MOBILE TELEPHONE NETWORK (PTY) LTD

PROPOSED 2AFRICA/GERA (EAST) SUBMARINE FIBRE OPTIC CABLE SYSTEM TO BE LANDED AT DUYNEFONTEIN, CITY OF CAPE TOWN, WESTERN CAPE, SOUTH AFRICA

MOBILE TELEPHONE NETWORK (PTY) LTD (LANDING PARTNER)

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

EIA REFERENCE: 14/12/16/3/3/2/2046

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DOCUMENT CONTROL

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Date: 5 July 2021	Date: 9 July 2021	Date: 9 July 2021

ENVIRONMENTAL IMAPCT ASSESSMENT REPORT DISTRIBUTION

Please note that due to the Covid-19 National State of Disaster and Lockdown in the country, the Department of Environment, Forestry and Fisheries requires Environmental Assessment Practitioners to undertake public participation in innovative ways that respect social distancing and other measures to contain the spread of the Corona virus.

ACER has created a project domain on the company website (https://acerafrica.co.za/) where all documents (including this Final Environmental Impact Assessment Report (FEIAR)) pertaining to this environmental authorisation process have been uploaded for public review. In addition, ACER has or will undertake the following:

- ❑ Notification letters about the submission of the FEIAR to DFFE for decision making have been sent to all registered Interested & Affected Parties (I&APs) and community forums.
- ❑ All comments received on the Draft EIAR were incorporated into the FEIAR and were captured in a Comments and Response Report that will accompany the submission of the FEIAR to DFFE for decision-making.

In addition to public review, the following authorities have been sent electronic copies of the FEIAR:

1. Department of Environment, Forestry and Fisheries
   Ms Sindiswa Dlomo
   Email: Sdlomo@environment.gov.za

2. Department of Environment, Forestry and Fisheries – Biodiversity Oceans and Coast Division
   Mr. Xolani Myanga, Ms Nontsasa Tonjeni and Ms Funanani Ditinti
   Email: XMyanga@environment.gov.za; ntonjeni@environment.gov.za; fditinti@environment.gov.za

3. Department of Environmental Affairs and Development Planning, Western Cape Government
   Mrs Adri La Meyer
   Email: Adri.LaMeyer@westerncape.gov.za

4. City of Cape Town (Energy, Environment and Spatial Planning Division)
   Ms Pat Titmuss
   Email:pat.titmuss@capetown.gov.za

5. West Coast District Municipality
   Ms. Doretha Kotze – Town & Regional Planner
   Email: dkotze@wcdm.co.za

6. CapeNature (Theewaterskloof, Overstrand & Stellenbosch)
   Mr Rhett Smart
   Email:rsmart@capenature.co.za

7. Department of Human Settlements, Water & Sanitation
   Mr Warren Dreyer
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8. Department of Human Settlements, Water & Sanitation
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9. Department of Public Works
   Mr Basson Geldenhuys
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10. Dr Ane Oosthuizen
    National Marine Co-ordinator; SANParks
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11. Mr Frans Van Rooyen
    Park Manager, SANParks, Table Mountain National Park
    table.mountain@sanparks.org

EXECUTIVE SUMMARY

Introduction

Submarine telecommunication cables are important for international telecommunication networks as they transport almost 100% of the trans-oceanic Internet traffic throughout the world. It is widely recognised that access to affordable international bandwidth is key to economic development in every country. As such, the improvement in Africa's information technology infrastructure via telecommunication cables will remove one of the current key inhibitors to development in Africa and support economic growth and opportunities on the continent.

Alcatel Submarine Networks (ASN) has been contracted to supply and install the proposed 2AFRICA/GERA (East) Marine Fibre-Optic Cable System with the end point landing on Van Riebeeckstrand at Duynefontein, located approximately 30 km north of Cape Town on the West Coast of South Africa. This is to be operated by Mobile Telephone Network (Pty) Ltd (MTN) as the South African landing partner.

The project requires environmental authorisation from the Department of Forestry, Fisheries and Environment (DFFE[1]) in terms of the 2014 Environmental Impact Assessment (EIA) Regulations (as amended), published under the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended). ACER (Africa) Environmental Consultants (ACER) has been appointed as the independent Environmental Assessment Practitioner (EAP) to assist with the application for environmental authorisation as well as other environmental permitting/licensing requirements (including a Sea Shore Lease from Cape Nature).

This Final EIA Report (FEIAR) and accompanying Environmental Management Programme (EMPr) have been prepared in accordance with the 2014 EIA Regulations.

Project Location and Scope

The project involves the installation and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing), which comprises marine and terrestrial components. The section of the Cable System which forms part of this environmental assessment includes the main trunk line which enters South Africa's EEZ from Mozambique's EEZ in the north, runs southward along the East Coast of South Africa and lands on Van Riebeeckstrand at Duynefontein on the West Coast of South Africa.

Once landing on Van Riebeeckstrand, the proposed cable will traverse the beach and link into the existing ACE Cable System beach anchor block, thereafter, being accommodated within existing underground ducts which run inland to the existing ACE Cable Landing Station (CLS) owned by MTN. Two alternative landing points have been considered. Alternative 1 uses the existing ACE beach anchor block and BMH and Alternative 2 requires construction of a new BMH and short section of new underground trenching, before linking into the existing ACE infrasructure.

Relevant GPS co-ordinates (approximate) are provided below. Project activities are described further under the technical description.

[1] Previously named Department of Environment, Forestry and Fisheries (DEFF).

GPS Co-ordinates of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) infrastructure (approximate)		
Location	**Latitude (S)**	**Longitude (E)**
Start of trunk cable at Mozambique/SA EEZ boundary	27°14'43.97"S	34°56'15.53''E
Mid-point of marine cable	35°55'26.82''S	25°05'54.54"E
ACE Cable System BMH at Van Riebeeckstrand, Duynefontein (Alternative 1)	33°41'39.96"S	18°26'23.22"E
ACE Cable system beach anchor block	33°41'39.97"S	18°26'20.75"E
Sea Earth Plate at Van Riebeeckstrand, Duynefontein	33°41'42.96"S	18°26'16.44"E
ACE Cable Landing Station	33°41'35.81"S	18°26'58.57"E
Approximate length of marine cable	2800 km	

Legal Requirements

There are many legal requirements (International, National, Provincial and Local Government spheres) to which the project proponent must adhere for the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). These were detailed in the Final Scoping Report (ACER, 2021) and a summary of applicable legislation and guidelines is provided in Chapter 2 of this report.

In terms of the 2014 EIA Regulations (as amended 2017) the project potentially triggers activities in Listing Notices 1, 2 and 3, as shown in Table 2 of this report. The application for environmental authorisation therefore requires a full Scoping and Environmental Impact Assessment (EIA) process.

Technical Description

The main trunk of the 2AFRICA/GERA (East) Cable System will enter South Africa's EEZ from Mozambique on Africa's east coast. Thereafter, the cable system follows a course south and west around the South African coast, before tracking north-east from a point approximately 100 km west of Cape Point to re-enter the EEZ and territorial waters before making landfall at Duynefontein.

Marine fibre-optic cables range in diameter from 17mm to 50 mm. They are essentially inert, as any heat emissions, electric or electro-magnetic associated with the cable are of negligible magnitude. Cables are laid on the seabed surface in deep water and buried under the seabed where possible in shallower waters (approximately < 1,500 m depths).

The proposed project will include the installation and operation of the following project components:

- Pre-installation activities including route engineering, route clearance and Pre-Lay Grapnel Run (PLGR).
- Laying and burial of the cable in the offshore environment within South Africa's EEZ from the border with Mozambique until it reaches the shore.
- Laying of the cable across the beach up to the position of the existing ACE Cable System BMH[2] (requiring excavations within the intertidal zone to bury the cable before it will be anchored into the existing ACE Cable System beach anchor block) and installation of a sea earth system (System Earth).
- Laying and of the cable in the offshore environment, including cable burial where possible at water depths less than 1,500 m.
- The laying of the cable within the shallow water environment is likely to involve a direct shore end operation where the shore end of the subsea cable is installed directly from the main subsea cable installation vessel and floated to the beach landing point using buoys and

[2] MTN operates the ACE Cable System and associated infrastructure.

assisted by small boats and divers. It will then be buried in the seabed using the diver jet burial technique. The cable will be buried in sediment wherever possible, and the route will be adjusted to avoid obvious visible rock. The aim is to bury the cable to a target depth of up to 2 m where possible.

- Excavations within the intertidal zone are to bury the cable before it is anchored into a BMH, which is a concrete utility vault where the marine portion of the subsea cable is connected to the terrestrial portion. (Note the preferred Alternative will make use of use the existing ACE Cable System anchor block and ACE BMH).
- On the beach, the cable will be buried to a depth of 2 meters, substrate permitting.

A detailed description of the various project components and the proposed construction methods are provided in Chapter 4 of this report.

Project Alternatives

Various project alternatives were considered during Scoping. Two landing sites and one marine cable route were taken forward for assessment in this Final EIA Report (FEIAR), as described in the project scope and technical description.

Need and Desirability

The need and desirability of a proposed development is a key consideration of an application for environmental authorisation and differs from the developer's aims and purpose of the development. The Guideline on Need and Desirability in terms of the EIA Regulations (DEA, 2017) states that *"consistent with national priorities, environmental authorities must support "increased economic growth and promote social inclusion" while ensuring that such growth is "ecologically sustainable"*. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable. Chapter 3 of this report deals with aspects of Need and Desirability, in terms of the Guideline.

Description of the Environment

The proposed construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) takes place within the marine and terrestrial environments, and, as such, a description of both environments is provided in Chapter 6 of this report.

Natural environment (terrestrial and marine)

Ecological drivers of relevance to the project include ocean currents, the natural oceanic wave climate, wind, mobility of sand, nearshore sand circulation, and offshore sediment transport, the deposition and decomposition of organic material and colonisation of dunes by vegetation.

On land, the study area falls within the strictly coastal West Strandveld Bioregion. The project intersects with two Threatened Terrestrial Ecosystems, viz. Cape Seashore Vegetation with a conservation status of Least Concern and Cape Flats Dune Strandveld (Endangered). The project will impact on a limited area of vegetation associated with the coastal dunes and a dune slack wetland. The preferred Alternative for this project will not directly impact on the dune slack wetland.

In the marine environment, the majority of the approximately 2,800 km long cable route traverses offshore habitats with a conservation status of Least Concern. However, very short sections do pass through various ecologically sensitive areas. These include Offshore Controlled Zones of the Robben Island Marine Protected Area (MPA) (also traversed by other cables landing at Duynefontein), Restricted Zone of the South Atlantic Seamount MPA, and Critical Biodiversity Areas (CBAs) as defined in the recent National Coastal & Marine Spatial Biodiversity Plan (Version 1). The alignment as far as possible avoids rocky substrates.

Due to cable burial, it is primarily sandy substrates and the benthic organisms that live in it, that will be disturbed. Larger and more mobile marine organisms in the water body, including fish, whales, dolphins, as well as seabirds and shorebirds, will be able to move out of the direct area of disturbance.

Due to the nature of the project and the dynamic nature of the environment (allowing for rapid recovery), impacts on the biophysical environment are mostly minor and temporary, occurring during the installation phase.

Social/socio-economic environment
From a development planning perspective, this project aligns with the objectives of the New Partnership for Africa's Development (NEPAD) and the South African government's Strategic Infrastructure Project 15 (SIP 15: Expanding Access to Communication Technology), which is also compatible with district and local development plans.

The cable landing will take place at Duynefontein, an upmarket residential area under the Cape Town Metropolitan Municipality. The cable landing passes through admiralty reserve administered by the Department of Public Works. It also lies within the formal emergency planning zone (EPZ) of the Koeberg Nuclear Power Station owned by Eskom.

With respect to marine areas, SAN Parks is the management authority of the Robben Island and South Atlantic Seamount MPA's and as such, approval from SAN Parks will be required to lay the cable through these areas.

Offshore in the study area along the East and West Coasts, there are a number of economic interests and activities to be considered, including pelagic and demersal fishing/trawling, the presence of other subsea cables and Oil and Gas exploration blocks on the seabed.

Cultural heritage
There are no land-based cultural heritage resources to be considered. Although potentially present, submerged prehistoric archaeological resources, palaeontological features and fossil material are very unlikely to be affected by the marine cable and shore landing. There are no recorded shipwrecks within 1 km of the cable alignment, although many occur in the general study area.

The Environmental Assessment Process and Methodology
The assessment process began with Scoping, which is a process designed to define the limits of the assessment, to elicit inputs from Interested and Affected Parties (I&APs), and to focus the scope of the assessment. The Impact Assessment process has followed Scoping, in accordance with the approved Plan of Study for Impact Assessment, with the main activities being:

- Focused scientific studies with contributions from specialists, engineers and the EAP team.
- Ongoing communication and participation with stakeholders.
- Integration of the findings into an EIAR, inclusive of mitigation measures. The final assessment of the significance of impacts was undertaken by the EAP, in accordance with assessment conventions stipulated in GNR 326.
- Preparation of an Environmental Management Programme (EMPr).

Public Participation Process

The public participation process was designed to comply with the 2014 EIA Regulations (as amended) and NEMA. The project team has been available for communication with I&APs throughout Scoping and the Impact Assessment. However, formal stages at which the public were notified, provided with information and given an opportunity to raise concerns and provide input were:

- Project Announcement, which included media adverts, Background Information Document, on site notices and written correspondence (02 September 2020).
- Notifications by telephone and one on one meetings.
- Posting of all relevant documents on ACER's website www.acerafrica.co.za.
- Circulation of the Draft Scoping Report for comment (15 January to 15 February 2021).
- Notification of submission of the Final Scoping Report (25 February 2021).
- Circulation of DEIAR for comment (28 May – 29 June 2021).

Issues raised by I&APs and responses thereto, have been captured in Comments and Responses Reports (CRR) appended to this FEIAR. Where relevant, they have been addressed in this FEIAR. To date, the comments received from I&APs and relevant authorities relate to the following topics:

- Stakeholder registration.
- Requests for mapping.
- Applicable legislation, permit and lease requirements.
- Water use, heritage and environmental authorisation application requirements and procedures.
- The landing site and cable position.
- Public access, health and safety.
- Effect on Critical Biodiversity Areas, use of directional drilling and rehabilitation requirements.
- Koeberg Nuclear Power Station Disaster Risk Management.
- Municipal water and sewage infrastructure.
- Coastal Navigation Safety.
- Location of trawling activities relative to the cable route.
- Requirements of the heritage authorities (HWC and SAHRA).
- Effects on Oil and Gas Rights Holders.
- Specialist assessment requirements.
- Public participation aspects.
- Protection of the coastal environment in line with the ICMA.
- Abalone ranching areas.

All relevant public participation documentation is appended to this report.

Summary of Specialist Findings

Seven specialist studies were undertaken. The table below summarises the main conclusions of these specialist reports.

	Specialist Study	Organisation	Main conclusions
1	Compliance Statement for Terrestrial and Freshwater Ecosystems (Appendix B1)	Inland Waters Consultancy in association with Capensis	Alternative 1 (the preferred alternative) will result in very few to no impacts on terrestrial ecosystems, freshwater ecosystems or non-marine fauna. Alternative 2 will potentially affect the foredune area and dune slack wetland, as well as fauna associated with these habitats. However, after mitigation, these impacts will be of low significance.
2	Commercial Fisheries Specialist Study (Appendix B2)	Capricorn Marine Environmental (Pty) Ltd (CapMarine)	The causes of potential impacts of the project on the fishing industry were identified as noise emissions; temporary exclusion from fishing grounds from vessels during cable laying (up to 1.5 km) and long-term exclusion of anchoring and trawling 500 m either side of the cable. Various fishing sectors will be affected, but those most affected are the demersal trawl and demersal longline. After mitigation (where applicable) the significance of all related impacts on fishing sectors is assessed as very low or low.
3	Beach and Coastal Dune Dynamics Impact Assessment (Appendix B3)	SDP Ecological & Environmental Services	The coastal inshore and supra tidal environment at Duynefontein is presently a mobilising system where engulfment and landward transport of sediments of the formerly vegetated dunes is seeing a leeward migration of dunes and engulfment of vegetation. Alternative 1 is recommended as it confines disturbance to the corridor used by the existing ACE infrastructure. Burial of the cable to 2m is recommended, with dune stabilisation using geofabric and limited planting of vegetation following installation.
4	Marine Ecology Assessment (Appendix B4)	Pisces Environmental Services (Pty) Ltd	The report identifies various impacts resulting from vessels and other activities which could take place during geophysical surveys, installation, and operation of the cable. There will be impacts on marine biota due to disturbance of the upper beach and intertidal and shallow subtidal sandy habitats, as well as the unconsolidated seabed beyond the surf-zone and across the shelf. There will also be impacts on marine biota including fish, marine mammals, seabirds and shorebirds. However, the significance of all these impacts is assessed as very low or low.
5	Maritime Archaeological Impact Assessment (Appendix B5)	ACO Associates cc	The report indicates no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources.
6	A review of the potential effects of submarine telecommunications cables on marine mammals in Southern Africa (Appendix B6)	Sea Search Research and Conservation	The main impacts of submarine cable projects which might affect marine mammals are: 1) avoidance of noise and masking of vocalisations by general ship noises and depth sounders and 2) potential startle responses of marine mammals to multi-beam echosounders, which could lead to mass stranding events. Mitigation options for these activities are limited. Entanglement of cetaceans in the cable is not regarded as a threat. There are concerns for the general impact of cable deployment operations on coastal species such as Heaviside's and humpback dolphins and southern right whales during work in the nearshore environment. The use of a suitably trained crew member as a Marine Mammal / Protected Species Observer (MMO/PSO) is recommended, and cable laying should take place outside of the main migration seasons for whales where possible.

	Specialist Study	Organisation	Main conclusions
7	Submarine Telecommunications Cables EIA: Generic Avifaunal Impact Assessment (Appendix B7)	WildSkies Ecological Services (Pty) Ltd	In general, the significance of anticipated impacts of submarine telecommunications cables projects on seabirds and shorebirds is low, provided the cable avoids particularly sensitive bird areas such as MPAs, IBAs, sensitive onshore areas and any islands.

Environmental Issues and Potential Impacts

The key issues identified during Scoping and carried through to the Impact Assessment were formulated as seven key questions:

- What are the potential social and socio-economic impacts associated with the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the marine environment including MPAs?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the fishing industry?
- What impact will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the beach and dune cordon at Van Riebeeckstrand?
- What impact will the construction of 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on cultural and heritage resources, including any paleontological resources?
- What cumulative impacts will result from the construction of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?

Potentially significant impacts associated with each of the above issues were discussed and assessed. Where relevant, significance ratings were assigned to impacts, both before mitigation, as well as after application of recommended mitigation measures.

Environmental Impact Statement

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity, and their significance (after mitigation, where applicable) is provided below.

Social and socio-economic impacts

Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the education and economic opportunities opened up as a result of access to improved telecommunications networks. While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA/GERA (East) Cable System supports SIP 15 via is international connectivity, capacity and speed. The significance of this positive impact is assessed as medium.

The 2AFRICA/GERA (East) Cable System (Duynefontein landing) (noting this includes the main trunkline from the Mozambique/SA EEZ boundary) will, however, render areas of the seabed unavailable to the Oil and Gas industry. Letters of No Objection and/or Co-operation Agreements between the cable developer/operator and affected O&G Rights Holders are required[3] and this is being dealt with directly by MTN outside of this EIA process. During installation, there is potential to negatively impact other existing subsea telecommunications cables. However, this can be managed by adherence to international guidelines and standards.

The project may cause minor nuisance impacts to the local community near Van Riebeeckstrand during the installation phase. In general, for both Alternative 1 and Alternative 2, the negative social and socio-economic impacts are of low significance, after mitigation.

Impacts on terrestrial ecosystems (vegetation, wetlands and fauna)
The installation of the cable across Van Riebeeckstrand beach to the proposed BMH sites (both Alternative 1 and Alternative 2) affects an area under the conservation category of "Other Natural Area" in terms of the WCBSP. Once the cable is installed, the beach is expected to quicky recover to its natural state. Alternative 1, because it makes use of existing infrastructure inland of the beach, will have no impact on terrestrial vegetation, wetland or other freshwater ecosystems and, therefore, will not impact negatively on any threatened terrestrial ecosystems or ecological support areas. Alternative 2 will affect a limited extent of dune vegetation and a dune slack wetland area associated with Cape Seashore Vegetation (Least Concern) and occurring near the transition to Cape Flats Dune Strandveld (Endangered). The present ecological state of the dune slack wetland is, however, rated as "Seriously Modified". Due to the very limited impact that both Alternatives will have on dune vegetation and dune slack wetland in this area, after mitigation, the negative impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on terrestrial areas of conservation value is assessed to be of low significance.

Impacts on marine ecosystems, vegetation, fauna and avifauna
The proposed marine cable traverses the Robben Island MPA, the South Atlantic Seamount MPA and some CBAs. However, the residual impacts of the cable on the benthic environment will be of low significance. The potential negative impacts of the project on marine flora and fauna (small and large) on shore, nearshore and offshore, are all of low significance (after applying mitigation where feasible). Similarly, the impacts on seabirds and shorebirds will be of low significance.

The cable, once in place, will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 500 m either side of the cable, which is considered a positive impact of low to medium significance.

Impacts on fisheries
Several fisheries operating in the area will potentially be negatively affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). A potential decline in catch rates due to temporary noise disturbance is assessed as being of low significance. The potential effect on operational activities and decline in catch rates due to the temporary (up to 1.5 km) safety exclusion zones around survey and cable laying vessels is assessed as being of low significance. The long-term effect on operational activities due to the 500 m exclusion zone either side of the cable will negatively impact fishing sectors, most particularly the demersal trawl and demersal longline as it traverses a heavily trawled area. However, the cable will not prevent trawling from continuing in the area, as trawlers will lift gear as they pass over the cable. The loss of fishing

[3] In terms of Section 53 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA), any person who intends to use the surface of any land in a manner which may be contrary to the objectives of the MPRDA or is likely to impede such objectives, must obtain consent from the rights holder and apply to the Minister for approval in the prescribed manner. Proof is required that no prospecting or mining right holders have objected to the proposed development based on its incompatibility with their interests.

ground is estimated to be 45 km^2 of the total trawl grounds available in that area and overall, the significance of this impact is assessed as low. The potential for mitigation of identified impacts of the project on fisheries is very low.

Impacts on the beach and coastal dunes
The proposed alignment of the cable across the beach to link with existing ACE infrastructure on land (Alternative 1) is proposed as the best practical option and Alternative 2 is not supported. The significance of potential negative impacts of the proposed Alternative 1 on drivers of coastal processes, sediment transport and habitat/ecomorphology of the beach and dunes will be low, both before and after mitigation. It is noted that burial of the cable to 2 m is advised, as well as dune stabilisation post installation, due to the sediment mobilisation prevailing at this site.

Impacts on cultural heritage
While there is evidence of submerged pre-historic archaeological resources, palaeontological resources and maritime archaeological resources in the broader study area, the likelihood of the project negatively impacting these resources is very low. Only seven named wrecks are located in the vicinity of the cable route as it crosses the contiguous zone, territorial waters and inland waters to the landfall at Duynefontein. However, none of these wrecks appear to be within 1 km of the cable alignment. As the impacts would be non-reversable if they should occur, the significance of impacts on these cultural heritage resources is assessed as medium, (after applying mitigation, where possible).

Cumulative impacts
The impacts resulting from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) are both positive and negative and along with other existing or future cables along the East and West Coasts of South Africa, will have cumulative effects on the social and biophysical environment. Conflicts of interest may increase over time between the subsea fibre optic cable developers and the trawling industry in the West Coast area, as increasing areas become excluded due to cables crossing trawling grounds. Similarly, conflicts of interest may increasingly arise between the subsea fibre optic cable developers and the O&G industry, particularly as offshore exploration activities ramp up and drilling plans materialise. Direct and early engagement between role-players will be required to ameliorate cumulative impacts.

The No Development Alternative
The No-Development Alternative would avoid potential negative impacts on the natural environment and competing seabed users. However, it would preclude the positive impacts which improved telecommunications would have on the country's socio-economic environment and would fail to support the country's SIP 15 goals. It is anticipated that, with required mitigation of negative impacts, the advantages of the project will outweigh the disadvantages. For this reason, the No-Development Alternative is not preferred.

Concluding Remarks
Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are no fatal flaws associated with the proposed project and that the negative impacts resulting from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE, conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr.

The project components to be authorised are the installation and operation of the marine cable, along the alignment as proposed, with the Alternative 1 shore end landing at Van Riebeeckstrand which links up to the existing ACE infrastructure (beach anchor block to CLS).

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DEFINITIONS

Alternatives - In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –
i. The property on which or location where it is proposed to undertake the activity.
ii. The type of activity to be undertaken.
iii. The design or layout of the activity.
iv. The technology to be used in the activity, and.
v. The operational aspects of the activity.

Baseline - Information gathered at the beginning of a study which describes the environment prior to development of a project, and against which predicted changes (impacts) are measured.

Benthic - Referring to organisms living in, or on, the sediments of aquatic habitats (lakes, rivers, ponds, etc.).

Biodiversity - The diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity.

Community - Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.

Construction Phase - The stage of project development comprising site preparation as well as all construction activities associated with the development.

Consultation - A process for the exchange of views, concerns and proposals about a project through meaningful discussions and the open sharing of information.

Critical Biodiversity Area - Areas of the landscape that must be conserved in a natural or near-natural state in order for the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.

Cumulative Impacts - Direct and indirect impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region that affect the same resources and/or receptors.

Ecosystem - A community of plants, animals and organisms interacting with each other and with the non-living (physical and chemical) components of their environment.

Environment - The surroundings within which humans exist and that are made up of
i. The land, water and atmosphere of the earth.
ii. Micro-organisms, plant and animal life.
iii. Any Part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Authorisation (EA) – The authorisation by a competent authority of a listed activity.

Environmental Assessment Practitioner (EAP) – The person responsible for planning, management and co-ordination of environmental impact assessment, strategic environmental assessments, environmental management plans or any other appropriate environmental instrument introduced through regulations.

Environmental Impact Assessment (EIA) – In relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application. This process necessitates the compilation of an Environmental Impact Report, which describes the process of examining the environmental effects of a proposed development, the anticipated impacts and proposed mitigatory measures.

Environmental Impact Report (EIR) - A report assessing the potential significant impacts as identified during the Scoping phase.

Environmental Management Programme (EMPr) - A management programme designed specifically to introduce the mitigation measures proposed in the Reports and contained in the Conditions of Approval in the Environmental Authorisation.

Epifauna[4] - Organisms, which live at or on the sediment surface being either attached (sessile) or capable of movement.

Gross Domestic Product (GDP) by region - represents the value of all goods and services produced within a region, over a period of one year, plus taxes minus subsidies.

Habitat - The place where a population (*.e.g.,* animal, plant, micro-organism) lives and its surroundings, both living and non-living.

Hazardous waste – means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical, or toxicological characteristics of the waste, have a detrimental impact on health and the environment.

Hydrocarbons – Oils used in machinery as lubricants, including diesel and petrol used as fuel.

Impact - A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.

Infauna - Animals of any size living within the marine sediment. They move freely through interstitial spaces between sedimentary particles, or they build burrows or tubes.

Interested and Affected Party (I&AP) – Any individual, group, organisation or association which is interested in or affected by an activity as well as any organ of state that may have jurisdiction over any aspect of the activity.

Marine environment - Marine environment includes estuaries, coastal marine and nearshore zones, and open-ocean-deep-sea regions.

Marine Protected Area (MPA) is an area of coastline or ocean that is specially protected for the benefit of people and nature.

[4] Marine Ecology Report (Appendix 5.4).

Memorandum of Understanding (MOU or MoU) is an agreement between two or more parties outlined in a formal document. It is not legally binding but signals the willingness of the parties to come to an agreement. This is also referred to as a Co-operation Agreement.

Municipality –
(a) Means a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998); or
(b) In relation to the implementation of a provision of this Act in an area which falls within both a local municipality and a district municipality, means
    (i) The district municipality, or
    (ii) The local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.

NEMA EIA Regulations - The EIA Regulations means the regulations made under section 24(5) of the National Environmental Management Act (Act 107 of 1998) (Government Notice No. R 982, R 983, R984 and R 985 in the Government Gazette of 4 December 2014 refer as amended by GNR 324, 325, 326 and 327 of 7 April 2017).

No-Go Alternative – The option of not proceeding with the activity, implying a continuation of the current situation / status quo.

Public Participation Process (PPP) - A process in which potential Interested and Affected Parties are given an opportunity to comment on, or raise issues relevant to, specific matters.

Recruitment - The replenishment or addition of individuals of an animal or plant population through reproduction, dispersion and migration.

Registered Interested and Affected Party (I&AP) – All persons who, as a consequence of the Public Participation Process conducted in respect of an application, have submitted written comments or attended a meeting with the applicant or environmental assessment practitioner (EAP); all persons who have requested the applicant or the EAP in writing, for their names to be placed on the register and all organs of state which have jurisdiction in respect of the activity to which the application relates.

Scoping process - A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail.

Scoping Report - The report describing the issues identified during the scoping process.

Sediment - Unconsolidated mineral and organic particulate material that settles to the bottom of aquatic environment.

Significant impact - Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Spatial Development Framework (SDF) - A document required by legislation and essential in providing conservation and development guidelines for an urban area, which is situated in an environmentally sensitive area and for which major expansion is expected in the foreseeable future.

Specialist study - A study into a particular aspect of the environment, undertaken by an expert in that discipline.

Species - A group of organisms that resemble each other to a greater degree than members of other groups and that form a reproductively isolated group that will not produce viable offspring if bred with members of another group.

Stakeholders - All parties affected by and/or able to influence a project, often those in a position of authority and/or representing others.

Subtidal - The zone below the low-tide level, *i.e.,* it is never exposed at low tide.

Sustainable development - Sustainable development is generally defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. NEMA defines sustainable development as the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

Surf-zone - Also referred to as the 'breaker zone' where water depths are less than half the wavelength of the incoming waves with the result that the orbital pattern of the waves collapses and breakers are formed.

Turbidity - Measure of the light-scattering properties of a volume of water, usually measured in nephelometric turbidity units.

Visibility - The area from which the project components would actually be visible and depends upon topography, vegetation cover, built structures and distance.

Visual Character - The elements that make up the landscape including geology, vegetation and land-use of the area.

ABBREVIATIONS AND ACRONYMS

ACER	ACER (Africa) Environmental Consultants
ASN	Alcatel Submarine Networks
BID	Background Information Document
BMH	Beach Manhole
CA	Competent Authority
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
CLS	Cable Landing Station
CMS	Convention on Migratory Species
CPTs	Cone Penetrometer Tests
CRR	Comments and Responses Report
DEADP	Western Cape Department of Environmental Affairs and Development Planning
DEFF	Department of Environment, Forestry and Fisheries (now DFFE, as below)
DEIAR	Draft Environmental Impact Assessment Report
DFFE	Department of Forestry, Fisheries and Environment (previously DEFF, as above)
DGPS	Differential Global Positioning System
DHSWS	Department of Human Settlements, Water and Sanitation
DSR	Draft Scoping Report
EAP	Environmental Assessment Practitioner
EBSA	Ecologically or Biologically Significant Area
EEZ	Exclusive Economic Zone
EIAR	Environmental Impact Assessment Report
EMF	Environmental Management Frameworks
EMPr	Environmental Management Programme
FSR	Final Scoping Report
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IBA	Important Bird Area
IDP	Integrated Development Plan
IFC	International Finance Corporation
LWM	Low Water Mark
MBES	Multi-beam echo sounder
MMO	Marine Mammal Observer
MoU	Memorandum of Understanding
MPAs	Marine Protected Areas
MTN	MTN (Pty) Ltd
NAVTEX	Navigational Telex
NCAS	National Climate Change Adaptation Strategy
NDP	National Development Plan
NEMA	National Environmental Management Act
NEPAD	New Partnership for Africa's Development
NHRA	National Heritage Resources Act
Nm	Nautical Mile
NWA	National Water Act, 1998 (Act 36 of 1998)
OC	Department of Forestry, Fisheries and the Environmental – Oceans and Coasts
ONA	Other Natural Areas
PAM	Passive acoustic monitoring
PAZ	Precautionary Action Zone
PEB	Public Exclusion Boundary
PES	Present Ecological State
PICC	Presidential Infrastructure Coordinating Commission
PLGR	Pre-Lay Grapnel Run
PSDF	Provincial Spatial Development Framework
PSO	Protected Species Observer

ROV	Remote Operated Vehicle
SADSTIA	South African Deep Sea Trawling Industry Association
SAHRA	South African Heritage Resources Agency
SAN	South African Navy
SARCA	Southern African Reptile Conservation Assessment
SAT-3/WASC	South Atlantic 3/West Africa Submarine Cable
SDF	Spatial Development Framework
TAC	Total Allowable Catch (TAC).
Telkom	Telkom SA SOC Limited
TW	Territorial Waters
UNCLOS	United Nations Convention on the Law of the Sea
USBL	Ultra-short base line
WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
WCBSP	Western Cape Biodiversity Spatial Plan
WD	Water Depth

AUTHORS

The co-authors of this Final EIA Report are Ms A McKenzie and Mr. G Churchill of ACER (Africa) Environmental Consultants.

AFFIRMATION BY THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

2AFRICA/GERA (EAST) SUBMARINE FIBRE OPTIC CABLE SYSTEM TO BE LANDED AT DUYNEFONTEIN, CITY OF CAPE TOWN, WESTERN CAPE, SOUTH AFRICA

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	ACER (Africa) Environmental Consultants			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	
EAP name:	Giles John Churchill			
EAP Qualifications:	MSc			
Professional affiliation/registration:	EAPASA registration no. (2019/1687) SACNASP registration no. (116348)			
Physical address:	26 Hely Hutchinson Rd, Suites 5/6 Golden Penny Centre, Mtunzini			
Postal address:	PO Box 503, Mtunzini, 3867, South Africa			
Postal code:	3867	Cell:	082 907 9738	
Telephone:	035 340 2715	Fax:	035 340 2235	
E-mail:	giles.churchill@acerafrica.co.za			

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended.

2. DECLARATION BY THE EAP

I, Giles John Churchill, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

Signature of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants

Name of Company:

02/07/2021

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Giles John Churchill, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants

Name of Company

02/07/2021

Date

Signature of the Commissioner of Oaths

2/07/2021.

Date

JACOBUS FREDERICK DU TOIT
EX OFFICIO COMMISSIONER OF OATHS
PRACTICING ATTORNEY R.S.A
FIRST FLOOR, GOLDEN PENNY CENTRE
26 HELY HUTCHINSON STR, MTUNZINI
TEL: (035) 340 1351

Details of EAP, Declaration and Undertaking Under Oath

Page 3 of 4

ADHERANCE TO REGULATORY REQUIREMENTS

Table i Content of an EIA Report as per the 2014 EIA Regulations (GNR 326) published in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended)

CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT AS PER THE 2014 EIA REGULATIONS (APPENDIX 3)		RELEVANT SECTION WITHIN THE EIA REPORT
(a)	Details of:	-
	(i) the EAP who prepared the report; and	Section 1.3
	(ii) the expertise of the EAP, including a curriculum vitae;	Section 1.3; Appendix A
(b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report including:	Section 1.2, Figures 1, 2 and 3
	(i) the 21-digit Surveyor General code of each cadastral land parcel;	Appendix C
	(ii) where available, the physical address and farm name;	Appendix C
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
(c)	A plan which locates the proposed activity or activities applied for as well as the associated structure and infrastructure at an appropriate scale, or, if it is:	Figure 1, Figure 2 & Figure 3
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;	Section 1.2
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 1.2
(d)	A description of the scope of the proposed activity, including:	Section 1.2,
	(i) all listed and specified activities triggered and being applied for; and	Section 1.4 (Table 2)
	(ii) a description of the associated structures and infrastructure related to the development;	Chapter 4
(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 2.2
(f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 3
(g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 5
(h)	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report including:	
	(i) details of all the alternatives considered;	Chapter 5

	(ii) details of the Public Participation Process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 8 and Appendix D
	(iii) a summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 8 and Comments and Responses Report (Appendix D &E)
	(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 6
	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts: (aa) can be reversed. (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 10
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 7.5
	(vii) positive and negative impacts that the proposed activity will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 10
	(viii) the possible mitigation measures that could be applied and level of residual risk;	Chapter 10 (mitigation measures)
	(ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such; and	N/A
	(x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 12
(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including -	Chapter 7
	(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and	Chapter 10
	(ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 10
(j)	An assessment of each identified potentially significant impact and risk, including	
	(i) Cumulative impacts;	Chapter 10
	(ii) The nature, significance and consequences of the impact and risk;	Chapter 10
	(iii) The extent and duration of the impact and risk;	Chapter 10
	(iv) The probability of the impact and risk occurring;	Chapter 10
	(v) The degree to which the impact and risk can be reversed;	Chapter 10

	(vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and	Chapter 10
	(vii) The degree to which the impact and risk can be mitigated;	Chapter 10
(k)	Where applicable, a summary of the finding and recommendation of any specialist report complying with Appendix 6 to these Regulation and an indication as to how these finding, and recommendation have been included in the final assessment report;	Chapter 9
(l)	An environmental impact statement which contains	Chapter 11
	(i) A summary of the key findings of the environmental impact assessment	Chapter 11
	(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and	Figures 2, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16a, 16b, 17, 18, 21, 34, 35, 37 & 39
	(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 10
(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 10
(n)	The Final proposed alternatives which respond to the impact management measures, avoidance, the mitigation measures identified through the assessment;	Chapter 5
(o)	Any aspects which were conditional to the finding of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 12
(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.7
(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 12
(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(s)	An undertaking under oath or affirmation by the EAP in relation to -	Near the front of this report (Affirmation by the Environmental Impact Assessment Practitioner)
	(i) the correctness of the information provided in the reports;	As above
	(ii) the inclusion of comments and inputs from stakeholders and I&APs;	As above
	(iii) The inclusion of inputs and recommendation from the specialist reports where relevant; and	As above

	(iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made interested or affected parties;	As above
(t)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(u)	An indication of any deviation from the approved scoping report, including the plan of study, including	N/A
	(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	N/A
	(ii) a motivation for the deviation;	N/A
(v)	Any specific information that may be required by the competent authority; and	Refer to the Comments and Responses Report in Appendix E
(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

1. INTRODUCTION

1.1 Background

The proposed submarine fibre-optic cable system known as 2AFRICA, essentially circumnavigates Africa, connecting Africa to Europe and the United Kingdom (Figure 1). The 2AFRICA (West) component connects South Africa to the United Kingdom and the 2AFRICA/GERA (East) component connects over eight countries on the east Africa continent to Europe (collectively, 2AFRICA West and East provide two submarine telecommunications cables around Africa connecting to Europe and the United Kingdom). The 2AFRICA/GERA (East) Cable System has a number of proposed South African landings. This report deals with the proposed cable landing at Duynefontein, Western Cape, South Africa (Figure 2 and Figure 3).

Submarine telecommunication cables are important for international telecommunication networks; they transport almost 100% of transoceanic Internet traffic throughout the world (https://www.iscpc.org/). It is widely recognised that access to affordable international bandwidth is key to unlocking economic development in every country. Today, Africa still relies primarily on satellites, with only few submarine cables to provide its international communications. Communication via submarine telecommunication cables generally allows for lower cost, better performance, and greater capacity (throughput) than that available via satellite. Improvement in Africa's information technology infrastructure via telecommunication cables will remove one of the current key inhibitors to development in Africa and support economic growth and opportunities on the continent.

Alcatel Submarine Networks (ASN) has been contracted to supply and install the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). This is to be operated by Mobile Telephone Network (Pty) Ltd (MTN) as the South African landing partner (License/Permit Applicant). The proposed project requires environmental authorisation from the Department of Forestry, Fisheries and the Environment[5] (DFFE) in terms of the 2014 Environmental Impact Assessment Regulations (as amended April 2017) (EIA Regulations) published under the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended). ASN, on behalf of MTN, has appointed ACER (Africa) Environmental Consultants (ACER) as the independent Environmental Assessment Practitioner (EAP) to undertake the application for environmental authorisation.

The application to DFFE requires a process of Scoping and Impact Assessment. Scoping has been completed, with the Final Scoping Report (FSR) submitted to DEFF (now DFFE) on 25 February 2021. The FSR and the Plan of Study for Impact Assessment was subsequently accepted (01 April 2021) with notice to proceed with the Impact Assessment. The Draft Environmental Impact Assessment Report (DEIAR) was circulated for comment from the 28 May – 29 June 2021. This Final Environmental Impact Assessment Report (FEIAR) presents the findings of the Impact Assessment and has been compiled in accordance with NEMA, in particular, Government Notice Regulation (GNR) 326 (April 2017), which outlines the requirements of an EIA process to be undertaken as part of the application for environmental authorisation for activities in Listing Notices 1, 2 and 3 of the EIA Regulations.

[5] Previously Department of Environment, Forestry and Fisheries (DEFF). The name change came into effect 1 April 2021.

Figure 1 General overview of the proposed 2AFRICA/GERA (East) and (West) Cable Systems (source: 2africacable.com)

1.2 General location and scope of the project

The project involves the installation and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing), which comprises marine and terrestrial components.

The section of the Cable System which forms part of this environmental assessment includes the main trunk line which enters South Africa's EEZ from Mozambique's EEZ in the north, runs southward along the east coast of South Africa and ends on the west coast of South Africa at Duynefontein, north of Cape Town (Figure 2). Once landing on shore at Van Riebeeckstrand, the proposed cable will traverse the beach and link into the existing Beach Man Hole (BMH) that accommodates the Africa Coast to Europe Cable System (ACE) cable (Figure 3). The 2AFRICA/GERA (East) Cable System (Duynefontein landing) will thereafter be accommodated within existing underground ducts which run inland to the existing ACE Cable Landing Station (CLS) owned by MTN.

Relevant GPS co-ordinates (approximate) are provided below.

GPS Co-ordinates of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) infrastructure (approximate)		
Location	**Latitude (S)**	**Longitude (E)**
Start of trunk cable at Mozambique/SA EEZ boundary	27°14'43.97"S	34°56'15.53''E
Mid-point of marine cable	35°55'26.82''S	25°05'54.54"E
ACE Cable System BMH at Van Riebeeckstrand, Duynefontein (Alternative 1)	33°41'39.96"S	18°26'23.22"E
ACE Cable system beach anchor block	33°41'39.97"S	18°26'20.75"E
Sea Earth Plate at Van Riebeeckstrand, Duynefontein	33°41'42.96"S	18°26'16.44"E
ACE Cable Landing Station	33°41'35.81"S	18°26'58.57"E
Approximate length of marine cable	2,800 km	

Project activities include:

- Pre-installation (marine).
  - Cable Route Survey (completed during project planning).
  - Route engineering.
  - Route Clearance.
  - Pre-Lay Grapnel Run.
- Installation (marine and terrestrial).
  - Cable Surface Lay (> 1,500 m depths).
  - Cable Burial (<1,500 m water depths).
  - Shore End Landing.
  - Beach Burial (including sea earth system).
  - Post Lay Inspection and Inshore Burial (burial in shallow water off the beach).
  - Installation of the terrestrial Fibre Optic Cable from the ACER BMH to the ACE CLS, via existing underground ducting.
- Operation of the cable (maintenance only, should breakages occur).
- Decommissioning of the cable (only after expected life span of > 25 years).

The above provides a summary. Refer to Chapters 4 and 5 for detailed descriptions of the project activities and alternatives.

