

# BASIC ASSESSMENT FOR A PROPOSED SPECULATIVE 3D SEISMIC SURVEY OFF THE SOUTHEAST COAST, SOUTH AFRICA

**Algoa/Outeniqua Basins**

Prepared for: CGG Services SAS

PASA Reference:12/1/045



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## REPORT SIGN OFF



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**Edward Perry**

Reg. EAP (EAPASA) (2019/2120)

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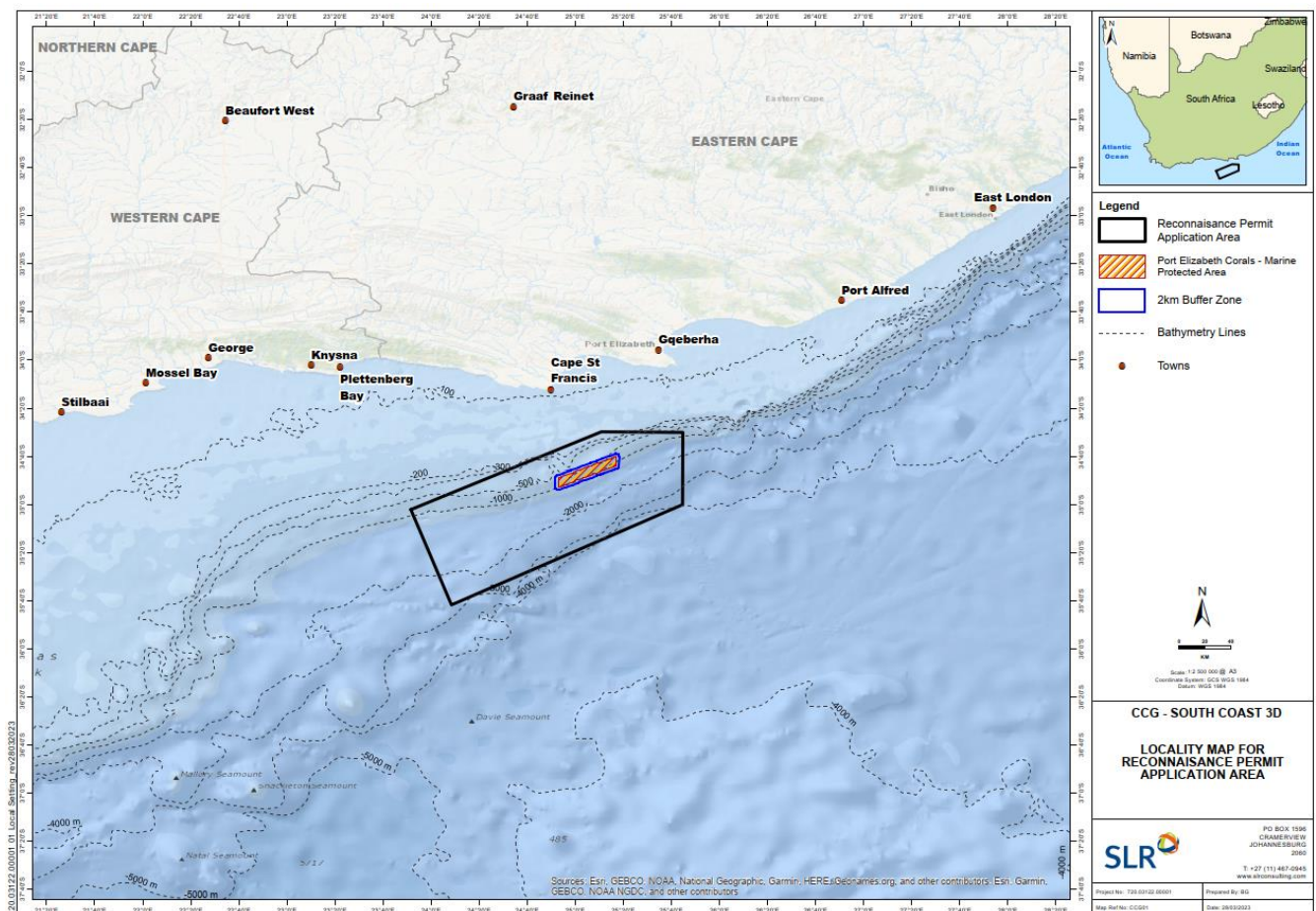
# EXECUTIVE SUMMARY

## 1. INTRODUCTION

### 1.1 Project Background and Location

On 23 January 2023, the Petroleum Agency SA (PASA) accepted a Reconnaissance Permit Application submitted by CGG Services SAS (CGG) in terms of Section 74 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002; MPRDA). The application provides for the undertaking of a multi-client speculative three-dimensional (3D) seismic survey in the Algoa/Outeniqua Basin off the Southeast Coast of South Africa (see Figure 1).

The proposed survey area would be up to 9 000 km<sup>2</sup> in extent within a 12 750 km<sup>2</sup> permit application area (area of interest). The area of interest is located roughly between Gqeberha and a point approximately 120 km southeast of Plettenberg Bay, ranging between 45 km and 120 km from the coast in water depths between 200 m and beyond 4 000 m. Actual survey commencement would ultimately depend on a permit award date and the availability of a survey vessel. It is currently anticipated that the survey would take up to five months to complete. Should the permit be awarded, it is anticipated that the proposed survey could commence in January 2024.



**Figure 1: Location of the Reconnaissance Permit area for seismic acquisition in the Algoa/Outeniqua Basin off the Southeast Coast**

Any activity which requires a Reconnaissance Permit must obtain Environmental Authorisation (EA) in terms of the National Environmental management Act, 1998 (No. 107 of 1998; NEMA), as amended, and the Environmental Impact Assessment (EIA) Regulations 2014 (as amended) before the proposed activity can be undertaken. In line with this legislative requirement, PASA instructed CGG to submit an Application for EA as

part of its acceptance of the Reconnaissance Permit Application. CGG, as the applicant for the Reconnaissance Permit, is also the applicant for the EA.

CGG appointed SLR Consulting (South Africa) (Pty) Ltd (SLR) as the independent Environmental Assessment Practitioner to undertake a Basic Assessment process for the proposed seismic survey in accordance with the requirements of NEMA and the EIA Regulations 2014, as amended.

## 1.2 Objectives and Purpose of this Report

This draft Basic Assessment Report (BAR) has been prepared in compliance with Appendix 1 of the EIA Regulations 2014 (as amended) and distributed for review and comment as part of the Basic Assessment process that is being undertaken for the application by CGG to undertake a 3D seismic survey off the Southeast Coast of South Africa. It summarises the process followed to date and provides a description of the proposed project and affected environment. It also provides an assessment of the impacts of the proposed project.

The objectives of the Basic Assessment process and this BAR are to, amongst others:

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Identify and assess the potential impacts that could result from the proposed project;
- Identify suitable mitigation measures to avoid, manage or mitigate identified impacts or optimisation to enhance potential benefits; and
- Through the above, ensure informed, transparent and accountable decision-making.

## 1.3 Opportunity to Comment

This draft version of the Basic Assessment Report (BAR) has been distributed for a 30-day review and comment period from **11 April to 15 May 2023** (making provision for intervening public holidays) in order to provide Interested and Affected Parties (I&APs) with an opportunity to comment on any aspect of the proposed project and the findings of the Basic Assessment process. Copies of the full report are available on the SLR website (<https://www.slrconsulting.com/en/public-documents/cgg-algoa>) and on a data free website (<https://slrpublicdocs.datafree.co/en/public-documents/cgg-algoa>). A Non-Technical Summary is also available on the website and can be sent to stakeholders directly, via email or WhatsApp, on request. Any person who has trouble accessing the full report or Non-Technical Summary is welcome to contact SLR for assistance. Hard copies of the BAR have been made available at the Walmer Library in Gqeberha (Main Road, Walmer), Jeffreys Bay Library (53 Diaz Road), St Francis Community Library (3 Assissi Drive, St Francis Bay) and Plettenberg Bay Library (Mellville Corner, Marine Drive).

Any comments should be sent to SLR at the address or e-mail address shown below. Comments may also be sent by sending a written message or voice message (including leaving your contact information) by WhatsApp or SMS to the mobile number provided below. For comments to be included in the final Basic Assessment Report, comments should reach SLR by **no later than 15 May 2023**.

**SLR Consulting (South Africa) (Pty) Ltd**

Attention: CGG Stakeholder Engagement Team

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After the conclusion of the comment period, all comments received will be collated into a Comments and Responses Report. The comments will be duly taken into account in compiling the updated BAR, which will be submitted to PASA for review and recommendation to the Department of Mineral Resources and Energy (DMRE) on whether the EA should be issued.

After DMRE has reached a decision, all registered I&APs will be notified of the outcome of the application and the reasons for the decision. A statutory appeal period in terms of the National Appeal Regulations, 2014 will follow the issuing of the decision.

## 2. BASIC ASSESSMENT PROCESS

### 2.1 Specialist Studies

One technical modelling study and three specialist studies were commissioned to address the key issues that required further investigation and detailed assessment. These include:

- Technical Modelling Studies:
  - Underwater Acoustics Modelling Study.
- Specialist Studies / Assessments:
  - Biodiversity and Ecosystem Services (marine fauna) Impact Assessment;
  - Commercial Fisheries Impact Assessment; and
  - Cultural Heritage Impact Assessment.

The specialist studies involved the gathering of data relevant to identifying and assessing environmental impacts. The impacts were assessed according to a pre-defined rating scale and appropriate mitigation and / or enhancement measures to minimise potential impacts or enhance potential benefits, respectively, were provided.

### 2.2 Compilation of draft BAR for Review

This draft BAR is compiled in compliance with Appendix 1 of the EIA Regulations, 2014 (as amended). The specialist findings and other relevant information were integrated into this draft BAR, which includes an Environmental and Social Management Programme (ESMP).

This report aims to present all information in a clear and understandable format suitable for easy interpretation by I&APs and authorities and provides an opportunity for I&APs to comment on all aspects of the proposed project, as well as findings of the impact assessment.

### 2.3 Public Participation

The steps undertaken during the public participation process are provided below:

- A preliminary I&AP database was compiled consisting of authorities (including state departments with jurisdiction in the area, municipal offices and ward councillors), Non-Governmental Organisations, Community-Based Organisations and other key stakeholders with a potential interest in the proposed project. Parties requesting to be registered on the project database as part of a previous application process by CGG off the Southeast Coast during 2021 have also been added to the database for this new application. To date, 990 I&APs have been registered on the project database.
- Copies of the full BAR and a Non-Technical Summary were placed on the SLR website (<https://www.slrconsulting.com/en/public-documents/cgg-algoa>), as well as on a zero-data rated website that I&APs could use to access the draft BAR (via internet-capable devices) at no charge (<https://slrpublicdocs.datafree.co/en/public-documents/cgg-algoa>).
- Advertisements were placed in two local and two regional newspapers in English, Afrikaans and isiXhosa.



- Site notices were also placed in coastal towns and radio notices were broadcast on a regional radio station.
- A notification letter was sent to all registered I&APs on the project database via email to inform them of the public participation process (PPP). The letter also announced the availability of the draft BAR for 30-day comment period and invited I&APs to submit comments on any aspect of the BA process and the proposed project. The notification letter provided a link to the SLR websites that I&APs could use to access and download the draft BAR.
- The advertisements and notification letter also invited I&APs to attend various public meetings.
- Various focus-group meetings were also arranged with indigenous groups, local authorities, small-scale fisheries and commercial fisheries.

### 3. NEED AND DESIRABILITY

There is global concern of the need to reduce carbon emissions and achieve carbon neutrality by 2050. South Africa is committed to a "just" transition to a net-zero and climate resilient society, whereby the need to reduce emissions is balanced with the need to grow the economy and create jobs, so that the needs of vulnerable groups are addressed. There is a drive from national and provincial Government to stimulate development and grow the economy of South Africa with a strong focus on job creation in all sectors, whilst protecting the environment. The COVID-19 pandemic has deepened the economic crisis in South Africa and as a result, inequality is expected to widen and poverty to deepen. To facilitate this economic growth, there is a need to ensure that there is sufficient capacity in the country's energy supply by diversifying the primary energy sources within South Africa. In this regard, South Africa needs to balance the three core dimensions of what has been defined as the "energy trilemma": (1) affordability and accessibility, (2) energy security and (3) environmental sustainability. In weighing up these core dimensions, South African Government policy currently supports exploration for indigenous hydrocarbon resources and currently promotes the use of natural gas as part of the energy mix up to 2030 (per the IRP, 2019).

Although the use of hydrocarbons is not aligned with other National plans and policies, which identify the need to reduce the reliance on fossil fuels and shift to lower-carbon electricity generation options in order for South Africa to reduce Greenhouse Gas (GHG) emissions and meet commitments in this regard, natural gas is included in the energy mix of the country to serve as a transition or bridge on the path to a carbon-neutral goal (as per the Paris Agreement) and provide the flexibility required to complement renewable energy sources. In addition to the use of hydrocarbons for electricity generation, the many other uses (e.g. transportation fuels, asphalt, and feedstocks for making the chemicals, polyurethane, solvents, plastics and other synthetic materials) will also need to see adaptation and mitigation during this transition period.

It is acknowledged that the proposed exploration project would not result in the production of hydrocarbons, but rather the generation of information on possible hydrocarbon resources in the area of interest off the Southeast Coast. By gaining a better understanding of the extent, nature and economic feasibility of extracting these potential resources, the viability of developing indigenous gas resources would be better understood.

The proposed exploration has no direct influence on South Africa's reliance on hydrocarbons and whether consumers use more or less oil or gas, nor on which types of fossil fuels contribute to the countries' energy mix. The proposed project will not necessarily change how we use hydrocarbons and has no direct influence on GHG emissions that would arise from the consumption of fossil fuels. These aspects are influenced by South Africa's energy and climate change related policy, the financial costs of the various energy sources and consumer choices in this regard.

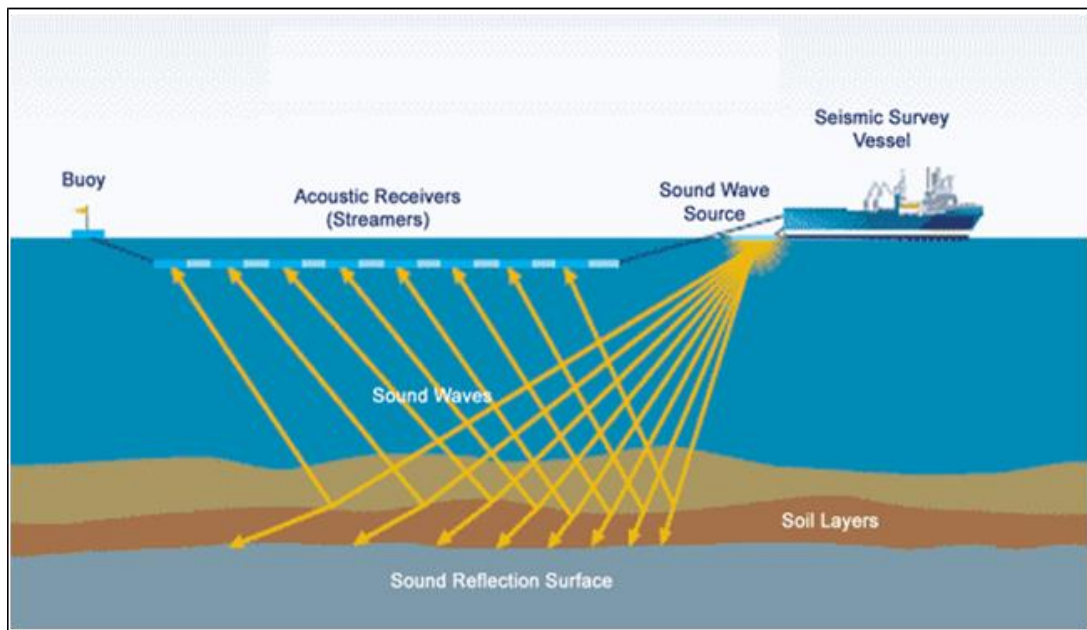
The proposed project will potentially lead to South Africa being able to optimise its own indigenous resources to provide for the hydrocarbon needs, rather than having to import, as at present. It won't necessarily change how

fossil fuels are used in the short- to medium-term as South Africa transitions to the goal of carbon neutrality by 2050. These National strategic policy issues fall beyond the scope of this Basic Assessment.

