

GALP

ENVIRONMENTAL IMPACT ASSESSMENT

APPLICATION FOR ECCS FOR FURTHER EXPLORATION ACTIVITIES IN PEL 83 (ORANGE BASIN), OFF THE COAST OF NAMIBIA:

1. AMENDMENT OF THE CURRENT ECC FOR THE PROPOSED OFFSHORE EXPLORATION WELLS DRILLING
2. APPLICATION FOR A NEW ECC RELATED TO THE PROPOSED 3D TOWED STREAMER SEISMIC ACQUISITION, OBN SEISMIC ACQUISITION AND ASSOCIATED ACTIVITIES

BACKGROUND INFORMATION DOCUMENT

1. INTRODUCTION

“PEL 83” is a Joint Venture between the block partners, namely Windhoek PEL 28 B.V. (a wholly-owned subsidiary of Galp Energia E&P B.V (i.e. Galp)), the National Petroleum Corporation of Namibia (NAMCOR) and Custos Investments. Galp holds an 80% controlling interest in Petroleum Exploration License (PEL) 83, while NAMCOR and Custos each hold 10%. Galp is currently the operator of PEL 83, which is located in the Orange Basin, off the coast of Namibia (see Figure 1).

PEL 83 covers an area of approximately 9 954 km² and is located between 130 km and 250 km from the coastline in water depths ranging from approximately 500 m to 2 500 m. Galp has been performing exploration activities in PEL 83 since 2016, with a 3D seismic acquired in 2019 and recently completed the drilling of two exploration wells and one well test in PEL 83.

The above-mentioned activities were undertaken on the basis of the successful completion of Environmental Impact Assessment (EIAs) processes, approved EIA reports and related Environmental Clearance Certificates (ECCs), issued by the Ministry of Environment, Forestry and Tourism (MEFT): Department of Environmental Affairs (DEA). Galp plans to continue their exploration / appraisal activities in PEL 83 and requires new environmental clearances from MEFT for the following activities (similar to what was previously undertaken):

- 3-Dimensional (3D) towed streamer seismic survey (i.e. changes in area / location from previously assessed / approved campaign – see Figure 2) as well as ocean bottom node (OBN) seismic acquisition.
- Appraisal wells drilling campaign (i.e. similar activities, but changes only in number of wells to be drilled over a period of 3 years).

2. ENVIRONMENTAL CLEARANCE

Windhoek PEL 28 B.V. (i.e. Galp) received an ECC on the 10th of October 2023 for their offshore exploration well drilling, including well flow testing in PEL 83, on the basis of an approved Amendment Application. The Environmental Management Plan (EMP) was updated and approved as part of this process. This ECC is valid until 7 March 2026.

Furthermore, Galp received an ECC from MEFT in November 2017 for their initial 3D towed streamer seismic survey activities in PEL 83, based on an approved EIA process and associated EIA Report and EMP. This ECC expired in November 2020.

Prior to the commencement of further activities proposed, including the amendments / additions to the previously approved activities, two separate applications will be submitted to the MEFT: DEA in terms of the Environmental Management Act, No. 7 of 2007 and associated EIA Regulations (January 2012), as follows:

- Amendment Application for the exploration & appraisal wells drilling campaign (i.e. an amendment to the current ECC).
- New application for the seismic (i.e. 3D towed streamer and OBN) surveys and related activities.

The related (parallel) EIA process will include a scoping (and updating the assessment of impacts from the original EIAs) phase and an amendment to the approved EMPs.

Namisun Environmental Projects & Development (Namisun) has been appointed by Galp as the independent Environmental Assessment Practitioner to undertake the EIA process for the proposed Project.

3. PURPOSE OF THIS DOCUMENT

This document has been prepared by Namisun to inform you about:

- Description of Galp's proposed future exploration/appraisal activities in PEL 83 (Section 5).
- The EIA process (Section 6).
- Key environmental issues (i.e. aspects and potential impacts) relating to the proposed exploration activities to be re-assessed (Section 7).
- How you can register as an interested and /or affected party (I&AP) (Sections 4 and 8).