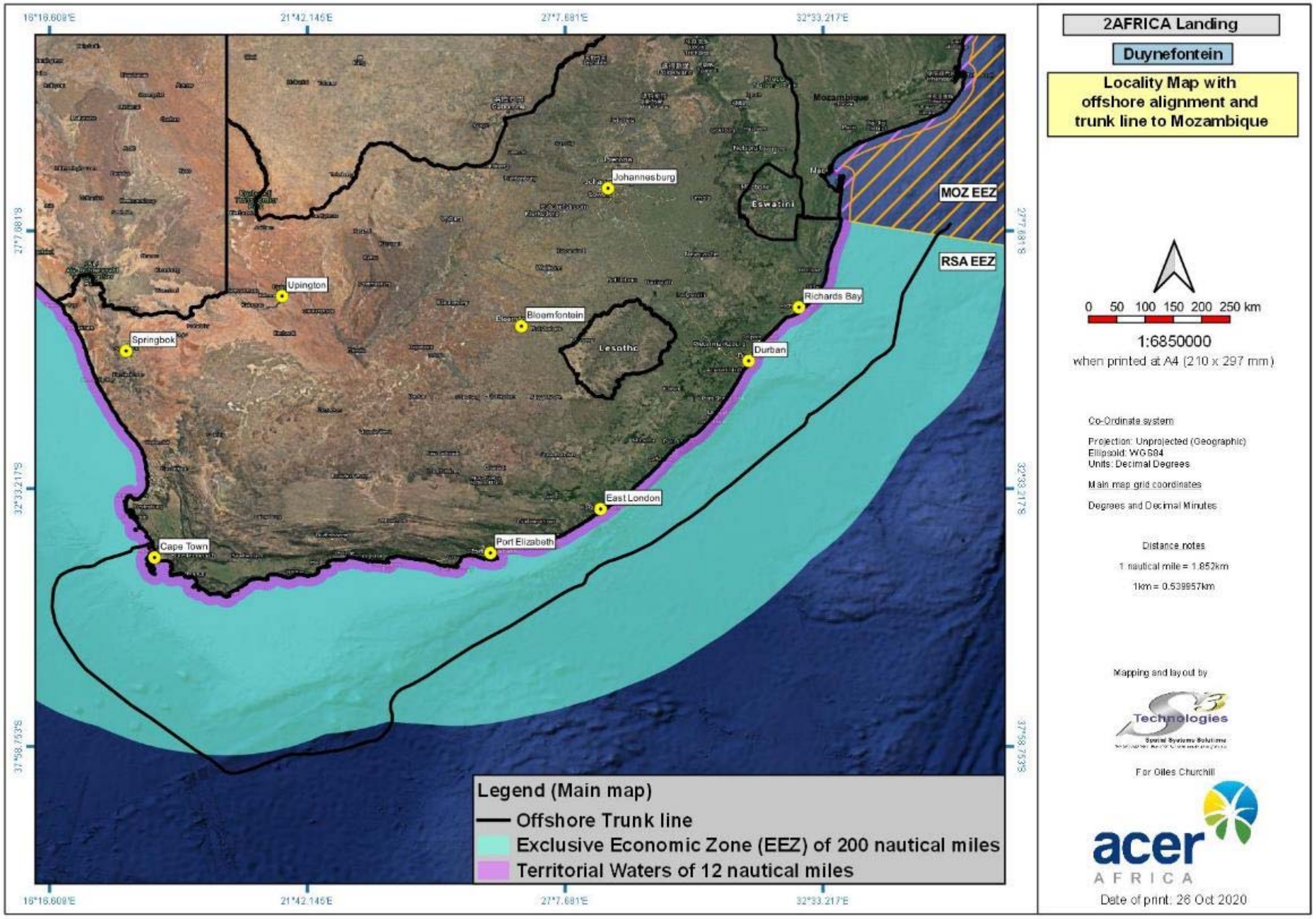


Figure 2 Overview of the 2AFRICA/GERA (East) Marine Cable System Alignment along the east coast of Africa through the EEZ and SA's Territorial Waters

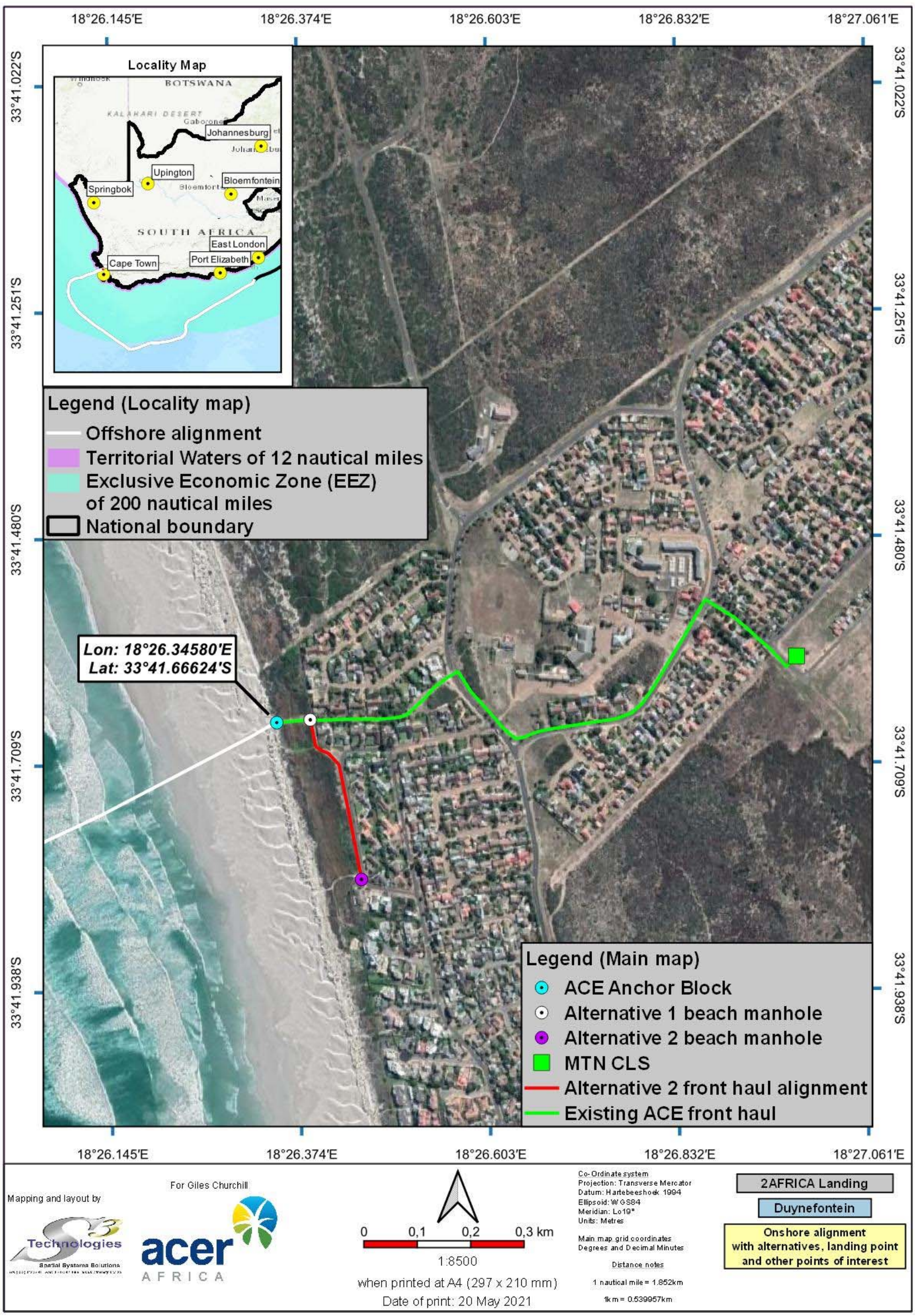


Figure 3 Proposed 2AFRICA/GERA (East) Marine Cable System landing point at Duynefontein (showing alternative BMH options and existing fronthaul infrastructure)

1.3 Qualifications and experience of the Environmental Assessment Practitioner

ACER (Africa) Environmental Consultants (ACER) is a well-established company with wide ranging expertise in environmental management and assessment processes. ACER has twice won the IAIAsa National Premium Award for excellence in environmental management and assessment. The qualifications and experience of the primary assessors and report compilers are listed in Table 1 and *curriculum vitae* are provided in Appendix A.

Table 1 Qualifications and experience of the Environmental Assessment Practitioner Team

Name	Academic Qualification	Relevant Work Experience
Ms A McKenzie (EAP, Pr. Sci. Nat. Author)	MSc	More than 21 years' experience in the field of environmental management. She is registered with the Environmental Assessment Practitioners Association of South Africa (2019/1337) and the South African Council for Natural Scientific Professions in the field of environmental science (Registration No 400026/05).
Mr Giles Churchill (EAP , Pr. Sci. Nat. Co-Author and internal review)	MSc	More than 14 years' experience in environmental management, impact assessments and the monitoring of compliance with specifications contained in Environmental Management Programmes. He is registered with the Environmental Assessment Practitioners Association of South Africa (2019/1687) and the South African Council for Natural Scientific Professions in the field of environmental science (Registration No 116348).

1.4 Triggered listed activities, environmental assessment requirements and process

In terms of the EIA Regulations published under Section 24(5) read with Sections 24, 24D and 44 of NEMA, the proposed project potentially triggers activities in Listing Notices 1, 2 and 3 (GNR 327, GNR 325 and GNR 324 respectively - 7 April 2017) as shown in Table 2. As such, the project may not commence without environmental authorisation from the relevant competent authority, in this case, DFFE[6] (in close consultation with the Western Cape Department of Environmental Affairs and Development Planning (DEADP)). In terms of the current regulations and environmental best practise, the potential impacts of the project on the environment (social, economic and biophysical) must be considered, investigated and assessed prior to implementation.

Given that the proposed project triggers listed activities in Listing Notice 2, the application for environmental authorisation requires a process of Scoping and Impact Assessment with specified timeframes (Figure 4), as outlined in GNR 326 (April 2017). The process is currently in the Impact Assessment Phase.

Based on the current regulations, the EAP must complete Scoping and the Impact Assessment within 300 days of acceptance of the Application for Authorisation by the National Department of Environment, Forestry and Fisheries (DFFE), which is the Competent Authority (CA).

[6] DFFE is the authorising authority as the project crosses international boundaries and is of national importance.

It is important to note that timeframes in the 2014 EIA Regulations (as amended) are based on calendar days and the following conditions apply:

- ❑ 15 December to 5 January are excluded from the calculation.
- ❑ No Public Participation between 15 December and 5 January unless justified by exceptional circumstances.
- ❑ Organs of State to comment within 30 days from the date on which it was requested to submit comments.
- ❑ For both Basic Assessments and Environmental Impact Assessments, the Competent Authority (CA) must issue a decision within 107 days.
- ❑ Notification of decision by CA within 5 days of date of decision.

Table 2 Listed activities potentially triggered by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

Activity Numbers	Relevant Listed Activities as set out in Listing Notice 1 (GN No. R. 327) and reasons why they are triggered
Activity 15 of Listing Notice 1 (No. R. 327 of 2017) The development of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding - (i) the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (ii) the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. (iii) the development of temporary structures within the beach zone where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared; or (iv) activities listed in activity 14 in Listing Notice 2 of 2014, in which case that activity applies.	The project will entail the landing of a marine telecommunications cable at Van Riebeeckstrand Beach, Duynefontein. This will require digging of a trench across the beach (coastal public property) into the intertidal zone and the installation of the telecommunications cable, system earth and associated activities.
Activity 17 of Listing Notice 1 (No. R. 327 of 2017) Development- i. in the sea. ii. .. iii. within the littoral active zone. iv. in front of a development setback; or v. if no development setback exists, within a distance of 100 metres inland of the high- water mark of the sea or an estuary, whichever is the greater. in respect of- a) .. b) .. c) ..	The project will entail the landing of a marine telecommunications cable at Van Riebeeckstrand Beach. This will require the digging of a trench across the beach into the intertidal zone and the installation of the telecommunications cable, which will be buried to provide additional protection. In shallow waters (less than 1,500 m in depth) the cable will be buried under the seabed where possible to provide extra protection.

d) .. e) infrastructure with a development footprint of 50 square metres or more - but excluding- (aa) . (bb) . (cc) . (dd) .	
Activity 18 of Listing Notice 1 (No. R. 327 of 2017) The planting of vegetation or placing of any material on dunes or exposed sand surfaces of more than 10 square metres, within the littoral active zone, for the purpose of preventing the free movement of sand, erosion or accretion, excluding where - (i) .. (ii)	The project will require the rehabilitation of the primary dune belt along Van Riebeeckstrand Beach where construction activities associated with the laying of the underground telecommunications cable will disturb vegetation on the primary dune. In addition to the above, the project will involve the planting of vegetation and material to aid in dune rehabilitation once construction is complete. As such, this listed activity is triggered.
Activity 19A of Listing Notice 1 (No. R. 327 of 2017) The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) A watercourse. (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing , dredging, excavation, removal or moving- (a) will occur behind a development setback. (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	The project will entail the excavation and deposition of more than 5 m^3 of material within the littoral active zone and within 100 m inland of the high-water mark of the sea when trenching for, and backfilling of, the marine telecommunications cable and system earth takes place. As such, this listed activity is triggered. Note that infilling or depositing or excavation from a watercourse (19A (i)) only applies to Alternative 2 and not to the preferred Alternative (1).

Activity Numbers	**Relevant Listed Activities as set out in Listing Notice 2 (GN No. R. 325) and reasons why they are triggered**
<u>Activity 14 of Listing Notice 2 (No. R. 325 of 2017)</u> The development and related operation of- (i) .. (ii) anchored platform; or (iii) any other structure or infrastructure on, below or along the seabed. excluding - (a) development of facilities, infrastructure or structures for aquaculture purposes; or (b) the development of temporary structures or infrastructure where such structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed 2AFRICA Cable System will be placed on the surface of the seabed in deep waters. In shallow waters (less than 1,500 m in depth) the cable will be buried under the seabed to provide extra protection, where the substrate allows.
<u>Activity 26 of Listing Notice 2 (No. R. 325 of 2017)</u> Development-- i. in the sea. ii. .. iii. within the littoral active zone. iv. .. v. if no development setback exists, within a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater. in respect of – a) .. b) .. c) inter- and sub-tidal structures for entrapment of sand. d) .. e) .. f) .. g) .. or h) underwater channels. but excluding the development of structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	Although unlikely to be triggered this listed activity has been included as the proposed trench for the marine cable may result in the entrapment of sand within the inter- and sub-tidal zones. In addition, the trench created to bury the cable may be construed as an underwater channel.

Activity Numbers	Relevant Listed Activities as set out in Listing Notice 3 (GN No. R. 324) and reasons why they are triggered
Activity 12 of Listing Notice 3 (No. R. 324 of 2017) The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **(i) Western Cape:** i… iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	if the Alternative 2 BMH is constructed, the proposed development will require the removal of indigenous primary dune vegetation where the cable system lands at Van Riebeeckstrand. In addition, Cape Flats Dune Strandveld (FS 6) which is listed as an "endangered" ecosystem in NEMBA (2011), will be impacted on by the front haul alignment from the Alternative 2 BMH to the existing ACE BMH which the cable will tie into.
Activity 15 of Listing Notice 3 (No. R. 324 of 2017) The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010. **(c) In Western Cape:** i. .. ii. Inside urban areas in: (aa) Areas zoned for conservation use or equivalent zoning, on or after 02 August 2010. (bb) . (cc) .	The proposed development (Alternative 2) will require the trenching of approximately 900 m of trench through areas zoned as public open space and conservation near Van Riebeeckstrand. It is anticipated that servitudes will have to be registered with the City of Cape Town and as such this listed activity is potentially triggered.

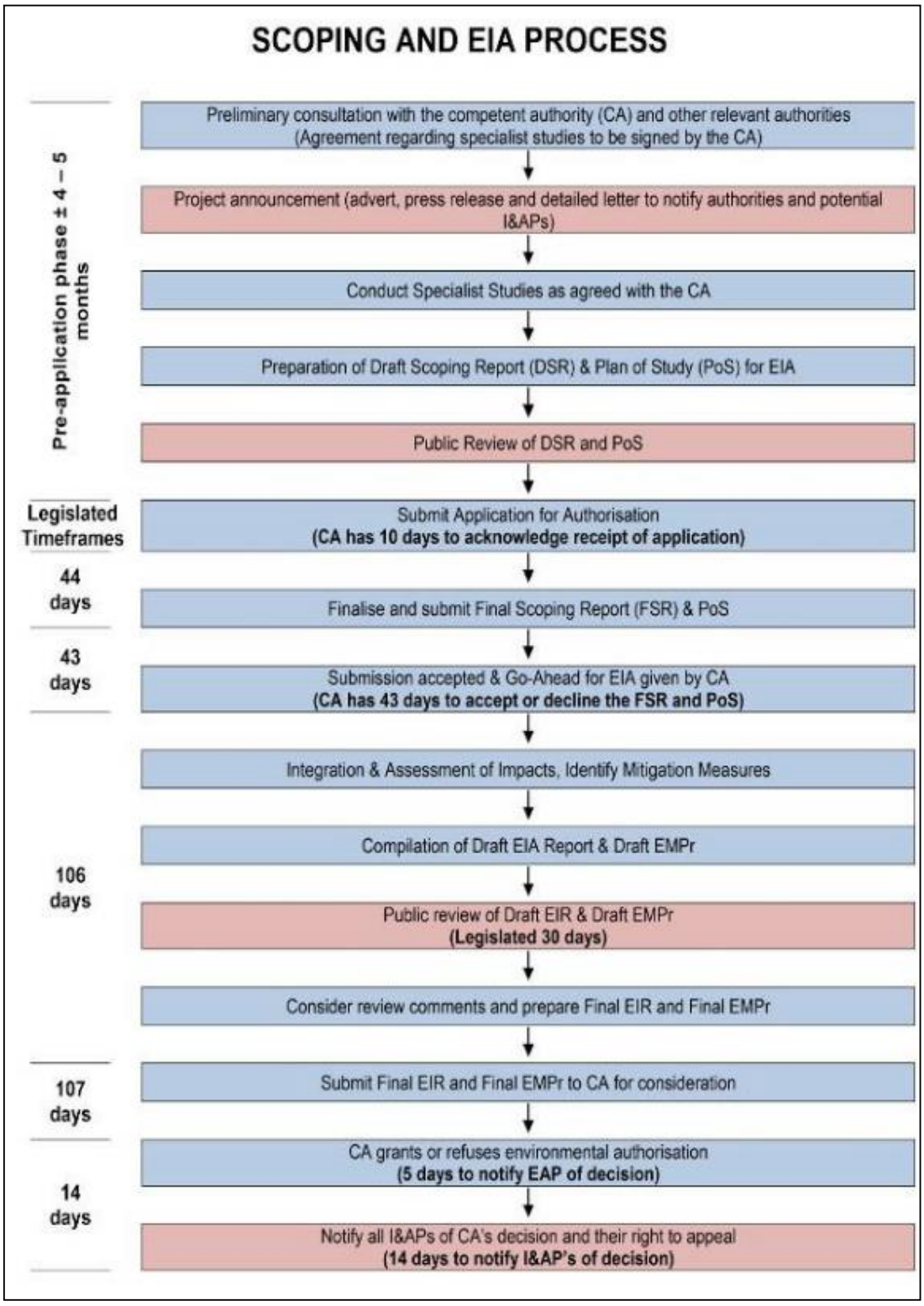


Figure 4 The phases of an environmental impact assessment

1.5 Environmental Impact Assessment Report

This report fulfils the function of the FEIAR, the findings of which will be reviewed by authorities, key stakeholders, and the public.

The purpose of the FEIAR is to collate, integrate, summarise, and evaluate the findings of the specialist studies and to consider each of the issues raised during Scoping. This aims at providing the reader with a holistic understanding of the potential positive and negative impacts of the proposed development in a singular congruent unit. A number of inputs have informed the content of the FEIAR, most notably the outcomes of the different specialist studies that were commissioned as part of the Impact Assessment and comments received from I&APs and authorities following the review of the DEIAR.

The information provided in this FEIAR complies with the legal requirements of GNR 326, as referenced in Tables (i) and (ii). The FEIAR will be finalised and submitted to DFFE for review and decision-making and I&APs will be notified of its submission and its availability for review and comment on ACER's website.

The following documentation is appended to this report:

- ❑ Appendix A: EAP *Curriculum Vitae.*
- ❑ Appendix B: Specialist reports, *Curriculum Vitae* and Declarations.
- ❑ Appendix C: Property Details.
- ❑ Appendix D: Public Participation Documentation.
- ❑ Appendix E: Comments and Responses Report.
- ❑ Appendix F: Environmental Management Programme.
- ❑ Appendix G: Supporting maps

1.6 Environmental Management Programme

An Environmental Management Programme (EMPr) has been prepared as part of this assessment. It contains mitigation measures to prevent, limit or enhance impacts identified during this EIA process. These measures may be applied at different stages of the project (design, construction or rehabilitation).

1.7 Assumptions, limitations and gaps in knowledge

Key assumptions, limitations and/or gaps in knowledge applying to the EAP are listed below. Additional discipline specific ones are listed in the individual specialist reports contained in Appendix B.

- ❑ This FEIAR has drawn on primary and secondary information from various sources including the client; engineering and survey team; national, provincial and municipal databases; municipal planning documents; specialist studies and input from Interested and Affected Parties (I&APs). It is assumed that this information from these sources was true and correct at the time of writing this report.
- ❑ It is assumed that the project scope and information, including maps, GPS co-ordinates and kml files, provided by the client and the engineering/survey team to the EAP and specialists, are accurate.

- The impact assessment conventions are more applicable to the biophysical environment. Therefore, for social/socio-economic impacts, professional judgement is applied to the conventions to arrive at the assessment of impact significance.
- Economic impacts are not quantified.
- Cumulative impacts cannot be quantified in all cases.
- Much is unknown of the marine environment at great depths.

2. FRAMEWORK FOR THE ENVIRONMENTAL ASSESSMENT

The key considerations that guided the approach to this EIA and helped to shape the assessment framework that was used are discussed below.

2.1 Concept of sustainability

The framework (Figure 5) within which environmental aspects arising from or influencing the proposed project (and its alternatives) are considered is the concept of sustainability. This considers the inter-related dimensions of the environment, viz. the social, economic and biophysical dimensions, underpinned by a system of sound governance through the legal/statutory requirements of South Africa (particularly NEMA).

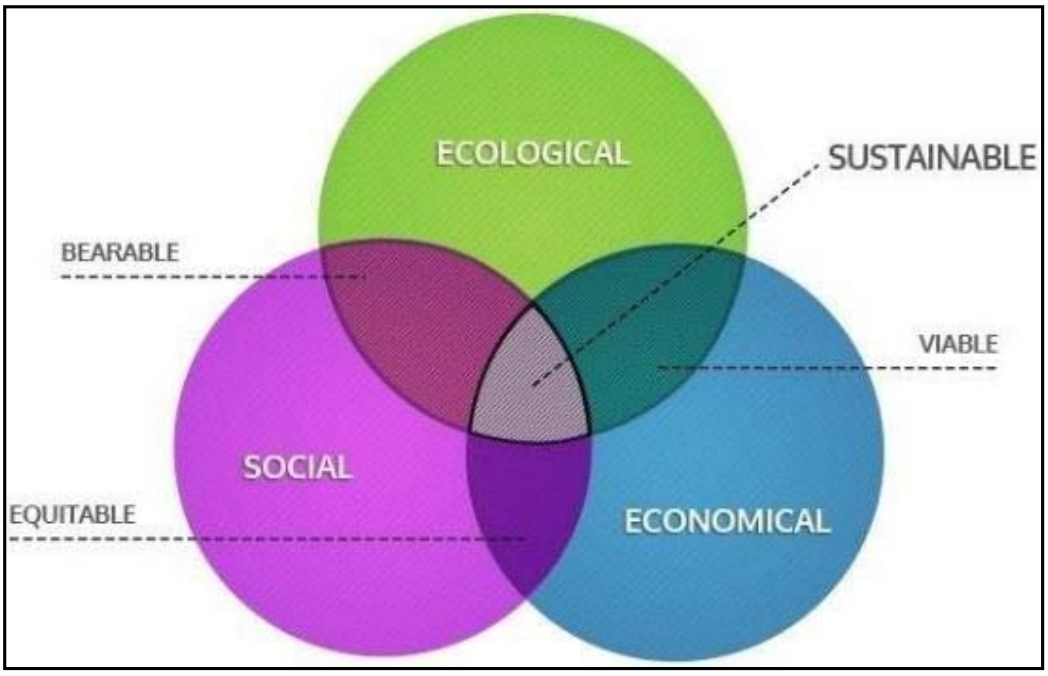


Figure 5 Inter-related dimensions of sustainability (in a perfect situation)

All three dimensions of the environment, and the interactions between them (two- and three - dimensional), contribute to achieving sustainability and, therefore, each dimension, individually and its combined interaction with the other two dimensions, needs to be taken into account when assessing a proposed option or project, taking due cognisance that the three dimensions are seldom in perfect balance, with optimised solutions often being dictated by local circumstances, and requiring trade-offs between the dimensions.

In terms of sustainability and the assessment framework, key principles included:

- Development must not irretrievably degrade the natural, built, social, economic and governance resources on which it is based.
- Current actions should not cause irreversible damage to natural and other resources, as this potentially precludes sustainable options.
- Where there is uncertainty about the impact of activities on the environment, caution should be exercised in favour of the environment.

- Land-use and environmental planning need to be integrated.
- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

Issues and impacts were identified by way of interlinked technical and public participation processes. Information gathering focused on gaining an understanding of the interactions between the different dimensions of the environment to identify potentially significant issues and associated impacts. This involved site visits, reference to existing documentation and maps, liaison with the project proponent and technical team, as well as consideration and incorporation of the issues raised during the public participation process. Information was collated, integrated and evaluated, and potentially significant issues and impacts were identified. This enabled the EAP to focus and tailor the scope of work for Specialist Studies and further detailed investigations, the results of which are documented in this report.

In addition to the requirement for Scoping and an Environmental Impact Assessment, a review of legislation applicable to the proposed 2AFRICA/GERA (East) Cable System was undertaken to establish what other licences and permits will be applicable to the project. Included in this review of legislation were the permit requirements of the Department of Human Settlements, Water and Sanitation (water use licences), the permit requirements of the DFFE – Oceans and Coasts (OC) (in terms of the proposed cable laying activities and beach access), plant permit requirements from DFFE and Cape Nature, permit requirements from the South African Heritage Resources Agency (SAHRA) and permit requirements of DFFE in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008). Findings from this review of applicable legislation and the required licence and permits are included in Section 2.2.

It should be noted that OC is also directly involved with Operation Phakisa which includes the sustainable utilisation of the oceans around South Africa to meet Government's development targets. It is estimated that the oceans around South Africa have the potential to contribute up to ZAR 177 billion to the country's Gross Domestic Product (GDP) and create just over one million jobs by 2033 (http://www.operationphakisa.gov.za). Operation Phakisa consists of four critical areas to unlock the potential of South Africa's coastline:

- Marine Transport and Manufacturing.
- Offshore Oil and Gas Exploration.
- Aquaculture.
- Marine Protection Services and Ocean Governance.

Of particular relevance to the proposed 2AFRICA/GERA (East) Cable System are the recently established Marine Protected Areas (MPAs) which have been implemented as part of the programme in an attempt to ensure the sustainable utilisation of South Africa's marine environments. The proposed 2AFRICA/GERA (East) Cable System traverses two declared MPAs namely the Southeast Atlantic Seamount MPA and the Robben Island MPA. As custodians of these MPAs, SANParks is the Management Authority and permission/consent must be obtained from SANParks for the cable to traverse the MPAs prior to DFFE issuing environmental authorisation.

2.2 Legal or statutory requirements

There are a host of legal requirements (national, provincial and local government spheres) to which MTN must adhere for the installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) and related infrastructure. Fundamentally, MTN is required to include and integrate environmental principles and values into all planning and implementation procedures taken for development purposes.

Underlying the above reasoning is the constitutional right that people have to environmental protection as set out in the Bill of Rights in the Constitution (Section 24). These rights have been interpreted and included into NEMA, which, together with other national and provincial legislation, governs the way environmental principles are incorporated into any form of development.

The Scoping Report (Draft and Final) have dealt in detail with the key pieces of legislation relevant to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). These are not repeated in this FEIAR. Rather, for completeness, the key pieces of legislation are listed below:

2.2.1 Legislation

- Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996) as amended by the Constitution of the Republic of South Africa, Amendment Act, 1997 (Act No. 35 of 1997).
- National Environmental Management Act, 1998 (Act 107 of 1998).
- The EIA Regulations, 2014 (as amended 2017).
- National Water Act, 1998 (Act 36 of 1998).
- National Heritage Resources Act, 1999 (Act 25 of 1999).
- National Forest Act, 1998 (Act 84 of 1998).
- Hazardous Substance Act, 1973 (Act 15 of 1973).
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008).
- National Environmental Management: Biodiversity, 2004 (Act 10 of 2004).
- National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003).
- Integrated Coastal Management Act, 2008 (Act 24 of 2008).
- Seashore Act, 1935 (Act 21 of 1935).
- The Marine Living Resources Act, 1998 (Act 18 of 1998).
- Maritime Zones Act, 1994 (Act 15 of 1994).
- Telecommunications Act, 1996 (Act 103 of 1996).
- Marine Traffic Act, 1981 (Act 2 of 1981).

For the proposed project, the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996) as amended by the Constitution of the Republic of South Africa, Amendment Act, 1997 (Act No. 35 of 1997) is the overarching legislation of over-riding importance. Chapter 2 of the Constitution contains the Bill of Rights, which is the cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and affirms the democratic values of human dignity, equality and freedom. It is within this context that all legislation since 1996 has been formulated.

There are several other pieces of key legislation through which the protection of human rights, community health, and safety and security will be assured:

- Labour Relations Act.
- Basic Conditions of Employment Act.
- Employment Equity Act.
- Occupational Health and Safety Act.
- Promotion of Access to Information Act.

And some key associated Regulations:

- Labour Relations Regulations.
- Compensation for Occupational Injuries and Diseases Regulations.
- Construction Regulations.
- General Safety Regulations.
- Hazardous Chemical Substances Regulations.

2.2.2 Guidelines

The following guidelines are also applicable:

- Public Participation Guideline in Terms of NEMA, 1998 and the EIA Regulations.
- Guideline Series 5: Companion to the EIA Regulations of 2010.
- Guideline Series 7: Public Participation in the EIA Process.
- Guideline Series 9: Need and Desirability in terms of the EIA Regulations of 2010 (Draft).
- Department of Environmental Affairs (DEA) Alternatives Guideline 5.
- DEA Guidelines for EMPrs.

2.2.3 National, provincial and local policies and plans

- National Development Plan 2030 (NDP).
- South African National Infrastructure Plan 2012 (with reference specifically to SIP 15 - expanding access to communication technology)
- National Climate Change Adaptation Strategy (NCCAS).
- National Climate Change Response White Paper.
- Western Cape Provincial Spatial Development Framework (PSDF).
- State of the Environment Outlook Report for the Western Cape Province (2018)
- State of the Coast Western Cape: A Review of the State of the Coastal Zone in the Western Cape (2018)
- Integrated Development Plan (IDP) for West Coast District Municipality (2017 – 2022) – 2 May 2019
- West Coast District Spatial Development Framework, 2020 (WDSDF)
- Swartland IDP & Spatial Development Framework Amendment (2018/2019) Spatial Vision, Principles and Directives 2017-2022

2.2.4 International treaties, conventions and protocols

There are various international treaties, conventions and protocols of relevance to this project:

- The National Convention for the Prevention of Pollution by Ships of 1973 and 1978, and the Protocol of 1997.
- The Convention on the Prevention of Marine Pollution through the Disposal of Waste and Other Matter, 1972 or the London Convention, 1972.
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.
- United Nations Convention on the Laws of the Sea (UNCLOS).

2.2.5 Permits required

The main licenses/permits[7] required or potentially required for the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) are summarised in Table 3.

Table 3 Main licenses/permit obligations for the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

License/Permit	Authority
Water Use Authorisation	DHSWS
Beach Driving Permit	Oceans and Coast (DFFE)
Seashore Lease Permit	CapeNature
Permit to construct infrastructure in the Coastal Public Property	Department of Public Works
Local Municipal Permits and Approvals	City of Cape Town
Cultural Heritage Permits (offshore)	SAHRA
Cultural Heritage Permits (onshore)	Heritage Western Cape (HWC)
Section 53 of the Mineral and Petroleum Resources Development Act	
Permission to cross MPAs	SAN Parks
Risk assessments and emergency evacuation plans in Precautionary Action Zone (PAZ) associated with Koeberg Nuclear Power Station	Eskom/City of Cape Town

It is within this framework that the proposed development will need to be constructed and operated.

It should also be noted that due to the Covid -19 pandemic, South Africa declared a national state of disaster on 15 March 2020 in terms of the Disaster Management Act, 2002 (Act No. 57 of 2002). Since this date, a host of Regulations have been promulgated in terms of the Disaster Management Act, dealing with a wide range of matters affected by the pandemic. Of possible relevance to the implementation of this project will be the effect on various government department's processes of engagement with applicants and the public, as well as time frames for permitting and authorisation processes. The Regulations also govern the manner in which public participation can be carried out, with a view to limiting social interaction via social distancing.

[7] Excluded from the above are the following which are the responsibility of Openserve (i) Telecommunications operators' licenses, cable landing station licences and similar licenses required from the national telecommunications regulators (ii) Permits in Principle specifically for system elements landward of the Beach Manholes (iii) Operational clearances (iv) Agreements to cross other submarine cables, oil and gas concession blocks, pipelines and other seabed assets.

3. NEED AND DESIRABILITY

The need and desirability of a proposed development is a key consideration of an application for environmental authorisation and differs from the developer's aims and purpose of the development. The Guideline on Need and Desirability in terms of the EIA Regulations (DEA, 2017) states that *"consistent with national priorities, environmental authorities must support "increased economic growth and promote social inclusion" while ensuring that such growth is "ecologically sustainable"*. In essence, need and desirability are based on the principle of sustainability, viz. that a development is ecologically sustainable and socially and economically justifiable.

Sustainability in this context implies ecological sustainability, recognising that the maintenance of healthy ecosystems and natural resources are preconditions for human wellbeing and recognising that there are limits to the goods and services that can be provided by the environment. Sustainable development is the process that is followed to achieve the goal of sustainability.

Over recent years, private sector finance for infrastructure projects, both in the developed and developing world, has increased in importance. This has exposed financial institutions to increasing pressure from Non-Governmental Organisations (NGOs) for their involvement in a variety of controversial projects and the need for greater transparency, accountability and tighter standards in the operations of commercial banking. Stemming from these demands and concerns is a set of standards known as the Equator Principles, which are based on the International Finance Corporation (IFC) performance standards on social and environmental sustainability, and on the World Bank Group's Environmental, Health and Safety General Guidelines. The Equator Principles promote socially responsible conduct and sound environmental practices in relation to project financing initiatives.

The single most important factor in reducing the environmental (and social) impacts of marine telecommunications infrastructure projects is good site selection and the ease at which marine telecommunications cable can tie into the existing land-based telecommunications network (distance from landing site to the CLS and existing network). The best option is, as much as possible, to avoid negative impacts on the environment from the outset, thereby minimising the amount of environmental mitigation measures required.

Table 4 and Table 5 are derived directly from the Guideline and contain the *"questions to be engaged with when considering need and desirability"* as highlighted in the guideline. Responses to these questions are correspondingly provided in the table, based on the information and knowledge gained during this EIA.

Table 4 Need and desirability aspects considered for securing ecological sustainable development and use of natural resources

Ref #	Description	Comment
1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Implementation of the marine component of the cable is expected to have localised impacts on the marine benthic and shallow benthic environment. The terrestrial cable component is expected to have a localised impact on Van Riebeeckstrand beach for the preferred Alternative 1 and no additional impacts inland from the BMH.
1.1	How will the following ecological integrity considerations be taken into account?	
1.1.1	Threatened ecosystems.	On land, no CBAs or formally protected areas will be affected. Identified impacts on dune vegetation and the dune slack wetland at the site will be limited and can be mitigated in accordance with the findings of the specialist studies undertaken in the EIA. With respect to the marine environment, the marine cable route has been carefully designed to avoid sensitive areas as far as possible. The cable installation will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. While the majority of the cable route traverses offshore habitats with a conservation status of “least concern”, it does, pass through various ecologically sensitive areas. These include Offshore Controlled Zones of the Robben Island MPA (also traversed by other cables landing at Duynefontein), Restricted Zone of the South Atlantic Seamount MPA and CBAs defined in the recent National Coastal & Marine Spatial Biodiversity Plan (Version 1). With mitigation (where applicable), impacts on these areas will be limited and of low significance, according to specialist studies and the assessment undertaken in this EIA (refer to Chapter 9 and Chapter 10).
1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems which require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	A specialist Beach and Coastal Dune Dynamics Impact Assessment as well as an Ecological Assessment (Vegetation, Wetlands and Fauna) were undertaken to identify potential impacts of the landing on the beach, coastal dunes, coastal vegetation and dune slack wetland in the study area. Specialist findings indicate that the preferred landing site will not impact significantly on these ecosystems (refer to Appendix B).
1.1.3	Critical Biodiversity Areas and Ecological Support Areas.	The project will not affect CBAs or ESAs. The affected beach and coastal dune area are classified as “Other Natural Areas” (ONA). This means the area is not currently identified as a priority, but these areas retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Refer also to 1.1.2 above.

Ref #	Description	Comment
1.1.4	Conservation targets.	The proposed cable will have no significant negative impacts on terrestrial or marine areas of conservation significance or on planned conservation targets.
1.1.5	Ecological drivers of the ecosystem.	Findings from the specialist studies indicate that there will be no significant impact on ecological drivers of the marine or beach ecosystems (refer to Appendix B).
1.1.6	Environmental Management Frameworks (EMF).	The preferred alternative for the BMH is the existing BMH already installed for the ACE cable system. The principles of sustainable development are incorporated into the identification, avoidance and mitigation of impacts. It must be noted however that there is, as yet no approved EMF for the West Coast District Municipality.
1.1.7	Spatial Development Frameworks (SDF).	The proposed development is in line with the SDF's objectives of sustainable development, as it is aimed at improving telecommunications that will stimulate local economic growth through data connectivity.
1.1.8	Global and international responsibilities relating to the environment (e.g., RAMSAR sites, climate change, etc).	Climate change is recognised in terms of the cumulative impact of sea-level rise and increased storm events on the beach environment. The implications for associated beach and dune erosion and mitigation thereof, are considered in the specialist Beach and Coastal Dune Dynamics study (Appendix B) and in this EIA.
2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Benthic ecosystems are associated with microorganisms that are essential for ecological functions. Initially, the installation of the marine cable will disturb both shallow and deep benthic ecosystems along its alignment. However, once installed, the benthic environment will be protected by a 500 m exclusion zone either side of the cable. This is expected to have a positive impact on benthic communities, as no trawling or anchoring of ships is permitted in the permanent exclusion zone.
3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Potential pollution onshore will be limited to hydrocarbon spills and light industrial and domestic waste. Specifications for the handling of waste and dealing with incidents are contained in the EMPr. Potential offshore pollution will be isolated and maintained, until disposed of at a registered landfill site. Further details are included in the EMPr.
4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will be limited to light industrial waste (cable offcuts and reclaimed cable from the seabed) in the marine environment and domestic waste in the terrestrial environment. Volumes are anticipated to be very small. Waste management specifications are provided in the EMPr.

Ref #	Description	Comment
5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	A maritime heritage specialist study was undertaken to identify potential impacts of the cable installation on cultural heritage resources under the sea. The findings indicate that while there is potential to impact these resources, the likelihood is improbable (refer to Appendix B).
6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Electricity is required to power the optical amplifiers to transmit the telecommunications signals over greater distances through the marine cable. It is possible that the generation of this power is from renewable energy sources. The source of energy originating at the start of the cable is outside the scope of this EIA.
7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	Electricity is required to transmit the telecommunication signal through the marine cable. It is possible that the generation of this power is from renewable energy sources. The source of energy originating at the start of the cable is outside the scope of this EIA.
7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e., de-materialised growth)? (Sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and	The development is neutral in terms of resource use, as once the cable has been laid it functions in its purposes of improving international telecommunications without further resource investment. Only cable repairs will be required on an *ad hoc* basis.

Ref #	Description	Comment
	reduce the amount of waste they generate, without compromising their quest to improve their quality of life).	
7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and inter-generational equity and are there more important priorities for which the resources should be used (i.e., what are the opportunity costs of using these resources for this proposed development?).	The natural resource to which the Applicant needs access to install a telecommunications cable is the "seabed". Telecommunications is one of the optimal uses of the "seabed". The other current "priority" for the use of the seabed, includes Oil & Gas. There are existing Oil & Gas Exploration Rights Holders in terms of the MPRDA who have rights to conduct exploration and rights to use the natural resource to install seabed infrastructure (such as well heads) as part of their exploration activities. The use of the seabed for both "telecommunications" and "Oil & Gas" is not mutually exclusive. The seabed resource is abundant enough for multiple types of uses when considering intra- and inter-generational equity. In addition, multiple uses can occur without undue and conflicting negative impact by the different activities on each other and on the seabed resource. The opportunity cost of preventing other uses and activities in future and for sterilizing hydrocarbon resources, can be minimised if the different parties share information early and consult with one another during the execution of their plans.
7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	N/A
8	How will a risk-averse and cautious approach be applied in terms of ecological impacts?	The cable alignment both offshore and onshore has been selected to minimise ecological impacts. Specialist studies have been undertaken to identify ecological impacts and how to mitigate them.
8.1	What are the limits of current knowledge (the gaps, uncertainties and assumptions must be clearly stated)?	Assumptions, limitations and gaps in knowledge are clearly stated in section 1.7 of this report and in each individual specialist report in Appendix B.
8.2	What is the level of risk associated with the limits of current knowledge?	Based on knowledge of previous (similar) projects and current knowledge of, the proposed project and study area, the risk is considered low.
8.3	Based on the limits of knowledge and the level of risk, how and to what extent will a risk-averse and cautious approach be applied to the development?	Please see Item 8.
9	How will the ecological impacts arising from this development impact on people's environmental rights in terms following:	
9.1	Negative impacts, e.g., access to resources, opportunity costs, loss of amenity (e.g., open space), air and water quality impacts, nuisance (noise, odour, etc), health impacts, visual	To effectively plan cable routes, armouring and burial and prevent cable system damage on the seabed (from other marine users who have current legal rights to perform activities in the marine environment and who have rights to install infrastructure on the seabed), the Applicant undertakes to

Ref #	Description	Comment
	impacts, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	implement the objectives of the International Cable Protection Committee to “share the seabed in harmony with others”. Applying the guidance from the International Cable Protection Committee to proactively inform all current marine users who have legal rights of its concept designs (for cable laying and routing) and to collaboratively plan on an ongoing basis its detailed installation designs and operational procedures. To promote spatial awareness and information sharing, and to formally document the cable routing, the Applicant undertakes to ensure that the cable routing is formally mapped on hydrographic and navigational charts by the South African Navy Hydrographic Office . With respect to Oil and Gas right Holders the applicant will obtain a right of access to the seabed by way of a Consent Letter from existing Oil & Gas Rights Holders as required by the MPRDA and negotiate a Cooperation Agreement with Oil and Gas right Holders outlining the principles of cooperation to limit the disruption of either parties commercial interests. The project will result in a temporary exclusion zone for fishing within 1,500 m of the cable laying vessels. A permanent exclusion zone of 500 m will apply either side of the cable once installed, precluding demersal trawling, longlining and anchoring, etc. This exclusion zone will serve to protect marine resources along the alignment.
9.2	Positive impacts, e.g., improved access to resources, improved amenity, improved air or water quality, etc. What measures will be taken to enhance positive impacts?	The project is expected to have a significant positive impact on the South African economy through improved telecommunications which, in turn, promotes economic development, job creation and education.
10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development’s ecological impacts will result in socio-economic impacts (e.g., on livelihoods, loss of heritage sites, opportunity costs, etc).	No ecological impacts associated with this development that result in significant negative socio-economic impacts, have been identified for this project.
11	Based on the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	The project will have limited negative impacts on the natural environment (marine and terrestrial). These have been assessed by specialists to be of low significance, after mitigation.
12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all	The preferred alternative (Alternative 1) is the best practicable option as it makes use of existing infrastructure on land and thus minimises environmental impacts.

Ref #	Description	Comment
	the different elements of the development and all the different impacts being projected) will result in the selection of the "best practicable environmental option" in terms of ecological considerations.	The proposed marine cable alignment as it nears Duynefontein, is located in proximity to existing alignments and avoids rocky areas and reefs, thereby minimising impacts and limiting the "spread" of environmental impacts widely across the ocean floor.
13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area.	No negative cumulative ecological impacts of high significance were identified by the EAP or specialists.

Table 5 Need and desirability aspects considered for promoting justifiable economic and social development

Ref #	Description	Comment
1	What is the socio-economic context of the area based on, amongst other considerations, the following?	
1.1	The Integrated Development Plan (IDP) (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area.	The proposed development is in line with the vision of the City of Cape Town and the Western Cape's objectives in terms of improving telecommunications technologies to facilitate investment and stimulate both the regional and national economy.
1.2	Spatial priorities and desired spatial patterns (e.g., need for the integration of segregated communities, need to upgrade informal settlements, need for densification, etc.).	N/A
1.3	Spatial characteristics (e.g., existing land uses, planned land uses, cultural landscapes, etc.)	Existing infrastructure will be accessed, with no impact on spatial characteristics.
1.4	Municipal Economic Development Strategy.	The project conforms to the Local and District Municipality's development strategy in that it will improve the telecommunications infrastructure within the province and in South Africa. This is intended to stimulate the local and international economy and open the gateway to further international trade agreements.
2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects) and specifically also on the socio-economic objectives of the area?	Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the educational and economic opportunities opened up as a result of access to improved telecommunications networks. The cable will render limited areas unavailable to the Oil and Gas industry however if the parties co-operate and share their plans, then this impact can be mitigated to a large extent. Offshore lease areas held by the following rights holders are crossed by the marine cable along its length between the Mozambique/SA EEZ boundary and the landing at Van Riebeeckstrand: ❑ Silver Wave Energy ❑ Sasol ENI ❑ Impact Africa ❑ Total ❑ Imaforce ❑ Anadarko (Total) ❑ Rhino Oil (located in Territorial waters) The use of the seabed by both the "telecommunications" and "Oil & Gas" sector to promote positive socio-economic development can be assured and is not mutually exclusive. .

Ref #	Description	Comment
		If the parties cooperate and share their plans, then potential impact can be minimised. Multiple uses of the sea and the seabed can occur without undue and conflicting negative impact by the different sector activities on each other and on the natural resources During installation, there is potential to negatively impact other existing cables if not well managed. The project will cause minor nuisance impacts during the installation phase (temporary).
2.1	Will the development complement the local socio-economic initiatives (such as local economic development initiatives), or skills development programs?	Improved telecommunications capacity in South Africa is anticipated to positively impact on skills development programs and education.
3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Improved telecommunications, as a key driver for economic development, is expected to benefit all communities within South Africa.
4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The investment in the 2AFRICA/GERA (East) Cable System is substantial and the telecommunications cable is anticipated to stay in operation for 25 years. There is no planned decommissioning date; however, technology will improve, and it is possible that the cable system will be replaced by enhanced technology in years to come.
5	In terms of location, describe how the placement of the proposed development will:	
5.1	Result in the creation of residential and employment opportunities in proximity to or integrated with each other.	Limited temporary employment opportunities will be created during cable installation via the appointed contractor through the employment of skilled and unskilled labour. A small amount of spending in the local economy is anticipated (for services, accommodation, etc.).
5.2	Reduce the need for transport of people and goods.	Improved telecommunications will reduce the need for people to travel to meetings, etc.
5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g., will the development result in densification and the achievement of thresholds in terms of public transport?).	N/A
5.4	Complement other uses in the area.	The improved telecommunications will support all other uses that make use of telecommunications in the area.
5.5	Be in line with the planning for the area.	The proposed development complements the development initiatives at the Local, District, Provincial level, including the rest of South Africa.
5.6	For urban related development, make use of underutilised land available within the urban edge.	N/A
5.7	Optimise the use of existing resources and infrastructure.	The proposed development will make use of the existing ACE BMH, front haul cable sleeves and CLS infrastructure.

