

MOL GROUP BISSAU

PRELIMINARY PETROLEUM SYSTEM AND HYDROCARBON EXPLORATION ASSESSMENT

FOR THE ONSHORE GUINEA-BISSAU PORTION OF THE BOVÉ BASIN

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IMPORTANT NOTICE

This document presents a preliminary and conceptual geological, petroleum-system, exploration and development assessment of the Guinea-Bissau onshore sector of the Bové Basin.

The document has been prepared for strategic planning, preliminary technical evaluation, exploration concept development, stakeholder discussion and future project-development purposes.

The geological interpretations, petroleum-system assessments, volumetric estimates, reservoir parameters, production scenarios and development assumptions presented herein are conceptual unless expressly identified as published or historical data.

The numerical values presented in this assessment, including conceptual reservoir depth, porosity, oil gravity, oil initially in place, recoverable resources, production rates and development parameters, are preliminary engineering and exploration assumptions intended for scenario modelling and technical screening.

They do not constitute certified reserves, a certified contingent-resource estimate, a commercial discovery declaration or an independent petroleum-reserves evaluation.

This assessment does not represent a confirmed commercial hydrocarbon discovery, a petroleum licence, a concession claim, a legal field boundary or an entitlement to petroleum resources.

The Guinea-Bissau onshore sector of the Bové Basin requires further geological, geophysical, seismic, geochemical and, where justified by the results of the preceding work, exploration-drilling activities.

MOL GROUP BISSAU currently does not possess proprietary geological, geophysical, seismic or geochemical datasets sufficient to independently confirm the conceptual subsurface parameters or resource ranges presented in this document.

All technical assumptions remain subject to future data acquisition, geological interpretation, geophysical investigation, seismic evaluation, geochemical analysis, basin modelling, exploration drilling, appraisal, independent technical evaluation and applicable legal and regulatory requirements.

1. EXECUTIVE SUMMARY

The Bové Basin represents a regionally significant Paleozoic sedimentary basin extending across parts of Guinea and Guinea-Bissau.

The geological history of the basin includes multiple sedimentary depositional phases, including continental and marine depositional environments. Historical geological studies have provided an important regional framework for understanding the stratigraphic and sedimentary evolution of the basin.

The Guinea-Bissau onshore sector of the Bové Basin, including the broader Bafatá Synclinal area, is considered by MOL GROUP BISSAU to warrant further systematic geological and geophysical evaluation.

The objective of this assessment is to establish a structured exploration concept based on:

- historical and published geological information;
- regional basin architecture;
- conceptual petroleum-system evaluation;
- identification of geological and exploration uncertainties;
- numerical subsurface and development scenarios;
- and a phased exploration programme designed to progressively reduce geological risk.

MOL GROUP BISSAU considers that the Bové Basin may contain geological conditions worthy of further hydrocarbon investigation.

However, the present public information base is not sufficient to confirm the existence, size, quality, maturity or commerciality of a petroleum accumulation.

Accordingly, the proposed exploration philosophy is:

- REGIONAL GEOLOGY
- DATA COMPILATION
- GEOPHYSICAL INVESTIGATION
- SEISMIC INTERPRETATION
- PETROLEUM-SYSTEM ANALYSIS
- PROSPECT IDENTIFICATION
- EXPLORATION DRILLING
- APPRAISAL

CONCEPTUAL FIELD DEVELOPMENT

2. PURPOSE AND SCOPE

The purpose of this document is to provide a preliminary technical framework for the evaluation of the Guinea-Bissau onshore sector of the Bové Basin.

The assessment has six principal objectives:

1. To summarise the regional geological setting of the Bové Basin.
2. To review the available historical geological knowledge relevant to the Guinea-Bissau onshore sector.
3. To establish a preliminary petroleum-system framework.
4. To define conceptual numerical subsurface and development scenarios for exploration screening.
5. To identify the principal technical uncertainties and data gaps.
6. To establish a phased exploration methodology for future evaluation following the acquisition of appropriate exploration rights and access to relevant technical data.

