



BIDDING OF
OIL CONCESSIONS 2020
REPÚBLICA DE ANGOLA

ONSHORE CONGO BASINS

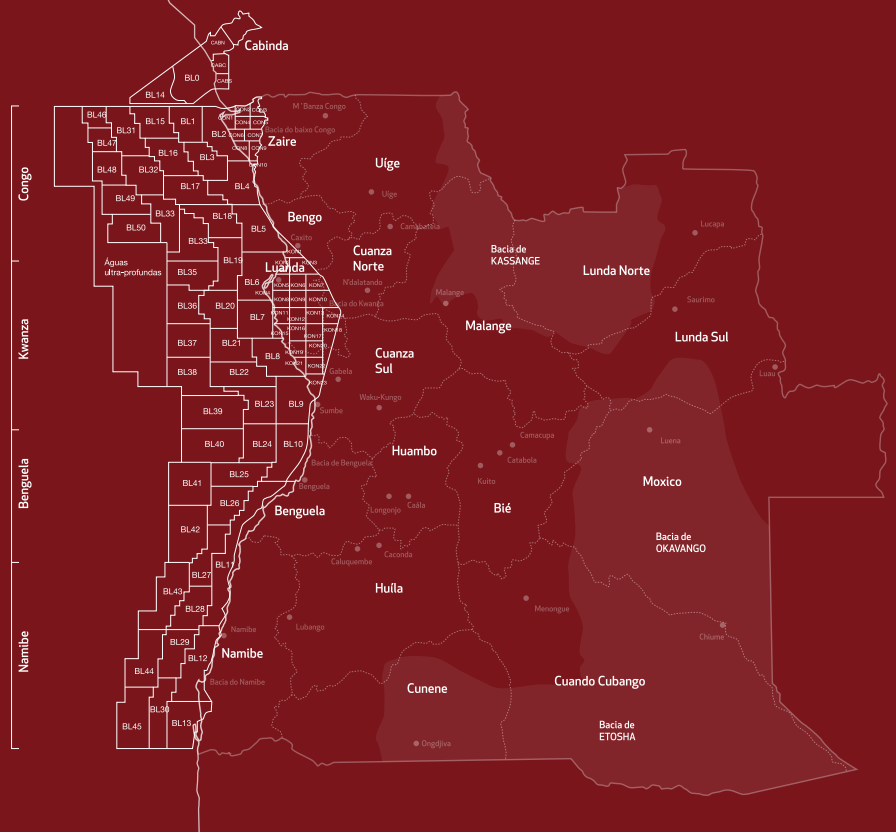
