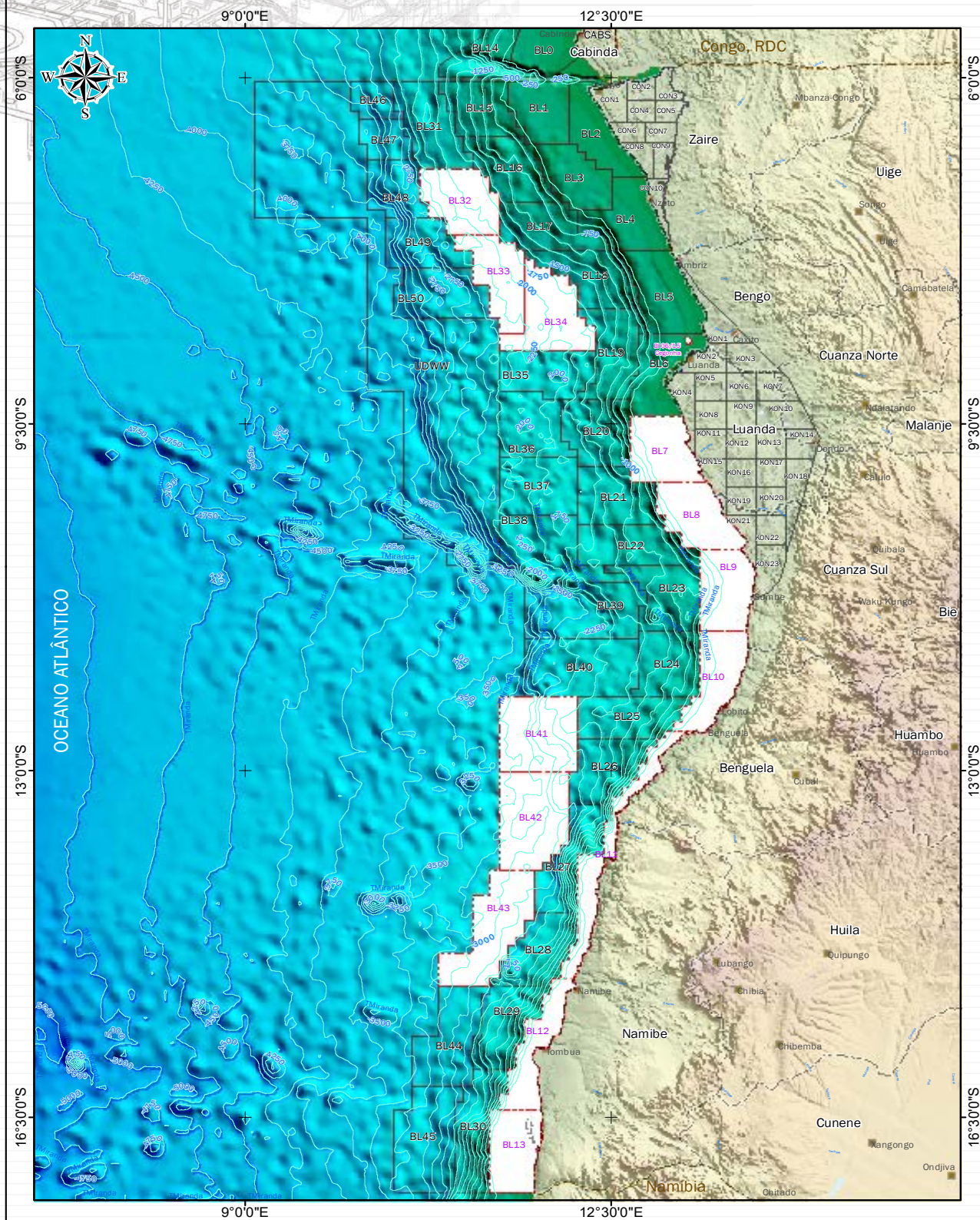
It must also prove its financial capacity, submitting annual reports including the balance sheet and accounts for the last three years or since its incorporation. In the case of a company incorporated less time ago, the reports must be those audited by an independent entity of recognized reputation. It should be noted that an eventual disqualification of the competitor, derived from non-compliance with the requirements, does not inhibit the investor from participating again.

Check out on the following pages the available opportunities in the Angolan oil sector, combined with our good business environment.





BATIMETRY MAP OF BLOCKS IN PERMANENT OFFER

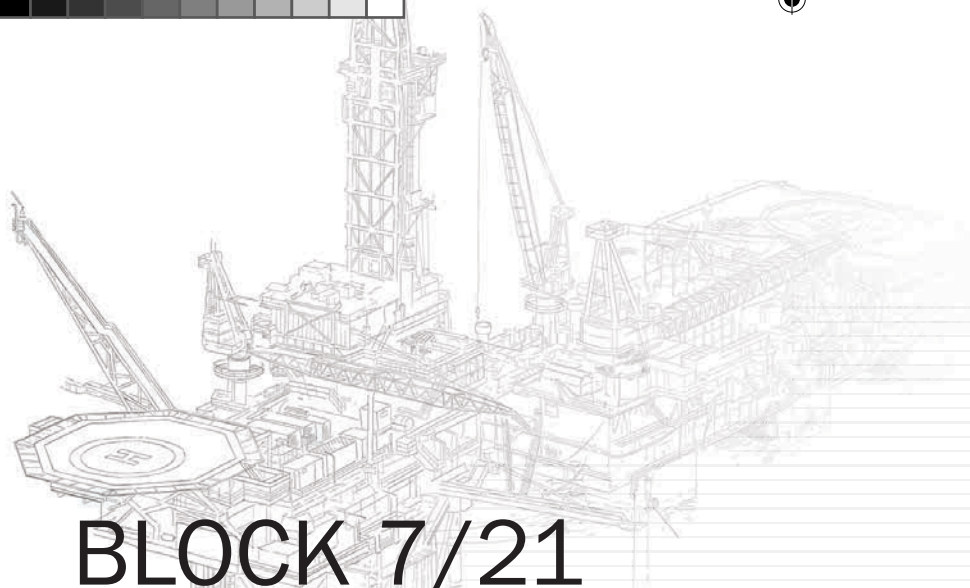


DATUM WGS84

6706-AGO-23-GIS-GAD

6 | Blocks in Permanent Offer Regime





BLOCK 7/21

Block 7 is located in the shallow water of offshore Kwanza Basin, with an area of 4 849 km² approximately and water depth from 0 to 800 m deep.

Block 7/21 is flanked by:

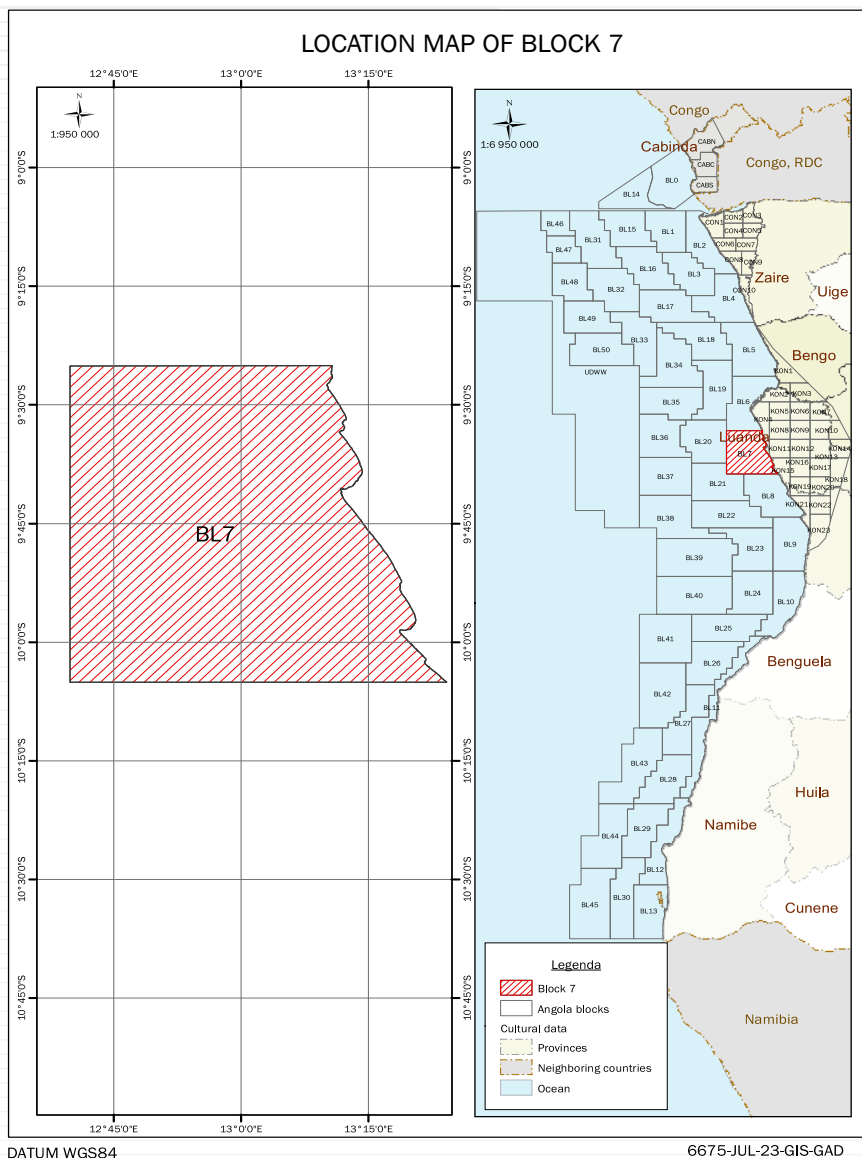
- North by Block 6;
- South through Blocks 8 and 21;
- East by the city of Luanda;
- West through Blocks 20 and 21.

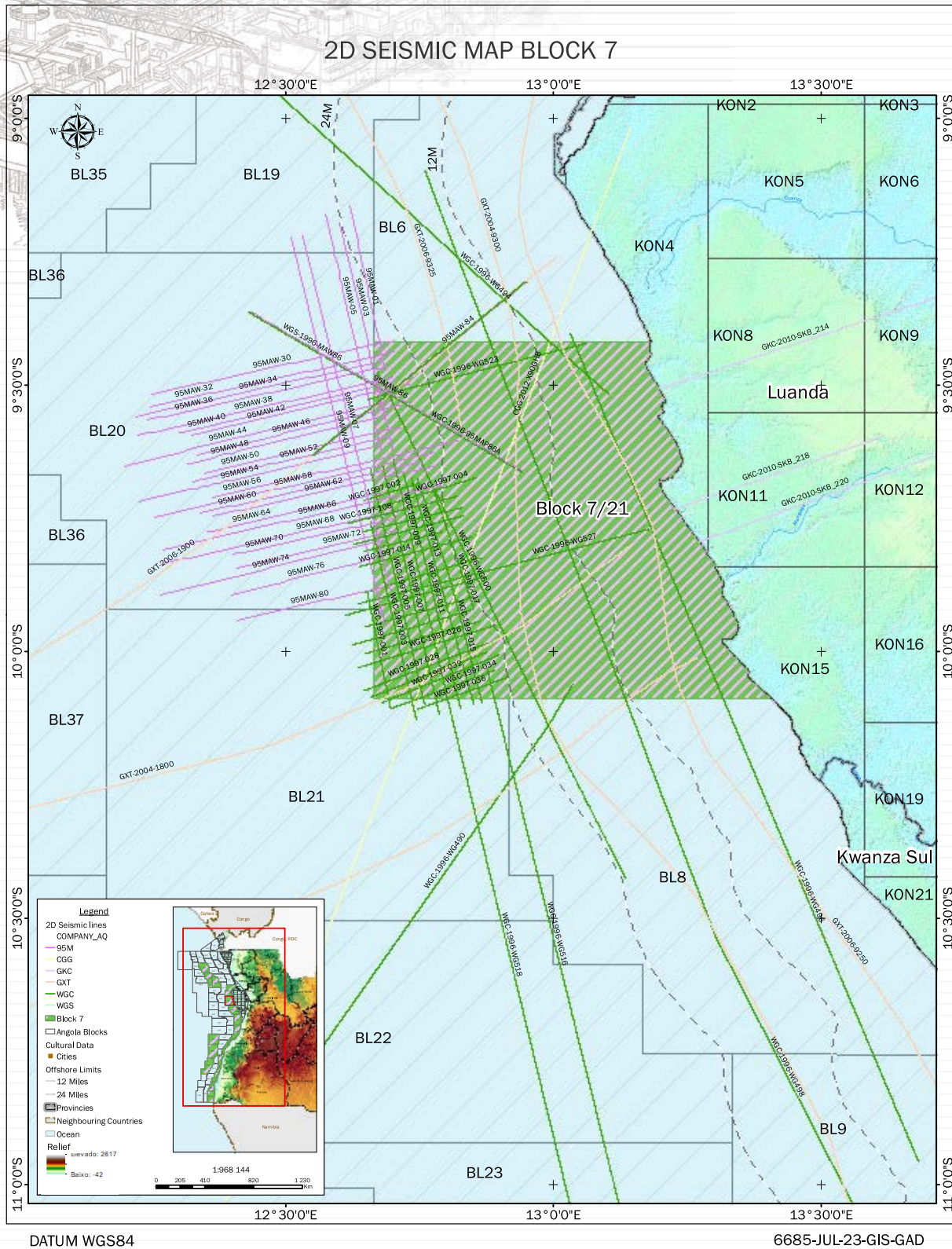
Block 7/21 has 2D seismic coverage of approximately 5 816 km and 1 557 km² of 3D seismic.

The Pre-Salt Unit is characterized by the presence of structures such as horsts and grabens, strongly influenced by plate tectonics, during the pre-rift to rift periods. Possible reservoirs in this lithostratigraphic are formed and deposited on flanks and in structural highs (lucula sandstones, coquinas and microbial carbonates).

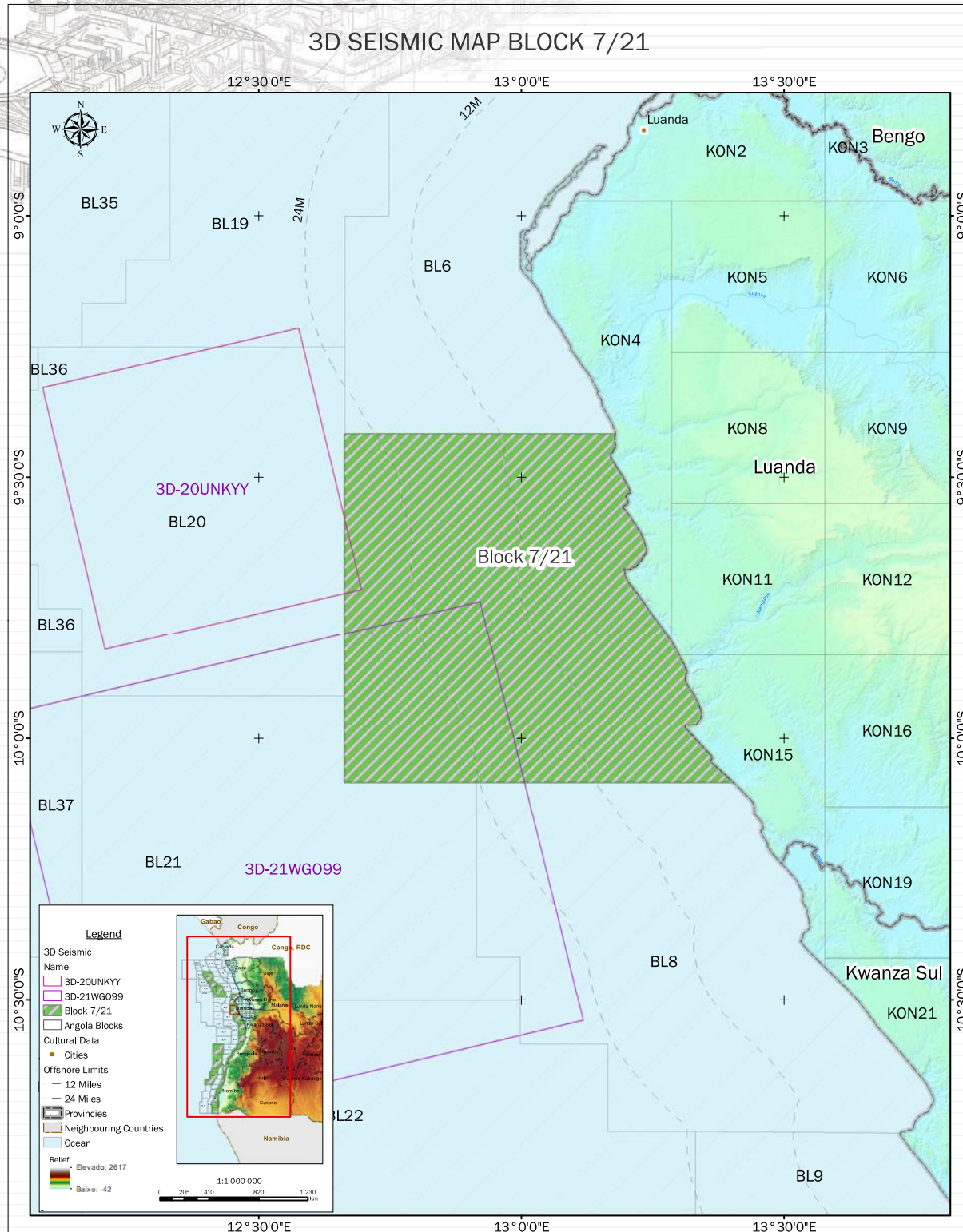
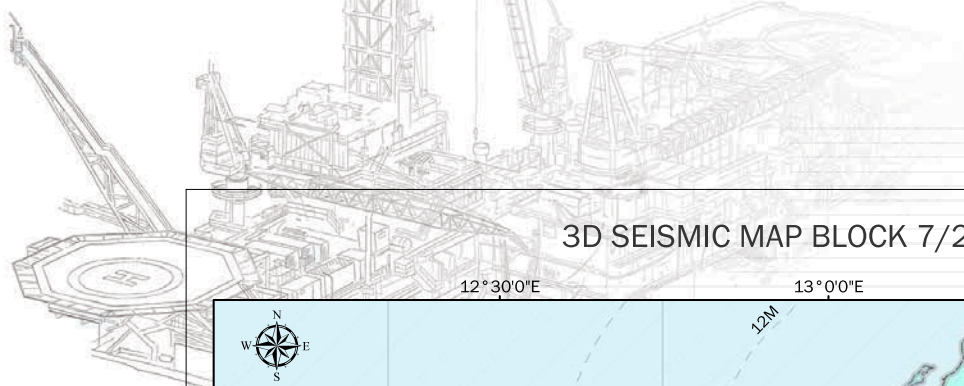
The source rocks were deposited in the structural lows, composed by a lacustrine silt-clay and carbonate sequence.

In the Post-Salt, the presence of raft-like structures (turtle shell) of Albian age are visible, strongly influenced by salt tectonics, and formation of listric growth faults. Antiforms and synforms structures from upper Cretaceous to Tertiary are also observed. At the Tertiary level, turbidite channels equivalent to those tested and proven in the Lower Congo Basin are evident.

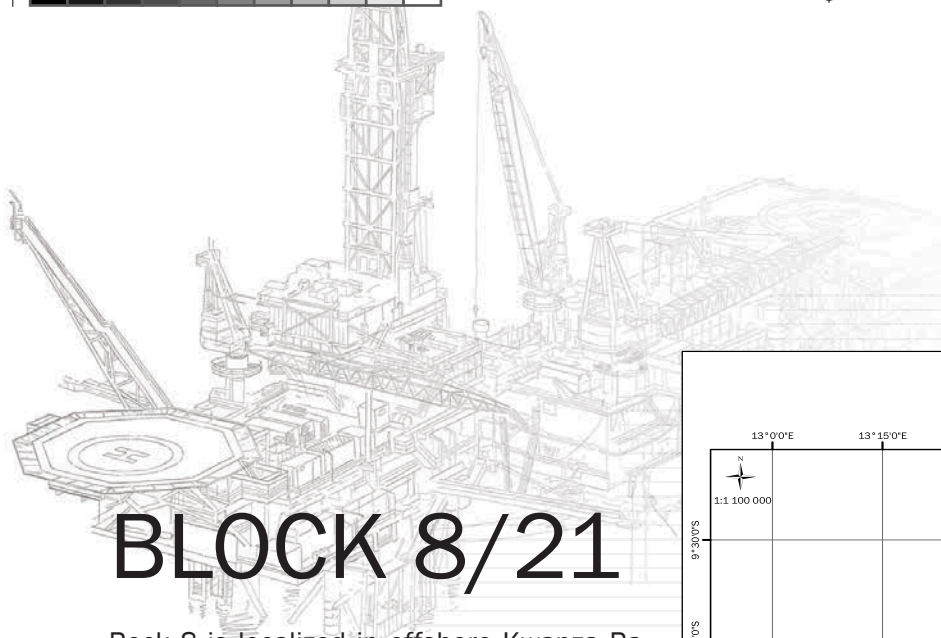




2D Seismic Coverage Map



3D Seismic Coverage Map



BLOCK 8/21

Block 8 is localized in offshore Kwanza Basin, in an area close to 4 835 Km² where the water depth ranges from 30 to 600 m.

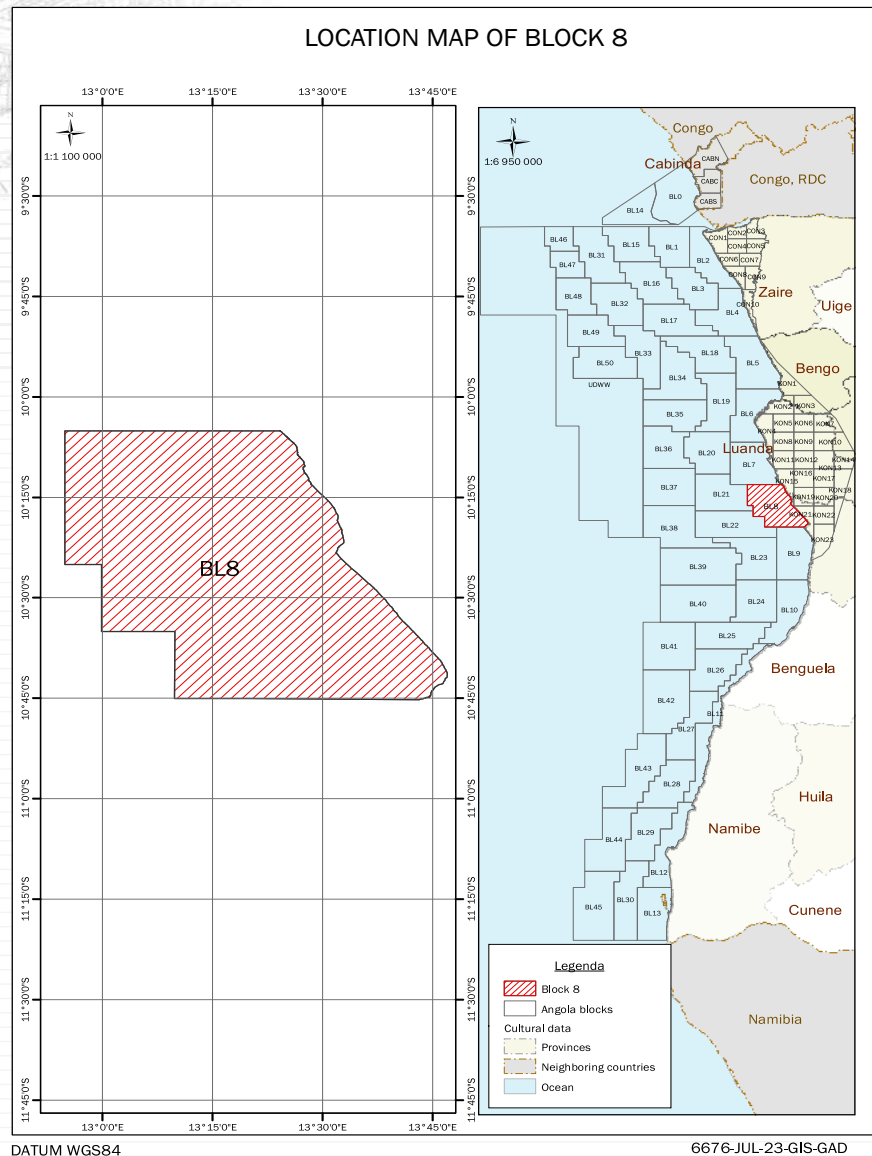
Block 8/21 is flanked by:

- North by block 7
- South by blocks 9 and 22
- East by blocks KON15 and KON21
- West by blocks 21 and 22.

Block 8/21 has 2D seismic coverage of approximately 5 376 km and 1 200 km² of 3D seismic.

2 wells drilled (Ametista-1 and Berilio-1, in Oligocene, Albian and Pre-salt).

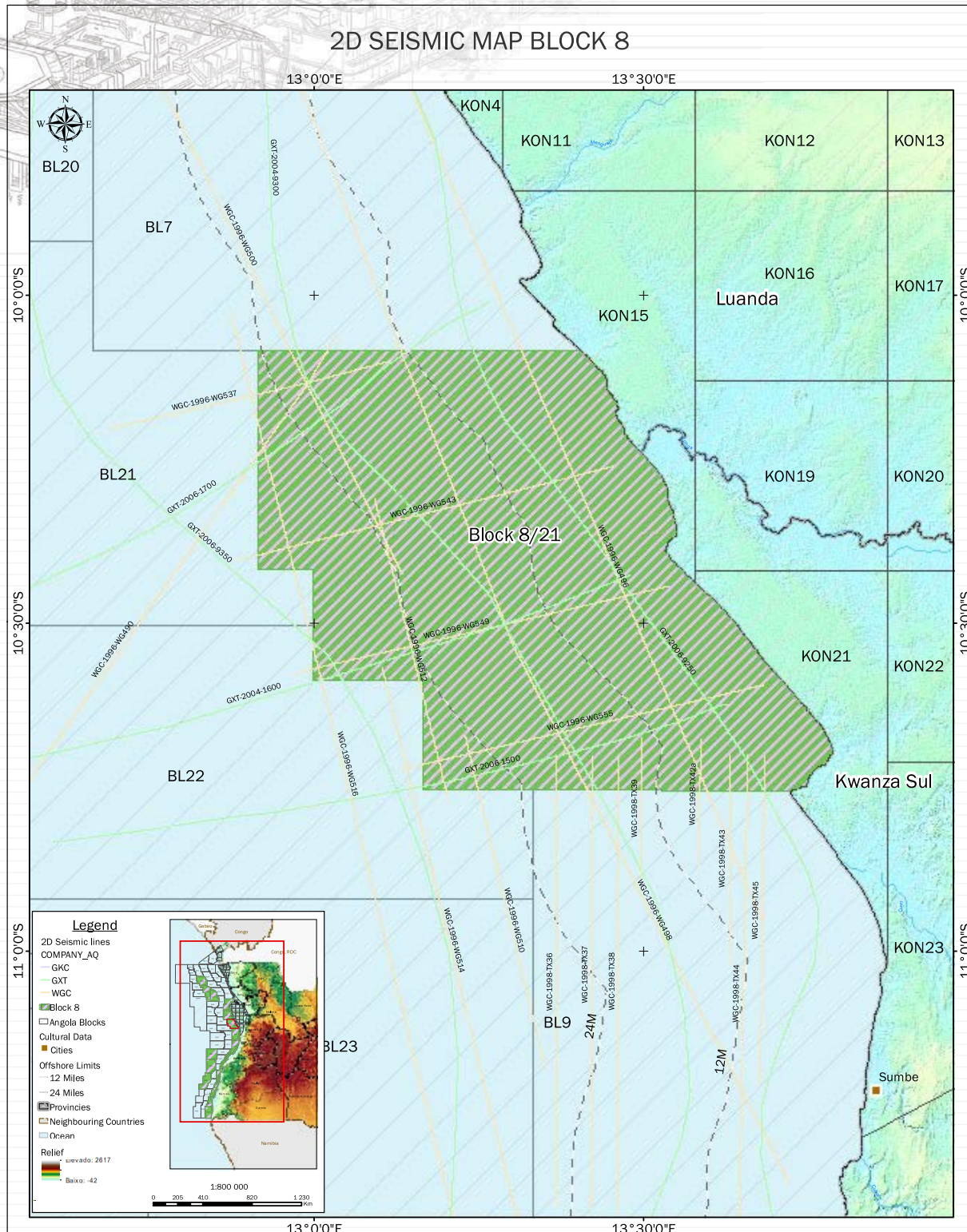
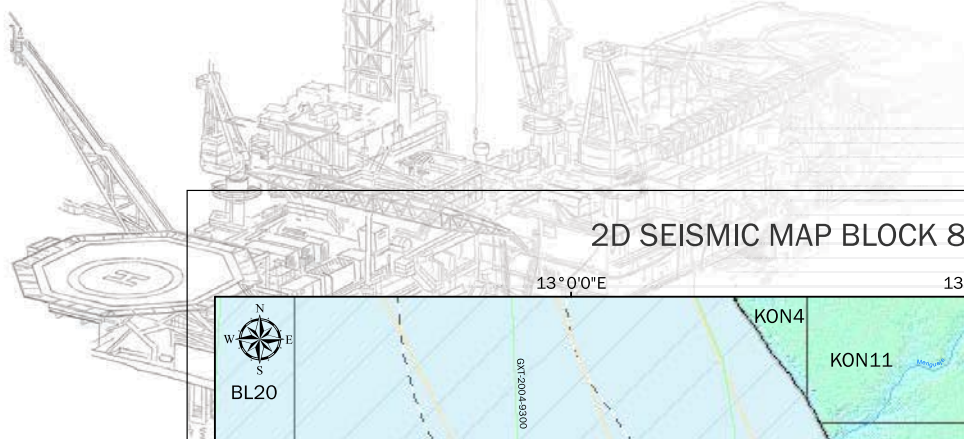
The geological model is characterized by a normal fault system on the basement forming horsts and grabens structures. In the grabens, sapropelic sediments rich in organic matter from the Cuvo Vermelho Formation were deposited forming the main pre-salt source rock.