The assessment is intended to function as a strategic technical document supporting the development of a future exploration programme.

3. REGIONAL GEOLOGICAL SETTING

The Bové Basin is a Paleozoic sedimentary basin extending across the West African region and including areas within Guinea and Guinea-Bissau.

The basin has undergone a complex geological history involving the deposition of sedimentary sequences in changing continental and marine environments.

Historical stratigraphic and sedimentological studies have identified multiple depositional phases within the basin, including Lower Paleozoic sedimentary successions and periods of marine transgression and regression.

These geological characteristics are relevant to petroleum exploration because hydrocarbon systems commonly require the interaction of several geological elements, including:

- organic-rich source rocks;
- porous and permeable reservoir rocks;
- sealing lithologies;
- structural or stratigraphic traps;
- hydrocarbon-generation and migration pathways;
- and appropriate burial and thermal-maturation history.

The existence of a sedimentary basin alone does not establish the presence of a commercial petroleum system.

However, the geological evolution of the Bové Basin provides a basis for further systematic investigation.

4. REGIONAL GEOLOGICAL EVOLUTION

The geological evolution of the Bové Basin is important for evaluating the possibility of petroleum-system development.

The basin records a complex history of sediment accumulation and changing depositional environments.

The regional geological framework includes:

- Paleozoic sedimentary deposition;
- changes between continental and marine depositional conditions;
- periods of sediment accumulation and erosion;
- structural deformation;
- and subsequent burial and geological modification.

The geological history is relevant because the formation of an effective petroleum system depends not only on the existence of sedimentary rocks, but also on the timing and interaction of:

- source-rock deposition;
- burial;
- thermal maturation;
- hydrocarbon generation;
- migration;
- reservoir development;
- trap formation;
- and seal preservation.

These relationships require further detailed evaluation.

5. GUINEA-BISSAU ONSHORE SECTOR

The Guinea-Bissau portion of the Bové Basin represents the principal geographic focus of this assessment.

The broader Bafatá Synclinal area is of particular strategic interest because of its regional geological setting and relationship to the broader Bové Basin geological framework.

The final exploration area to be selected by MOL GROUP BISSAU has not yet been finally defined.

Consequently, this assessment does not establish:

- a final exploration polygon;
- final GPS coordinates;
- a legally defined block;
- a final exploration-area size;
- a definitive administrative boundary;
- or a final legal concession area.

The final exploration area should be selected following technical, legal, geological, environmental and administrative evaluation and in accordance with the applicable legal framework of the Guinea-Bissau Republic.

The present document therefore provides a regional and conceptual assessment rather than a legally defined exploration-area description.

6. HISTORICAL GEOLOGICAL KNOWLEDGE

Historical geological studies provide an important foundation for understanding the Bové Basin.

Published geological research has examined the stratigraphic, sedimentological and paleogeographic evolution of the basin, including the development of Lower Paleozoic sedimentary sequences.

These studies are relevant because they help establish:

- the geological age of sedimentary sequences;
- depositional environments;
- regional sedimentary evolution;
- continental and marine depositional phases;
- and the broader geological architecture of the basin.

Historical geological information must, however, be distinguished from modern petroleum-exploration data.

Historical geological research does not automatically provide:

- modern 2D seismic coverage;
- modern 3D seismic coverage;
- high-resolution subsurface imaging;
- modern basin modelling;
- modern source-rock geochemistry;
- or a certified petroleum-resource estimate.

Accordingly, historical geological information should be treated as a geological foundation for further exploration rather than as proof of commercial hydrocarbons.

7. PRELIMINARY PETROLEUM-SYSTEM ASSESSMENT

The petroleum-system assessment presented in this document is preliminary and conceptual.

The following petroleum-system elements require evaluation:

SOURCE ROCK
RESERVOIR
SEAL
TRAP
CHARGE AND MIGRATION
TIMING AND MATURATION

Each element is discussed separately below.