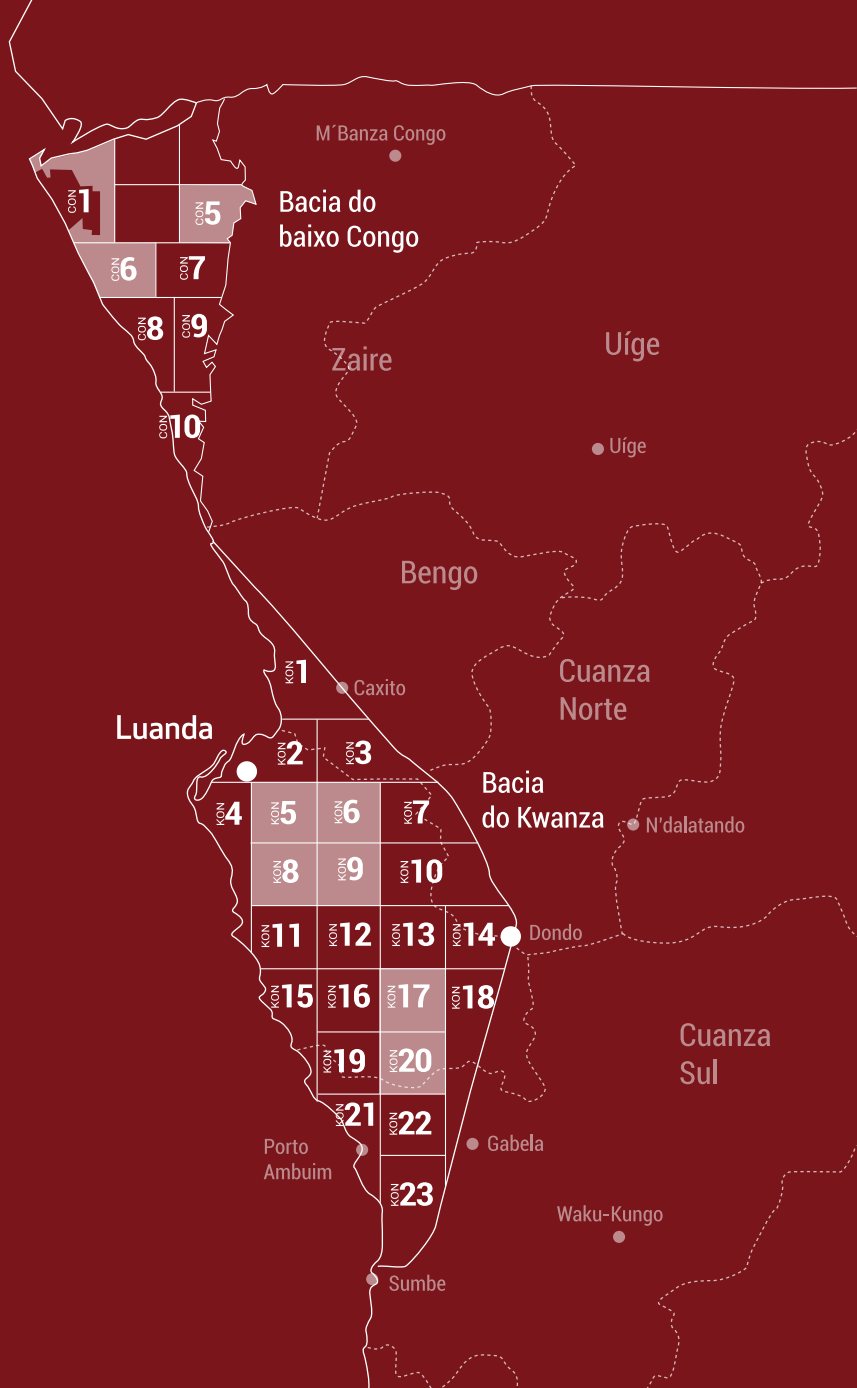
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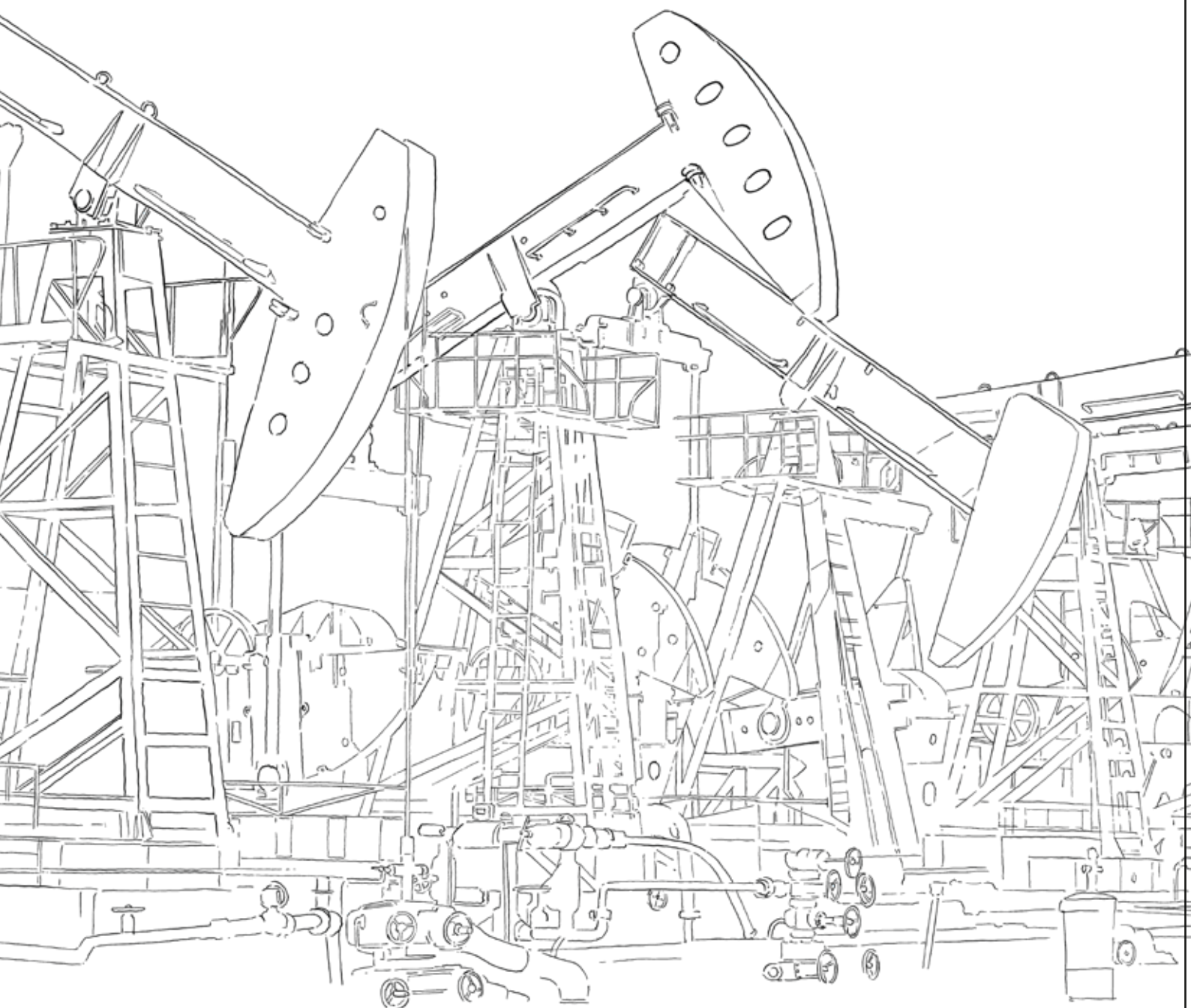