On the top of horsts, lacustrine carbonates equivalent to the Lower Congo Basin Toca Formation were deposited while on its flanks were deposited sandstone sediments in pinch out against fault planes, the probable reservoirs of the Erva Formation Equivalent.

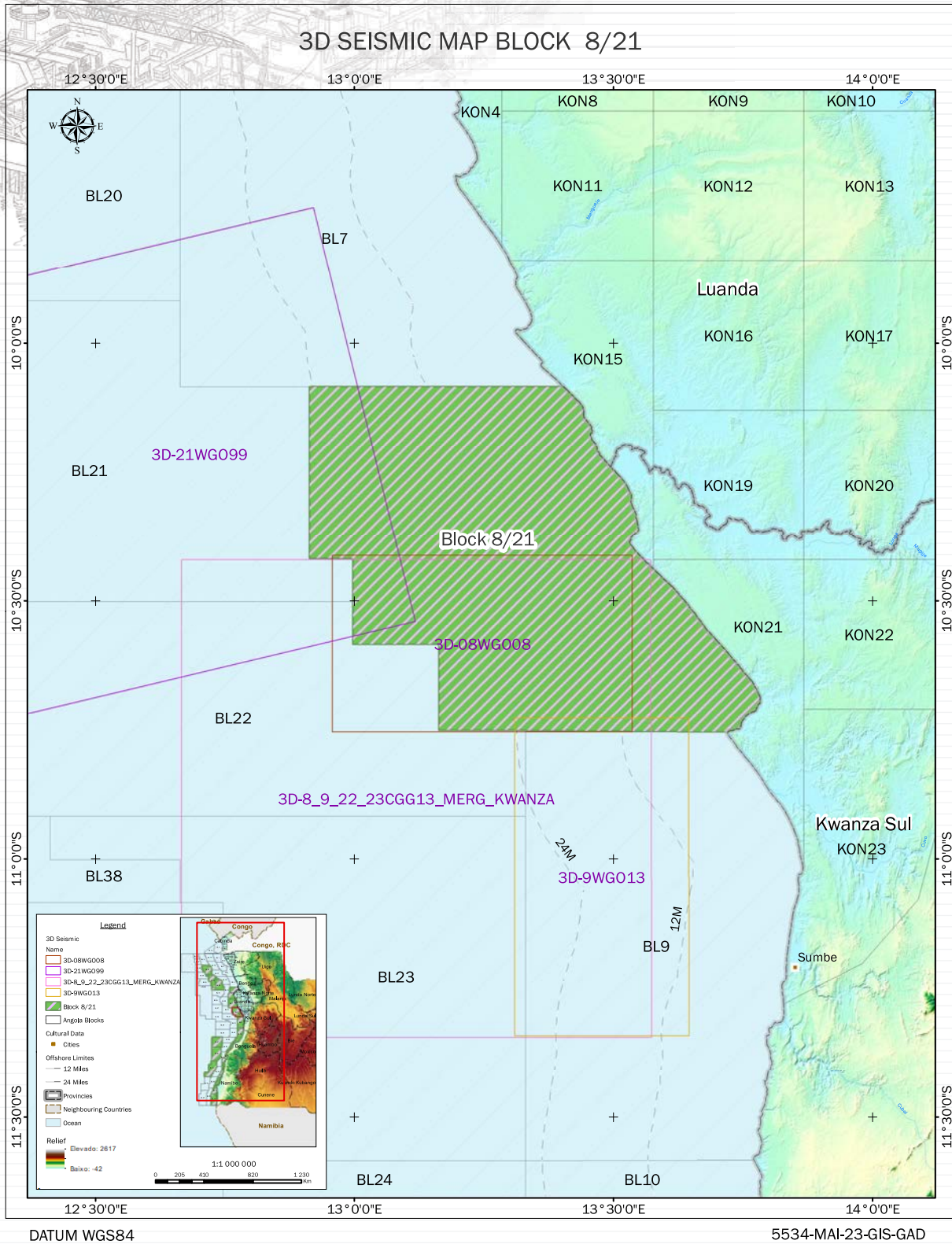
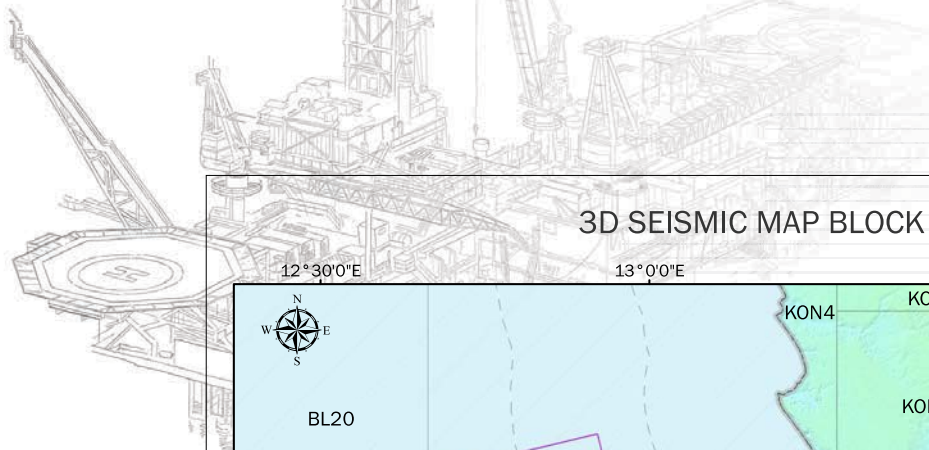
The domes and diapirs of the salt layer, responsible for the post-salt structuring can act as a seal at this level. The Albian is characterized by syndepositional normal growth faults, anticlinals, rafts and salt walls structures. The Upper Cretaceous is characterized by faults resulting from the salt movement. The Tertiary is less faulted with a clastic sedimentation where possible reservoirs constituted by the Oligo-Miocene turbidite channels can be found.





6686-JUL-23-GIS-GAD

2D Seismic Coverage Map



3D Seismic Coverage Map





BLOCK 9/21

Block 9/21 localized in offshore Kwanza Basin, in an area close to 4 001.36 Km² where the water depth ranges from 0 - 1000 m.

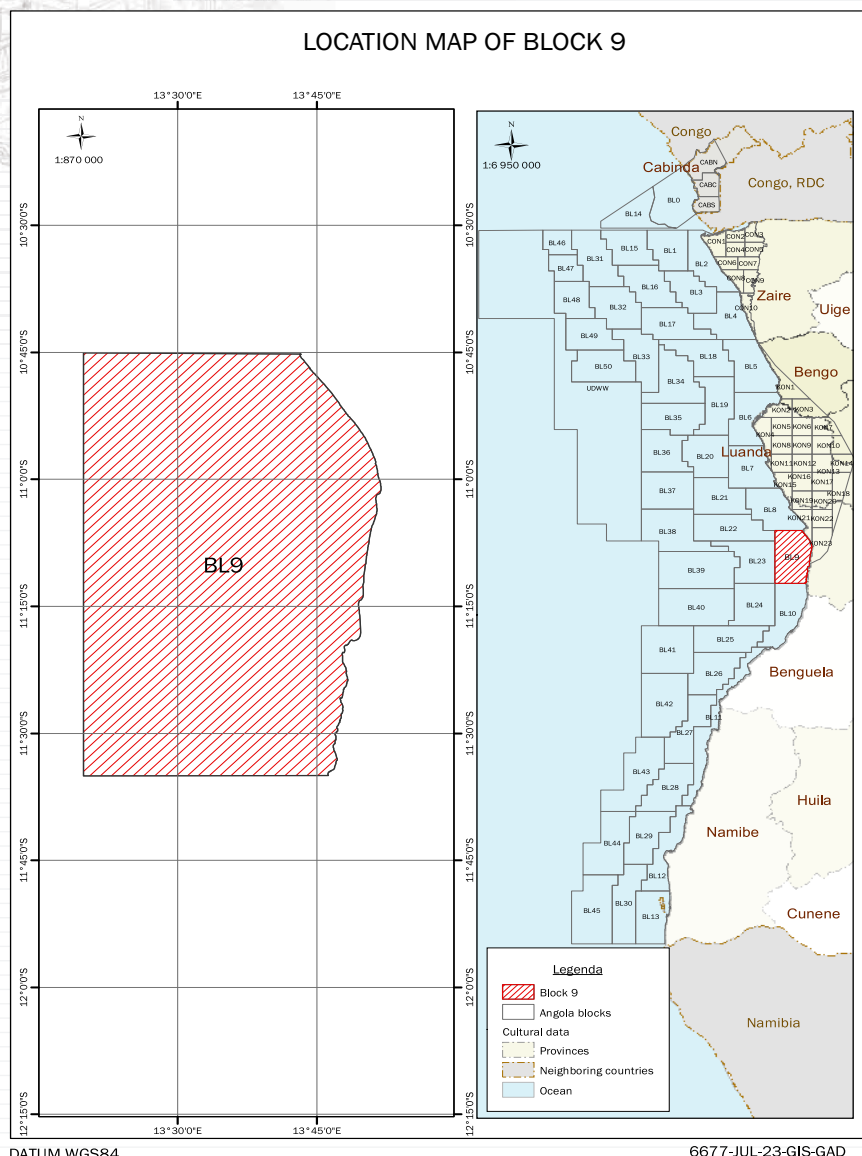
Block 9/21 is flanked by:

- North by block 8;
- South by block 10;
- East by blocks KON 21 and KON 23;
- West by blocks 22 and 23.

Acquired 5 571 Km of 2D Seismic and 2 650 Km² of 3D Seismic data.

8 wells drilled (Múcua-1, Maboque-1, Abacaxi-1, Dendén-1, Pitanga-1, Goiaba-1, Jambo-1 and Loengo-1, in Tertiary, Albion and Pre-salt). Three discoveries (Maboque-1, 26.7 °API; Abacaxi-1, 20-25 °API and Denden-1, 25 °API).

The geological model is characterized by a normal fault system on the basement forming horsts and grabens structures. In the grabens, sapropelic sediments rich in organic matter from the Red Cuvo Formation were deposited forming the main pre-salt source rock.



On the top of horsts, lacustrine carbonates equivalent to the Lower Congo Basin Toca Formation were deposited while on its flanks were deposited sandstone sediments in pinch out against fault planes, the probable reservoirs of the Erva Formation Equivalent.

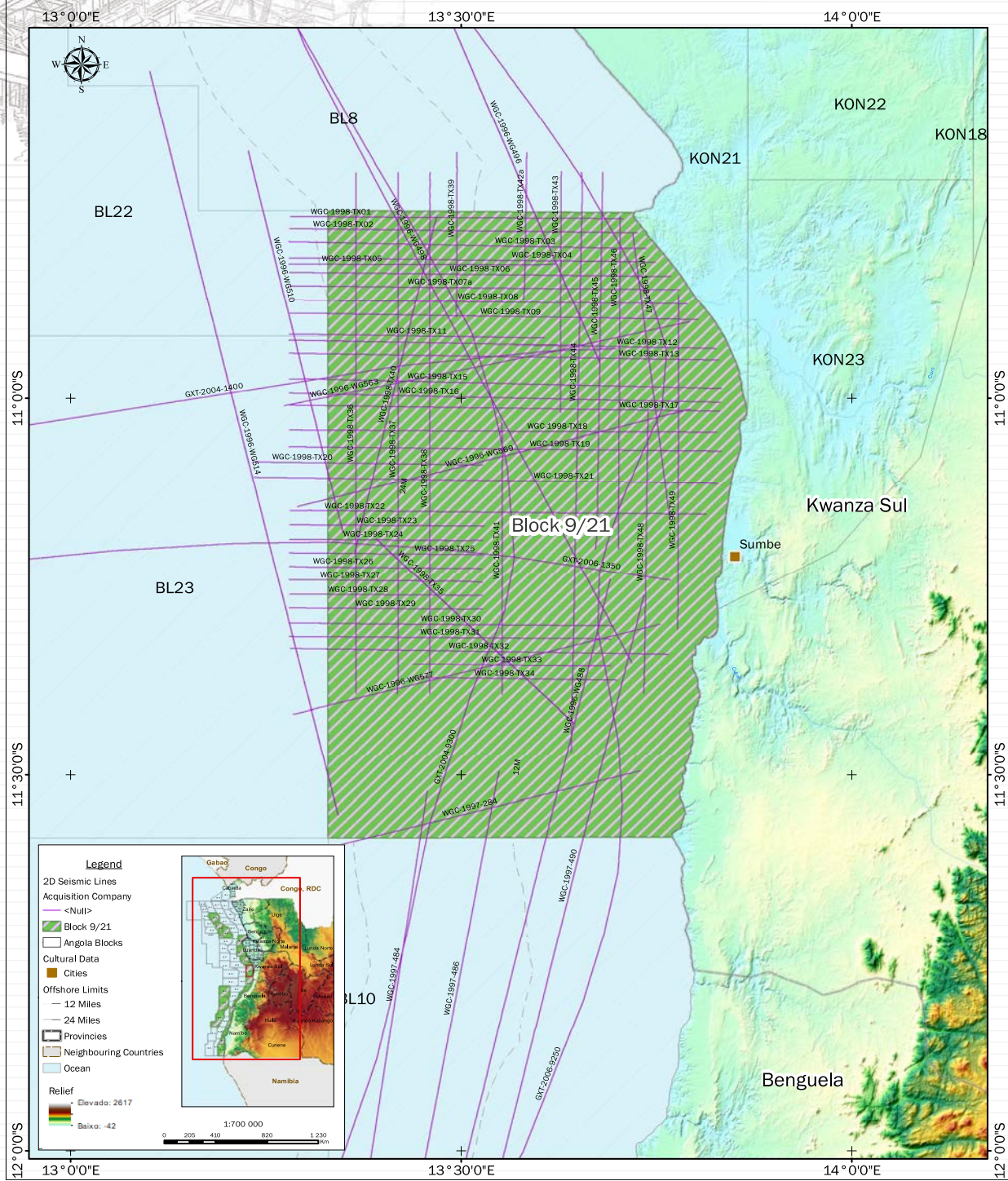
The domes and diapirs of the salt layer, responsible for the post-salt structuring can act as a seal at this level. The Albion is characterized by syndepositional normal growth faults, anticlinals, rafts and salt walls structures.

The Upper Cretaceous is characterized by faults resulting from the salt movement. The Tertiary is less faulted with a clastic sedimentation where possible reservoirs constituted by the Oligo-Miocene turbidite channels can be find.





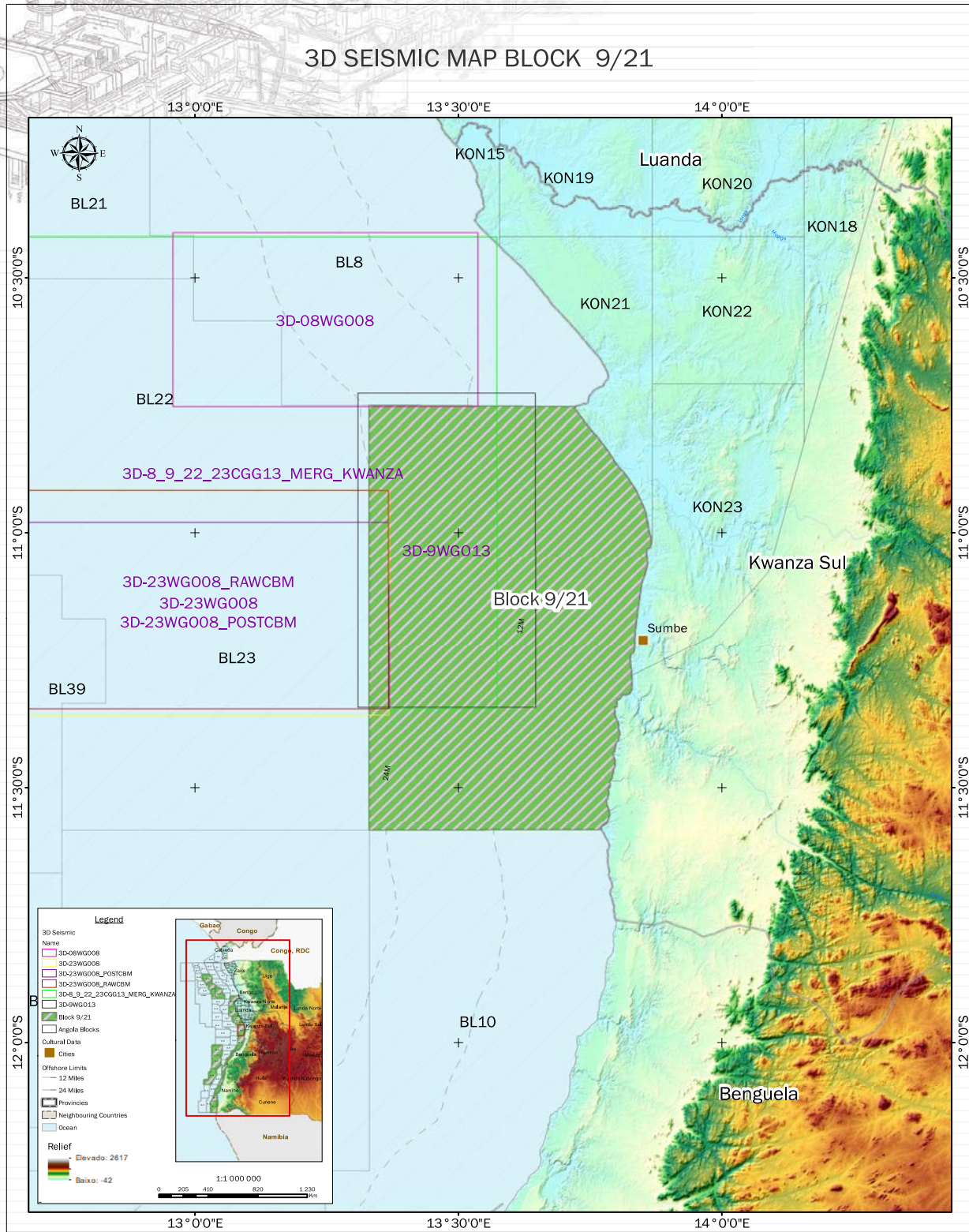
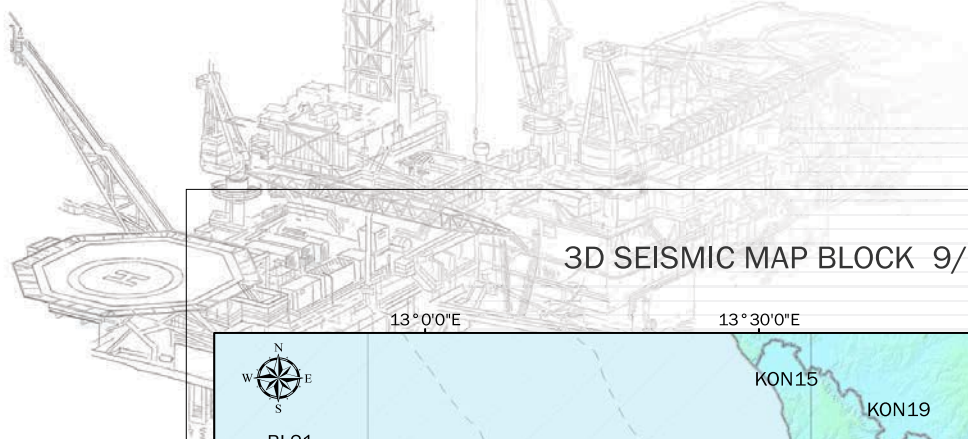
2D SEISMIC MAP BLOCK 9/21



DATUM WGS84

5517-MAI-23-GIS-GAD

2D Seismic Coverage Map



3D Seismic Coverage Map





BLOCK 10

Block 10 is located to the west of Angola in the Maritime Basin of Benguela, south of the Kwanza onshore basin, in shallow waters with a water depth ranging from 0 to 475 m and a total coverage of approximately 4,780.00 km².

Block 10 is flanked by:

- North by Block 9;
- South through Block 11;
- East by the Province of Benguela;
- West through Blocks 24 and 25;

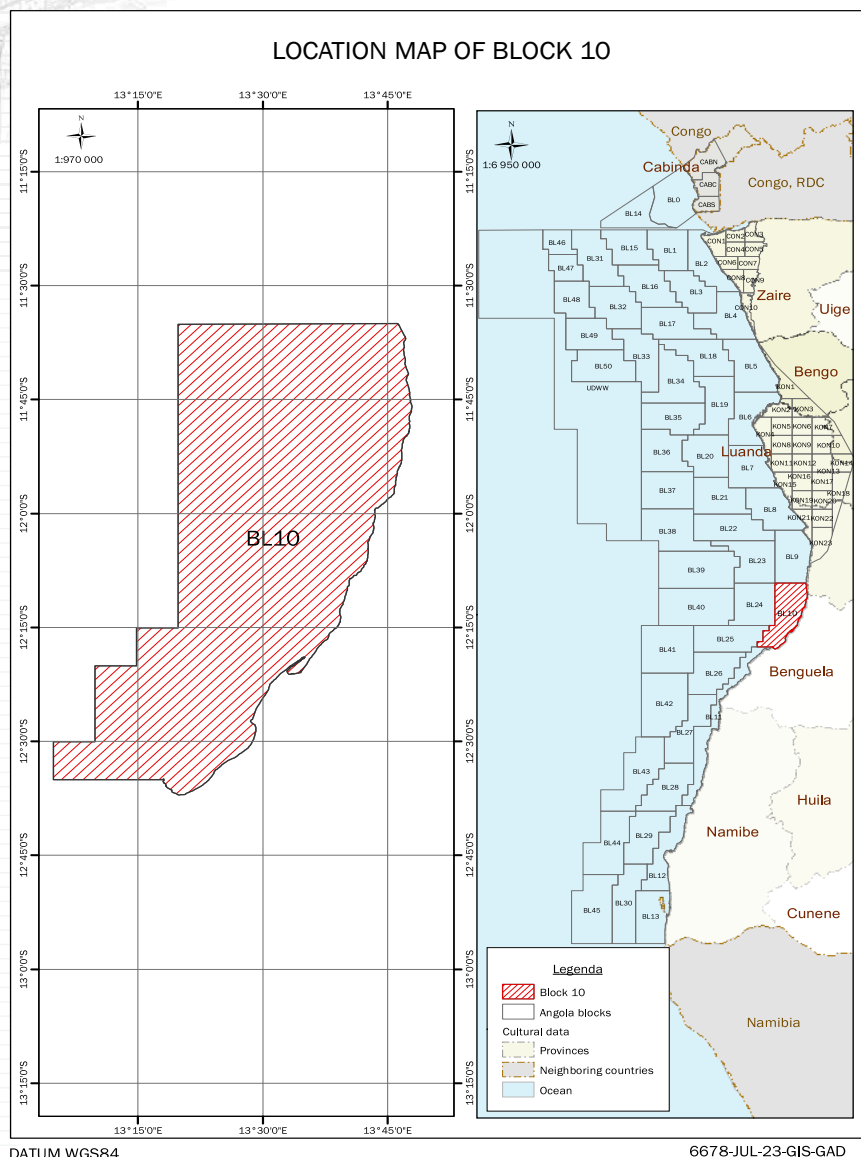
Block 10 has a 2D seismic coverage of approximately 1492 Km and 1180,99 Km² of 3D.

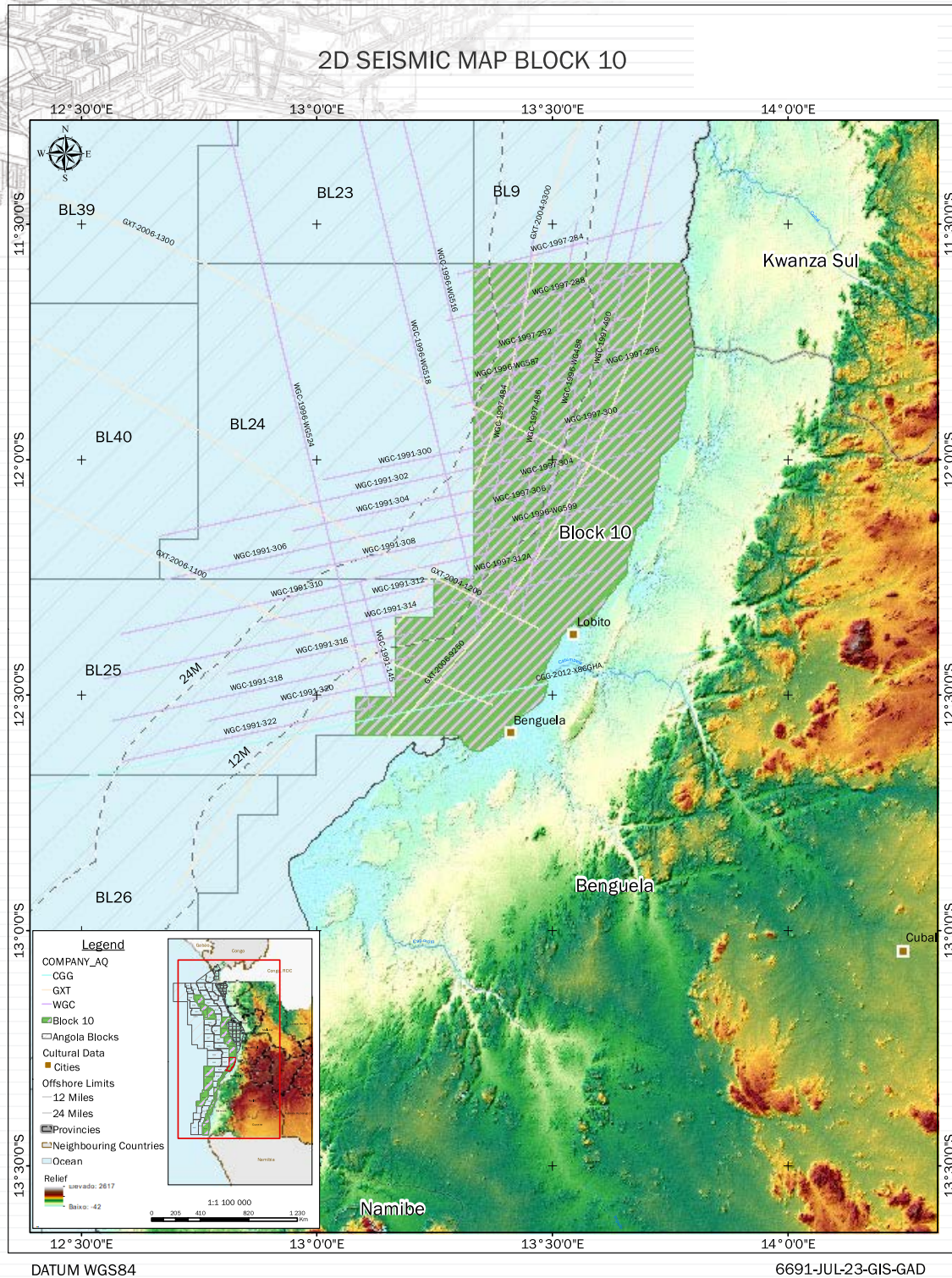
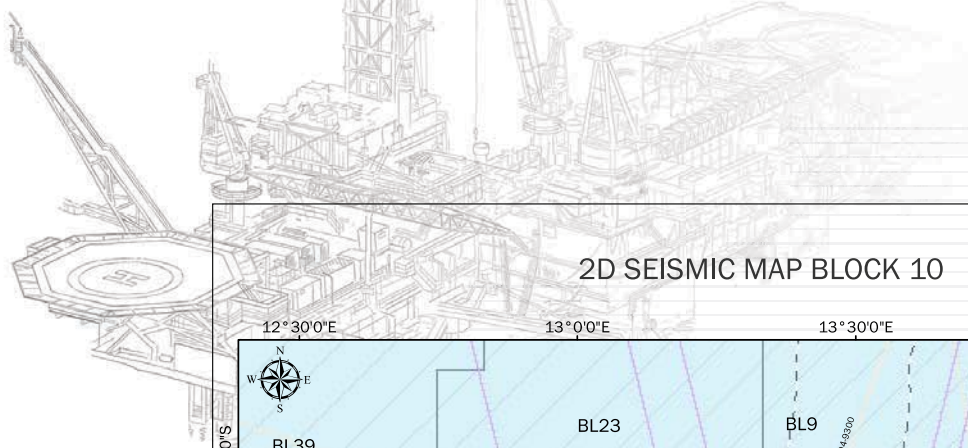
The Pre-Salt is characterized by geological structures resulting from a rift phase large-scale faulting that created structural highs (Horst) in the eastern part of the Block in which carbonates were deposited and by Grabens in the western part where organic rich clays were deposited.