Ref #	Description	Comment
5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g., not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement).	N/A
5.9	Discourage urban sprawl and contribute to compaction/densification.	N/A
5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs.	Improved telecommunications will be accessible to all communities/locations with internet connections.
5.11	Encourage environmentally sustainable land development practices and processes.	N/A
5.12	Take into account special locational factors that might favour the specific location (e.g., the location of a strategic mineral resource, access to a port, access to rail, etc.).	The offshore alignment will take sensitive marine ecosystems into account. It must be noted that the offshore alignment has been selected based on suitable seabed conditions, alignments of existing cables and minimising impacts on fishing grounds. The existing ACE telecommunications infrastructure plays a vital role in the site selection as it provides an existing footprint with capacity to facilitate the 2AFRICA (East) marine cable system.
5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e., an area with high economic potential).	N/A
5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area.	While there is potential for the project to negatively impact on submerged pre-historic archaeological resources and palaeontological resources, the likelihood is very low. The significance of the impact is assessed as medium. Mitigation is not possible (other than the no -go option). Potential negative impacts on maritime archaeological resources (e.g., shipwrecks) are improbable. Should they occur, the significance is assessed as medium.
5.15	In terms of the nature, scale and location of the development, promote or act as a catalyst to create a more integrated settlement.	N/A
6	How will a risk-averse and cautious approach be applied in terms of socio-economic impacts?	The use of existing land infrastructure was selected to reduce socio-economic impacts on the residents. A marine cable alignment in close proximity to other marine cables landing on the west coast was selected to reduce the impact on other users of the seabed.
6.1	What are the limits of current knowledge? (The gaps, uncertainties and assumptions must be clearly stated).	Assumptions, limitations, and gaps in knowledge are clearly stated in section 1.7 of this report and in each individual specialist report in Appendix B.

Ref #	Description	Comment
6.2	What is the level of risk? (Related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability, and sustainability) associated with the limits of current knowledge).	Nil.
6.3	Based on the limits of knowledge and the level of risk, how and to what extent will a risk-averse and cautious approach be applied to the development?	See Item 6.
7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms of the following?	
7.1	Negative impacts: e.g., health (e.g., HIV/AIDS), safety, social ills, etc. What measures will be taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The EMPr (Appendix F) provides specifications aimed at reducing negative impacts on health and wellbeing.
7.2	Positive impacts. What measures will be taken to enhance positive impacts?	The use of existing infrastructure on land is key to the project design. Measures include local employment opportunities and improved telecommunications with a positive socio-economic impact.
8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g., over utilisation of natural resources, etc.).	N/A
9	What measures will be taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The use of existing infrastructure on land is key to the project design.
10	What measures will be taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified allow the "best practicable environmental option" to be selected or is there a need for other alternatives to be considered?	Improved telecommunications enabled by the proposed project will benefit all South Africans, including the disadvantaged.

Ref #	Description	Comment
11	What measures will be taken to pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing, and what special measures will be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The technology enabled by the cable will be widely accessible.
12	What measures will be taken to ensure that the responsibility for the environmental health and safety consequences of the development have been addressed throughout the development's life cycle?	Environmental considerations are actioned by the Developer through all phases of the project (design, construction, operation, and maintenance) by various measures, including: ❑ Technical research and development. ❑ Risk analyses. ❑ Compliance with environmental and safety legislation. ❑ Environmental Screening, Scoping, and Impact Assessment. ❑ EMPRs ❑ Maintenance and monitoring as required.
13	What measures will be taken to:	
13.1	Ensure the participation of all interested and affected parties.	The minimum requirements of the EIA Regulations were followed with respect to public participation, also taking into account special requirements to reduce the spread of Covid 19. Refer to the Chapter on Public Participation in this report, and to Appendix D and Appendix E.
13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.	The regulated public participation process is designed to share information and facilitate public comment. ACER staff make themselves available to discuss the project telephonically and respond to queries throughout the duration of the project. Given the current Covid risk, public meetings are not recommended but ACER will be available to hold virtual focus group meetings.
13.3	Ensure participation by vulnerable and disadvantaged persons.	Disadvantaged individuals will be involved in the project during the construction phase, via local contractors who employ unskilled, disadvantaged workers as part of their company policies/ BEE principles.
13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	The regulated public participation process is designed to share information and raise awareness.
13.5	Ensure openness and transparency, and access to information in terms of the process.	The Scoping Reports and DEIAR have been circulated for comment, and all documents were made available on ACER's website. All issues raised during the Public Participation Process have been responded to and captured in a CRR (Appendix E). The EAP team has been available throughout the EIA process to respond to project related queries and concerns.
13.6	Ensure that the interests, needs and values of all interested and affected parties will be taken into account, and	Refer to all responses under Item 13.

Ref #	Description	Comment
	that adequate recognition is given to all forms of knowledge, including traditional and ordinary knowledge.	
13.7	Ensure that the vital role of women and youth in environmental management and development are recognised and their full participation therein is promoted.	Internal empowerment was promoted during the EIA process, with both women and younger EAP team members. The Public Participation Process in terms of the 2014 EIA Regulations is open to all I&APs including women and youth. The improved telecommunications resulting from the proposed project will benefit all segments of society, including those involved in education.
14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g., a mixture of low-, middle-, and high-income housing opportunities) that are consistent with the priority needs of the local area (or that are proportional to the needs of an area).	The improved telecommunication provision will benefit all segments of society.
15	What measures will be taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Environmental awareness training was employed during the cable survey and will be provided to staff once cable laying commences. Furthermore, ASN is an internationally acclaimed cable laying company with stringent Health, Safety and Environment protocols.
16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
16.1	The number of temporary versus permanent jobs that will be created.	Job creation during the installation of the 2AFRICA/GERA (East) Cable System will be limited to temporary jobs during cable landing activities. The project is, however, expected to promote economic development within South Africa which could result in significant job opportunities (albeit not directly related to the project).
16.2	Will the labour available in the area be able to take up the job opportunities (i.e., do the required skills match the skills available in the area?).	Specific skills are required for the cable landing activities and, therefore, the use of local labour will be limited.
16.3	The distance from where labourers will have to travel.	N/A
16.4	The location of job opportunities versus the location of impacts (i.e., equitable distribution of costs and benefits).	The project will not result in any additional permanent local job opportunities directly related to the project.
16.5	The opportunity costs in terms of job creation (e.g., a mine might create 100 jobs but impact on 1,000 agricultural jobs, etc.).	Temporary jobs created during project implementation will not be at the expense of job losses in other sectors either directly or indirectly affected by the proposed development.

Ref #	Description	Comment
17	What measures will be taken to ensure:	
17.1	That there is inter-governmental coordination and harmonisation of policies, legislation and actions relating to the environment.	Local, provincial, and national Government departments will be consulted with the purpose of aligning requirements.
17.2	That actual or potential conflicts of interest between organs of state are resolved through conflict resolution procedures.	This is ongoing to achieve alignment between the three spheres of Government.
18	What measures will be taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The environmental authorisation process will be undertaken as per the prescribed environmental legislation and associated regulations. Impacts will be mitigated to ensure the long-term sustainability of the proposed development.
19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	It is the EAP's opinion that the proposed mitigation measures will be realistic and achievable. The decommissioning of the marine cable in 25 years' time is likely to require an impact assessment at the time.
20	What measures will be taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	These will be addressed in the EMPr, and the conditions of authorisation issued by the competent authority.
21	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), will result in the selection of the best practicable environmental option in terms of socio-economic considerations.	The preferred alternative (Alternative 1) is the best practicable option as it makes use of existing infrastructure on land and thus minimises environmental impacts. The proposed marine cable alignment as it nears Duynefontein, is located in proximity to existing alignments thereby minimising impacts on seabed and seabed users by limiting the "spread" of environmental impacts widely across the ocean floor.
22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	Various socio-economic impacts resulting from the proposed project are identified in the EIA report. They are both positive and negative and along with other existing or future cables in the area can have cumulative effects on the environment. The increasing number of cables landing on the west coast are excluding an increased surface area of the seabed to trawling, demersal long-lining and to the oil and gas industry. However, there are no negative cumulative impacts that have been identified as being of high significance.

4. PROJECT DESCRIPTION

This chapter describes the infrastructure and operational aspects of the 2AFRICA/GERA (East) Cable System (Duynefontein landing). The aim of this chapter is to enable readers to gain an understanding of how the cable system will be installed and maintained in order to understand the possible impacts the development may have on the receiving environment.

4.1 General description

The main 2AFRICA/GERA (East) cable trunk will be located approximately 200 to 500 km from the shoreline in international waters and will run down the East Coast of Africa as shown in Figure 1 (generally parallel to the coastline) and approach South African coastal waters from the north (i.e., from Mozambican waters) as shown in Figure 2. From the main cable, branches will run through exclusive economic zones and territorial waters to the landing sites in each country. The proposed Duynefontein landing site (Figure 3) in South Africa is the southern-most point of the cable (end station). It will make landfall near the ACE Cable landing point and takes into consideration existing cable systems landing in the area 8, known seabed conditions and the offshore trawling grounds.

The proposed 2AFRICA/GERA (East) landing in Duynefontein will include the installation and operation of the following project components:

- Pre-installation activities including cable route survey, route engineering, route clearance and Pre-Lay Grapnel Run.
- Laying and burial of the cable in the offshore environment within South Africa's EEZ from the border with Mozambique until it reaches the shore.
- Laying of the cable across the beach up to the position of the existing MTN BMH (requiring excavations within the intertidal zone to bury the cable before it will be anchored into the BMH) and installation of a sea earth system (System Earth).
- Laying and of the cable in the offshore environment, including cable burial at water depths less than 1,500 m.
- The laying of the cable within the shallow water environment is likely to involve a direct shore end operation where the shore end of the subsea cable is installed directly from the main subsea cable installation vessel and floated to the beach landing point using buoys and assisted by small boats and divers. It will then be buried in the seabed using the diver jet burial technique. The cable will be buried in sediment wherever possible, and the route will be adjusted to avoid obvious visible rock. The aim is to bury the cable to a target depth of up to 2 m where possible.
- Excavations within the intertidal zone are to bury the cable before it is anchored into a BMH, which is a concrete utility vault where the marine portion of the subsea cable is connected to the terrestrial portion. (Note the preferred Alternative will make use of use the existing ACE Cable System anchor block and ACE BMH)
- On the beach, the cable will be buried to a depth of 2 meters, substrate permitting.

Importantly, the preferred landing alternative (Alternative 1 - refer to Section 5.1), once installed to the ACE BMH, will incur no further disturbance to the terrestrial environment as it will share the ACE cable landing infrastructure operated by MTN including:

- Buried sleeves from the beach anchor point up to the BMH.
- The BMH.

[8] Currently SAT3; ACE, SAT-2, SAFE and the planned Equiano cable system.

- ❑ The onshore cable section between the BMH and the CLS.
- ❑ The CLS site in Duynefontein.

4.2 Marine components and installation methods

4.2.1 Marine Fibre Optic Cable

Offshore, the cable is laid by a purpose-built cable-laying ship. The unarmoured cable (Plate 1 and Plate 2) will rest on the seabed in deeper water (depths greater than 1,500 m), where the risk of inadvertent damage from human activities is negligible.

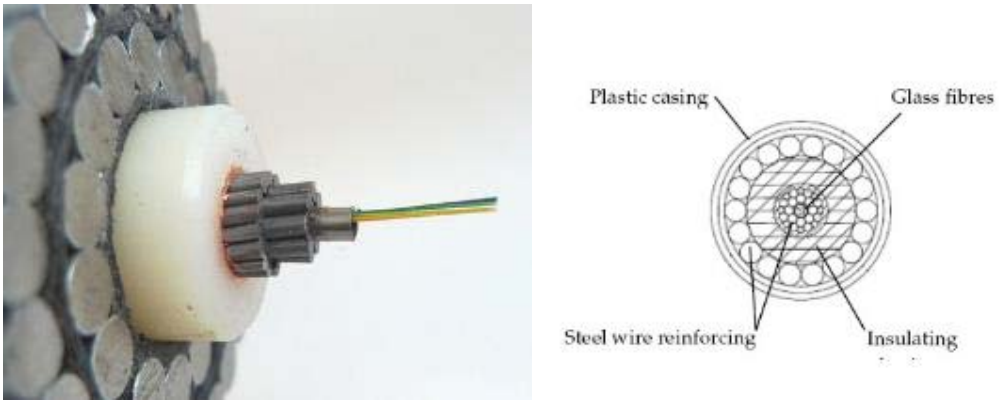


Plate 1 Cross section of a typical marine telecommunications cable

Plate 2 Cable armouring and operational depths

In shallower waters, at depths less than 1,500 m, the cable will be buried beneath the sandy seabed. This is typically achieved with the use of a specially designed plough which is submerged onto the seabed by the cable laying ship. The cable is then fed from the ship to the plough which effectively buries the cable to a depth of up to 2 m where conditions permit it. This burial is intended to provide protection to the cable from the hazards posed by ships' anchors, fishing trawls/lines and the like.

The diameters of the marine fibre optic cables range in size from 17 mm diameter (cables installed at a water depth of between 7,000 – 1,500 m) to a maximum of 50 mm diameter (rock armoured cable which is installed in shallow water depths (< 200 m). In shallow waters close to the beach (generally less than 10 m water depth) articulated pipes may be used to protect the armoured cable which have a diameter of 148 mm. These articulated pipes protect the cable and aid in cable burial due to their weight.

4.2.1.1 Repeaters

Repeaters are optical amplifiers that are installed along the length of the cable and are used to extend the reach of optical communications links by overcoming loss due to attenuation of the optical fibre (Plate 3). Repeaters will be installed at specific distances along the route making up the cable system.

Repeaters are designed to function continuously without maintenance for 25 years in depths of up to 8,000 m with no degradation in mechanical, electrical and optical performance. This requires a controlled ambient internal climate and a durable enclosure.

Internal atmosphere is controlled to 20% relative humidity over the operating temperature range by the hydrogen getters[9] and moisture absorbing desiccants[10]. The controlled internal gas atmosphere is suitable for maintaining the life expectations of all internal components.

The main structural component of the repeater housing is a monobloc tubular case fabricated from high tensile steel. The bulkhead and composite gland assembly provide full protection against water and gas ingress, either directly from the surrounding sea or from axial cable leakage due to a cable break close to the repeater.

The repeater housing is protected against corrosion with an organic electrically insulating barrier coating with additional mechanical reinforcement. This prevents seawater contact with the repeater housing steel surface and eliminates risk of metal wastage and galvanic corrosion and magneto-hydrodynamic effects that could generate hydrogen.

Repeaters are electrically powered. Voltage insulation is maintained between the internal unit and the repeater housing by two insulation paths: the polyethylene liner and the power conductor feeding through the gland assembly.

The repeaters will have the following specifications:

- The diameter of the rigid sea-case (white tube section in the photo) is approximately 270 mm.
- The length of the sea-case section of the repeater is approximately 980 mm.

[9] A "getter" is a deposit of reactive material placed inside a vacuum system to maintain the vacuum. Gas molecules striking the getter material combine with it chemically or by absorption, and the gas is removed from the evacuated space.

[10] A **desiccant** is a hygroscopic substance that is used to induce or sustain a state of dryness (desiccation) in its vicinity

- The total length of repeater is approximately 3,900 mm to 4,240 mm depending on cable coupling.
- The spacing between repeaters is approximately 75 km to 83 km, varying with the route plan.

Plate 3 Repeater

4.2.1.2 Branching units

Branching Units create junctions in submarine telecommunications cable systems so that the cable can be split to serve more than one destination.

4.2.2 Physical characteristics of fibre optic cables

4.2.2.1 External chemical properties of the cable

The external protection of the cable comprises a naturally occurring bitumen (asphalt) as a compound to adhere the outer polypropylene housing to the armour wires on the armoured shallow water cables. No form of additive to prevent biodegradation or anti-fouling is used in the cable's outermost layers. The other cable components in contact with the sea are the galvanized steel armour wires and the polyethylene sheath, which also contain no additives harmful to marine life (Heath; 2001).

4.2.2.2 Electrical Current

According to Heath (2001), optical fibre cables carry a constant dc[11] current of 1.6 Amps to feed power to the underwater repeaters. This current is fed along the copper clad steel inner conductor and depending on the length of the cable span it may require several thousands of volts to maintain it. In very approximate terms the cable resistance is about 1 Ohm per kilometre and the repeaters, spaced at 50 km, drop about 30 volts each.

[11] DC is direct current: the one directional or unidirectional flow electric charge.

Therefore, a cable spanning 4,000 km would have about 80 repeaters and require a power feed voltage of about 6,500 volts. It is normal practice to apply half this voltage at positive polarity to one end of the system and half the voltage at negative polarity to the other end to establish a zero-voltage point midway along the cable span. This reduces the level of voltage stress on the cable and repeaters.

There is no external electric field associated with the power on the inner conductor. The ratio of the conductivity of the polyethylene insulation to that of seawater means that the electric field remains only within the cable insulation.

4.2.2.3 Electromagnetic Fields (EMFs)

Electromagnetic fields (EMFs) are generated by current flow passing through cables and can be divided into electric fields (called E-fields, measured in volts per metre, V m^{-1}) and magnetic fields (called B-fields, measured in µT) (Taormina *et al*., 2018). The dc current in the inner conductor does set up a stationary magnetic field in the form of concentric rings emanating from the cable. The magnetizing force produced by this field diminishes with increasing radius from the cable. EMFs are generally effectively confined inside cables by armouring (Taormina et al., 2018). As referenced from Heath (2001), for a cable carrying 1.6 amps this means that the magnetic flux density due to the cable at a distance 1 metre away is 0.32 micro-Tesla. This is two orders of magnitude lower than the vertical component of the earth's magnetic field on the West Coast of the United States, which is about 43 micro-Tesla. This means that marine life forms would need to approach to within less than half an inch of the cable to detect its magnetic field above that of the earth.

4.2.2.4 Audible sound and frequency association with “toning”

Audible sound lies in the range 15 to 40,000 Hertz and neither coaxial nor optical cables emit this range, or any other frequencies, during their normal operation. During the laying of the cable, it does vibrate as a result of regular vortex shedding as it descends the water column. This is a low frequency phenomenon, at approximately 10 Hertz, is short lived and ceases when the cable comes to rest on the bottom.

The injection of a low frequency electrical signal from the land station is known as "toning". Toning is undertaken as an aid to cable location in the event of a fault on the cable or where other marine work is being conducted, which involves keeping a safe distance from the working cable. Toning works on the principle of a coaxial transmission line, formed by the inner conductor of the cable and the external armouring, providing a circuit for a low frequency signal.

At low frequency, a current applied to the inner conductor will propagate along the line, with its return path provided by a combination of the steel armour wires and the surrounding seawater. It is the proportion of current in the seawater, which enables electrodes trailed from a ship to detect the cable by locating the maximum level of the tone. During toning the level of the signal injected is usually around 160 mA at 25 Hz as the threshold level of detection on the ship electrodes is normally around 20 mA. The attenuation of the cables at low frequency is such that the tone injected at the terminal should be detectable across the length of the cable.

Toning is undertaken infrequently and is only really required prior to or during a repair operation on the cable. Toning is also undertaken during the installation of new cables, which have to cross or come close to the existing working cables. To increase safety margins in this situation, it helps the new installer to know the precise whereabouts of existing cables, which are mostly buried on the shelf area. Although toning is less effective in buried cables, it is much more reliable than visual or magnetometer detection in shallow water regions.

Toning has been used for many years on telegraph, coaxial, and optical fibre submarine cables throughout the world. From video evidence of ROV's tracking toned cables, the short-term presence of a low frequency, low level electric field in seawater does not appear to have any influence on the behaviour of fish.

4.2.2.5 Heat dissipation

When electric energy is transported, a certain amount is lost as heat by the Joule effect, leading to an increase in temperature at the cable surface and subsequent warming of the immediate surrounding environment (OSPAR, 2012). This is commonly referred to as thermal radiation. Thermal radiation in buried cables can warm the surrounding sediment in direct contact with a high voltage cable (Emeana *et al*., 2016). High voltage cables are used for transferring electricity related to offshore energy projects. Heat emission is higher in AC than DC cables at equal transmission rates (Taormina *et al*., 2018). According to Taormina *et al*. (2018), the impacts of local temperature increase caused by electric cables on benthic communities have rarely been examined and *in situ* investigations are lacking. They refer to this knowledge gap as preventing conclusions from being drawn about ecological impacts of long-lasting thermal radiation on ecosystems. They conclude that considering the narrowness of the corridor and the expected weakness of thermal radiation, impacts are not considered to be significant, referring to the need for new field measurements and experiments under operational conditions.

4.2.3 Marine Fibre Optic Cable Installation

Prior to the installation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) taking place, the following offshore marine investigations will be performed by a contractor appointed by ASN to install the cable system.

4.2.3.1 Cable Route Survey

The proposed cable route was surveyed by the project team to identify whether or not the substrate and topography of the ocean floor is suitable for the installation of the 2AFRICA/GERA (East) Cable System main trunk line and Duynefontein landing. The survey included the following activities:

- A geophysical survey of the deep water, shallow water, and inshore sections of each proposed cable route was undertaken. This included the establishment of bathymetric corridor widths of 500 m (inshore and up to a depth of 1,500 m). In deeper water this corridor extended up to three times the water depth centred on the proposed cable route.
- Conducting a side scan sonar and survey of a 500 m corridor width (inshore and up to a depth of 500 m) centred along the proposed cable route.
- Bottom samples taken at an average 10 km spacing in shallow water (less than 1,500 m in depth) (Sample sizes were approximately the size of a standard 10 l bucket).

- The cable route was surveyed using a multi-beam echo sounder (MBES) Swath Bathymetry system (the MBES equipment is integrated with the ship's surface navigation equipment (GPS)).
- Bathymetric data was processed using the onboard workstation with specialised software to verify the coverage and accuracy of the collected bathymetry data and to provide colour contour charts. These charts were used to review the proposed route and where necessary plan offset lines.
- In the shallow water sections, an integrated Side Scan Sonar and a Sub-bottom Profiler was used. These were housed in a device which was towed behind the ship to get to an optimum position close to the seabed. The position of this towed device was tracked acoustically using an ultra-short base line (USBL) tracking system.
- A burial assessment survey was undertaken from the shoreline up to a depth of 1,500 m to test the suitability of the substrate for cable burial. The survey included Cone Penetrometer Tests (CPTs) with an average of 1 CPT taken at 4 km intervals in planned burial areas.
- The landing sites for all cable segments were positioned utilising GPS and topographic surveying practices. (The in-shore survey vessels used a GPS navigation system).
- At each landing site, the survey of the shore approaches was supported where appropriate by a diver/swim team equipped with both video camera and bar probes. Any obstructions, potential hazards or engineering constraints to the submarine cable were located and fully documented.

4.2.3.2 Cable Route Clearance Operations

Prior to the installation of the 2AFRICA/GERA (East) Cable System, route clearance operations will be conducted along those sections of the route where burial is to be performed to ensure that, as far as practically possible, the burial operation will not be hindered by out of service cables or discarded fishing gear. This route clearance operation is typically called the Pre-Lay Grapnel Run (PLGR). The objective of the PLGR operation is the clearance of any seabed debris, for example wires or hawsers, fishing equipment etc., which may have been deposited along the route.

PLGR is undertaken by dragging grapnels (Plate 4) behind a ship along the proposed cable route in order to clear the route of debris. Different types of grapnels can be used depending on the seabed conditions (Gifford in rockier areas and Rennies and Flat Fish in softer sandy sediments). The PLGR operations are normally carried out by a vessel specifically fitted out with winches and grapnels, and capable of sustaining good slow speed positional control. The vessel will be equipped with navigation and positioning system to the same specification as the main lay vessel.

Any debris recovered during these operations will be discharged ashore on completion of the operations and disposed in accordance with local regulations. If any debris cannot be recovered, then a local re-route of the cable system will be planned to avoid the debris.

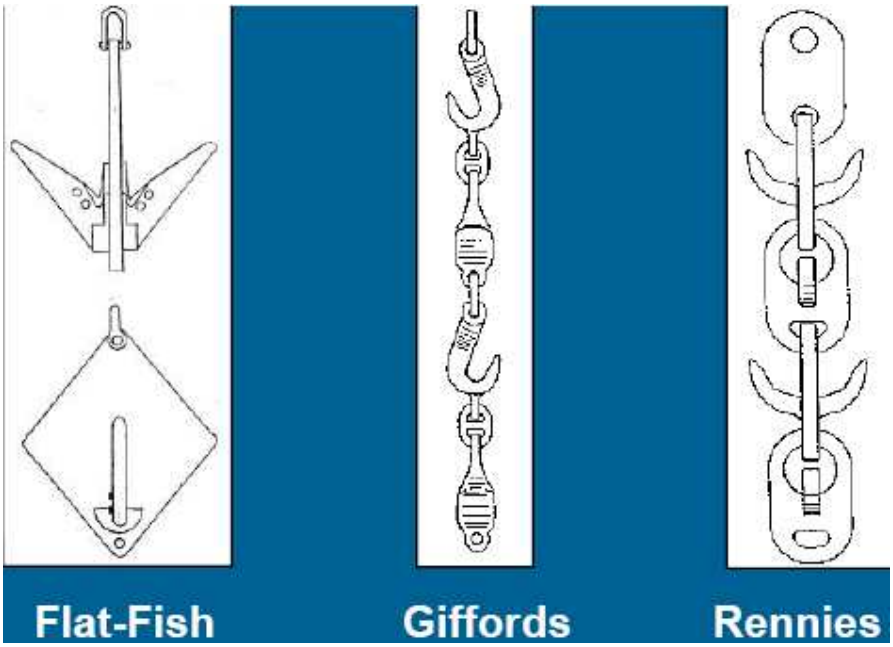


Plate 4 Types of grapnels used to clear the cable route of debris

4.2.3.3 Installation of the marine telecommunications cable

The 2AFRICA/GERA (East) Cable System will be installed using a purpose-built cable ship fully equipped with all the necessary equipment, tools and facilities to safely handle and install, join, test, and power the submerged plant, including simultaneous lay and plough burial. The vessel will have sufficient power and dynamic positioning capability to carry out the installation in the expected weather and current conditions. During cable laying an automatic log of all critical operational parameters will be kept including navigational data, speed, tension, slack, cable counter and plough data.

SURFACE LAYING OPERATIONS

Surface laying implies that the cable will be laid on the surface of the seabed. The objective is to install the cable as close as possible to the planned route with the correct amount of cable slack to enable the cable to conform to the contours of the seabed without loops or suspensions.

PLOUGH BURIAL OPERATIONS

The cable will be buried to a target depth as defined in the burial plan, and as determined by the cable route and burial assessment surveys. Burial depth will be controlled by adjusting the height of the plough's front skids. The depth of burial achieved will be continuously recorded by the plough and logged with the ship's data. In areas where plough burial is planned, the cable will be buried to a target depth of 2 m (Plate 5). The footprint of the cable trench is generally less than a 1 m in width with the plough skids having a width of less than 6 m.

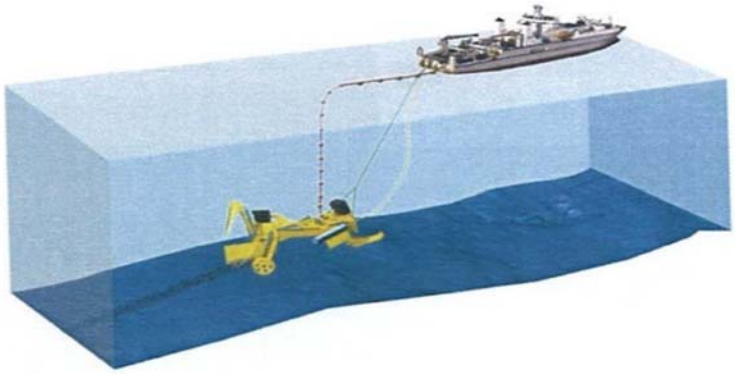


Plate 5 **Sea plough to be used to bury the cable along sections of the cable alignment from a depth of 15 m to 1,500 m where conditions permit burial**

CROSSING OF EXISTING SUBMARINE CABLES AND PIPELINES

For cable route planning, ASN uses the Global Marine Cable Database (Global Marine, 2019) augmented by ASN's own internal databases and Admiralty Charts (UKHO, 2019) to identify all known existing and proposed telecommunication and power cable systems that will be crossed by the 2AFRICA/GERA (East) Cable System. Where existing cables are crossed, the industry norm is to ensure that the crossing is undertaken using a similar type of cable, i.e., an armoured cable crosses an armoured cable, or an un-armoured cable crosses an un-armoured cable. Where seabed conditions allow, post lay cable burial using a Remote Operated Vehicle (ROV) can be performed to afford additional protection to the cables at the crossing point.

If the 2AFRICA/GERA (East) Cable System requires a pipeline crossing, ASN recommends the application of Uraduct (or similar product) (Plate 6) to the cable at the point of contact with the pipeline. Uraduct is a protection system designed and developed to protect subsea fiber optic cables, power cables, umbilical's, flexible flowlines, rigid flowlines, hoses and bundled products from abrasion and impact.

Generally, the length of Uraduct required for a pipeline crossing is 50 m each side of the crossing or quarter the water depth either side of the crossing. Mattressing[12] can also be used when crossing pipelines; however, this is not considered necessary for standard pipeline crossings but may be installed in special circumstances at the request of the pipeline operator. (There will be no such pipeline crossing in South African waters, but there are pipeline crossings in other parts of the system).

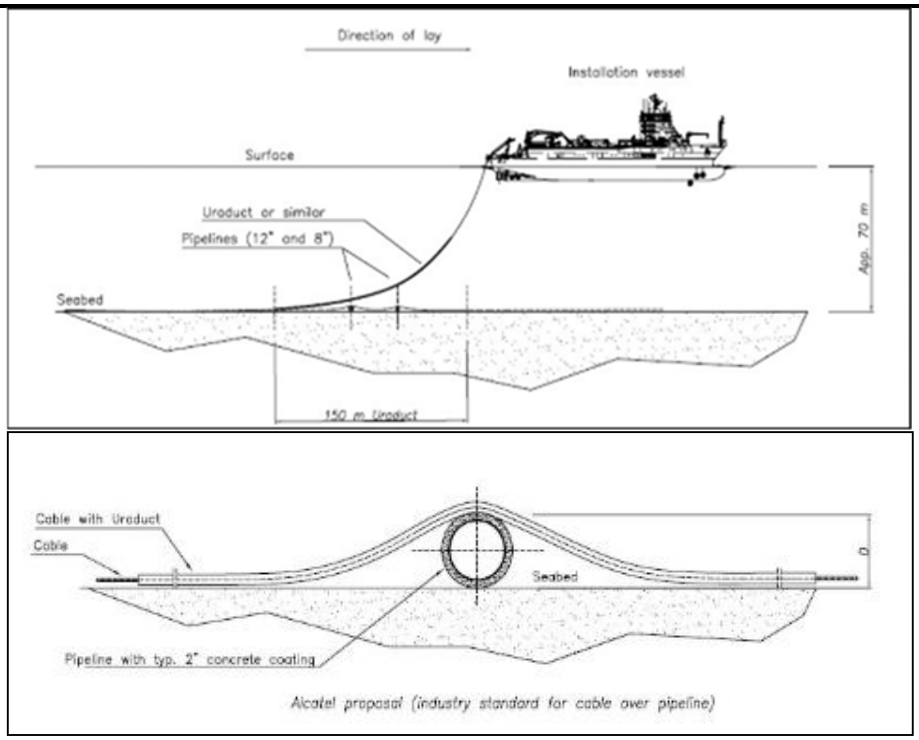


Plate 6 Example of a cable crossing using Uraduct or similar product (Source: ASN REH, 2019)

SHORE END OPERATIONS

Shore end operations refer to the installation of the cable through the shallow water near shore, through the intertidal zone and up onto the beach (Plate 7 and Plate 8). All shore end landings will be performed directly from the main cable installation vessel except where shallow water conditions require the use of a small shallow draft vessel or barge, usually mobilised specifically for the task, and equipped with cable tanks, cable engines, cable handling gear and a suitable cable burial device.

During cable landing near Van Riebeeckstrand Beach, the following activities will be performed by the appointed contractor:

- ❑ Preparation of a detailed operational plan based on the findings of the survey, with site visits as necessary.
- ❑ Provision of an advance party to establish the beach equipment and to prepare the beach, cordon off a working area to protect the public, etc.

[12] Generally, mattresses are made of high strength concrete segments linked together with a network of high strength polypropylene ropes to form a continuous flexible concrete barrier which is used to separate structures ensuring the protection of infrastructure.

- ❑ The marking of any existing in-service cables at the shore end location (with the assistance of the cable owners).
- ❑ Performance of the installation of the shore end section of the sea cable and support of the cable vessel activity.
- ❑ Installation of cable slack at the beach, as required.
- ❑ Installation of a cable loop in the beach manhole to facilitate re-terminations.
- ❑ Securing the cable in the beach manhole by means of an armour wire anchor clamp.
- ❑ Burial of the cable from the existing ACE beach anchor block to the Low Water Mark (LWM) to a depth of 2 m (or to bedrock, if reached sooner).
- ❑ This may also include installation and burial of the sea earth plate and earth cable (System Earth).
- ❑ All digging will start the day before the planned cable landing.
- ❑ Reinstatement of the beach to the required standards.
- ❑ All testing, reporting, and accurate as-built records.
- ❑ Articulated pipe, where required across the beach up to the existing ACE Cable system beach anchor block.

Plate 7 Landing of the cable on shore. Similar works will be undertaken for the landing of the 2AFRICA/GERA (East) Cable System

In the near shore zone (generally in waters less than 9m in depth) external protective measures such as articulated split pipes will be installed around the 2AFRICA/GERA (East) Cable to guard against cable damage due to the following:

- ❑ Surf zone wave action.
- ❑ Small vessel anchoring.
- ❑ Nearshore currents and tidal ebb and flow.

Using articulated pipe in the near shore environment increases cable protection against chafing by providing an additional physical barrier of protection against external forces. Articulated pipe (Plate 9) is usually made of cast iron and the additional weight it provides to the cable aids in stabilising the cable and in maintaining cable burial depth where that is possible. Standard practice is to apply articulated pipe to beyond the surf zone, however, at landings where burial may prove difficult, articulated pipe can be extended further offshore.

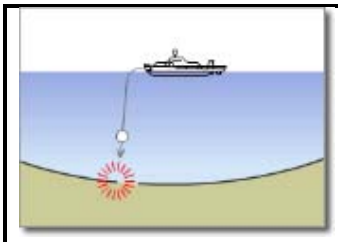
Plate 8 Bringing the cable to shore from the cable laying vessel. Cable is buoyed off and pulled to shore with smaller vessels

Plate 9 Articulated pipe sections which are installed around the cable in shallow water to offer additional protection

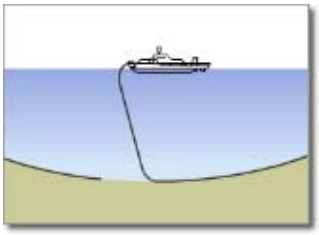
4.2.4 Post construction maintenance of the cable

Once installed, marine telecommunications cables generally require little to no maintenance if the cable is not damaged by natural disasters (underwater landslides, earthquakes, etc.) or through human activities (fishing trawlers, anchors, etc.). If the cable is damaged, a cable repair ship is dispatched to repair the cable fault (Plate 10), which usually entails the following:

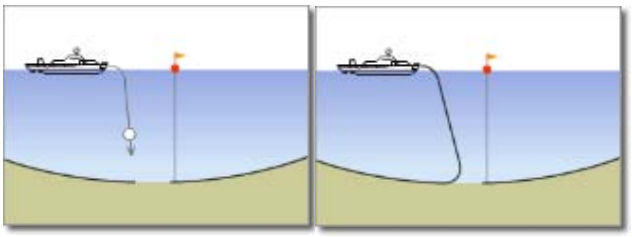
- ❑ Localization of the cable failure point and recovery of the failed cable section onto the ship.
- ❑ Cutting and removal of the cable failure section and then joining the recovered cable to the new cable section on board the ship.
- ❑ Testing of the cable followed by reburial of the cable on the exact same alignment.



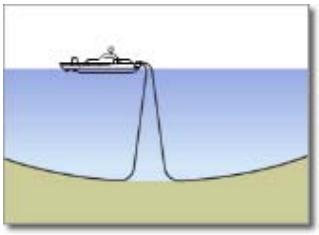
The cable ship is navigated to the location by a Differential GPS (DGPS). Once the fault is located, a cable cutting tool attached to the rope is paid out to the seabed. This tool and grapnel (Cable Catch) are then used to hook the cable before cutting the cable.



Once cut, the cable is recovered to the ship (Cable Recovery). Once on board the cable is tested to find the fault and that section of cable is removed. The cable is then waterproofed and dropped back to the sea floor attached to a buoy.



The same procedure is then carried out on the other section of cable still on the sea floor.



Once both sides of the fault have been repaired, the cables are once again bought up to the ship where a new section of cable is joined to the cable sections. Once completed the cable is placed back onto its original alignment and if necessary reburied.

Plate 10 Protocol for repairing cable faults to marine telecommunications cables (Source: http://www.k-kcs.co.jp/english/solutionRepairingMethod.html)

4.3 Terrestrial components and installation methods

4.3.1 Beach Manhole

A BMH is typically an underground chamber made of reinforced concrete, with the approximate dimensions: 3m (length) x 1.8 m (height) x 2m (width). It usually houses 4 cable ducts (two spare for future use). Once complete, the only visible sign of the structure is the manhole covers and cement roof slab which will cause minimal interference with vehicle movement or other activities.

Once the fibre optic cable has made landfall and been buried through the beach section of the cable alignment, it will be anchored to a BMH. Two options have been considered:

- The preferred option (Alternative 1) is to anchor at the existing ACE Cable System beach anchor block and link into the existing ACE BMH which is located on the edge of the residential area at Van Riebeeckstrand (see Figure 6).
- The second option (Alternative 2) is to land at a site located directly adjacent to Die Bad Road and south of Alternative 1 (as shown in Figure 3).

4.3.2 Cable ducting from BMH to CLS

The 2AFRICA cable will be accommodated within sleeves already installed for the ACE Cable System. These sleeves run from the ACE BMH to the existing CLS.

4.3.3 Cable Landing Station

A CLS is a building that functions as a control centre for the subsea cable system and where the system is connected to the domestic telecommunication network. The project will make use of the existing ACE CLS made available by MTN, situated approximately 1 km inland from the BMH (see Figure 3).

4.4 Existing services and project implementation

Construction and installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) on land will involve the following services/utilities/resources:

4.4.1 Construction camps

Given the small scale of the development on land, no construction camp will be required during construction. It is envisaged that the only infrastructure which will be erected during landing of the 2AFRICA/GERA (East) Cable System will be a temporary perimeter fence with lockable gates to ensure that no members of the public enter the construction site. The type of perimeter fence will be decided on following discussions with the City of Cape Town to conform with the city's current building regulations. Should material need to be stored on site, a lay-down area will be established within the parking area to the south of the access road to the BMH and will be fenced off in the same manner as the construction site.

The exact extent of the working area to be fenced off will be identified by the contractor, Resident Engineer (RE) and the City of Cape Town prior to construction (this will need to be identified with the assistance of the Environmental Control Officer (ECO) so that it does not infringe on sensitive areas). No construction workers will be accommodated at the construction or lay-down sites.

4.4.2 Water

Water for construction purposes will be sourced from the closest municipal supply point and tankered to site when required. Water use during construction is however very limited and would be primarily for the concrete works required for the construction of a BMH (not needed in the case of the preferred Alternative 1).

4.4.3 Sewage

Chemical toilets will be provided for construction workers. These chemical toilets will be routinely serviced by the appointed service providers and all waste will be disposed at a licensed waste treatment works within the area. Given the short construction period associated with this project, the impact associated with sewage is not expected to pose any significant risk.

4.4.4 Storm water

The proposed development should not have any impact on storm water once construction is completed. However, the appointed contractor will take cognisance that the City of Cape Town does have storm water structures within the project area and that these structures should be avoided during construction.

While trenching along the cable alignment across the beach and primary dune cordon is underway, stockpiles of sand will be located outside any storm water drains to prevent the wash away of material and siltation of downstream habitats. This is of relevance in the dune slack wetland, to where most of the stormwater from Van Riebeeckstrand is channelled.

4.4.5 Waste streams

Little waste is expected to be generated on site and waste will be limited to general litter, spoil from the trenching operations (where rubble or buried waste is unearthed) and material off cuts. It is envisaged that a skip will be hired for the duration of the construction period where all construction related waste will be stored and then disposed of by an appointed service provider. Hazardous and general waste must be stored separately and disposed of as per the current regulations.

4.4.6 Job creation and procurement

Specific skills are required for the cable landing activities and the land-based work will be of short duration. Therefore, for the landing, the use of unskilled, local labour will be limited. It is anticipated that 3 professional positions, 5 skilled and 10 unskilled positions will be made available for the installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Specific measures will be put in place to optimise job opportunities, specifically to ensure that local people are employed.

(Note, that during operation, the proposed project is not expected to create many jobs with the work force at the CLS comprising approximately 2 individuals).

South Africa has statutory requirements for the composition of a labour force and, to this end, MTN will ensure that its appointed contractors adhere (comprising a balance between genders, youth, elderly and disabled persons) to these requirements. MTN will be guided by the provisions of the Labour Relations Act, the Basic Conditions of Employment Act, the Skills Development Act and the Employment Equity Act (and all relevant Regulations published under these Acts).

4.4.7 Anticipated construction dates and programme

It is anticipated that construction of all infrastructure required for the landing of the 2AFRICA/GERA (East) Cable System (preferred alternative) will not take longer than 3-4 months to complete including the offshore cable installation.

The landing of the cable is entirely dependent on receiving a positive Environmental Authorisation which will be issued by the Department of Environment, Forestry and Fisheries. Only once the environmental authorisation process is nearing its completion will the project proponent be able to realistically set dates for project implementation. MTN is hoping to have the 2AFRICA/GERA (East) Cable System (Duynefontein landing) installed by mid-2022.

4.4.8 Decommissioning

Submarine Cables are designed to have a lifespan of 25 years. Decommissioning of the of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) in the near future is unlikely given the current growth in the telecommunications sector within South Africa. If, and when, decommissioning takes place, all activities would be subject to legislation relevant at the time.

5 PROJECT ALTERNATIVES

Alternatives are different means of achieving the purpose and need of a proposed development and include alternative sites, layouts or designs, technologies and the “no development” or “no go” alternative. This chapter describes the various alternatives applicable to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

5.1 Proposed landing site alternatives

Two potential shore landing points have been considered (detailed below). Both alternatives will make use of the existing CLS building in Duynefontein. Both alternatives have been assessed by the specialists appointed for the Impact Assessment (Chapter 9). The identification of impacts and motivation for a preferred alternative for implementation, are discussed in Chapter 10.

5.1.1 Landing Site Alternative 1 (preferred)

Alternative 1 is the Van Riebeeckstrand landing point at the existing ACE Cable System landing point (see Figure 3 and Figure 6). It is located along the northern section of Van Riebeeckstrand beach, close to the Safety Exclusion Zone of the Koeberg Nuclear Power Plant, which is approximately 1.7 km further north (Figure 7). Access to the site is from Dunker Street and then along the maintenance road which is used by the City of Cape Town when cleaning out the stormwater drains located behind the primary dune cordon.

Feature	GPS Co-ordinates (approx.)
ACE BMH (Alternative 1)	33°41.666’ S; 18° 26.387’ E
Landing Point Alternative 1	33° 41.722'S; 18° 26.237'E

From the ACE BMH, the 2AFRICA cable will be accommodated within existing sleeves that run from the BMH to the MTN CLS site in Duynefontein (approximately 1.3 km in length). No excavations or unnecessary disturbance of surrounding vegetation or infrastructure will, therefore, be incurred.

Vehicle access to the beach will be along an existing beach access ramp which is located near the Melkbosstrand Beach parking area to the north of the Sout River (33°42'46.54"S and 18°26'39.27"E). The City of Cape Town currently uses this beach access ramp for TLB's and tractors to access the beach for cleaning operations and for the maintenance of storm water drains which have outlets further north on the Van Riebeeckstrand Beach

5.1.2 Landing Site Alternative 2

Alternative 2 is the Van Riebeeckstrand landing point to the south of Alternative 1. It will require construction of a new BMH and a short section of new ducting (see Figure 3). It is situated directly in front of the access track used by the City of Cape Town for storm water maintenance (which runs from Die Bad Road towards the beach).

Feature	GPS Co-ordinates (approx.)
Proposed BMH Alternative 2	33°41'49.52 S; 18°26'26.85 E
Landing Point Alternative 2	33°41.825′ S; 18°26.448 ′E

From the new Alternative 2 BMH, a new front haul trench along Die Bad Road will have to be constructed (see red line in Figure 3) to tie the cable into the existing ACE BMH and front haul route. The trenching activities for this section of front haul will result in disturbance to natural vegetation along Die Bad Road. From the ACE BMH, the cable will then be accommodated within existing sleeves that run from the ACE BMH to the CLS site in Duynefontein.

5.2 Proposed marine cable alignment alternatives

To reduce impacts on seabed user groups (fishing, trawling, offshore exploration and mining, etc.) the current and planned future cable landings tend to follow very similar alignments once reaching water depths of 1,000 m and less. These “cable corridors” have been selected to reduce the risks to other user groups as well as to capitalise on the seabed conditions required for the safe installation and longevity of the marine telecommunications cables.

Only one marine cable alignment is being considered for the 2AFRICA/GERA (East) Cable System (Duynefontein landing) and has been identified based on a combination of engineering, environmental and economic factors. As shown in Figure 2, the main cable trunk extends from the South Africa/Mozambique EEZ boundary in the northeast and circumnavigates coastline to land at Duynefontein on the southwest side of South Africa’s coastline[13]. As shown in Figure 8, the final section of cable will align with the SAFE cable coming from the south before aligning closely with the ACE cable in shallower waters before landing at the ACE BMH at Van Riebeeckstrand.

5.3 Technology alternatives

Although there are a few available telecommunication mechanisms used world-wide and in South Africa, the scale of customer demand and expectation of ever faster data transfer have made many of these inadequate or obsolete. Radio has largely been phased out due to restricted bandwidth and poor data transmission. Currently, Africa relies primarily on satellites with few submarine cables to provide its international communications. Satellite and microwave transmissions are unable to offer the capacity required for South Africa and other African countries to remain part of the global community in terms of communication services.

Within South Africa, fibre optic networks are currently the only available technology that are able to transmit sufficiently high volumes of voice and data traffic, with higher security, reliability and at a lower cost. This is the current preferred technology for meeting demand for data and voice transmission on a global scale and is one of the main reasons why the 2AFRICA (East) Cable System is based on a fibre optic network.

13 Note that the branch cables for other landings along the length of the main trunk are dealt with under separate applications for environmental authorisation.