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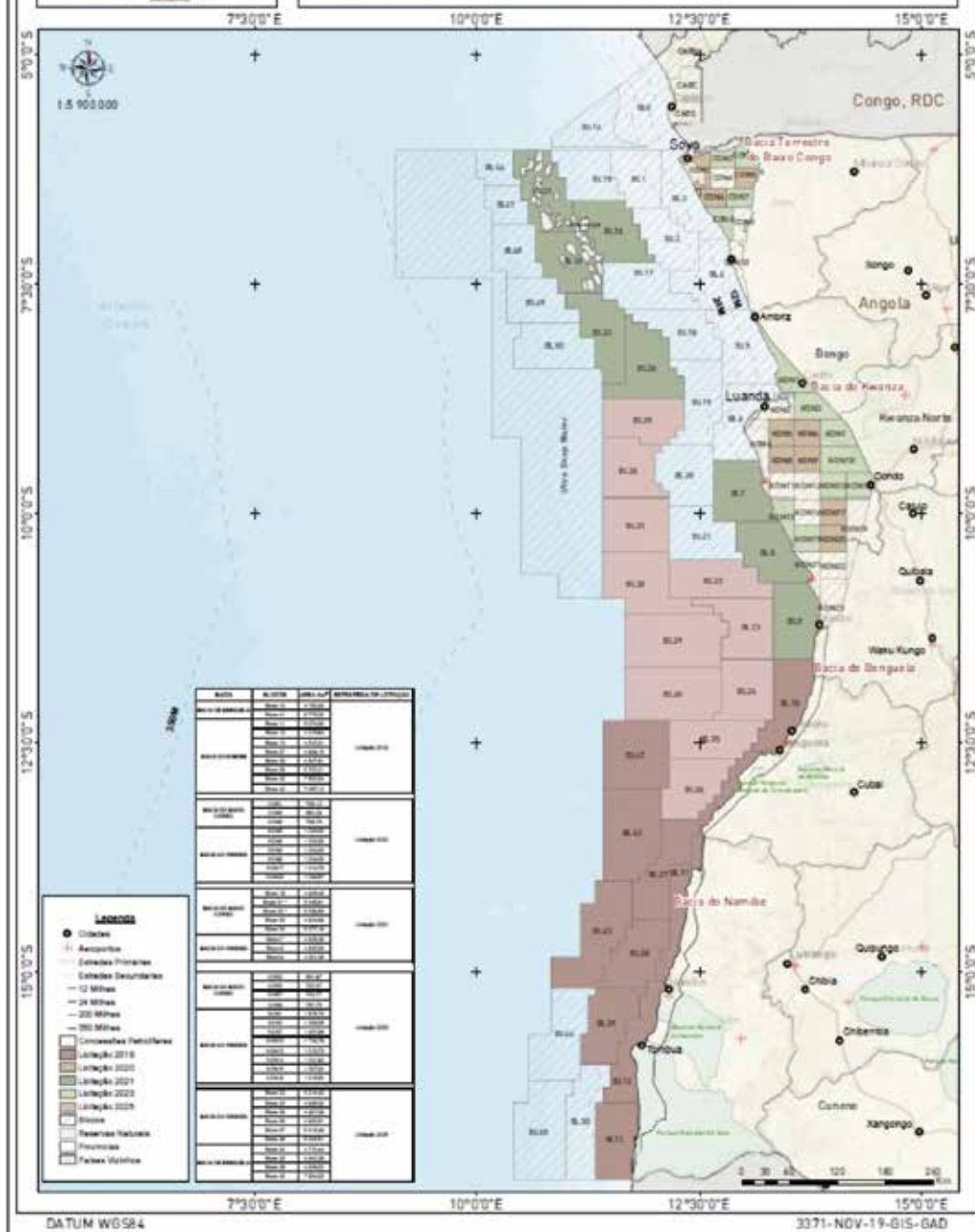