7.1 SOURCE-ROCK POTENTIAL

The presence, quality, maturity and distribution of effective source rocks require confirmation through:

- geological sampling;
- geochemical analysis;
- total organic-carbon analysis;
- Rock-Eval pyrolysis;
- vitrinite-reflectance or equivalent maturity analysis;
- biomarker analysis where appropriate;
- and basin modelling.

The current assessment therefore considers source-rock potential to be:

PRELIMINARY — REQUIRES CONFIRMATION.

The principal questions for future investigation include:

- whether organic-rich source rocks are present;
 - their total organic-carbon content;
 - kerogen type;
 - thermal maturity;
 - hydrocarbon-generation potential;
 - lateral continuity;
 - and burial history.

7.2 RESERVOIR POTENTIAL

The conceptual exploration model allows for the potential presence of reservoir intervals within suitable sedimentary successions.

For preliminary engineering and exploration screening purposes, a conceptual reservoir-depth range of approximately: 2,200–2,800 metres / may be considered as a working scenario.

This depth range is not presented as a confirmed measurement for a specific Bové Basin reservoir.

Future seismic interpretation and exploration drilling would be required to determine:

- actual depth;
- thickness;
- lithology;
- porosity;
- permeability;
- pressure;
- fluid saturation;
- and reservoir continuity.

Potential reservoir lithologies may include suitable sandstone or other porous sedimentary units, subject to confirmation by future geological and petrophysical evaluation.

7.3 POROSITY

For conceptual modelling purposes, a preliminary porosity range of:

20–24%

may be used as a scenario parameter.

This range is not a measured Bové Basin reservoir value.

Actual porosity must be established through:

- core analysis;
- wireline logging;
- formation evaluation;
- pressure data;
- and laboratory petrophysical analysis.

Porosity may vary substantially according to:

- depositional environment;
- burial depth;
- compaction;
- cementation;
- diagenesis;
- lithology;
- and structural history.

7.4 PERMEABILITY

Permeability is not assigned a definitive value in the present preliminary assessment.

The future evaluation should establish:

- horizontal permeability;
- vertical permeability;
- permeability anisotropy;
- fracture contribution;
- and the relationship between porosity and permeability.

Permeability is expected to be one of the principal parameters controlling future well productivity and recovery performance.

7.5 RESERVOIR FLUID CHARACTERISTICS

For conceptual development screening, a crude-oil gravity range of:

34–38° API

may be considered as a preliminary scenario assumption.

This value is not a confirmed fluid-property measurement for the Bové Basin.

Future fluid samples and laboratory analysis would be required to determine:

- API gravity;
- viscosity;
- gas-oil ratio;
- bubble-point pressure;
- formation-volume factor;
- sulphur content;
- wax characteristics;
- and other relevant PVT properties.

7.6 SEAL POTENTIAL

The presence and effectiveness of regional or local sealing units require further stratigraphic and geological evaluation.

Potential sealing intervals may include:

- shale-rich units;
- fine-grained sedimentary sequences;
- tight mudstones;
- and other low-permeability lithologies.

The effectiveness of any seal must be confirmed through geological, petrophysical and pressure analysis.

The principal seal risks include:

- insufficient thickness;
- lateral discontinuity;
- fault leakage;
- fracturing;
- and post-depositional modification.

7.7 TRAP POTENTIAL

Potential traps may include:

- structural closures;
- folded structures;
- fault-related traps;
- stratigraphic pinch-outs;
- unconformity-related traps;
- and combined structural-stratigraphic traps.

The identification of actual prospective traps requires modern geophysical and seismic interpretation.

No specific commercial prospect should be considered confirmed until supported by appropriate geological and geophysical evidence.

7.8 CHARGE AND MIGRATION

The existence of an effective petroleum system depends on the generation and migration of hydrocarbons.

Future evaluation should consider:

- source-rock distribution;
- source-rock maturity;
- hydrocarbon-generation timing;
- migration pathways;
- carrier beds;
- faults;
- fractures;
- and trap formation.

Charge risk remains unconfirmed at the present stage.

The principal technical tools for future evaluation include:

- geochemical analysis;
- basin modelling;
- burial-history reconstruction;
- thermal-maturity modelling;
- and seismic interpretation.