## 4. PROJECT DESCRIPTION

### 4.1 Seismic Surveys

Marine seismic surveys are an essential part of exploring for hydrocarbons. They provide information on the depth, position and shape of underground geological formations. The principles of marine seismic acquisition are illustrated in Figure 2.



**Figure 2: Principles of offshore seismic acquisition surveys**

Source: <https://www.tes.com/>

During seismic surveys, high-level, low frequency sounds are directed towards the seabed from near-surface sound sources towed by a seismic vessel. The acoustic signal emitted into the water column penetrates the seabed, then is reflected by the rock formations encountered. The reflected signals are recorded by multiple receivers (or hydrophones) towed in a single or multiple streamer configuration. Analyses of the returned signals allow for interpretation of subsea geological formations.

A seismic acquisition campaign can be carried out in two or three dimensions (2D or 3D).

### 4.2 Project Scope and Activities

For this project, CGG is proposing to undertake a 3D seismic survey campaign during the 2023/2024 summer survey window period (from December to May inclusive), likely commencing in January 2024 at the earliest, assuming authorisation. CGG is likely to only acquire data in an area of approximately 9 000 km<sup>2</sup> within the proposed area of interest, with no data acquisition in Marine Protected Areas (MPAs) or within 45 km of the coast. The proposed survey area would avoid squid fishing areas along the coast and also largely avoid the key demersal trawl areas.

### 4.3 Technical Characteristics of the Seismic Acquisition

The main technical characteristics of the proposed 3D seismic survey is summarised in Table 1 below.



**Table 1: Characteristics of seismic acquisition operations (indicative)**

Airgun	
Type of Energy Source	Pressurized air
No. of airgun arrays	3
No. of active airguns	Approximately 36 per array
Spacings between airgun arrays	50 m to 100m
Towing depth of the airgun	Approximately 7 m
Source volume	Max 3 000 cubic inches each
Operational pressure	2 000 psi
Shot interval	Max every 5 seconds, 18.75 m interval between consecutive shot-points
Hydrophone Streamer	
Types of streamer	Solid
Number of streamers	8
Length of streamer	6 000 m
Depth of streamer	10 to 20 m

#### 4.4 Main Project Components for Seismic Surveying

The main project components include the following:

- Seismic survey vessel: There will likely be a single survey vessel equipped with seismic source and streamers. Under the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS, 1972, Part B, Section II, Rule 18), a seismic survey that is engaged in surveying is defined as a “vessel restricted in its ability to manoeuvre”, which requires that power-driven and sailing vessels give way to a vessel restricted in her ability to manoeuvre. Vessels engaged in fishing are required to, so far as possible, keep out of the way of the seismic operation. It is also considered to be an “offshore installation” in terms of the Marine Traffic Act, 1981 (No. 2 of 1981), and as such it is protected by a 500 m exclusion zone.
- Support and escort (‘chase’) vessel: The proposed survey would be supported by two vessels. The support vessel would perform logistics support (including crew changes, supply of equipment, fuel, food and water) to the survey vessel. The escort vessel will assist in monitoring for and alerting other vessels (e.g. fishing, transport, etc.) about the survey and the lack of manoeuvrability of the survey vessel. At a minimum, one Fisheries Liaison Officer (FLO) person speaking English and Afrikaans will be on board the escort vessel to facilitate communication in the local language with the fishing (or other) vessels that are in the area.
- Onshore supply base: The onshore supply base will be at the Port of Gqeberha. The service infrastructure required to provide the necessary onshore support is already in place in Gqeberha and no additional onshore infrastructure should be necessary for this project. It is also proposed to refuel in port during crew changes/re-provisioning.

### 5. RECEIVING ENVIRONMENT

#### 5.1 Biophysical Environment

The water depths in the survey area of interest range from approximately 200 m to beyond 4 000 m. A major bathymetric feature within the area of interest is Kingklip Ridge, situated on the slope between Gqeberha and Cape St Francis, a unique 40 km long, 500 m wide feature that rises from a depth of more than 700 m to as shallow as 350 m (Figure 3).

Along the Eastern Cape, westerly winds predominate in winter, frequently reaching gale force strengths. During summer, easterly wind directions increase markedly resulting in roughly similar strength/frequency of east and west winds during that season. The strongest winds are observed at capes, including Infanta, Robberg and Cape Recife.

On the Southeast coast, the majority of waves arrive from the south-west quadrant, dominating wave patterns during winter (June – August) and spring (September – November). Waves from this direction frequently exceed 6 m and can reach up to 10 m. The survey area of interest is located along the Eastern Agulhas Bank. The western Agulhas Bank is associated with higher nutrient values driven by coastal upwelling, whereas the shelf edge of the eastern Agulhas Bank is characterised by nutrient-poor surface waters and nutrient-rich bottom water, while the major part of the eastern Agulhas Bank is under the influence of the far-eastern Agulhas Bank upwelling cell, which provides nutrient rich bottom water.

## 5.2 Biological Oceanography

The survey area of interest falls into the Southwest Indian Deep Ocean ecoregion, with only the inshore portions falling into the Agulhas ecoregion. It is located beyond the 200 m depth contour, comprising primarily deepwater benthic habitats and the water body. The 2018 National Biodiversity Assessment rated the benthic habitat types and the offshore pelagic habitat types along most of the Southeast coast and within most of the Reconnaissance Permit Area as ‘Least Threatened’. The Agulhas Coarse Sediment Shelf Edge, Agulhas Sandy Outer Shelf, Agulhas Upper Canyon and Kingklip Koppies ecosystem types are considered ‘Vulnerable’ and the Kingklip Ridge ecosystem type is considered ‘Endangered’ (see Figure 4).

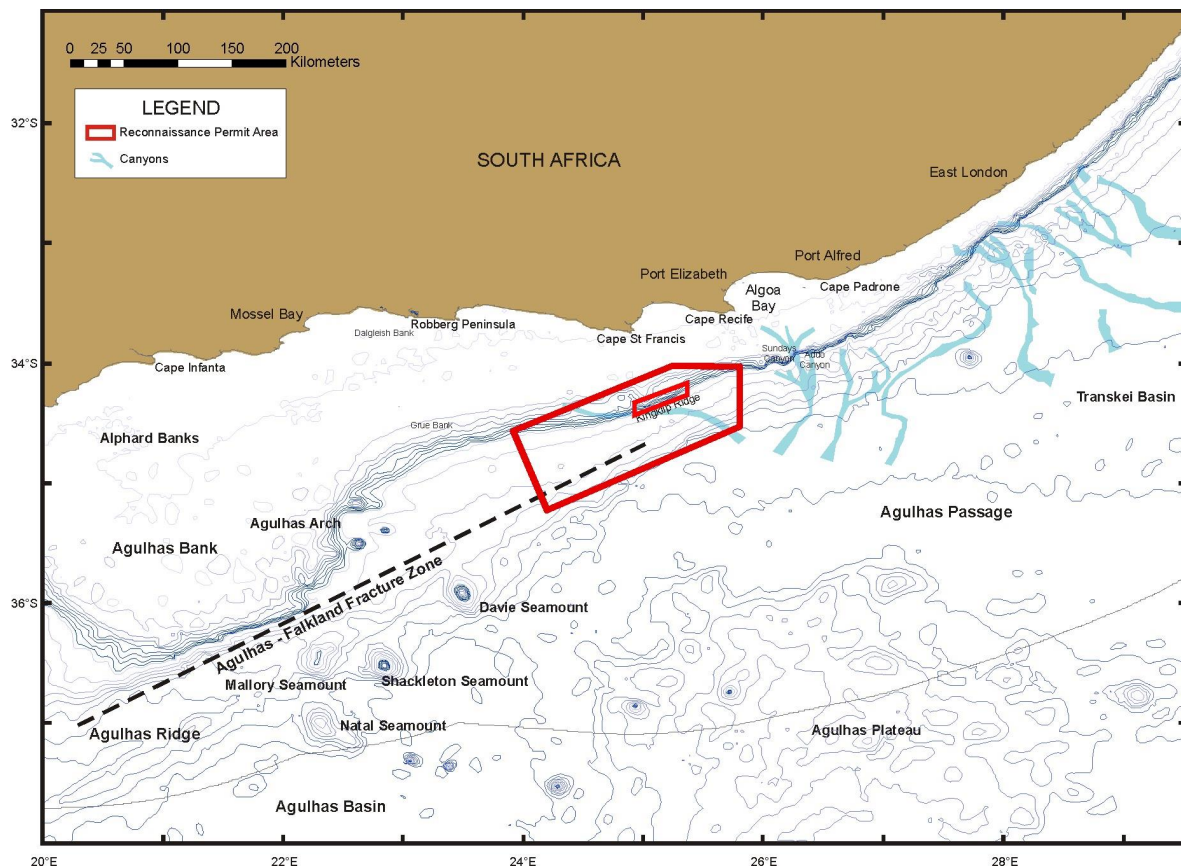
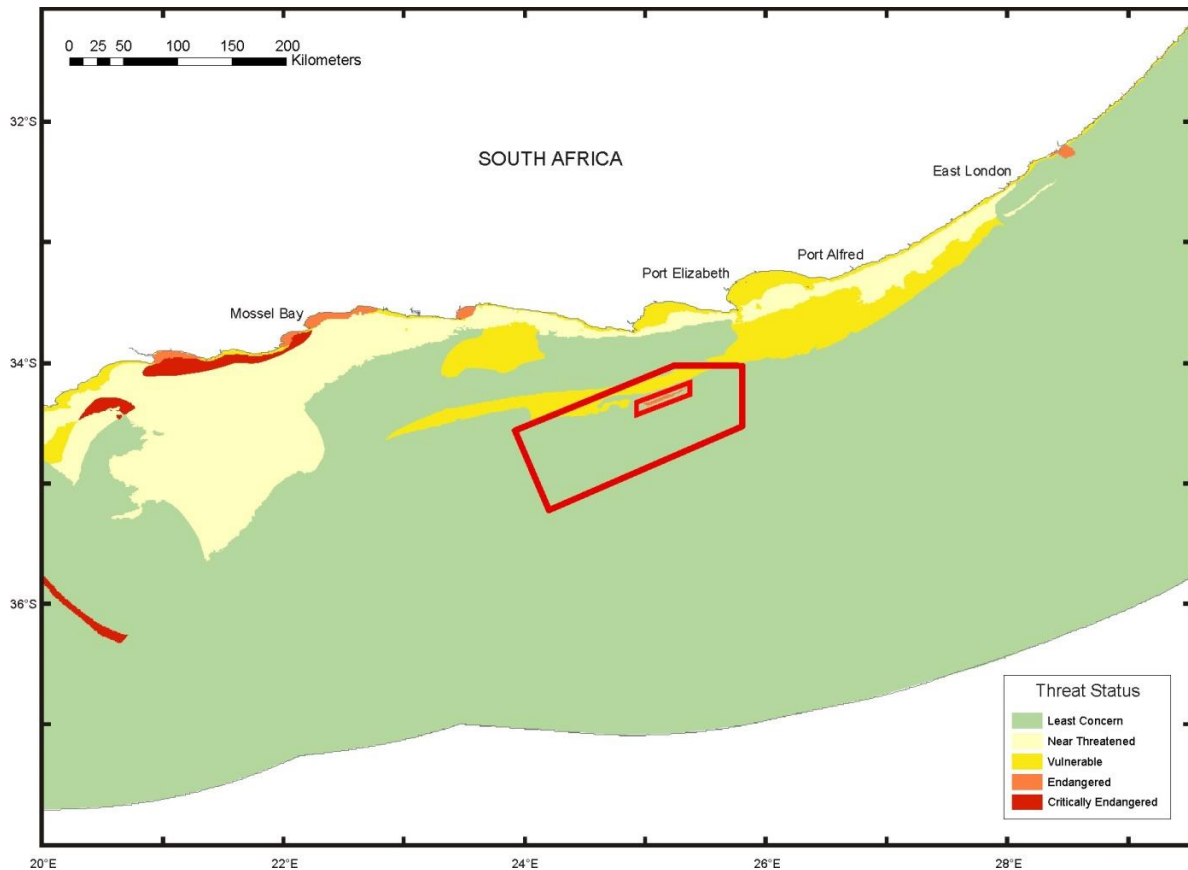


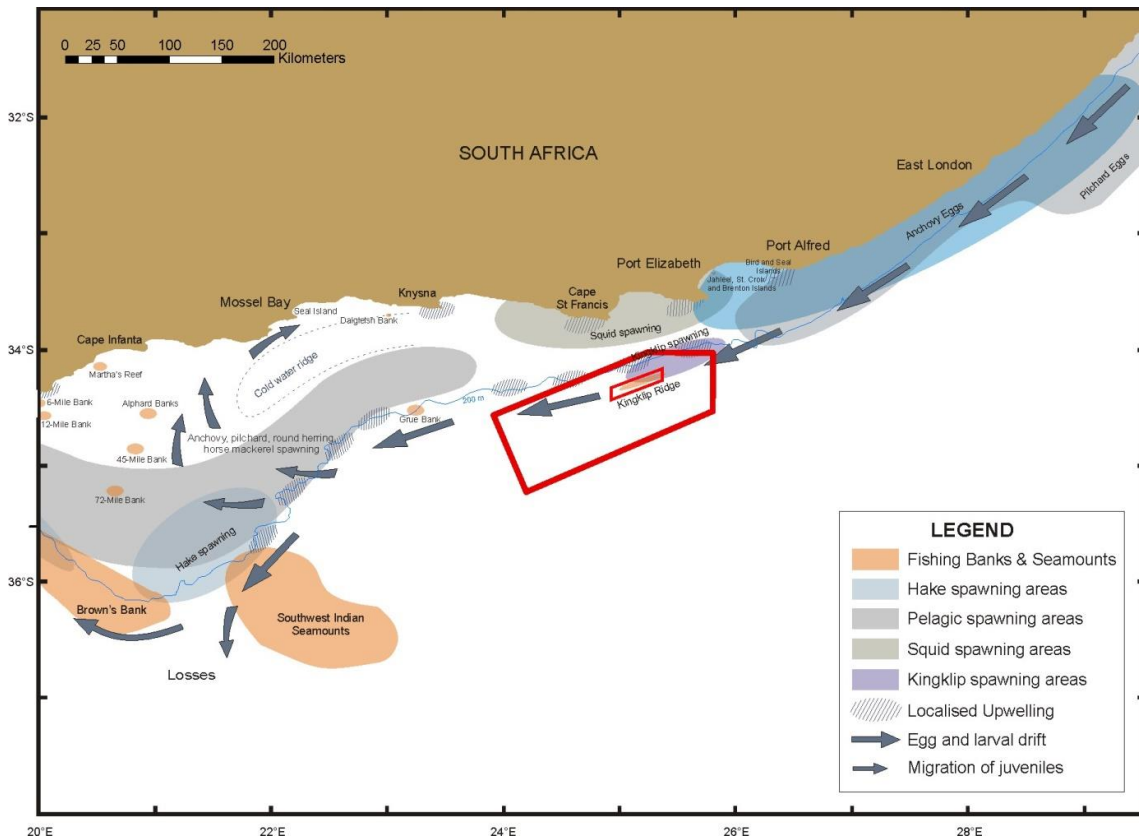
Figure 3: Area of interest (shaded) in relation to bathymetry and seabed features off the Southeast Coast



**Figure 4: Survey Area of interest (red polygon) in relation to ecosystem threat status on the Southeast Coast**

A variety of pelagic fish species, including anchovy, round herring and horse mackerel, spawn east of Cape Agulhas between the shelf-edge upwelling and the cold-water ridge (see Figure 5). Spawning of the shallow-water hake occurs primarily over the shelf (<200 m) whereas that by the deep-water hake occurs off the shelf. Although hake are reported to spawn throughout the year (Strømme *et al.* 2015), they move to the western Agulhas Bank and southern West Coast to spawn in late winter and early spring (key period), when offshore Ekman losses are at a minimum. Their eggs and larvae drift northwards and inshore to the West Coast nursery grounds, where the greatest concentration of eggs and larvae occurs between September – October. Kingklip aggregate to spawn in an isolated area off the shelf edge to the south of St Francis and Algoa Bay referred to as the ‘spawning box’. Spawning starts from August through to September and is habitat associated, occurring mostly in areas dominated by deep-water corals at depths of between 300 m and 500 m. Although the survey is not proposed during the key spawning season, there is some overlap of the inshore areas of the survey area of interest with the key kingklip spawning area (see Figure 5). Ichthyoplankton abundance in the inshore portions of the 3D survey area is thus likely to be seasonally high.