ONSHORE CONGO BASINS



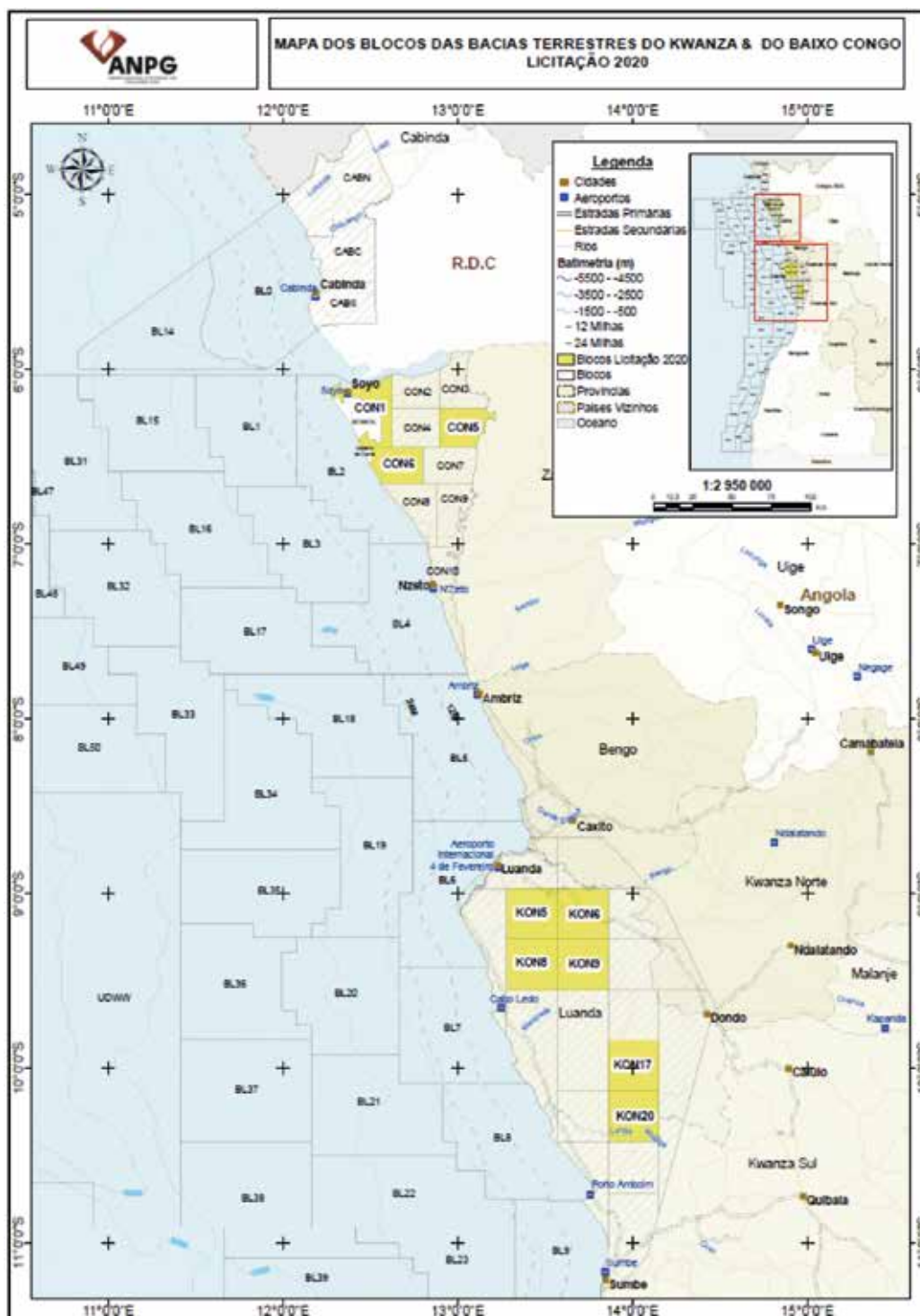


Bacias	2019	2020	2021	2023	2025
Congo		Block CON 1 Block CON 5 Block CON 6	Block 33 Block 34 Block 31* Block 32*	Block CON 2 Block CON 3 Block CON 7 Block CON 8	
Kwanza		Block KON 5 Block KON 6 Block KON 8 Block KON 9 Block KON 17	Block 7 Block 8 Block 9 Block 16	Block KON 1 Block KON 3 Block KON 7 Block KON 10 Block KON 13	Block 22 Block 23 Block 35 Block 36 Block 37 Block 38
Benguela	Block 10				
Namibe	Block 11 Block 12 Block 13 Block 27 Block 28 Block 29 Block 41				

* Blocks with open areas

ANGOLA 2020 GENERAL STRATEGY BASIS

- Reassesses the oil potential in the Lower Congo and Kwanza Terrestrial Basins; Replacement of reserves;
- Relaunch the exploration and production of hydrocarbons in the onshore areas of the referred basins and promote alternatives for accelerated development;
- Reduce the decline in production by 10% with the increase in the activity of exploring and discovering new resources;
- Stimulate local and foreign investment by small and medium-sized oil companies;
- Promote the incorporation of qualified Angolan labor and promote the dissemination of knowledge, technological innovation and good governance practices.



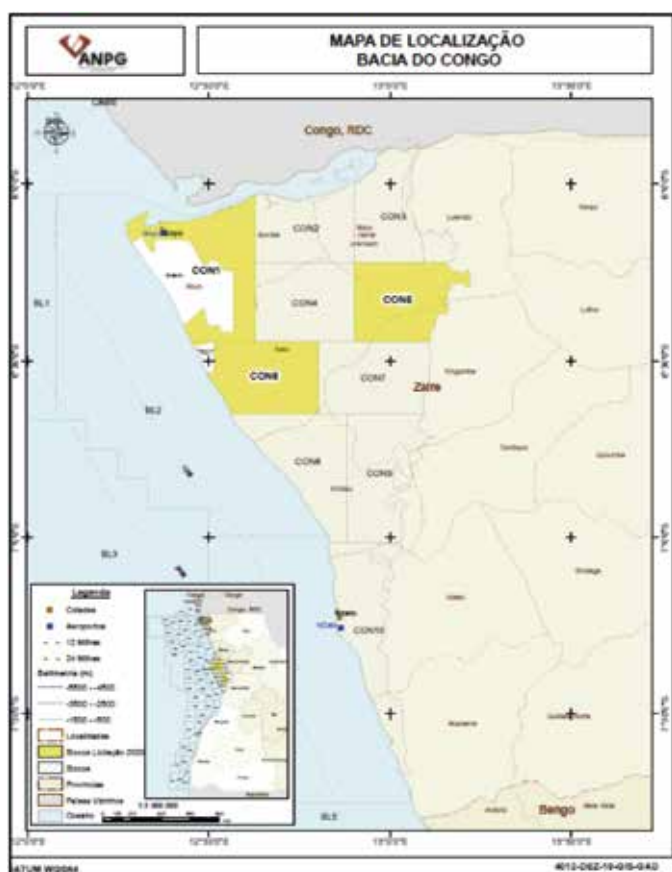
ONSHORE KWANZA BASIN AND LOWER CONGO BASIN

The Lower Congo and Kwanza Onshore Basins are closely linked, from a lithostratigraphic and structural point of view, to the rupture of the supercontinent Gondwana and subsequent formation of the South Atlantic Ocean. These basins are of Meso-Cenozoic age ranging from the Neocomian to the Holocene.

Its sedimentary history is characterized by paleoenvironmental variations between transitional continental and marine environments.