The Post-Salt section in the Albian level is characterized by growth faults, rafts, semi rafts and rollovers to the west and anti-form structures to the East.

In the Tertiary we can observe extensional faults and arenitic channel complexes of Oligo-Miocene age, resulting from the turbidity current.

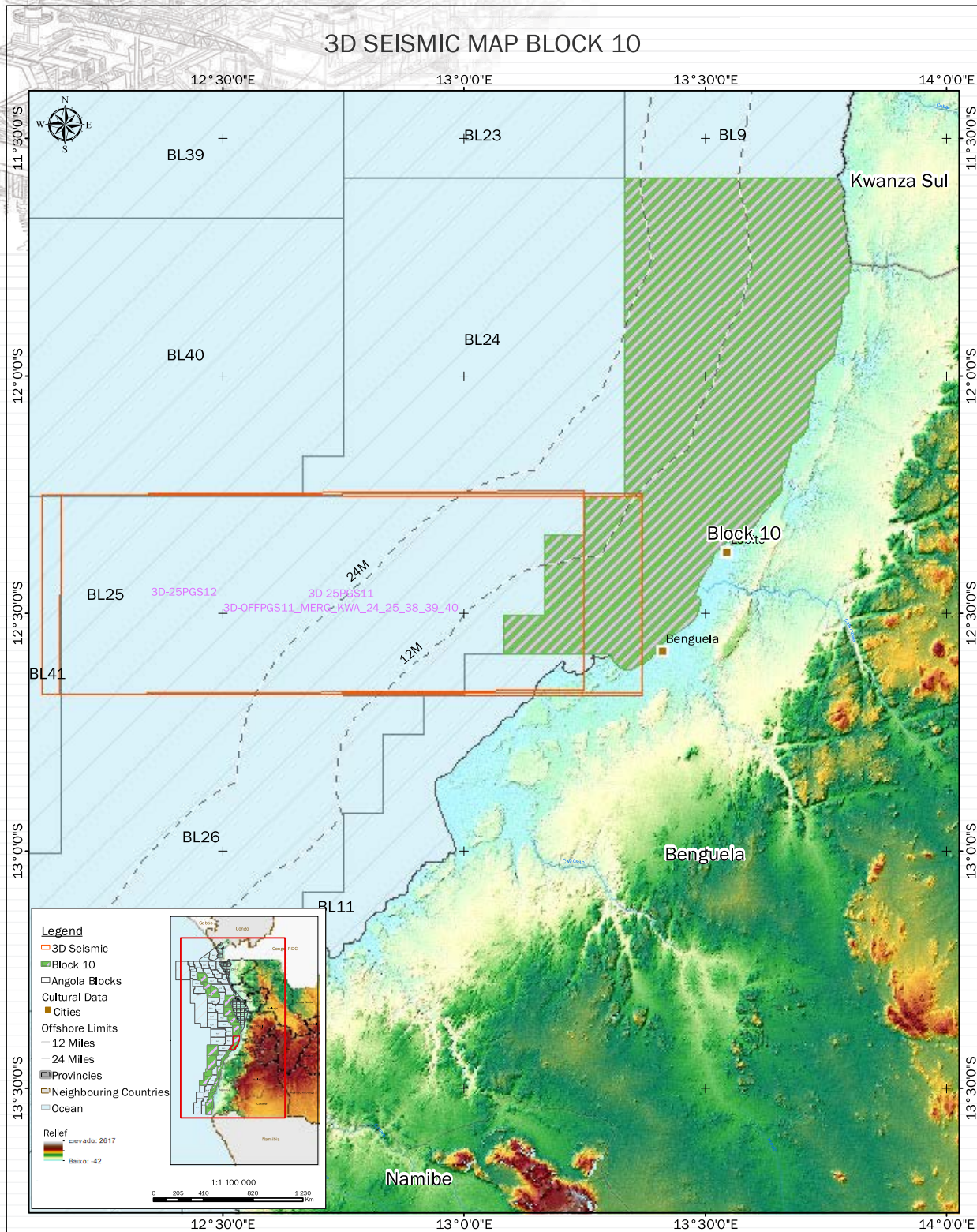
The re-evaluation of the block was conducted in order to identify new structures, confirm untested structures, as well as understand the failure of the two drilled wells.





2D Seismic Coverage Map





2D Seismic Coverage Map



BLOCK 11

Block 11 is located offshore Namibe Basin occupying an area of approximately 5.074Km², in a water depth ranging from 0 to 200 meters. The Block is adjacent to the Coast line.

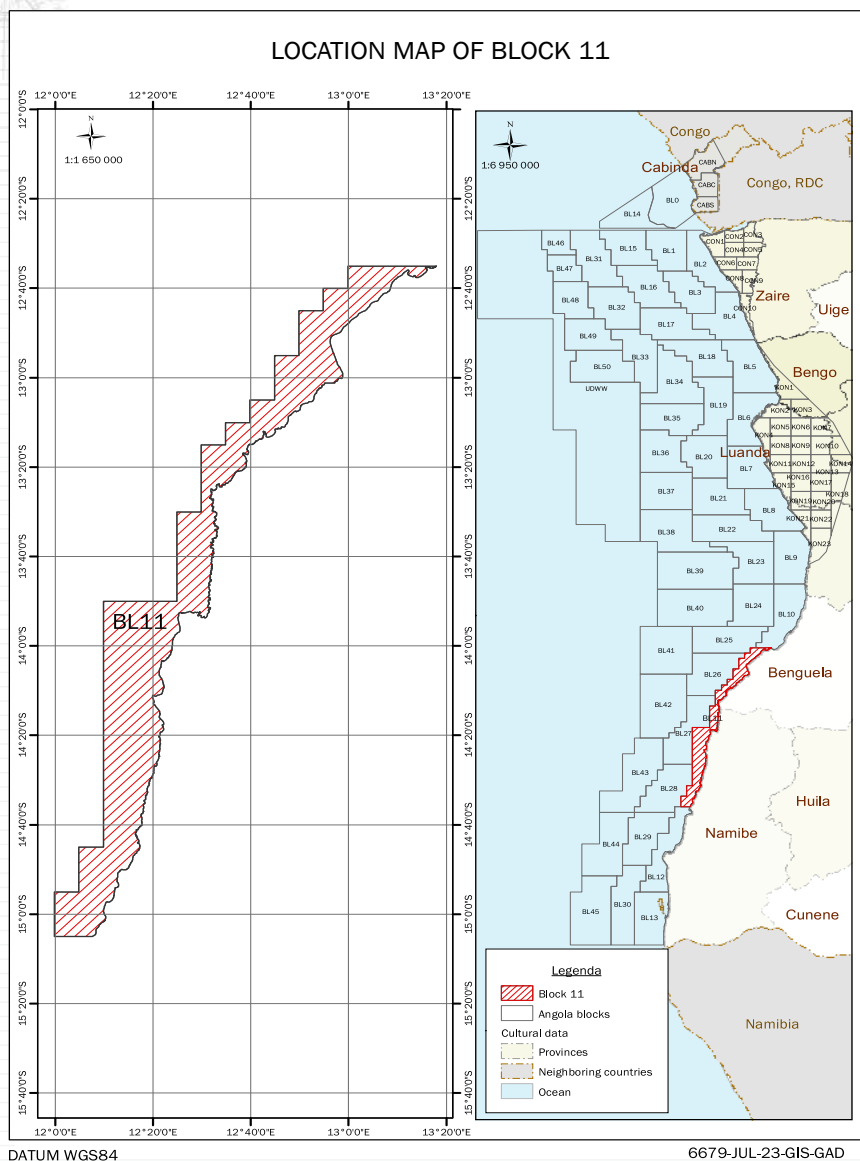
Block 11 It is flanked by:

- North by Block 10
- South by Block 12
- East by Blocks 26, 27 and 28
- West by coast line.

Block 11 has a 2D seismic coverage of approximately 1492 Km.

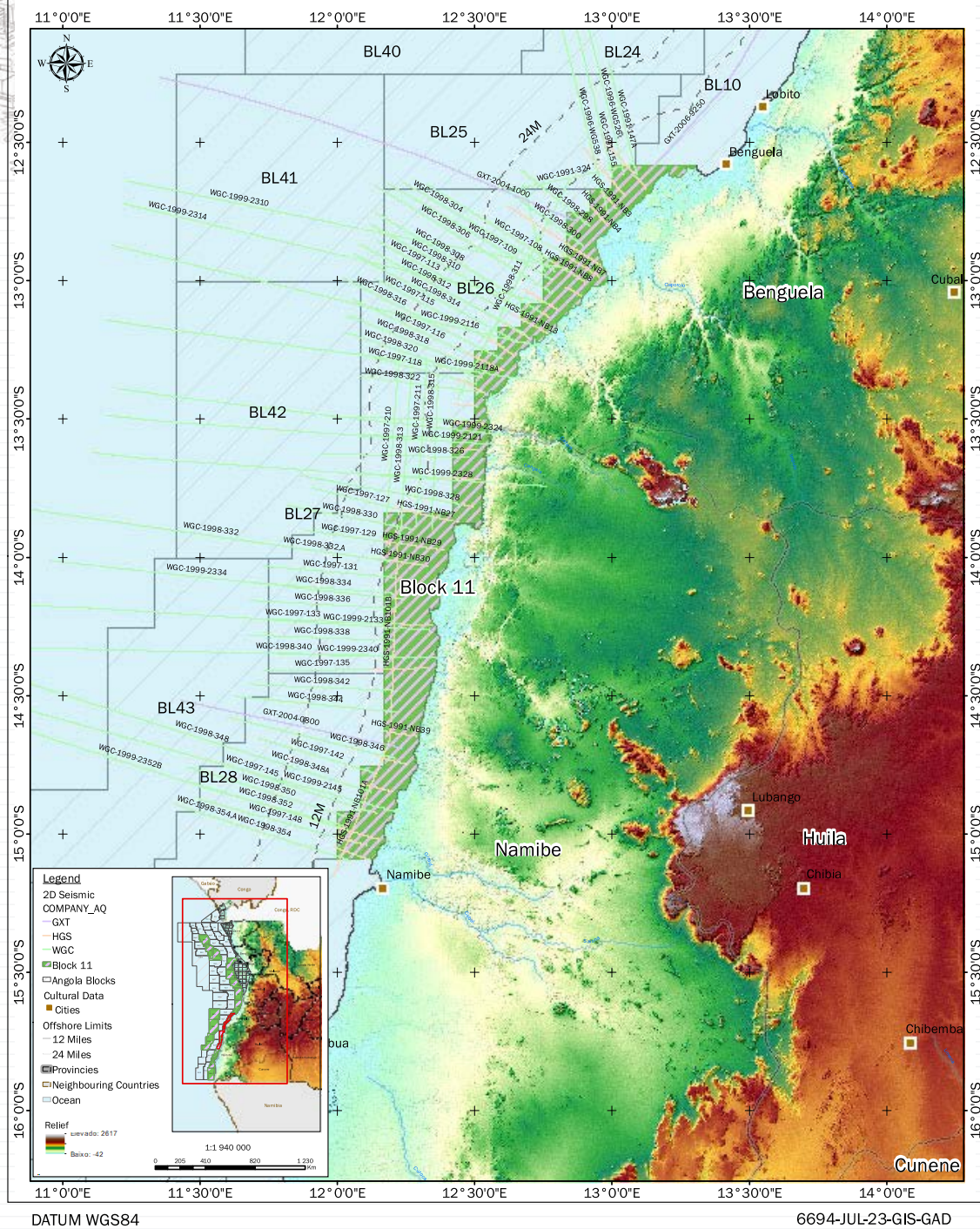
The main tectonic events known in Block 11 observed from magnetometric (RTP) and gravimetric data (Bouguer anomaly of the public domain) as well as seismic are the Syn-rift and Post-rift phases of the Cretaceous to Recent age.

Pre-Salt geological structures are characterized by plate tectonics in the Rift phase, while in the Post-Salt period they are characterized by the salt tectonics of the post-rift phase, which created mound formations at the top of Cretaceous Horst and sandstone channels in the Oligo-Miocene interval.





2D SEISMIC MAP BLOCK 11



2D Seismic Coverage Map



BLOCK 12

Block 12 is in the southern part offshore Namibe Basin, in central Angola. It has an area of approximately 4219.19 km² and water depth ranging from 0 to 400 meters.

Block 12 is flanked by:

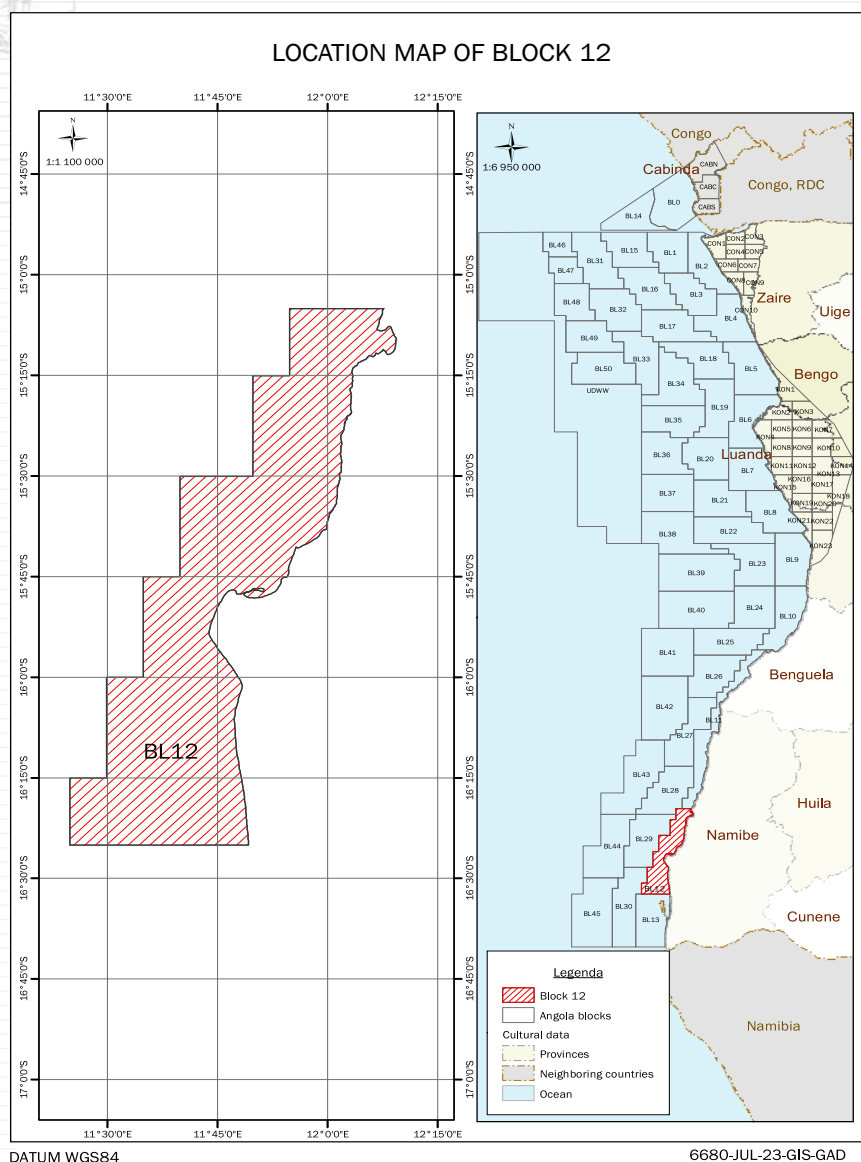
- North by Block 11;
- South by Block 13;
- East by the Coastline;
- West by Block 29.

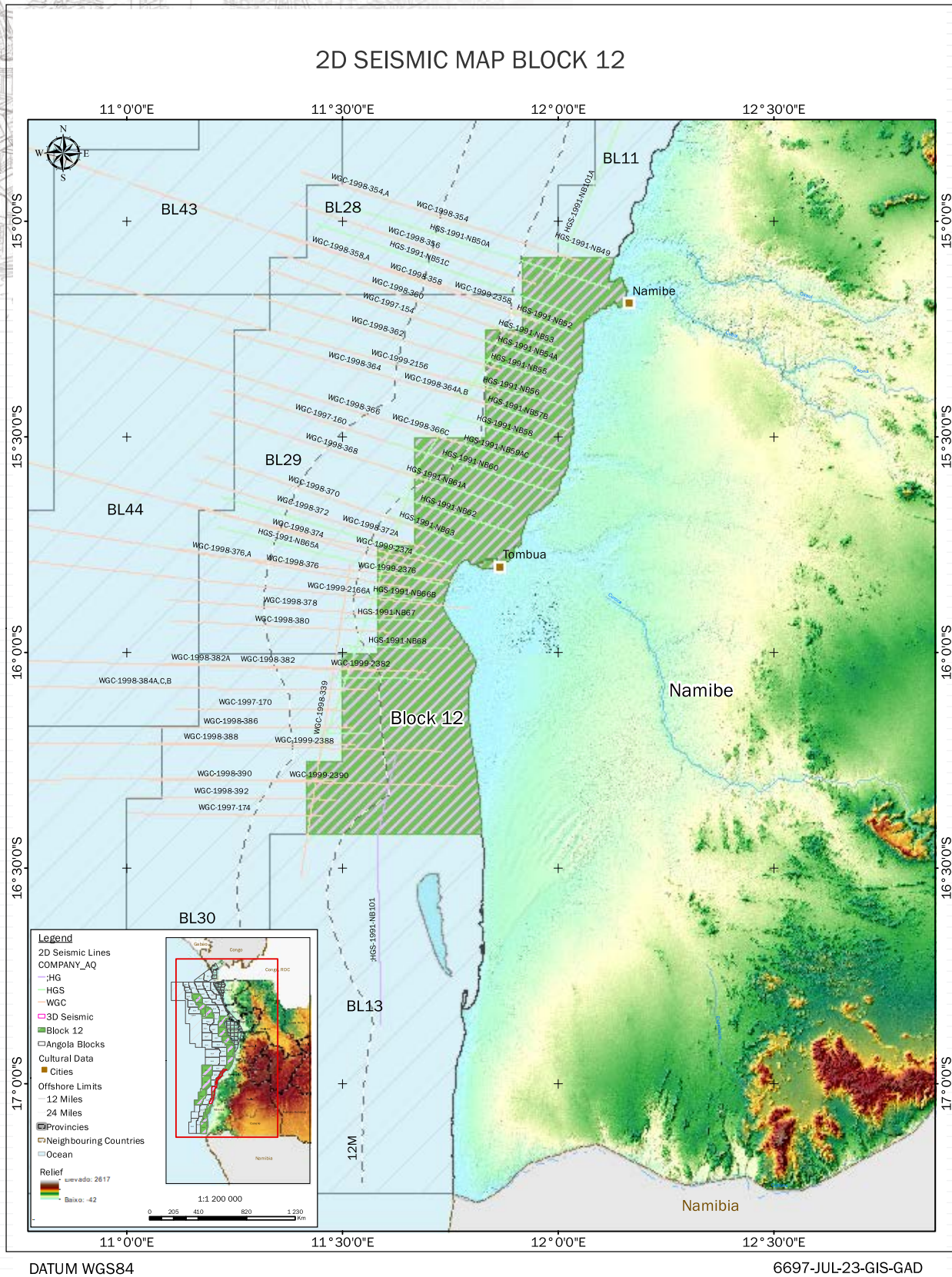
Block 12 has a 2D seismic coverage of approximately 1824 Km.

The main tectonic events observed in block from magnetometry (RTP), gravimetric and 2D seismic data indicate that geological structures in the pre-salt are characterized by a strong tectonism, resulting in the creation of Horsts and Grabens.

The structural highs (horsts) are associated with the formation of mound shaped carbonate reservoirs and sandstone channels in the fault planes. The organic-rich source rock from Cuvo Formation are found in the Grabens.

The post-salt section in the Albian and Upper Cretaceous is characterized by anti-forms, rafts, semi-rafts and growth faults, however, in the Oligo-Miocene interval, it is characterized by turbidites channels.





2D Seismic Coverage Map





BLOCK 13

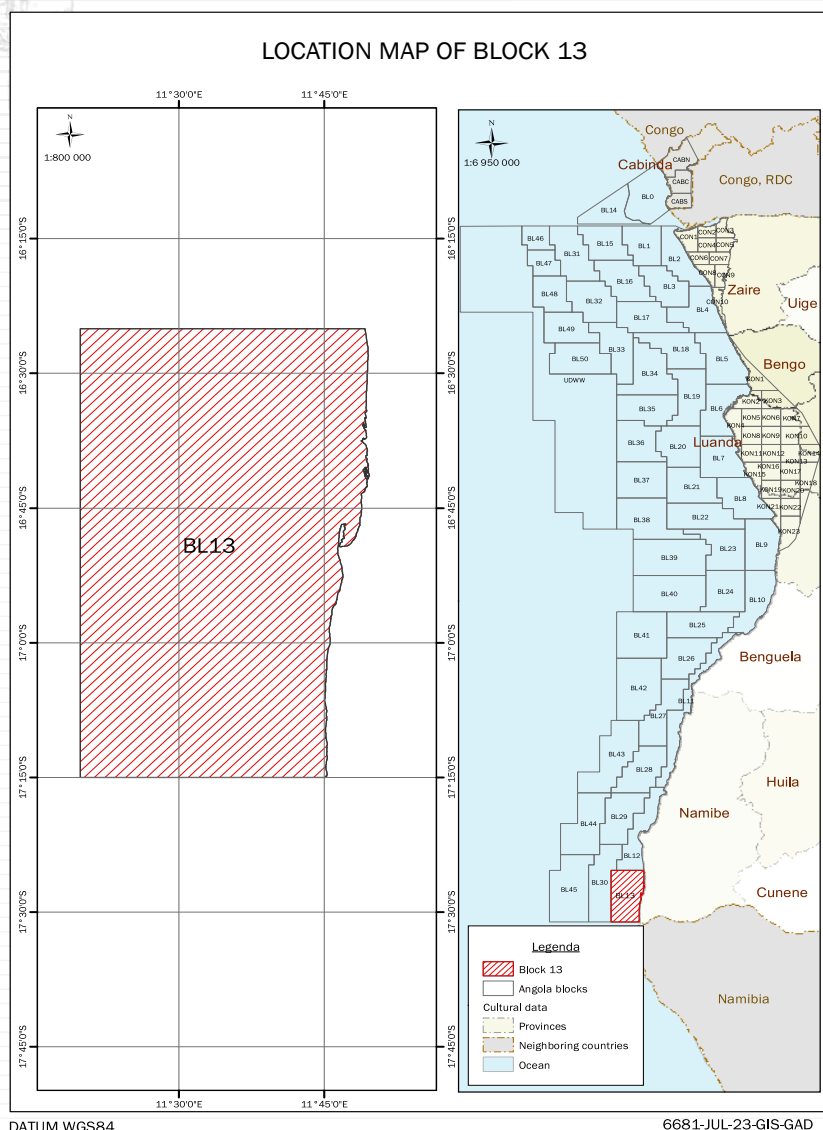
Block 13 is in the southern shallow waters offshore Namibe Basin, in a water depth ranging from 50 to 1 000 m. covering an area of approximately 4 513.30 km².

Block 13 is flanked by:

- North by Block 12;
- South by Namibian Offshore Basin;
- East by Namibe Onshore Basin
- West by Block 30.

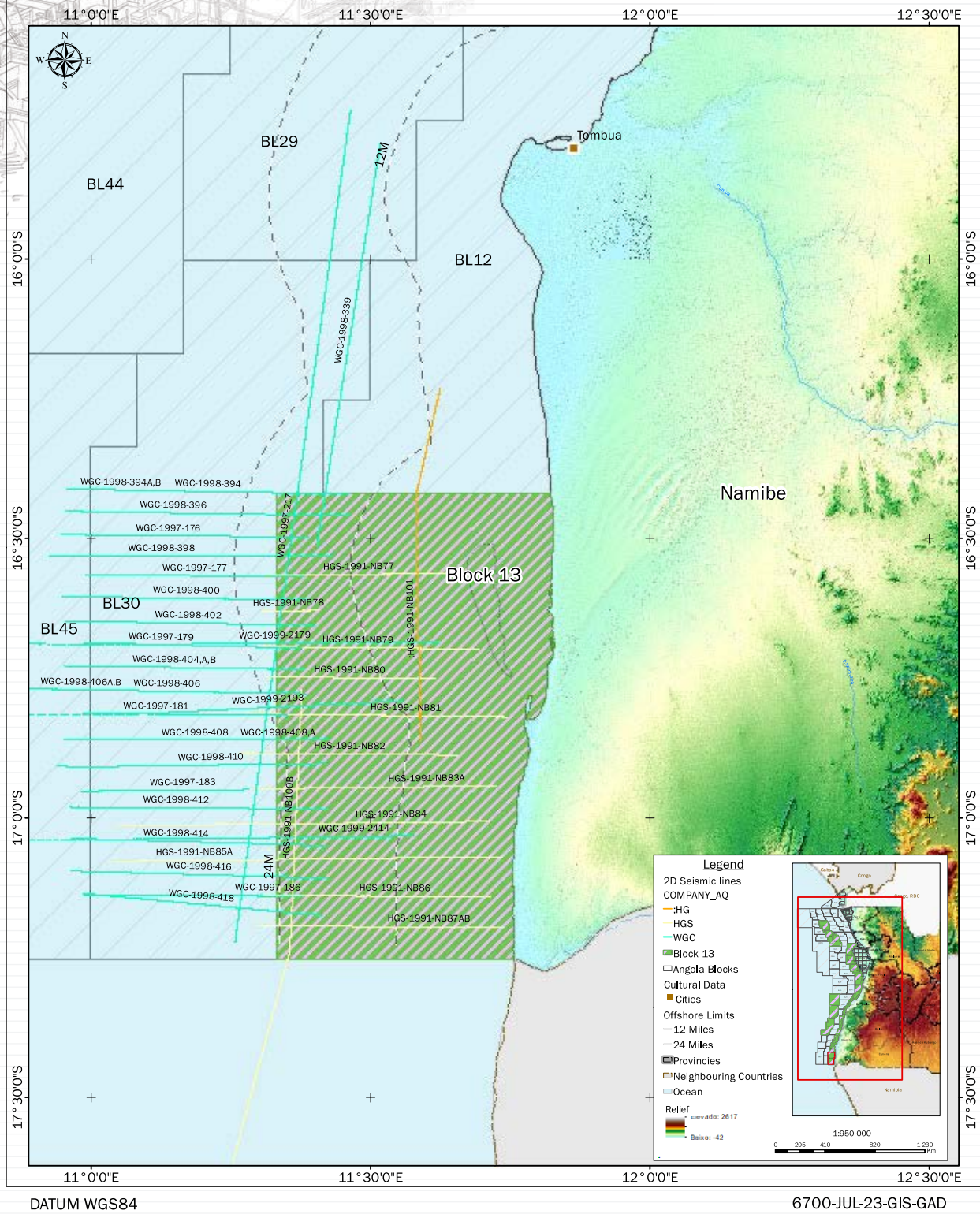
Block 13 has a 2D seismic coverage of approximately 1742 Km.