Figure 6 **Preferred Landing Site (Alternative 1) and position of the existing ACE Anchor Block and BMH. (Part of the required trenching for Alternative 2 is also shown).**

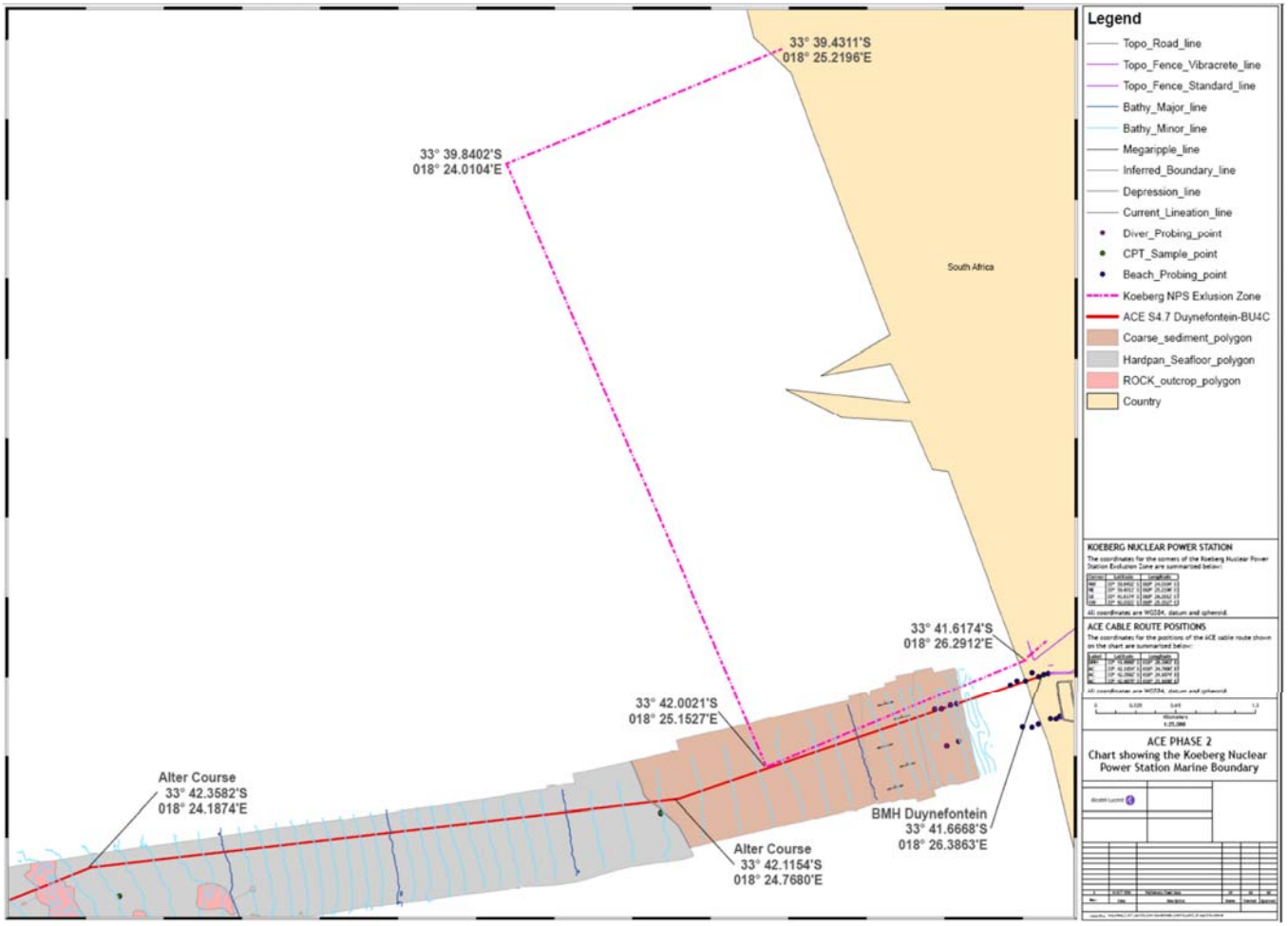


Figure 7 Koeberg Safety 2 km exclusion zone in relation to the ACE Cable alignment and BMH

5.4 Operational alternatives

The timing from a tourism and recreational perspective of the construction required on the beach, will need to be taken into consideration as soon as the project's timing is determined.

The timing in relation to seasonal whale migration patterns will also need to be taken into account.

5.5 No development alternative

In the context of the proposed development, the No-Go alternative would involve MTN not landing and installing the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Although impacts on the marine and terrestrial environments would be avoided entirely, the benefits from the proposed submarine telecommunication cable, in line with the country's development goals, would not be realised. This needs to be understood in the context that access to affordable international bandwidth is widely recognised as being key to economic development in every country.

Africa relies primarily on satellites (with few submarine cables) to provide its international communications. Communication via submarine telecommunications cables generally allows for lower cost, better performance, and greater capacity (throughput) than that available via satellites. If the No-Go alternative is selected, MTN and South Africa as a whole, would miss an opportunity to unlock economic development within the country. In addition, should the No-Go alternative be selected, it would mean that MTN would be unable to increase their supply of international fibre-optic bandwidth and they will be unable to facilitate more affordable and effective transport of voice, data, Internet and television services to South Africa's population.

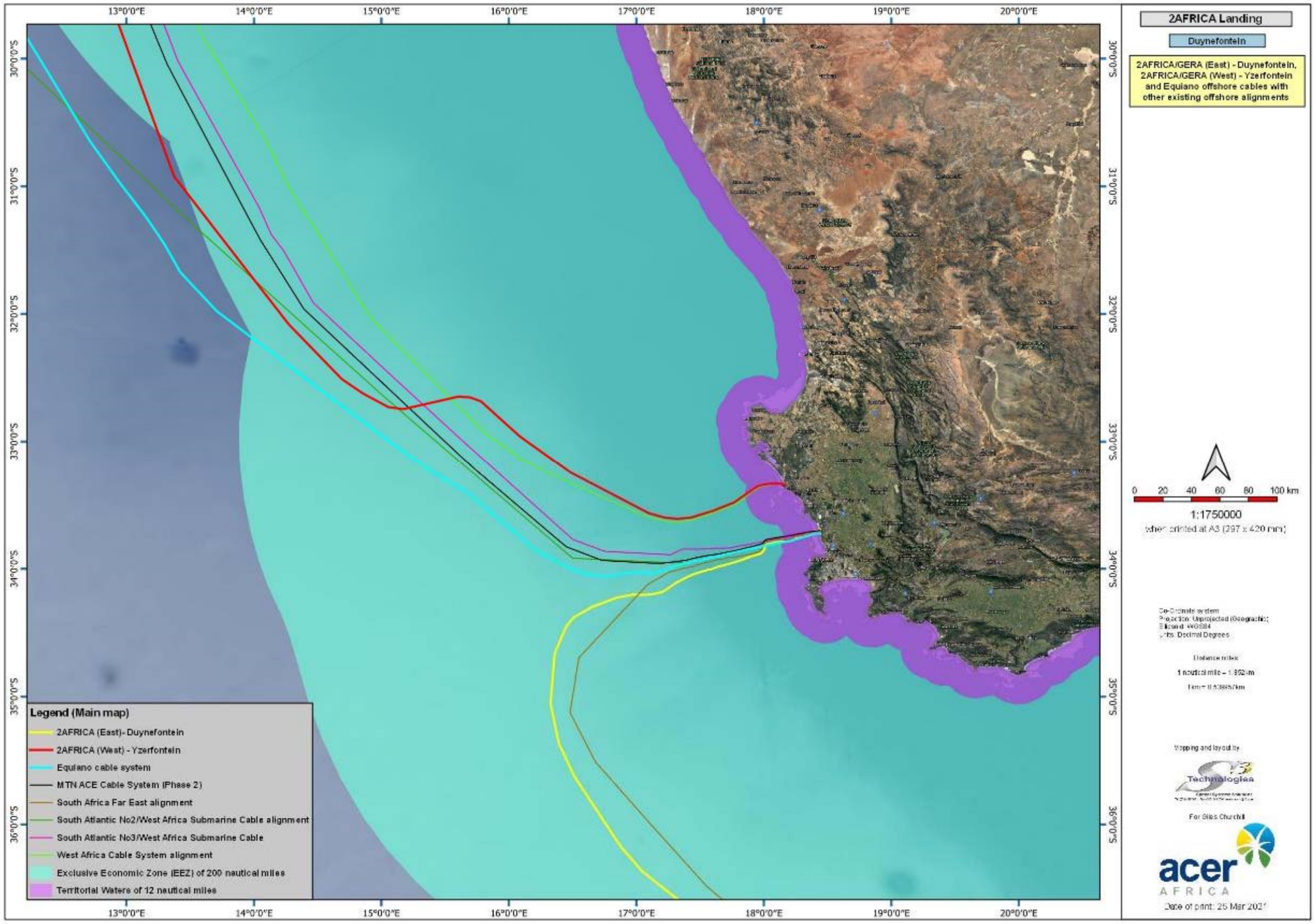


Figure 8 Map indicating other existing subsea cables in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

A broad description of the receiving environment was provided in the Scoping Report for the 2AFRICA/GERA (East) Cable System (Duynefontein landing). Where applicable, further detailed information is provided in this section, most of it sourced directly from the specialist reports contained in Appendix B, unless otherwise cited. Note that the primary literature references for the information presented in this section can be found in the corresponding specialist reports and have not been cited here.

6.1 Marine and offshore environment

The descriptions of the physical and biological environments along the South African Coast focus primarily on the area between St Helena Bay and Cape Town, where the cable will cross onto the continental shelf and make landfall. Descriptions of the physical and biological environments along the cable route along the East and South Coasts are generic only, as information on the biotic components of the deep ocean beyond the shelf break is largely unknown. The purpose of this environmental description is to provide the marine baseline environmental context within which the proposed subsea cable will be installed.

6.1.1 Geophysical characteristics -Bathymetry and seabed geomorphology

A detailed description of the bathymetry, seabed geomorphology and sediments along the east, south and west coasts of South Africa is provided in the marine ecology specialist report (Pisces, 2021, contained in Appendix B).

The 2AFRICA/GERA (East) main trunk cable (Duynefontein landing) runs well seawards of the continental shelf, and the alignment generally follows the gentlest topography. As illustrated in Figure 9, the orientation of South Africa's east coastline is relatively uniform, and north-northeast trending. Along the East Coast, the bathymetry is characterised by a very narrow shelf, which widens in the region of Algoa Bay. Whereas the East Coast is primarily linear, the coastline of the South Coast is characterised by a number of capes separated by sheltered sandy embayments. Along the West Coast, the continental shelf is generally wide and deep, although large variations in both depth and width occur. The shelf maintains a general north-northwest trend, widening north of Cape Columbine and reaching its widest (180 km) off the Orange River. Numerous topographical features including submarine canyons, ridges and seamounts occur along the South African coastline.

On the West Coast in the region of the Duynefontein cable landing, the immediate nearshore area consists mainly of a narrow (about 8 km wide) rugged rocky zone and slopes steeply seawards to a depth of around 80 m. The middle and outer shelf normally lacks relief and slopes gently seawards reaching the shelf break at a depth of ~300 m. Underwater features in the general project area include the Cape Canyon and Cape Valley (see Figure 9). The cable route crosses the base of the Cape Canyon but lies some 100 km north of the Cape Valley.

Detailed descriptions of the seabed geomorphology along the cable route are also provided in the cable survey reports Fugro (2020a, 2020b, 2020c). These reports emphasize the diversity of seabed sediments and features often over small spatial scales and at great depths.

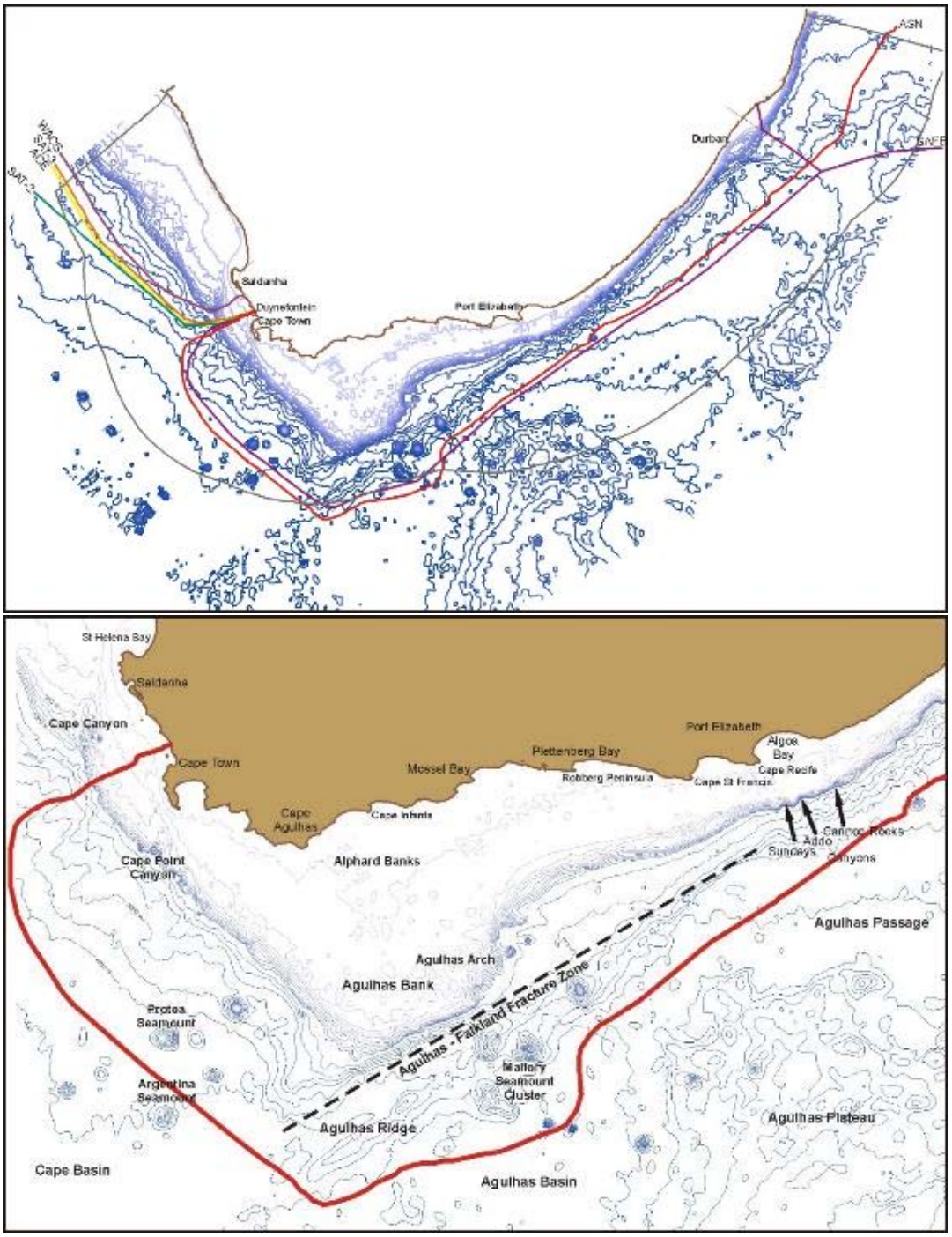


Figure 9 **Map indicating proposed route of the 2AFRICA/GERA (East) Cable System in relation to other existing subsea cables and bathymetric features off the South African coast (top). Specific bathymetric features off the south coast in relation to the cable routing are shown (bottom)**

6.1.2 Biophysical Characteristics

6.1.2.1 Large scale circulation and coastal currents

The oceanographic regime around South Africa is dominated by two major current systems: the cold Benguela Current along the Atlantic coast to the west and the warm Agulhas Current along the Indian Ocean coast to the east (Figure 10). On the west coast, the Benguela Current has two main components, namely the eastern limb of the South Atlantic Subtropical Gyre which has a broad, sluggish, equator ward flow of only 0.1–0.3 m s^{-1} and inshore of this, a coastal component which exhibits dynamic wind-driven upwelling. The inshore coastal component is mainly driven by local weather systems, resulting in short-term upwelling cycles with a periodicity of 5–10 days. Offshore, mean monthly sea surface temperatures range from 15.4°C to 20.1°C, but in the near shore upwelling region, variability is greater, and temperatures range from 10°C to 18°C. These upwelling events along the west coast bring nutrient rich waters which result in high biological productivity, which in turn supports large fish stocks, including pilchard, anchovy, hake, and rock lobster, each forming the basis for lucrative commercial fisheries.

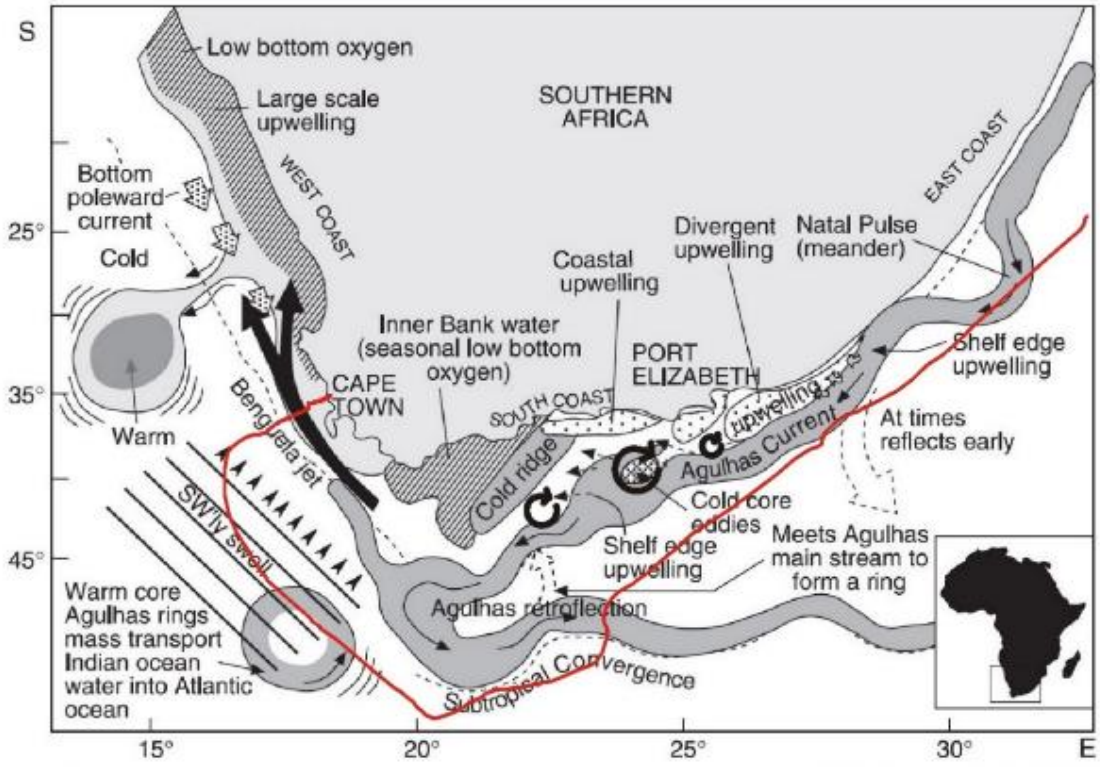


Figure 10 The proposed 2AFRICA/GERA (East) Cable route (red line) in relation to the major circulatory elements along the South Coast

The southern African West Coast is strongly influenced by the Benguela Current. On its western side, flow is more transient and characterised by large eddies shed from the retroflection of the Agulhas Current, resulting in considerable variation in current speed and direction over the area. In the south, the Benguela current has a width of 200 km, widening rapidly northwards to 750 km. Current speeds decrease with depth, while directions rotate from predominantly north-westerly at the surface to south-easterly near the seabed. Near bottom shelf flow is mainly poleward, with low velocities of typically <5 cm/s.

On the East Coast of South Africa, the Agulhas Current dominates, flowing along the edge of the continental shelf at a rapid rate (surface speed of 1-1.5 m.sec^{-1} in the core) in a generally south-west direction. Four current regions can be identified at the surface, namely:

- The inshore region comprising relatively cool, low velocity water over the continental shelf.
- The western boundary of the current consisting of a region of intense horizontal shear and a fairly strong temperature gradient (1°C to 20°C in 10 km).
- The current core where the water velocity exceeds 1 m/s. The temperature of the Agulhas core ranges from about 22 °C in August to 27°C in March.
- The eastern boundary of the current comprising weak gradients beyond the core region, where both water velocity and temperatures decrease gradually with distance from the coast.

6.1.2.2 Wind and swell patterns

The main wind axis off the East Coast of South Africa is parallel to the coastline, with north-north-easterly and south-south-westerly winds predominating for most of the year and with average wind speeds around 2.5 m/s. In the sea areas off Durban, the majority of swells (which can attain up to >7 m) are from the South and South-southwest. Less regular weather patterns can result in swells >10 m.

Along the South Coast, 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 Agulhas, Infanta, Cape Seal, Robberg and Cape Recife (Jury & Diab 1989). Calm periods are most common in autumn. On the South 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 wave regime along the southern African West coast shows only moderate seasonal variation in direction, with virtually all swells throughout the year coming from the south and south-south-west. Winter swells typically exceed 2 m in height, averaging about 3 m, and often attaining over 5 m in height. These swells can reach up to 10 m in height when combined with wind speeds capable of reaching 100 km/h during heavy winter south-westerly storms. Summer swells tend to be smaller on average, typically around 2 m.

Focusing specifically on the wave regime and exposure ratings at the proposed landing site at Duynefontein, like most of the southern African West Coast, the coastline at the shore crossing is classified as exposed, experiencing strong wave action, rating between 13-17 on the 20-point exposure scale. Much of the coastline is impacted by heavy south-westerly swells generated in the roaring forties, as well as significant sea waves generated locally by the prevailing moderate to strong southerly winds characteristic of the region. The peak wave energy periods fall in the range 9.7 – 15.5 seconds.

In common with the rest of the southern African coast, tides are semi-diurnal, with a total range of some 1.5 m at spring tide, but only 0.6 m during neap tide periods.

6.1.2.3 Upwelling and Plankton Production

The west coast of Southern Africa is characterised by upwelling events where comparatively nutrient-poor surface waters are displaced by enriched deep water, supporting substantial seasonal primary phytoplankton production. The cold, upwelled water is rich in inorganic nutrients, the major contributors being various forms of nitrates, phosphates, and silicates.

The Benguela upwelling region is an area of particularly high natural productivity, with extremely high seasonal production of phytoplankton and zooplankton. These plankton blooms in turn serve as the basis for a rich food chain up through pelagic baitfish (anchovy, pilchard, round-herring and others), to predatory fish (snoek), mammals (primarily seals and dolphins) and seabirds (jackass penguins, cormorants, pelicans, terns and others).

6.1.3 The biological environment

6.1.3.1 Overview of ecoregions, ecosystems and habitat types encountered by the 2AFRICA/GERA (East) Cable System (Duynefontein landing)

Biogeographically, the 2AFRICA/GERA (East) Cable System will traverse the Southern Benguela, South-eastern Atlantic Deep Ocean and Southwest Indian Deep Ocean Ecoregions (Sink *et al.,* 2019). The cable will largely be located beyond the shelf break in over 2,000 m of water. The seabed communities in the project area lie within the Southwestern Cape photic, sub-photic and continental slope bioregion, which extend from the shore to the shelf edge. Where the cable passes from the upper and lower continental slope and abyssal deep sea, it lies within the Atlantic Offshore, Indo-Pacific Offshore, West Indian Offshore and Southwest Indian Offshore bioregions.

The benthic habitats of South Africa were mapped as part of the 2018 National Biodiversity Assessment and subsequently the benthic ecosystem types were assigned an ecosystem threat status based on their level of protection. Although most of the cable route falls within offshore habitats considered of ‘least concern’, the cable does pass through portions of the inner and outer continental shelf on the West Coast rated as ‘vulnerable’. The proposed routing, however, avoids the ‘endangered’ habitat types associated with the Cape Upper Canyon and Robben Island.

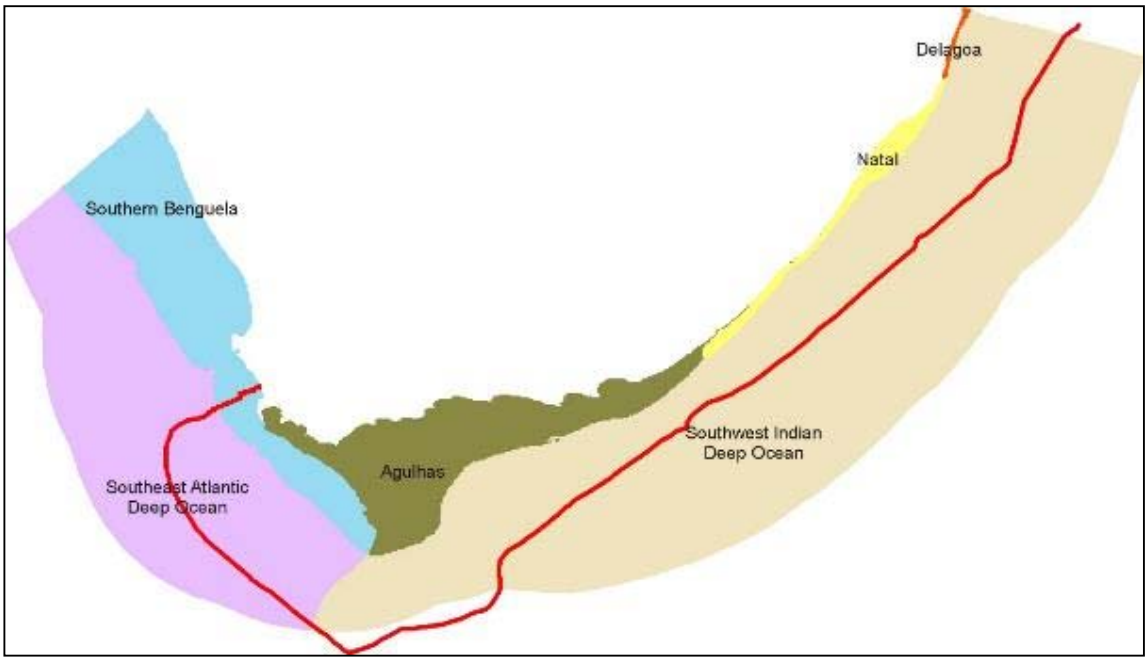


Figure 11 The South African inshore and offshore ecoregions in relation to the proposed 2AFRICA/GERA (East) Cable route (red line) (adapted from Sink *et al*., 2019)

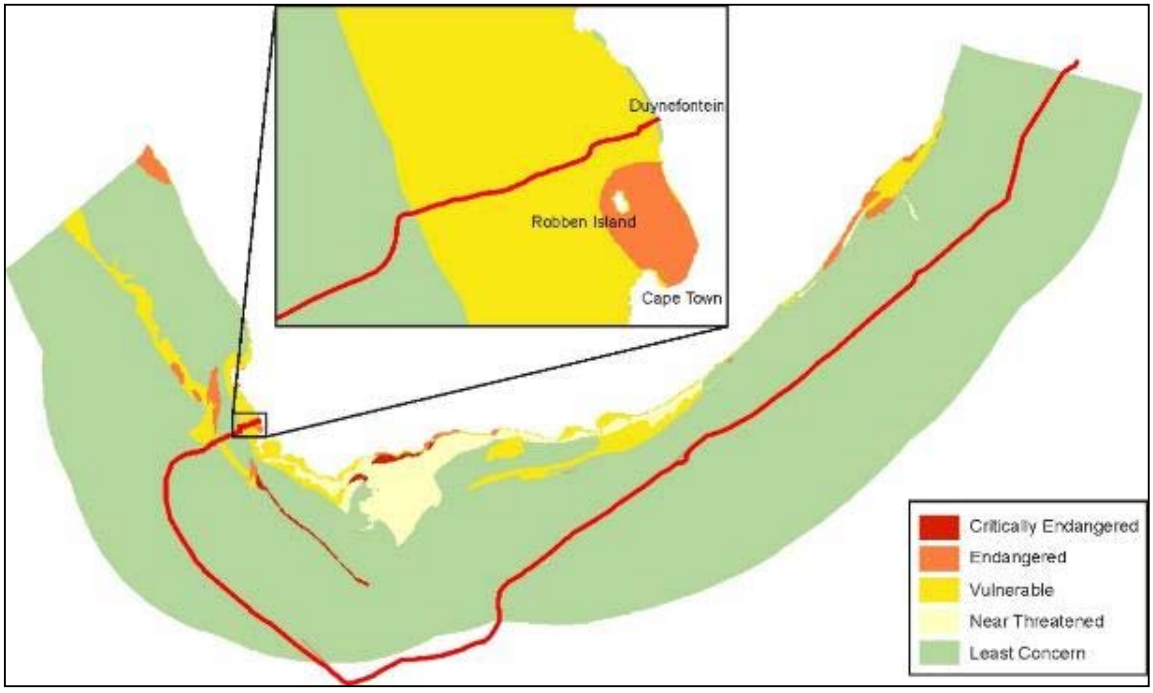


Figure 12 Ecosystem threat status for coastal and offshore benthic habitat types on the South African West Coast in relation to the proposed 2AFRICA/GERA (East) Cable route (red line) (adapted from Sink *et al*., 2019). Insert shows details of the shore crossing

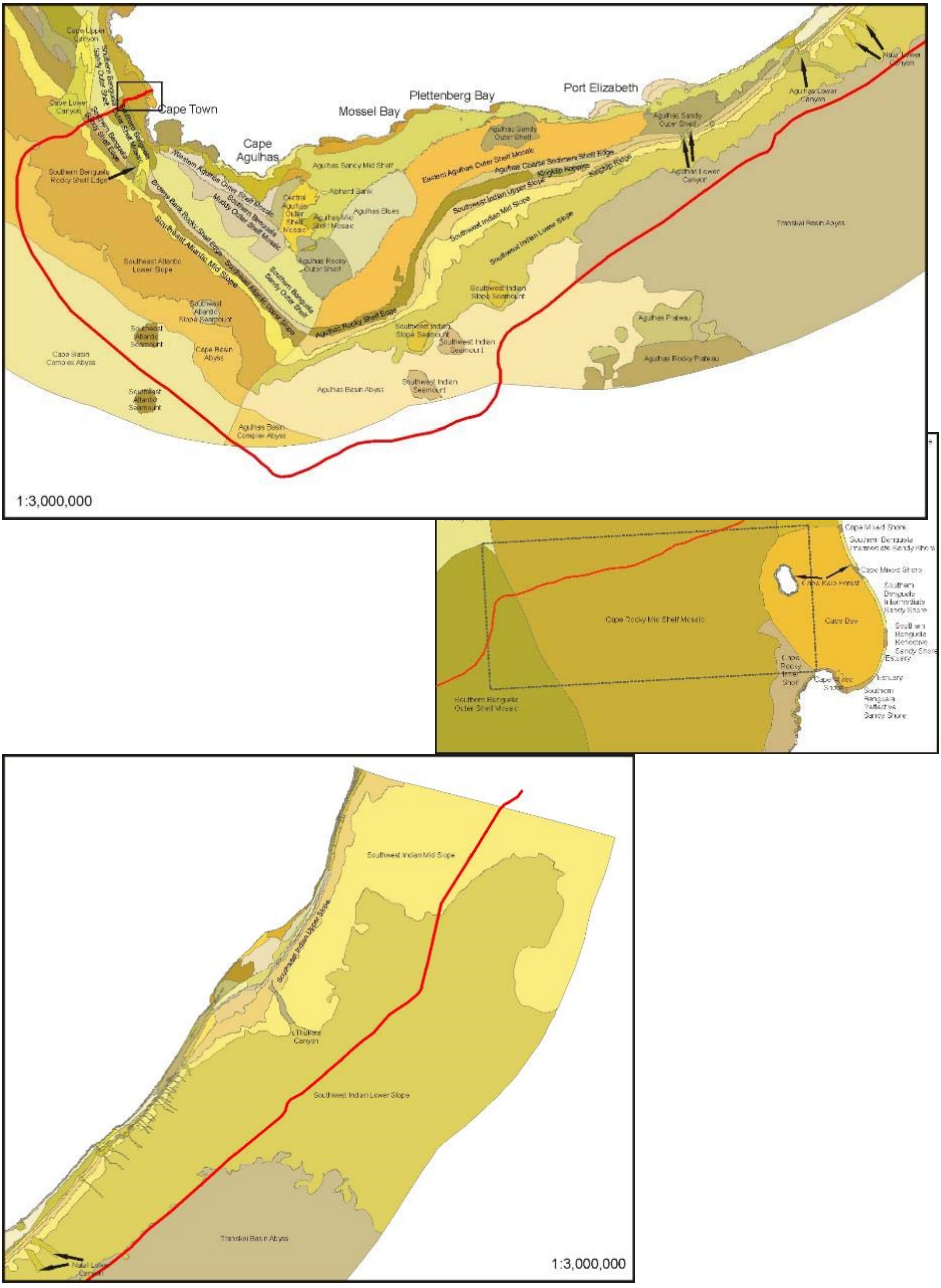


Figure 13 **Offshore and coastal ecoregions in relation to the proposed 2AFRICA/GERA (East) (Duynefontein landing) route (red line) (adapted from Sink *et al.,* 2019). Note: only offshore ecoregions have been labelled. Those inshore habitats affected by the shore crossing are detailed in the insert (bottom). The boundary of the Robben Island MPA is also shown**

As the benthic fauna of the outer shelf and continental slope (beyond ~450 m depth) are very poorly known, this description of the biological communities focuses primarily on those in the Southern Benguela ecoregion, where the cable crosses the continental shelf to land at Duynefontein. Where information on the larger pelagic species is available from along the entire cable route, this is provided.

The biota of nearshore marine habitats on the West Coast are relatively robust, being naturally adapted to an extremely dynamic environment where biophysical disturbances are commonplace. Communities within this region are largely ubiquitous, particular only to substrate type (i.e., hard vs. soft bottom), exposure to wave action, or water depth.

Habitats specific to the study area include:

- Sandy intertidal and subtidal substrates.
- Intertidal rocky shores and subtidal reefs.
- The water body.

The biological communities consist of many hundreds of species, often displaying considerable temporal and spatial variability (even at small scales). No rare or endangered species have been recorded. The biological communities 'typical' of these habitats are described briefly below, focussing both on dominant, commercially important and conspicuous species, as well as potentially threatened or sensitive species, which may be affected by the proposed 2AFRICA/GERA (East) Cable System routing.

6.1.3.2 Sandy substrate habitats and biota

The benthic biota of soft bottom substrates constitutes invertebrates that live on, or burrow within, the sediments, and are generally divided into megafauna (>10 cm), macrofauna (animals >1 mm) and meiofauna (<1 mm).

INTERTIDAL SANDY BEACHES

The coastline between Cape Town and Saldanha Bay is dominated by sandy shores, although isolated rocky headlands occur. Sandy beaches are one of the most dynamic coastal environments. With the exception of a few beaches in large bay systems, the beaches along the South African west coast are typically highly exposed. Exposed sandy shores consist of coupled surf-zone, beach and dune systems, which together form the active littoral sand transport zone. The composition of their faunal communities is largely dependent on the interaction of wave energy, beach slope and sand particle size, which is termed beach morphodynamics. Three morphodynamic beach types are described: dissipative, reflective and intermediate beaches (McLachlan *et al.,* 1993). Generally, dissipative beaches are relatively wide and flat with fine sands and low wave energy, and usually harbour the richest intertidal faunal communities. According to the 2018 National Biodiversity Assessment, the beach at Duynefontein is classified as dissipative. The landing site is characterised by a gently sloping beach of ~80 m width (Fugro 2020a).

NEARSHORE AND OFFSHORE UNCONSOLIDATED HABITATS

To date, very few areas on the continental slope off the west coast have been biologically surveyed. Although sediment distribution studies suggest that the outer shelf is characterised by unconsolidated sediments, recent surveys conducted between 180 m and 480 m depth revealed high proportions of hard ground rather than unconsolidated sediment. A detailed description of currently known macro-infauna communities in areas on the continental shelf is provided in the marine ecology specialist report.

The invertebrate macrofauna are important in the marine benthic environment as they influence major ecological processes and serve as an important food source for commercially valuable fish species and other higher order consumers.

Also associated with soft-bottom substrates are demersal communities that comprise epifauna and bottom-dwelling vertebrate species, many of which are dependent on the invertebrate benthic macrofauna as a food source.

6.1.3.3 Rocky substrate habitats and biota

The biological communities of rocky intertidal and subtidal reefs are generally ubiquitous throughout the southern African west coast region, being particular only to wave exposure, turbulence and/or depth zone. A detailed description of these rocky substrate habitats and associated biota may be found in the marine specialist report, including intertidal rocky shores, rocky subtidal habitat and kelp beds, deep water coral communities and Vulnerable Marine Ecosystems.

It can be noted, however, that the beach at Duynefontein is sandy and intertidal rocky shores and kelp beds will not be directly encountered where the proposed marine cable comes ashore. Figure 13 (middle) shows the location of nearby kelp beds/forests. The cable route survey report (Fugro, 2020a) indicates that the cable can be buried along most of its length up to 1,500m depths. Although it does indicate the presence of rock (boulders) within target burial depth offshore, no presence of coral reef or sea grass was observed (Fugro, 2020a).

6.1.3.4 The Water Body

MARINE FAUNA

The marine environment off the south-Western coast of Africa with its nutrient rich waters supports large populations of pelagic[14], mid-water and demersal[15] fish species as well and high numbers of bird and mammalian predators. While a comprehensive description is provided in the marine ecology report, a summary is provided below.

Fish species

Of relevance to the proposed 2AFRICA/GERA (East) Cable System are the fish stocks occurring within oceans surrounding the proposed cable route and the fishing industry which targets these fish species. These include the following commercially targeted species shown in Plate 11 and Plate 12:

Pelagic species (Plate 11)

- Pilchard (*Sardinops occelata*).
- Anchovy (Family Engraulidae).

[14] Pelagic species live and feed in the water column.
[15] Demersal fish are those that live and feed on or near the seabed.

- ❑ Snoek (*Thyrsites atun*).
- ❑ Chub mackerel (*Scomber japonicus*).
- ❑ Yellowtail (*Seriola lalandi/rivoliana*).
- ❑ Tuna (numerous species).

Demersal species (Plate 12)

- ❑ Hake (*Merluccius paradoxus/capensis*).
- ❑ Kingklip (*Genypterus capensis).*
- ❑ Monkfish (*Lophius americanus*).

Marine Mammals (West Coast of South Africa)

There are a number of marine mammals which occur on the West Coast of South Africa and within the project area, including the Cape Fur Seal; three dolphin species, namely the common, bottlenose and Heaviside's dolphins (Plate 13). Of the whale species known to occur on the West Coast of South Africa, the most common are the southern right whale and humpback whale (Plate 13). Whales are generally observed in the waters off Duynefontein and Yzerfontein between June and December when groups of between 8-10 whales are often observed. During this period, the cows calve in the calm coastal waters along the coastline.

Comments received from DFFE - OC (dated 24/08/2020 on the review of the Equiano Cable System DIEAR) have noted that the West Coast from St Helena Bay south is a 'stranding hotspot' and there have been mass strandings in the Melkbosstrand area, including of false killer whales and other species. While reasons for stranding are often unclear, disorientation likely plays a role, therefore, this risk from proposed activities should be considered. In addition, DFFE - OC noted that there are large feeding pods of humpback whales (sometimes greater than 100 animals), and that at certain times of the year, activities could potentially be disruptive to their behavior.

Marine Mammals (East Coast of South Africa)

Some 34 species of cetacean are believed to occur off the East Coast of South Africa; 8 Mysticete (baleen whale) species and 26 odontocete (toothed whale and dolphin) species (some examples are illustrated in Plate 14). There are marked offshore (water depth) differences in distributions of individual species within both the migratory and resident fauna.

The baleen whales along the east coast are largely migratory, making extensive migrations along the southern African coastal and offshore waters between summer polar feeding grounds and winter low latitude breeding grounds, in both coastal and offshore waters. This results in their abundance along the East Coast being highly seasonal. Baleen whale species recorded within the coastal and offshore waters of the study area include both pygmy and Antarctic blue whales, fin whales, sei whales, minke whales (both Antarctic and dwarf minke whales), Bryde's whales, humpback whales and southern right whales.

Pilchards

Anchovy

Snoek

Yellowtail

Plate 11 Examples of commercially targeted pelagic fish species

Hake

Kingklip

Monk Fish

Plate 12 Examples of commercially targeted demersal fish species

Humpback whale

Killer Whale

Heaviside's Dolphin

Plate 13 Cetacean species known to occur on the west coast of southern Africa

Bryde's Whale

Southern Right Whale

Minke whale

Bottlenose Dolphin

Plate 14 **Cetacean species known to occur on the east coast of southern Africa**

Turtles

Five species of turtles are found in South African waters. The Leatherback and the Loggerhead turtles' nest on the beaches of northern KwaZulu-Natal. The Green turtle is a non-breeding resident, while the Hawksbill and Olive Ridley turtles occur as strays in our waters. Three species occur along the West Coast, namely the Leatherback and occasionally the Loggerhead and the Green turtle. The Leatherback is the only turtle likely to be encountered in the offshore waters of west South Africa.

Leatherback Turtles are listed as "Vulnerable" worldwide by the IUCN and are in the highest categories in terms of need for conservation in CITES (Convention on International Trade in Endangered Species), and CMS (Convention on Migratory Species). Loggerhead turtles are globally listed as "Vulnerable", whereas Green turtles are globally listed as "Endangered". As a signatory of CMS, South Africa has endorsed and signed a CMS International Memorandum of Understanding specific to the conservation of marine turtles. South Africa is thus committed to conserve these species at an international level.

Seabirds

The near shore environment of Southern Africa supports large numbers of both breeding and non-breeding seabirds. Breeding seabirds are spatially restricted by the availability of safe nesting sites such as islands and mainland cliffs, but non-breeding species can occur throughout the region. The distribution of sea birds is also highly dependent on food availability and, as a consequence, the upwelling of nutrient-rich water in the Benguela Current often results in large numbers of seabirds congregating around large shoals of fish such as pilchards and smaller pelagic shoal fish.

Fourteen species of seabirds breed in southern Africa: viz. Cape Gannet, African Penguin, four species of Cormorant, White Pelican, three Gull and four Tern species. The breeding areas are distributed around the coast with islands being especially important. Breeding islands near Duynefontein are Bird Island at Lambert's Bay, the Saldanha Bay islands, Dassen Island off Yzerfontein and Robben Island in Table Bay.

Shore birds likely to be encountered in the area of the shore crossing include the African Black Oystercatcher *Haematopus moquini*. As the southern African population is estimated at only between 5,000 and 6,000 individuals, the species has been listed as 'near threatened' on the IUCN red data list. The breeding success of African Black Oystercatcher is particularly susceptible to disturbance from off-road vehicles and coastal developments as they nest and breed on beaches between the Eastern Cape and southern Namibia.

6.1.4 Marine Protected Areas and marine areas of conservation significance

Numerous areas of conservation significance exist along South Africa's coastline, both onshore and offshore, affording protection to the marine ecosystems and biota. Those relevant to the proposed 2AFRICA/GERA (East) (Duynefontein landing) are discussed briefly in the sections below.

6.1.4.1 Biodiversity Priority Areas as per the National Coastal and Marine Spatial Biodiversity Plan

The 2018 National Biodiversity Assessment, with its updated ecosystem maps and assessments, provided an opportunity for the first National Coastal and Marine Critical Biodiversity Areas (CBA) to be developed as described in the National Coastal and Marine

Spatial Biodiversity Plan (Version 1, Beta 2) (Harris, L.R., Sink, K.J., Holness, S.D., Kirkman, S.P., Driver, A. 2020). The CBA map aims to consolidate several past and present spatial assessment and planning initiatives to provide a coherent map of the coastal and marine biodiversity priority areas in South Africa that require focused management measures to support sustainable development of the blue economy. These initiatives include: the most recent classification, mapping and assessment of coastal and marine biodiversity in South Africa; previous and new work to support MPA expansion; identification, revised delineation and proposed management of Ecologically or Biologically Significant Marine Areas (EBSAs; MARISMA Project 2020); and other spatial prioritisations done at local, provincial or other sub-national scales.

Figure 14 shows part of the CBA map and indicates that the proposed 2AFRICA/GERA (East) cable route passes through limited areas of CBA1 and CBA2 regions as well as Ecological Support Areas (ESAs) and MPAs before reaching its end at Duynefontein.

CBA 1 indicates irreplaceable or near-irreplaceable sites that are required to meet biodiversity targets with limited, if any, option to meet targets elsewhere, whereas CBA 2 indicates optimal sites that generally can be adjusted to meet targets in other areas. ESAs represent EBSAs outside of MPAs and not already selected as CBAs. The management objectives for these CBA and ESA categories are shown in Table 6.

The National Coastal and Marine Spatial Biodiversity Plan further proposes a list of sea use activities under various proposed Marine Spatial Planning (MSP) Zones, in accordance with their compatibility with MPAs, CBAs and ESA's. Under the present draft National Coastal and Marine Spatial Biodiversity Plan (Version 1, Beta 2), undersea cables are proposed under an MSP Zone named "Underwater Infrastructure" and may be conditionally allowed in CBA areas and considered compatible in ESA's. These proposals are considered draft and still under discussion.

Table 6 Definitions of biodiversity priority areas, including the management objective of each category (adapted from SANBI 2017). (CBA= Critical Biodiversity Area; ESA= Ecological Support Area)

Category	Definition	Broad management objective
Protected Areas	Protected areas declared or recognised in the National Environmental Management: Protected Areas Act (No. 57 of 2003)	As per each Protected Area Management Plan
CBA 1	Irreplaceable or near-irreplaceable sites where there are no other options to represent the features they contain in the planning area. Ideally these sites are natural or near-natural, but exceptions can be made if the only sites where a feature exists are degraded.	Must be kept in a natural or near-natural state
CBA 2	Sites that are the best option available for representing the features in a spatial prioritisation. Ideally these sites are natural or near-natural, but exceptions can be made if the only sites where a feature exists are degraded.	
ESA 1	Sites that are not CBAs but are still important for meeting targets for biodiversity and ecological processes. These sites must be in natural, near-natural or moderately modified ecological condition.	Must be kept in at least a functional state (ideally at least in a moderately modified ecological condition)
ESA 2	Sites that are not CBAs but are still important for meeting targets for biodiversity and ecological processes. These sites are generally in severely modified ecological condition.	