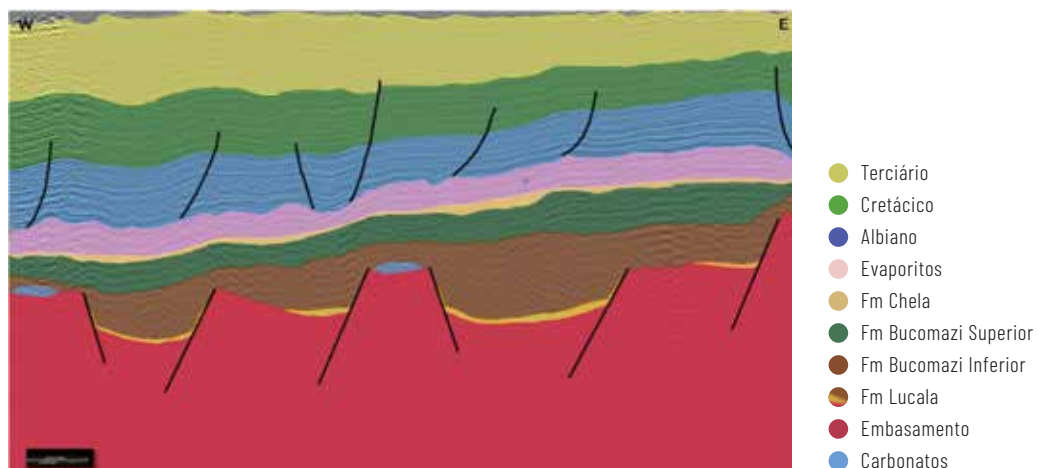
The Onshore Lower Congo Basin (Soyo)

located on the north shore of the Angolan coast, bordered to the north by the Congo River and to the south by the Kwanza Basin, covering an area of approximately 7.653,24km², subdivided in 10 blocks.



ONSHORE KWANZA BASIN AND LOWER CONGO BASIN GEOLOGICAL PROFILES

Onshore Lower Congo Basin Geological Profile



Pre-salt

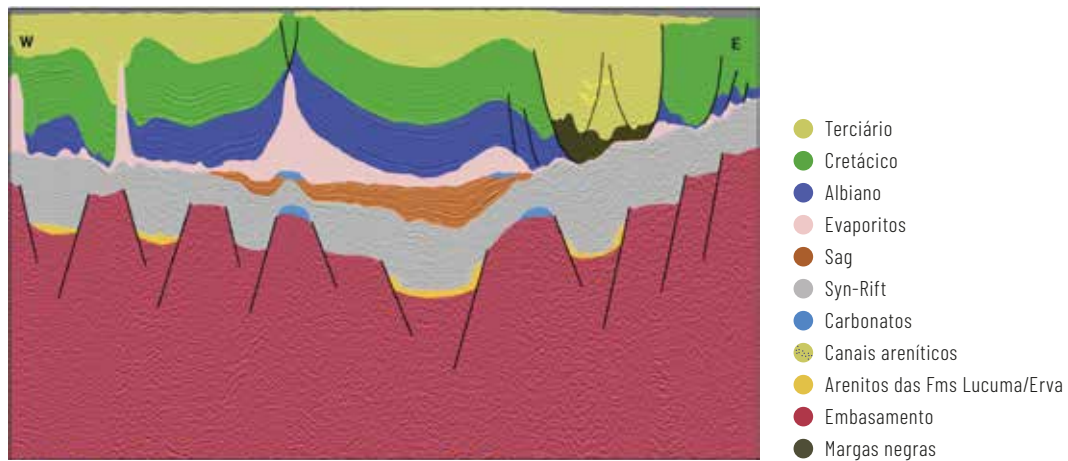
- Horsts and Grabens structures
- Sandstones in the flank of Horsts
- Carbonates on top of horsts and microbiolites at Sag
- Thick Evaporite Sequence that presents an effective pre-salt seal

Post-salt

- Little sequence of the evaporitic sequence as a structuring element
- Occurrence of normal fault in the Albian

ONSHORE KWANZA BASIN AND LOWER CONGO BASIN GEOLOGICAL PROFILES

Onshore Kwanza Basin Geological Profile



Pre-salt

- Horsts and Grabens structures
- Sandstones in the flank of Horsts
- Carbonates on top of horsts and microbiolites at Sag
- Evaporitic sequence representing an effective pre-salt seal

Post-salt

- A strong influence of salt tectonics
- Syn-depositional growth failures with lystric angles.
- Tertiary pits filled with clayey sediments rich in organic matter, with high generation potential interspersed with sands channels with reservoir characteristics.

ONSHORE
CONGO BASINS



ONSHORE LOWER CONGO BASIN

Block CON 1



Pleistocene-Sand & Conglomerates

INTRODUCTION

Location: Northwest in the Lower Congo Onshore Basin, limited to the North by the Congo River, to the East by the Blocks CON 2 and CON 4, to the South by the Block CON 6 and to the West by the FS/FST concession and Block 2 of the offshore.

Area: 755 km²

Historic:

- 10 wells have been drilled.
- 2D Seismic: 240,44 km (2007) and 34,54 km (2009).

The surface of Block CON 1 is covered mostly by outcrops of the Quaternary. The geological model presents a moderate tectonism in the Pre-Salt level with horsts and semi-grabens structures on which sediments from the Syn-rift and Sag phases were deposited. The presence of a thin layer of salt is visible acting as a seal for the pre-salt reservoirs.

The Post-salt level is quite failed, presenting antiform structures, rafts with normal sin-depositional listric thrust faults.