The pre-salt play is characterized by a strongly faulted basement due to the very accentuated tectonism that originated the horsts and grabens as can be observed from the integration of magnetometry (RTP), gravimetry (Bouguer anomaly of the public domain) and seismic data. The Pre-salt section is identified in seismic by possible mounds at the top of the horsts and pinch-out structures. The Post-salt is characterized by rafts and anticlines in the Albian and sandstone channels in the Oligo-Miocene interval.

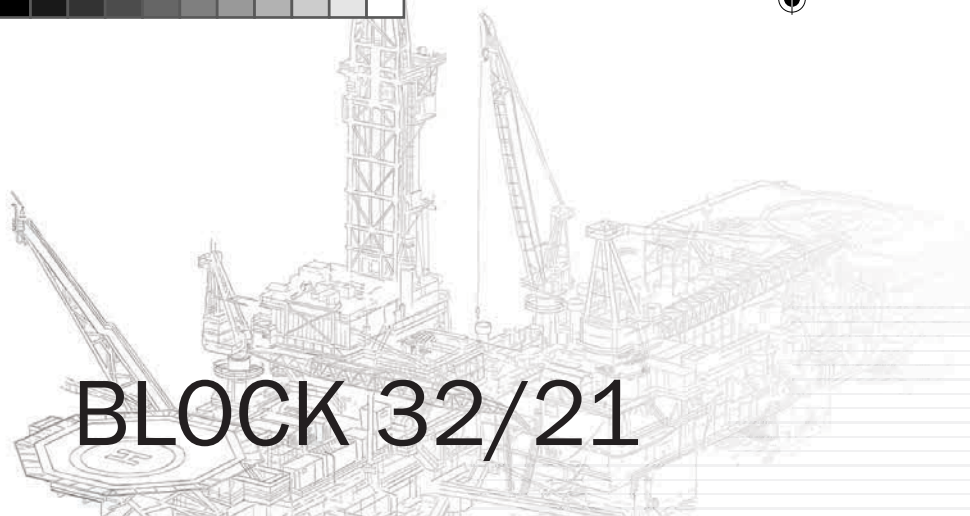




2D SEISMIC MAP BLOCK 13



2D Seismic Coverage Map



BLOCK 32/21

Block 32 is in the ultra-deep waters offshore Congo Basin, in central Angola. It has an area of approximately 5 089 km² and water depth ranging from 1500 to 2500 meters.

Block 32 is flanked by:

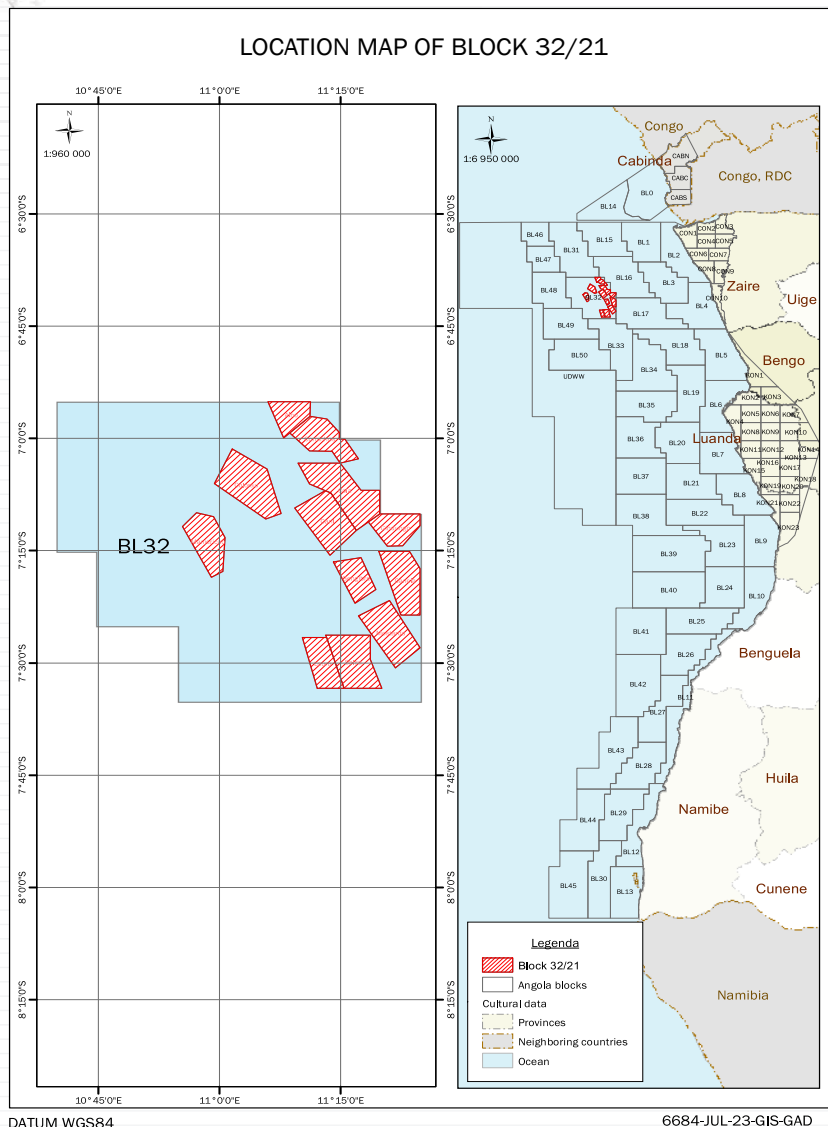
- North by Block 31;
- South by Block 33;
- East by Block 16 and 17;
- West by Blocks 48.

Regarding existing seismic, the Block has coverage of 2 502,37 km² 2D seismic, 13,832 km² of 3D seismic and approximately 1,435 km² of 4D seismic.

The main tectonic events observed in block from magnetometry (RTP), gravimetric and 2D seismic data indicate that geological structures in the pre-salt are characterized by a strong tectonism, resulting in the creation of Horsts and Grabens.

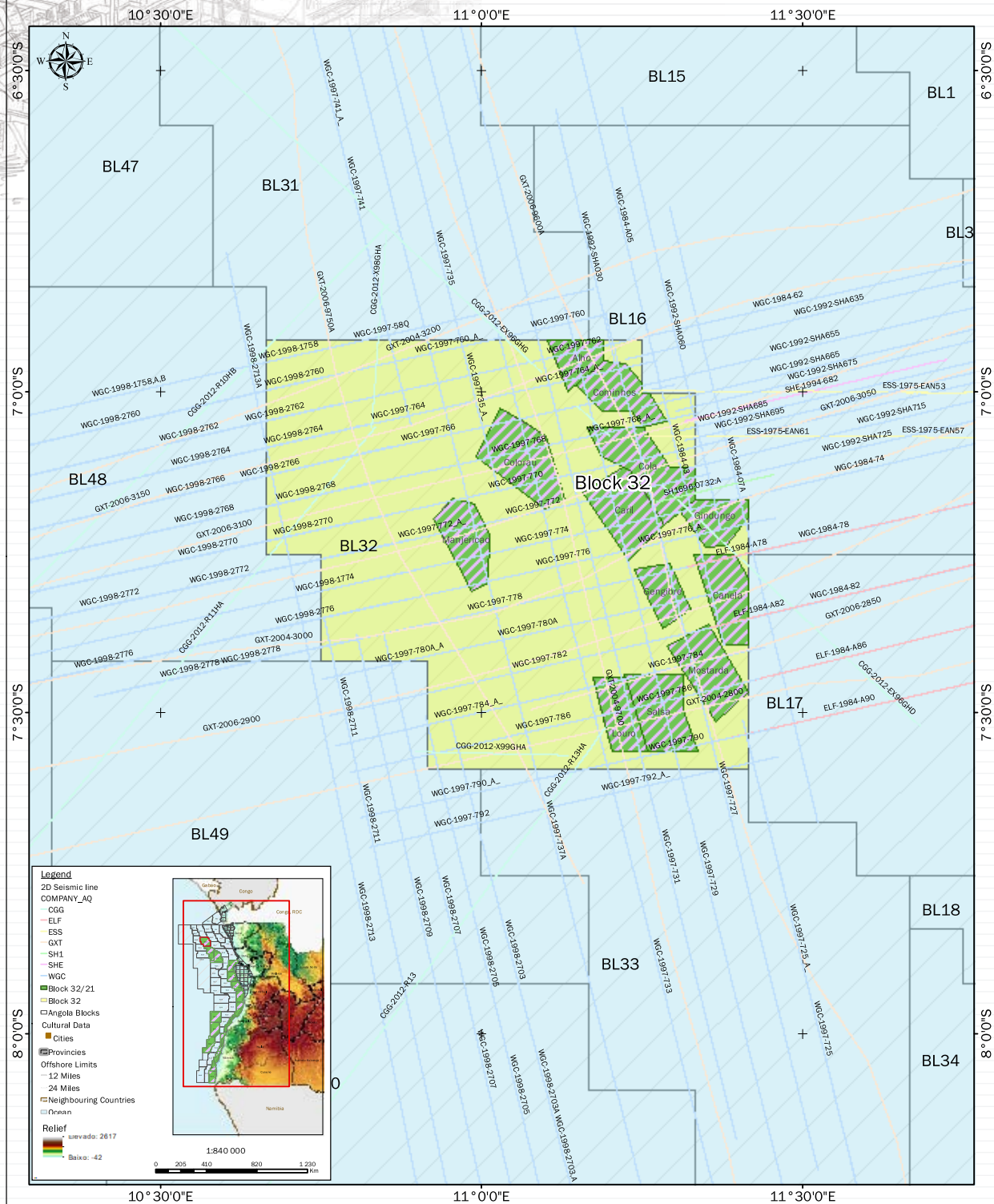
The block is characterized by a normal fault system on the basement forming horsts and grabens structures at the pre-salt level. On the grabens, sediments rich in organic matter from the Bucomazi Formation were deposited, on the top of horsts were deposited lacustrine carbonates from the Toca Formation while at its flanks were deposited sandstone sediments in pinch out, the Lucula formation.

The Loeme Formation is responsible on the strong post-Salt structuring and acts as a seal. The Albian is characterized by normal listric growth faults generating antiform structures. Tertiary is marked by post-depositional extensional faults and by turbidite channels as reservoirs.





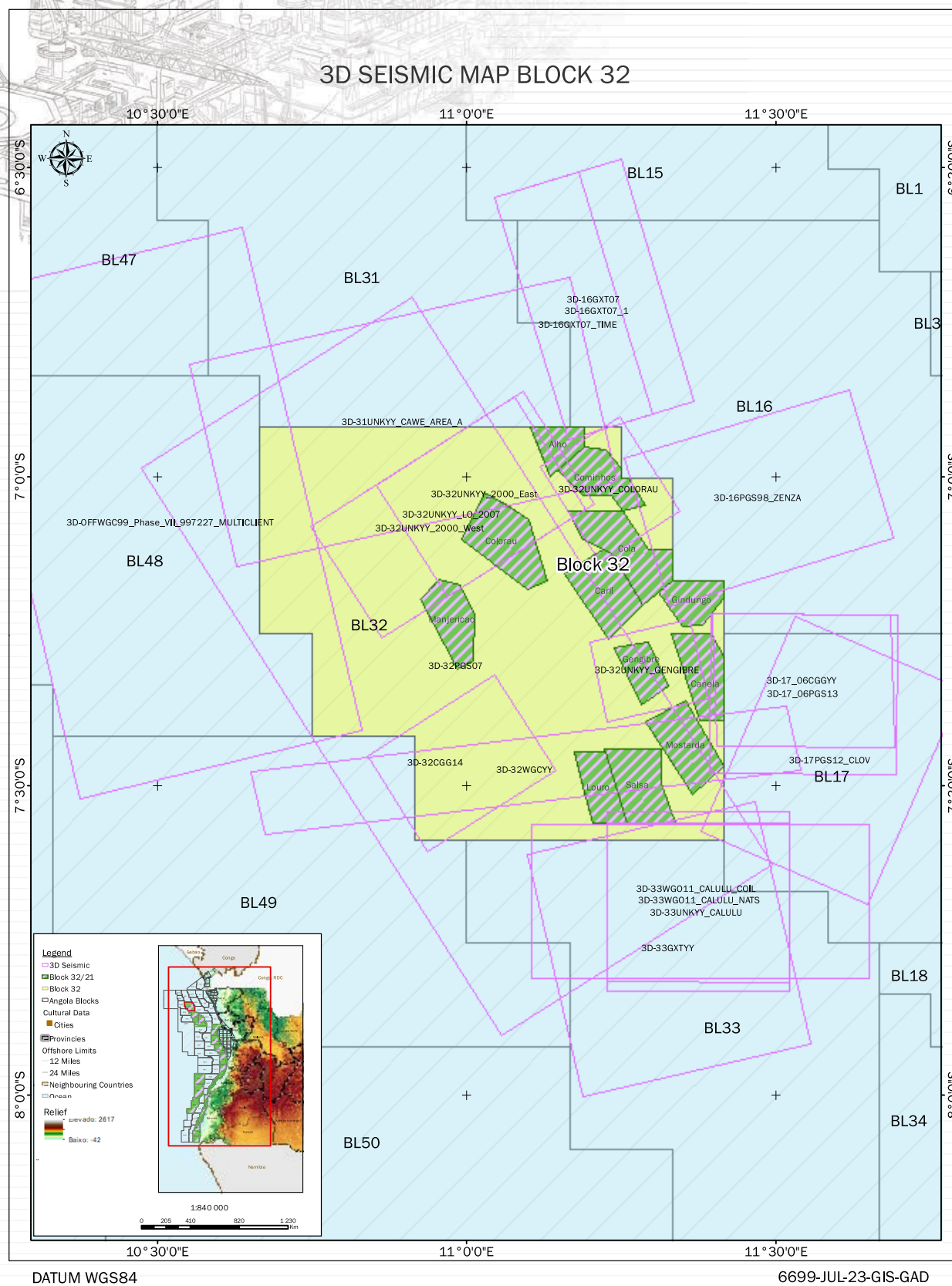
2D SEISMIC MAP BLOCK 32



DATUM WGS84

6698-JUL-23-GIS-GAD

2D Seismic Coverage Map



3D Seismic Coverage Map



BLOCK 33/21

Os located in ultra-deep waters on the North Lower Congo Basin, with a depth of 2 000 – 2 500 m. It has an area of approximately 4 925 km².

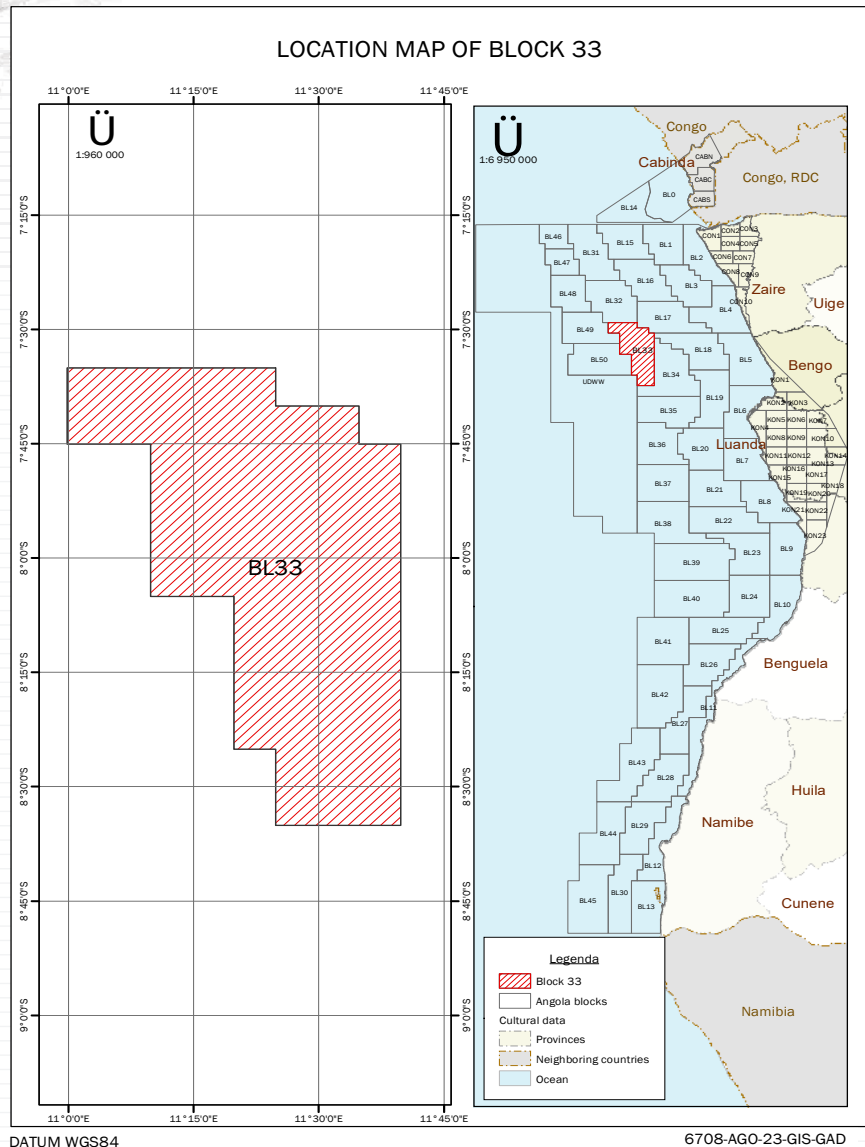
Block 33/21 is flanked by:

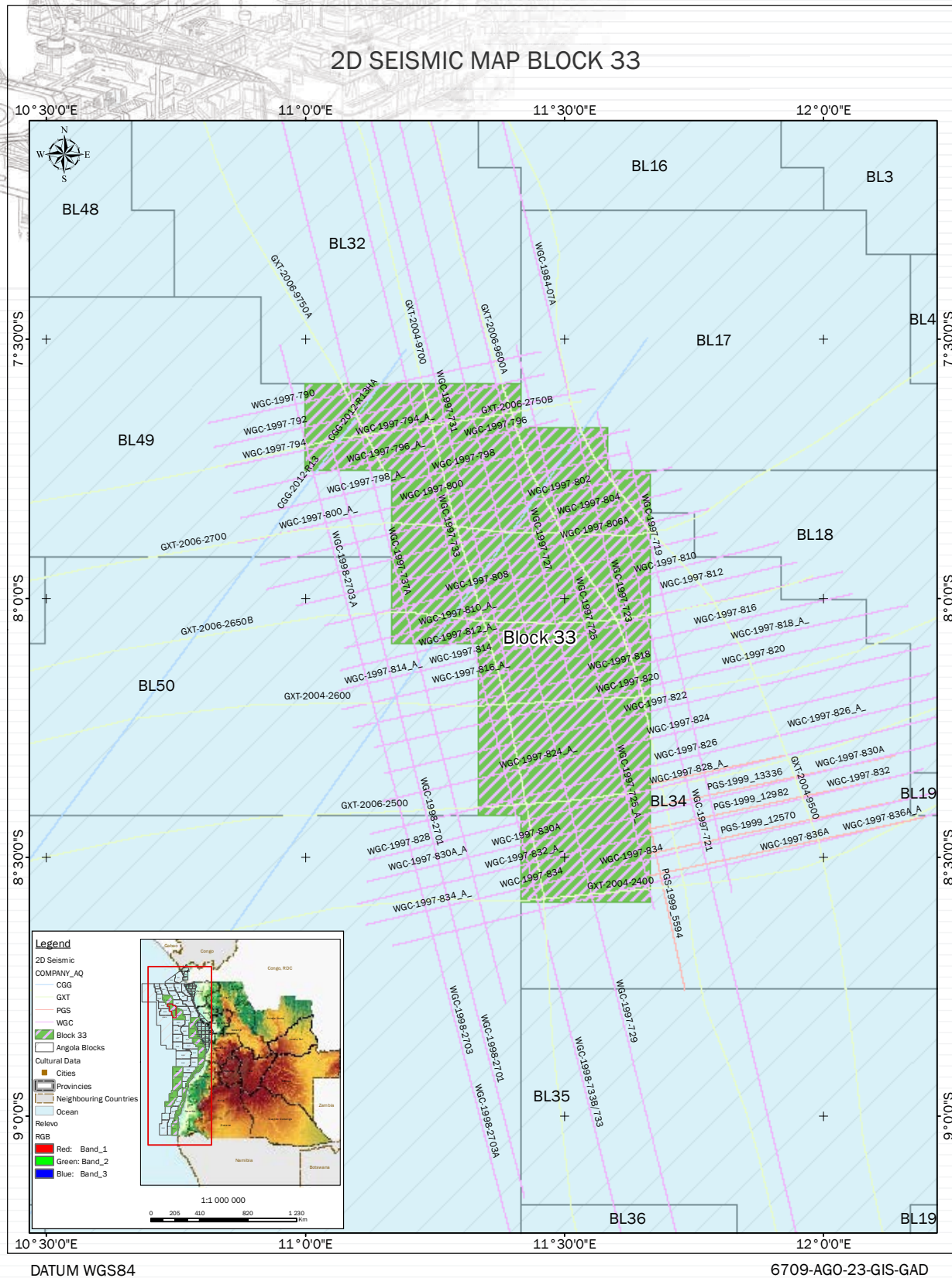
- North by Blocks 17 and 32;
- South and East by Block 34;
- West by Blocks 49 and 50.

Block 33/21 has a 2D and 3D seismic coverage of approximately 2570 km and 74450,78 km² respectively and 6 exploration wells.

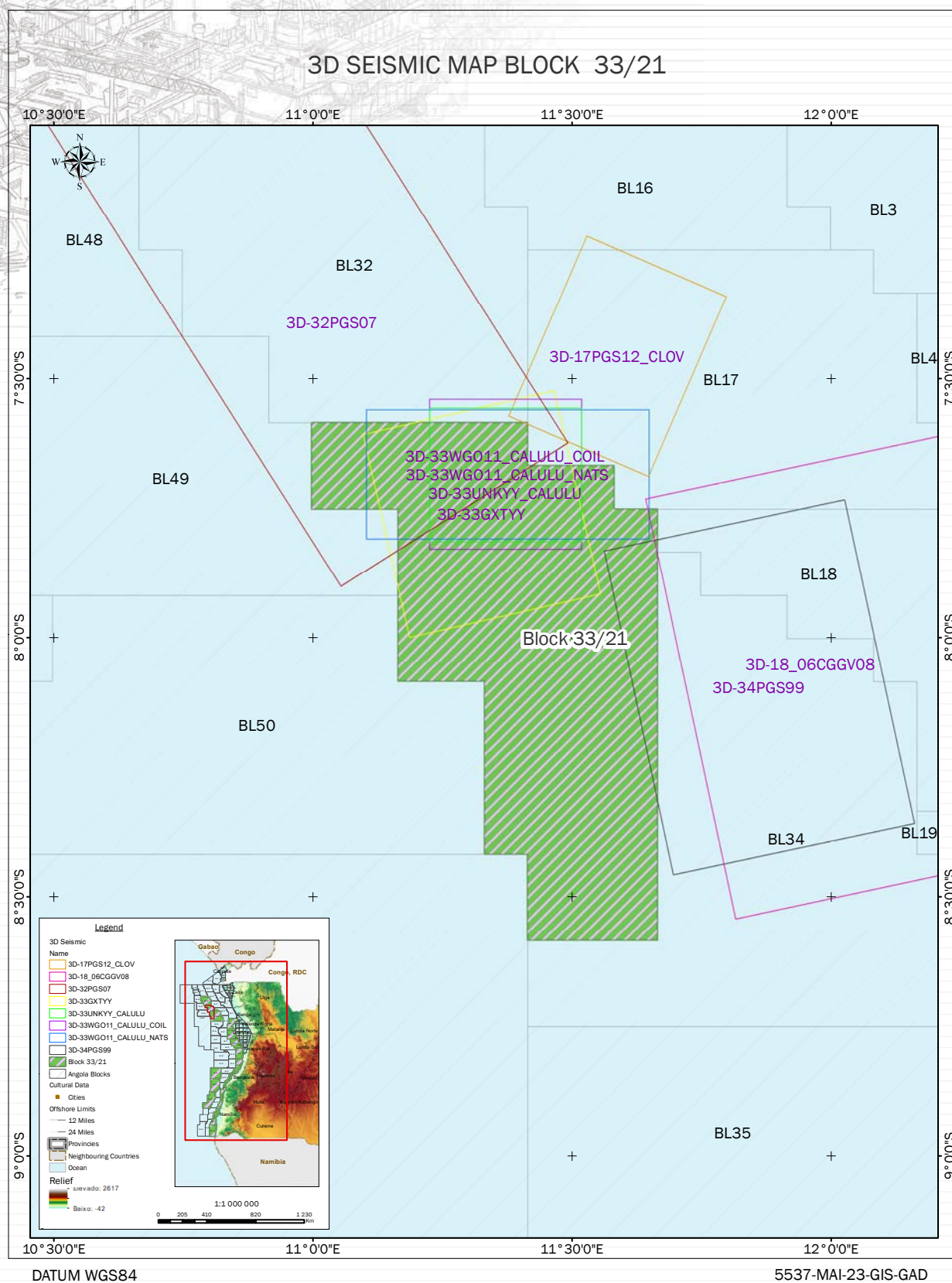
Is characterized by normal fault system on the basement forming horsts and grabens structures at the pre-Salt level. At the bottom of the grabens, sediments rich in organic matter from the Bucomazi Formation were deposited, at the top of horsts were deposited lacustrine carbonates from the Toca Formation while at its flanks were deposited sandstone sediments in pinch out, the Lucula Formation.

The Loeme Formation (salt), with strong tectonic influence generated salt walls that contributed to the post-Salt structuring. The Albian is characterized by normal listric growth faults generating antiform structures. Tertiary is marked by post-depositional extensional faults and by turbidite channels as reservoirs.

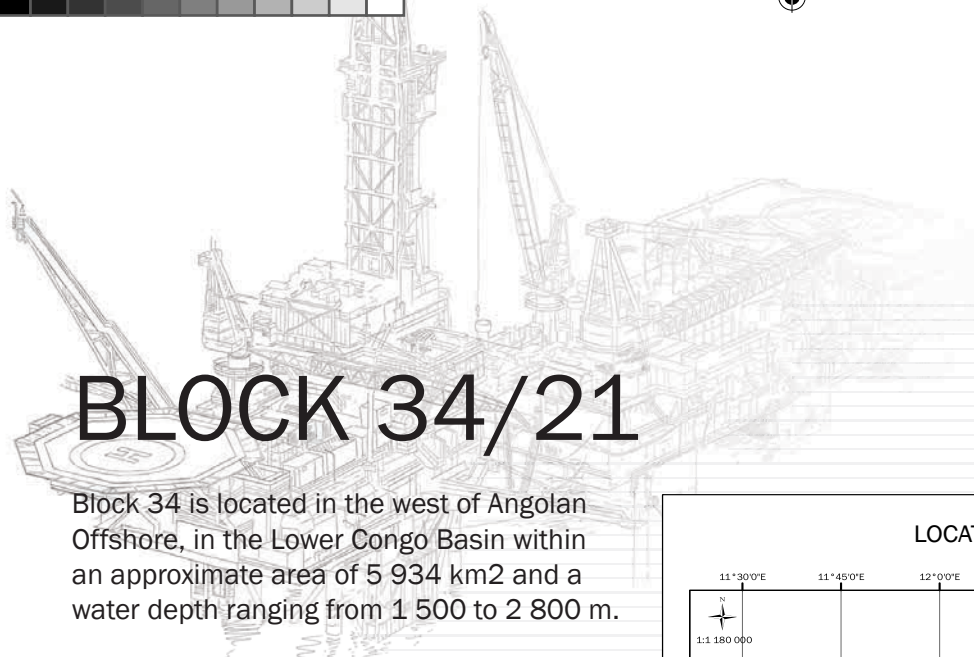




2D Seismic Coverage Map



3D Seismic Coverage Map



BLOCK 34/21

Block 34 is located in the west of Angolan Offshore, in the Lower Congo Basin within an approximate area of 5 934 km² and a water depth ranging from 1 500 to 2 800 m.