4. PARTICIPATION IN THE EIA PROCESS

Public participation is an essential part of the EIA process. If you want to register as an I&AP and have input into the EIA process, please refer to the box below. All comments / questions / concerns will be recorded and addressed in the EIA process. Public meetings and key focus group meetings will be set up and further scheduled on request. See Section 6 for more information.

HOW TO REGISTER AS AN I&AP

Please register as an I&AP and submit any questions or comments through communication with Namisun.

Attention: Werner Petrick *E-mail address:* wpetrick@namisun.com *Cell number:* +264 (0)81 739 4591

If you would like your comments to be addressed in the EIA Report, please submit them by **30 April 2024**.

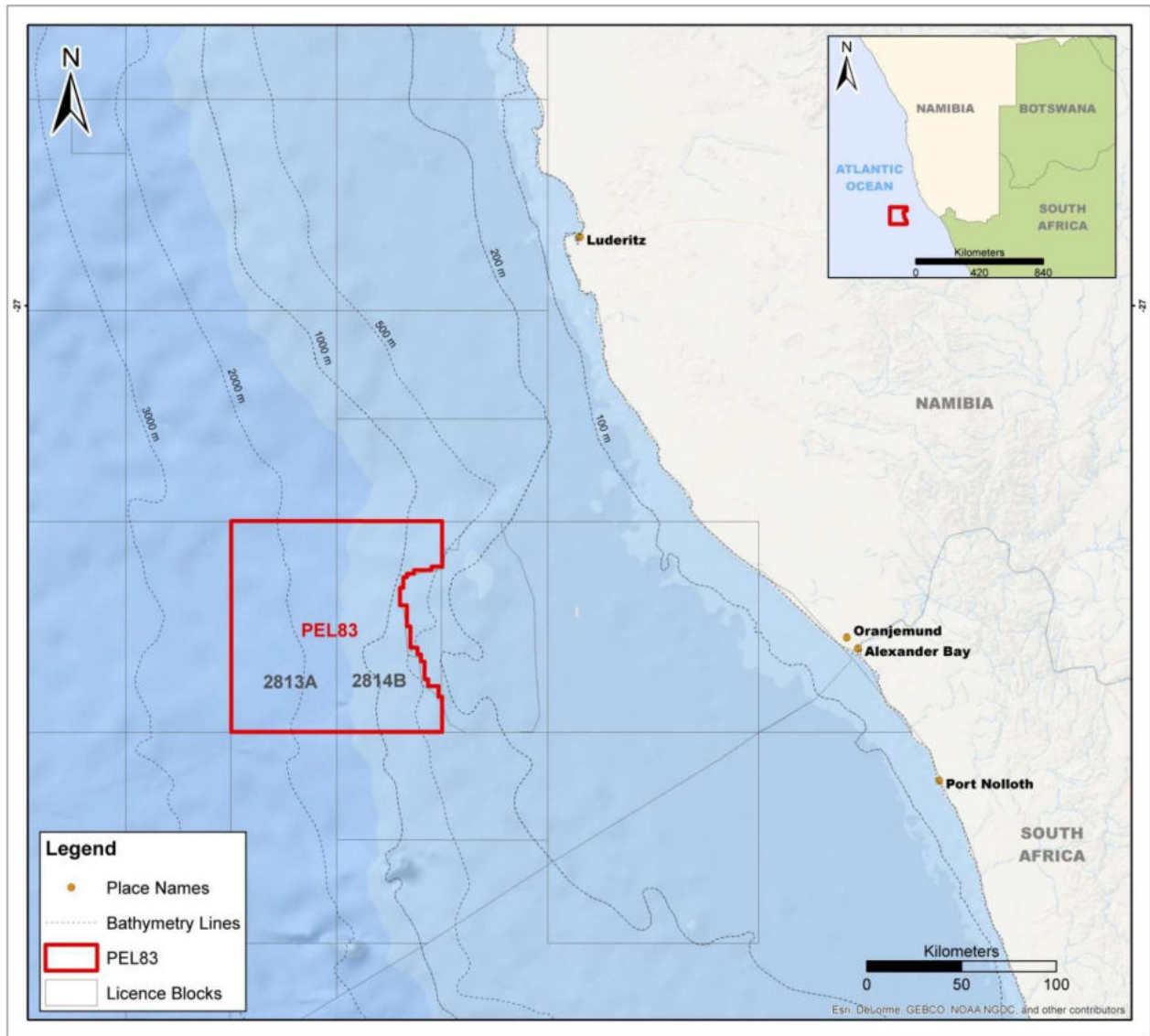


FIGURE 1: LOCATION OF PEL 83 (FIGURE FROM ORIGINAL EIA REPORT, SLR 2019)