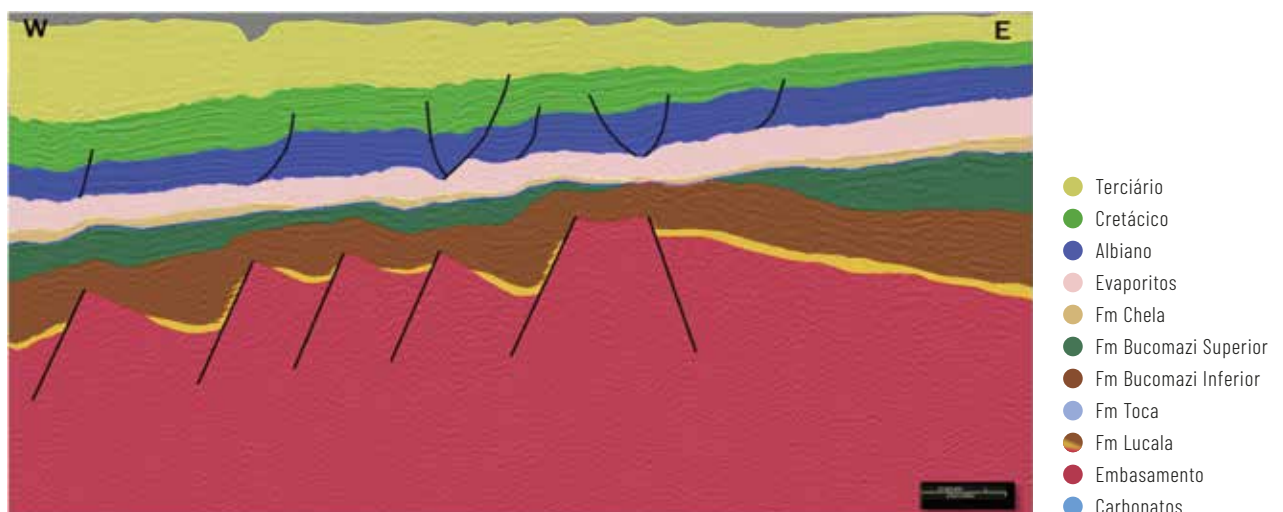
CON 1 Location



Magnetometry Coverage

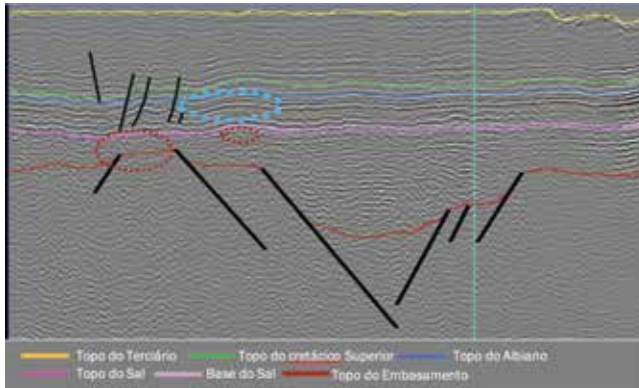


Wells and Seismic Coverage



Geological Model

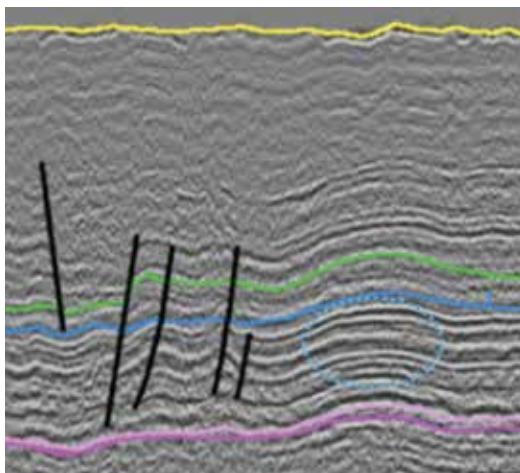
PROSPECTIVITY



Leads have been identified at the following stratigraphic level:

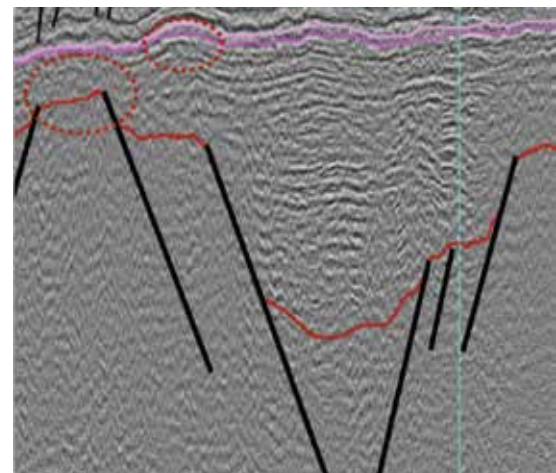
- Pre-salt: Syn-rift, Sag
- Post-salt: Albian, Upper Cretaceous and Tertiary.

Identified Leads:



Post-salt Leads (Albian):

Anti-form type structures induced by salt tectonics, located in the North of the Block. The Pinda Fm. Works as a reservoir and is sealed by the overlapping clays of the Iabe Fm., as well as by intraformational clays. The Pinda Fm. is the Source rock for this level. The Lead can also be charged by the pre-salt type source rock like the Bucomazi Fm.



Pre-salt Leads:

two potential leads were identified, one from Chela Fm. And the other at the top of the horsts (coquina type carbonates). The Luculo-1 well found a reservoir in the pre-salt Chela Fm. with traces of hydrocarbons. The main Source rock is the Bucomazi Fm. The seal is provided by the clays and the Loeme Fm.

ONSHORE LOWER CONGO BASIN

Block CON 5



Margas – Cretácico Superior

INTRODUCTION

Location: located to the East in the Onshore Lower Congo Basin, limited to the North by Block CON 3, to the East by basement's outcrops, to the South by Block CON 7 and to the West by Block CON 4.

Area: 683,29 km².

Historic:

- 2D Seismic: 124,61 km (2009).

On the surface of Block CON 5, crops up sediments that are dated back to the early Cretaceous to recent age. According to the geological model, the pre-salt is characterized by a strongly faulted basement, causing formation of horsts and grabens.

In the grabens, fine sediments rich in organic matter were deposited, constituting a possible source rocks. At the pre-salt level, the main reservoirs are sandstones (Chela Fm.).