Block 34/21 is flanked by:

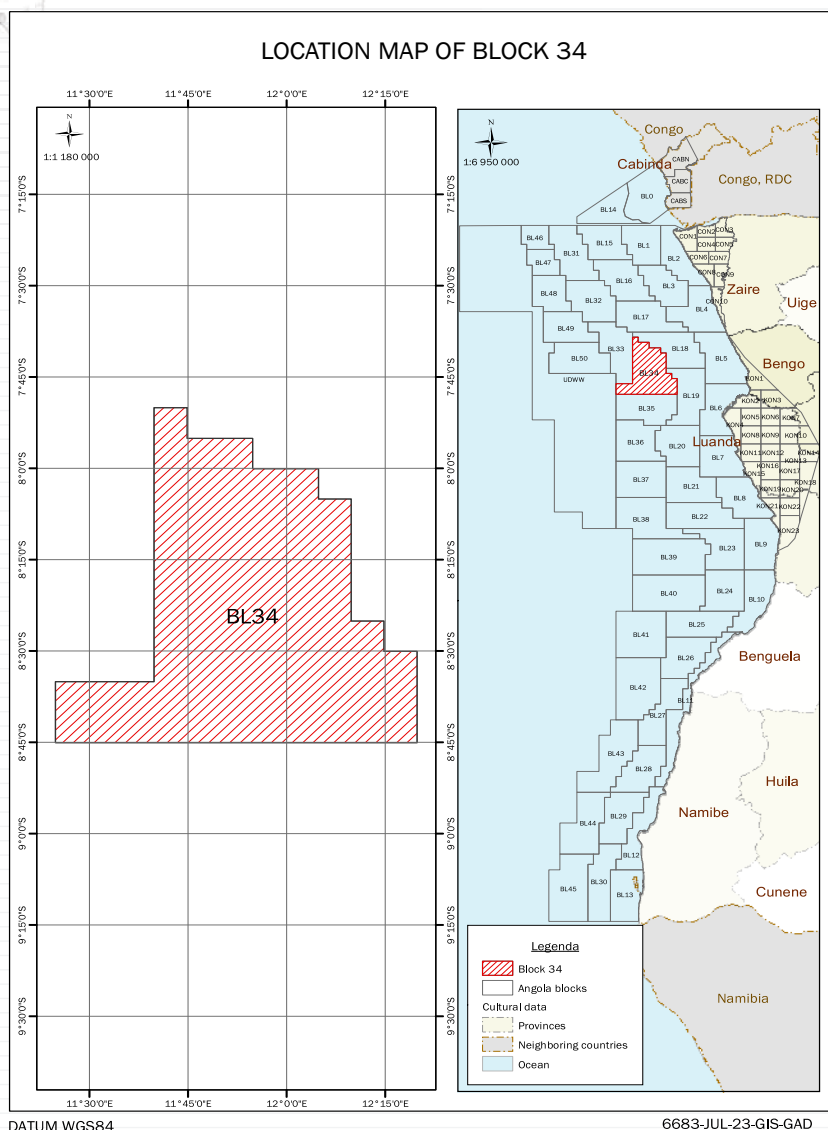
- North by Block 18;
- South by Block 35;
- East by Blocks 18 and 19;
- West by Block 33.

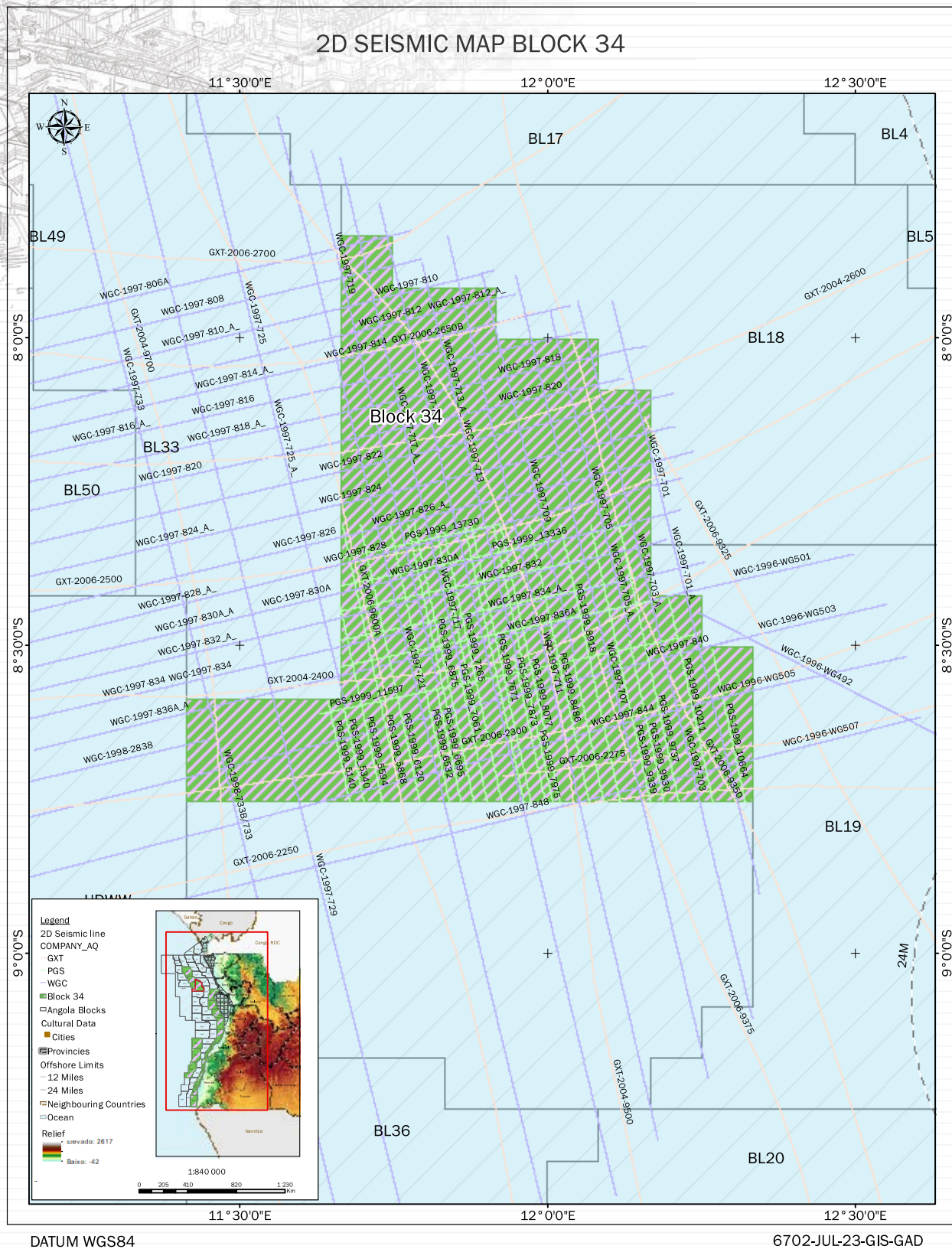
Block 34/21 has a 2D and 3D seismic coverage of approximately 2500km and 5662 km² respectively. Pre-Salt Unit is characterized by a faults eradicated in the basement system, that originated structures such as horsts and grabens.

In early Aptian occurs a salt layer deposition, the Loeme Formation, that provides a seal for the Pre-salt reservoirs meanwhile contributes to the Post-salt structuring.

Post-Salt Unit is characterized by salt tectonics influenced sedimentation forming listric faults.

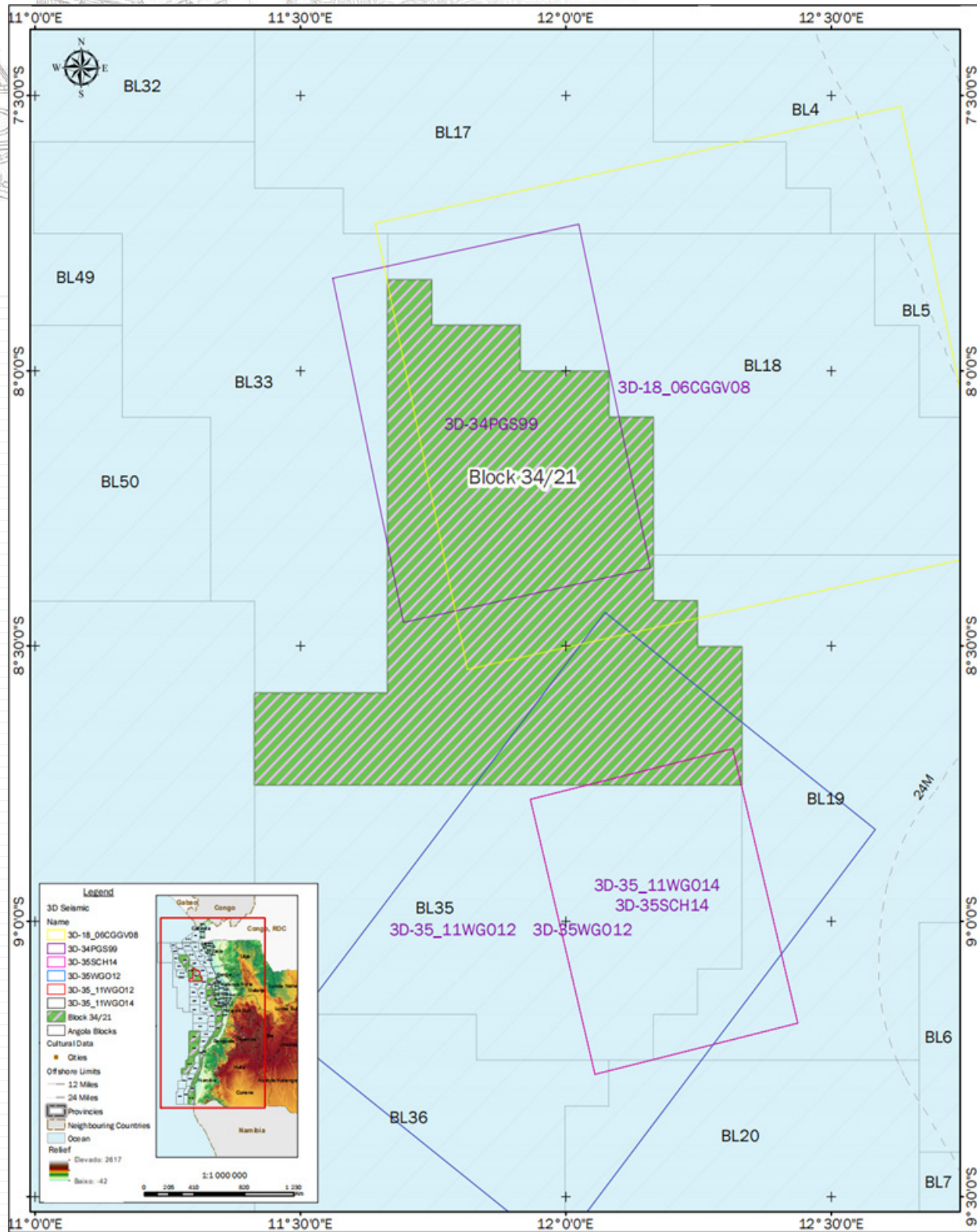
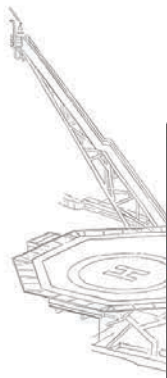
The post-Salt Albian play is characterized by carbonates, turtle-shell and raft structures and Oligo-Miocene play by turbiditic channels complexes and troughs.





2D Seismic Coverage Map





3D Seismic Coverage Map



BLOCK 41

Block 41 is in ultra-deep offshore Namibe Basin, in central Angola. It has an area of approximately 6711 km² and water depth ranging from 1500 to 2000 meters.

Block 41 is flanked by:

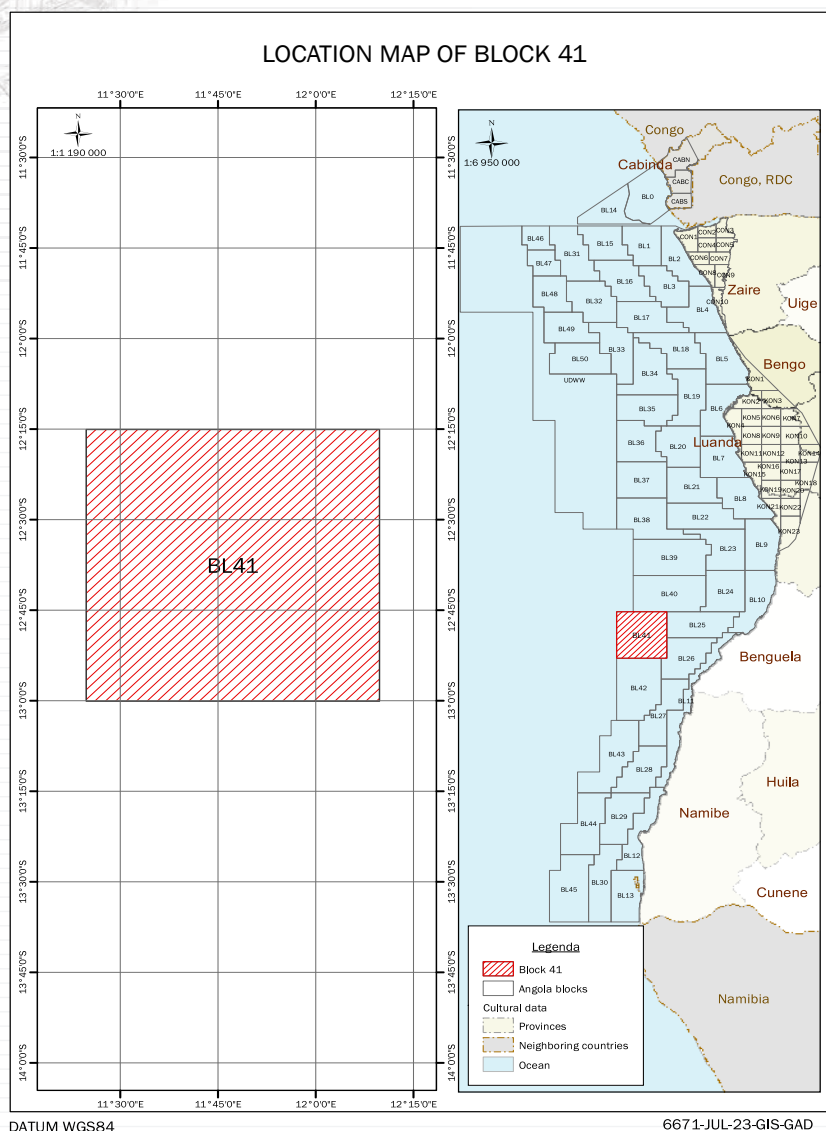
- North by Block 40;
- South by Block 42;
- East by the Block 25;
- West by the Atlantic Ocean.

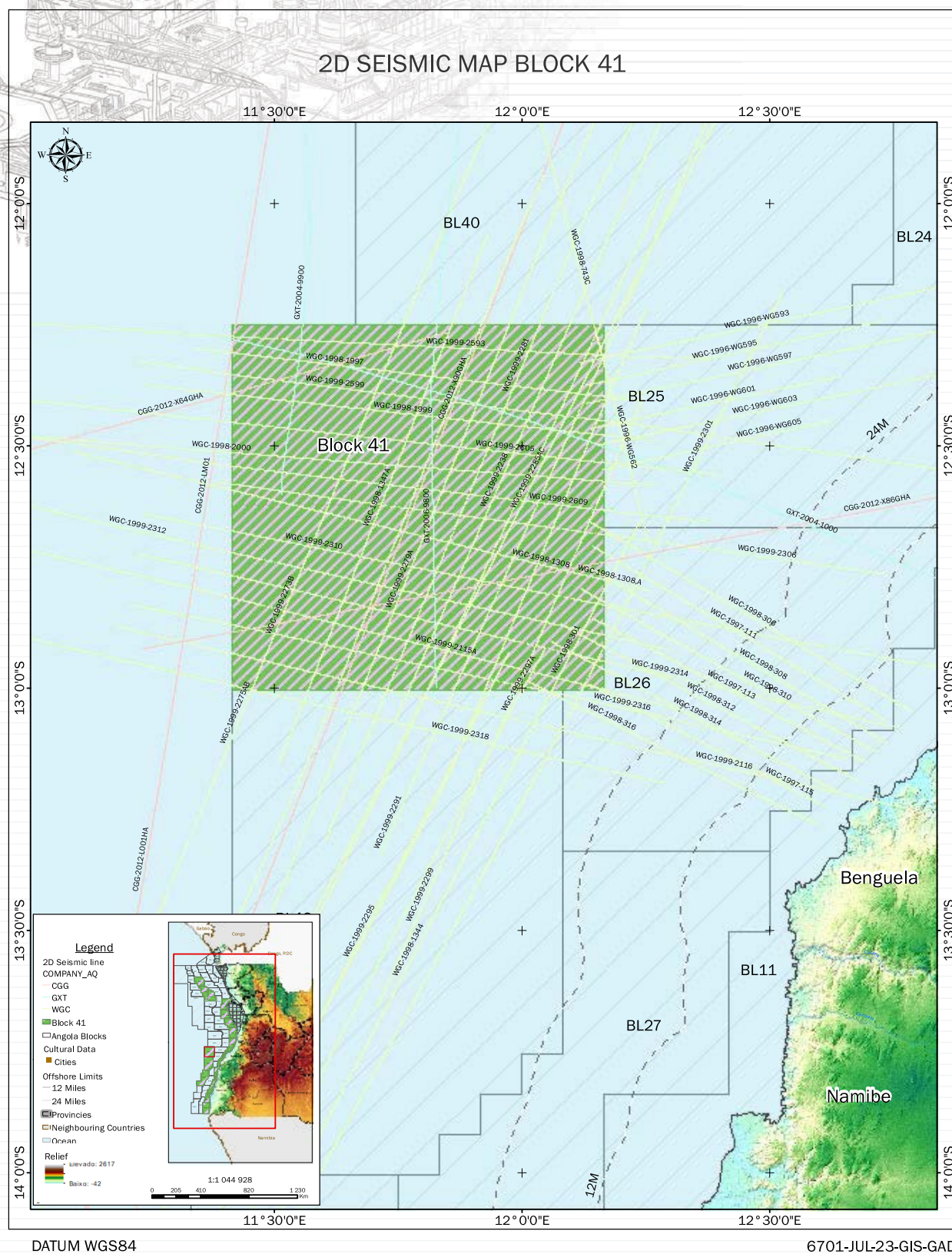
Block 41 has a 2D seismic coverage of approximately 2586,40 Km.

The main tectonic events observed in block from magnetometry (RTP), gravimetric and 2D seismic data indicate that geological structures in the pre-salt are characterized by a strong tectonism, resulting in the creation of Horsts and Grabens.

The structural highs (horsts) are associated with the formation of mound shaped carbonate reservoirs and sandstone channels in the fault planes. The organic-rich source rock from Cuvo Formation are found in the Grabens.

The post-salt is characterized by a compressional domains, forming anti-forms, rafts, semi-rafts and growth faults caused by the movement of Salt in large masses in the West of the Basin. The Oligo-Miocene interval, it is characterized by turbidites channels.





2D Seismic Coverage Map



BLOCK 42

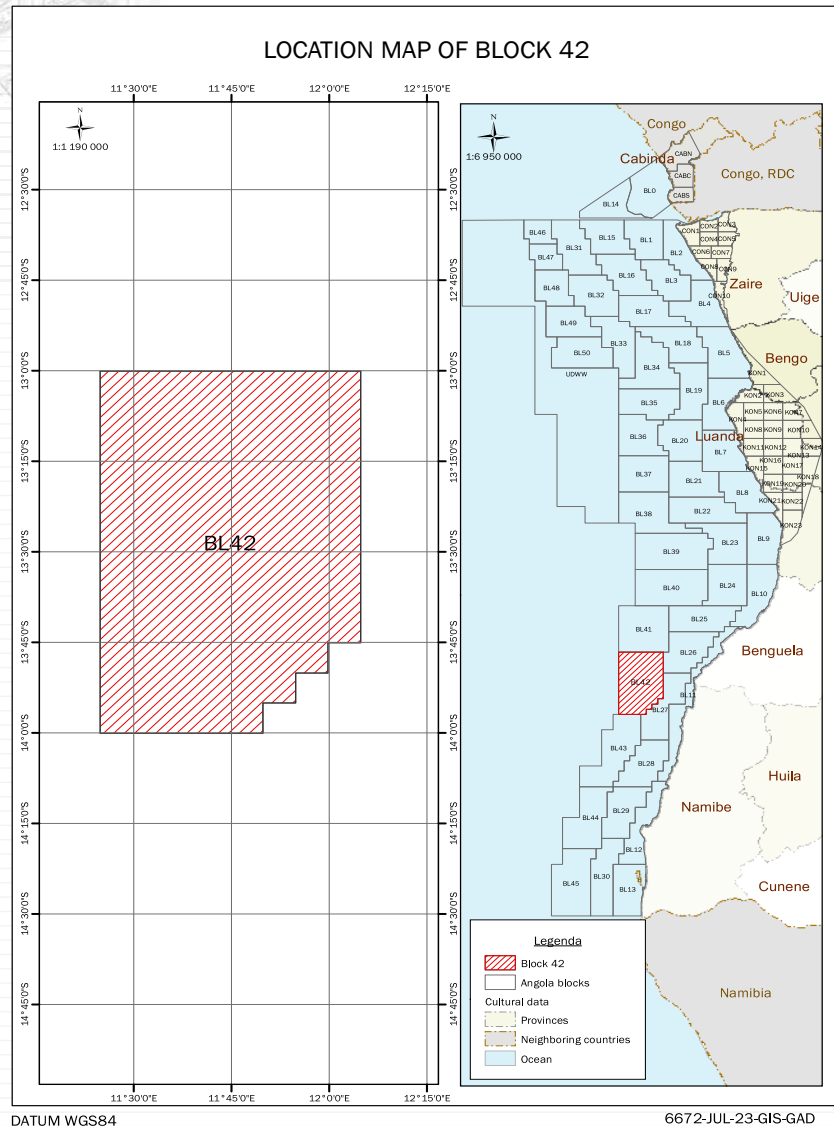
Block 42 is located Namibe Basin, in an water depth that ranges from 2000 to 3000 meters with an area of approximately 7512 km².

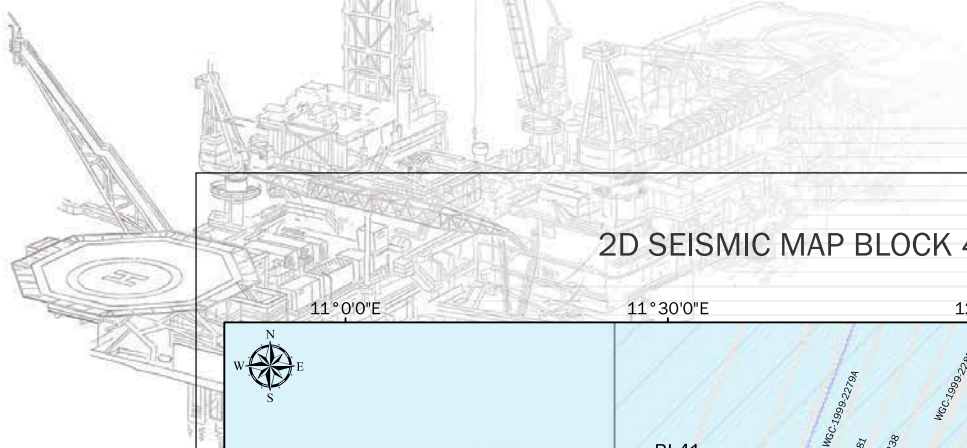
Block 42 is flanked by:

- North by Block 41;
- South by Block 43;
- East by Blocks 26 and 27;
- West y the Atlantic Ocean.

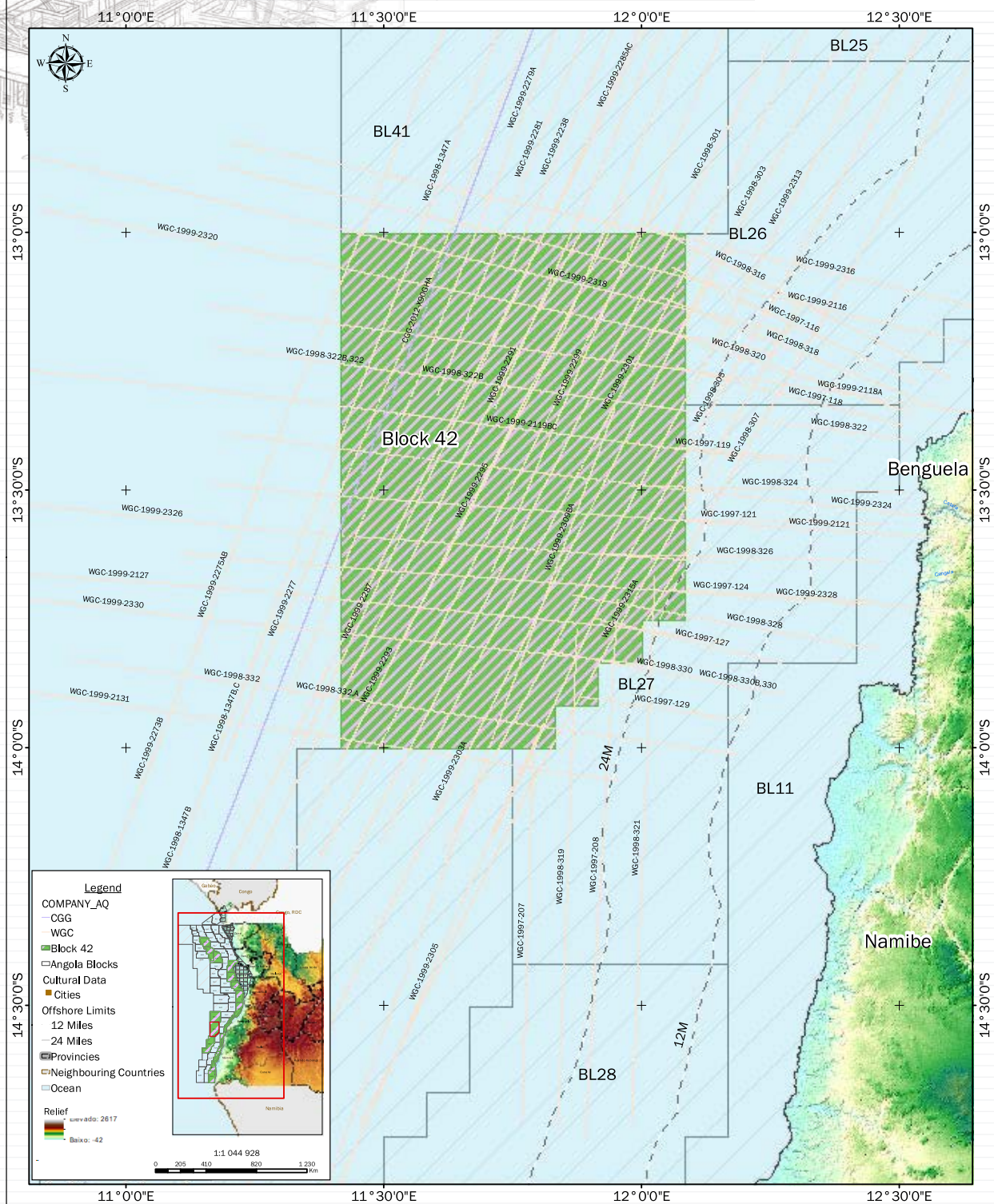
Block 42 has a 2D seismic coverage of approximately 2852 Km.