7.9 TIMING AND MATURATION

The timing relationship between:

- source-rock maturation;
- hydrocarbon generation;
- migration;
- trap formation;
- and seal preservation

is a critical element of petroleum-system evaluation.

This relationship cannot be confirmed through regional geological information alone.

Future basin modelling should be used to evaluate:

- burial history;
- thermal history;
- source-rock maturity;
- generation windows;
- migration timing;
- and preservation risk.

8. CONCEPTUAL RESOURCE SCENARIO

For preliminary volumetric and engineering screening purposes, the MOL GROUP BISSAU conceptual model may consider the following scenario range.

CONCEPTUAL FIELD AREA

Approximately 50 km²

CONCEPTUAL RESERVOIR DEPTH

Approximately 2,200–2,800 metres

CONCEPTUAL POROSITY

Approximately 20–24%

CONCEPTUAL OIL GRAVITY

Approximately 34–38° API

CONCEPTUAL OOIP

Approximately 450–650 MMbbl

CONCEPTUAL RECOVERABLE RESOURCES

Approximately 135–195 MMbbl

These values are conceptual scenario parameters.

They are not certified reserves.

They are not independently verified petroleum-resource estimates.

They are not presented as a confirmed discovery.

They are intended to provide a numerical framework for:

- preliminary volumetric screening;
- exploration scenario analysis;
- development-concept testing;
- production-profile modelling;
- infrastructure screening;
- and preliminary economic evaluation.

The conceptual recoverable-resource range corresponds to an indicative recovery factor of approximately 30% of the conceptual OOIP range.

The actual recovery factor could be materially different depending on:

- reservoir quality;
- drive mechanism;
- pressure support;
- fluid properties;
- well productivity;
- recovery technology;
- reservoir heterogeneity;
- and final field-development design.

9. CONCEPTUAL VOLUMETRIC FRAMEWORK

The conceptual resource scenario is based on the principle that in-place hydrocarbons are a function of:

- reservoir area;
- gross reservoir thickness;
- net-to-gross ratio;
- porosity;
- hydrocarbon saturation;
- formation-volume factor;
- and other geological and engineering parameters.

The conceptual resource range should therefore be considered a scenario envelope rather than a single deterministic estimate.

A future volumetric evaluation should use:

- low case;
- best estimate case;
- and high case scenarios.

The 450–650 MMbbl conceptual OOIP range is intended to represent a preliminary screening range.

The 135–195 MMbbl conceptual recoverable-resource range is intended to represent a preliminary development scenario based on an indicative recovery factor of approximately 30%.

These values require substantial future technical validation.

10. CONCEPTUAL PRODUCTION SCENARIO

For preliminary development screening, the conceptual production scenario may consider:

INITIAL PRODUCTION TARGET

Approximately 15,000 bopd

POTENTIAL CONCEPTUAL PLATEAU

Approximately 50,000 bopd

These values represent development scenarios and are not production forecasts based on confirmed well data.

A future production profile would depend on:

- the number of commercially successful exploration wells;
- reservoir productivity;
- pressure behaviour;
- well spacing;
- completion design;
- artificial-lift requirements;
- surface infrastructure;
- export logistics;
- and the final field-development strategy.

The production scenario should therefore be revised following the acquisition of actual subsurface and well data.

11. CONCEPTUAL FIELD DEVELOPMENT FRAMEWORK

If future exploration and appraisal activities confirm a commercially viable hydrocarbon accumulation, the development concept may include:

- phased development;
- initial production facilities;
- gathering systems;
- separation facilities;
- storage capacity;
- export infrastructure;
- water management;
- production monitoring;
- and future recovery optimisation.

A conceptual development sequence may be structured as follows:

PHASE 1 — EXPLORATION

- geological evaluation;
- geophysical acquisition;
- seismic interpretation;
- exploration drilling.

PHASE 2 — APPRAISAL

- appraisal drilling;
- reservoir delineation;
- pressure evaluation;
- fluid sampling;
- reservoir modelling.