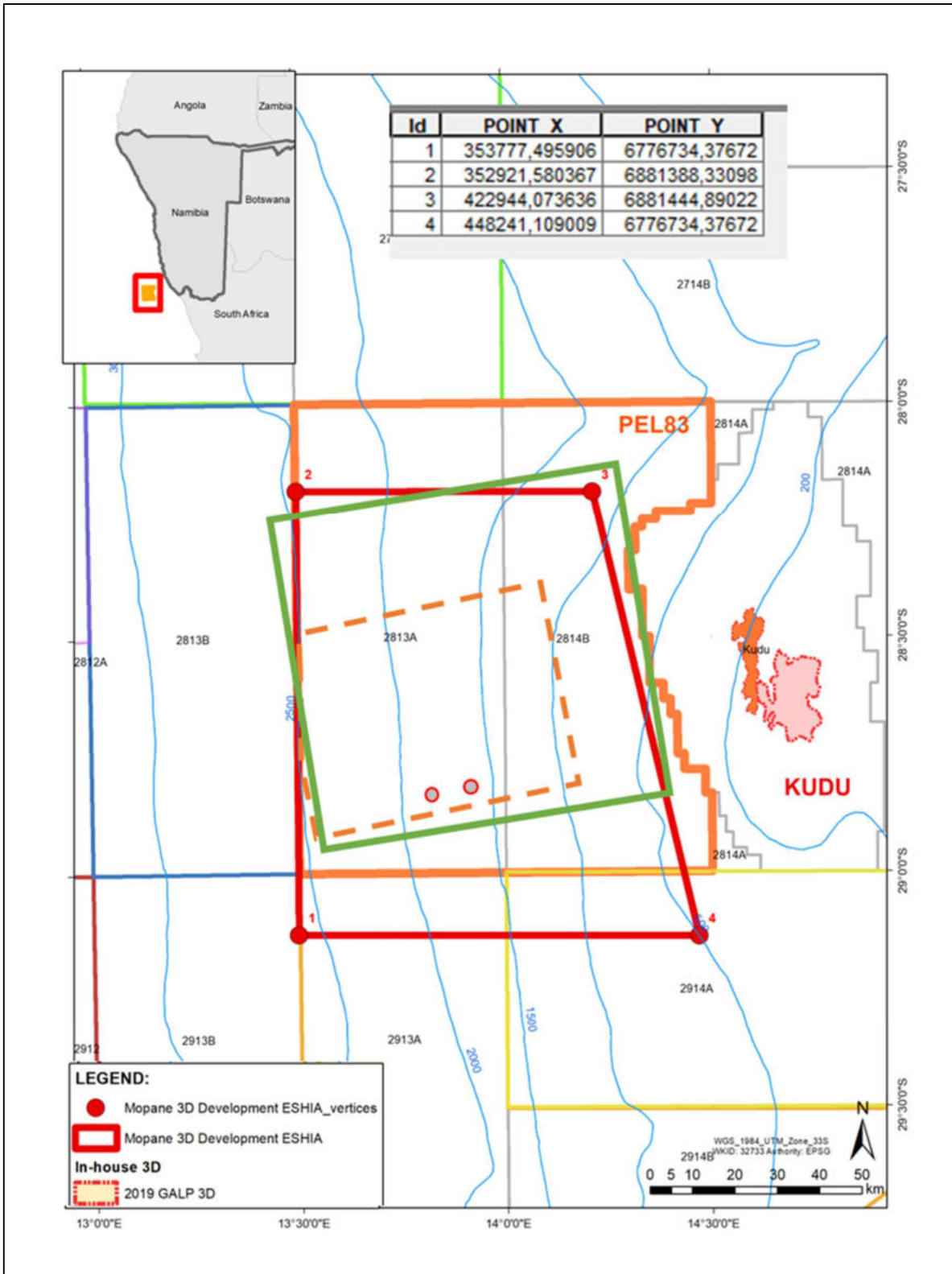


FIGURE 2: LOCATION OF EXPLORATION ACTIVITIES ON PEL 83 (RED POLYGON: PROPOSED FURTHER 3D SEISMIC STUDY AREA; GREEN POLYGON: 2017 ASSESSED AND APPROVED 3D SEISMIC STUDY AREA)

5. PROPOSED AMENDMENTS AND ADDITIONAL EXPLORATION ACTIVITIES

With reference to Section 1, Galp has successfully completed various exploration activities in PEL 83, including, amongst others, the following:

- A 3D-seismic survey between January and March 2019, over an area covering ~3,015 km² of the PEL 83 (see Figure 2).
- Drilling of two exploration wells (see Figure 2 for the locations).
- Flow testing (DST) on one well.

The well drilling and testing were recently conducted and the final well testing is expected to be completed in May 2024. Due to the positive results from the recent exploration activities, Galp plans to continue with further activities, as described below.

5.1 3D TOWED STREAMER SEISMIC SURVEY

Galp plans a further 3D seismic survey campaign in PEL 83. Seismic surveys are carried out during oil and gas exploration activities in order to investigate subsea geological formations.

The area to be surveyed by Galp, towards end of 2024 and first quarter 2025, will be ~ 4000 km² within the red polygon as shown in Figure 2. The activities will be similar in nature to that previously undertaken, as follows:

During the seismic surveys, high-level, low frequency sounds will be directed towards the seabed from near-surface sound sources (i.e. source air-gun arrays) towed by a seismic vessel. Signals reflected from geological interfaces below the seafloor will be recorded by multiple receivers towed in a multiple streamer configuration (see Figure 3). Analyses of the returned signals will allow Galp to further interpret the subsea geological formations.

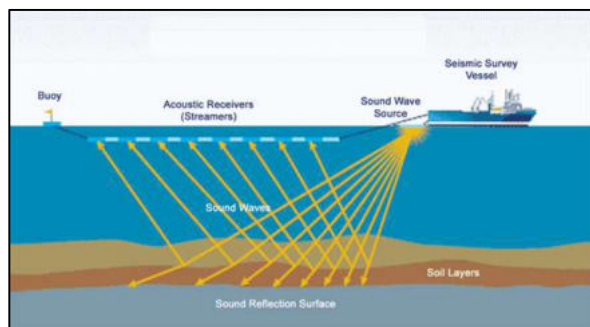


FIGURE 3: PRINCIPLES OF 3D SEISMIC SURVEYS (source: <https://oceansnotoil.org/offshore-oil-and-gas-phases/>)

5.2 ADDITIONAL WELL DRILLING¹

Subsequent, well drilling activities are being planned for PEL 83 similar to those recently undertaken by Galp. These include up to 10 exploration & appraisal wells, including flow testing, planned over a period of ~ 3 years. The location of each of these wells within PEL 83 still needs to be determined, based on, amongst others, the further 3D seismic survey results. The first well is scheduled for drilling no earlier than Q2 2025. These appraisal wells would be drilled in a location and to a depth determined by the results of the exploratory wells. The expected drilling depth will be approximately 4 to 5 km below the seafloor and is expected to take approximately 2 to 3 months per well to complete.