Small pelagic species include the sardine/pilchard, anchovy, chub mackerel, horse mackerel and round herring. These shoaling species generally occur within the 200 m contour and thus unlikely to be encountered in the majority of the survey area of interest. The fish most likely to be encountered on the shelf, beyond the shelf break and in the offshore waters of the proposed survey area are the large migratory pelagic species, including various tunas, billfish and sharks.



**Figure 5: Survey area of interest (red polygon) in relation to major spawning areas off the southeast coast**

Five species of turtle occur along the East Coast, with the Leatherback and Loggerhead turtles being the most likely to be encountered in the offshore waters of the area of interest during foraging migrations. Their abundance in the study area is expected to be low.

Fifteen seabird species breed within the Southeast Coast region, including Cape Gannets and African penguins, Cape Cormorants, White-breasted Cormorant, Roseate Tern, Swift Tern and Kelp Gulls. Most of the breeding resident seabird species feed on fish (with the exception of the gulls, which scavenge, and feed on molluscs and crustaceans), at times intensively target shoals of pelagic fish, particularly during the ‘sardine run’. Small pelagic species such as anchovy and pilchard form important prey items for Agulhas Bank seabirds, particularly the Cape Gannet and the various cormorant species. African Penguin colonies in the vicinity of the Reconnaissance Permit Area occur at Cape Recife, and on the Algoa Bay islands (St Croix Island, Jaheel Island, Bird Island, Seal Island, Stag Island and Brenton Rocks), located 50 km and between 80 and 90 km inshore of the survey area of interest, respectively. This species forages at sea with most birds being found within 20 km of the coast. The majority of Algoa Bay penguins forage to the south and east of Cape Recife and thus inshore of the area of interest. Cape Gannets may feed further offshore and may be encountered in the survey area of interest.

Between 28 and 38 species or sub-species/populations of cetaceans (whales and dolphins) are known or likely to occur in the waters of the Southeast Coast. The most common species within the project area (in terms of likely encounter rate not total population sizes) are likely to be the long-finned pilot whale, sperm whale, southern right and humpback whale.

The Cape fur seal is the only species of seal that has breeding colonies along the Southeast coast, namely on the northern shore of the Robberg Peninsula in Plettenberg Bay and at Black Rocks (Bird Island group) in Algoa Bay, approximately 110 km and 90 km inshore of the survey area of interest, respectively.

### 5.3 Marine Protected Areas and other Conservation Areas

Approved Marine Protected Areas (MPAs) and Ecologically or Biologically Significant Areas (EBSAs) within the broad project area are shown in Figure 6. One offshore MPA, Port Elizabeth Corals MPA, is located within the area of interest, with three coastal MPAs located inshore of the survey area of interest, namely the Tsitsikamma, Sardinia Bay and Addo Elephant MPAs. No seismic survey operations would be undertaken within these MPAs. The survey area of interest also overlaps areas mapped as Critical Biodiversity Area 1 (CBA 1) Critical Biodiversity Area 2 (CBA 2) and Ecological Support Area (see Figure 7).

Coastal Important Bird Areas (IBAs) are all located inshore of the Reconnaissance Permit area and should not be directly affected by the proposed seismic survey. The eastern area of the Reconnaissance Permit area does, however, overlap with a portion of the proposed Alexandria coastal belt/Algoa Bay Islands Nature Reserve Marine IBA, specifically aimed at protecting the African Penguin, Cape Gannet, Kelp Gull, Damara Tern and Roseate Tern.

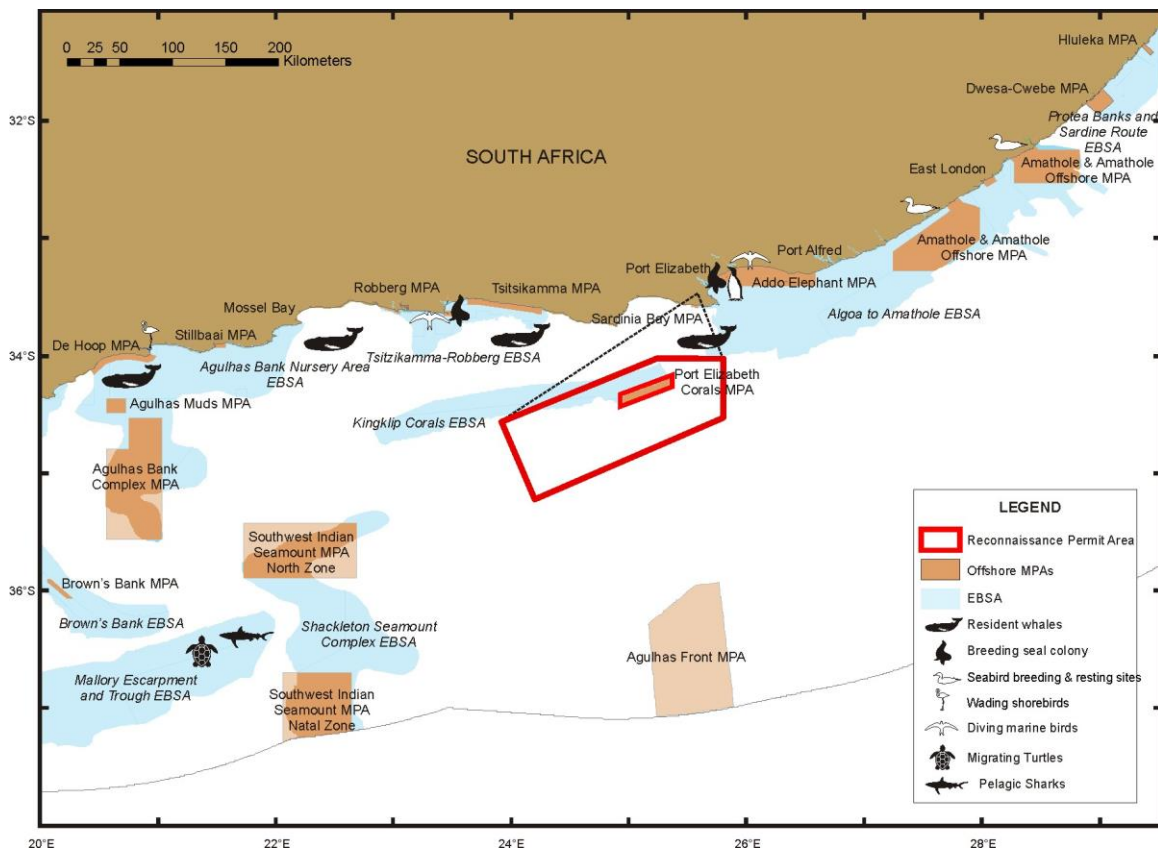


Figure 6: Survey area of interest (red polygon) in relation to MPAs and EBSAs off the southeast coast



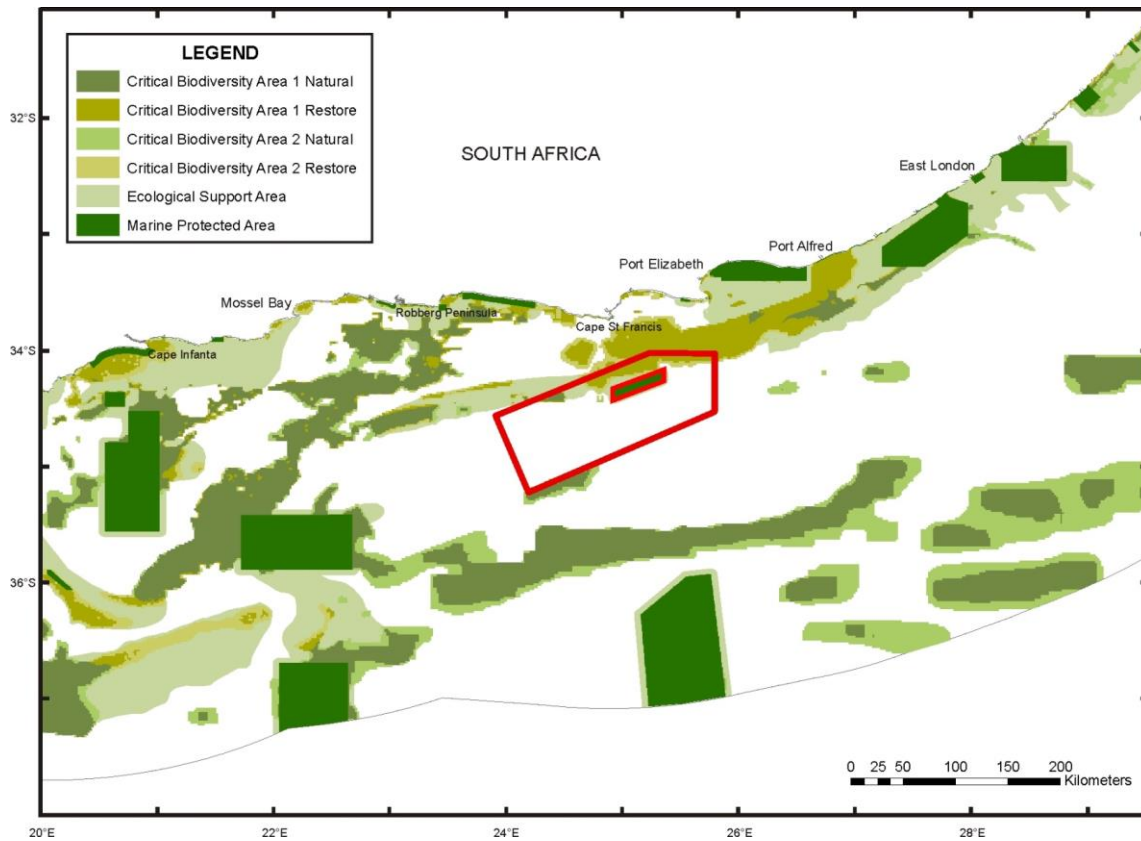


Figure 7: Survey area of interest (red polygon) in relation to CBAs off the southeast coast

#### 5.4 Social Context and Human Utilisation

The project’s area of influence encompasses the survey operational area within the proposed survey area of interest (including turning circles), the Port of Gqeberha for logistical support and the marine traffic route between Gqeberha and the survey area of interest. The survey area of interest is located offshore of the Sarah Baartman District Municipality and Nelson Mandela Bay Metropolitan Municipality in the Eastern Cape Province. The Sarah Baartman DM is further divided into seven local municipalities, four of which are located along the coast, namely: the Kou-Kamma, Kouga, Sundays River Valley and Ndlamba Local Municipalities.

The survey area of interest overlaps with fishing grounds of five commercial sectors (% of national catch shown in brackets), including demersal trawl (6.4%), midwater trawl (16.2%), hake-directed demersal longline (6.7%), large pelagic longline (3.3%) and South Coast rock lobster (1.9%). Refer to Figures 8 to 13 for the proximity of the proposed project in relation to the key fishing sectors. The proposed survey area of interest does not overlap with fishing grounds of the shark-directed demersal longline, small pelagic purse-seine, traditional linefish, squid jig and small-scale fisheries.



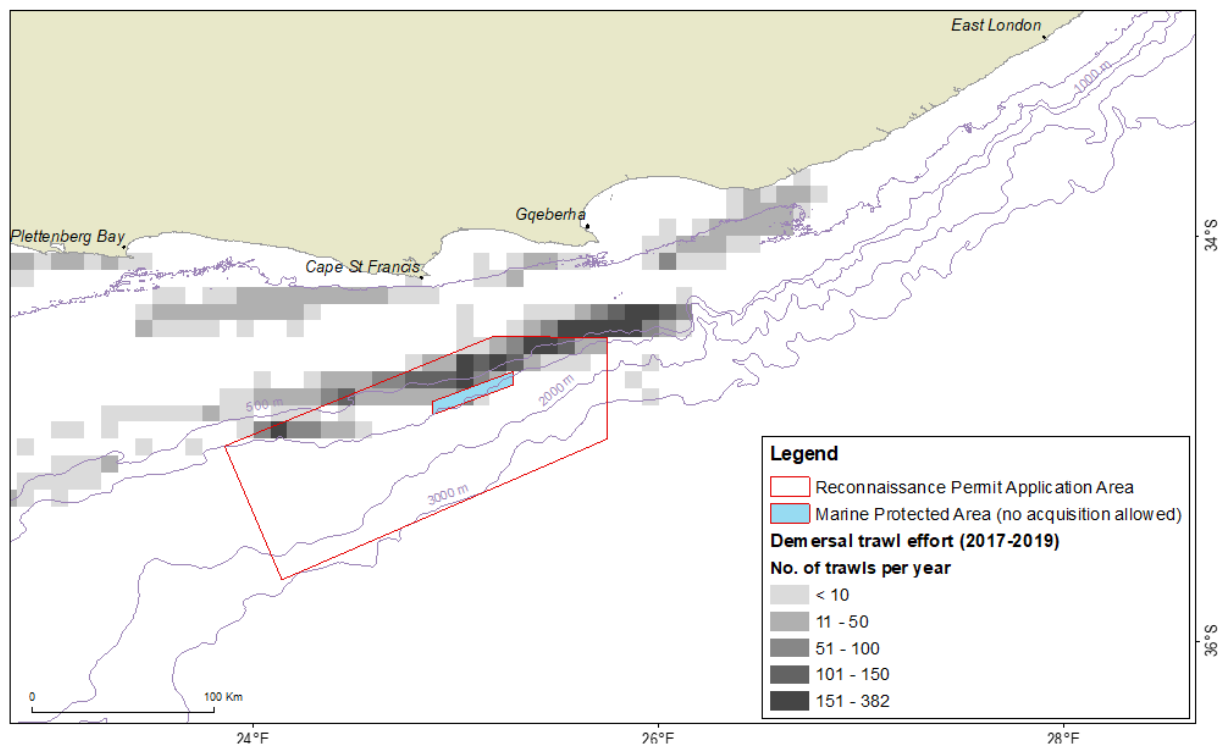


Figure 8: Survey area on interest in relation to the spatial distribution of demersal trawl effort (2017-2019)