PHASE 3 — EARLY DEVELOPMENT

- initial production wells;
- central processing facilities;
- gathering systems;
- storage and export systems.

PHASE 4 — FULL FIELD DEVELOPMENT

- additional production wells;
- water injection if justified;
- pressure maintenance;
- production optimisation;
- enhanced recovery evaluation.

The final development configuration would depend on future exploration and appraisal results.

12. EXPLORATION DATA GAP

At the current stage, MOL GROUP BISSAU does not possess sufficient proprietary exploration data to independently confirm the conceptual parameters presented in this assessment.

The current data gap includes:

- proprietary geological datasets;
- proprietary 2D seismic datasets;
- proprietary 3D seismic datasets;
- proprietary geochemical datasets;
- modern exploration-well data;
- core data;
- well logs;
- pressure data;
- and laboratory fluid-property data.

This data gap represents an exploration challenge but also defines the principal opportunity for a future exploration programme.

The purpose of the initial exploration programme should therefore be progressive risk reduction.

13. PROPOSED EXPLORATION PROGRAMME

PHASE 1 — DATA COMPILATION AND TECHNICAL REVIEW

The initial phase should include:

- collection of available geological maps;
- review of historical geological publications;
- compilation of available well information;
- review of historical geophysical data;
- gravity and magnetic data compilation;
- review of available seismic information;
- and evaluation of government-held data subject to applicable access rules.

PHASE 2 — REGIONAL GEOLOGICAL EVALUATION

The regional evaluation should include:

- stratigraphic interpretation;
- structural geological analysis;
- basin-architecture evaluation;
- sedimentary-evolution analysis;
- identification of major structural trends;
- and preliminary petroleum-system mapping.

PHASE 3 — GEOPHYSICAL INVESTIGATION

Depending on the results of Phase 1 and Phase 2, the programme may include:

- gravity interpretation;
- magnetic interpretation;
- reconnaissance 2D seismic acquisition;
- targeted high-resolution seismic acquisition;
- and, where justified, 3D seismic acquisition over mature prospects.

PHASE 4 — PETROLEUM-SYSTEM ANALYSIS

The programme should include:

- source-rock screening;
- geochemical analysis;
- burial-history modelling;
- thermal-maturity modelling;
- hydrocarbon-generation assessment;
- migration analysis;
- reservoir evaluation;
- and seal assessment.

PHASE 5 — PROSPECT MATURATION

Prospects should be ranked according to:

- geological chance of success;
- structural definition;
- source-rock confidence;
- reservoir confidence;
- seal confidence;
- charge risk;
- volumetric potential;
- and commercial development potential.

PHASE 6 — EXPLORATION DRILLING

Exploration drilling should only be undertaken following sufficient geological and geophysical evaluation.

A potential exploration-well programme should be designed to test:

- the presence of hydrocarbons;
- reservoir quality;
- reservoir thickness;
- fluid properties;
- pressure;
- hydrocarbon-water contacts;
- and the broader petroleum-system model.

14. EXPLORATION RISK

The current preliminary risk assessment is:

BASIN PRESENCE

REGIONALLY ESTABLISHED

SOURCE ROCK

UNCONFIRMED — REQUIRES EVALUATION

RESERVOIR

POTENTIAL — REQUIRES CONFIRMATION

SEAL

POTENTIAL — REQUIRES CONFIRMATION

TRAP

REQUIRES SEISMIC DEFINITION

CHARGE

UNCONFIRMED

COMMERCIALITY

UNKNOWN

The principal purpose of the exploration programme is therefore to convert geological uncertainty into measured technical data.

15. EXPLORATION DECISION GATES

The exploration programme should be managed through progressive technical decision gates.

DECISION GATE 1 — REGIONAL GEOLOGICAL REVIEW

Question:

Does the available geological information justify continued evaluation?

DECISION GATE 2 — GEOPHYSICAL EVALUATION

Question:

Does the geophysical information identify structures or geological features worthy of detailed seismic investigation?

DECISION GATE 3 — SEISMIC INTERPRETATION

Question:

Does the seismic data define potential closures or other prospective geological configurations?