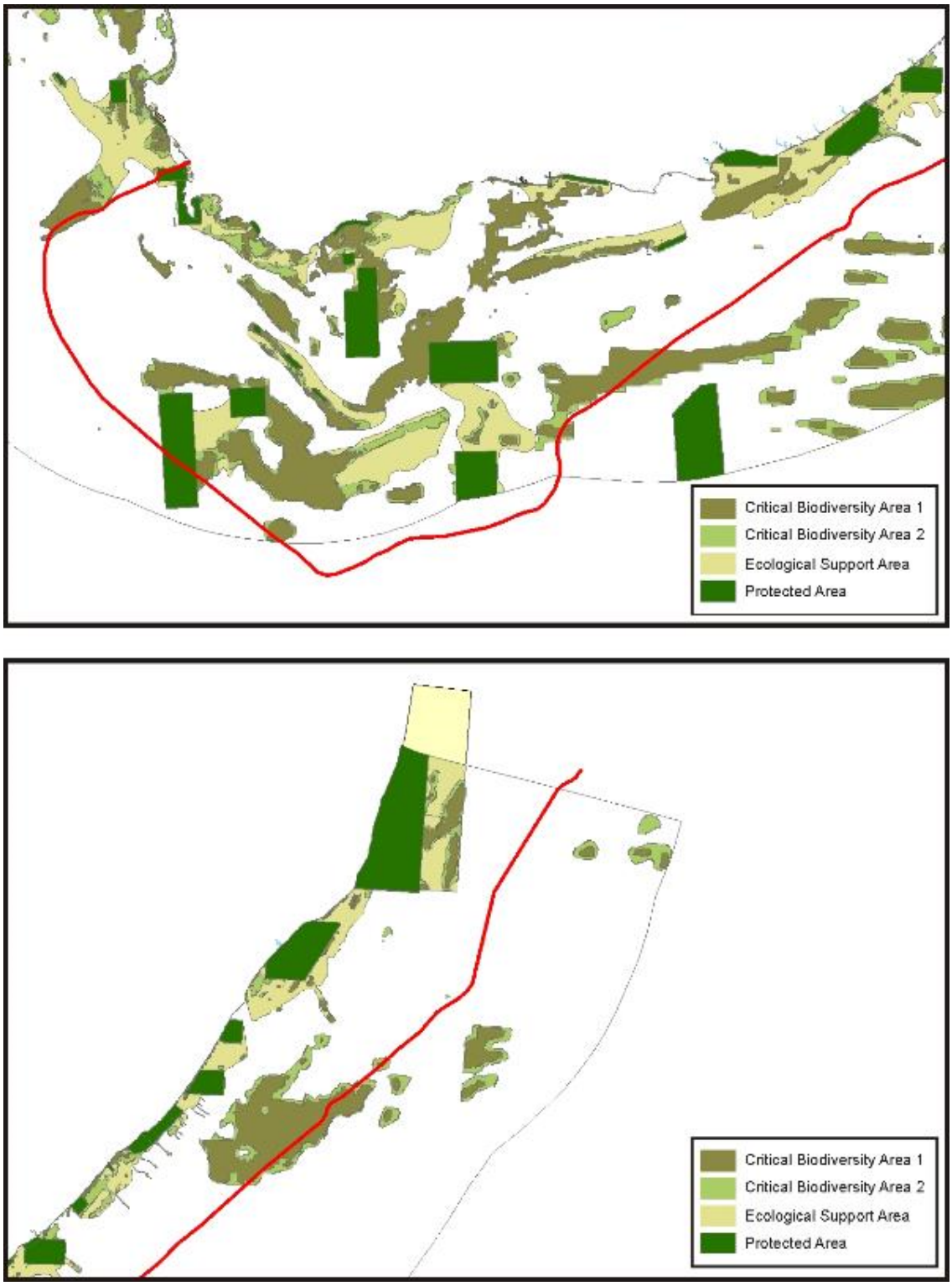


Figure 14 The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) (red line) in relation to the National Coastal and Marine Critical Biodiversity Areas (version 1.0 (Beta 2)) (adapted from Harris *et al*. (2020))

6.1.4.2 Marine Protected Areas

Figure 15 shows the location of MPAs in relation to the proposed 2AFRICA/GERA (East) (Duynefontein landing) The cable traverses two declared MPAs namely the Robben Island MPA and the Southeast Atlantic Seamount MPA. As custodians of these MPAs, SAN Parks is considered the Management Authority in terms of the Act and permission must be obtained from SAN Parks for the cable to traverse the MPAs prior to DFFE issuing environmental authorisation.

ROBBEN ISLAND MARINE PROTECTED AREA

This MPA covers 612 km^2 and was proclaimed in 2019 to protect the surrounding kelp forests and is one of the few areas that still supports viable stocks of abalone. The island harbours the 3rd largest penguin colony, with the breeding population peaking in 2004 at 8,524, but declining since. The island also holds the largest numbers of breeding Bank Cormorant in the Western Cape (120 pairs in 2000) and significant populations of Crowned Cormorant, African Black Oystercatcher (35 breeding pairs in 2000), Hartlaub's Gull and Swift Tern. The MPA consists of four distinct zones – a Restricted Zone (RIRZ) and three controlled zones - Offshore Controlled Zone (RIOCZ), a Middle-Controlled Zone (RIMCZ) and an Inner Controlled Zone (RIICZ). Although the ASN 2AFRICA/GERA (East) Cable would pass through the RIOCZ and RIMCZ (Figure 16), the proposed routing follows that of the decommissioned SAT-2 cable. All other cables that land in the vicinity of Melkbosstrand and Duynefontein also pass through the RIOCZ (Figure 16).

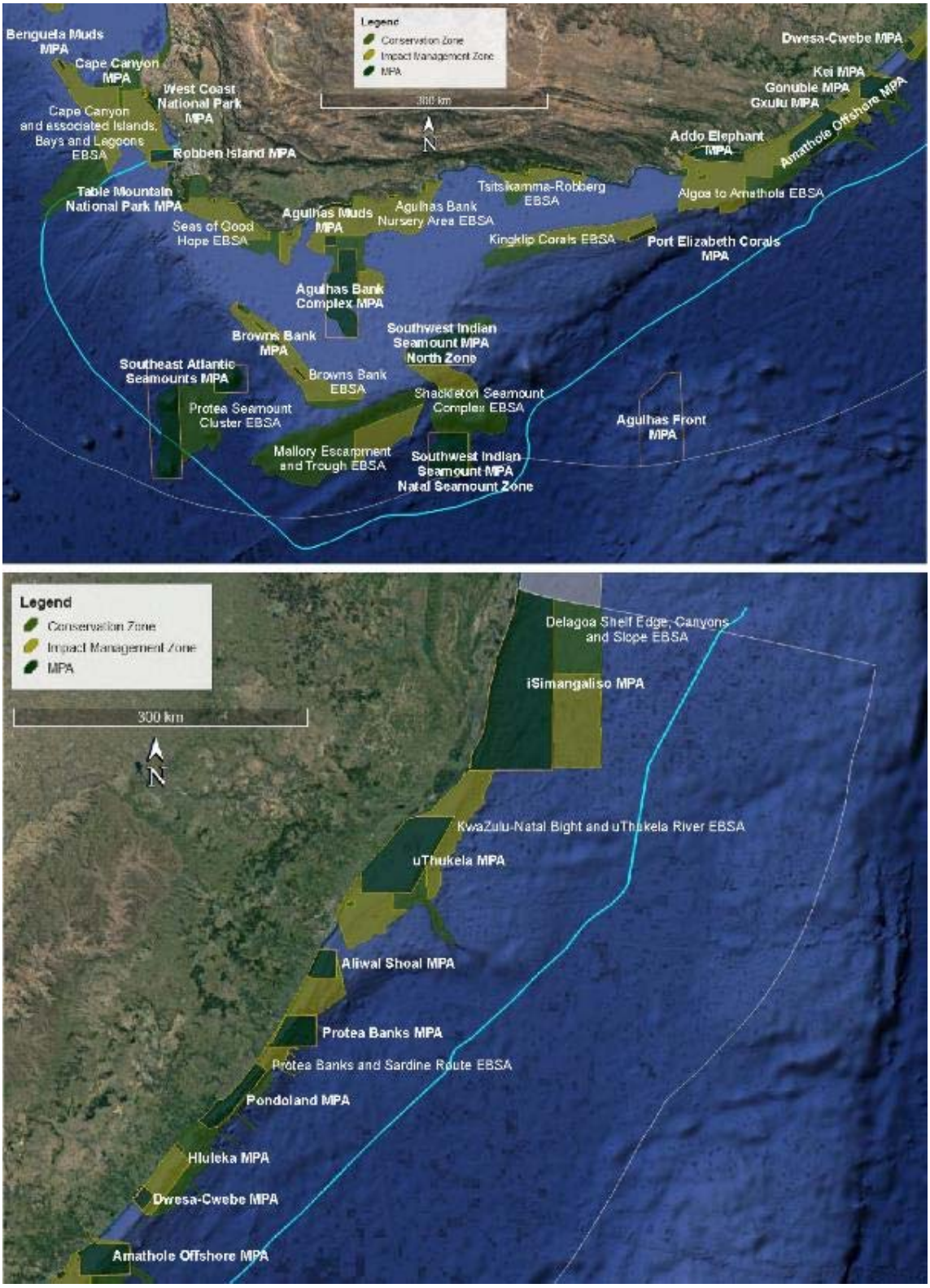


Figure 15 Marine Protected Areas (MPAs) and Ecologically and Biologically Significant Areas (EBSAs) off the South African Coast, in relation to the proposed 2AFRICA/GERA (East) Cable route (cyan line)

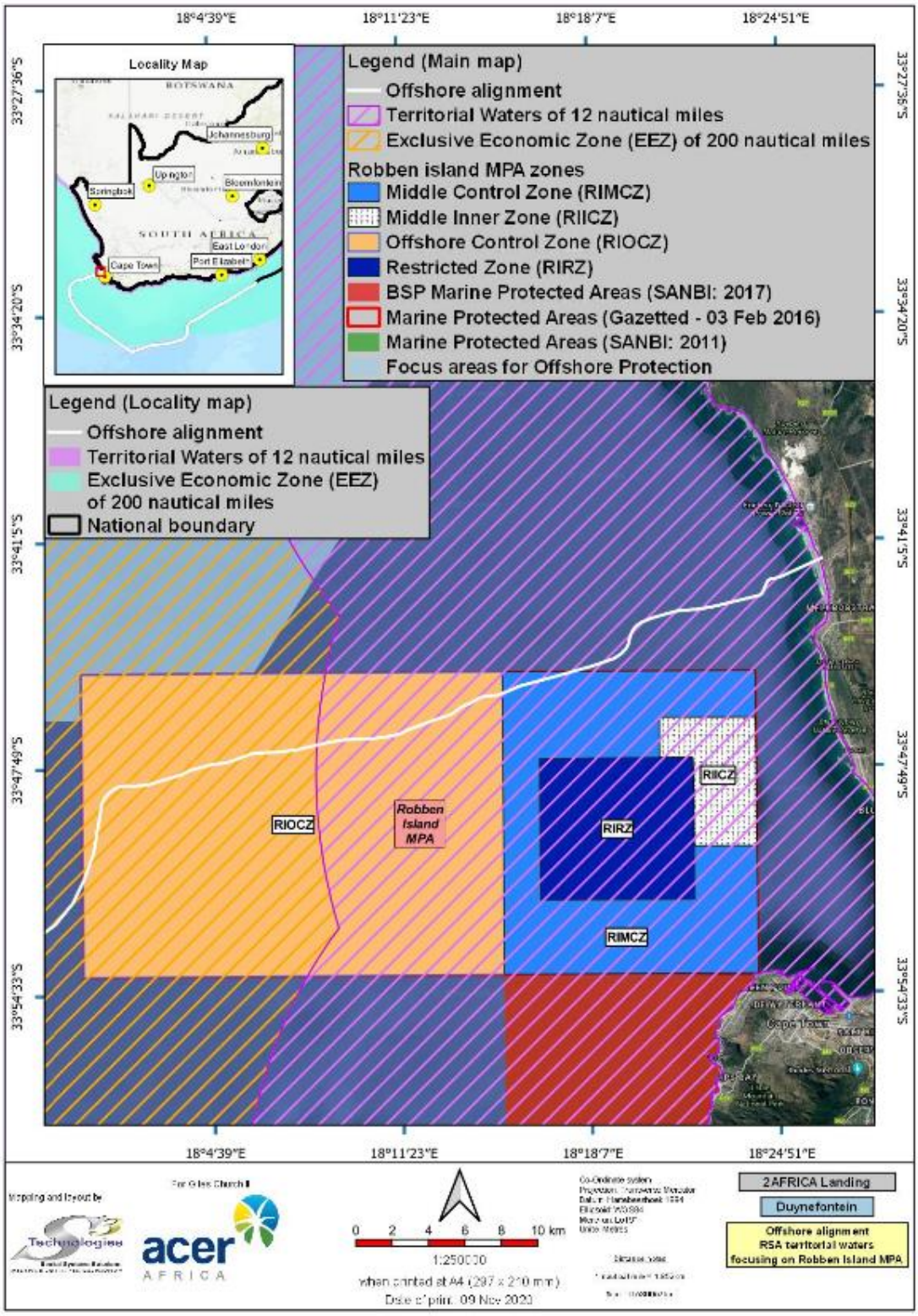


Figure 16 The 2AFRICA/GERA (East) Cable System Alignment relative to the Robben Island MPA (www.sanparks.org)

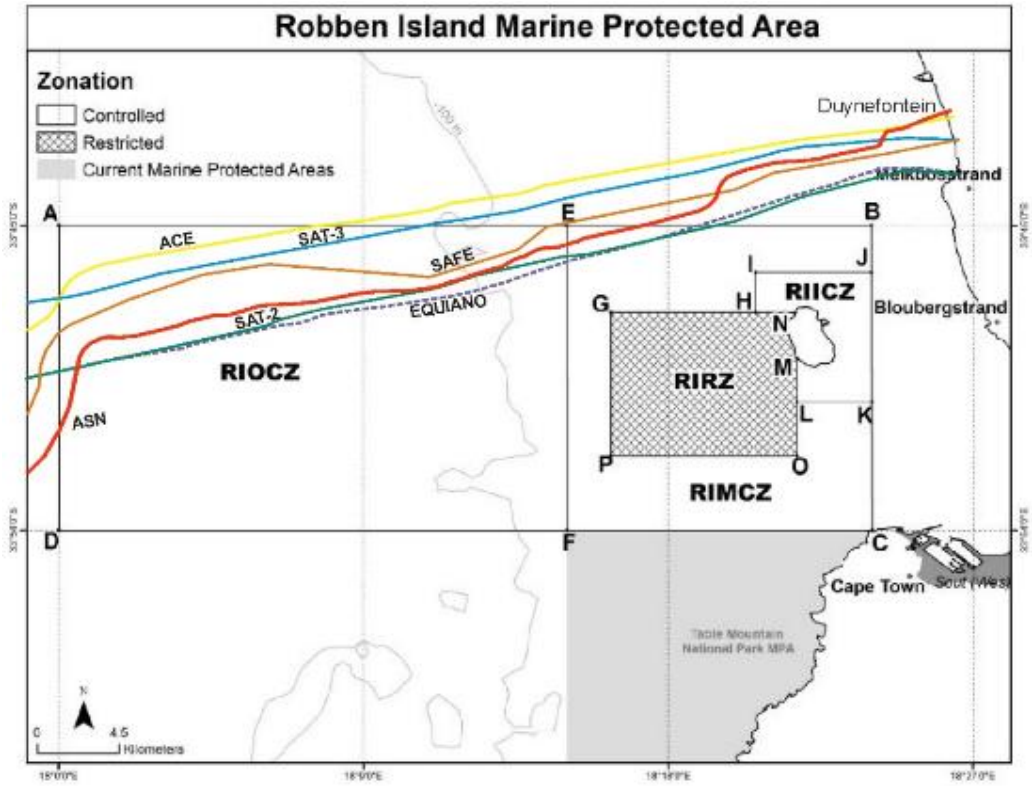


Figure 17 The Robben Island Marine Protected Area showing the zonation and the routing of the proposed ASN 2AFRICA/GERA (East) Cable in relation to other existing and planned cables (adapted from Government Gazette 2019)

SOUTHEAST ATLANTIC SEAMOUNT MARINE PROTECTED AREA

The Southeast Atlantic Seamount Marine Protected Area is an offshore MPA with depths ranging between 2,000 to 4,000 m and is located approximately 174 km southwest of Gansbaai in the Western Cape. The MPA is approximately 6,000 km^2 in size and was declared as a MPA in 2019 to protect South Africa's undersea mountains in the Atlantic Ocean. Most noticeable are the Protea and Argentina seamounts which are approximately 1.8 km high, rising from 2,500 m WD to 700 m WD. These seamounts were formed by volcanic activity and are recognised as biological hotspots due to their abundant variety of marine animals. The biological richness of seamounts results from their steep slopes that interact with currents to carry nutrients from the ocean to the sunlit surface waters. This elevated productivity provides food for creatures ranging from corals to fish and turtles.

Anthropogenic activities which threaten these ecosystems include benthic and pelagic fisheries, petroleum exploration and in some areas, seabed mining.

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) passes through the western section of South Atlantic Seamount MPA through the restricted zone (RZ) (Figure 18). The cable route crosses Southeast Atlantic Rocky Abyssal substratum between the Protea and Argentina seamounts, thereby avoiding the sensitive habitats associated with seamounts. As it crosses the abyssal plain at water depths of up to 4,600 m, no cable burial will be required, and the cable is simply placed on the seabed resulting in almost no disturbance to the benthic environment.

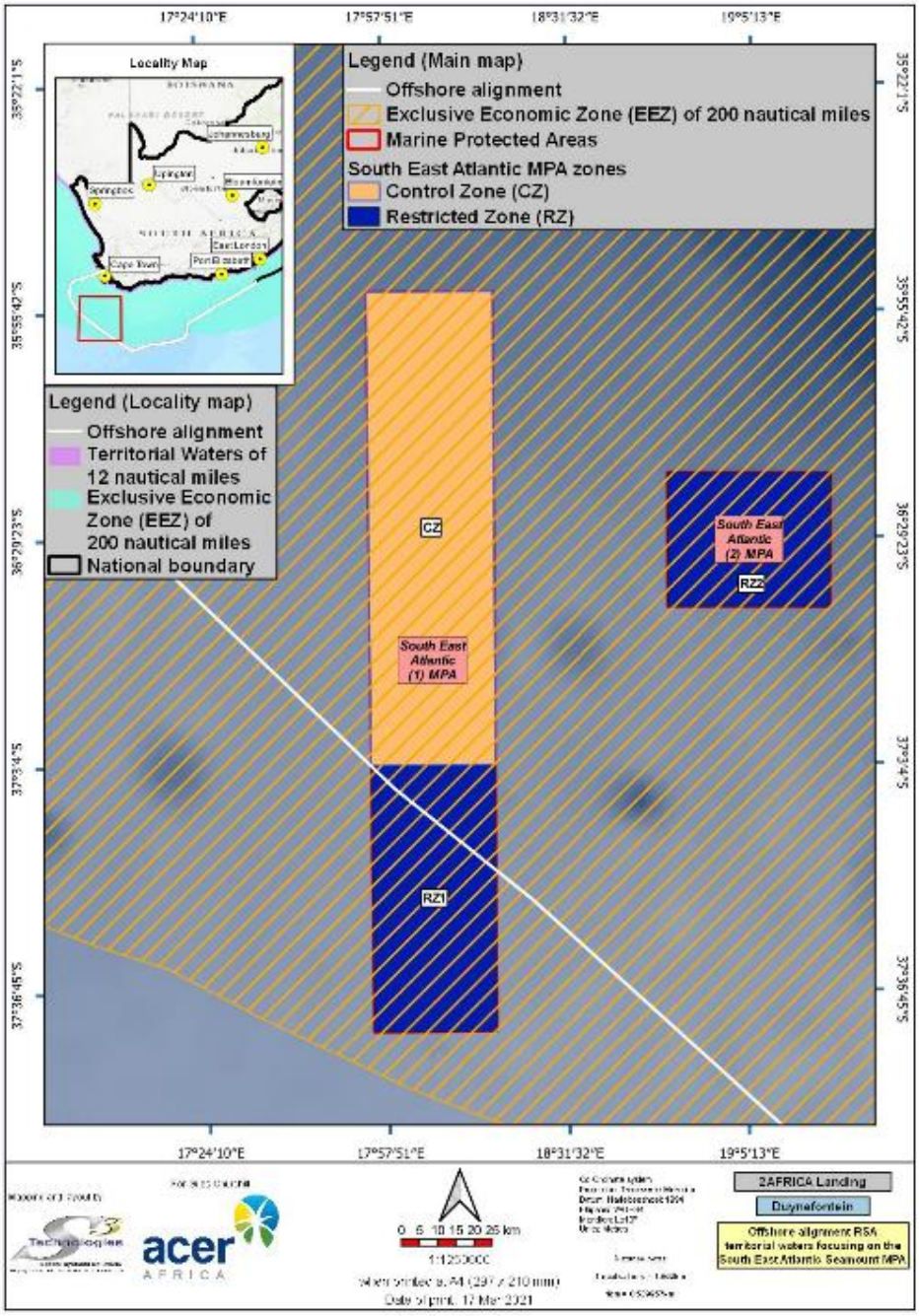


Figure 18 The 2AFRICA/GERA (East) Cable System Alignment relative to the South East Atlantic MPA

6.1.4.3 Ecologically or Biologically Significant Areas (EBSAs)

Together with MPAs, EBSAs represent a network of sites that are important for biodiversity and contribute towards including connectivity in the CBA Map. They also encompass areas that are important for ecological processes.

As shown in Figure 15, the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) passes through 3 EBSAs, which are described below.

THE BENGUELA UPWELLING SYSTEM

The Benguela Upwelling System, a transboundary EBSA, is globally unique as the only cold-water upwelling system to be bounded in the north and south by warm-water current systems and is characterized by very high primary production. It includes important spawning and nursery areas for fish as well as foraging areas for threatened vertebrates, such as sea- and shorebirds, turtles, sharks, and marine mammals. Another key characteristic feature is the diatomaceous mud-belt in the Northern Benguela, which supports regionally unique low-oxygen benthic communities that depend on sulphide oxidising bacteria.

THE CAPE CANYON AND ASSOCIATED ISLANDS EBSA

The Cape Canyon and Associated Islands EBSA lies to the southeast of the Deep Western Orange Basin block. This EBSA includes the Benguela Muds MPA and the Cape Canyon, which is thought to host fragile habitat-forming species. The area is considered important for pelagic fish, foraging marine mammals and several threatened seabird species and serves to protect nine ‘Endangered’ and 12 ‘Vulnerable’ ecosystem types, and two that are ‘Near Threatened’. There are several small coastal MPAs within the EBSA. The proposed cable route traverses through a small portion of the southwestern extension of the EBSA, which has been assigned as a conservation zone.

THE PROPOSED PROTEA SEAMOUNT CLUSTER

The proposed Protea Seamount Cluster area is important for both its benthic and pelagic features, notably for supporting threatened habitats and species, and vulnerable, fragile and sensitive ecosystems and species. It comprises a seamount cluster that includes the Protea and Argentina Seamounts that rise from the southeast Atlantic abyss. The Agulhas Current, which flows south-westward along the eastern coast of South Africa, has its retroflection in this area. Given this position, and its location relative to the Agulhas basin and Agulhas continental shelf, local productivity is high and consequently, it serves as an important aggregation site for migratory species, such as sharks, seabirds and tuna. Adult female leatherback turtles have been satellite tracked to these seamounts and surrounds following nesting, with the site likely also used by juvenile turtles. n between the seamounts there is a matrix of abyssal and bathyal habitat, which represent the broader area where top predators aggregate in the water column in response to the elevated productivity, likely also encompassing the full extent of seamount-related ecological processes. The proposed cable route traverses through the southern portion of the EBSA, which has been assigned as a conservation zone.

MANAGEMENT OBJECTIVES FOR EBSA'S

Under the current MARISMA Programme (MARISMA 2014-2020), South Africa has revised its EBSAs and is preparing management recommendations for each one. It is proposed that EBSAs comprise two zones, a Biodiversity Conservation Zone and an Environmental Impact Management Zone, with recommendations for management per zone. There is alignment in the management objectives of CBAs and the Biodiversity Conservation Zone, and of ESAs and the Environmental Impact Management Zone. Therefore, the National Coastal and Marine CBA map has been adopted as the tool by which South Africa's EBSAs are zoned for recommended inclusion in the national Marine Spatial Planning processes. This careful and deliberate alignment of the National Coastal and Marine CBA Map and the EBSA zones is important for identifying a single, coherent portfolio of coastal and marine biodiversity priorities.

The management objective in the zones marked for 'Conservation' is "*strict place-based biodiversity protection aimed at securing key biodiversity features in a natural or semi-natural state, or as near to this state as possible*". The management objective in the zones marked for 'Impact Management' is "*management of impacts on key biodiversity features in a mixed-use area to keep key biodiversity features in at least a functional state*" (https://cmr.mandela.ac.za/EBSA-Portal/South-Africa/SA-EBSA-Status-Assessment-Management). Activities within these two zones can be placed into one of four different Marine Spatial Planning (MSP) categories depending on their compatibility with the EBSA features and management objective of that zone.

6.1.4.4 Important Bird Areas (IBAs)

IBAs in the general project area are illustrated in Figure 19. The cable landing crosses through the proposed Bird Island / Dassen Island / Heuningnes River and estuary system /Lower Berg River wetlands – Marine IBA with confirmed coastal IBAs in the vicinity of the shore crossing including Dassen and Robben Islands, Rietvlei Wetland and False Bay Nature Reserve. Various marine IBAs have also been proposed in South African territorial waters.

The closest IBA to the proposed 2AFRICA/GERA (East) Cable System is the Robben Island IBA which accommodates approximately 1,600 pairs of African Penguin which breed on Robben Island. The Island also holds the largest colony of breeding Bank Cormorant in South Africa and significant populations of Cape Cormorant, Crowned Cormorant, African Black Oystercatcher (*Haemotopus moquini*), Hartlaub's Gull and Swift Tern. The Swift Tern and Hartlaub's Gull colonies are the most important along the South African coastline. A significant number of Kelp Gull breed on the island. As with many of the other west coast islands, the main threat to the seabirds is competition with commercial fisheries and human induced disturbance and activity on Robben Island (through both tourism and residents).

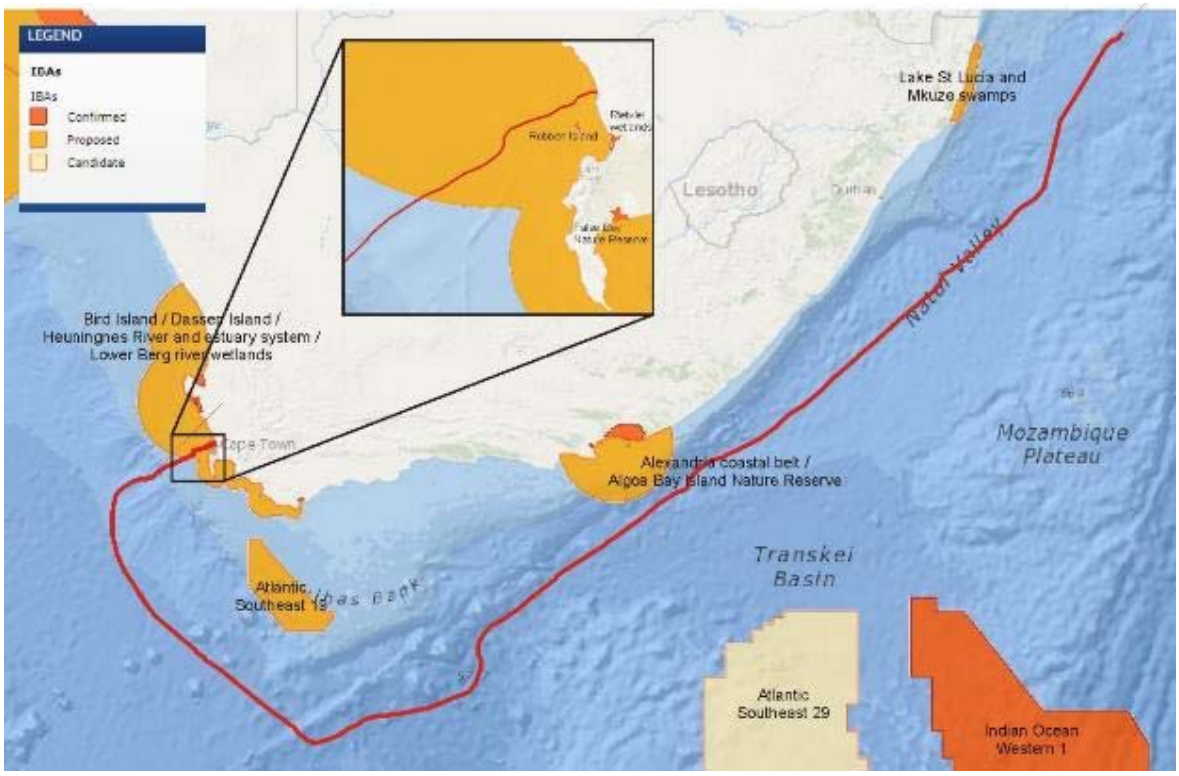


Figure 19 The ASN 2AFRICA/GERA (East) cable route in relation to coastal and marine IBAs (Source: https://maps.birdlife.org/marineIBAs)

6.1.5 Offshore Fishing Industry

The South African offshore commercial fishing industry is an important contributor to the economy, with the wholesale value of production in 2017 estimated at almost R9.8 billion. The primary fisheries in terms of highest economic value are the demersal (bottom) trawl and long-line fisheries targeting the Cape hakes (*Merluccius paradoxus* and *M. capensis*). Secondary species include a large assemblage of demersal fish of which monkfish (*Lophius vomerinus*), kingklip (*Genypterus capensis*) and snoek (*Thyrsites atun*) are the most commercially important.

6.1.5.1 Demersal Trawl

The demersal trawl fishery comprises an offshore and inshore fleet. The wholesale value of catch landed by the inshore and offshore demersal trawl sectors, combined, during 2017 was R3.982 billion, or 40.5% of the total value of all fisheries combined.

The offshore fishery is comprised of 45 vessels operating from most major harbours on both the West and South Coasts. On the West and South-West Coasts, these grounds extend in a continuous band along the shelf edge between the 200 m and 1,000 m bathymetric contours although most effort is in the >300 m to 600 m depth range. Trawl nets are generally towed parallel to the depth contours (thereby maintaining a relatively constant depth) in a north-westerly or south-easterly direction.

Trawlers also target fish aggregations around bathymetric features, in particular seamounts and canyons, where there is an increase in seafloor slope and in these cases the direction of trawls follow the depth contours. The deep-sea sector is prohibited from operating in waters shallower than 110 m or within five Nm of the coastline.

The inshore fishery consists of 31 vessels, which operate on the South Coast mainly from the harbours of Mossel Bay and Port Elizabeth. Inshore grounds are located on the Agulhas Bank and extend towards the Great Kei River in the east. Vessels also target sole close inshore between Struisbaai and Mossel Bay, between the 50 m and 80 m isobaths. Hake is targeted further offshore in traditional grounds between 100 m and 200 m depth in fishing grounds known as the Blues located on the Agulhas Bank.

The activity of the fishery is restricted by permit condition to operating within the confines of a historical "footprint" – an area of approximately 57 300 km^2 and 17 000 km^2 for the offshore and inshore fleets, respectively. Figure 20 shows an overview of the spatial distribution of demersal trawling activity in relation to the proposed cable route within the EEZ.

Trawling on rough ground near the Cape Canyon (off Saldanha Bay) started in the late 1990's and has regularly been fished since then. With improvements in technology and experience, rough ground in areas such as "the Blades" off Cape Point (an area of irregular hard ground near Cape valley) became more frequently trawled with less damage or loss to gear. At present, the Cape Valley, the southern canyon off Cape Point, has a high trawling effort in the South African context and this area has been fairly intensively fished for the last 25 years.

Demersal trawling activity takes place across the cable route alignment at a depth range of 200 m to 1000 m (Figure 21). Within this area, the fishery operates continuously throughout the year.

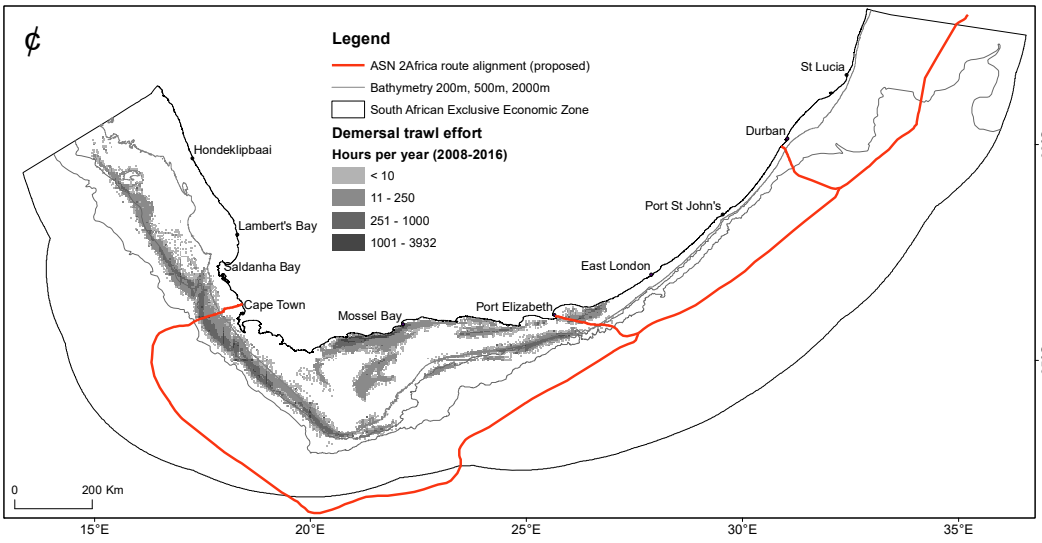


Figure 20 Overview of the spatial distribution of fishing effort expended by the demersal trawl sector within the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

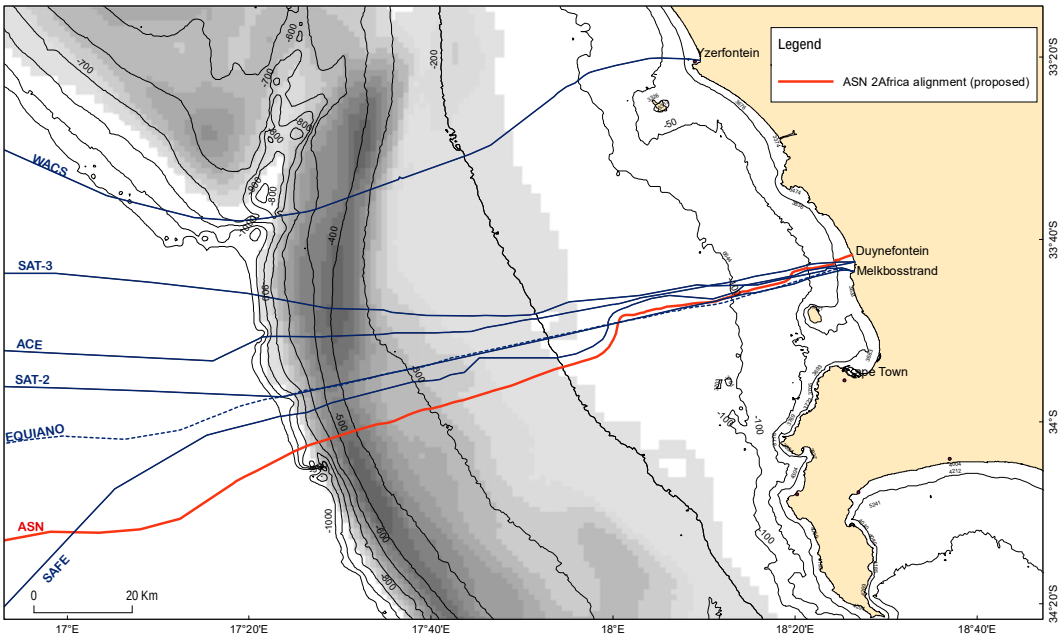


Figure 21 Spatial distribution of fishing effort expended by the demersal trawl sector in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Existing submarine cables in the area are also shown

6.1.5.2 Mid-Water Trawl

This sector includes 6 vessels and 34 rights holders which target adult horse mackerel (*Trachurus capensis*) of which a total catch of 19 555 tons were landed in 2019. Mid-water trawl is defined as any net which can be dragged by a fishing vessel along any depth between the seabed and the surface of the sea without continuously touching the bottom. In practice, mid-water trawl gear does occasionally come into contact with the seafloor. Mid-water trawling gear configuration is similar to that of demersal trawlers, except that the net is manoeuvred vertically through the water column.

The fishery operates predominantly on the edge of the Agulhas Bank, where shoals are found in commercial abundance. Fishing grounds off the South Coast are situated along the shelf break and three dominant areas can be defined. The first lies between 22 °E and 23 °E at a distance of approximately 70 nm offshore from Mossel Bay and the second extends from 24 °E to 27 °E at a distance of approximately 30 nm offshore. The third area lies to the south of the Agulhas Bank 21 °E and 22 °E. These grounds range in depth from 100 m to 400 m and isolated trawls are occasionally recorded up to 650 m. From 2017, DFFE has permitted experimental fishing to take place westward of 20°E. Figure 22 shows the spatial extent of grounds fished by mid-water trawlers within the EEZ and Figure 23 shows effort expended in relation to the proposed Duynefontein cable routing. The fishery operates continuously throughout the year, with no clear seasonality. A 1,500 m exclusion zone around the vessel during cable laying and 500 m exclusion zone around the cable route would cover 41 km^2 (0.25%) of the midwater trawl fishing ground.

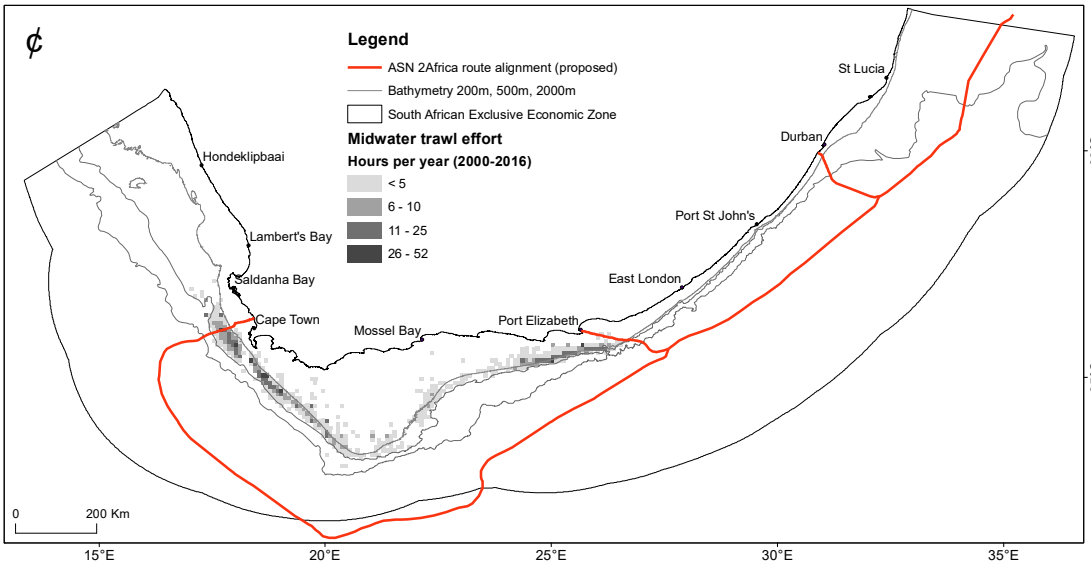


Figure 22 **Overview of the spatial distribution of fishing effort expended by the mid-water trawl sector targeting horse mackerel within the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)**

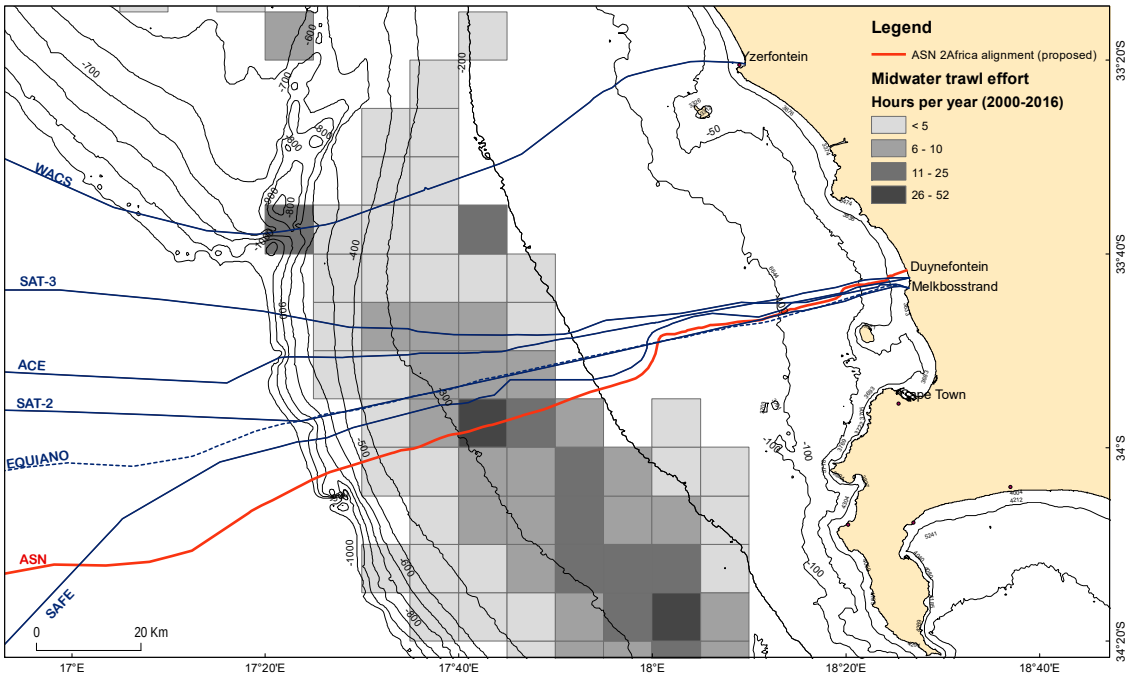


Figure 23 **Spatial distribution of fishing effort expended by the mid-water trawl sector in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Effort is shown as the number of fishing hours at a gridded resolution of 5x 5 minutes (resolution of approximately 85 km^2)**

6.1.5.3 Demersal Longline

Like the demersal trawl fishery, the target species of the longline fishery is the Cape hakes, with a small non-targeted commercial by-catch that includes kingklip. In 2017, 8113 tons of catch was landed with a wholesale value of R319.2 million, or 3.2% of the total value of all fisheries combined. Landings of 8 230 tons were reported in 2018. A demersal longline vessel may deploy either a double or single line which is weighted along its length to keep it close to the seafloor.

Currently 64 hake-directed vessels are active within the fishery, most of which operate from the harbours of Cape Town and Hout Bay. Fishing grounds are similar to those targeted by the hake-directed trawl fleet. The hake longline footprint extends down the west coast from approximately 150 km offshore of Port Nolloth (15°E, 29°S). It lies inshore to the south of St Helena Bay moving offshore once again as it skirts the Agulhas Bank to the south of the country (21°E, 37°S). Along the south coast the footprint moves inshore again towards Mossel Bay. The eastern extent of the footprint lies at approximately (26°E, 34.5°S). Lines are set parallel to bathymetric contours, along the shelf edge up to the 1 000 m depth contour in places. The patchier nature of effort in the north-western extents of the footprint and the eastern edge of the Agulhas Bank may be attributed to proximity to fishing harbours.

Figure 24 shows the spatial extent of demersal longline grounds within the South African EEZ, and Figure 25 shows the amount of fishing effort in relation to existing cables and the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Demersal longline activity may occur across the proposed routing at a seafloor depth range of 150 m to 1000 m.