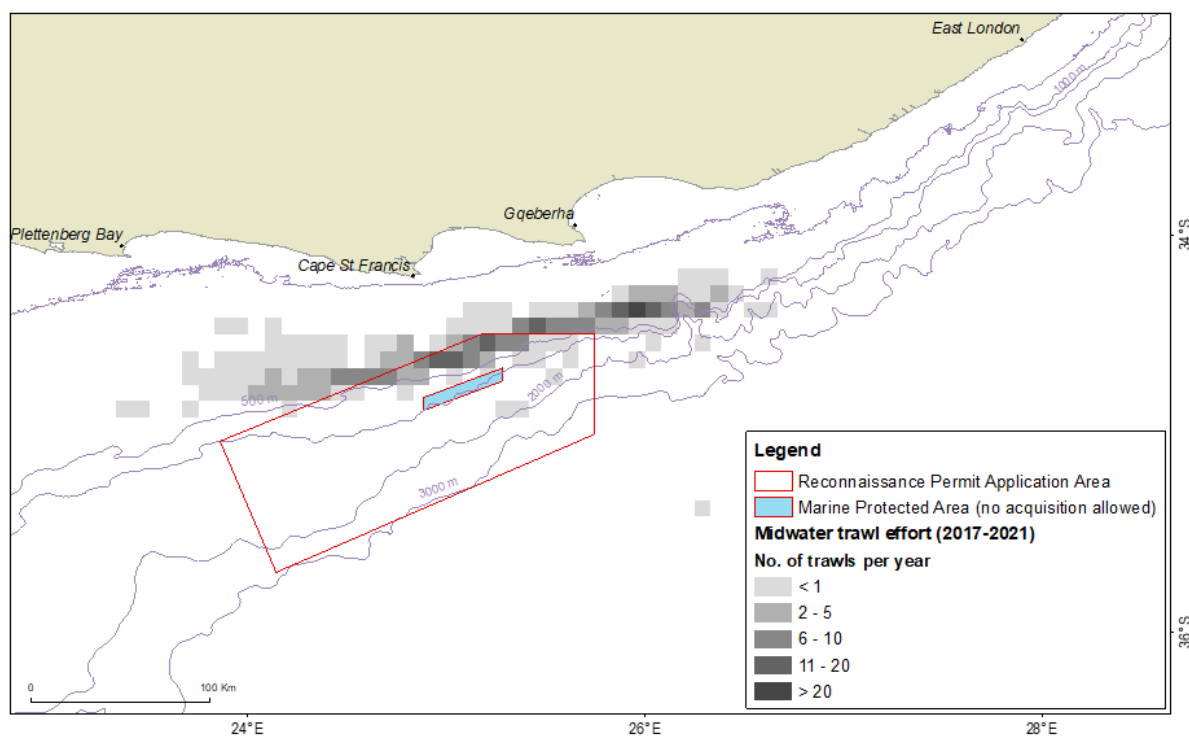


Figure 9: Survey area of interest in relation to the spatial distribution of mid-water trawl effort targeting horse mackerel (2017-2021)

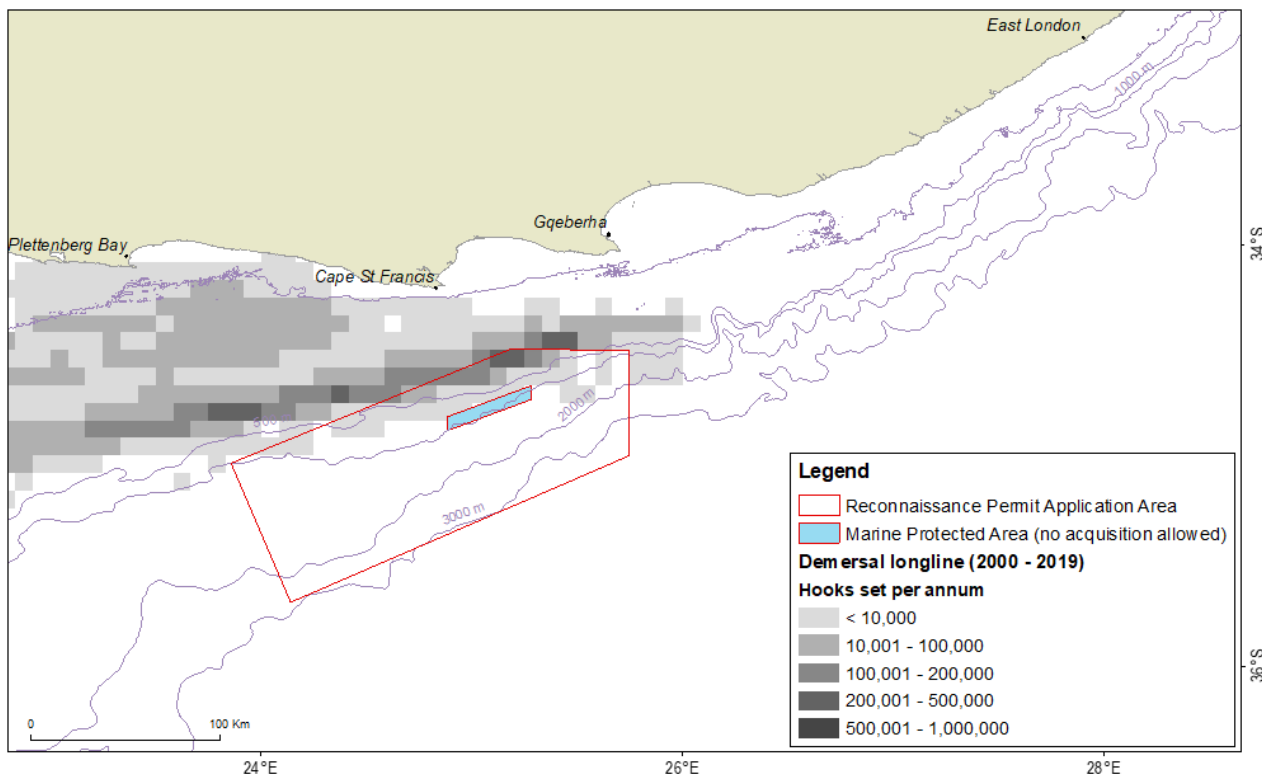


Figure 10: survey area in relation to the spatial distribution of hake-directed demersal longline effort (2000-2019)

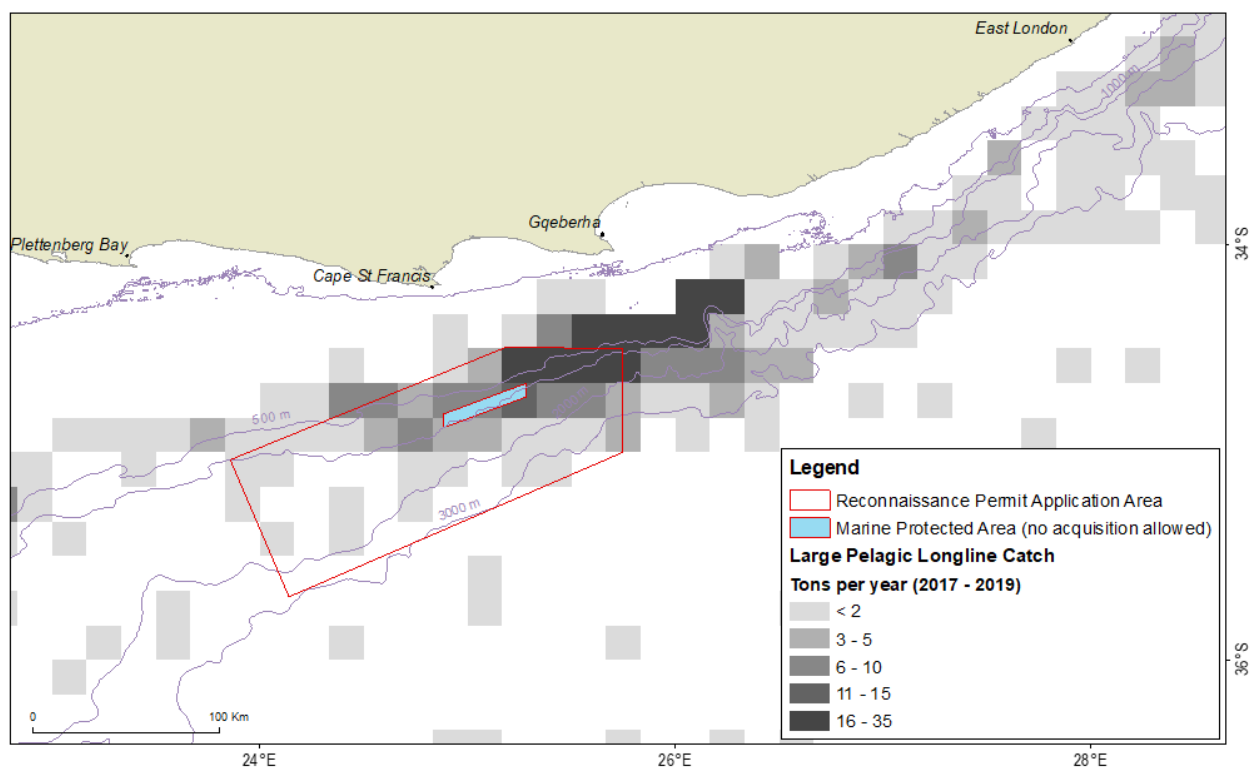
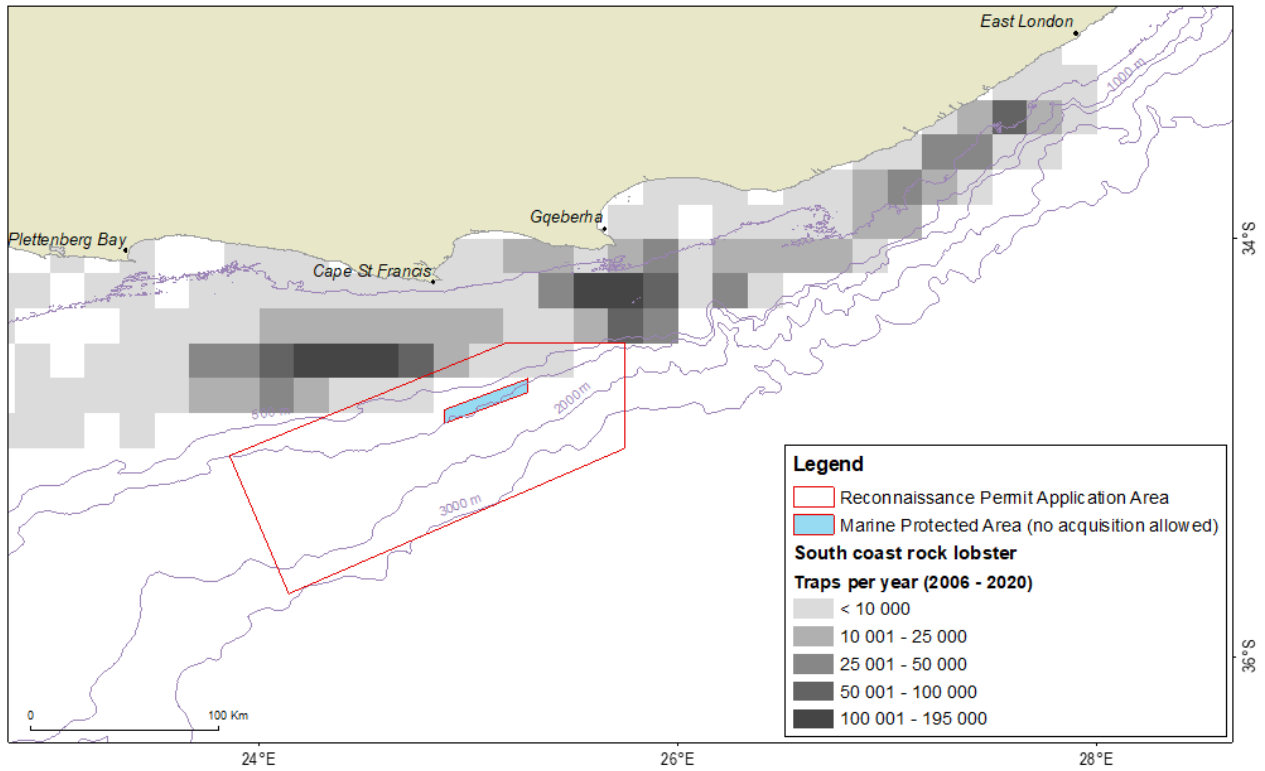
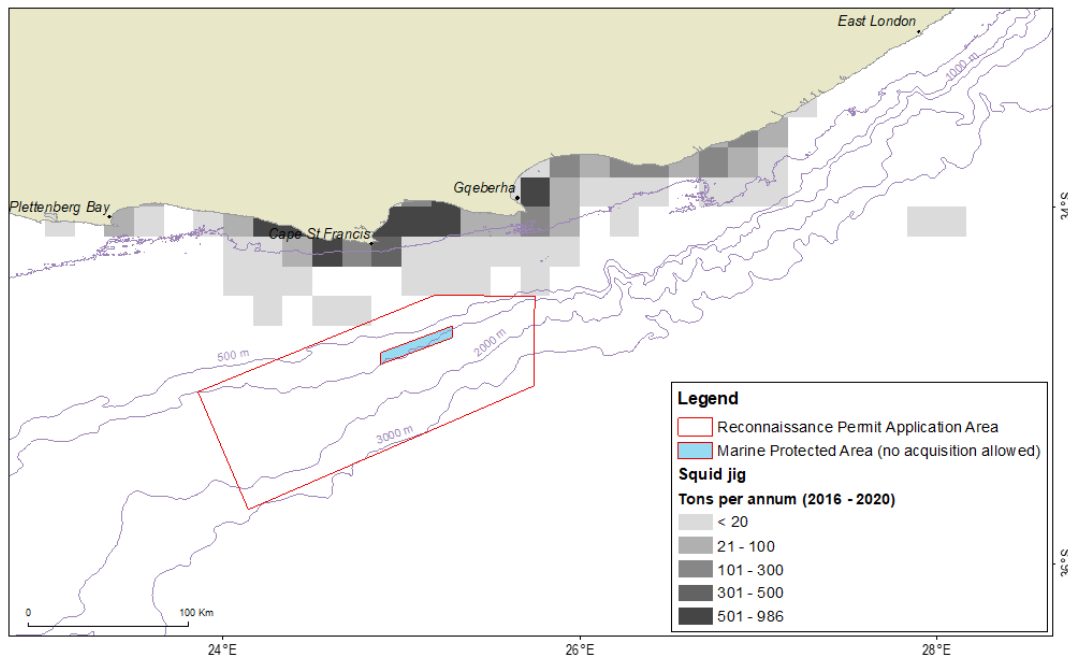


Figure 11: Survey area of interest in relation to the spatial distribution of large pelagic longline catch (2017-2019)