DECISION GATE 4 — PETROLEUM-SYSTEM CONFIRMATION

Question:

Is there sufficient evidence of source, reservoir, seal and charge potential to justify drilling?

DECISION GATE 5 — EXPLORATION DRILLING

Question:

Does drilling confirm hydrocarbons and a technically meaningful accumulation?

DECISION GATE 6 — APPRAISAL

Question:

Is the accumulation sufficiently large and productive to justify development evaluation?

This staged approach is intended to reduce unnecessary capital exposure and progressively improve the technical basis for investment decisions.

16. MOL GROUP BISSAU EXPLORATION CONCEPT

MOL GROUP BISSAU proposes a phased exploration strategy based on progressive technical risk reduction.

The Company's conceptual approach is not based on the assumption that commercial hydrocarbons are already proven.

Rather, the exploration concept is based on the following principle:

THE BOVÉ BASIN SHOULD BE EVALUATED SYSTEMATICALLY BEFORE LARGE-SCALE DEVELOPMENT DECISIONS ARE MADE.

The exploration programme should therefore progress from:

REGIONAL GEOLOGY

to

GEOPHYSICAL EVALUATION

to

SEISMIC INTERPRETATION

to

PROSPECT MATURATION

to

EXPLORATION DRILLING

to

APPRAISAL

and only thereafter to:

FIELD DEVELOPMENT.

17. STRATEGIC EXPLORATION RATIONALE

The strategic rationale for further exploration of the Guinea-Bissau onshore sector of the Bové Basin is based on five principal considerations.

FIRST:

The basin has a documented geological history and regional sedimentary framework.

SECOND:

The existing public information does not appear sufficient to provide a modern, high-resolution evaluation of the complete petroleum system.

THIRD:

The absence of sufficient modern exploration data creates substantial uncertainty but also creates an opportunity for new data acquisition.

FOURTH:

A phased exploration programme allows geological risk to be reduced before major development expenditure is committed.

FIFTH:

A successful exploration programme could establish a new domestic hydrocarbon-development opportunity for the Guinea-Bissau Republic, subject to future technical confirmation, legal approvals and commercial viability.

18. CONCLUSION

The Guinea-Bissau onshore sector of the Bové Basin represents a geological area worthy of further systematic evaluation.

Historical geological research provides an important foundation for understanding the regional stratigraphic and sedimentary evolution of the basin.

However, the existing public geological framework does not independently establish the presence of a commercially exploitable hydrocarbon accumulation.

MOL GROUP BISSAU therefore considers that the principal exploration opportunity lies in the acquisition and integration of modern geological, geophysical, seismic and geochemical data.

The conceptual numerical parameters presented in this assessment, including:

- **a conceptual field area of approximately 50 km²;**
 - **reservoir depths of approximately 2,200–2,800 metres;**
 - **porosity of approximately 20–24%;**
 - **oil gravity of approximately 34–38° API;**
 - **conceptual OOIP of approximately 450–650 MMbbl;**
 - **conceptual recoverable resources of approximately 135–195 MMbbl;**
 - **initial production of approximately 15,000 bopd;**
 - **and a potential conceptual plateau of approximately 50,000 bopd;**
- are retained as preliminary engineering and exploration scenarios.**

These numerical scenarios are intended to provide a technical basis for further evaluation and are subject to substantial geological and technical uncertainty.

They do not constitute certified reserves, certified resources or a confirmed commercial discovery.

The next critical step is the acquisition of the legal right to conduct systematic hydrocarbon exploration within an appropriately defined area of the Guinea-Bissau onshore sector of the Bové Basin.

Following the establishment of the appropriate exploration rights, MOL GROUP BISSAU intends to develop a structured exploration programme designed to progressively reduce geological uncertainty and determine whether a commercially viable petroleum system exists.

MOL GROUP BISSAU therefore considers the Bové Basin to represent a potentially significant opportunity for a phased, technically disciplined and data-driven hydrocarbon exploration programme.

END OF DOCUMENT

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