At the Aptian level, there is a thin layer of salt which constitute a potential regional seal.

The Post-salt is characterized by little to a few structures.



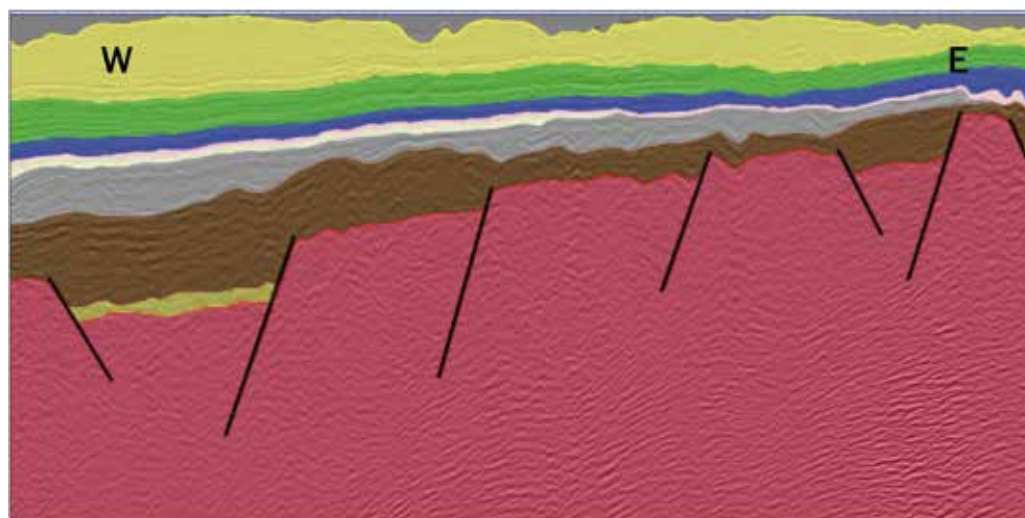
CON 5 Location



Magnetometry Coverage



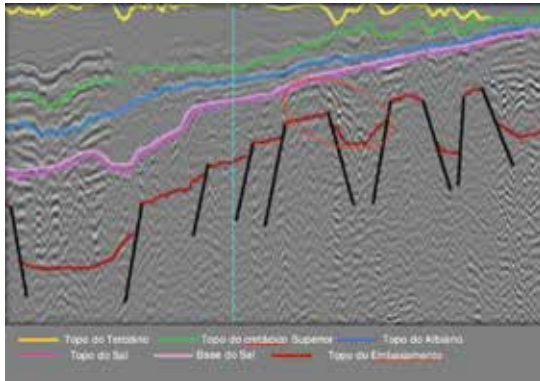
Wells and Seismic Coverage



Geological Model

- Terciário
- Cretácico
- Albiano
- Evaporitos
- Fm Chela
- Fm Bucomazi Superior
- Fm Bucomazi Inferior
- Fm Lucala
- Embasamento
- Carbonatos

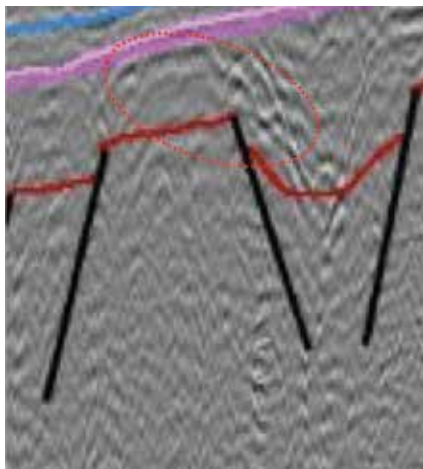
PROSPECTIVITY



Leads have been identified at the following stratigraphic level:

- Pre-salt: Syn-rift, Sag
- Post-salt: Albian, Upper Cretaceous and Tertiary.

Identified Leads:



Pre-salt Lead (Syn-rift):

the reservoir is constituted by sandstones on the flanks of the structural highs and/or by carbonate mounds deposited on top of the horsts.

The seal is provided by the Loeme Fm. and/or by intraformational clays from the Bucomazi Fm.

The Main Source Rock is characterized by clays rich in organic matter from the Bucomazi Fm.

It presents traps of a combined type (structural and stratigraphic).

ONSHORE LOWER CONGO BASIN

Block CON 6



Diaclastic Silts – Eocene Plistocénico

INTRODUCTION

Location: Midwest of the Onshore Lower Congo Basin, limited to the North by Blocks CON 1 and CON 4, to the East by Block CON 7, to the South by Block CON 8 and to the West by the Coast line (Offshore Block 2).

Area: 631.97 km²

Historic:

- 4 wells have been drilled
- 2D Seismic: 279,64 km (2007) e 138,98 km (2009).

On the surface of Block CON6, there are outcrops that date from the Oligocene to the recent age. According to the geological model, the basement is characterized by a tectonism marked by normal faults resulting in the formation of horsts and semi-grabens, and in the bottom of the semi-grabens, fine sediments rich in organic matter are deposited, constituting the source rock. The possible reservoirs correspond to the sandstones deposited on the sides of the horsts and against the base of the salt. At the Aptian level, there is a thin layer of salt, a potential regional seal. The post-salt layer is characterized by a strong structure at the Albian level with good thickness.