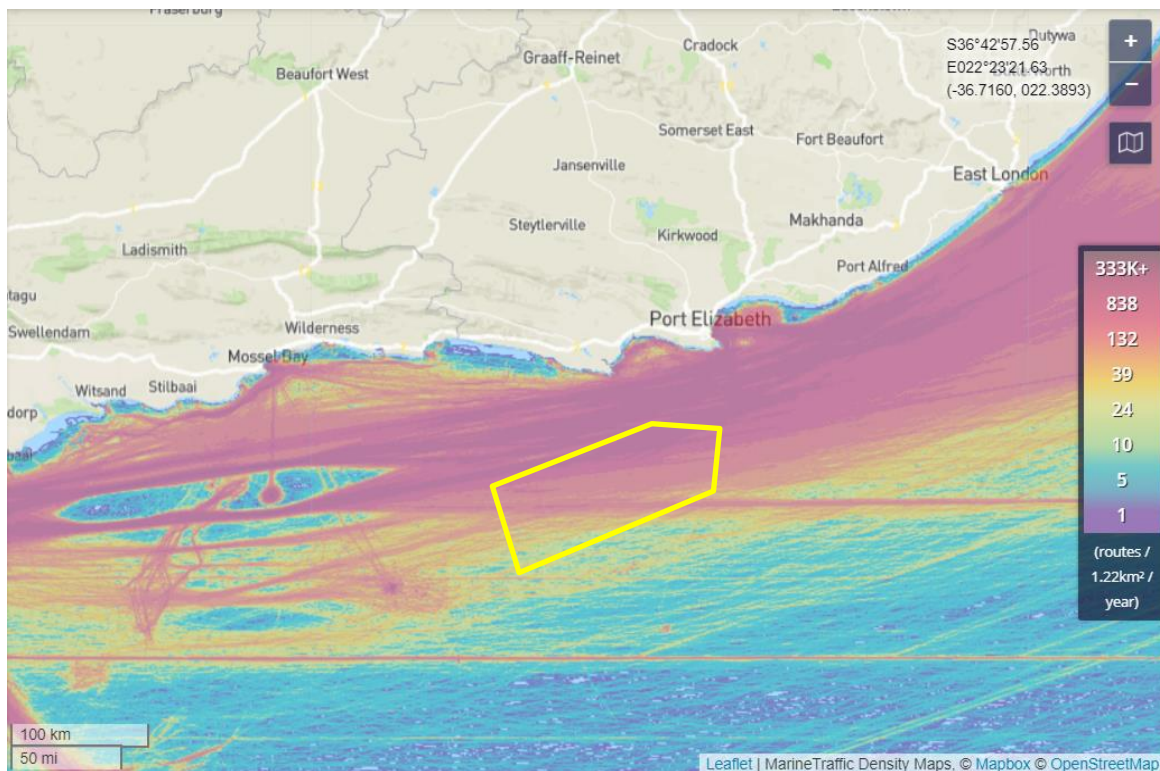


**Figure 12: Survey area of interest in relation to the spatial distribution of South Coast rock lobster fishing effort (2006-2020)**



**Figure 13: Survey area of interest in relation to the spatial distribution of catch taken by the squid jig fishery (2016-2020)**

Although the majority of vessel traffic, including commercial and fishing vessels, remains close inshore, a significant amount of ship traffic can be anticipated to pass through the area of interest (see Figure 14).



**Figure 14:** The major shipping routes off the Southeast Coast of South Africa in relation to the proposed survey area of interest (yellow polygon) Source: <http://www.marinetraffic.com>

## 6. IMPACT ASSESSMENT SUMMARY TABLE

A summary of the assessment of potential impacts and proposed mitigation is provided in Table 2 overleaf.

**Table 2: Summary of the significance of the impacts associated with the proposed speculative seismic survey off the Southeast Coast**

- Note: (1) Neg = Negligible; VL = Very Low; L = Low; M = Medium; H = High; VH = Very High; +ve = Positive.  
 (2) \* indicates that no mitigation is possible and/or considered necessary, thus significance rating remains.  
 (3) \*\* indicates that although the significance rating of the impact remains the same, the intensity of the impact decreases due to the proposed mitigation.

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
<b>1</b>	<b>OPERATION OF VESSELS (SURVEY AND SUPPORT)</b>					
<b>1.1</b>	<b>Emissions to Atmosphere</b>					
1.1.1	Emissions from the operation of the project vessels	Increase of air pollutants	Local reduction in air quality	NEG	Compliance with MARPOL 73/78 Annex VI	NEG**
1.1.2			Contribution to global greenhouse gas emissions	NEG		NEG
<b>1.2</b>	<b>Routine Operational Discharges to Sea</b>					
1.2.1	Liquid and solid discharges to sea	Local reduction in water quality	Impact marine ecology/environment	VL	Compliance with MARPOL 73/78 Annexes I, IV and V	VL
1.2.1	Discharge of ballast water and vessel / equipment transfer	Potential introduction of alien invasive species	Impact on marine biodiversity	VL	Compliance with IMO 2004 Ballast Water Management Convention	NEG
<b>1.3</b>	<b>Underwater noise from project vessels transit</b>					
1.3.1	Vessel operation	Increased underwater noise levels	Impact on marine fauna	VL	None	VL*
<b>1.4</b>	<b>Lighting from vessels</b>					
1.4.1	Vessel operation (at night)	Increased ambient lighting	Impact on marine fauna	VL	Optimise lighting	VL**
<b>1.5</b>	<b>Noise from helicopters</b>					
1.5.1	Helicopter operation (unlikely, emergencies)	Increased ambient airborne noise levels	Impact on coastal and marine fauna	VL	<ul style="list-style-type: none"> <li>Avoid sensitive areas</li> <li>Maintain specified altitudes</li> </ul>	VL**
<b>1.6</b>	<b>Impact on intangible cultural heritage</b>					
1.6.1	Vessel operations and seismic acquisition	Seismic activities in areas considered of cultural importance	Impact on intangible cultural heritage linked to sense of place, spirituality, ancestry and livelihoods	M	<ul style="list-style-type: none"> <li>Appropriate consultation with indigenous groups</li> <li>Implementation of ritual events, if requested</li> </ul>	L

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
<b>2</b>	<b>SEISMIC ACQUISITION</b>					
<b>2.1</b>	<b>Underwater Noise from Airguns</b>					
2.1.1	Seismic acquisition / firing of the airguns	Increased underwater ambient noise levels	Impact on cetaceans	<b>M</b>	<ul style="list-style-type: none"> <li>Avoid key migration period</li> <li>Pre-shoot watch (MMO &amp; PAM)</li> <li>“Soft-start” procedures</li> <li>MMO observation during surveying (daylight)</li> <li>PAM during surveying (24/7)</li> <li>Shut-downs</li> </ul>	<b>L</b>
2.1.2						
2.1.3			Impact on seals	<b>L</b>	<ul style="list-style-type: none"> <li>Pre-shoot watch (MMO)</li> <li>“Soft-start” procedures</li> <li>MMO observation during surveying (daylight)</li> <li>Shut-downs</li> </ul>	<b>VL</b>
2.1.4			Impact on turtles	<b>M</b>	<ul style="list-style-type: none"> <li>Pre-shoot watch (MMO)</li> <li>“Soft-start” procedures</li> <li>MMO observation during surveying (daylight)</li> <li>Shut-downs</li> </ul>	<b>L (adults)</b>
						<b>M (hatchlings)</b>
2.1.5			Impact on penguins and feeding diving seabirds	<b>L</b>	<ul style="list-style-type: none"> <li>Pre-shoot watch (MMO)</li> <li>“Soft-start” procedures</li> <li>MMO observation during surveying (daylight)</li> <li>Shut-downs</li> </ul>	<b>VL</b>
2.1.6			Impact on fish	<b>M</b>	<ul style="list-style-type: none"> <li>Avoid key spawning period</li> <li>Pre-shoot watch (MMO)</li> <li>“Soft-start” procedures</li> <li>MMO observation during surveying (daylight)</li> <li>Shut-downs</li> </ul>	<b>L</b>



No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
2.1.7	Seismic acquisition / firing of the airguns	Increased underwater ambient noise levels	Impact on invertebrates	VL	<ul style="list-style-type: none"> <li>“Soft-start” procedures</li> <li>Shut-downs</li> <li>Avoid key spawning period (September - December)</li> <li>Stakeholder notification</li> <li>Navigational warning</li> <li>5-day and 24-hr survey forecasts</li> <li>Fisheries Liaison Officer (FLO)</li> <li>Grievance mechanism</li> </ul>	NEG**
2.1.8			Impact on plankton	L		VL
2.1.9			Impact on demersal trawl	H		L
			Impact on midwater trawl, demersal longline, large pelagic longline, South Coast rock lobster	L		L
2.1.10			Impact on squid jig, small pelagic purse-seine, small-scale fisheries	No Impact		No Impact
<b>2.2</b>	<b>Temporary Safety Zone around Survey Vessel and Array</b>					
2.2.1	Operation of seismic vessel	Temporary safety zone around survey vessel and array	Impact on demersal trawl	M	<ul style="list-style-type: none"> <li>Avoid key fishing periods</li> <li>Stakeholder / vessel notification</li> <li>5-day and 24-hr survey forecasts</li> <li>Navigational warning</li> <li>Fisheries Liaison Officer (FLO)</li> <li>Vessel lighting</li> <li>Grievance mechanism</li> </ul>	L
2.2.2			Impact on midwater trawl, demersal longline, large pelagic longline, South Coast rock lobster	L		L
2.2.3			Disruption to commercial shipping	L		L**
<b>3</b>	<b>INTERACTION WITH THE LOCAL ECONOMY</b>					
<b>3.1</b>	<b>Employment and Business Opportunities</b>					
3.1.1	Provision of services	Local employment and local business opportunities	Economic benefits for local service providers and suppliers	NEG +ve	<ul style="list-style-type: none"> <li>Contracting of local companies</li> <li>Manage community expectations</li> <li>Grievance mechanism</li> </ul>	NEG +ve

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
<b>4</b>	<b>UNPLANNED EVENTS</b>					
<b>4.1</b>	<b><i>Collisions with project vessels and equipment</i></b>					
4.1.1	Ship strikes and entanglement	Obstruction on sea surface, seafloor or in water column	Health and safety impacts to coastal recreation and fishing	NEG	<ul style="list-style-type: none"> <li>Emergency Response Plan</li> <li>Stakeholder information</li> <li>Navigation warning</li> <li>Implement a grievance mechanism</li> </ul>	NEG**
4.1.2			Impacts on marine fauna	L		<ul style="list-style-type: none"> <li>'Turtle-friendly' tail buoys</li> <li>Reduced transit speed</li> <li>Ensure all equipment used is thoroughly cleaned</li> </ul>
<b>4.2</b>	<b><i>Accidental Release of Oil at Sea</i></b>					
4.2.1	Vessel or equipment damaged and bunkering of fuel	Release of fuel into the sea and localised reduction in water quality	Impacts on marine ecology/environment	M	<ul style="list-style-type: none"> <li>Bunkering procedure</li> <li>Shipboard Oil Pollution Emergency Plan – MARPOL Annex I</li> <li>Emergency Response Plan and notification</li> <li>Spill training and clean-up equipment</li> <li>Insurance cover</li> </ul>	L
4.2.2			Impacts on offshore commercial fishing	VL		VL**
4.2.3			Impacts on commercial fishing	L		L**
4.2.4			Impact on intangible cultural heritage	M		L
<b>4.3</b>	<b><i>Loss of Equipment at Sea</i></b>					
4.3.1	Accidental loss of equipment	Obstruction on seafloor or in water column	Impacts on marine ecology/environment	VL	<ul style="list-style-type: none"> <li>Maintenance and lifting procedures</li> <li>Retrieve of lost objects / equipment, where practicable</li> <li>Notify PASA, SAMSA and the SAN Hydrographer</li> </ul>	VL**
4.3.2			Impacts on commercial fishing	VL		VL**

## 7. CONCLUSIONS

### 7.1 Normal operation

#### 7.1.1 Operation of Project Vessels: Emissions, Routine Discharges, Lighting and Noise

The majority of the impacts associated with the normal operation of the project vessels will occur in the vicinity of the area of interest, which is the offshore marine environment, more than 45 km offshore, removed from sensitive coastal receptors (e.g. key faunal breeding / feeding areas and bird or seal colonies). The area of interest, however, overlaps with the Port Elizabeth Corals MPA, and a portion of the Kingklip Corals EBSA and CBAs in the inshore area.

The dominant wind and current direction will ensure that any **emissions and discharges** move mainly in a south-westerly direction away from the coast. These impacts will largely be regional (although generally localised at any one time), of short-term duration (up to five months) and of very low to low intensity, and are considered to range from **NEGLIGIBLE** to **VERY LOW** significance with mitigation. Key mitigation includes ensuring that the project vessels comply with MARPOL 73/78 standards.

**De-ballasting** of project vessels could lead to the introduction of exotic species and harmful aquatic pathogens to the marine ecosystem. The risk of impacts on marine biodiversity related to the introduction of alien species is significantly reduced by adherence to the 2004 IMO guidelines governing discharge of ballast, which specifies minimum discharge distances from the nearest land. Considering the dynamic location of the survey area and compliance with the IMO guidelines for ballast water, the residual impact is considered to be of very low intensity in the short-term (due to invasive species not being able to establish) and of regional extent. Thus, the residual impact is of **NEGLIGIBLE** significance.

The **noise generated by the operation of the project vessels** falls within the hearing range of most fish and marine mammals, and would be audible for considerable ranges before attenuating to below threshold levels. However, underwater noise from vessels is not considered to be of sufficient amplitude to cause direct harm to marine life, even at close range. The impact related to vessel noise is considered to be of **VERY LOW** significance. No mitigation measures are proposed or deemed necessary.

**Operational lighting** used to illuminate the project vessels at night will increase ambient lighting in offshore areas, which may disturb and disorientate pelagic seabirds feeding in the area. Since the survey area is located within a busy traffic route along the Southeast Coast of South Africa, which experiences high vessel traffic, animals in the area should be accustomed to vessel traffic within a few days. The residual impact related to vessel lighting is considered to be of **VERY LOW** significance.

These impacts are not unique to the project vessels, but common to the numerous vessels that pass through South African coastal waters on a daily basis.

#### 7.1.2 Helicopter Operations

Crew changes will most likely occur by support or survey vessel calling to port. However, if necessary for personnel transfer or in emergency situations, the helicopter may fly over or in close proximity to sensitive coastal receptors, such as seal and seabird breeding colonies, which could be affected by a flight path between the survey area of interest and the airport. Although exposure during crew changes will be limited over the five-month survey duration and be of a temporary nature while the helicopter passes overhead, indiscriminate or direct low altitude flying over seabird and seal colonies or breeding cetaceans could impact fauna behaviour and breeding success. Specified flight paths that avoid these sensitive receptors will reduce the impact intensity on marine fauna, but maintain the **VERY LOW** significance.

### 7.1.3 Seismic Acquisition

Seismic noise could impact **marine fauna** in number of different ways, including physiological injury (e.g. permanent - PTS and temporary - TTS), disturbance and / or behavioural changes, masking of environmental sounds and communication, and effects on predator-prey relationships. Any impact to fish and fish behaviour could, in turn, impact commercial fisheries that operate in the area through the reduction in catch rates and/or an increase in fishing effort.

The maximum estimated zones of impact for PTS, TTS and behaviour for the various faunal groups are summarised in Table 3 below.

**Table 3: Zones of Impact from seismic pulses for all faunal groups**

Type of animal		Zones of impact – maximum horizontal distances from source to impact threshold levels				
		Immediate Impact from Single Pulses		Cumulative Impact from Multiple Pulses		Behaviour
		Injury (PTS) onset	TTS onset	Injury (PTS) onset	TTS onset	
Mammals	Cetaceans	480 m (VHF cetaceans)	850 m (VHF cetaceans)	800 m (LF cetaceans)	12 000 m (LF cetaceans)	4 400 m
	Seals	25 m	35 m	-	< 10 m	-
Type of animal		Mortality & Mortal Injury	Recovery injury	Mortality & Mortal Injury	Recovery injury	
Fish	Fish (with swim bladder)	240 m	240 m	20 m	50 m	5 000 m
Sea turtles		240 m	-	< 10 m	-	3 100 m
Notes:						
<ul style="list-style-type: none"> <li>• A dash indicates the threshold is not applicable.</li> <li>• If the zone of impact for cumulative is smaller than that for the single pulse, then the marine species are likely to be more sensitive to pressure impact than energy impact.</li> </ul>						

Thus, animals would need to be in relatively close proximity to operating airguns to suffer permanent physiological injury, and, most being highly mobile, it is assumed that they would avoid sound sources at distances well beyond those at which injury is likely to occur. Behavioural effects, although with a slightly larger zone of impact, are generally short-term with duration of the effect being less than or equal to the duration of exposure, although these vary between species and individuals, and are dependent on the properties of the received sound.