Block 42 is characterized by large tectonic events identified by the integration of data from magnetometry (RTP), gravimetry and seismic, in which the pre-salt corresponds to the Rift phase, causing the formation of mounds at the top of horsts, constituting potential reservoirs at this level, while in the post-salt the plate tectonics plays a fundamental role in structuration, forming antiforms and some channels in the Oligo-Miocene interval.





2D SEISMIC MAP BLOCK 42



DATUM WGS84

6703-JUL-23-GIS-GAD

2D Seismic Coverage Map

Blocks in Permanent Offer Regime | 37





BLOCK 43

Block 43 is located in the northwestern part offshore Namibe Basin. It covers an area of approximately 7067,12 km² in a water depth that ranges from 2500 to 3000 meters

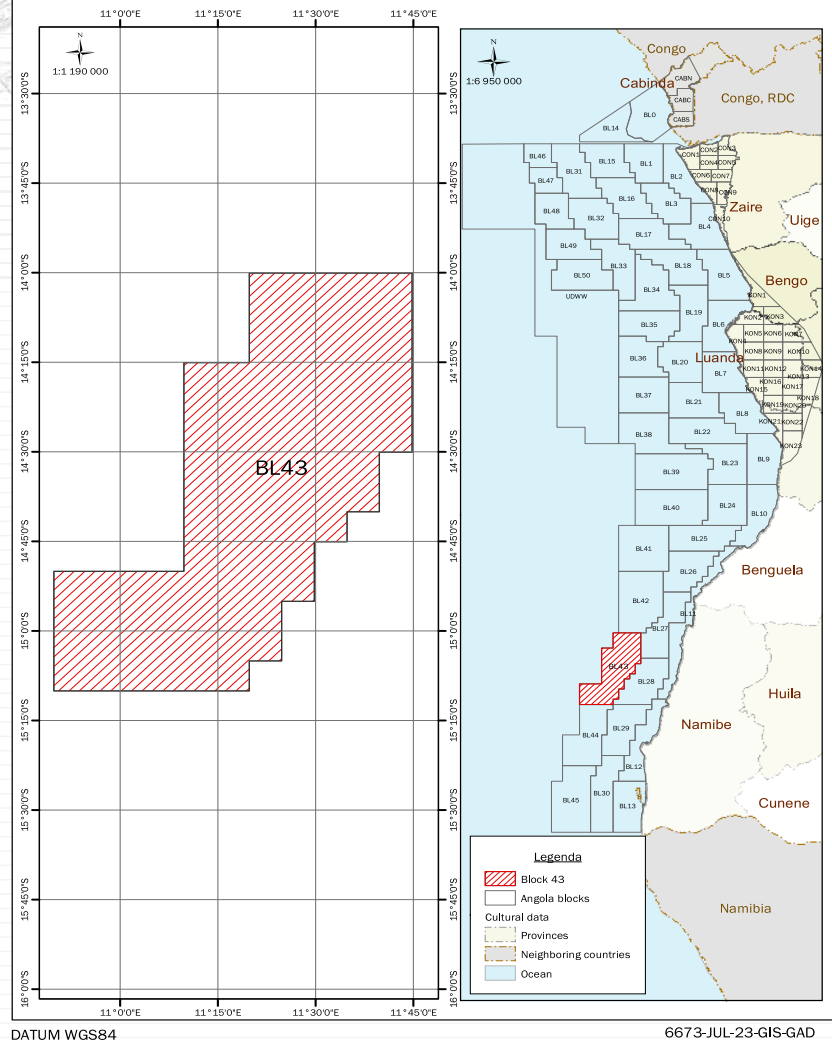
Block 43 is flanked by:

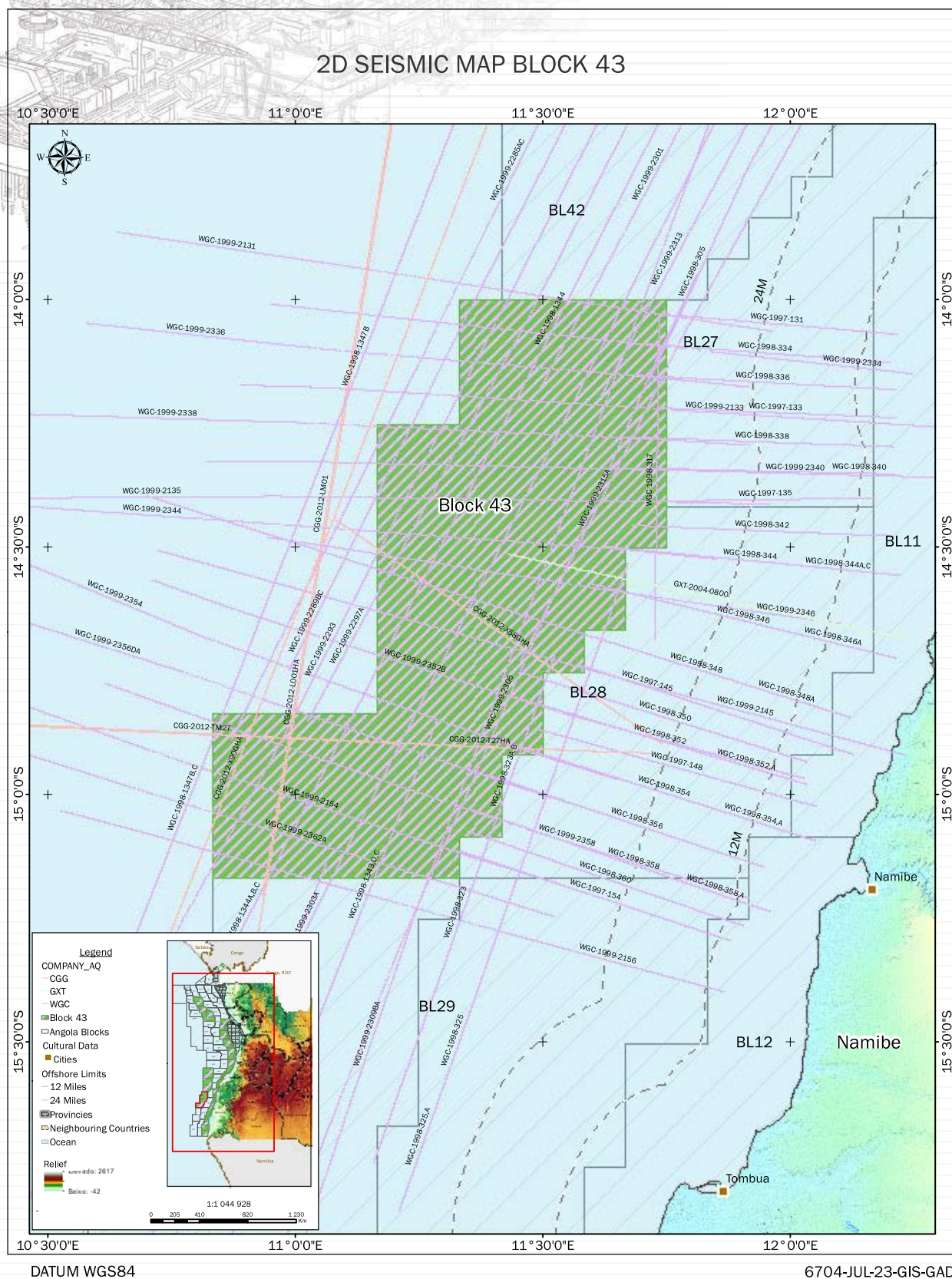
- North by Block 42;
- South by Block 44;
- West by the Atlantic Ocean;
- East by Blocks 27 and 28.

Block 43 has a 2D seismic coverage of approximately 1544 Km.

The main tectonics events identified and known in the block aided by the integration of seismic data, magnetometry (RTP) and gravimetry (Bouguer Anomaly), made it possible to show the structural lows and highs in the Pre-salt level, where carbonates were deposited at the top of horsts, and continuous parallel reflectors in the grabens, made evident the presence of a source rock and sands in pinch-out like in the fault planes of the horsts. At the Post-Salt level, was identified the occurrence of Albian sediments and sandstones channels of Oligo-Miocene age forming stratigraphic traps.

LOCATION MAP OF BLOCK 43





2D Seismic Coverage Map



BLOCK 6/15

Block 6/15 is in the offshore Kwanza Basin, in central Angola. It has an area of approximately 4930 km² and water depth ranging from 0 to 800 meters.

Block 6/15 is flanked by:

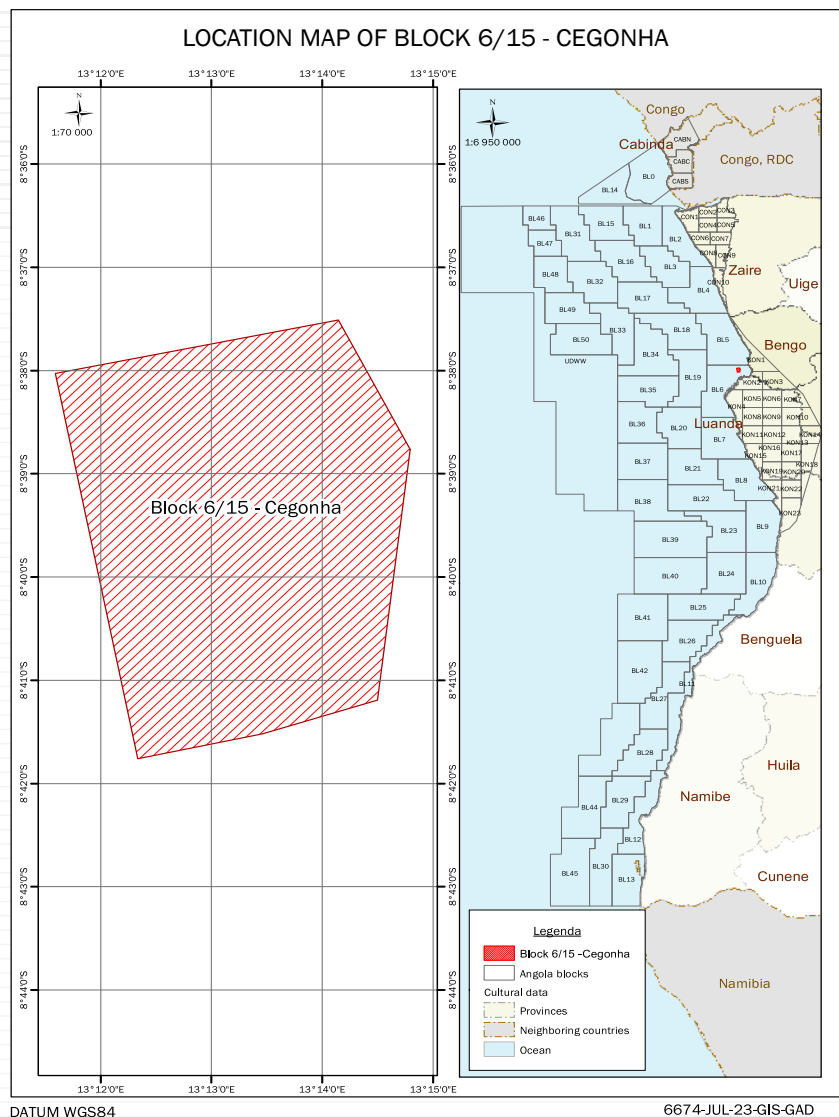
- North by Block 5;
- South by Block 7;
- East by Kons1, 2, and 4;
- West by Blocks 19 and 20.

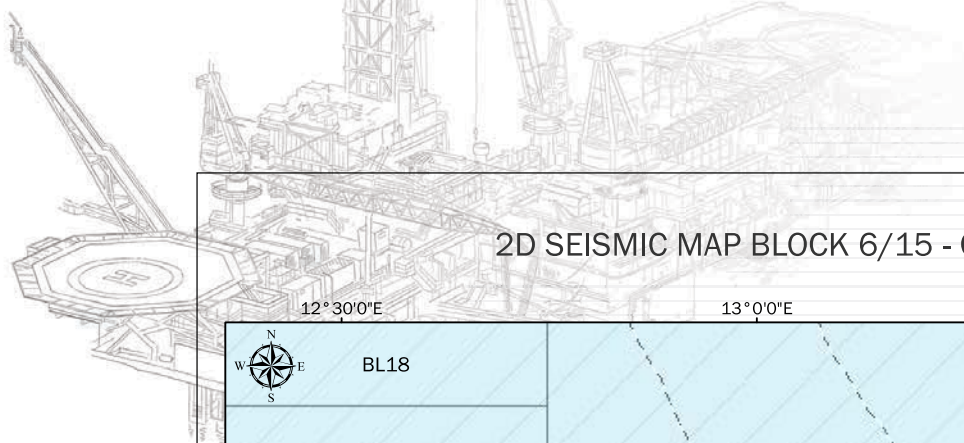
Block 6/15 has a 2D seismic coverage of approximately 1492 Km and 2739,29 km² of 3D.

The main tectonic events observed in block from magnetometry (RTP), gravimetric and 2D seismic data indicate that geological structures in the pre-salt are characterized by a strong tectonism, resulting in the creation of Horsts and Grabens.

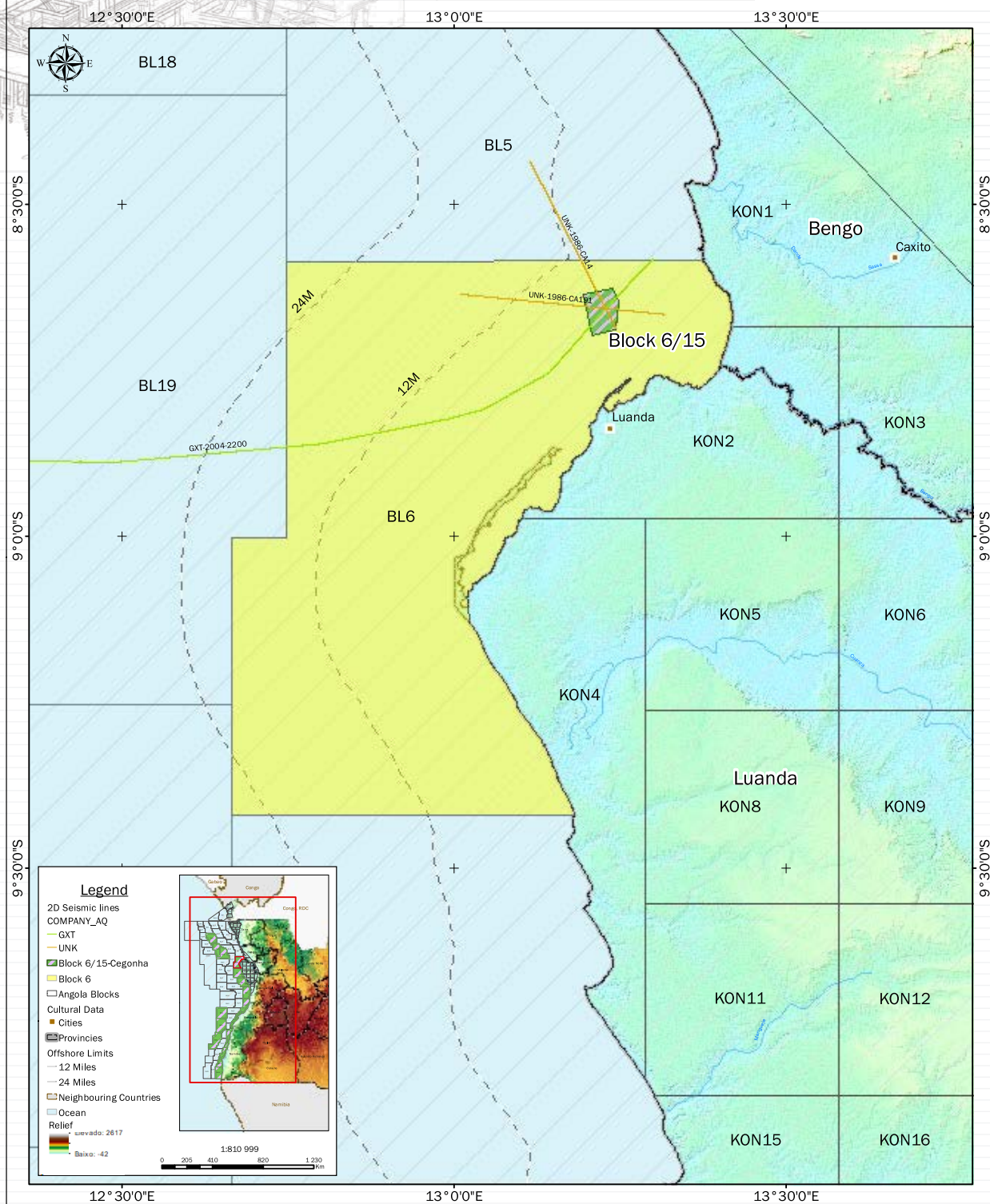
The structural highs (horsts) are associated with the formation of mound shaped carbonate reservoirs and sandstone channels in the fault planes. The organic-rich source rock from Cuvo Formation are found in the Grabens.

The post-salt section in the Albian and Upper Cretaceous is characterized by anti-forms, rafts, semi-rafts and growth faults, however, in the Oligo-Miocene interval, it is characterized by turbidites channels.





2D SEISMIC MAP BLOCK 6/15 - CEGONHA

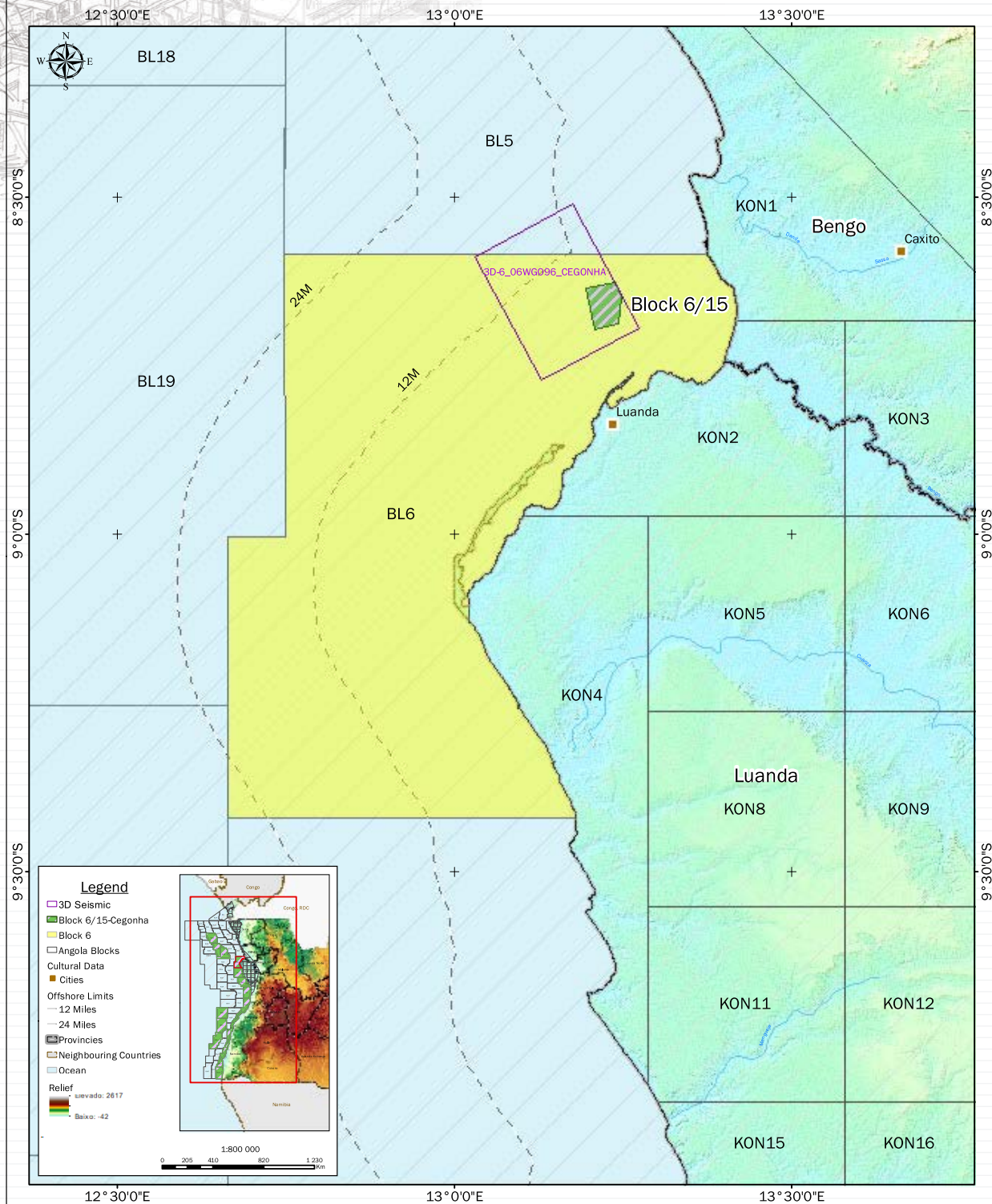


2D Seismic Coverage Map





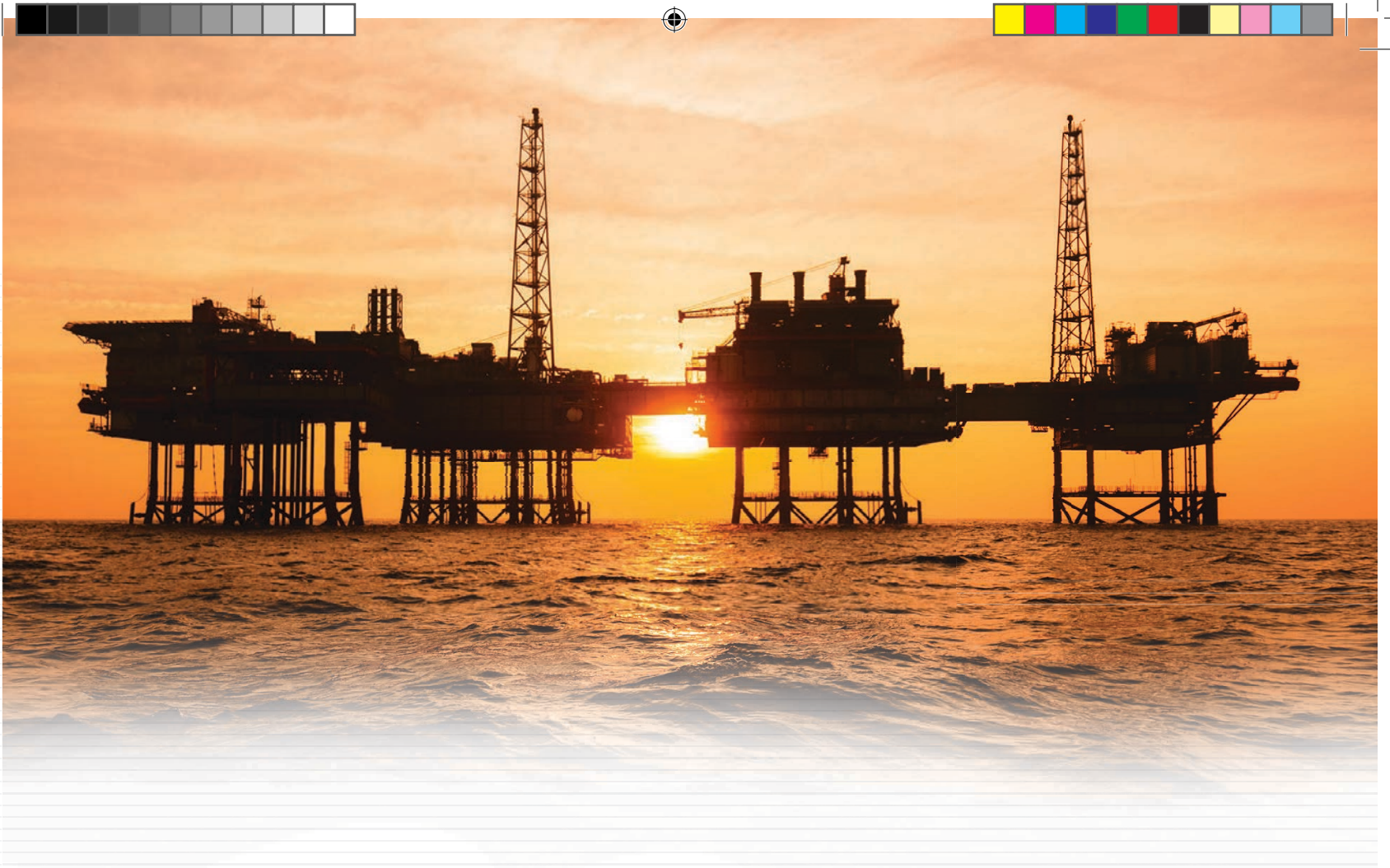
3D SEISMIC MAP BLOCK 6/15 - CEGONHA



6689-JUL-23-GIS-GAD

3D Seismic Coverage Map





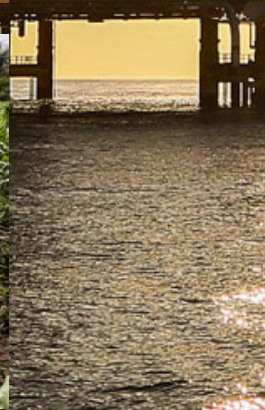
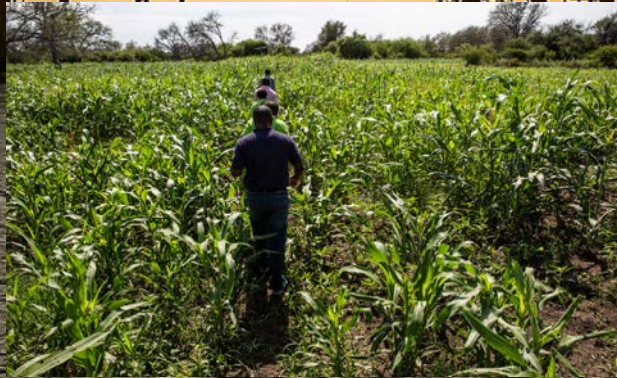
The documents concerning the expression of interest must be submitted to the following address:

ANPG – National Agency for Petroleum, Gas and Biofuels

Torres do Carmo Building – Tower 2, Rua Lopes Lima
Ingombota Urban District, Luanda – Republic of Angola
Trading Department, 1st floor
Email: licitacoes@anpg.co.ao
PO Box: 3279
Tel: +244 226428225