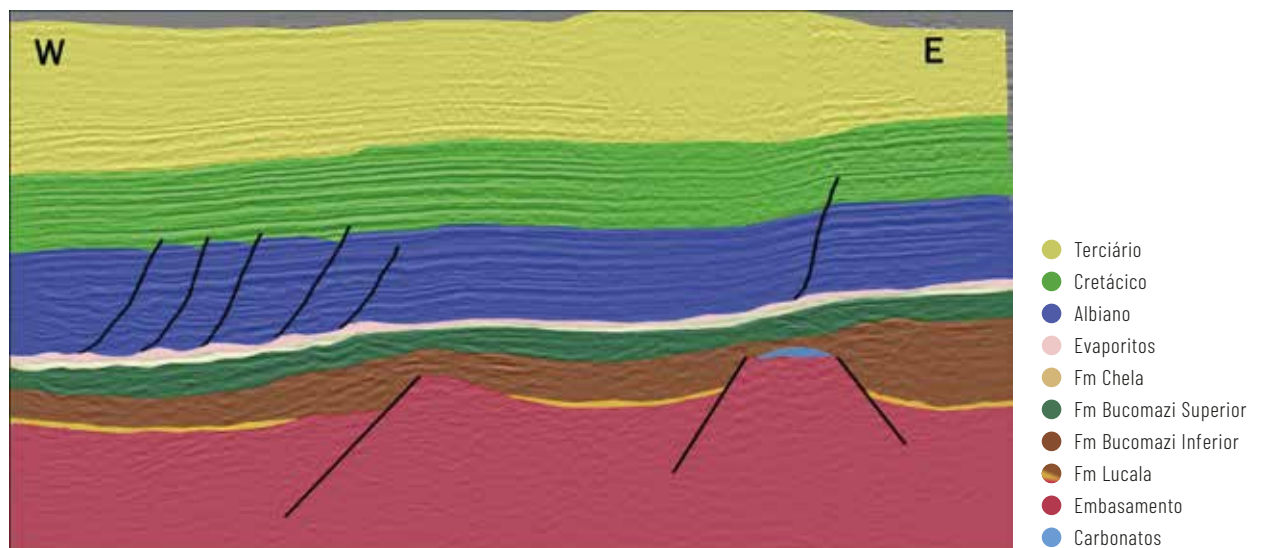
CON 5 Location



Magnetometry Coverage

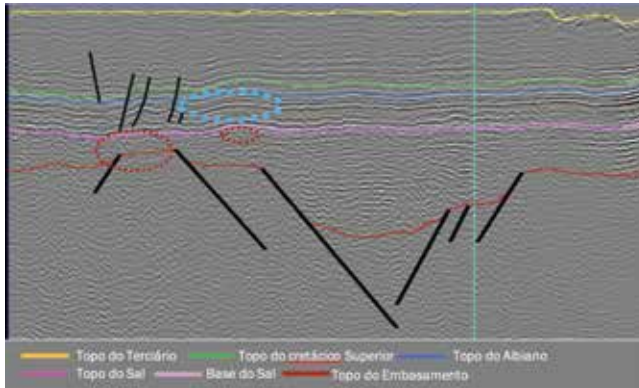


Wells and Seismic Coverage



Geological Model

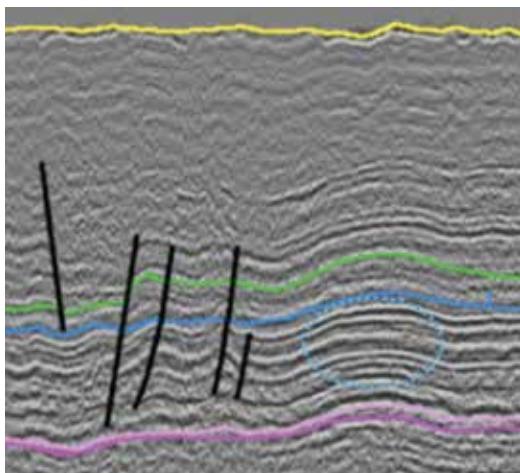
PROSPECTIVITY



Leads have been identified at the following stratigraphic level:

- Pre-salt: Syn-rift, Sag
- Post-salt: Albian, Upper Cretaceous and Tertiary.

Identified Leads:

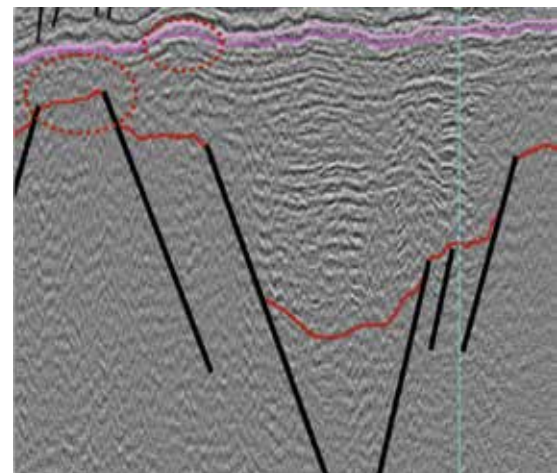


Pre-salt Leads (Syn-rift and Sag):

Reservoirs constituted by carbonate mounds deposited on top of horsts as well as sands deposited along the salt base.

The seal is provided by the Loeme Fm. and/or by intraformational clays of the Bucumazi Fm.

The Main Source Rock is characterized by clays rich in organic matter from the Bucumazi Fm. It presents traps of the combined type (structural and stratigraphic).



Post-salt Leads (Albian):

raft-type structures forming compartmentalized reservoirs induced by the halokinesis (Salt movement). The carbonate and sandstone sediments of Pinda Fm. work as reservoirs.

This structure is charged by rich organic matter (black marls) from Pinda Fm. (Albian) and/or by clays of the Bucumazi Fm. (Pre-salt).

The intraformational clays from Pinda Fm. along with overlaying clays from Iabe Fm. constitute the seal for this level.

It presents traps of the combined type (structural and stratigraphic).