With the implementation of the recommended mitigation, the residual impact on **marine fauna** ranges from **LOW** (cetaceans, turtles (**MEDIUM** for hatchlings) and fish) to **VERY LOW** (diving seabirds, seals and plankton) to **NEGLIGIBLE** (invertebrates and other plankton) significance. Key mitigation includes ensuring the seismic survey avoids the key cetacean migration period from June to November (inclusive) and key spring fish spawning periods (September to December (inclusive), implementing a 60-minute pre-watch period and “soft-start” procedure, monitoring the faunal activity within the mitigation zone when the airgun array is active and terminating seismic shooting, as specified.

The area of interest overlaps with the fishing grounds of five **fishing sectors**, namely demersal trawl, midwater trawl, demersal longline, large pelagic longline and South Coast rock lobster. It is highly likely that the survey will only commence in January 2024 at the earliest, assuming permit award. The avoidance of December will help mitigate the potential impact on the demersal trawl, midwater trawl and demersal longline sectors. With

the January commencement and implementation of the mitigation measures related to the temporary exclusion zone, which will ensure good communication and coordination with the fishing sectors, the residual impact on the demersal trawl, midwater trawl, demersal longline, large pelagic longline and South Coast rock lobster is assessed to be of **LOW** significance. Although fishing activities will be temporarily excluded from the safety zone around the survey vessel and its array, fishing could continue in adjacent areas.

There is **no anticipated impact on the traditional linefish, small pelagic purse-seine, squid jig and small-scale sectors** which are unlikely to range beyond 25 km from the coastline; thus, falling inshore of the area of interest..

Similarly, **commercial shipping** would be excluded from portions of the survey area at any one time and may require these vessels to adjust their course slightly (detour) to avoid the survey vessel and lines being shot. With the implementation of the mitigation measures, which includes the broadcasting of a navigational warning for the duration of the survey, residual impacts on commercial shipping are assessed to be of **LOW** significance.

Any impact on the marine ecosystem could in turn impact the **intangible cultural heritage** of people who have a close spiritual link to the sea. The sea is described as 'living' waters and is believed to play a critical role in spiritual and health management in indigenous groups specifically (First Peoples and Nguni). With appropriate and substantive public participation efforts and the possible implementation of ritual events the potential impact is assessed as being of **LOW** significance.

#### 7.1.4 Interaction with the Local Economy

The seismic activities will result in limited **economic benefits** with respect to the recruitment and the use of local service providers or suppliers. The demand for such local services will largely be limited to crew accommodation, meals, basic goods, and refuelling, provided in the selected supply port, Gqeberha. In addition, the workforce required for the exploration activities is expected to be 100 persons in total. Although the majority of these positions will be filled by international experts employed by the seismic survey contractor, there will be indirect employment via the contracting of local service providers and suppliers. The maximisation of opportunities for locals will result in a residual impact of **NEGLIGIBLE (positive)** significance. Due to the limited nature of this work, it is important to actively manage community expectations related to local procurement, local content, and local employment opportunities.

## 7.2 Unplanned Events

Unplanned events may conceivably occur as a result of accidents or abnormal operating conditions, including a vessel collision and faunal strikes, accidental spills from bunkering or a vessel accident, and lost equipment.

**Oil or diesel spilled** in the marine environment will have an immediate detrimental effect on water quality. Being highly toxic, marine diesel released during an operational spill (e.g. during bunkering, vessel or equipment damage) will negatively affect any marine fauna in which it comes into contact. In the unlikely event of a spill, the intensity of the impact would depend on whether the spill occurred in offshore waters where encounters with pelagic seabirds, turtles and marine mammals would be low due to their extensive distribution ranges, or whether the spill occurred closer to the shore where encounters with sensitive receptors will be higher. Due to the dominant winds and currents, a diesel slick in the survey area would be blown in a south-westerly direction and away from sensitive coastal receptors. A small diesel spill would remain at the surface for less than 5 days (short-term) with no chance of it reaching sensitive coastal habitats. A spill within the port limits during bunkering / loading could, however, be easily managed and contained, and is less likely to pose a risk to the nearshore environment. A spill outside the port near the coast (e.g. in

the unlikely event of a vessel collision) could reach the shore and mariculture activities through wave action and tidal currents. As the intensity of a nearshore spill may be higher than an offshore spill, the residual impacts on marine ecology and nearshore fishing (mariculture and small-scale) are considered to be of **LOW** significance, while the residual impacts on commercial fishing (offshore) are considered to be of **VERY LOW** significance. Key project controls include implementing the Shipboard Oil Pollution Emergency Plan and Emergency Response Plan.

The potential impacts associated with **lost equipment** to the seabed may initially crush benthic fauna, whereafter it would provide a localised area of hard substrate in an area of otherwise unconsolidated sediments. This would be of short-term duration as any lost object will likely sink into the sediments and be buried over time. Since the proposed survey area of interest overlaps with demersal fishing grounds along the shelf break, snagging of demersal gear due to equipment that sinks to the seabed is considered possible. The loss of a streamer would also result in entanglement and collision hazards in the water column before they sink under their own weight. The residual impacts on marine fauna and commercial fishing are both considered to be of **VERY LOW** significance. Due to the cost of the equipment, gear will be recovered, where possible, thereby reducing the likelihood of these impacts.

Movement of vessels between the survey area and the supply port may result in limited interaction with recreational and fishing boats that could lead to **vessel collisions** and related damage to vessels and death / injuries to humans. To be prepared for a collision event, the project will implement an emergency response system. As standard practice, an Emergency Response Plan and Medical Evacuation Plan will be implemented. Assuming compliance with port control and laws of the sea when navigating in the vicinity of the supply port, it is unlikely that collisions would occur, and the potential residual impact is assessed to be of **NEGLIGIBLE** significance.

**Faunal strikes** with the project vessels or the towed array, although unlikely, may occur during vessel transit or surveying. The residual impact is considered to be of **LOW** significance with the use of 'turtle-friendly' tail buoys, ensuring that all equipment that has been used in other regions is thoroughly cleaned prior to and regularly during use (less likely to attract animals wanting to feed off organisms growing on the equipment) and reducing transit speed from 12 knots to 10 knots in the vicinity of sensitive marine fauna and within 25 km from the coast.

Any unplanned events that impact on the marine environment could in turn impact on the **intangible cultural heritage** of people, largely due to *perceived* impacts of an accidental spill. With the efficient implementation of emergency response plans and appropriate consultation, the residual impact is considered to be of **LOW** significance.

### 7.3 Cumulative Impact

The assessments of impacts of seismic sounds provided in the scientific literature usually consider short-term responses at the level of individual animals only, as scientific understanding of how such short-term effects relate to adverse residual effects at the population level are limited. Data on behavioural reactions to seismic noise acquired over the short-term could, however, easily be misinterpreted as being less significant than the cumulative effects over the long-term. Despite the density of seismic survey coverage over the past years in the South African offshore and particularly along the southern coast, the number of Southern right and Humpback whales around the southern African coast have increased, and their lingering on West Coast feeding grounds long into the summer, suggest that those surveys conducted over the past decades have not negatively influenced the distribution patterns of these two migratory species at least. Information on the population trends of resident species of baleen and toothed whales is unfortunately lacking, and the potential



effects of seismic surveys on such populations remains unknown. Consequently, suitable precautionary mitigation measures must be implemented during seismic data acquisition to ensure the least possible disturbance of marine fauna in an environment where the cumulative impact of increased background anthropogenic noise levels has been recognised as an ongoing and widespread issue of concern.

There is the possible chance of an increase in disturbance and disruption to fisheries active in the area should additional exploration activities be undertaken during the same survey window period. There is also the possibility of cumulative benefits being accrued to local service providers and suppliers if multiple exploration activities become active either in parallel or in close sequence to each other. The need for ongoing support from local service providers and suppliers over multiple projects may see possible cumulative benefits over a longer period of time, but may also raise strong expectations.

Thus, should other speculative or proprietary seismic survey campaigns be undertaken concurrently with CGG's proposed survey programme off the Southeast Coast (although unlikely to be undertaken in the same area during the same survey window due to impacts on operation and data acquisition), cumulative impacts may be likely and there would need to be alignment in planning of such concurrent operations in order to avoid cumulative impacts.

#### 7.4 Recommendation

All residual impacts related to normal operations are of **NEGLIGIBLE** to **LOW** significance with the implementation of the recommended mitigation measures. Based on the nature, duration (short-term) and extent (regional, although generally localised at any one time) of the proposed seismic survey and the findings of the specialist studies, SLR is of the opinion that there is no reason why the proposed project should not, with implementation of the project controls and proposed mitigation measures, receive a favourable decision and the issuing of an Environmental Authorisation.

In making a decision on this application, PASA and DMRE will, however, need to weigh up these potential impacts with the project's alignment with National strategic policy (specifically the "just" transition to net carbon zero) and the large amount of public opposition to the continued use of fossil fuels and the exploration for new hydrocarbons resources.

## CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 Project Background .....	1
1.2 Objectives and Purpose of this Report .....	2
1.3 Structure of this Report .....	4
1.4 Opportunity to Comment .....	5
<b>2. ADMINISTRATIVE AND LEGAL FRAMEWORK .....</b>	<b>6</b>
2.1 South African Institutional and Administrative Framework.....	6
2.1.1 Department of Mineral Resources and Energy (DMRE) .....	6
2.1.2 Petroleum Agency South Africa (PASA) .....	6
2.1.3 Department of Forestry, Fisheries and the Environment (DFFE) .....	6
2.1.4 South African Heritage Resources Agency (SAHRA).....	7
2.1.5 South African Maritime Safety Authority (SAMSA) .....	7
2.1.6 Transnet National Ports Authority (TNPA).....	7
2.2 South African Legislation .....	7
2.2.1 Introduction.....	7
2.2.2 National Environmental Management Act (NEMA), 1998.....	8
2.2.3 Mineral and Petroleum Resources Development Act (MPRDA), 2002 .....	9
2.2.4 National Environmental Management: Air Quality Act, 2004 .....	9
2.2.5 National Environmental Management: Waste Act, 2008 .....	10
2.2.6 National Environmental Management: Protected Areas Act, 2003.....	10
2.2.7 Other South African Laws and Policies Relevant to Oil and Gas Exploration.....	11
2.3 International Regulations, Conventions and Best Practice .....	12
2.4 CGG Environmental Policy Statement .....	17
2.5 Guidelines .....	18
<b>3. BASIC ASSESSMENT APPROACH AND PROCESS.....</b>	<b>19</b>
3.1 Details of the Project Team .....	19
3.2 Assumptions and Limitations.....	20
3.3 Basic Assessment Process.....	21
3.3.1 Objectives.....	21
3.3.2 Application for Reconnaissance Permit and Environmental Authorisation.....	21
3.3.3 DFFE Screening Tool Report .....	22
3.3.4 Specialist Studies.....	24
3.3.5 Compilation of BAR for review .....	25
3.3.6 Completion of the Basic Assessment Process .....	28
<b>4. PUBLIC PARTICIPATION PROCESS.....</b>	<b>29</b>
4.1 Principles .....	29
4.2 Public Participation steps .....	29

4.2.1	Stakeholders Identification.....	29
4.3	Consultation and Disclosure .....	30
4.3.1	Availability of the draft BAR.....	30
4.3.2	Advertising.....	30
4.3.3	Site Notices.....	30
4.3.4	Radio Announcements.....	31
4.3.5	Notification of draft BAR Comment Period and Meetings.....	31
4.3.6	Public and Focus Group Meetings.....	31
4.3.7	Notification of DMRE’s Decision.....	32
<b>5.</b>	<b>NEED AND DESIRABILITY .....</b>	<b>33</b>
5.1	CONSISTENCY WITH National Policy and Planning Frameworks.....	33
5.1.1	White Paper on the Energy Policy of the Republic of South Africa (1998).....	33
5.1.2	New Growth Path (2011).....	33
5.1.3	National Development Plan 2030 (2013) .....	33
5.1.4	Draft Integrated Energy Plan (2013).....	34
5.1.5	Operation Phakisa (2014) .....	35
5.1.6	Integrated Resources Plan (2019).....	35
5.1.7	South African Economic Reconstruction and Recovery Plan (2020).....	36
5.1.8	National Climate Change Response White Paper (2014).....	36
5.1.9	Paris Agreement - United Nations Framework Convention on Climate Change (2015) .....	37
5.2	Need and Desirability Summary .....	37
<b>6.</b>	<b>PROJECT DESCRIPTION .....</b>	<b>39</b>
6.1	General Information .....	39
6.1.1	Applicant.....	39
6.1.2	Existing Permit and Right Holders .....	39
6.1.3	Details of Reconnaissance Permit Area/Survey Area of Interest .....	39
6.1.4	Project Scope and Activities .....	41
6.2	Seismic Surveys.....	42
6.2.1	Principles .....	42
6.2.2	Sound Source and Sound Pressure Emission Levels.....	44
6.2.3	Recording Equipment and Tail Buoy .....	46
6.2.4	Technical Characteristics of the Seismic Acquisition .....	47
6.2.5	Main Project Components for Seismic Surveying .....	48
6.2.6	Emissions, Discharges and Wastes.....	52
6.3	Financial Provision and Insurances .....	55
6.4	Consideration of Alternatives .....	56
<b>7.</b>	<b>DESCRIPTION OF THE AFFECTED ENVIRONMENT .....</b>	<b>59</b>
7.1	Introduction.....	59
7.2	Areas of Influence.....	59
7.3	Physical Environment .....	61
7.3.1	Climate.....	61
7.3.2	Bathymetry and Sediments .....	62

---

7.3.3	Water Masses and Circulation.....	65
7.3.4	Thermal Structure and Variability .....	67
7.3.5	Tides, Wind and Swells .....	69
7.3.6	Nutrient Distributions .....	70
7.3.7	Turbidity.....	71
7.3.8	Sedimentary Phosphates .....	72
7.4	Biological Oceanography .....	74
7.4.1	Introduction.....	74
7.4.2	Plankton.....	77
7.4.3	Benthic and Pelagic Invertebrate Communities .....	80
7.4.4	Pelagic and Demersal Fish .....	90
7.4.5	Turtles.....	101
7.4.6	Sea Birds .....	104
7.4.7	Marine Mammals.....	111
7.5	Marine Protected Areas and Potential Vulnerable Marine Ecosystems .....	127
7.5.1	Coastal Marine Protected Areas .....	129
7.5.2	Offshore Marine Protected Areas .....	130
7.5.3	Ecologically or Biologically Significant Areas .....	130
7.5.4	Biodiversity Priority Areas.....	132
7.5.5	Algoa Bay Systematic Conservation Plan .....	133
7.5.6	Important Bird Areas.....	134
7.5.7	Important Marine Mammal Areas .....	135
7.6	Socio-Economic Environment.....	137
7.6.1	Regional Context .....	137
7.7	Fishing Sector Activities .....	141
7.7.1	Demersal Trawl .....	142
7.7.2	Mid-Water Trawl.....	144
7.7.3	Demersal Longline – Hake-directed .....	145
7.7.4	Demersal Longline – Shark-directed .....	147
7.7.5	Small Pelagic Purse-Seine .....	148
7.7.6	Pelagic Longline.....	150
7.7.7	Traditional Line Fish .....	153
7.7.8	South Coast Rock Lobster .....	155
7.7.9	Squid Jig.....	156
7.7.10	Small-Scale Fishing .....	157
7.7.11	Fisheries Research.....	159
7.7.12	Summary of Fishing Activities in Project Area .....	161
7.8	Offshore Marine and Coastal Infrastructure and Activities .....	162
7.8.1	Marine Traffic and Transport .....	162
7.8.2	Exploration, Production and Mining .....	163
7.8.3	Anthropogenic Marine Hazards .....	165
7.9	Cultural Heritage and Sites.....	166
7.9.1	Shipwrecks.....	167