ANGOLA



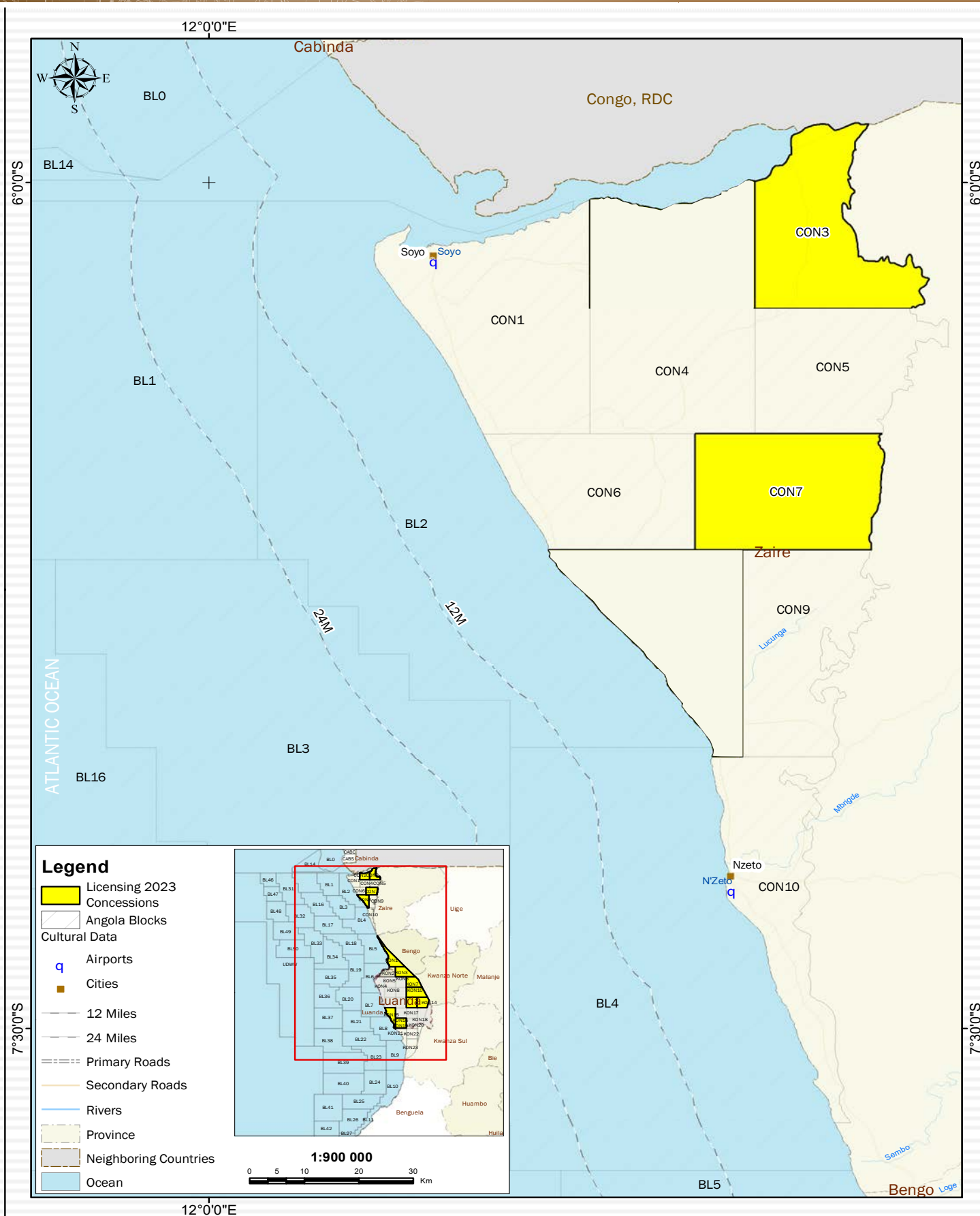


ONSHORE LOWER CONGO BASIN OPPORTUNITIES

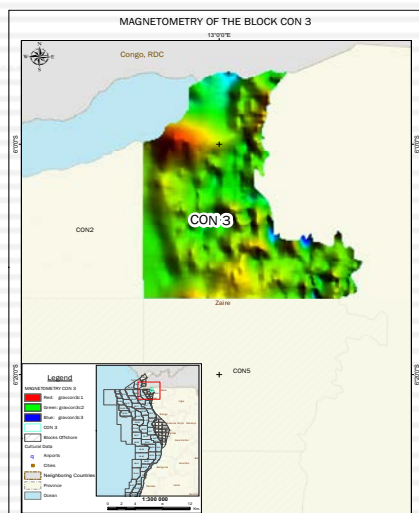
B R O C H U R E



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BLOCK CON3

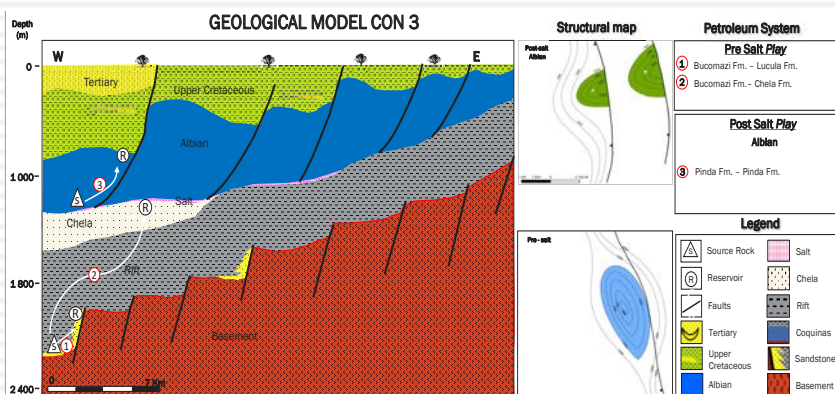
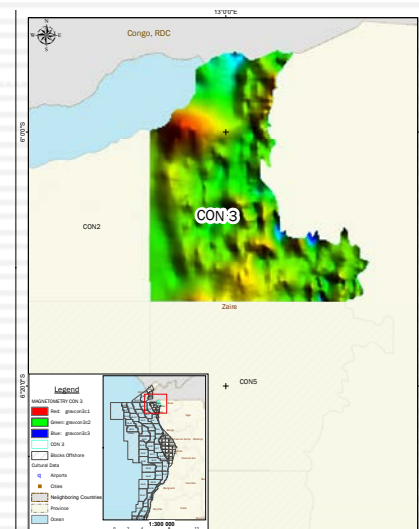


Block **CON 3** is in the northern portion of the Lower Congo Basin, in the Soyo area. It is limited to the north by the Zaire River, to the south by Block CON 5, to the east by Precambrian Basement and to the west by Block CON 2.

Area: 723,3 km²

Between 2008 and 2009 Alrosa conducted a regional seismic survey in the Basin. For CON 3 it covered an area of 19,29 km of 2D seismic.

The company ENI in 1998 and the company Geokinetics carried out aerogravimetric and magnetometric surveys of the Basin.

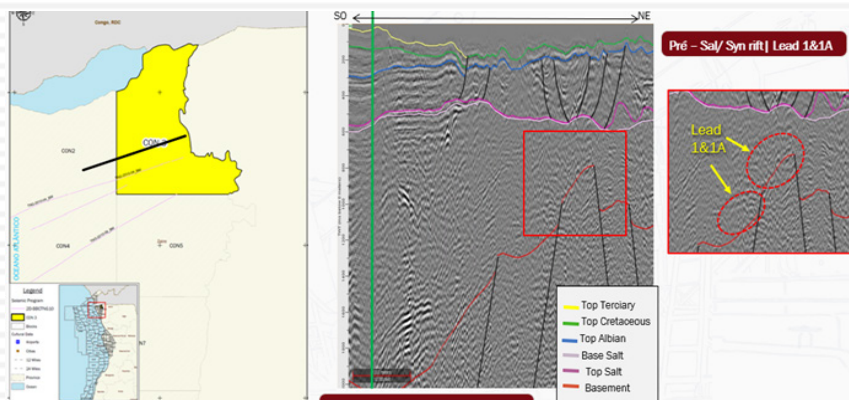


Pre-Salt: Characterized by horsts and grabens structures with faults in the basement. The deeper parts correspond to zones with accumulation, preservation, and generation of hydrocarbons, which migrate to reservoirs through faults and salt windows. In the Aptian, was deposited the salt Loeme, which is the main seal of this unit.

Post-Salt: Characterized by post-depositional extensional structures (rafts and turtles backs) in the Albion, due to the movement of the salt, overlain by sediments of Upper Cretaceous and Tertiary. The argillite sediments and organ-

ic-rich calcilutites of the Pinda Formation constitute the source rocks at the Albion level. Fractured dolomitic limestones and sandstones constitute the main reservoirs, and Upper Cretaceous clays as the cover rock. In the Upper Cretaceous was deposited amounts of pelagic sediments such as marls, gray clays, brown limestones, micaceous siltstones, and sandstones deposited during minor marine regressions. Upper Cretaceous clays of the labe Formation are proven source rock.

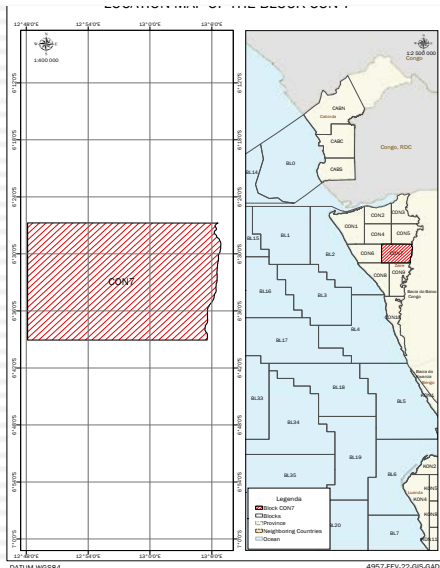
OPPORTUNITIES



Post Salt Lead 2

- **Source:** Shales from Bucomazi Formation
- **Reservoir:** Sandstone pinch-out and Toca Carbonates on the top of horsts
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Evaporites from Loeme Formation.

BLOCK CON7

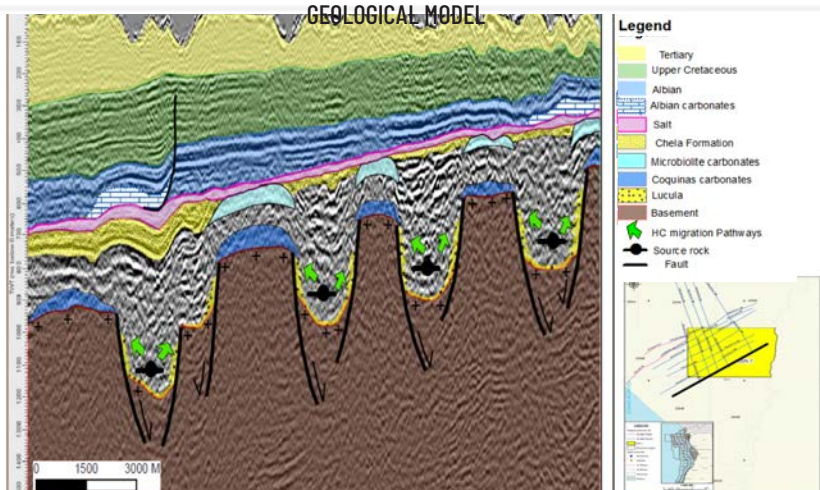
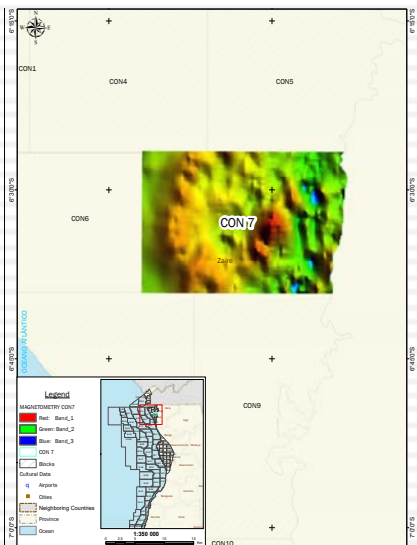


Block CON 7 is in the east central portion of the Lower Congo Basin, in the Soyo area. It is limited to the north by Blocks CON 4 and CON 5, on the south by Blocks CON 8 and CON 9, to the east by Precambrian Basement and to the west by Block CON 6.

Area: 744,77 km²

Between 2008 and 2009 Alrosa conducted a regional seismic survey in the Basin. For CON 7 it covered an area of 105.4 km of 2D seismic.

The company ENI in 1998 and the company Geokinectics carried out aerogravimetric and magnetometric surveys of the Basin.

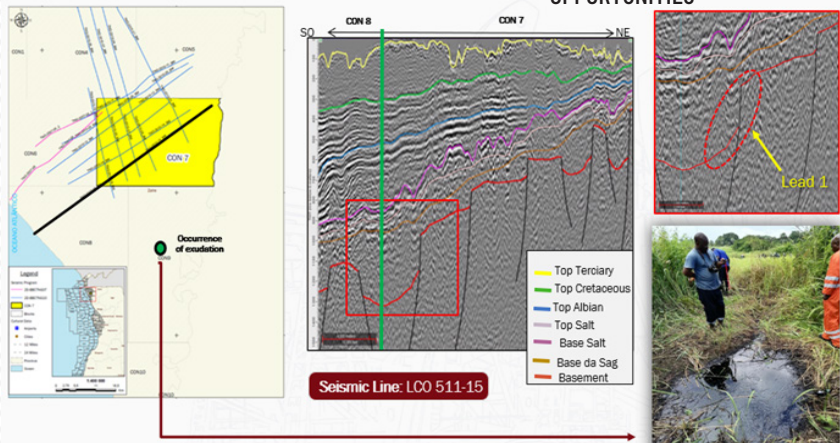


Pre-Salt: Characterized by horsts and grabens structures with faults in the basement. The deeper parts correspond to zones with accumulation, preservation, and generation of hydrocarbons, which migrate to reservoirs through faults and salt windows. In the Aptian, was deposited the salt Loeme, which is the main seal of this unit.

Post-Salt: Characterized by post-depositional extensional structures (rafts and turtles backs) in the Albian, due to the movement of the salt, overlain by sediments of Upper Cretaceous and Tertiary. The argillite sediments and organic-rich calcilutites of the Pinda Formation constitute the source rocks at the Albian level. Fractured dolomitic limestones and sandstones constitute the main reservoirs, and Upper Cre-

taceous clays as the cover rock. In the Upper Cretaceous was deposited amounts of pelagic sediments such as marls, gray clays, brown limestones, micaceous siltstones, and sandstones deposited during minor marine regressions. Upper Cretaceous clays of the labe Formation are proven source rock.

OPPORTUNITIES



Post Salt Lead 2

- **Source:** Shales from Bucomazi Formation
- **Reservoir:** Pinch Out Sandstone from Erva Formation
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales from Bucomazi Formation

Occurrence of exudates in an area of the E-W direction Lu-cunga River floodplain, 11 km from Block CON7.

Adjacent to this point are terrace deposits, lithologically covered by river channel conglomerates with presence of clas-tics of the crystalline basement.



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ANGOLA



ANPG
Agência Nacional de Petróleo, Gás e Biocombustíveis
E-mail: licitacao2023@anpg.co.ao
Tel.: +244 226 428 602
website: www.anpg.co.ao

Edifício Torres do Carmo-Torre 2, Rua Lopes Lima, Distrito Urbano da Ingombota,
Município de Luanda, República de Angola

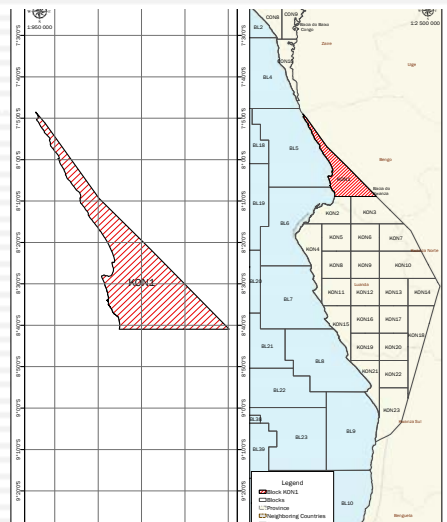


ONSHORE KWANZA BASIN OPPORTUNITIES

B R O C H U R E



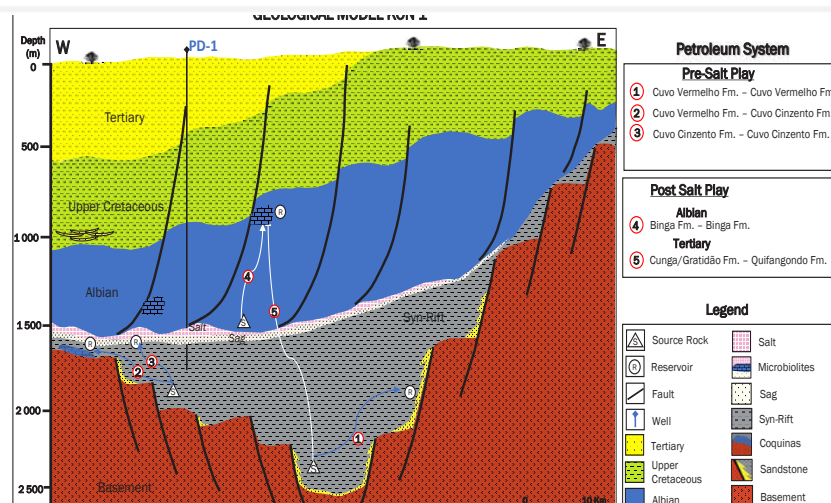
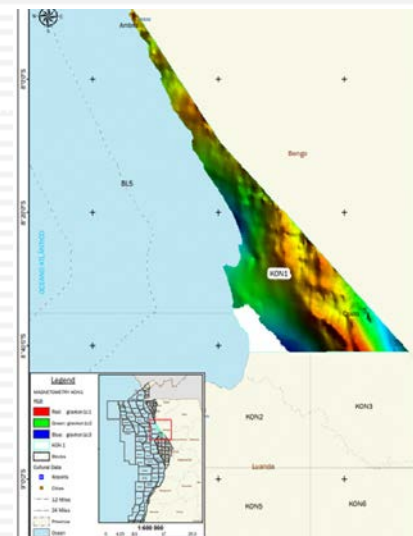
BLOCK KON 1



Block **KON1** is in the northern Part of Kwanza Basin, in the Soyo area. Limited to the north by the Precambrian Basement, to the south by Blocks KON 2 and KON 3, to the east by the Precambrian Basement and to the west by the Atlantic Ocean.

Area: 1.575,75 km²

- **1915-1932:** sixteen (16) explorations wells drilled.
- **1970-1973:** 500 Km of 2D seismic acquired and processed by Petrangol.
- **2010-2015:** Geological mapping and geochemical conducted by Obrangol and Previsão Oil.



Pre-salt: Dominated by of horsts and graben. The grabens, represents a potential generation kitchen of hydrocarbon. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. The salt layer deposited in early Aptian with greater evidence in the western part of Block which is the main seal rock of this unit.

Post-salt: Represented by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the sediments, such as marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba Formations are potential reservoirs. The Tertiary is absent in the eastern part and had greater representativeness to the west of the Block.

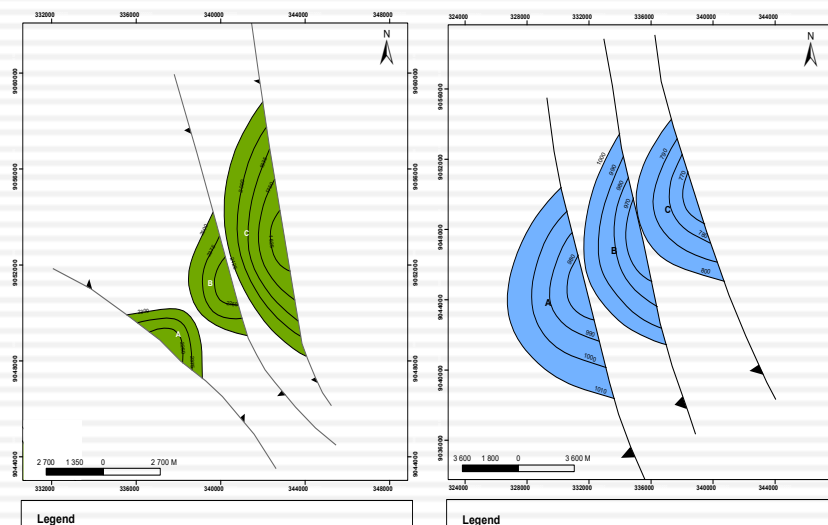
OPPORTUNITIES

Post Salt

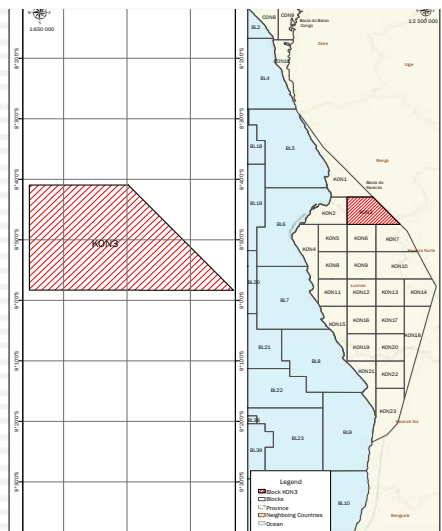
- **Source:** Shales from Cuvo and Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales from Binga and Cabo Ledo Formation.

Pre Salt

- **Source:** Shales from Cuvo Formation
- **Reservoir:** Carbonates from Cuvo and sandstones wedging onto basement highs.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales from Cuvo Formation and salt.



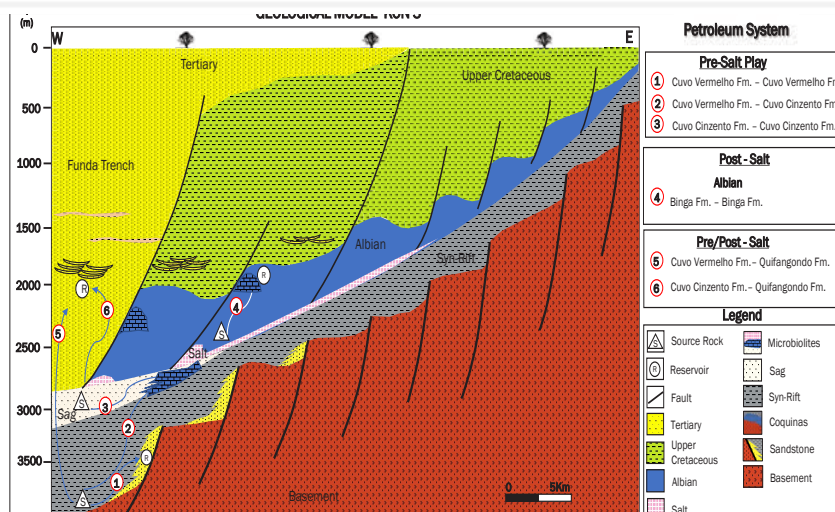
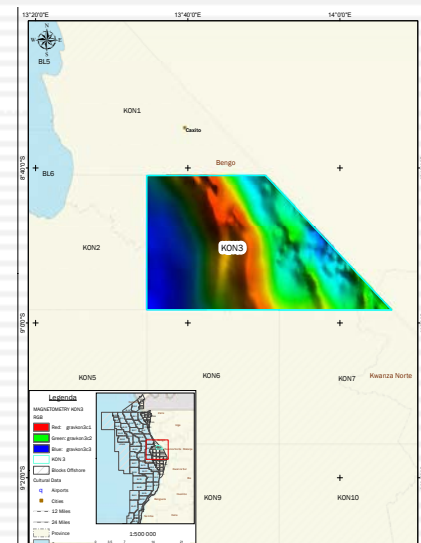
BLOCK KON 3



Block KON 3 is in the northeastern portion of the onshore Kwanza Basin. It is limited to the north by Block KON 1, to the south by Blocks KON 6 and KON 7, to the east by Precambrian Basement and to the west by Block KON 2.

Area: 1.385,06 km²

- 1970-1973: Seismic acquisition by Petrangol.
- 1998: Aerogravimetric and magnetometry surveys by ENI.
- 2009-2012: 68,5 Km of 2D seismic acquired by Geokinectics.
- 2010-2015: Geological mapping and geochemical conducted by Obrangol and Previsão Oil.



Pre-Salt: Characterized by horsts and grabens. The deep zones, mainly on the west, represents areas of hydrocarbon generation. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. Although the salt layer is thin on this section, but it represents the seal on this level and we also have the intraformational shales from cuvo Formation.

Post-Salt: Represented by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba Formations are potential reservoirs. At the Tertiary level, because of the sedimentary overload, it formed the Funda trench to the west, with a predominance of potential reservoir sands in the Quifangondo Formation.

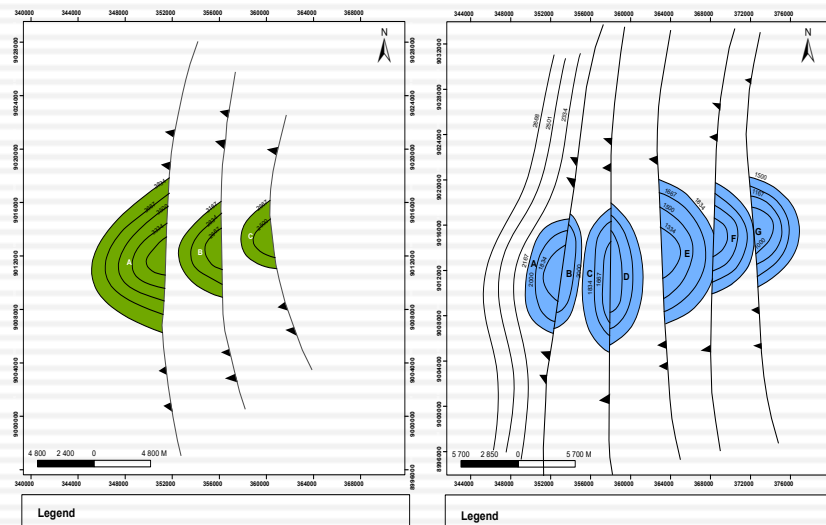
OPPORTUNITIES

Post Salt

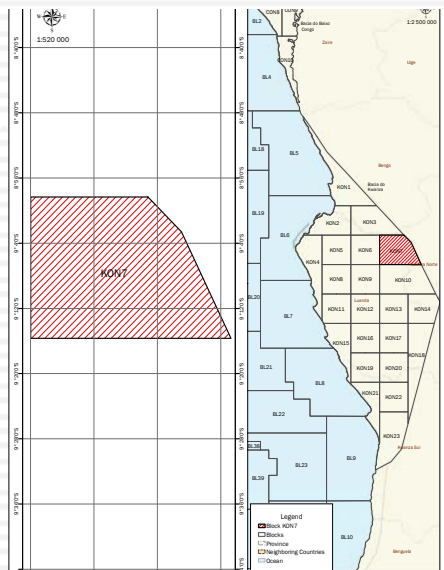
- **Source:** Shales from Cuvo and Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales from Binga and Cabo Ledo Formation.

Pre-Salt

- **Source:** Shales from Cuvo Formation.
- **Reservoir:** Carbonates from Cuvo and sandstones wedging onto basement highs.
- **Trap:** Combined (Structural and Stratigraphic).
- **Seal:** Shales from Cuvo Formation and salt.



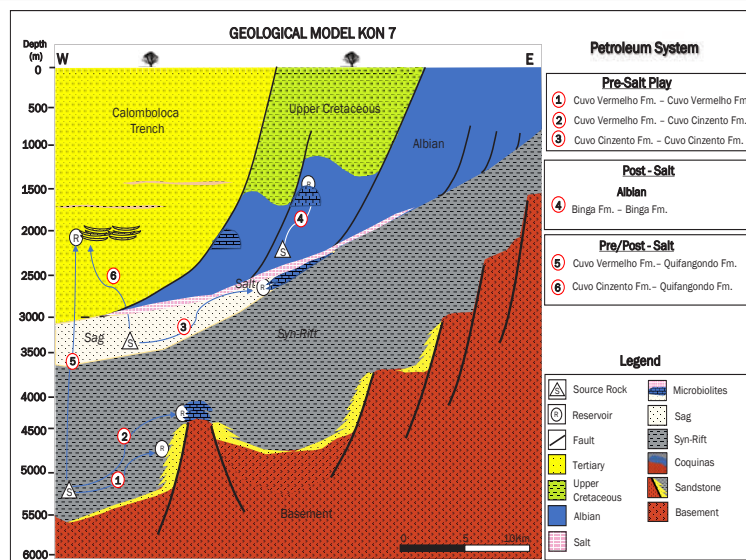
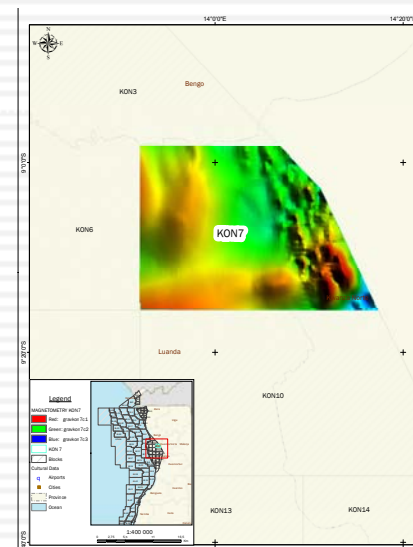
BLOCK KON 7



Block KON 7 is in the northeastern of onshore Kwanza Basin. It is limited to the north by Block KON 3, to the south by Block KON 10, to the east by outcrop of basement and to the west by Block KON 6.

Area: 1 207.86 Km²

- **1998:** Aerogravimetric and magnetometry surveys by ENI.
- **2009-2012:** 151,07 Km of 2D seismic acquired by Geokinetics
- **2010-2015:** Geological mapping and geochemical conducted by Obrangol and Previsão Oil.



Pre-Salt: Characterized by horsts and grabens. The deeps zones, mainly on the Calomboloca graben in the west, represents areas of hydrocarbon generation. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. The salt layer and the shales from cuvo Formation represents the seal on this level.