5.2.1 Drilling unit

Galp will either use a drillship or a semi-submersible drilling vessel (rig) for drilling, depending on rig availability, design specifications, safety, and metocean conditions. The drilling unit will be held in position by dynamic positioning thrusters. A temporary 500 m operational safety zone will be imposed around the unit, while operational.

5.2.2 Well drilling activities

A well will be created by drilling a hole into the seafloor with a drill bit attached to a rotating drill string, which crushes the rock into small particles, called “cuttings”. After the hole is drilled, casings (sections of steel pipe), are placed in the hole and permanently cemented into place. The diameter of the well will decrease with increasing depth. Drilling is undertaken in two stages, namely the riserless and risered drilling stages (see Figure 4 and Figure 5).

Initial (riserless) drilling stage

An initial section of conductor pipe will be either jetted or drilled and then cemented into place. The conductor is run in the shallow unconsolidated sediment section to prevent the sides of the well from caving in. Subsequently, a wellhead is placed on top of the conductor, which is the foundation of the well. Below the conductor, a 26-inch diameter hole will be drilled to a specific depth below the seabed. A surface casing of 20-inch diameter is then placed into the hole and secured into place by pumping cement through the annulus (the space between the casing and the borehole). These initial hole sections will be drilled using seawater (with viscous sweeps) and water-based mud (WBM). All cuttings and drill fluids from this initial

¹ Information obtained from the BID for Galp's original offshore exploration well drilling in PEL 83 – BID prepared by SLR (2019).

drilling stage will be discharged directly onto the seafloor.

Risered drilling stage

This stage commences with the lowering of a blow-out preventer (BOP) and installing it onto the wellhead (Figure 5 on bottom). The BOP is designed to seal the well and prevent any uncontrolled release of fluids from the well (a 'blow-out'). A marine riser is then installed between the drilling unit and the wellhead. The riser isolates the drilling fluid and cuttings from the environment, thereby creating a "closed loop system". Drilling is continued by lowering the drill string through the riser, BOP and casing and then rotating the drill string. Drilling fluid (a synthetically oil-based mud - SOBm) is continuously pumped down the inside of the hollow drill string. The fluid emerges through ports in the drill bit and then rises (carrying the rock cuttings with it) up the annular space between the sides of the hole to the drilling unit. The returned drilling fluid is treated. The cuttings are separated from the fluid, after which they are further dried until the oil content is low enough. The cuttings are then discharged overboard.

Well logging and testing

Once the reservoir target depth is reached the well will be logged and tested (including Vertical Seismic Profiling and flow testing for the appraisal wells).

Decommissioning and demobilization of the well

Once drilling and logging have been completed, the well will be plugged, tested for integrity and abandoned or some equipment will be installed in the well (lower completion) that will allow at a later stage to be a well producer also called as a "keeper". Abandonment will involve the insertion of cement plugs across any reservoir sections. The wellhead, with a height of approximately 4 m, will remain on the seafloor with an abandonment cup.

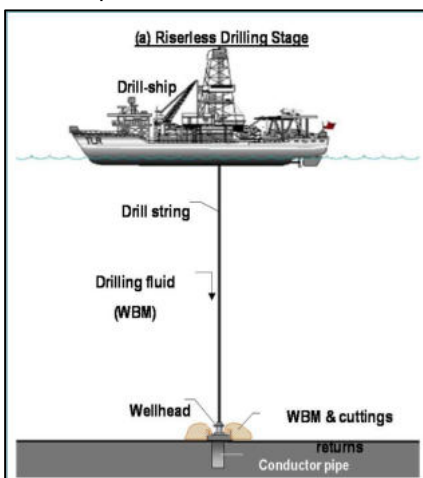


FIGURE 4: RISERLESS DRILLING

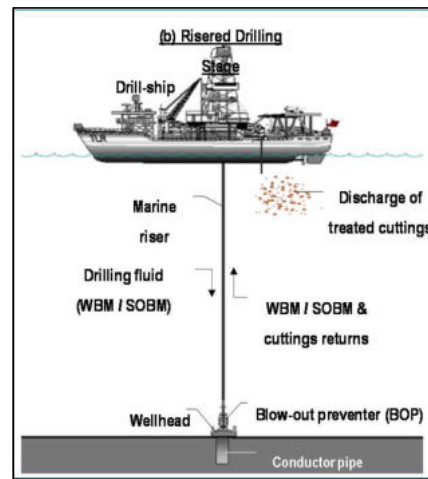


FIGURE 5: RISERED DRILLING

5.3 OBN SEISMIC ACQUISITION

Galp will undertake an OBN seismic acquisition within the area where the 3D towed streamer seismic activities will be conducted, either during the same time or at a later stage - to be determined.