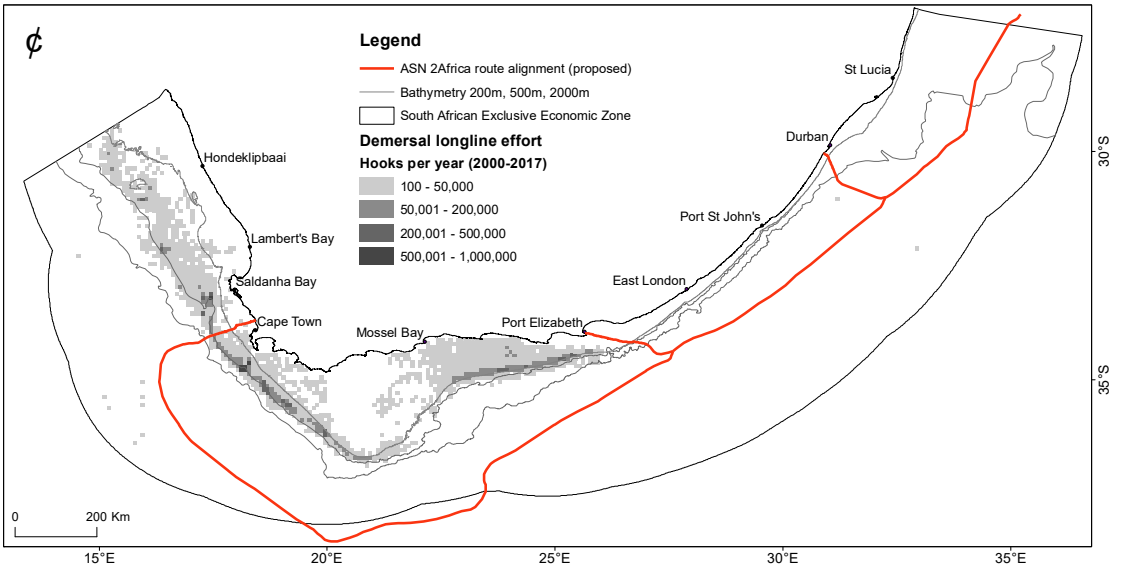


Figure 24 An overview of the spatial distribution of fishing effort expended within the South African EEZ by the demersal longline sector and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

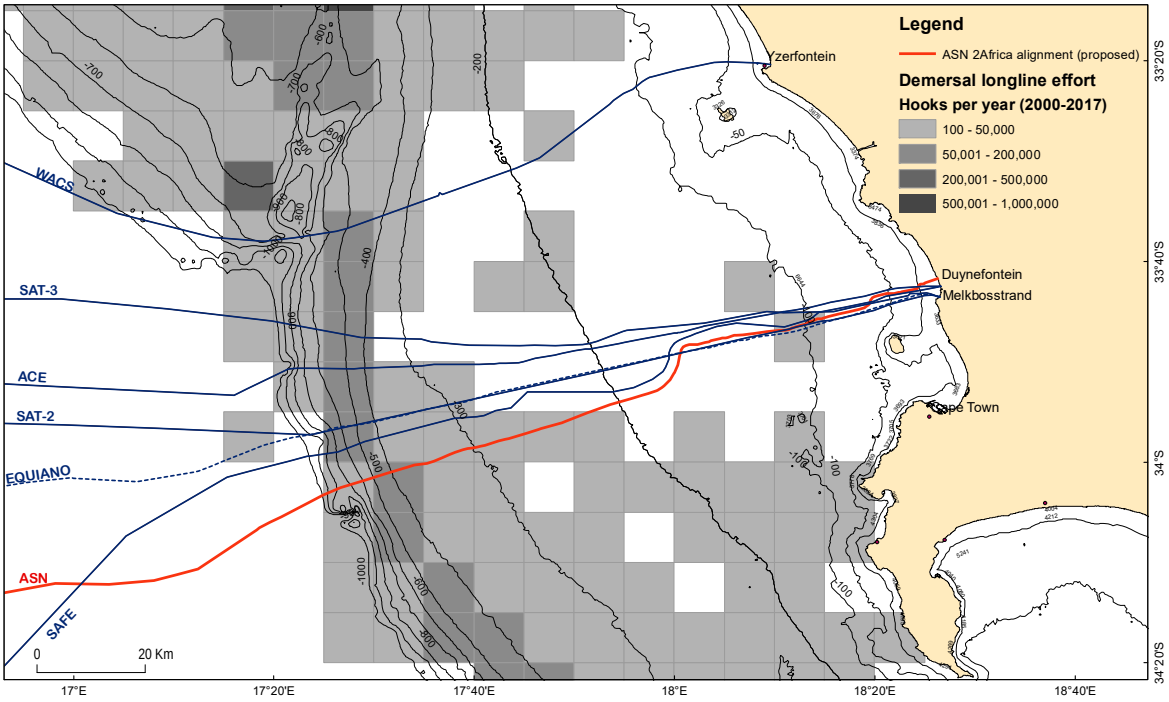


Figure 25 Spatial distribution of fishing effort expended by the longline sector targeting demersal fish species in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Effort is shown as the number of hooks set at a gridded resolution of 5x 5 minutes (each grid block covers an area of approximately 85 km^2)

6.1.5.4 Small Pelagic Purse-Seine

The pelagic-directed purse-seine fishery targeting pilchard (*Sardinops sagax)*, anchovy (*Engraulis encrasicolus*) and red-eye round herring (*Etrumeus whitheadi*) is the largest South African fishery by volume (tons landed) and the second most important in terms of economic value. The targeted species are surface-shoaling and once a shoal has been located the vessel will steam around it and encircle it with a large net, extending to a depth of 60 m to 90 m. It is important to note that after the net is deployed, the vessel has no ability to manoeuvre until the net has been fully recovered on board and this may take up to 1.5 hours. Vessels usually operate overnight and return to offload their catch the following day. The majority of the fleet operate from St Helena Bay, Laaiplek, Saldanha Bay and Hout Bay with fewer vessels operating on the South Coast from the harbours of Gansbaai, Mossel Bay and Port Elizabeth.

Figure 26 shows the spatial extent of fishing grounds within the South African EEZ and Figure 27 shows fishing grounds in relation to the proposed cable route landing at Duynefontein.

Fishing activity may occur across the proposed routing at a seafloor depth range of up to 1000 m; however, the majority of fishing effort is centred inshore of the 100 m depth contour. The proposed cable routing passes through eight commercial fisheries grid blocks, the combined landings recorded within these blocks amounted to 2.9% of the total landings recorded by the fishery and 2.6% of the overall effort expended by the fishery.

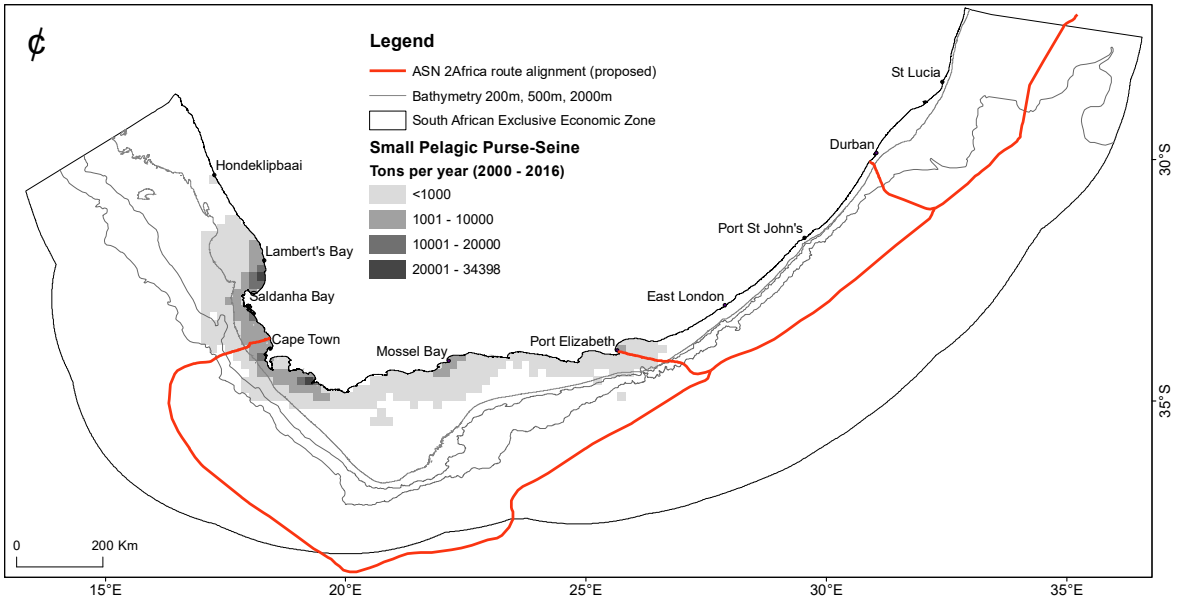


Figure 26 **An overview of the spatial distribution of catch reported by the purse-seine sector targeting small pelagic species in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)**

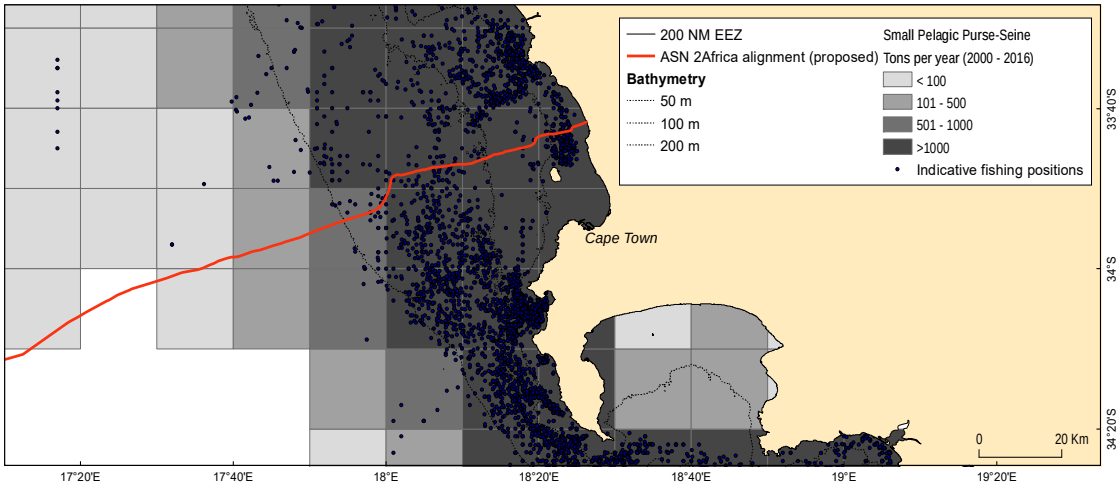


Figure 27 **Spatial distribution of catch landed by the purse-seine sector targeting small pelagic species in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Catch is shown in tons per year at a gridded resolution of 10x 10 minutes**

6.1.5.5 Large Pelagic Longline

Highly migratory tuna and tuna-like species are caught on the high seas and seasonally within the South African EEZ by the pelagic longline and pole fisheries. Targeted species include albacore (*Thunnus alalunga*), bigeye tuna (*T. obesus*), yellowfin tuna (*T. albacares*) and swordfish (*Xiphias gladius*). The total number of active long-line vessels within South African waters is 22, 18 of which fished in the Atlantic (West of 20°E) during 2017. These were exclusively domestic vessels, with three Japanese vessels fishing exclusively in the Indian Ocean (East of 20°E) during 2017 (DAFF, 2018). Gear consists of monofilament mainlines of between 25 km and 100 km in length which are suspended from surface buoys and marked at each end. As gear floats close to the water surface it would present a potential obstruction to surface navigation as well as a snagging risk to the gear array towed by the seismic survey vessel. Lines are usually set at night and may be left drifting for a considerable length of time before retrieval, which is done by means of a powered hauler at a speed of approximately one knot. During hauling, vessel manoeuvrability is severely restricted. In the event of an emergency, the line may be dropped and hauled in at a later stage.

The fishery operates extensively within the South African EEZ, primarily along the continental shelf break and further offshore. Fishing effort within the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) is shown in Figure 28 and Figure 29, respectively.

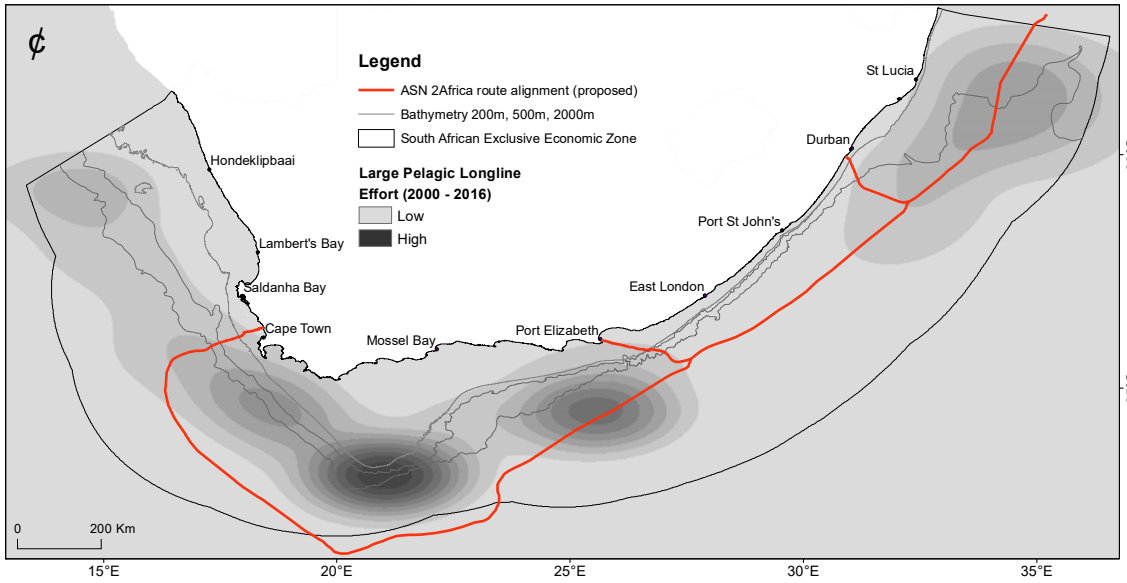


Figure 28 An overview of the spatial distribution of fishing effort expended by the longline sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

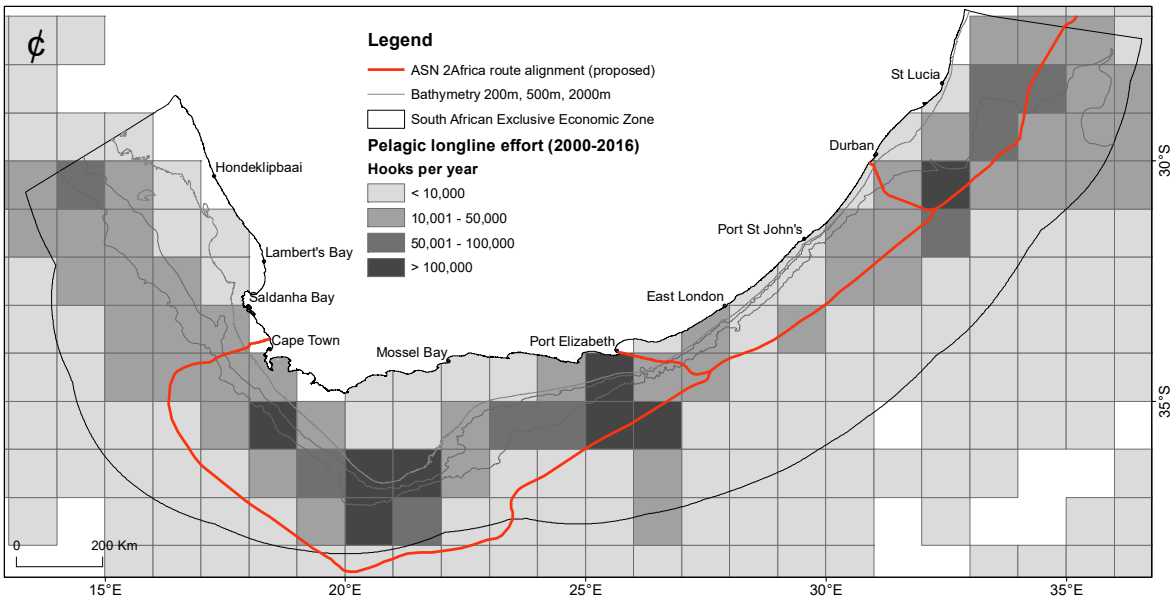


Figure 29 Spatial distribution of fishing effort expended by the long-line sector targeting large pelagic fish species in relation to the proposed 2AFRICA (East) cable landing at Duynefontein. Effort is shown at a 1° grid resolution (60 x 60 nautical minutes)

6.1.5.6 Tuna Pole

Poling for tuna is predominantly based on the southern Atlantic longfin tuna stock also referred to as albacore (*T. alalunga*). Other catch species include yellowfin tuna, bigeye tuna, skipjack tuna (*Katsuwonus pelamis*), snoek and yellowtail. The active fleet consists of approximately 92 pole-and-line vessels (also referred to as “baitboat”), which are based at the ports of Cape Town, Hout Bay and Saldanha Bay. Vessels normally operate within a 100 nm radius of these locations with effort concentrated in the Cape Canyon area (South-West of Cape Point), and up the West Coast to the Namibian border with South Africa.

Tuna swimming near the surface are caught with hand-held fishing poles. The nature of the fishery and communication between vessels often results in a large number of vessels operating in close proximity to each other at a time. The vessels fish predominantly during daylight hours and are highly manoeuvrable. However, at night in fair weather conditions the fleet of vessels may drift or deploy drogues to remain within an area and would be less responsive during these periods.

Fishing activity occurs along the entire West Coast beyond the 200 m bathymetric contour. Activity would be expected to occur along the shelf break with favoured fishing grounds including areas north of Cape Columbine and between 60 km and 120 km offshore from Saldanha Bay. Figure 30 shows the extent of fishing on the within the South African EEZ and Figure 31 shows the tuna pole catch between 2007 and 2016 in the vicinity of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

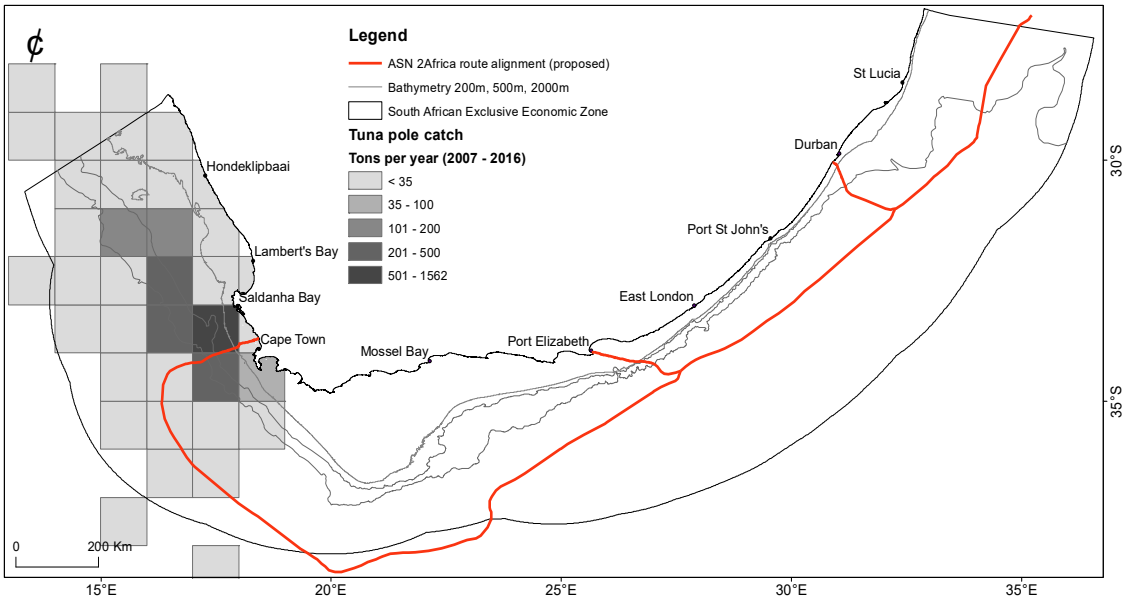


Figure 30 An overview of the spatial distribution of fishing effort expended by tuna pole sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

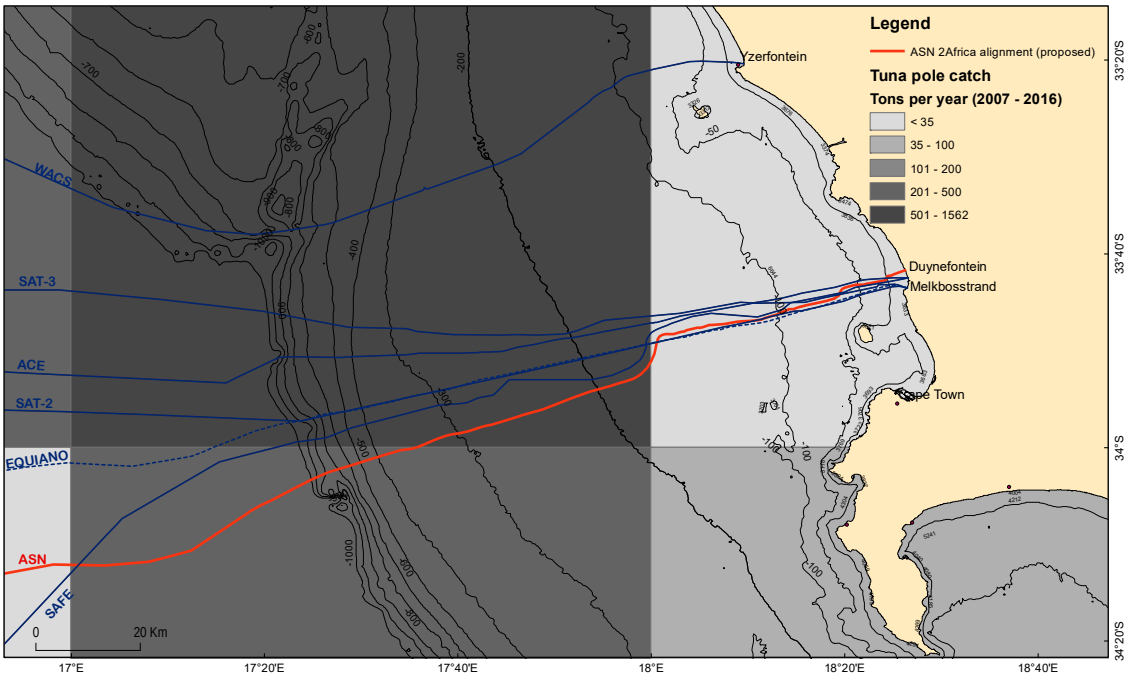


Figure 31 An overview of the spatial distribution of catch landed by the tuna pole sector targeting large pelagic fish species in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

6.1.5.7 Traditional Linefish

The traditional line fishery is the country's third most important fishery in terms of tonnage landed and economic value. It is a long-standing, nearshore fishery based on a large assemblage of different species using hook and line but excludes the use of longlines. Within the Western Cape the predominant catch species is snoek (*Thyrsites atun*) while other species such as Cape bream (hottentot) (*Pachymetopon blochii)*, geelbek (*Atractoscion aequidens)*, kob (*Argyrosomus japonicus)* and yellowtail (*Seriola lalandi)* are also important. The traditional line fishery is a boat-based activity and has since December 2000 consisted of 3450 crew operating from 455 commercial vessels. DFFE has proposed an increase in the apportionment of TAE to small-scale fishing from 13% to 50% commencing in 2021 in order to boost economic possibilities for coastal communities.

Crew use hand line or rod-and-reel to target approximately 200 species of marine fish along the full 3 000 km coastline, of which 50 species may be regarded as economically important. Most of the catch (up to 95%) is landed by the Cape commercial fishery, which operates on the continental shelf from the Namibian border on the West Coast to the Kei River in the Eastern Cape. Figure 32 shows the spatial extent of traditional linefish grounds at a national scale and Figure 33 shows linefish catch in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

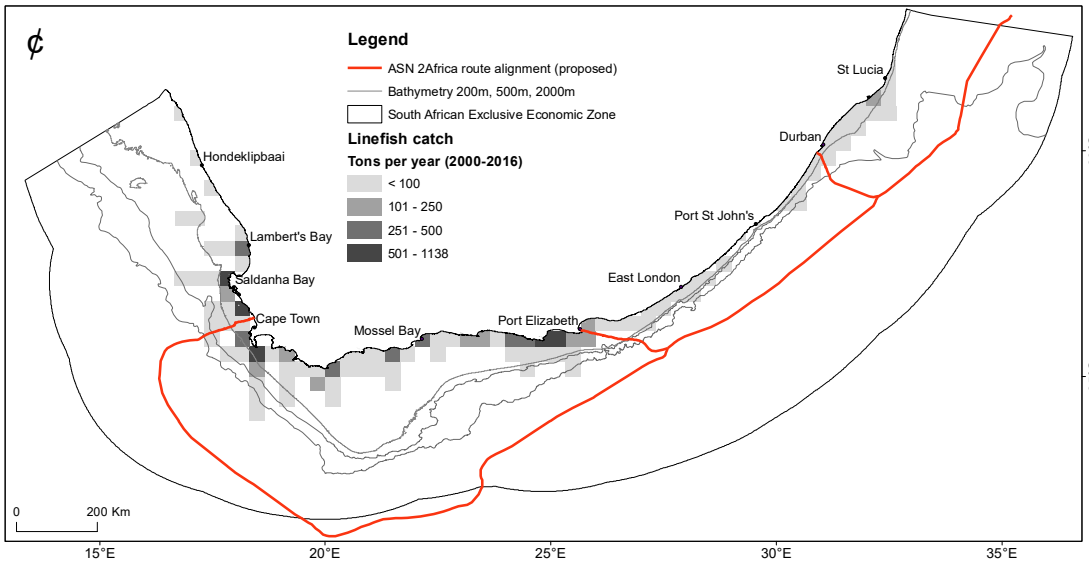


Figure 32 An overview of the spatial distribution of catch taken by the line-fish sector in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

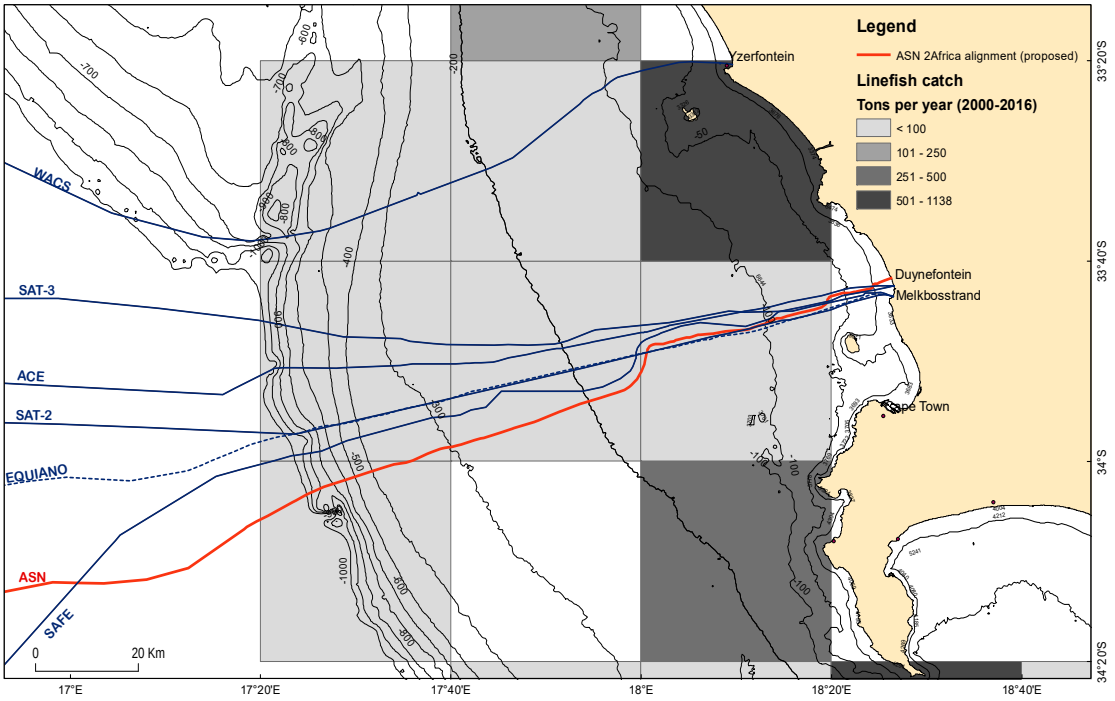


Figure 33 Spatial distribution of catch by the linefish sector in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Data is shown as tons per year at a gridded resolution of 20x20 minutes)

6.1.5.8 West Coast Rock Lobster

The West Coast rock lobster *Jasus lalandii* is a valuable resource of the South African West Coast and consequently an important income source for West Coast fishermen. The resource occurs inside the 200 m depth contour along the West Coast from Namibia to East London on the East Coast of South Africa. The fishery is composed of four sub-sectors – commercial nearshore, commercial offshore, small-scale and recreational fishing, all of which have to share from the same global Total Allowable Catch (TAC). The offshore sector is comprised of trap boats that operate at a depth range of approximately 30 m to 100 m and the nearshore sector makes use of hoop nets to a maximum fishing depth of about 30 m. Fishing grounds stretch from the Orange River mouth to east of Cape Hangklip in the South-Eastern Cape. The offshore sector makes use of traps consisting of rectangular metal frames covered by netting, which are deployed from trap boats, whilst the inshore fishery makes use of hoop nets deployed from small dinghies. Traps are set at dusk and retrieved during the early morning.

Figure 34 and Figure 35 show the rock lobster catch by management zone for the commercial offshore sector between 2006 and 2016, in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). The proposed Duynefontein landing point falls within management zone D, in a subarea referred to as Dassen Eiland.

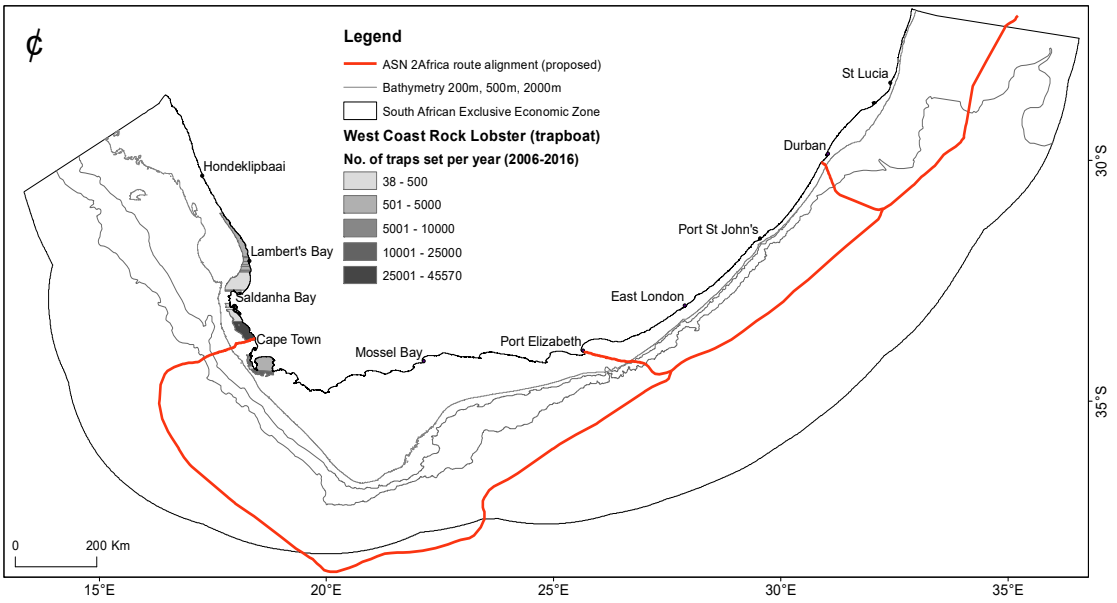


Figure 34 An overview of the spatial distribution of traps set by the West Coast rock lobster trapboat fishery in the South African EEZ and in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

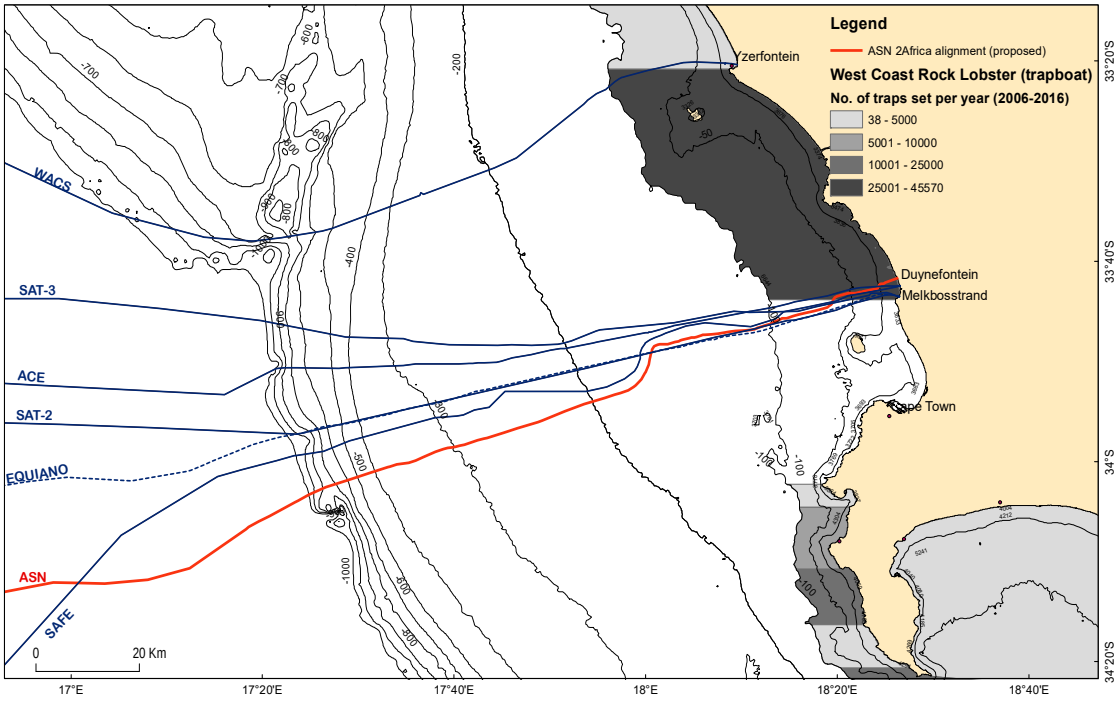


Figure 35 An overview of the spatial distribution of traps set by the west coast rock lobster trapboat fishery in the vicinity of the proposed2AFRICA/GERA (East) Cable System (Duynefontein landing)

6.1.5.9 South Coast Rock Lobster

The South Coast rock lobster fishery is a deep-water long-line trap fishery. Barrel-shaped plastic traps are set for periods ranging from 24 hours to several days. Each vessel typically hauls and resets approximately 2 000 traps per day in sets of 100 to 200 traps per line. They will set between ten lines and 16 lines per day, each of which may be up to 2 km in length. Each line is weighted to lie along the seafloor and will be connected at each end to a marker buoy at the sea surface. Vessels are large, ranging from 30 m to 60 m in length. Those that have on-board freezing capacity will remain at sea for up to 40 days per trip, while those retaining live catch will remain at sea between seven and 10 days before discharging at port. The fishery operates year-round with comparatively low activity during October. There are currently seven vessels operating within the fishery which landed a total lobster tail weight of 340 t in 2018. During the 2018/19 season, eight vessels were active in the fishery.

South Coast Rock Lobster (*Palinurus gilchristi*) occurs on the continental shelf of the South Coast between depths of 50 m and 200 m. The stock is fished in commercially viable quantities in two areas off the South Coast, the first is on the Agulhas Bank approximately 200 km offshore and the second is within 50 km of the shoreline between Mossel Bay and East London. This fishing sector is not directly affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

6.1.5.10 Squid Jig

Chokka squid (*Loligo vulgaris reynaudii*) is distributed from the border of Namibia to the Wild Coast. It occurs extensively on the Agulhas Bank out to the shelf edge, increasing in abundance towards the eastern boundary of the South Coast, especially between Plettenberg Bay and Algoa Bay. Along the South Coast adult squid is targeted in spawning aggregations on shallow-water fishing grounds extending from Plettenberg Bay to Port Alfred between 20 m and 130 m depths. The method of fishing involves hand-held jigs and bright lights which are used to attract squid at night. Vessels predominantly operate out of Cape St Francis and Port Elizabeth harbours. This fishery has various closed seasons during the year.

This fishing sector is not directly affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

6.1.5.11 Crustacean Trawl

South Africa's crustacean trawl fishery operates exclusively within the province of KwaZulu-Natal. This fishing sector is not directly affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

6.1.5.12 Small-Scale Fisheries

The term small-scale is usually used to distinguish between capital intensive commercial fisheries and low technology, labour intensive fishing activities (Sowman, 2006). Small-scale fishers' fish to meet food and basic livelihood needs and may also directly be involved in fishing for commercial purposes.

These fishers traditionally operate on nearshore fishing grounds, using traditional, low technology or passive fishing gear to harvest marine living resources on a full-time, part-time or seasonal basis. Fishing trips are usually of short-duration and fishing/harvesting techniques are labour intensive[16].

Small-scale fishers are an integral part of the rural and coastal communities in which they reside, and this is reflected in the socio-economic profile of such communities. In the Eastern Cape, KwaZulu-Natal and the Northern Cape, small scale fishers live predominantly in rural areas while those in the Western Cape live mainly in urban areas. A small-scale fishing right is the right to catch different species of fish in the near shore. These rights are allocated to communities and not to individuals. More than 270 communities have registered an Expression of Interest with the Department. The location of these coastal communities and the number of fishers per community are shown in Figure 36.

Approximately 10 000 small-scale fishers have been identified around the whole coast (including approximately 60 small-scale fishers at the communities closest Duynefontein i.e., Mamre, Atlantis and Bloubergstrand). The small-scale fishery rights cover the nearshore area (defined in section 19 of the MLRA as being within close proximity of shoreline). These in reality are unlikely to extend beyond 3 nm from the coast.

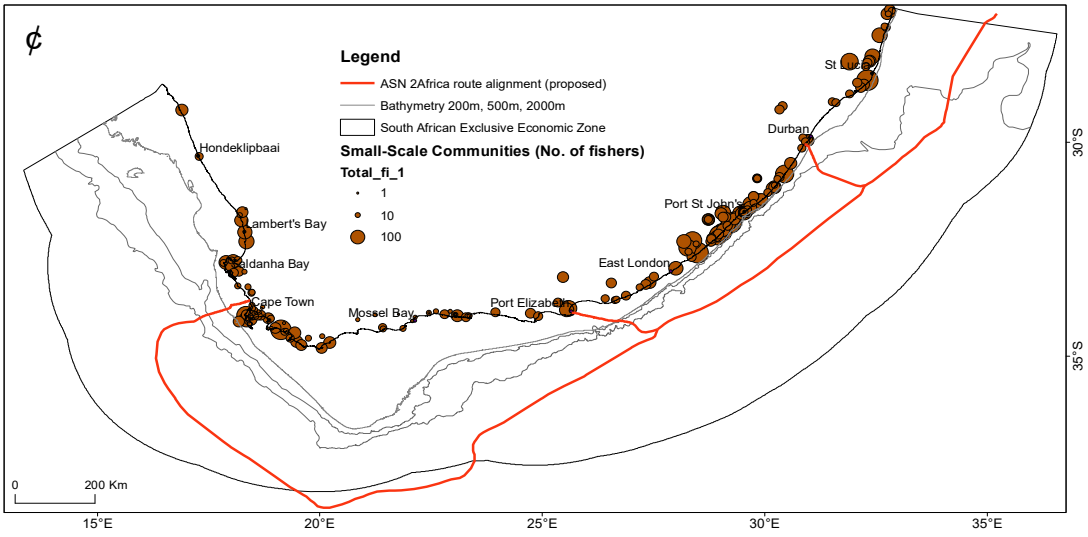


Figure 36 Overview of spatial distribution of small-scale fishing communities and number of participants per community along the South African coastline and in relation the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

16 The equipment used by small scale fishers includes rowing boats in some areas, motorized boats on the south and west coast and simple fishing gear including hands, feet, screw drivers, hand lines, prawn pumps, rods with reels, gaffs, hoop nets, gill nets, seine/trek nets and semi-permanently fixed kraal traps.

6.1.5.13 Summary of seasonality of catches for commercial fishing sectors

The seasonality of each of the main commercial fishing sectors that operate within the South Africa EEZ is indicated in Table 7. Also presented is the relative intensity of fishing effort on a month-by-month basis.

Table 7 Summary table showing seasonal variation in fishing effort expended by each of the main commercial fisheries sectors operating in South African waters.

Sector	Targeted Species	Fishing Intensity by Month within South African Exclusive Economic Zone (EEZ) H = high; M = Low to Moderate; N = None											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Demersal Trawl	Deepwater hake and shallow-water hake	H	H	H	H	H	H	H	H	H	H	H	H
Midwater Trawl	Horse mackerel	H	H	H	H	H	H	H	H	H	H	H	H
Demersal Longline	Shallow-water hake	M	M	M	H	H	H	H	H	H	H	H	H
Small Pelagic Purse-Seine	Anchovy, sardine, Red-eye round herring	M	H	H	H	H	H	H	H	H	H	H	M
Pelagic Longline	Yellowfin tuna, big eye tuna, Swordfish, southern bluefin	M	M	M	H	H	H	H	H	H	H	H	H
Tuna Pole	Albacore	H	H	H	H	H	M	M	M	M	M	H	H
Traditional Linefish	Snoek, Cape bream, geelbek, kob, yellowtail, Sparidae, Serranidae, etc	H	M	M	M	M	M	M	M	M	M	M	H
West Coast Rock Lobster	*Jasus lalandii*	M	M	M	M	M	M	M	M	M	N	M	M
South Coast Rock Lobster	*Palinurus gilchristi*	H	H	H	H	H	M	M	M	M	H	H	H
Squid Jig	Squid/chokka	H	H	M	N	N	M	M	M	M	H	H	H
Crustacean Trawl	various	M	M	M	M	M	M	M	M	M	M	M	M

6.1.6 Offshore Mining Concessions

Approximately 98% of South Africa's exclusive economic zone is subject to a right or lease for offshore oil and gas exploration or production[17]. The Petroleum Agency of South Africa (PASA) is responsible for the 'promotion and regulation of offshore exploration and production' and maintains a national database of petroleum exploration and production. Over the past decade (since 2006) this database has shown a rapid increase in the application and grant of offshore rights and leases. The South African government has also actively promoted offshore oil and gas exploration through Operation Phakisa which seeks to support the rapid development of the offshore oil and gas sector by "*creating an environment that promotes exploration*".

The following leases of offshore concession areas are crossed by the marine cable, starting from the Mozambique EEZ on the east coast and following the cable route to the west coast of South Africa to its proposed landing point at Duynefontein (as shown in in Figure 37 and Figure 38):

- Silver Wave Energy
- Sasol ENI
- Impact Africa
- Total
- Imaforce
- Anadarko (concession block now taken over by Total)
- Rhino Oil (located in Territorial waters)

Concession holders have been notified of the proposed project during the environmental authorisation process. Further detail on where the proposed marine cable enters and exits each block is provided in the relevant cable survey reports (Fugro, 2020a, 2020b, 2020c)

[17] https://www.seafoodsource.com/news/environment-sustainability/proposed-oil-exploration-raises-concerns-from-south-africa-s-fishing-industry.

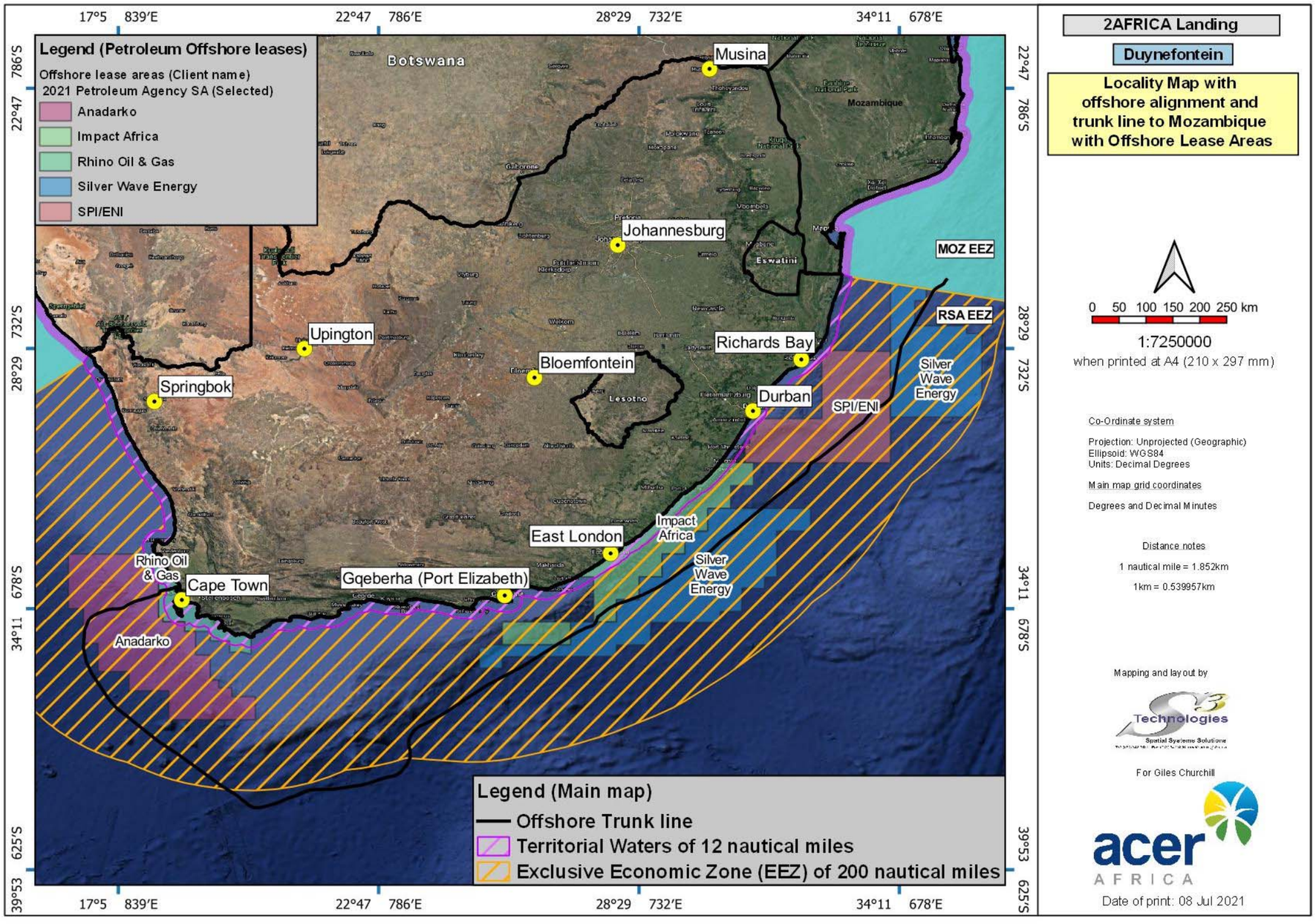


Figure 37 2AFRICA (East) Trunk line to Duynefontein from Mozambique showing the offshore lease areas

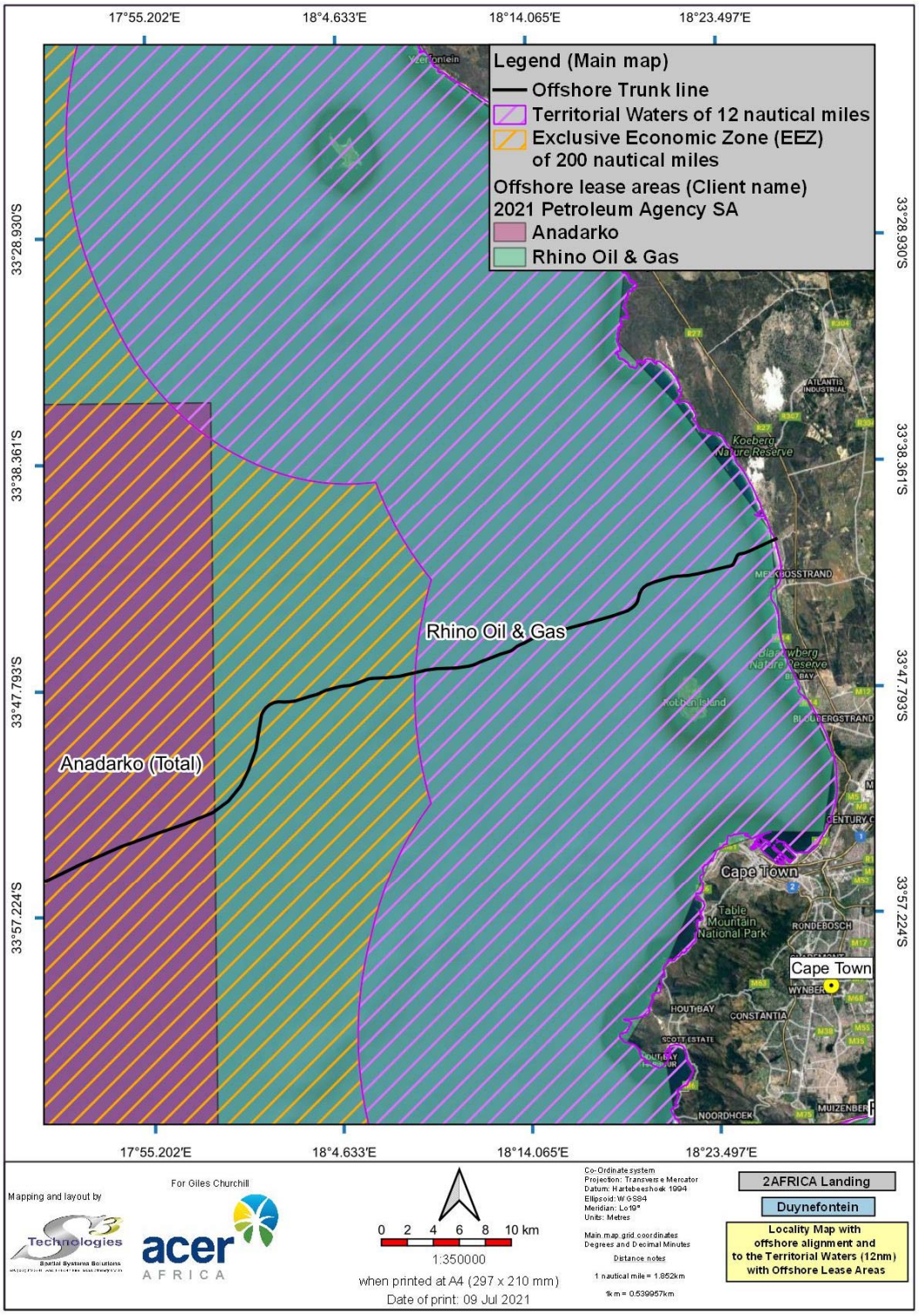


Figure 38 2AFRICA (East) Trunk Line to Duynefontein showing the offshore alignment with the offshore lease areas showing more detail in Territorial Waters at the landing location

6.1.7 Offshore marine telecommunications and marine pipelines infrastructure

Figure 8 shows the Duynefontein end of the proposed 2AFRICA/GERA (East) Cable System in relation to other existing cables. According to the marine survey report (Fugro, 2020a), there are nine (8) cable crossings at the Duynefontein end of the cable. SAT 3 is crossed once (1), SAFE is crossed three times (3), two unknown Telegraph cables are crossed each once (1) and SAT 2 (decommissioned but to be replaced by the Equiano Cable System) is crossed twice (2).