Post-Salt: Represented by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the sediments, such as marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba Formations are potential reservoirs. At the Tertiary level, because of the sedimentary overload, it formed the Calomboloca trench to the west, with a predominance of potential reservoir sands in the Quifangondo Formation.

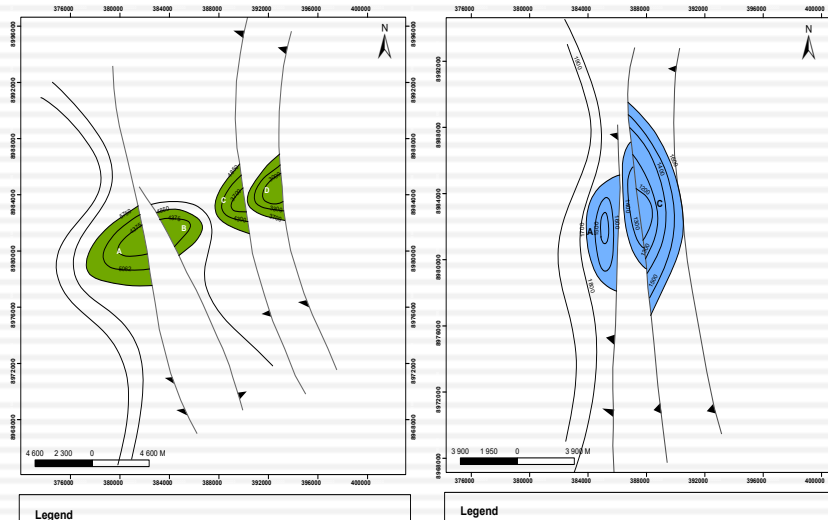
OPPORTUNITIES

Post Salt

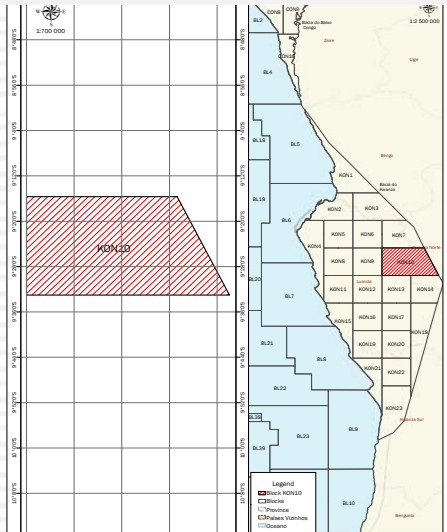
- **Source:** Shales from Cuvo and Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Intraformational shales from Albian and Cabo Ledo Formation.

Pre Salt

- **Source:** Shales from Cuvo Formation.
- **Reservoir:** Carbonates from Cuvo and sandstones wedging onto basement highs
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales Cuvo Formation and salt.



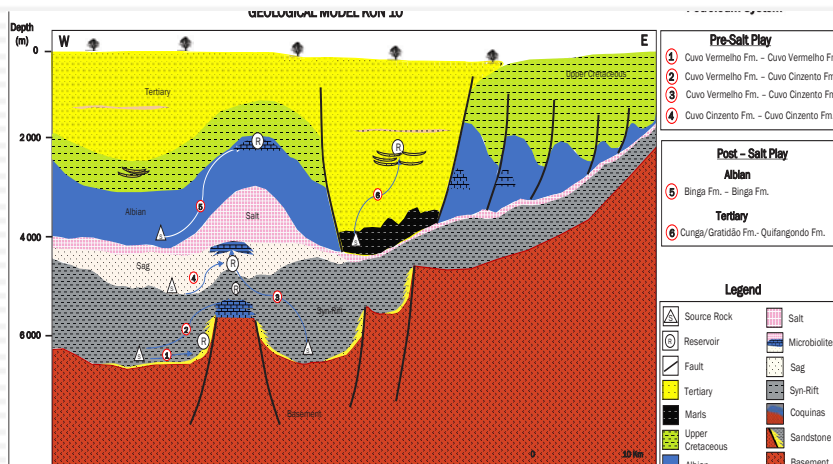
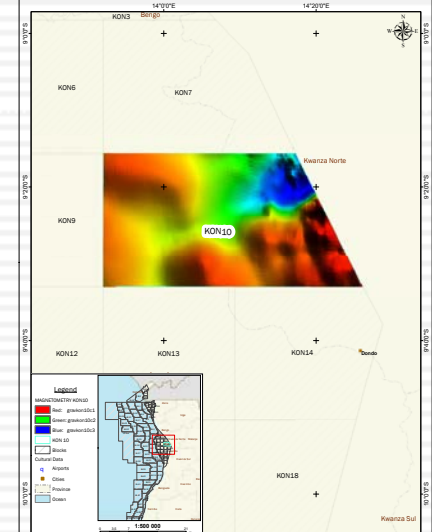
BLOCK KON 10



Block **KON 10** is in the northwest of onshore Kwanza Basin. It is limited to the north by Blocks KON 7, to the south by Blocks KON 13 and KON 14, to the east by Precambrian Basement and to the west by Block KON 9.

Area: 1.734,78 km²

- **1921-1974:** Drilled four (4) wells by Sinclair, Petrangol and total.
- **1998:** Aerogravimetric and magnetometry surveys by ENI.
- **2009-2012:** 132,67 Km of 2D seismic acquired by Geokinectics.
- **2010-2015:** Geological mapping and geochemical conducted by Obrangol and Previsão Oil.

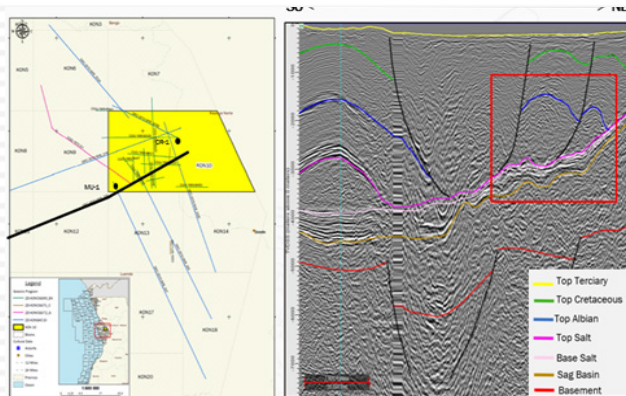


Pre-Salt: Represented by horsts and grabens. The deeps zones, represents areas of hydrocarbon generation. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. The salt layer represents the seal on this level and we also have the shales from cuvo Formation.

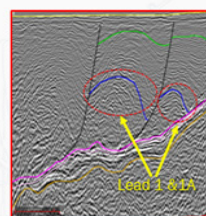
Post-Salt: Characterized by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the sediments, such as marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba Formations are potential reservoirs. At the Tertiary level, be-

cause of the sedimentary overload, formed the trench, with a predominance of potential reservoir sands in the Quifangondo Formation.

OPPORTUNITIES



Seismic Line: SKB-220

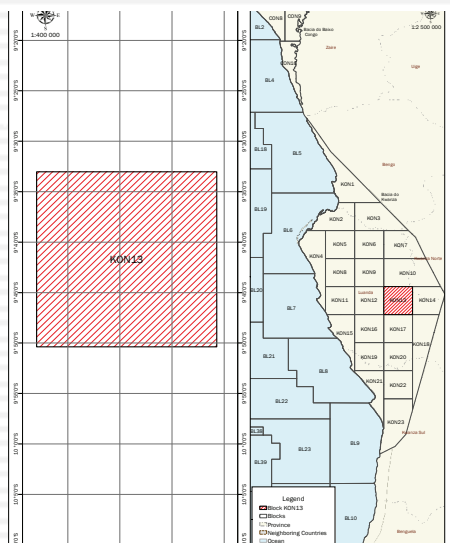


Post Salt Lead 1 & 1A

- **Source:** Shales from Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Intraformational shales from Albian and Cabo Ledo Formation.

Well	Reservoir	Outcome
Carimba 2	Cabo Ledo	Oil and gas shows
Muxima 1	Binga	Presence of asphalt

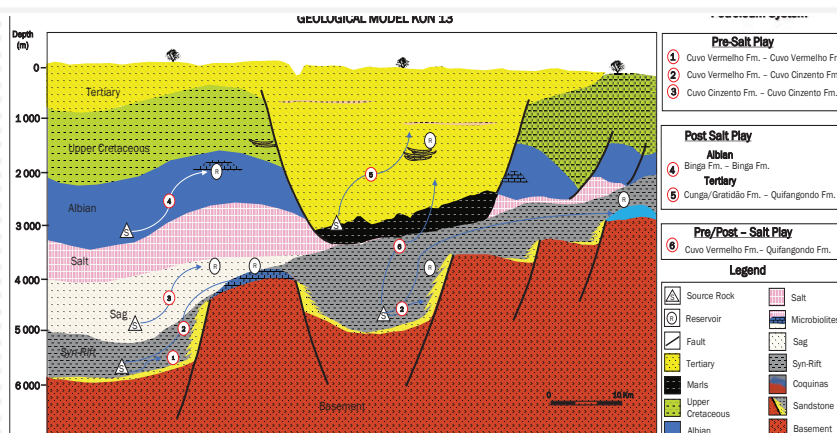
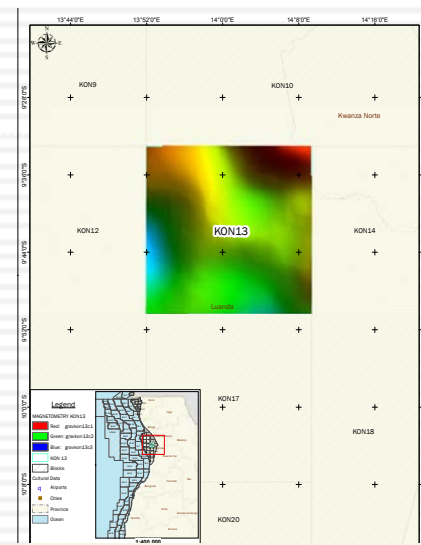
BLOCK KON 13



Block KON 13 is in the Central-Eastern part of onshore Kwanza Basin. It is limited to the north by Block KON 10, to the south by Block KON 17, to the east by Block 14 and to the west by Block KON 12.

Area: 1.010,73 km²

- **1969:** Drilled two (2) exploration wells by Sinclair.
- **1998:** Aerogravimetric and magnetometry surveys by ENI.
- **2009-2012:** 135,7 Km of 2D seismic acquired by Geokinetics.
- **2010-2015:** Geological mapping and geochemical conducted by Obrangol and Previsão Oil.

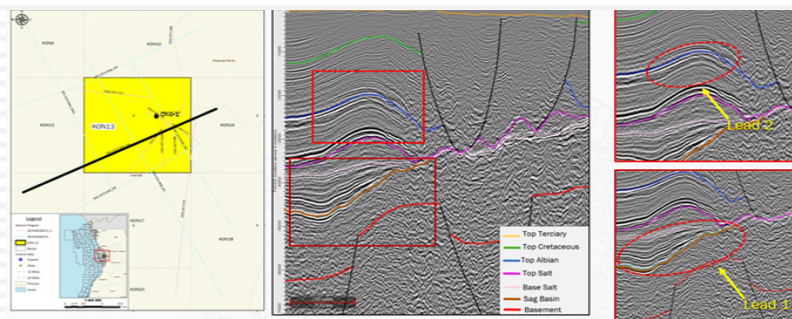


Formations are potential reservoirs. At the Tertiary level, because of the sedimentary overload, formed the trench in the central part of the model, with a predominance of potential reservoir sands in the Quifangondo Formation.

Pre-Salt: Characterized by horsts and grabens. The deeps zones, represents areas of hydrocarbon generation. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. The salt layer represents the seal on this level and we also have the shales from cuvo Formation.

Post-Salt: Represented by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the sediments, such as marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba

OPPORTUNITIES



Post Salt

- **Source:** Shales from Cuvo and Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Intraformational shales from Albian and Cabo Ledo Formation.

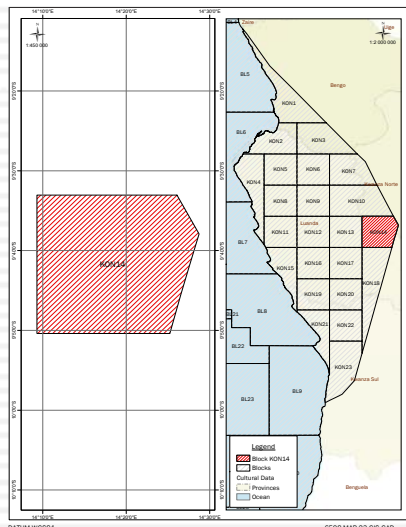
Pre Salt

- **Source:** Shales from Cuvo Formation
- **Reservoir:** Carbonates from Cuvo and sandstones wedging onto basement highs.
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Shales from Cuvo Formation and salt

CHIO-1 Well

Sample	Formation	Ro (%)	TOC (%)	S1	S2	TMax (°C)	IP	HI (mg HC/g TOC)	Observation
Carote	Cuvo Cinzento	1,11	1,83	0,25	1,16	465	0,17	63,38	Mature SR
Carote	Cuvo Cinzento	n/r	1,06	0,16	0,73	458	0,17	68,86	Mature SR
Carote	Cuvo Vermelho	0,57	1,35	0,64	2,77	441	0,18	205,18	Mature SR

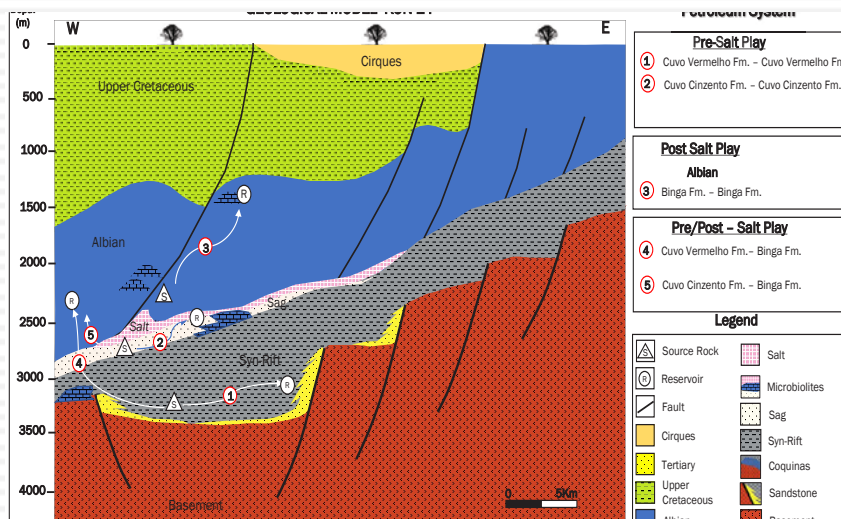
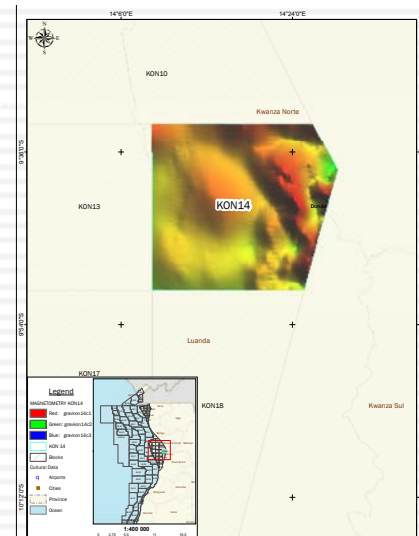
BLOCK KON 14



Block KON 14 is in the southwest part of onshore Kwanza Basin. It is limited to the north by Block KON 10, to the south by Block KON 18, to the east by Precambrian basement and to the west by Block KON 13.

Area: 1.021,93 km²

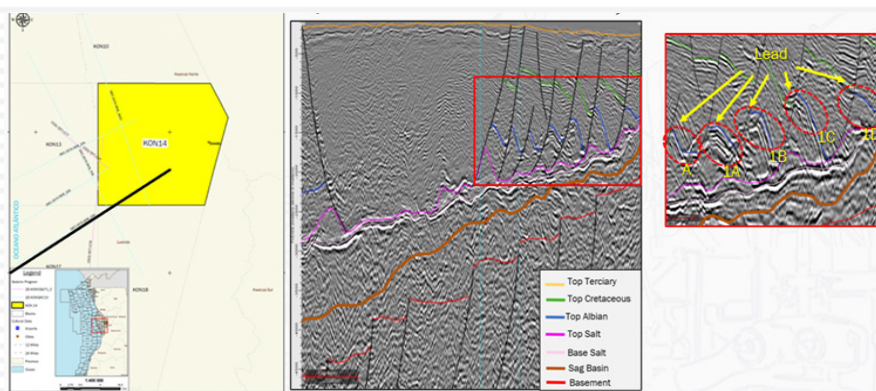
- 1998: Aerogravimetric and magnetometry surveys by ENI.
- 2009-2012: 151,07 Km of 2D seismic acquired by Geokinetics.
- 2010-2015: Geological mapping and geochemical conducted by Obrangol and Previsão Oil.



Pre-Salt: Represented by horsts and grabens. The deeps zones, represents areas of hydrocarbon generation. The clays of Red Cuvo and Gray Cuvo Formations are potential source rocks, the sandstones of the Red Cuvo in pinchout, carbonates on top of the horsts and sandstones of the Gray Cuvo are the reservoir rocks. The salt layer represents the seal on this level and we also have the shales from cuvo Formation.

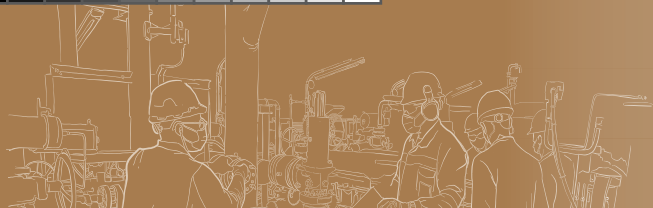
Post-Salt: Characterized by extensional structures (rafts and turtles backs) in the Albian with listric faults, because of salt tectonic. Clays limestones are potential source rocks, salt windows allow the migration of hydrocarbons from Pre-salt to Post-salt. In the Upper Cretaceous, the sediments, such as marls and gray clays, are potential source and seal rocks, sandstones of the Itombe and Teba Formations are potential reservoirs.

OPPORTUNITIES



Post Salt Lead 1 & 1A

- **Source:** Shales from Cuvo and Binga Formation
- **Reservoir:** Carbonates from Binga and Catumbela Formation. •
- **Trap:** Combined (Structural and Stratigraphic)
- **Seal:** Intraformational shales from Albian and Cabo Ledo Formation.



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ANPG
Agência Nacional de Petróleo, Gás e Biocombustíveis
E-mail: licitacao2023@anpg.co.ao
+244 226 428 602
geral@anpg.co.ao | website: www.anpg.co.ao

Edifício Torres do Carmo-Torre 2, Rua Lopes Lima, Distrito Urbano da Ingombota, Município de Luanda, República de Angola



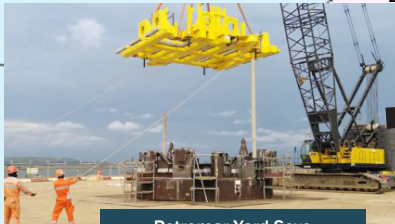
A N G O L A

INFRASTRUCTURES

LOGISTICS OPPORTUNITIES AND
REGIONAL DEVELOPMENT



Kwanda Base



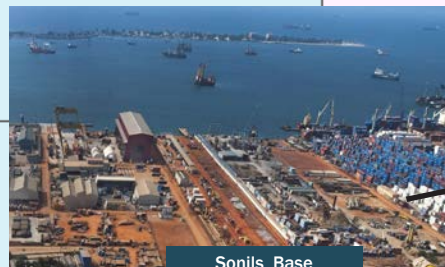
Petromar Yard Soyo



Petromar Yard Ambriz



Dande Oceanic Terminal



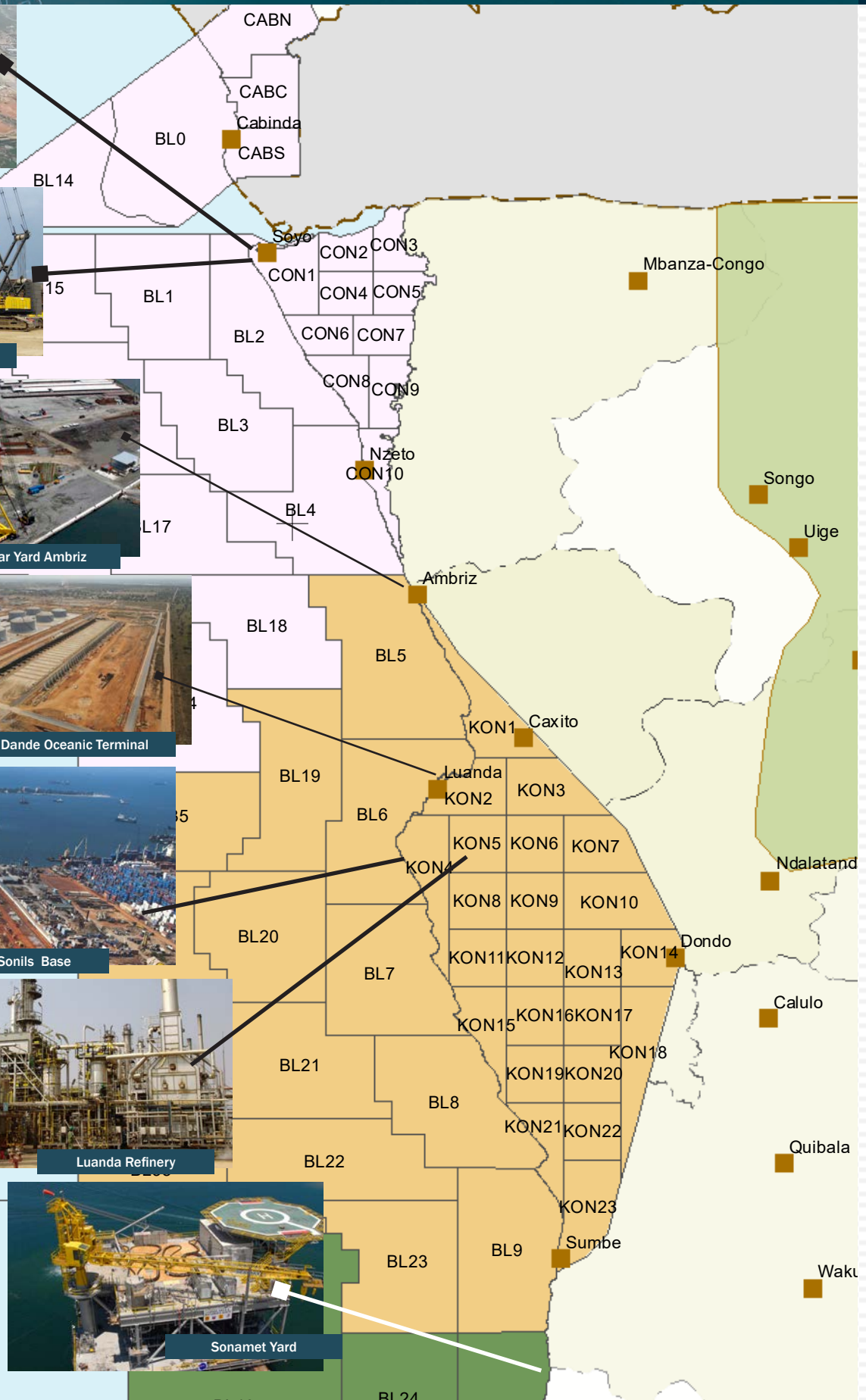
Sonils Base



Luanda Refinery



Sonamet Yard





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Crude Oil Processing & Storage Area

FOCUS	Processing, Operational Storage and Dispatch
CAPACITY	65,000 bopd and upto ~2 Million bbls Storage

Oilfield Logistics & Supply Hub

FOCUS	Logistics, Warehouse and Oilfield Supply Base
CAPACITY	Onshore Lower Congo and Kwanza Basin Operations



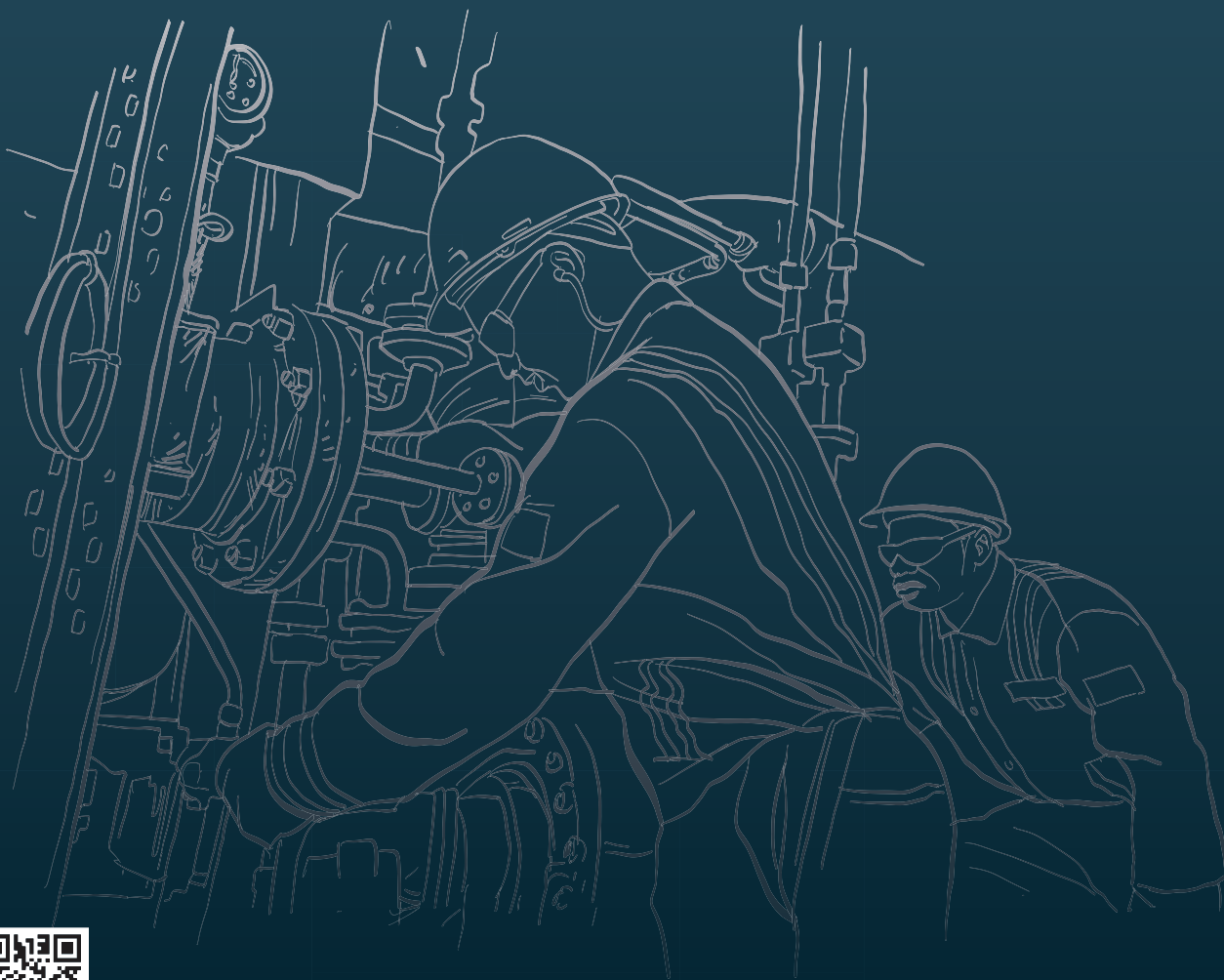
Integrated Joint Facility

FOCUS	<ul style="list-style-type: none">Operational Efficiency & Productivity
CAPACITY	<ul style="list-style-type: none">Improve Financial Viability of the Project





ANGOLA



ANPG
Agência Nacional de Petróleo, Gás e Biocombustíveis
E-mail: licitacao2023@anpg.co.ao
Tel.: +244 226 428 602
website: www.anpg.co.ao

Edifício Torres do Carmo-Torre 2, Rua Lopes Lima, Distrito Urbano da Ingombota,
Município de Luanda, República de Angola



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