An OBN seismic acquisition is very similar to a 3D towed streamer seismic acquisition regarding the source wavefields created by the air-gun arrays. The most relevant difference is the receiver's component, which is placed on the seafloor for a specific period.

OBN is a multi-component seismometer (3 geophones positioned orthogonally to each other and a hydrophone) placed on the seafloor which could independently collect and record seismic signals. It can record P-waves and mode-converted shear waves (S-waves) by the geophones on the seabed.

Seismic data is stored in the OBN until it's recovered to the nodes vessel, where data is downloaded.

At an OBN acquisition, the nodes are handled by a nodes vessel or remotely operated vehicle (ROV) node handling vessel (see Figure 6).

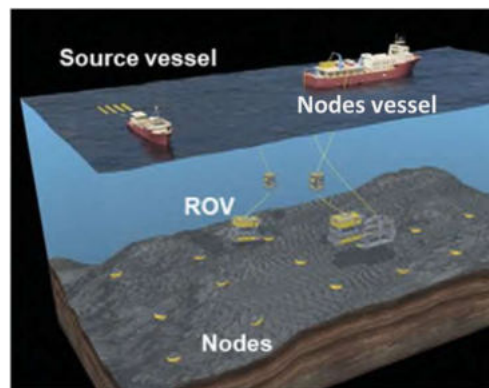


FIGURE 6: GENERIC DIAGRAM OF A OBN ACQUISITION

5.4 SHORE BASE AND SUPPLY VESSELS

The onshore logistics base will be located in the Port of Walvis Bay with some emergency support from Lüderitz.

The shore base will be used for the storage of materials and equipment (including casing, drilling fluid, cement, chemicals, diesel and water) that will be transported by sea to / from the seismic survey and drilling units, where relevant. The shore base will also be used for offices (with communications and emergency procedures / facilities), waste management services, bunkering vessels, and stevedoring / customs clearance services.

The seismic survey vessel and drilling units will be supported / serviced by at least 3 support vessels, which will facilitate equipment and material transfer between the drilling unit and the shore base. The supply vessels will call into port regularly during the seismic survey and drilling campaigns.

A supply vessel will always be on standby near the drilling unit to provide support for firefighting, oil containment / recovery, rescue in the unlikely event of an emergency and supply any additional equipment that may be required.

6. EIA PROCESS

The main objectives of the EIA process are to:

- Provide information on the further exploration / appraisal activities proposed by Galp.
- Identify / update, in consultation with I&APs, the potential negative and positive environmental aspects.
- Assess (i.e. 're-assess') the potential impacts resulting from the proposed activities, taking updated baseline environmental information as well as proposed changes to the activities into consideration. The original (previously approved) EIAs for these (similar) activities will however be considered and the relevant study findings used in the updated assessments.
- Report on measures required to avoid impacts or mitigate such impacts to acceptable levels by updating the approved EMPs.
- Further develop specific environmental monitoring requirements.

The likely steps and timeframes of the EIA process are provided in Table 1.