---

---

7.9.2	Intangible Cultural Heritage .....	167
<b>8.</b>	<b>IMPACT ASSESSMENT.....</b>	<b>170</b>
8.1	INTRODUCTION .....	170
8.2	Screening of Aspects and Impacts .....	170
8.2.1	Environmental and Social Interaction Matrix.....	170
8.2.2	Aspects and Impacts Register.....	171
8.3	Operation of Vessels (Survey and Support) .....	175
8.3.1	Emissions to Atmosphere .....	175
8.3.2	Routine Operational Discharges to Sea .....	178
8.3.3	Discharge of Ballast Water from Vessels and Vessel / Equipment Transfer .....	182
8.3.4	Underwater Noise from Vessel Operations and Transit .....	185
8.3.5	Lighting from Vessels .....	187
8.3.6	Noise from Helicopters .....	190
8.3.7	Impact on Intangible Cultural Heritage.....	193
8.4	Seismic Acquisition .....	196
8.4.1	Underwater Noise from Airguns .....	196
8.5	Temporary Exclusion Zone .....	232
8.5.1	Impact on Commercial Fishing .....	232
8.5.2	Disruption to Commercial Shipping Routes.....	236
8.6	Interaction with the Local Economy .....	237
8.6.1	Employment and Business Opportunities .....	237
8.7	Unplanned Events.....	239
8.7.1	Collisions with Project Vessels and Equipment .....	239
8.7.2	Accidental Release of Oil at Sea .....	244
8.7.3	Loss of Equipment at Sea.....	249
8.7.4	Impact on Intangible Cultural Heritage.....	254
8.8	Cumulative Impact.....	256
8.8.1	Bio-Physical.....	256
8.8.2	Socio-Economic.....	259
8.9	No-Go Alternative.....	260
8.10	Impact Assessment and Mitigation Summary .....	261
<b>9.</b>	<b>ENVIRONMENTAL AND SOCIAL MANAGEMENT PROGRAMME.....</b>	<b>266</b>
9.1	Introduction.....	266
9.1.1	Scope and Objectives.....	266
9.1.2	Chapter Structure.....	266
9.2	Summary of the Key Environmental and Social Sensitivities .....	267
9.3	Supporting Documentation .....	268
9.3.1	Survey Design .....	268
9.3.2	Contractor HSE Plan.....	268
9.3.3	Contractor Project Plan.....	268
9.3.4	Contractor HSE-MS Bridging document.....	268

---

9.3.5	Contractor Kick-Off Meeting and Crew Awareness .....	269
9.3.6	Commitments Register .....	269
9.3.7	Plans and Procedures.....	269
9.4	Roles and Responsibilities.....	275
9.4.1	CGG .....	275
9.4.2	Seismic Contractor .....	276
9.4.3	Marine Mammal Observers (MMOs) .....	276
9.4.4	PAM Operators.....	277
9.4.5	Fisheries Liaison Officer (FLO) .....	278
9.5	Training, Awareness and Competency .....	278
9.6	Compliance Verification and Corrective Actions .....	279
9.6.1	Monitoring.....	279
9.6.2	Auditing.....	283
9.6.3	Corrective Actions.....	284
9.7	Management of Change .....	284
9.8	Communication .....	285
9.8.1	Internal Communication.....	285
9.8.2	Stakeholder Engagement.....	285
9.9	Document Control and Reporting.....	285
9.9.1	Documentation .....	285
9.9.2	Incident Reporting .....	285
9.9.3	ESMP Close-Out Compliance Report.....	285
9.10	Environmental and social mitigation management Commitment Register .....	286
<b>10.</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>316</b>
10.1	Normal Operations .....	316
10.1.1	Operation of Project Vessels: Emissions, Routine Discharges, Lighting and Noise .....	316
10.1.2	Helicopter Operations.....	316
10.1.3	Seismic Acquisition.....	317
10.1.4	Interaction with the Local Economy .....	319
10.2	Unplanned Events.....	319
10.3	Comparative Assessment of alternatives.....	320
10.4	Cumulative Impact.....	321
10.5	Recommendation .....	321
<b>11.</b>	<b>REFERENCES.....</b>	<b>322</b>

## LIST OF TABLES

Table 2-1:	List of Applicable Activities in terms of Listing Notice 1 (as amended) .....	9
Table 2-2:	Other applicable South African legislation .....	11
Table 2-3:	Ratified international conventions and treaties .....	13
Table 2-4:	Guidelines relevant to the Basic Assessment process .....	18



Table 3-1: Details of the Basic Assessment project team and specialists.....	19
Table 3-2: Requirements of a Basic Assessment Report in terms of the EIA Regulations 2014.....	25
Table 4-1: Details of planned public meetings .....	31
Table 6-1: List of Right Holders in the Reconnaissance Permit Application area boundary.....	41
Table 6-2: Reconnaissance Permit Application area coordinates .....	41
Table 6-3: Summary of project phases and activities .....	42
Table 6-4: Characteristics of seismic acquisition operations (indicative).....	47
Table 6-5: Generic specifications of a seismic vessel .....	49
Table 6-6: Generic specifications of a seismic support vessel .....	51
Table 6-7: Estimated fuel consumption.....	53
Table 6-8: Estimated total atmospheric emissions.....	53
Table 6-9: Summary of potential solid waste streams .....	55
Table 6-10: Summary of Project Alternatives.....	57
Table 7-1: Potential VME species from the eastern Agulhas Bank and shelf edge. ....	84
Table 7-2: Some of the more important large migratory pelagic fish likely to occur in the offshore regions of the South and East Coasts and their conservation status.....	92
Table 7-3: Some of the more important demersal and pelagic linefish species along the inshore shallow water areas along the South Coast.....	96
Table 7-4: Some of the chondrichthyan species occurring along the South Coast and their conservation status (CCA & CMS 2001; Harris <i>et al.</i> 2022). ....	98
Table 7-5: Global and Regional Conservation Status of the turtles occurring off the South Coast showing variation depending on the listing used. ....	104
Table 7-6: Breeding resident seabirds present along the Southeast coast (adapted from CCA & CMS 2001).....	105
Table 7-7: Pelagic seabirds common off Southern Africa (BirdLife South Africa).....	108
Table 7-8: Cetaceans occurrence off the Southeast coast of South Africa, their seasonality and likely encounter frequency with proposed seismic survey operations (adapted from S. Elwen, Mammal Research Institute, pers. comm., Best 2007). IUCN Conservation Status is based on the SA Red List Assessment (2014) (Child <i>et al.</i> 2016).....	112
Table 7-9: Seasonality of baleen whales in the broader project area (Best 2007 and other sources) and data from stranding events (NDP unpubl data). Values of high (H), Medium (M) and Low (L) are relative within each row (species) and not comparable between species. ....	114
Table 7-10: Total catch (t) and number of active domestic and foreign-flagged vessels targeting large pelagic species for the period 2008 to 2018 (Source: DEFF, 2019). ....	151
Table 7-11: Summary table of seasonal variation in fisheries active in the proposed survey area of interest .....	161
Table 8-1: Environmental and Social Interaction Matrix .....	172
Table 8-2: Aspects and Impacts Register .....	173
Table 8-3: Impact of atmospheric emissions on air quality and greenhouse gas emissions .....	177
Table 8-4: Impacts on marine ecology/environment from operational discharges to sea .....	182
Table 8-5: Impact on marine biodiversity from ballast water discharge and equipment fouling .....	184
Table 8-6: Impact on marine fauna from vessel noise .....	187
Table 8-7: Impact on marine fauna from vessel lighting .....	189
Table 8-8: Impact of helicopter noise on coastal and marine fauna .....	192
Table 8-9: Impact on Intangible Cultural Heritage .....	195
Table 8-10: Zones of immediate impact from single pulses and multiple pulses (cumulative) for cetaceans .....	198
Table 8-11: Impact on cetaceans from seismic noise .....	205
Table 8-12: Zones of immediate impact from single pulses and multiple pulses (cumulative) for other marine carnivores (seals) .....	206
Table 8-13: Impact on seals from seismic noise .....	208
Table 8-14: Zones of immediate impact from seismic single pulses and multiple pulses (cumulative) for turtles .....	210
Table 8-15: Impact on sea turtles from seismic noise .....	212

Table 8-16: Impact on penguins and feeding aggregations of diving seabirds from seismic noise .....	215
Table 8-17: Zones of immediate impact from single pulses and multiple pulses (cumulative) for fish .....	217
Table 8-18: Impact on fish from seismic noise .....	220
Table 8-19: Impact on marine invertebrates from seismic noise .....	223
Table 8-20: Impact on plankton from seismic noise .....	225
Table 8-21: Fisheries sectors that operate off the Southeast Coast, the likelihood of their presence and the % catch / effort and seasonality in the area of interest .....	228
Table 8-22: Impact of Seismic Noise on Fishing Sectors off the Southeast Coast .....	231
Table 8-23: Impact of temporary exclusion from fishing grounds for fishing sectors off the Southeast Coast .....	235
Table 8-24: Impacts on commercial shipping due to safety zone around survey vessel and seismic array .....	237
Table 8-25: Economic benefits for local service providers and suppliers due to employment and business opportunities .....	239
Table 8-26: Health and safety impacts to coastal/near-shore tourism and recreation due to a vessel collision.....	241
Table 8-27: Impacts on marine fauna from vessel strikes and entanglement .....	244
Table 8-28: Impacts on marine ecology/environment from the accidental release of oil .....	247
Table 8-29: Impacts on Commercial Fishing from the accidental release of oil .....	249
Table 8-30: Impacts on Marine Ecology/Environment from loss of equipment at sea .....	252
Table 8-31: Impacts on Commercial Fishing from loss of equipment at sea .....	253
Table 8-32: Impact on Intangible Cultural Heritage .....	256
Table 8-33: Summary of the significance of the impacts associated with the proposed 3D seismic survey off the Southeast Coast .....	262
Table 9-1: Description of the structure and content of the ESMP .....	266
Table 9-2: Key sensitivities in the project’s area of influence .....	267
Table 9-3: Waste prevention and management principles .....	270
Table 9-4: Monitoring Requirements for Seismic Surveys.....	280
Table 9-5: Audit Rating Scale .....	283
Table 9-6: Environmental and Social Mitigation Management Commitment Register for seismic surveys .....	287
Table 10-1: Zones of Impact from Seismic Pulses for all Faunal Groups .....	317
Table 10-2: Comparative Assessment of Alternatives .....	320

## LIST OF FIGURES

Figure 1-1: Location of the Reconnaissance Permit area off the Southeast Coast .....	3
Figure 3-1: Flow Diagram showing the Basic Assessment Process .....	22
Figure 6-1: Location of the Reconnaissance Permit Applicatio/Area of Interest for the proposed 3D survey area in relation to licence blocks .....	40
Figure 6-2: Principles of offshore seismic acquisition surveys.....	43
Figure 6-3: Example of a 3D image .....	43
Figure 6-4: A typical seismic source / airgun array .....	44
Figure 6-5: A seismic source (airgun array) deployed at sea .....	44
Figure 6-6: Pattern of measurable received sound levels around a schematic representation of an array, assuming a nominal point source level of 260 dB peak sound pressure level ( $SPL_{peak}$ ) re 1 $\mu Pa$ .....	45
Figure 6-7: A typical pressure signature produced on firing of an airgun .....	46
Figure 6-8: Example of a hydrophone streamer .....	46
Figure 6-9: Example of a tail buoy .....	47
Figure 6-10: Graphic of a seismic vessel towing gear and a cross section of the resulting data image .....	47
Figure 6-11: Amazon Conqueror.....	49
Figure 6-12: Typical configuration and safe operational limits for 3D seismic survey operations .....	50
Figure 6-13: Example of a typical seismic escort vessel (M/V Thor Freyja) .....	51
Figure 7-1: Area of Influence during seismic operations .....	60

Figure 7-2: Historic rainfall and temperature monthly averages for Cape St Francis (top) and Gqeberha (Port Elizabeth) (bottom) ..... 61

Figure 7-3: Location, bathymetry and seabed features off the Southeast Coast in relation to the Reconnaissance Permit Area ..... 63

Figure 7-4: The Reconnaissance Permit Area (red) in relation to coastal and offshore benthic habitat types of the Southeast coast (adapted from Sink *et al.* 2019) ..... 64

Figure 7-5: The predominance of the Agulhas current in the oceanography of the Reconnaissance Permit Area (adapted from Roberts *et al.* 2010) ..... 65

Figure 7-6: The Reconnaissance Permit Area (red) in relation to important physical processes and features associated with the Southeast coast (adapted from Roberts 2005) ..... 66

Figure 7-7: Satellite imagery of sea surface temperature between 1 and 8 March 2010, showing an upwelling event. Cool water first emerges at Woody Cape / Cape Padrone and expands into Algo Bay (Source: Hutchings *et al.* 2013) ..... 68

Figure 7-8: Wind rose for a location at approximately 35°40'S, 23°20'E for the period 1950 – 2019 (ACTIMAR). ..... 69

Figure 7-9: Wave rose showing the direction, proportion and magnitude of waves experienced offshore of the St. Francis- Algoa Bay region (Source: SADC Voluntary Observing Ships for a 30-year period) ..... 70

Figure 7-10: The Reconnaissance Permit Area (red polygon) in relation to benthic turbidity events on the Eastern Agulhas Bank in April 1992 (bottom) and April 1999 (top) (adapted from Dorfler 2002). The turbidity scales are in Nephelometric Turbidity Units (NTU). ..... 72

Figure 7-11: Phosphorite hard ground (left) and its distribution (cyan) on the South African continental shelf (right) in relation to the Reconnaissance Permit Area (red polygon) (adapted from Morant 2013). ..... 73

Figure 7-12: The Reconnaissance Permit Area in relation to the South African inshore and offshore ecoregions (adapted from Sink *et al.* 2019) ..... 74

Figure 7-13: The Reconnaissance Permit Area (red polygon) in relation to the ecosystem threat status for coastal and offshore benthic habitat types (adapted from Sink *et al.* 2019) ..... 75

Figure 7-14: The Reconnaissance Permit Area (red) in relation to ecosystem types along the Southeast coast (adapted from Sink *et al.* 2019) ..... 76

Figure 7-15: The Reconnaissance Permit Area (red polygon) in relation to important pelagic and demersal fish and squid spawning areas (after Anders 1975; Crawford *et al.* 1987; Hutchings 1994). ..... 78

Figure 7-16: The Reconnaissance Permit Area (red polygon) in relation to squid spawning areas (top), and the distribution of sardine (middle) and anchovy (bottom) spawning areas (adapted from Harris *et al.* 2022).  
79

Figure 7-17: Examples of offshore benthic communities on reefs at <50 m depth on the central Agulhas Bank (left) and sandy seabed (right) ..... 84