MTN is a member of the ICPC and, as such, there are several guidelines and standards to abide by to ensure that new cable systems do not negatively impact on existing marine telecommunications systems. Therefore, MTN must abide by the conditions stipulated by the ICPC to ensure no negative impacts are experienced by existing marine cable operators. As per the recommendations of the ICPC, MTN will engage directly with all affected marine cable operators to notify them with regard to the installation and operation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing).

According to Fugro (2020a), the proposed cable landing at Duynefontein crosses no pipelines.

6.1.8 Shipping and ports

South Africa is positioned on a major shipping route and has 8 commercial ports and 44 non-commercial harbours (CSIR, 2016). A large number of vessels in transit navigate along the east, south and west coasts of South Africa on their way around the southern African subcontinent.

6.1.9 Other beneficial uses of the marine environment

Other users of the marine environment include marine diamond mining, and the intake of feedwater for mariculture, fish processing or diamond-gravel treatment. Most of these are located well away from the proposed cable route, with the exception of the cooling water intake for Koeberg Nuclear Power Station, which is located approximately 2 km from the proposed landing site. This and other intakes should in no way be affected by installation of the cable system.

It should be noted that the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) does not pass-through sites[18] falling within the Western Cape Aquaculture Abalone ranching area (additionally, the cable avoids rocky areas, which are a requirement for abalone ranching operations).

6.2 Beach and Terrestrial Environment

6.2.1 Conservation categories as per Western Cape Biodiversity Spatial Plan (2107)

Figure 39a provides an overview of the conservation categories in the land portion of the study area, referenced from the Western Cape Biodiversity Spatial Plan (2017) (WCBSP).

[18] Kml files for these sites were provided by Department of Environment, Forestry & Fisheries (Fisheries Management, Directorate: Sustainable Aquaculture Management).

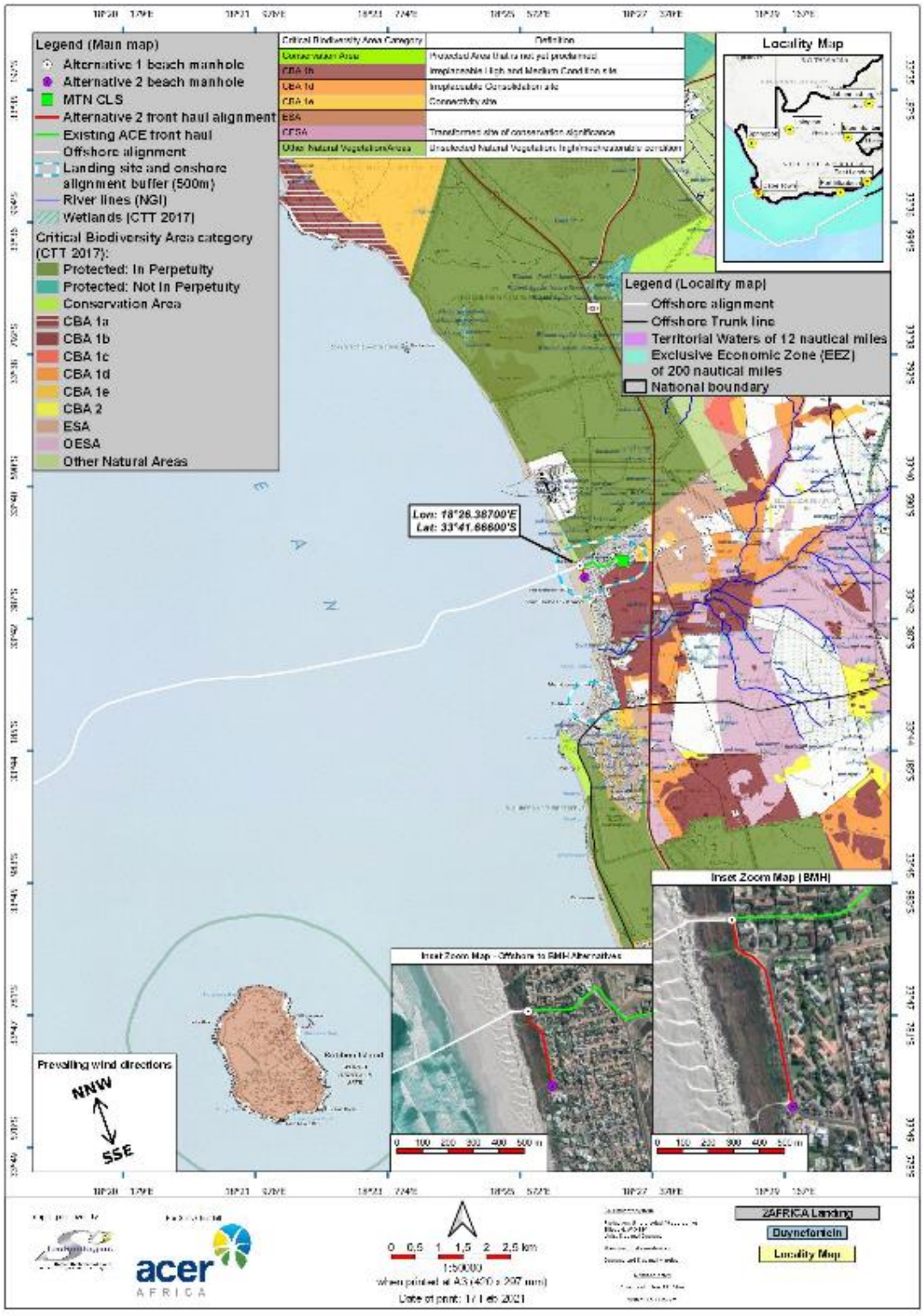


Figure 39a Environmental Sensitivity Map showing vegetation types and areas of conservation

The WCBSP is the product of a systematic biodiversity planning assessment that delineates CBAs and ESAs which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and freshwater realms. These spatial priorities are used to inform sustainable development in the Western Cape Province. This product replaces all previous systematic biodiversity planning products and sector plans with updated layers and features.

The City of Cape Town Biodiversity Network (2017 version)[19] indicates that, while most of the study area has been transformed (through the establishment of the residential suburb of Duynefontein), there is a Protected Area (Koeberg Nature Reserve) to the north, a terrestrial CBA to the south-east, and a strip of "Other Natural Area" along the coast, into which category Van Riebeeckstrand falls (Figure 39b). "Other Natural Areas" within the area are characteristically in good or restorable condition and are considered to be of locally significant conservation importance with recommended management objectives that should be based on sustainable management within general rural land use principles.

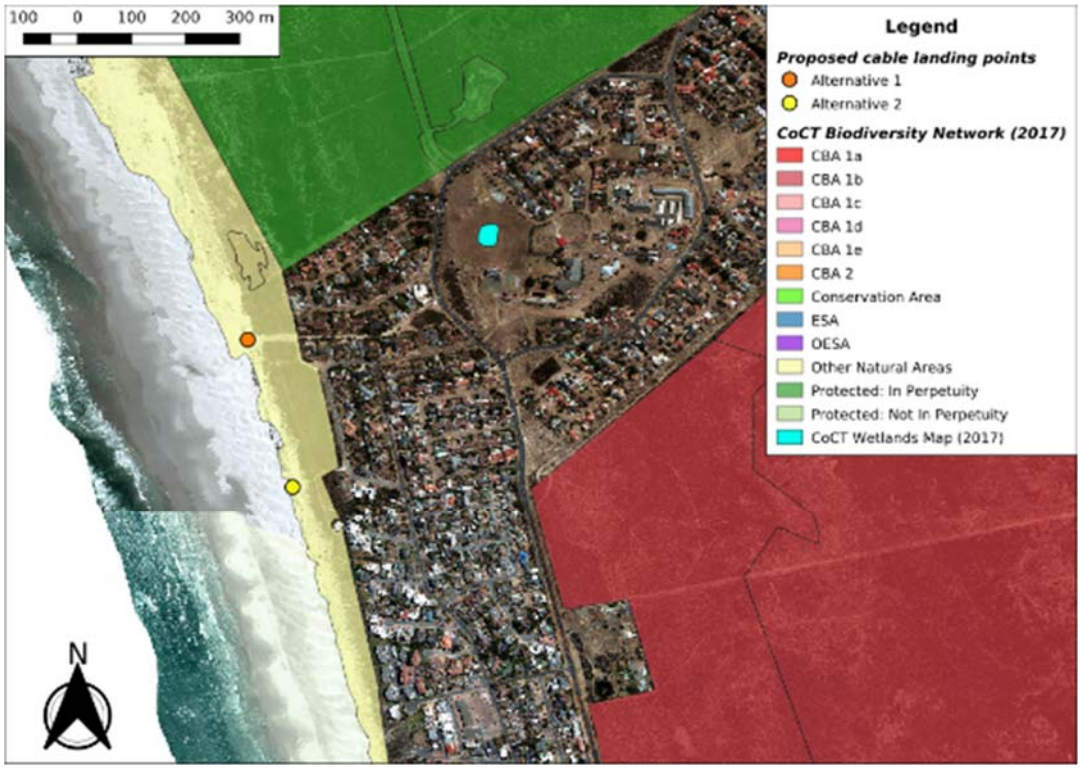


Figure 39b Features captured within the study area by the City of Cape Town's (CoCT) Biodiversity Network and accompanying Wetlands Map

[19] Spatial data for the CoCT's Biodiversity Network and Wetlands Map are publicly available online from the City's Open Data Portal: https://web1.capetown.gov.za/web1/opendataportal/default.

6.2.2 Ecological drivers

The key ecological drivers in coastal ecosystems and of relevance to this project include:

- ❑ The natural oceanic wave climate.
- ❑ Wind.
- ❑ Mobility of sand.
- ❑ Nearshore sand circulation, and offshore sediment transport.
- ❑ The deposition and decomposition of organic material.
- ❑ Colonisation of dune by beach and strandveld vegetation.

6.2.3 Van Riebeeckstrand Beach and coastal dunes

The Duynefontein (Van Riebeeckstrand) beach is a wide embayment of approximately 10 km in length that is bound by the Soutrivier in the south and a promontory to the north, known as Ouskip. However, the placement of infrastructure within the marine, inter tidal and supra tidal environment at the Koeberg Nuclear Power Station has served to further entrain this bay to the south.

The coastline and dune form at Duynefontein trends in a north–south direction with a wide, dissipative beach being evident along the shore. Much of the Cape Town metropolitan region has been subject to urban development and settlement, which has seen both the drainage of inland, wetland areas, as well as the stabilization of formerly mobile dune forms.

The dune cordon at Van Riebeeckstrand lies leeward of a wide dissipative beach (Figure 40). The cordon comprises of a number of dune structures and a wide, permanently wet dune cordon. Recent imagery indicates that previously stable portions of dune have become more transgressive in nature and that the dune slack is an important stabilizing feature within the area (Figure 41).

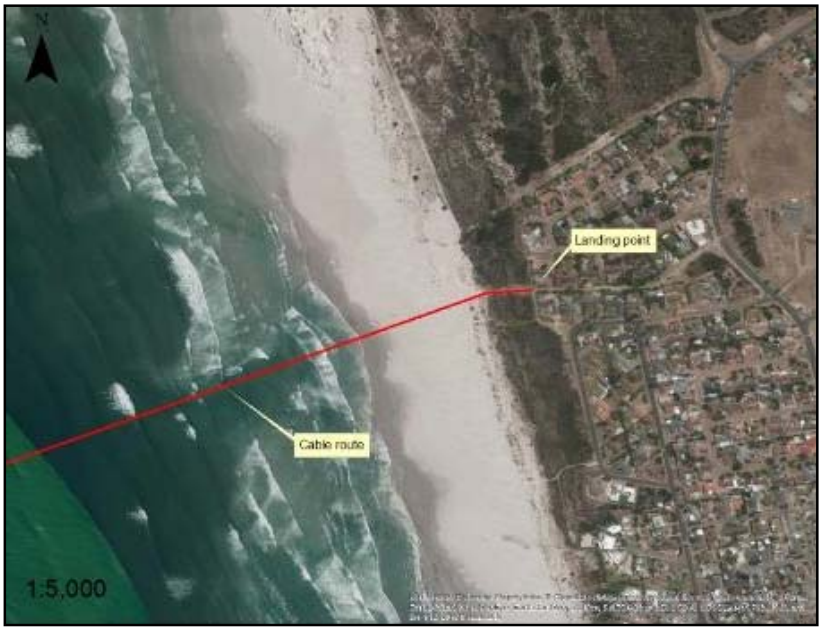


Figure 40 Image of cable route over the beach and dune cordon at Van Riebeeckstrand

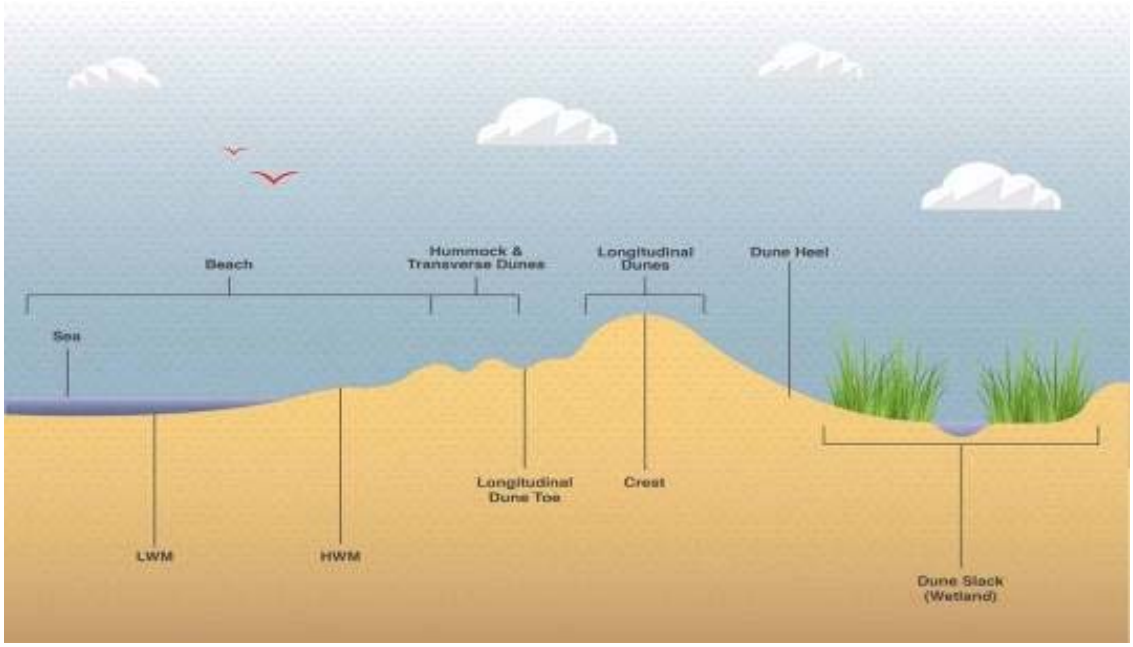


Figure 41 Diagrammatic representation of profile across beach at Duynefontein

6.2.4 Terrestrial ecosystems and vegetation types

The study area falls within the strictly coastal West Strandveld Bioregion (after Rutherford *et al*., 2006). The most recent national vegetation map of South Africa (Mucina & Rutherford 2006, with updates up to 2018) indicates three vegetation types to be present in the study area (Figure 42), viz. a narrow band of Cape Seashore Vegetation along the coastline, with a band of Cape Flats Dune Strandveld inland of this, grading into Atlantis Sand Fynbos to the east. According to the National List of Threatened Ecosystems[20], Atlantis Sand Fynbos is listed as Critically Endangered and Cape Flats Dune Strandveld as Endangered, although the Ecosystem Threat Status (ETS) rating for Atlantis Sand Fynbos has been revised to Endangered according to the results of the National Biodiversity Assessment 2018 (NBA-2018) (Skowno *et al*., 2019).

The main terrestrial habitats that would potentially be affected by the proposed project are beach, sand dune and dune slack habitats associated with Cape Seashore Vegetation occurring near the transition to Cape Flats Dune Strandveld. Cape Seashore Vegetation has been classified as an ecosystem type of Least Concern.

Cape Seashore Vegetation is described as *"Beaches, coastal dunes, dune slacks and coastal cliffs of open grassy, herbaceous and to some extent also dwarf-shrubby (sometimes succulent) vegetation, often dominated by a single pioneer species. Various plant communities reflect the age of the substrate and natural disturbance regime (moving dunes), distance from the upper tidal mark and the exposure of dune slopes (leeward versus seaward)."*

[20] As contained in Government Notice 1002 of December 2011, promulgated in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

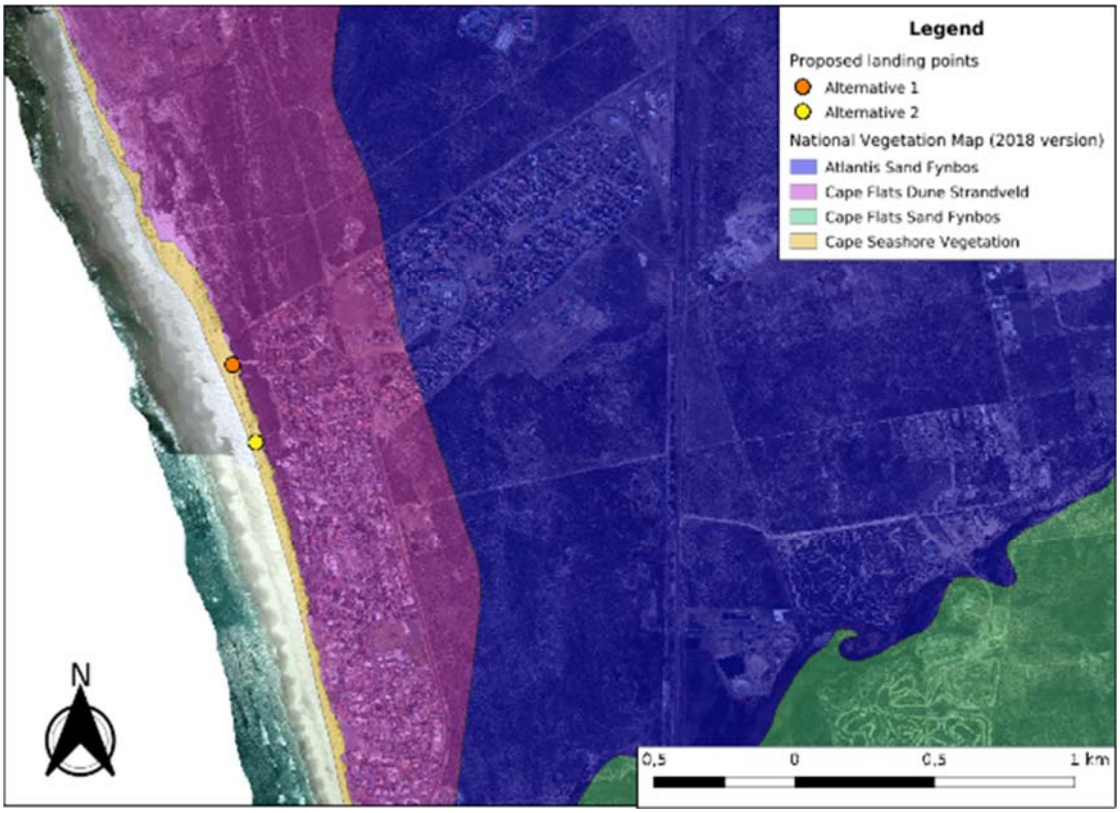


Figure 42 Vegetation types within the study area (after Mucina & Rutherford 2006)

6.2.5 Vegetation on site

The only terrestrial habitat that would really be affected by the preferred routing option for the 2AFRICA cable landing at Duynefontein (Alternative 1) is the beach. Beaches are hostile environments for plants and these areas are typically largely without plant life (Plate 15) . Vegetation only starts to become observable near the foot of the foredunes at the upper edge of the beach, where the hardy pioneer species *Tetragonia decumbens* and *Artotheca populifolia* are dominant, as is typical of this zone in Cape Seashore Vegetation (Mucina *et al*., 2006). Towards the south, in the vicinity of the proposed cable landing position for Alternative 2, *Cladoraphis cyperoides* was also observed by Todd (2016) on the fore dunes at the top edge of the beach, together with the two above-mentioned species. This is a relatively common graminoid species in the foredune zone of Cape Seashore Vegetation (Mucina *et al*., 2006).

The foredunes around the proposed landing point for Alternative 1 are slightly more sparsely vegetated than those around the proposed landing point for Alternative 2 (e.g., see comparative photos in Plate 16). At both of the proposed cable landing points, the area behind the foredunes grades into a dune slack wetland area (as can be seen on the left-hand side photos in Plate 16). This ecosystem is described in the following section.

Plate 15 **Photographs of unvegetated beach environment on the seaward side of foredunes near the proposed cable landing points for Alternative 1 (left photo) and Alternative 2 (right photo)**

Plate 16 **Photographs of foredunes near the proposed cable landing points for Alternative 1 (top photos) and Alternative 2 (bottom photos), looking eastward from the landward edge of the foredunes towards the dune slack zone (left photos) and westward away from the dune slack zone towards the foredunes (right photos)**

Vegetation within the study area is subject to ongoing disturbance, primarily through pedestrian traffic moving through the dune slack and frontal dune cordon to access the beach. In addition, the establishment of storm water infrastructure within the dune slack and clearance of vegetation have resulted in ongoing disturbance to the area, the latter being evident where there are attempts within the slack to facilitate the flow of water. There is also evidence of informal attempts to stabilise the frontal dune cordon through *ad hoc* brush wood packing and occasional plantings.

6.2.6 Freshwater resources and wetlands

A dune slack wetland area approximately 2 ha in extent lies behind the foredunes of the beach.at Van Riebeeckstrand. Figure 43 shows the location of the proposed cable routing in relation to this wetland.

The dune slack wetland (Plate 17) is situated along the eastern edge of the beach, between two lines of dunes. It is an inter-dune depression that would presumably, in its natural state, have been fed predominantly by groundwater (through the seasonal rising of the water table, which is probably relatively close to the ground surface based on the landscape setting of a coastal plain) and direct precipitation. As such, it is presumed that the natural hydrological regime of this wetland would have been highly seasonal, with saturation and very shallow inundation of portions of the wetland only occurring during the wet season (winter to early spring) and forming a mosaic of damp areas interspersed with drier non-wetland areas. The wetland occurs on sandy coastal soils associated with the Witzand Formation and the natural (terrestrial) vegetation type is Cape Seashore Vegetation, near the transition to Cape Flats Dune Strandveld.

6.2.7 Fauna

The beach habitat on the seaward side of the foredunes at Van Riebeeckstrand, in addition to being a hostile environment for plants, is also a very harsh environment for terrestrial fauna and is thus not considered to be an ecologically sensitive area for mammals, reptiles or amphibians. The foredune area and, in particular, the dune slack area and associated wetland habitat on the landward side of the foredunes are far more important for terrestrial and non-marine semi-aquatic and aquatic fauna. The mammal, reptile and amphibian fauna potentially associated with these areas are described below.

6.2.7.1 Mammals

The landing area of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) is likely to have relatively low mammalian species richness. Although the site falls within or near the edge of the distribution range of 42 terrestrial mammals and nine bats, the high degree of transformation within the study area means that only species tolerant of human development are likely to be present. Species which are known to be located within the study area include the Cape Gerbil (*Tatera afra*) and the Cape Molerat (*Georychus capensis*). Two listed terrestrial mammal species are described as potentially occurring within the study area, namely the Honey Badger (*Mellivora capensis*) and the White-tailed Mouse (*Mystromys albicaudatus*) (Endangered) but their presence at the site is highly unlikely given the extensive transformation of most habitats within the urban setting of the routes.

Figure 43 Dune slack wetland in relation to the proposed Alternatives for the 2AFRICA/GERA (East) Cable System (Duynefontein landing)

Plate 17 Photographs of the dune slack wetland, showing the more disturbed central portion dominated by reeds *(Typha and Phragmites*) [top photos] in comparison to some of the less disturbed portions where there is a greater diversity of naturally occurring vegetation [bottom photos]

6.2.7.2 Reptiles

According to the Southern African Reptile Conservation Assessment (SARCA) database, 31 reptiles have been recorded within the study area in the vicinity of Duynefontein. This includes three listed species, the Bloubergstrand Dwarf Burrowing Skink (*Scelotes montispectus*), Cape Dwarf Chameleon (*Bradypodion pumilum*) and Cape Sand Snake (*Psammophis leightoni*). Although the Cape Dwarf Chameleon might occur in residents' gardens, it is unlikely that these three species occur within the affected areas of the cable route as the habitat is not suitable either through the transformed nature of the urban context or through degradation of remnant vegetation along the route.

6.2.7.3 Amphibians

The diversity of amphibians within the affected area is likely to be relatively low. Up to eight species of frogs could be associated with the dune slack wetland, but only one of these species is currently noted to be of conservation concern by the IUCN, namely *Cacosternum capense* (Cape Caco), which is listed as Near Threatened.

The likelihood of finding this species in the dune slack wetland is, however, very limited because the wetland does not provide optimal breeding or foraging habitat (the Cape Caco typically breeds in very shallow, temporary 'pans' in clay soils). Therefore, with respect to amphibian fauna, the dune slack wetland does not hold significant conservation value.

6.3 Climate

Cold and warm coastal currents running north-west and north-east respectively account for the difference in climates between the West and East coasts of South Africa. The West coast has a Mediterranean climate with dry warm summers and colder wet winters. The South Coast is more arid and cold, grading to temperate with a dry hot summer, and the East Coast is temperate, with hot summers and rain falling throughout the year (https://en.wikipedia.org/wiki/Climate_of_South_Africa#/media/File:Koppen-Geiger_Map_ZAF_present.svg.)

6.3.1 Climate change

According to information provided in the Beach and Coastal Dune Dynamics specialist report (Appendix B), a significant background factor affecting the Western Cape coastline is that of climate change, giving rise to increasing storminess, coupled with sea level rise and with expectations of increasing aridity, reduced winter rainfall periods, and more severe storm events. Sea level rise, which according to recorded data varies between 0.42 and 1.87 mm/year, is expected to result in inundation along low lying areas of the West Coast and increasing erosion of soft coastlines, in particular dune forms, as well as beach erosion. In turn, saline intrusion into sub-surface, freshwater systems is likely to have a more latent but significant impact on the state and structure of coastal dunes.

6.4 Topography and geology

The topography of the broader study area around Duynefontein is characterised by plains and a moderate to low relief, with gentle slopes. The surface geology along the coast at Van Riebeeckstrand is dominated by Quaternary sediments, overlying meta-sediments of the Tygerberg Group. The Quaternary sediments grade from those associated with the Langebaan Formation (consisting of limestone and calcrete, partially cross-bedded with calcified parabolic dune sand) immediately inland of the coastline to those associated with the Witzand Formation (consisting of unconsolidated calcareous sand of marine origin), with the more acidic light grey to pale-red sandy soils of the Springfontyn Formation occurring further inland to the east.

6.5 Socio-economic overview of the receiving environment

This section focuses mainly on the cable’s shore landing area at Duynefontein, as the trunkline is located far out at sea.

6.5.1 Development Planning Context

There are several national, provincial and local policies and plans relevant to the study area, which have been discussed in detail in the Scoping Report, in as far as they relate to the development of telecommunications infrastructure in the country.

Notably, in South Africa, the Presidential Infrastructure Coordinating Commission (PICC) launched the national SIP 15: Expanding Access to Communication Technology. This is led by the Department of Communications and supported by the Department of Public Enterprises and Department of Science and Technology. SIP 15 aims to ensure universal service and access to reliable, affordable and secure broadband services by all South Africans, prioritising rural and under-serviced areas and stimulating economic growth. This project, although not registered with the South African Government as a SIP project, will support SIP 15.

The City of Cape Town's Five-Year Integrated Development Plan (July 2017 – June 2022), as amended for 2020/21, aligns with national and provincial planning strategies. The IDP identifies various priorities, which include positioning Cape Town as a forward-looking globally competitive business city; leveraging technology for progress; economic inclusion; and operational sustainability. The CoCT aims to transform Cape Town into the most digital city in Africa.

6.5.2 Key institutions and role-players and affected properties

Duynefontein is located in Ward 23 of the City of Cape Town, managed by the City of Cape Town Municipality. Cape Nature is responsible for conservation and biodiversity management. Although much of the Cape West Coast Biosphere Reserve as shown in Figure 44 below is comprised of buffer or transition zones which include transformed lands, it nonetheless is still recognised as a mechanism which impedes upon the further hardening or degradation of these areas (Turner; 2017, cited in ACER, 2021).

The cable landing passes through admiralty reserve administered by the Department of Public Works. It also lies within the formal emergency planning zone (EPZ) of the Koeberg Nuclear Power Station.

With respect to marine areas, SANParks is the management authority of the Robben Island and South Atlantic Seamount MPA's and as such, approval from SAN Parks will be required to lay the cable through these areas, as stipulated in the NEM: Protected Areas Act, Act 57 of 2003.

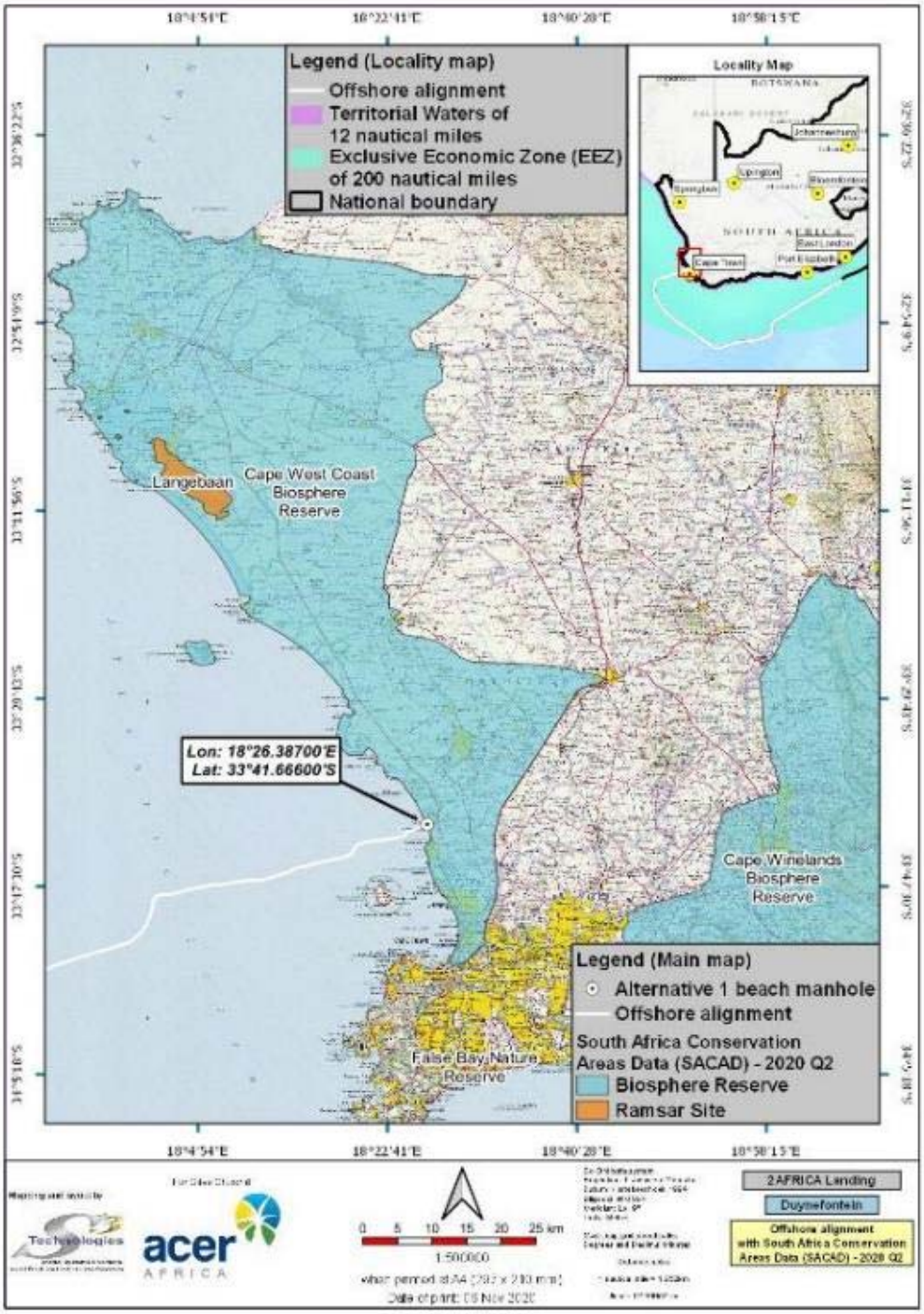


Figure 44 Cape West Coast Biosphere Reserve

6.5.3 Land use in the study area

Van Riebeeckstrand lies adjacent to the residential town of Duynefontein, forming part of the northern extremities of the City of Cape Town. The area where the proposed cable will land can be described as a middle to upper income suburban area. The town is situated in close proximity to the R27 regional road and is surrounded by conservation areas such as Koeberg Nature Reserve and the Cape West Coast Biosphere Reserve, with the Blouberg Provincial Nature Reserve located to the south. The dominant land-uses in the immediate study area consist mainly of urban residential areas, commercial areas, roads and buildings, while the Koeberg Nuclear Power Station and the Koeberg Wastewater Treatment Works are situated in the broader surrounds.

6.5.4 Koeberg Nuclear Power Station

Koeberg is the only nuclear power station in Africa and is operated by Eskom. Koeberg has operated safely since 1984. Koeberg is surrounded by a 3,000-ha private game reserve owned by Eskom, containing more than 150 species of birds and half a dozen small mammal species. The power station was originally located outside the metropolitan area, but growth has far exceeded expectations in the intervening 20 years, so that the power station is now close to suburban housing (https://en.wikipedia.org/wiki/Koeberg_Nuclear_Power_Station). Development is however prevented within the Public Exclusion Boundary (PEB) which, is an area within a 2 km radius from the nuclear facility (both on and offshore), and which is not accessible to the public. It should be noted that proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) falls outside of the PEB. The closest point of the proposed alignment to the PEB is located approximately 1.8 km offshore as shown in Figure 45.

In terms of the National Nuclear Regulator Act, 1999 and Government Notice No. 287, 2004, developments surrounding a nuclear installation must be assessed to demonstrate that the municipality's Nuclear Emergency Plan can be effectively implemented. In light of this legislation, the National Nuclear Regulator (NNR) requested the City of Cape Town to develop their procedures and processes in order to comply (http://repository.up.ac.za/bitstream/handle/2263/5908/021.pdf;jsessionid=59B3CD6603074D1BF909C4A866B87414?sequence=1).

As the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) makes landfall within the 5 km Precautionary Action Zone (PAZ) of the reactors, a risk assessment and emergency evacuation plan are required by the City of Cape Town for the proposed development during construction and operation. These plans are provided as part of the EMPr in Appendix F of this report and will be submitted to the City of Cape Town for review and signoff prior to project implementation if authorized. One of the key components of the plan must be to show that all staff or employees on the project must be capable of being evacuated from the area within four hours of an event.

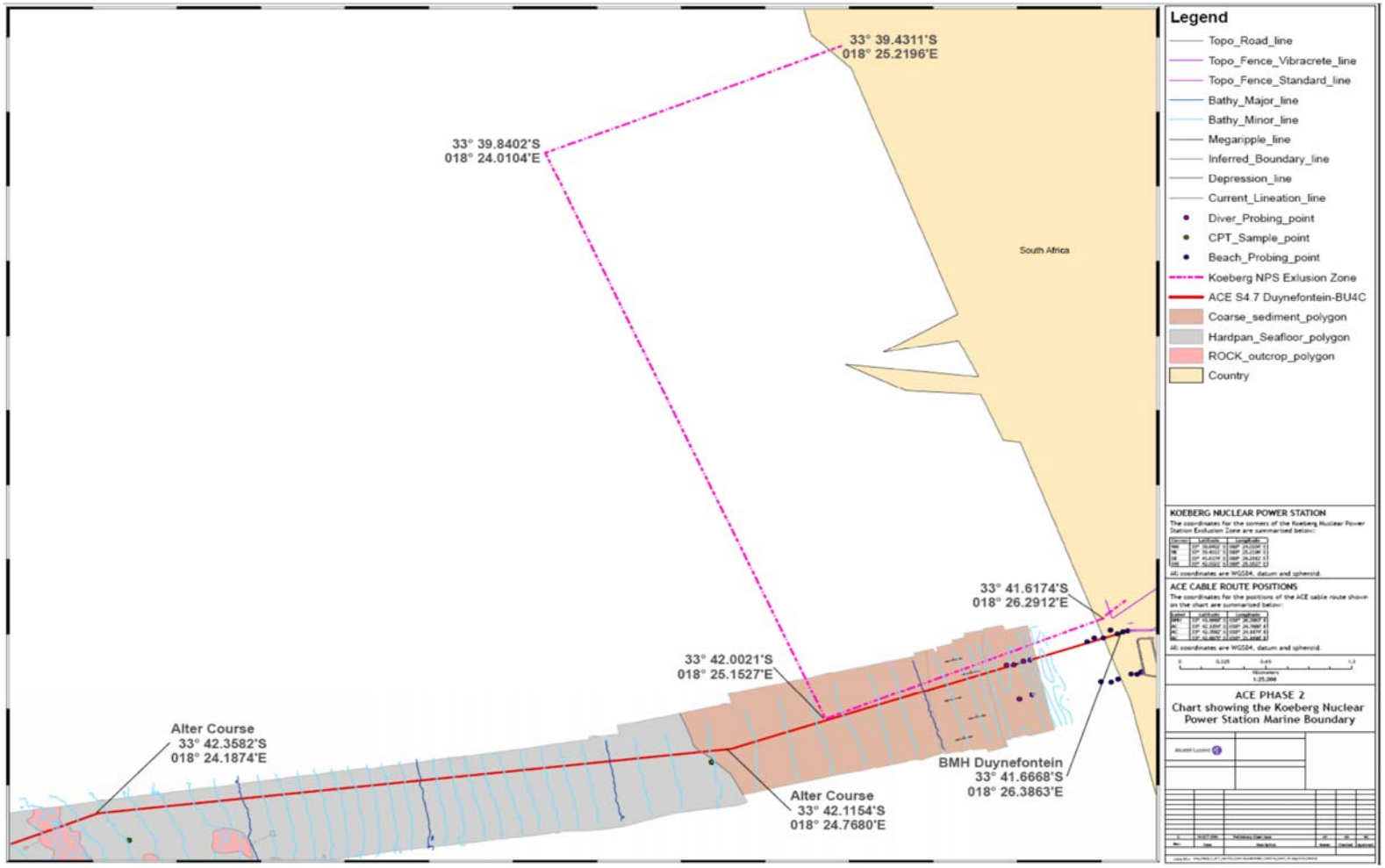


Figure 45 Koeberg 2 km Exclusion Zone showing the alignment of the ACE Cable System

6.5.5 Demographics and socio-economic profile

Ward 23 has a population of 33,448 which equates to 13,215 households with an average household size of 2.53 people which is below the municipal average of 3.5 people per household (StatsSA, 2012). The population within the ward is predominantly white (76%) which is in contrast to the municipal averages where 42% of the population is classified as coloured and 39% black (StatsSA, 2012). In terms of age structure, the majority of the population (60.7%) fall between the ages of 25 and 64 years of age, higher than the municipal figure of 51.3% in the same age category (SatsSA, 2012). Access to education is also better within Ward 23 than the municipality as a whole, with 82% of the population over the age of 20 in Ward 23 having completed a Grade 12 or higher while only 46% of the population in the municipality have attained this level of education (StatsSA, 2012).

Ward 23 exhibits higher levels of socio-economic development than the City of Cape Town, the Western Cape Province and South Africa as a whole. Households within the study area have higher levels of income, better access to education and unemployment levels in the ward are significantly lower than municipal (24%), provincial (21.4%) and national averages (29.4%) (StatsSA, 2012).

6.5.6 Tourism activities

The beach at Van Riebeeckstrand is predominantly used by local residents for walking, swimming, surfing and fishing, although kite surfers/wind surfers also frequent this beach as it has a left to right break with swells reaching up to 3 m at times (ACER, 2017).

Duynefontein is situated 30 km from the City of Cape Town and therefore, apart from the beach and various nature reserves and natural areas further inland, is within easy access to the plethora of tourism activities that the Western Cape has to offer.

6.6 Cultural Heritage

The marine portion of the cable route to the BMH is under the jurisdiction of the South African Heritage Resources Agency (SAHRA). SAHRA is the relevant heritage authority for all heritage resources located below the high-water mark of the sea up to a distance of 24 Nm seaward whilst the terrestrial portion of the cable route inland of the BMH falls under the jurisdiction of HWC. South Africa's record of maritime and underwater cultural heritage resources is based on a mix of information derived from historical documents and other secondary sources, and from very limited primary sources such as geophysical data and other field-based observations and site recordings (Gribble; 2019).

6.6.1 Submerged prehistoric archaeological resources

According to the heritage specialist report (ACO Associates, 2021 – See Appendix B), since the start of the Quaternary, approximately 2.6 million years ago, the world has been subject to a series of cooling and warming climatic cycles in which sea level has generally been lower than it is today. Periods of low sea level would have added a large coastal plain to the South African land mass, where parts of the continental shelf were exposed as dry land (Figure 46). The exposure of the South African continental shelf would have been most pronounced on the wide Agulhas Bank off the southern Cape coast, and it is estimated that a new area of land, as much as 80,000 km^2 in extent, was exposed.

Figure 46 Possible extent of the South African continental shelf c.137,000 years ago (Source: Franklin *et al.*, 2015, cited in ACO Associates, 2021)

The exposed continental shelf was quickly populated by terrestrial flora and fauna, and also by our human ancestors who were dependant on these resources (Compton, 2011). As a result, for periods numbering in the tens of thousands of years on at least three occasions during the last 500,000 years our ancestors inhabited areas of what is now seabed around the South African coast.

This means that a large part of the archaeological record of the later Earlier, Middle and early Late Stone Age is located on the continental shelf and is now “inundated and for all practical purposes absent from [that] record” (Van Andel, 1989).

Until relatively recently there was little or no access to the submerged prehistoric landscapes and sites on the continental shelf, although evidence from various parts of the world of drowned, formerly terrestrial landscapes hinted at the tantalising prospect of prehistoric archaeological sites on and within the current seabed.

There have, to date, been no studies of submerged prehistory in the study area. However, archaeological evidence for a hominin presence along this portion of the West Coast, particularly during Later Stone Age, is plentiful.

More pertinent to this study, however, are the important Earlier Stone Age sites of Duynefontein 1 and 2, approximately 5 km north of the cable landfall area. These sites have produced Early Stone Age, Acheulean stone tools in association with animal bone, deposited between 200,000 and 400,000 years ago, around palaeo-pans or lakes that developed in hollows within a large dune field, where hominins were hunting or scavenging animals.

During periods of lower sea level, similar palaeo-pans and palaeo-river channels are likely to have been present on the exposed continental shelf of the West Coast. Together with ancient rivers courses, these water sources, which are today buried under modern seabed sediment, would have been an important focus for hominin activity on the exposed continental shelf. According to the specialist heritage report, there is a clear potential for the occurrence of ancient, submerged archaeological material in association with such seabed features within the area to be affected by the 2AFRICA/GERA (East) cable system.