Table 1: EIA Process

STEPS IN THE EIA PROCESS
<p>PHASE I: Project initiation & Internal Screening (March - April 2024)</p> <ul style="list-style-type: none"> • EIA project initiation. • Identify / update environmental issues. • Identify key stakeholders.
<p>PHASE II – Combined Scoping & Assessment Phase and updated EMPs (April – July 2024)</p> <ul style="list-style-type: none"> • Notify the Ministry of Mines and Energy (MME) and MEFT through the submission of the two applications for ECCs and online (MEFT) registration. • Notify other relevant regulatory authorities and I&APs of the proposed / further exploration activities (via newspaper advertisements, the BID, emails, site notices, etc.). • Conduct public meetings and key stakeholder focus group meetings. • Carry out specialist investigations (marine biologist and fisheries specialist) and review / update the original environmental baseline information. • Assess (re-assess) the potential impacts of the proposed activities and compile an EIA Report and updated EMPs – taking the key study findings from the original EIAs into consideration. • Distribute the EIA reports for review and comment by regulatory authorities and registered I&APs. • Consider comments received and compile the final reports (including an Issues and Response Report). • Submit the final reports to MME and MEFT for their review and decision-making.

A consolidated (draft) EIA Scoping (including Impact Assessment) Report (including two Amended EMPs - one for the seismic survey activities and one for the well drilling activities) will be made available for a public review and comment period. Registered I&APs will be notified via e-mail of the review period and the availability of the drafted documents.

The final EIA report, along with all IA&P comments, will be submitted to the MME and MEFT (Environmental Commissioner) for review and a final decision.

7. KEY ISSUES RELATED TO THE FURTHER EXPLORATION ACTIVITIES

Various specialist studies and associated specialist reports (compiled by 'environmental experts / specialists') formed part of the initial EIAs. These studies (i.e. oil spill modeling and noise assessments, amongst others) will be referred to in the current EIA.

A marine ecologist and fisheries specialist have been appointed to assess / re-assess potential impacts resulting to further exploration activities (see section 5).

7.1 POTENTIAL IMPACTS RELATING TO SEISMIC SURVEY ACTIVITIES

7.1.1 Marine Ecology

- The potential impact on marine mammals (physiological injury and behavioural avoidance) as a result of seismic noise.

7.2.2 Fishing

- The potential impact on the fishing industry (vessel interaction, disruption to fishing operations and reduced catch) due to the presence of the survey vessel with limited maneuverability and with its associated safety zone, potential fish avoidance of the survey area and changes in feeding behaviour.

7.2 POTENTIAL IMPACTS RELATING TO WELL DRILLING ACTIVITIES

7.2.1 Marine Ecology

- Normal discharges to sea, including sewage, galley waste, and deck and machinery space drainage.
- Disturbance of marine fauna due to noise and lighting.
- Sediment disturbance due to drilling activities and placement of infrastructure on the seafloor.
- Smothering of relatively immobile or sedentary benthic species and biochemical effects due to the discharge of cuttings, drilling fluid and cement.
- Increased biodiversity and biomass on wellhead due to the increased amount of hard substrate available for colonisation by benthic organisms.
- Introduction of alien invasive marine species through vessels transfer and ballast water discharge.
- Accidental release of oil.

7.2.2 Fishing

- Disruption to fishing operations and loss of access to fishing grounds due to the 500 m safety exclusion area around the drilling unit.
- Fish avoidance of immediate area and changes in feeding behaviour due to drilling noise.
- Disruption of fishing activities due to abandonment of wellhead on the seafloor.
- Accidental release of oil.

7.2.3 Socio-Economic

- Interference with shipping routes as a result of the 500 m safety exclusion area around the drilling unit.

7.3 POSITIVE SOCIO-ECONOMIC ISSUES – RELEVANT TO ALL ACTIVITIES

- Employment and business opportunities.
- Generation of direct revenues.

8. INVITATION TO REGISTER AND COMMENT

If you would like to register as an I&AP to the proposed project and EIA applications process, or if you have any questions / comments, please contact Namisun.

For comments to be included in the EIA Amendment Report they must reach Namisun by no later than **30 April 2024**.

8.1 PUBLIC MEETINGS

The following (public) information-sharing meetings will be held:

Date	Time	Venue
26 April 2024	10:00 am	Alte Turnhalle, Lüderitz
29 April 2024	9:00 am	Protea by Marriott Hotel Walvis Bay Indongo