Figure 7-18: Vulnerable sponge- and soft coral-dominated biota at 60 m depth on the Alphen Bank (left) and black coral at 130 m depth on the 72-Mile Bank (from Sink *et al.* 2010). ..... 84

Figure 7-19: Sandy seabed with rocky outcrops characterising the F-O Field area (from Shipton & Atkinson 2008). ... 86

Figure 7-20: Extent of the Agulhas inshore reef and hard ground habitat types (shown in black) and deep water reefs in relation to the Reconnaissance Permit area (adapted from Sink *et al.* 2012a). ..... 87

Figure 7-21: Diverse and unique reef assemblages, dominated by cauliflower soft coral occur on the inshore reefs to - 30 m depth off Port Elizabeth (Source: Sink *et al.* 2011). ..... 88

Figure 7-22: Squid spawn in nearshore areas off the Southeast coast (left) and South Coast rock lobster occur in deep water (right) (photos: [www.mpa.wwf.org.za](http://www.mpa.wwf.org.za); Steve Kirkman and [www.aquarium.co.za](http://www.aquarium.co.za)). ..... 89

Figure 7-23: Distribution of the giant squid (<http://iobis.org>). Blue squares <5 records, green squares 5-10 records. 90

Figure 7-24: Cape fur seal preying on a shoal of pilchards (left). School of horse mackerel (right) (photos: [www.underwatervideo.co.za](http://www.underwatervideo.co.za); [www.delivery.superstock.com](http://www.delivery.superstock.com)). ..... 91

Figure 7-25: Large migratory pelagic fish such as longfin tuna (left) and sailfish (right) occur in offshore waters (photos: [www.arkive.org](http://www.arkive.org); [www.osfimages.com](http://www.osfimages.com)). ..... 92

Figure 7-26: The great white shark *Carcharodon carcharias* (left) and the dusky shark *Charcharhinus obscurus* (right) (photos: [www.flmnh.ufl.edu](http://www.flmnh.ufl.edu)). ..... 93

Figure 7-27: The Reconnaissance Permit Area (red polygon) in relation to the long-distance return migrations of two tracked great white sharks along the South African coast. The black trace shows a migration from 24 May – 2 November 2003; the white trace shows a migration from 31 May – 1 October 2004 (adapted from Bonfil *et al.* 2005). ..... 95

Figure 7-28: The Agulhas Inshore and offshore reefs support a wide diversity of teleost species including musselcracker (left) and red stumpnose (right) (photos: <http://spearfishingsa.co.za>, [www.easterncapescubadiving.co.za](http://www.easterncapescubadiving.co.za)). ..... 96

Figure 7-29: The distribution of various cartilaginous species mentioned in Table 7-4 in relation to the Reconnaissance Permit area (red polygon) (adapted from Harris *et al.* 2022). The IUCN conservation status is provided. .... 100

Figure 7-30: Leatherback (left) and loggerhead turtles (right) occur along the East Coast of South Africa (Photos: Ketos Ecology 2009; [www.aquaworld-crete.com](http://www.aquaworld-crete.com)). ..... 101

Figure 7-31: The Reconnaissance Permit Area (red polygon) in relation to the migration corridors of loggerhead (top) and leatherback (bottom) turtles in the south-western Indian Ocean. .... 103

Figure 7-32: Typical diving seabirds on the South Coast are the Cape Gannets (left) (Photo: NACOMA) and the flightless African Penguin (right) (Photo: Klaus Jost). ..... 106

Figure 7-33: The Reconnaissance Permit Area (red polygon) in relation to the foraging and core usage areas of Cape Cormorant (top) and the core usage areas (red line) and general distribution (blue shading) of breeding Cape Gannets from Bird Island (bottom)(adapted from Harris *et al.* 2022; BirdLife South Africa 2022). 107

Figure 7-34: The north-eastern corner of the Reconnaissance Permit Area (purple polygon) in relation to the core usage area (red line) and general distribution (blue shading) of A) breeding and B) pre-moult African penguins from Bird Island and C) St Croix Island (Source: BirdLife South Africa 2022). ..... 108

Figure 7-35: The Reconnaissance Permit area (blue polygon) in relation to the foraging areas of Indian Yellow-Nosed Albatross (top), Northern Giant Petrels (middle) and Wandering Albatross (bottom) (adapted from Harris *et al.* 2022; BirdLife South Africa 2022). ..... 110

Figure 7-36: The Reconnaissance Permit Area (black polygon) in relation to the distribution and movement of cetaceans in the broader project area collated between 2001 and 2020 (SLR MMO database). ..... 115

Figure 7-37: The Reconnaissance Permit area in relation to projections of predicted distributions for nine odontocete species off the coast of South Africa (adapted from Purdon *et al.* 2020a)..... 116

Figure 7-38: The humpback whale (left) and the southern right whale (right) migrate along the Southeast coast during winter (Photos: [www.divephotoguide.com](http://www.divephotoguide.com); [www.aad.gov.au](http://www.aad.gov.au)). ..... 117

Figure 7-39: The project area in relation to the distribution and movement of humpback whales along the southern African coast collated between 2001 and 2020 (SLR MMO database; top) and predicted distributions ( adapted from Harris *et al.* 2022; bottom) ..... 118

Figure 7-40: The Bryde’s whale *Balaenoptera brydei* (left) and Minke whale *Balaenoptera bonaerensis* (right) Photos: [www.dailymail.co.uk](http://www.dailymail.co.uk); [www.marinebio.org](http://www.marinebio.org) ..... 119

Figure 7-41: The project area in relation to projections of predicted distribution of Bryde’s whales (adapted from Harris *et al.* 2022) ..... 120

Figure 7-42: Sperm whales *Physeter macrocephalus* (left) and killer whales *Orcinus orca* (right) are toothed whales likely to be encountered in offshore waters (Photos: [www.onpoint.wbur.org](http://www.onpoint.wbur.org); [www.wikipedia.org](http://www.wikipedia.org)). .... 122

Figure 7-43: The project area in relation to the distribution and movement of sperm whales along the southern African coast collated between 2001 and 2020 (SLR MMO database; top) and projections of predicted winter (bottom left) and summer (bottom right) distributions (adapted from Harris *et al.* 2022). ..... 122

Figure 7-44: Toothed whales that occur on the South Coast include the Indo-Pacific bottlenose dolphin (left) and the Indian Ocean humpback dolphin (right) (Photos: [www.fish-wallpapers.com](http://www.fish-wallpapers.com); [www.shutterstock.com](http://www.shutterstock.com)). 123

Figure 7-45: Colony of Cape fur seals (Photo: Dirk Heinrich)..... 127

Figure 7-46: The Reconnaissance Permit Area (red polygon) in relation to Marine Protected Areas (MPAs) and Ecologically and Biologically Significant Areas (EBSAs) on the Southeast Coast. The location of seabird and seal colonies and seasonal whale populations are also shown. .... 128

Figure 7-47: The Reconnaissance Permit Area (red polygon) in relation to Critical Biodiversity Areas and Ecological Support Area (version 1.2) (adapted from Harris *et al.* 2022)..... 133

Figure 7-48: The Reconnaissance Permit area (red polygon) in relation to fine-scale marine biodiversity priority areas identified for Algoa Bay (adapted from Harris *et al.* 2022). ..... 134

Figure 7-49: The Reconnaissance Permit Area (red polygon) in relation to confirmed and proposed coastal and marine IBAs in the Eastern Cape (<https://maps.birdlife.org/marineIBAs>) ..... 135

Figure 7-50: The Reconnaissance Permit area (red polygon) in relation to coastal and marine IMMAs (Source: [www.marinemammalhabitat.org/imma-eatlas/](http://www.marinemammalhabitat.org/imma-eatlas/))..... 136

Figure 7-51: Provincial and district administrative structures off the South Coast of South Africa ..... 138

Figure 7-52: Trawl gear typically used by demersal trawlers targeting hake ..... 143

Figure 7-53: Distribution of fishing effort of the offshore demersal trawl sector (2017-2021)..... 143

Figure 7-54: Typical configuration of mid-water trawl gear ..... 144

Figure 7-55: Distribution of fishing effort of the mid-water trawl sector (2017-2021) ..... 145

Figure 7-56: Typical configuration of demersal (bottom-set) hake longline gear ..... 146

Figure 7-57: Spatial distribution of fishing effort expended by the demersal longline sector (2000-2019)..... 147

Figure 7-58: Spatial distribution of catch taken by the demersal shark longline sector (2017-2019) ..... 148

Figure 7-59: Typical configuration and deployment of small pelagic purse-seine for targeting anchovy and sardine as used in South African waters ..... 149

Figure 7-60: Distribution of fishing effort of the purse-seine sector in relation to the proposed survey area of interest (2000-2016) ..... 150

Figure 7-61: Monthly variation of catch and effort recorded by the large pelagic longline sector (average figures for the period 2006 – 2016) within the Reconnaissance Permit area..... 151

Figure 7-62: Inter-annual variation of catch landed and effort expended by the large pelagic longline sector in South African waters as reported to the two regional management organisations, ICCAT and IOTC (2000 - 2018)..... 152

Figure 7-63: Distribution of longline fishing effort targeting large pelagic species in relation to the proposed survey area of interest (2017-2019)..... 152

Figure 7-64: Typical pelagic longline gear source ..... 153

Figure 7-65: The spatial distribution of the traditional line fishery sector in relation to the proposed survey area of interest (2017-2019) ..... 154

Figure 7-66: South Coast rock lobster catch and effort by month within the proposed survey area of interest (2006-2016)..... 155

Figure 7-67: An overview of the spatial distribution of South Coast rock lobster fishing effort off the Southeast Coast zones (2006-2020) ..... 156

Figure 7-68: Spatial distribution of catch taken by the squid jig fishery in relation to the proposed survey area of interest (2016-2020) ..... 157

Figure 7-69: Location of small-scale fishing communities along the Southeast Coast and number of participants per community in the vicinity of the proposed survey area of interest ..... 159

Figure 7-70: Spatial distribution of research survey trawling effort by DFFE off the Southeast Coast. .... 160

Figure 7-71: Spatial distribution of sampling stations for acoustic surveys off the Southeast Coast (2020-2021). .... 161

Figure 7-72: The major shipping routes off the Southeast Coast of South Africa in relation to the proposed survey area of interest (yellow polygon)..... 162

Figure 7-73: Petroleum Licence Blocks off the West, South and East Coasts of South Africa (PASA, September 2022) 164

Figure 7-74: Distribution of anthropogenic marine hazards on the seafloor in relation to the proposed survey area of interest (black polygon) ..... 165

Figure 7-75: Map indicating sites of archaeological importance, coastal caves and mega-midden sites of cultural value along the South Coast. The survey area of interest is shown in yellow..... 169

Figure 8-1: Comparison of noise sources in the ocean ..... 186

Figure 8-2: The Reconnaissance Permit Area (red polygon) in relation to the marine ecological condition (top) and cumulative impacts on marine biodiversity (bottom), based on the intensity of all cumulative pressures and the sensitivity of the underlying ecosystem types to each of those pressures (adapted from Sink *et al.* 2019). ..... 258

Figure 8-3: The Reconnaissance Permit area (yellow) in relation to historic 2D (orange lines) and 3D (blue and purple polygons) seismic surveys conducted off the Southeast Coast between 2001 and 2018 (Source: PASA) 259

## APPENDICES

Appendix 1: PASA EA Application Acknowledgement

Appendix 2: EAP Declaration

Appendix 3: Curricula Vitae of Project Team

Appendix 4: Public Participation Process

Appendix 4.1: Text of Advertisements and Site Notices

Appendix 4.2: Notification Letters

Appendix 4.3: Non-Technical Summary

Appendix 5: Sound Transmission Loss Modelling Study

Appendix 6: Biodiversity and Ecosystem Services Impact Assessment (Marine Fauna)

Appendix 7: Commercial Fisheries Impact Assessment

Appendix 8: Cultural Heritage Impact Assessment

Appendix 9: Method of Assessing Impact Significance



## ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
3D	Three-dimensional
ACAP	Agreement on the Conservation of Albatrosses and Petrels, 2004
ACE	African Coast to Europe
AEL	Atmospheric Emissions Licence
ALARP	As Low as Reasonably Practicable
BAT	Best Available Technology
BCC	Benguela Current Commission
BOD	Biological Oxygen Demand
BWM	International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (in force from 2017)
CBA	Critical Biodiversity Area
CBA 1	Critical Biodiversity Area 1
CBA 2	Critical Biodiversity Area 2
CGG	CGG Services (UK) Ltd
CITES	Convention on International Trade in Endangered Species
CLC	International Convention on Civil Liability for Oil Pollution Damage, 1969
CMS	Convention on Migratory Species
COGSA	Carriage of Goods by Sea Act, 1986 (No. 1 of 1986)
COLREGS	Convention on the International Regulations for Preventing Collisions at Sea, 1972
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
EBSA	Ecologically or Biologically Significant Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ERP	Emergency Response Plan
ESA	Ecological Support Area
EMP	Environmental Management Plan
ESMP	Environmental and Social Management Plan
FLO	Fisheries Liaison Officer
FRAP	Fishery Rights Allocation Process
GDP	Gross Domestic Product
GHG	Greenhouse gas
GIIP	Good International Industry Practice
GIS	Geographical Information System
GN	Government Notice
HABs	Harmful Algal Blooms

Acronym / Abbreviation	Definition
HFO	Heavy Fuel Oil
HSE	Health, Safety and Environment
I&APs	Interested and Affected Parties
IBA	Important Bird Area
ICCAT	International Commission for the Conservation of Atlantic Tunas
IEP	Integrated Energy Plan
IFC	International Finance Corporation
ILO	International Labour Organisation
IMO	International Maritime Organisation
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MGO	Marine Gas Oil
MMO	Marine Mammal Observer
MPA	Marine Protected Area
MPRDA	Mineral and Petroleum Resources Development Act (No. 28 of 2002)
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998), as amended
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004), as amended
NEM: PAA	National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003), as amended
NEM: WA	National Environmental Management: Waste Act, 2008 (No. 59 of 2008), as amended,
NGO	Non-Government Organisation
NGP	New Growth Path
OECMs	Other Effective Area-Based Conservation Measures
OMZ	Oxygen Minimum Zone
OPRC Convention	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
PAM	Passive Acoustic Monitoring
PASA	Petroleum Agency SA
PIM	Particulate Inorganic Matter
POM	Particulate Organic Matter
PTS	Permanent hearing Threshold Shift
QMAs	Quota Management Areas
ROV	Remotely Operated Vehicle
SACNASP	South African Council for Natural Scientific Professions
SACW	South Atlantic Central Water

Acronym / Abbreviation	Definition
SAFE	South Africa Far East
SAHRA	South African Heritage Resources Agency
SAMSA	South African Maritime Safety Authority
SAT3	South Atlantic Telecommunications cable No.3
SLR	SLR Consulting (South Africa) (Pty) Ltd
SME	Small and Medium Enterprise
SMS	Short Messaging System
SOPEP	Shipboard Oil Pollution Emergency Plan
SPL	Sound Pressure Level
SSA	Statistics South Africa
TAC	Total Allowable Catch
TOPS	Threatened or Protected Species
TNPA	Transnet National Ports Authority
TSPM	Total Suspended Particulate Matter
TTS	Temporary hearing Threshold Shift
UN	United Nations
UNCLOS	United Nations Law of the Sea Convention, 1982
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC CoP21	United Nations Framework Convention on Climate Change
VMEs	Vulnerable Marine Ecosystems
VOCs	Volatile Organic Compounds
WACS	West Africa Cable System