6.6.2 Palaeontological features and fossil material

In terms of palaeontological potential within the study area, extensive cemented crusts or “hardgrounds” formed on formations exposed at the seabed and eroded and reconsolidated during glacial sea level oscillations. These have produced a wide array of multiphase phosphorite nodules and phosphatic shell casts of various ages. The bones and teeth of sharks and other fishes, the skulls of extinct whale species and the occasional remains of land-living animals that roamed the ice age exposed shelf are also phosphatized and reworked into the latest, loose sediments on the seabed.

6.6.3 Maritime archaeological resources

6.6.3.1 Maritime history of the South African coast

South Africa has a rich and diverse underwater cultural heritage. Strategically located on the historical trade route between Europe and the East, South Africa’s rugged and dangerous coastline has witnessed more than its fair share of shipwrecks and maritime dramas in the last 500 years. At least 2400 vessels are known to have sunk, grounded, or been wrecked, abandoned or scuttled in South African waters since the early 1500s. More than 1900 of these wrecks are older than 60 years of age and are thus protected by the NHRA as archaeological resources.

The existing list of wrecks is by no means complete and does not include the as yet unproven potential for shipwrecks and other sites that relate to pre-European, Indian Ocean maritime exploration, trade and interactions along the South African east coast. It is anticipated that further research in local and foreign archives, together with physical surveys to locate the remains of historical shipwrecks will produce a final tally of more than 3000.

The historical shipwrecks that form part of South Africa's underwater cultural heritage are a unique and highly cosmopolitan repository of information about global maritime trade during the last five centuries and potentially much further back into the past. These sites contain a wealth of cultural material associated with that trade and clues to the political, economic, social and cultural changes that accompanied this trade, and which contributed to the creation of the modern world.

6.6.3.2 Maritime history of the Duynefontein area

The 2AFRICA/GERA (East) cable system, in its crossing of the contiguous zone and territorial waters off the West Coast, will be routed well to the north of the historical anchorage in Table Bay which has the largest concentration of historical wrecks in South African waters (more than 400). The concentration of shipping casualties in Table Bay is the result of a combination of factors, including a lee shore to the Western Cape's winter storms and the long history of the bay as busy shipping hub, which do not apply to the coast north of Table Bay. Very few shipping casualties therefore occurred between Bloubergstrand and Dassen Island, south of Yzerfontein, and no wrecks are recorded at Duynefontein or within its immediate vicinity.

There are no known or recorded shipwrecks within the study area for the 2AFRICA/GERA (East) cable system in the contiguous zone, territorial waters or internal waters.

The nearest recorded wreck to the study area is L'Lucie, a French sailing vessel wrecked in Losperds Bay in October 1808, approximately 3 km south of the cable system landfall at Duynefontein. Eight other wrecks are recorded in the wider vicinity of the cable system route as shown on Figure 47.

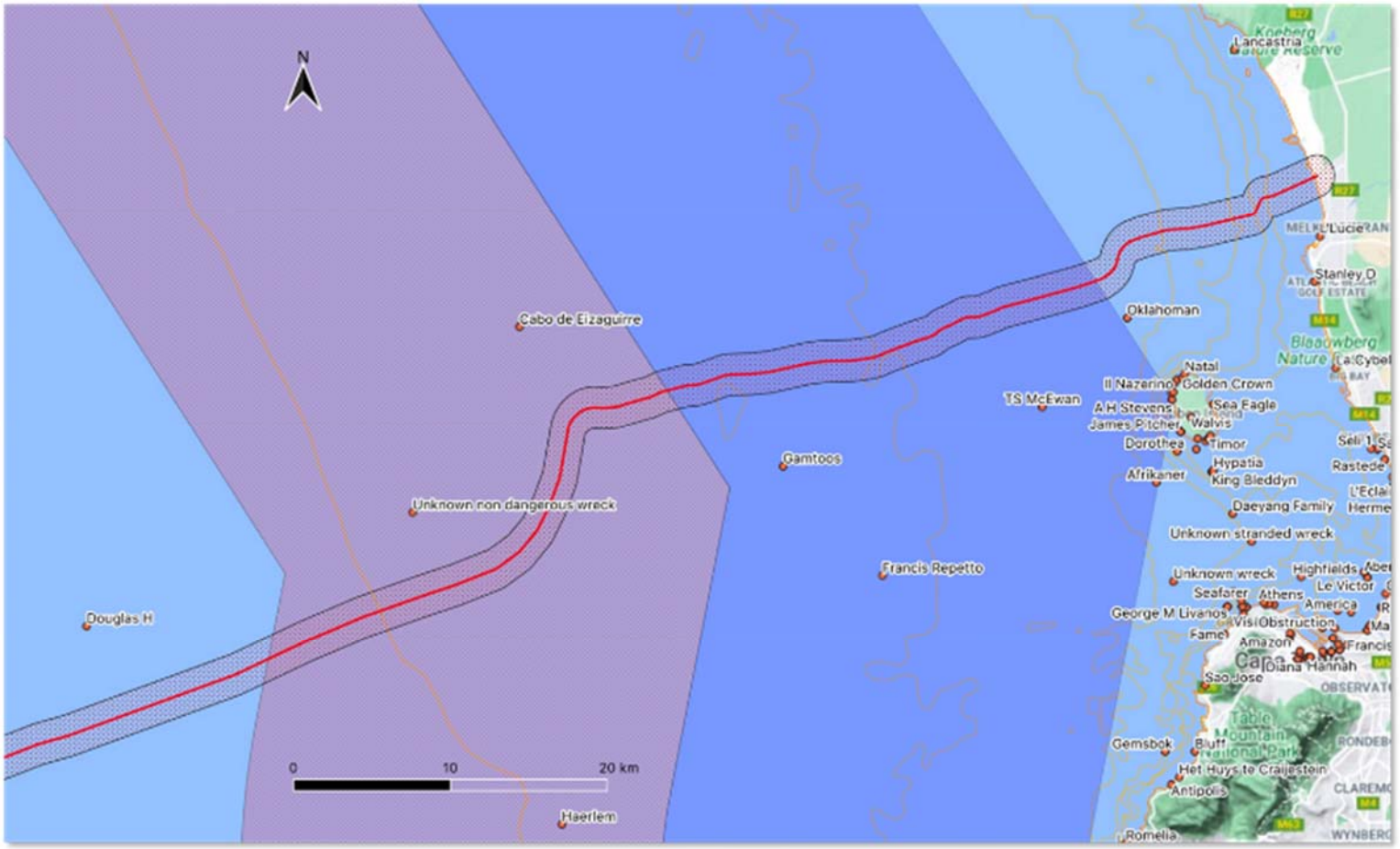


Figure 47 **Proposed alignment of the 2AFRICA/GERA (East) cable system across the contiguous zone, territorial waters and inland waters. The 1 km buffer of the maritime assessment study area is shown on either side of the route as are the recorded wrecks in the vicinity, and some of the 400 plus historical wrecks Table Bay in the bottom right of the image (Source: Google Earth)**

7 ENVIRONMENTAL ASSESSMENT PROCESS

7.1 Scoping

Scoping was undertaken between February 2020 and March 2021. The primary product of Scoping was the FSR. An important part of the FSR was the Plan of Study for Impact Assessment, which provided information on which specialist studies would be undertaken, what would be investigated within each specialist study, how the investigations would be conducted, how potential impacts would be assessed, and impact significance determined, public participation activities, and applicable timelines.

7.2 Impact Assessment

The aim of the Impact Assessment was to investigate the environmental issues and concerns that were identified during Scoping. The technical and public participation processes continued to interact at important stages to ensure that both processes built towards a comprehensive investigation of the issues identified. The main activities during this phase were to:

- Undertake focused scientific studies to assess the issues of concern.
- Maintain ongoing communication and participation with stakeholders.
- Integrate the findings into an EIA Report, inclusive of mitigation measures to ameliorate the effects of negative impacts and optimise positive ones.
- Prepare an EMPr.

7.2.1 Technical process

To provide scientifically sound information in regard to the various issues raised, a number of specialist studies were commissioned. Where applicable, specialists were encouraged to interact and share information to inform the assessment of potential impacts. To address the key issues, each specialist was tasked with assessing the possible impact from their angle of expertise. An integrated approach was adopted to consider direct, secondary and cumulative impacts wherever applicable.

Importantly, technical information on certain project components and activities were fed into this EIA process from other project team members who did not necessarily form part of the EIA specialist study group. In addition, the EAP took into consideration information from other existing documentation, for example, local and regional town planning documents. Thereafter, the findings (along with relevant input from the public participation process described in Chapter 8) were integrated by the EAP to provide a comprehensive understanding of the issues and associated potential impacts.

An important component of the FEIAR is the associated EMPr. The EMPr (Appendix F) outlines the mitigation and monitoring measures for avoiding or minimising negative impacts and optimising benefits during project implementation. In this regard, the EMPr provides a critical link between mitigation measures described in the FEIAR and their actual implementation.

7.3 Specialist Studies and Terms of Reference

The specialist studies were undertaken by professionals regarded as experts in their specific disciplines. Arising from Scoping and the distillation of issues and associated potential impacts, the need for the following specialist studies was identified:

- Vegetation and Ecological Specialist Study
- Fisheries Specialist Assessment.
- Wetlands Specialist Study
- Marine Ecology Specialist Assessment.
- Beach and Coastal Dune Dynamics Assessment.
- Heritage Assessment.

Terms of reference for the different specialist studies are contained in Appendix B. The results of the specialist studies were used by the EAP when undertaking the integrated assessment. The outcomes of integration and assessment have been documented in this FEIAR, which will be submitted to DFFE for decision making. Comments on the DEIAR were considered and included in this Final EIAR for submission to DFFE.

7.4 Integration, impact description and assessment conventions

Considering the specialist findings and information from other sources, the EAP assessed all identified impacts (positive and negative), using the following assessment conventions to determine their significance:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity.

- **Cumulative impacts** are those that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

- **Nature** – the evaluation of the nature of the impact. Most negative impacts will remain negative, however, after mitigation, significance should reduce:
  - Positive.
  - Negative.

- **Spatial extent** – the size of the area that will be affected by the impact:
  - Site specific.
  - Local (limited to the immediate areas around the site; <2 km from site).
  - Regional (would include a major portion of an area; within 30 km of site).
  - National or international.

- **Duration** – the timeframe during which the impact will be experienced:
  - Short-term (0-3 years or confined to the period of construction).
  - Medium-term (>3-10 years).
  - Long-term (the impact will only cease after the operational life of the activity).
  - Permanent (beyond the anticipated lifetime of the project).

- **Intensity** – this provides an order of magnitude of whether or not the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium or high:
  - Negligible (inconsequential or no impact).
  - Low (small alteration of systems, patterns or processes).
  - Medium (noticeable alteration of systems, patterns or processes).
  - High (severe alteration of systems, patterns or processes).

- **Frequency** – this provides a description of any repetitive, continuous or time-linked characteristics of the impact:
  - Once off (occurring any time during construction).
  - Intermittent (occurring from time to time, without specific periodicity).
  - Periodic (occurring at more or less regular intervals).
  - Continuous (without interruption).

- **Probability** – the likelihood of the impact occurring:
  - Improbable (very low likelihood that the impact will occur).
  - Probable (distinct possibility that the impact will occur).
  - Highly probable (most likely that the impact will occur).
  - Definite (the impact will occur).

- **Irreplaceability** – of resource loss caused by impacts:
  - High irreplaceability of resources (the project will destroy unique resources that cannot be replaced).
  - Moderate irreplaceability of resources (the project will destroy resources, which can be replaced with effort).
  - Low irreplaceability of resources (the project will destroy resources, which are easily replaceable).

- **Reversibility** – the degree to which the impact can be reversed/the ability of the impacted environment to return/be returned to its pre-impacted state (in the same or different location):
  - Impacts are non-reversible (impact is permanent).
  - Low reversibility.
  - Moderate reversibility of impacts.
  - High reversibility of impacts (impact is highly reversible at end of project life).

- **Significance**[21] – the significance of the impact on components of the affected environment (and, where relevant, with respect to potential legal infringement) is described as:
  - Low - the impact will not have a significant influence on the environment and, thus, will not be required to be significantly accommodated in the project design.
  - Medium - the impact will have an adverse effect or influence on the environment, which will require modification of the project design, the implementation of mitigation measures or both.

[21] This excludes positive impacts on the environment. In these cases, the level of significance should be denoted as Low**, Moderate** or High**.

- High - the impact will have a serious effect on the environment to the extent that, regardless of mitigation measures, it could block the project from proceeding.

- **Confidence** – the degree of confidence in predictions based on available information and specialist knowledge:
  - Low.
  - Medium.
  - High.

8 PUBLIC PARTICIPATION PROCESS

The public participation process was designed to comply with the requirements of the EIA Regulations (Sections 41 to 44 of GNR 326) and NEMA. Important elements are:

- The manner in which I&APs were notified of the application for environmental authorisation. This includes on-site notice boards, giving written notice to landowners, letters, Background Information Documents (BID) and advertisements in the media (Section 41).
- Opening and maintaining a register containing the names and addresses of I&APs. These include all persons who have submitted comments, attended meetings, and are organs of State who have jurisdiction in the assessment process, and all those who have requested that they be placed on the register as registered I&APs (Section 42).
- Registered I&APs are entitled to comment, in writing, on all written submissions made to the competent authority by the applicant or the Environmental Assessment Practitioner managing the application, and to bring to the attention of the competent authority any issues, which that party believes may be of significance when the application is considered for authorisation (Section 43).
- The comments of registered I&APs and responses thereto must be recorded and included with the reports submitted to the competent authority (Section 44).

Public participation in an EIA process aims to provide sufficient and accessible information to I&APs, in an objective manner, to assist them to:

- During the Scoping Phase.
  - Identify issues of concern and provide suggestions for enhanced benefits and alternatives.
  - Contribute local knowledge and experience.
  - Verify that their issues have been considered.

- During the Impact Assessment.
  - Verify that their issues have been considered either by the EIA Specialist Studies, or elsewhere.
  - Comment on the findings of the DEIAR, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

All relevant public participation documentation is provided in Appendix D and Appendix E.

Due to the Covid-19 National State of Disaster and Lockdown in the country, the Department of Environment, Forestry and Fisheries requires Environmental Assessment Practitioners to undertake public participation in innovative ways that respect social distancing and other measures to contain the spread of the Corona virus. A public participation process was compiled to comply with the “Directions regarding measures to address, prevent and combat the spread of COVID-19 relating to National Environmental Management Permits and Licenses” in Government Notice (GN) No. 650 dated 5 June 2020.

8.1 Notification of the application

Stakeholders were informed of MTN's intention to apply for environmental authorisation via a BID, media advertisements and on-site notice board. The application was also posted on ACER's website for stakeholder review.

8.2 Identification and registration of Interested and Affected Parties (I&APs)

Key stakeholders and other I&APs were identified, and their contact details incorporated into a project database. They included representatives of a variety of sectors, as shown in Table 8. A copy of the stakeholder database is provided in Appendix D.

Table 8 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
Parastatals (Koeberg, Eskom, SAMSA, Transnet National Ports Authority)
Representative Associations: ❑ South African Deep Sea Trawling Industry Association ❑ Offshore Mining Concession Holders ❑ Conservation Organisations ❑ Tourism Organisations
Non-Governmental Organisations
Landowners and Local Residents Associations
Conservation Authorities and Conservation Groups
Business and Industry

While consultation has taken place with representatives of different sectors of society, special efforts have been made to obtain the contributions of all people who may be directly affected by the proposed project. These efforts will be on-going for the duration of the EIA.

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8.3 Project announcement

The opportunity to participate in the EIA was announced as follows:

- ❑ Advertisements in local and provincial newspapers:
  - Table View Tygerburger (02 September 2020).
  - Cape Times (03 September 2020).
- ❑ A Background Information Document (BID) was compiled and emailed to all key stakeholders on 02 September 2020. All I&APs who registered following the project announcement adverts were also sent the BID for their records.
- ❑ Notifications by telephone.
- ❑ Placement of an on-site notice board at the cable landing preferred site Alternative 1.

8.4 Obtaining and dealing with comments from I&APs

During Scoping, the following opportunities were provided to I&APs to contribute comments:

- Completing and returning Registration and Comment Sheets.
- Providing comments telephonically or by email.
- During the Scoping Report public review periods, one on one meetings (telephonic or via Zoom) were held with key stakeholders to address particular concerns.

Responses in writing or by telephone were provided directly to I&APs where relevant, and/or in the Comments and Responses Report circulated with the FSR and DEIAR (see below).

8.5 Comments and Responses Report and summary of issues raised

Issues and concerns raised by I&APs to date, and responses thereto, have been captured in a Comments and Responses Report (CRR) provided in Appendix E. To date, the comments received from I&APs and relevant authorities relate to the following topics:

- Stakeholder registration details.
- Requests for mapping.
- Various comments from the City of Cape Town, relating to:
  - applicable legislation, permit and lease requirements
  - the landing site and cable position
  - public access, health and safety
  - effect on Critical Biodiversity Areas, use of directional drilling and rehabilitation requirements.
  - Koeberg Nuclear Power Station Disaster Risk Management.
  - Municipal water and sewage infrastructure.
- Coastal Navigation Safety.
- Location of trawling activities relative to the cable route.
- Requirements of the heritage authorities (HWC and SAHRA).
- Requirement to obtain a lease/wayleave agreement over the Coastal Public Property from the Department of Public Works and Infrastructure.
- Comments from O&G Rights Holders relating to exploration of hydrocarbon activities offshore in relation to their Exploration Right Blocks.
- Comments from Western Cape Department of Environmental Affairs and Development Planning, relating to the Listed Activities, Specialist studies, and public participation aspects.
- Comments from DFFE (Environmental Authorisations), relating to Listed Activities, Layout and Sensitivity maps, public participation, specialist assessments and other aspects of the EIA process.
- Comments from DFFE (Oceans and Coasts) relating to the protection of the coastal environment in line with the ICMA, including comment on specialist studies.
- Comments from DFFE (Fisheries Management) relating to abalone ranching areas.
- Comments from DHSWS relating to water use authorisation applications.
- Comments from City of Cape Town Environmental and Heritage Management Department relating to various general matters in the FSR.

8.6 Draft and Final Scoping Report

The purpose of the Draft Scoping Report (DSR) and FSR was to enable I&APs and authorities to verify that their contributions had been captured, understood and correctly interpreted. The issues identified by I&APs and by the environmental technical specialists were used to define the terms of reference for the specialist studies for this impact assessment.

The availability of the DSR for public comment was advertised on 15 January 2021 as follows:

- Notification letters were sent to all registered I&APs (15 January 2021).
- Notices were placed at strategic points (local shops, library, etc.) within and around Duynefontein, notifying the public of the availability of the DSR for review and comment.

The DSR was made available at the Koeberg Public Library within the study area for public review (with a 30-day comment period, 15 January to 15 February 2021) and was posted on ACER's website. A reminder to comment was sent to registered I&APs on 03 February 2021.

Comments submitted during this period were taken into account when finalising the Scoping Report. They were included in the Final CRR which was submitted to DFFE with the FSR on 25 February 2021. I&APs were notified of the submission of the FSR to DFFE and an electronic copy of the FSR was uploaded to the ACER website for review and comment by I&APs. A hard and CD copy of the FSR was also sent to the City of Cape Town.

DFFE approved the FSR on 01 April 2021, allowing the Impact Assessment to follow in accordance with the Plan of Study.

8.7 Draft and Final Environmental Impact Assessment Reports and Environmental Management Programme

The purpose of the DEIAR and accompanying Draft EMPr was to collate, integrate, summarise, and assessed the findings of the specialist studies and to consider each of the issues raised during Scoping. The DEIAR was made available for public and authority review at appropriate and accessible local public venues and by placing documentation on ACER's website between the period 28 May – 29 June 2021.

Following the public review period, the DEIAR and Draft EMPr were amended according to comments received, and then finalised along with the Final CRR.

This report fulfils the function of a FEIAR the findings of which will be reviewed by DFFE during decision making. The purpose of the FEIAR is to collate, integrate, summarise, and assess the findings of the specialist studies and to consider each of the issues raised during Scoping. This aims at providing the reader with a holistic understanding of the potential positive and negative impacts of the proposed development. Several inputs have informed the content of the FEIAR, most notably the outcomes of the different specialist studies that were commissioned as part of the Impact Assessment and the comments received from I&APs and authorities following review of the DEIAR.

An Environmental Management Programme (EMPr) has also been prepared for the design, construction, and rehabilitation phases of the project. The purpose of the EMPr is to provide a structured framework for managing the causes of environmental impacts. The information and findings contained in this report have informed the EMPr.

This FEIAR has been submitted to DFFE for decision making and has also been made available to I&APs for review and comment (should comments be received these will be forwarded on to DFFE for consideration).

8.8 Notification of I&APs of DFFE's decision making

Once DFFE has issued (or refused) an environmental authorisation on the proposed project, registered I&APs will be notified via post or email of the decision, including details on the appeal procedure.

9 SUMMARY OF SPECIALIST STUDY FINDINGS

The specialist studies produced by each specialist are listed in Table 9 and contained in Appendix B, as referenced. Note that while separate terms of reference were compiled (refer to Section 7.3), the Wetlands and Vegetation/Ecology specialist studies were combined into a single report. The reports on Avifauna and Marine Mammals were commissioned as additional overview reports for the use of all of the 2AFRICA landings in South Africa, in response to comments raised by DFFE – OC. They are therefore additional to the Plan of Study for Impact Assessment as outlined in the FSR for the 2AFRICA/GERA (East) Cable System (Duynefontein landing).

The approach, findings and conclusions of the specialist reports, as they apply to the selected alternatives that are assessed in this EIA, are summarised below. Note that the environmental baseline referenced from specialist reports, where applicable, has been included in Chapter 6 of this report.

Table 9 Specialist studies and specialists

	Specialist Study	Specialist	Organisation
1	Ecological Impact Assessment Report (Vegetation, Wetlands/Watercourses & Fauna). (Appendix B1)	Mr D. Ollis and Mr Paul Emms	Inland Waters Consultancy in association with Capensis
2	Commercial Fisheries Specialist Study (Appendix B2)	Mr David Japp and Ms Sarah Wilkinson	Capricorn Marine Environmental (Pty) Ltd (CapMarine)
3	Beach and Coastal Dune Dynamics Impact Assessment (Appendix B3)	Mr Simon Bundy	SDP Ecological & Environmental Services
4	Marine Ecology Assessment (Appendix B4)	Dr Andrea Pulfrich	Pisces Environmental Services (Pty) Ltd
5	Maritime Archaeological Impact Assessment (Appendix B5)	Mr John Gribble	ACO Associates cc
6	A review of the potential effects of submarine telecommunications cables on marine mammals in Southern Africa (Appendix B6)	Mr Simon Elwen	Sea Search Research and Conservation
7	Submarine Telecommunications Cables Environmental Impact Assessment. Generic Avifaunal Impact Assessment (Appendix B7)	Mr Jon Smallie	WildSkies Ecological Services (Pty) Ltd

9.1 Ecological Impact Assessment (Vegetation, Wetlands/Watercourses & Fauna).

9.1.1 Introduction

The report (Appendix B1) deals with impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on terrestrial and freshwater ecosystems (meeting the two terms of reference initially compiled for vegetation and wetlands, respectively). This report was compiled to meet the minimum criteria for reporting on the terrestrial and aquatic biodiversity themes as required in terms of the relevant protocols published in Government Notice No. 320 of 20 March 2020 (Government Gazette No. 43110).

9.1.2 Approach

The following tasks were undertaken:

- Review of available documentation for the proposed cable installation and reports from the EIA conducted for the landing of the ACE Cable System in the same study area.
- Application of the DFFE national web-based environmental screening tool.
- Examination of maps, biodiversity plans and aerial photographs of the study area as a basis for preliminary desktop-based mapping of potentially affected terrestrial and freshwater ecosystems.
- Site visit (on 4 February 2021) to identify, delineate and visually assess the present ecological condition of the terrestrial and freshwater ecosystems that could potentially be impacted by the proposed cable installation, and to determine whether any Species of Conservation Concern (SCC) are present (or likely to be present).
- The dominant plant species were identified and noted, based on visual observations, and high-resolution photographs were taken to assist with post-fieldwork identification of observed species. Geographical coordinates were also recorded for each photograph and observation point.
- Identification of potential impacts on terrestrial and/or aquatic (freshwater) biodiversity, and formulation of recommended mitigation measures for identified impacts.
- Assessment of the significance of the potential impacts identified, considering the situation both with and without the recommended mitigation measures assumed to be in place, using the specified method provided by ACER.
- Review of potentially relevant legislation and identification of required permits / licenses / authorisations.
- Compilation of an Ecological Impact Assessment Report (i.e., the current report), which includes all the minimum criteria for reporting on the terrestrial and aquatic biodiversity themes as required in terms of the relevant protocols published in Government Notice No. 320 of 20 March 2020 (Government Gazette No. 43110).
- Compilation of Compliance Statements for the environmental themes relating to terrestrial plant species and terrestrial animal species, as required in terms of the protocols for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant and animal species (Government Notice No. 1150, Government Gazette No. 43855 of 30 October 2020).

9.1.3 Findings

The preferred alternative (Alternative 1) would result in very few to no impacts on terrestrial ecosystems, freshwater ecosystems or non-marine fauna, largely because Alternative 1 would involve the use of existing infrastructure associated with the ACE Cable System. The only area that would really be affected would be the beach on the seaward side of the foredunes, where a trench would need to be excavated up to the existing anchor block for the installation of the new 2AFRICA cable. The potentially affected beach environment has no vegetation or freshwater ecosystems and is not an important habitat for non-marine fauna.

The new infrastructure that would need to be installed for Alternative 2 would, on the other hand, potentially affect the foredune area in the vicinity of the proposed landing point and the dune slack wetland on the landward side of this, as well as the fauna associated with these habitats. These potential impacts on vegetation, wetlands and fauna were however all rated to be of low-to-medium significance without mitigation for Alternative 2, reducing to low significance with the proper implementation of the recommended mitigation measures.

No terrestrial plant or animal species of conservation concern are likely to be affected by either alternative, which is one of the reasons for the impact ratings of low significance. It was also concluded that no negative cumulative impacts of significance to terrestrial ecosystems, freshwater ecosystems or non-marine fauna would result from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing), irrespective of which route alternative is followed.

Since project installation activities will be taking place within 500 m of wetlands, an application needs to be made to the Western Cape regional office of DHSWS in the form of a General Authorisation for Section 21 (c) and (i) water uses (Government Notice of 26 August 2016).

Mitigation measures from this specialist report have been carried across to Section 10.2 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.1.4 Conclusion

Overall, Alternative 1 is recommended over Alternative 2 from an ecological perspective. Alternative 2 would, however, also be acceptable if all the recommended mitigation measures (as outlined in specialist report) were to be properly implemented.

9.2 Fisheries Specialist Assessment

9.2.1 Introduction

The report (Appendix B2) provides an assessment of the potential impacts of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the commercial fishing industry.

9.2.2 Approach

The applicable legislation specifying safety and exclusion zones around submarine cables and cable laying vessels was outlined. An overview of South African fisheries was provided and thereafter a detailed description of those fisheries whose fishing grounds coincide with the proposed cable routing. For each of these fishing sectors, the report identified (where the information was available):

- Target species.
- Wholesale economic value of the sector.
- Nominal catch.
- The vessels, gear, methods and timing involved in the fishing activity and the way in which this may impact or be impacted by the proposed cable.
- The location and extent of the fished areas in relation to the proposed cable.
- An estimation of the fishing effort affected by the exclusion zones applied during installation and operation of the cable, in relation to the overall effort recorded by the sector.
- Possible mitigation.

Taking the above into account, the report identified and assessed the potential impacts of each stage of the cable installation (survey, installation, and operation) on affected fishing sectors.

9.2.3 Findings

9.2.3.1 Exclusion zones

Under the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS, 1972, Part A, Rule 10), a vessel that is engaged in cable laying 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. Furthermore, under the Marine Traffic Act, 1981 (No. 2 of 1981), a vessel used for the purpose of cable laying falls under the definition of an "offshore installation" and as such it is protected by a 500 m safety zone. It is an offence for an unauthorised vessel to enter the safety zone. In practice a 1,500 m exclusion zone will be requested around the cable laying vessel during cable installation.

Once installed, a subsea cable is protected by a 500 m exclusion zone on either side of the cable, and it is an offence for any anchoring or trawling within this zone.

9.2.3.2 Commercial fisheries which intersect with the marine cable alignment

Fishing activity for the following commercial fishing sectors overlaps to varying extents with the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) marine cable alignment:

- ❑ Demersal Trawl
- ❑ Mid-Water Trawl
- ❑ Demersal Longline
- ❑ Small Pelagic Purse Seine
- ❑ Large Pelagic Longline
- ❑ Tuna Pole
- ❑ Traditional Linefish
- ❑ West Coast Rock Lobster
- ❑ Small Scale Fisheries

Generally, the most affected area is off the West Coast along the cable route within approximately 100 km of the shore. There is a gradual convergence of at least 5 other cables in a similar area, making landfall at Melkbosstrand and Duynefontein.

Primary fisheries in terms of economic value and overall tonnage of landings (Figure 48) are the demersal (bottom) trawl and long-line fisheries targeting the Cape hakes (*Merluccius paradoxus* and *M. capensis*) and the pelagic-directed purse-seine fishery targeting pilchard (*Sardinops sagax)*, anchovy (*Engraulis encrasicolus*) and red-eye round herring (*Etrumeus whitheadii*). Highly migratory tuna and tuna-like species are caught on the high seas and seasonally within the South African waters by the pelagic long-line and pole fisheries.

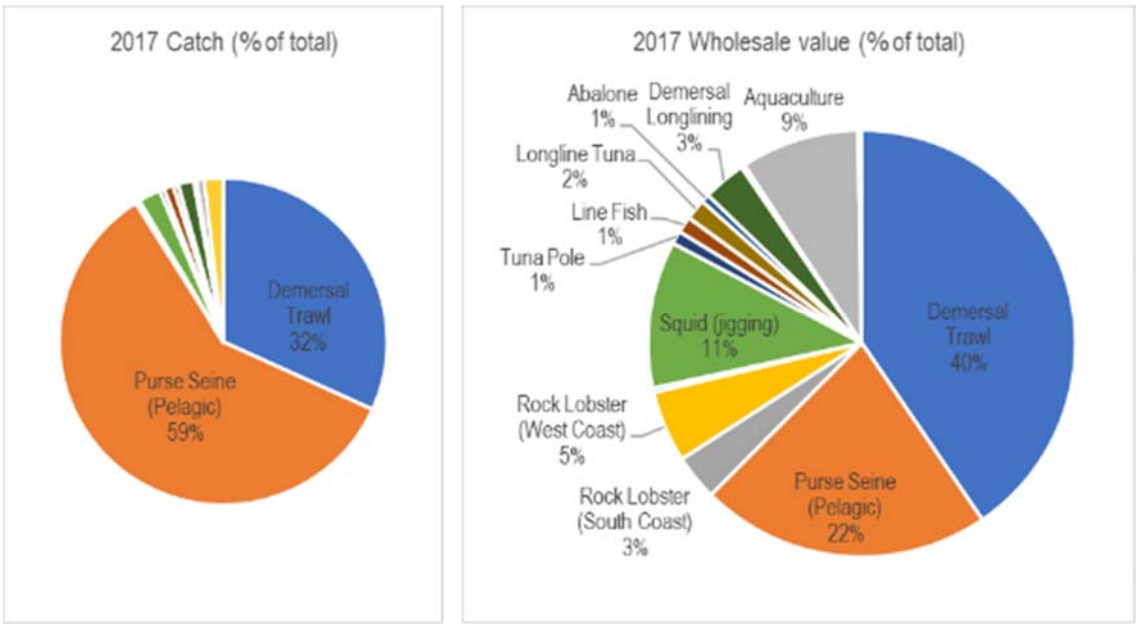

Figure 48 Pie chart showing percentage of landings by weight (left) and wholesale value (right) of each commercial fishery sector as a contribution to the total landings and value for all commercial fisheries sectors combined (2017). Source: DEFF, 2019, cited in CapMarine, 2021)

The demersal trawl fishery would be affected due to its operation directly on the seabed and the trawling grounds overlapping with areas along the proposed cable alignment (depth range of 200 m to 1000m). The mid-water trawl is also affected where it overlaps with the cable route. The demersal longline is also affected, with its fishing grounds similar to those targeted by the hake-directed trawl fleet. The small pelagic purse-seine fishery does not directly make contact with the seabed (nets extend to a depth of 60 m to 90 m), however its area of operation overlaps with a section of the proposed cable alignment, particularly closer inshore. The large pelagic longline utilizes gear which can make contact with the seabed and its area of operation overlaps with areas of the proposed cable alignment. In this case, there is a significant amount of overlap with the main trunkline along the southeast and east coasts, in addition to the final section approaching Duynefontein. There is some overlap with areas fished by the traditional line fish sector along the West Coast, as well as the West Coast Rock Lobster sector, which operates close inshore near Duynefontein.

9.2.3.3 Potential impacts of the project on fisheries

The causes of potential impacts of the project on the fishing industry were identified as:

- ❑ Noise emissions generated during geophysical survey activities which may harm or temporarily displace fish.
- ❑ Temporary exclusion from fishing ground during geophysical survey and cable-laying operations.
- ❑ Long-term exclusion of anchoring and trawling around the cable.

NOISE EMISSIONS DURING THE GEOPHYSICAL SURVEY

The presence and operation of the survey vessel will introduce a range of underwater noises into the surrounding water column that may potentially contribute to and/or exceed ambient noise levels in the area. Elevated noise levels could impact marine fauna by:

- Causing direct physical injury to hearing or other organs, including permanent or temporary threshold shifts in hearing.
- Masking or interfering with other biologically important sounds (e.g., communication, echolocation, signals, and sounds produced by predators or prey).
- Causing disturbance to the receptor, resulting in behavioural changes or displacement from important feeding or breeding areas.

Should the above negatively affect populations of target species, this could in turn negatively impact the catch of commercial fisheries. The acoustic impact of the proposed geophysical surveying on marine fauna was assessed by Pisces (2020). The findings of the assessment are that the noise generated by the acoustic equipment utilized during geophysical surveys would not coincide with the hearing range of fish and crustaceans. Due to the short-term duration and the low intensity of noise generated by the acoustic equipment utilized during geophysical surveys, the specialist report considers the significance of the impact to be very low. No mitigation measures are possible or considered necessary for the generation of noise by the geophysical survey methods proposed. The impact is considered to be highly reversible, as any disturbance of behaviour that may occur as a result of survey noise would be temporary. While there is little scope for mitigation, the assessment indicates that the overall impact of temporary exclusion is of very low significance.

TEMPORARY EXCLUSION FROM FISHING GROUND DURING GEOPHYSICAL SURVEY AND CABLE-LAYING OPERATIONS DUE TO TEMPORARY EXCLUSION ZONES AROUND VESSELS

By law, vessels engaged in surveying as well as vessels engaged in laying of subsea cables are protected by a 500 m exclusion zone however when cable laying is underway the vessel will request up to a 1,500 m exclusion zone depending on water depth. The demersal trawl, midwater trawl, demersal longline, small pelagic purse-seine, large pelagic longline, tuna pole, traditional linefish and West Coast rock lobster trap sectors have historically operated across the proposed Duynefontein landing route and are all currently active to a lesser or greater degree.

All unauthorised vessels would be excluded from entering the exclusion zone. The implementation of the safe operational zone will effectively exclude fishing vessels from portions of their fishing grounds when the vessels are on site. The temporary exclusion of fisheries from the exclusion zone will effectively reduce fishing grounds, which in turn could potentially result in a loss of catch and/or displacement of fishing effort (direct negative impact).

For all fishing sectors, the impact is considered to be short-term (limited to the duration of the survey and cable laying operations) with the extent being localised. The intensity of the impact on each sector will be based on the proportion of fishing effort and catch within the affected area, relative to total effort and catch reported by each sector. The intensity of the impact is assessed to be low for all sectors. While there is little scope for mitigation, the assessment indicates that the overall impact of temporary exclusion is of very low significance.

EXCLUSION FROM FISHING GROUND DUE TO PERMANENT EXCLUSION ZONE AROUND CABLE

Once installed, a subsea cable is protected by a 500 m exclusion zone on either side of the cable, and it is an offence to anchor or trawl within this zone. The proposed project therefore presents an impact on the fishing industry via exclusion to the demersal trawl or demersal longline operations.

The majority of the proposed cable routing falls offshore of the demersal trawl fishing grounds. Where the cable routing traverses shallower water, from a seabed depth of 1000 m to 200 m, trawling activity could be expected to take place across a 45 km section of the cable. Within this area trawlers could be expected to cross the proposed cable routing at a bearing (from true north) of approximately 165° or 345° (i.e., in both directions). Figure 49 shows the location of a sample of trawl tracks as well as trawling effort in relation to existing cables and the proposed cable routing. Note that although trawl tracks are shown to cross the existing cables, trawling with gear on the seabed is unlikely as skippers would lift gear off the seabed to avoid potential contact with the cables.

Over the period 2008 to 2016 an average of 228 trawls per year (or 665 fishing hours) were recorded within a distance of 1 nautical mile of the proposed cable routing at Duynefontein. This is equivalent to 0.6% of the overall effort expended by the fishery. The amount of hake caught within the area was 678 tons per year or 0.6% of the overall effort recorded by the sector. A 500 m exclusion zone around the cable route would cover 45 km^2 (0.08%) of the demersal trawl fishing ground.

Based on the high levels of effort recorded in the area, the probability that the impact would occur is definite and the duration of the impact would be long-term. The intensity of the impact is considered to be medium (where fishing may continue in a modified way). Mitigation potential is low, and the overall significance of permanent exclusion is considered to be low.

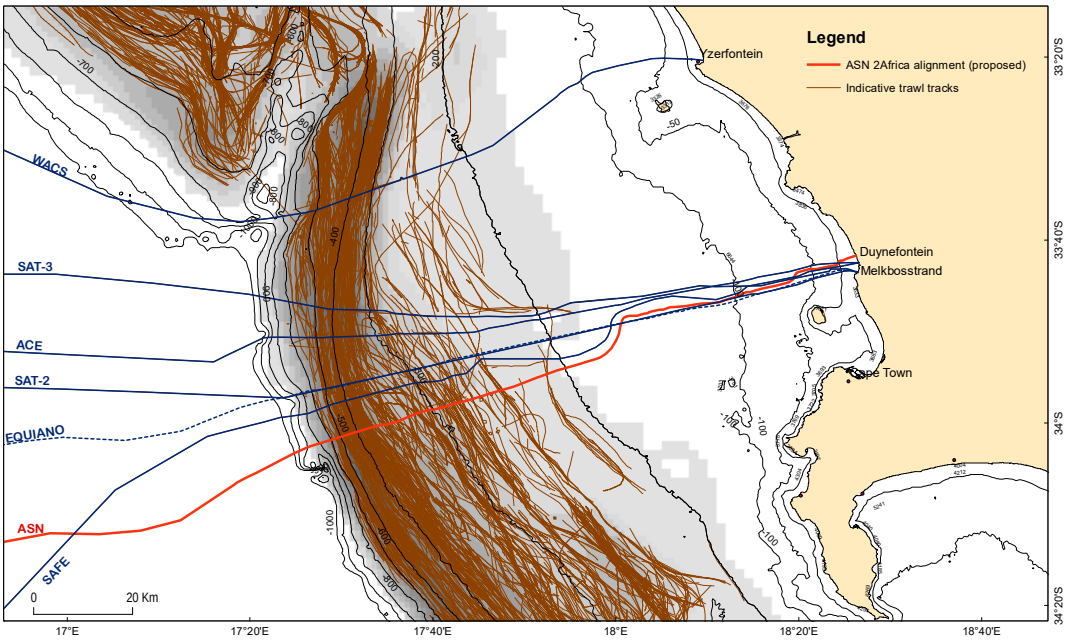

Figure 49 Spatial distribution of fishing effort expended by the demersal trawl sector in relation to the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). Indicative trawl tracks are shown in relation to the proposed and existing cables

Mitigation measures from this specialist report that can be applied, have been carried across to Section 10.4 of this report and incorporated into the EMPr (Appendix F).

9.2.4 Conclusion

The report concludes with a summary table, listing a significance of very low or low, for each of the identified project impacts on affected fisheries, before and after the implementation of mitigation measures (Table 10).

Table 10 Summary of the impacts on fisheries of each of the identified project activities (2AFRICA/GERA (East) Cable System (Duynefontein landing).

Ref:	Potential Impact Source	Project Phase	Impact Significance	
			Pre-Mitigation Impact	Residual Impact
1	Noise Effects on Catch Rates during Geophysical Survey (multi-beam echo sounder, side-scan sonar, sub-bottom profiler)	Pre-Installation	Very Low	Very Low
2	Temporary Exclusion Zone around Geophysical Survey Vessel	Pre-Installation	Very Low	Very Low
3	Temporary Exclusion Zone around Cable-Laying Vessel	Installation	Very Low	Very Low
4	Permanent Exclusion Zone around Cable	Operation Demobilisation	Low	Low

9.3 Beach and Coastal Dune Dynamics

9.3.1 Introduction

The report (Appendix B3) provides an assessment of the potential impacts of the proposed 2AFRICA 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the beach and dune cordon, within and adjacent to the proposed landing point.

9.3.2 Approach

The investigation utilised desk-top assessments and field reconnaissance to investigate various selected parameters and to identify biophysical factors associated with the area that may be considered drivers that determine the status and ecological function of the beach and dune cordon. In addition, the investigation considers the ecological impacts that may arise within the dune system from the establishment of the cable, the most appropriate routing for the cable, as well as mitigation and management measures that may be employed during and post the installation phase. This study also took into account previous information gathered by SDP Ecological and Environmental Services in 2016, for the establishment of the ACE cable.

9.3.3 Findings

Although Duynefontein is a highly transformed area, the dune cordon and supratidal[22] environment along the Duynefontein coastline, is considered to be of very high ecological sensitivity.

The nature of the dune form at Duynefontein is a function of the dissipative morphology of the beach and accounts for the dune forms evident along the cordon. The dune cordon is comprised of three differing dune structures, backed by a wide, permanently wet and inundated dune slack (see Section 6.2.6). The three dune forms comprise of embryonic or hummock dunes, which are most closely associated with the back beach environment and longitudinal dunes, which form a secondary dune cordon.

A comparison of the beach and dune form between 2011 and 2019 show a significant change in the dune cordon, with a regression in stable dune of up to 90 m landward. As such this would equate to a regression approximating 10 m per year over the last decade. The reason for such regression is evidently unknown but can be suggested as arising from possible inter-decadal meteorological and maritime cycles. Climate change phenomena as well as more direct and site-specific changes associated with the back of beach, in particular freshwater availability in the dune slack, may also be playing a role. It is clear that restoration of the dune immediately following establishment of the cable is important, to ensure that disturbance of the dune does not exacerbate dune regression.

A wet dune slack lies to the east of the dune heel and is an important driver of vegetation within the more seaward dune cordon. As such, the dune slack is a significant source of freshwater to frontal dune vegetation which is supplied either directly through sub surface inundation and seep, or condensation and capillarity within the proximal dune structure. The dune regression discussed above, has effectively seen a decrease in vegetation cover on the frontal dune cordon.

Leeward of the longitudinal dune, the wet slack gives rise to a habitat dominated by *Typha capensis* and *Juncus kraussii*, but where a more mesic environment prevails, species typical of Cape Flats Dune Strandveld veld type are evident, in particular *Chrysanthemoides monilifera* and *Dassispermum suffruticosum*.

The leeward habitat has been subject to some level of transformation with the establishment of stormwater outfalls, walkways and other infrastructure (including sub surface cables) being evident. Nonetheless this area can be described as being of high ecological significance, as is common with most coastal wetland environments. Notable is the presence of the Cape dune mole rat (*Bathyergus suillus*), which is typically associated with the wet slack and dune environment. Although considered to be of least concern from a conservation perspective, this species is losing habitat on account of urban expansion along the coastlines of the Western Cape.

Given the ecological significance of the land lying leeward of the primary dune, it would be important to ensure that the establishment of the cable aligns closely with existing disturbed areas and that disturbed areas are rapidly re-established. The use of an existing cable route is therefore considered to be the most prudent approach (i.e., Alternative 1). Stabilisation of the dune should be undertaken on a temporary basis utilising geofabric or related materials, and limited planting of materials is proposed after the cable is installed.

[22] The supra tidal or supralittoral zone is the area above the spring high tide line, on coastlines and estuaries, that is regularly splashed, but not submerged by ocean water.

Mitigation measures from this specialist report have been carried across to Section 10.5 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.3.4 Conclusion

The report concludes that due to the mobilising conditions of the coastal inshore and supra tidal environment at Duynefontein, the most prudent approach to limiting impacts will be to use the route of the existing cable (i.e., Alternative 1). This will collate disturbance into a singular traverse and will improve management and restoration initiatives as recommended.

9.4 Marine Ecology Assessment

9.4.1 Introduction

The report (Appendix B4) was compiled as a desktop study and provides an assessment of the potential impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the marine environment.

9.4.2 Approach

The specialist adopted a 'desktop' approach. The landing site at Duynefontein is characterized by a stretch of dissipative sandy beach, no different from other similar beaches in the southern Benguela, and which have been adequately described in the scientific literature. A detailed site investigation was thus not deemed necessary, and no new data were collected.

The study provides a description of the natural baseline environment in the marine study area based on a review and collation of existing information and data from the scientific literature, and various internal reports. The information for the identification of potential impacts on benthic communities was drawn from various scientific publications, and information sourced from the Internet. The report identified and assessed the potential impacts of each stage of the cable installation (survey, installation, and operation) on benthic habitat, marine fauna and water and sediments. All identified marine impacts were summarised, categorised, and ranked in impact assessment tables, which have been translated into the impact assessment tables in Chapter 10 of this FEIAR, as applicable.

Note that there are assumptions and information gaps relevant to this marine ecology assessment.

9.4.3 Findings

9.4.3.1 Sensitive areas encountered along the marine cable route alignment

The route of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) passes through several ecologically sensitive areas, with differing levels of protection, including:

- The West Coast National Park MPA.
- EBSA associated with the Cape Canyon and associated Islands, Bays and Lagoons and situated between Cape Canyon and Robben Island MPAs.
- Robben Island MPA.
- Southeast Atlantic Seamounts MPA.
- The Protea Seamount Cluster EBSA.
- CBA1 and CBA2 areas in terms of the new National Coastal and Marine Spatial Biodiversity Plan (2020).
- Threatened ecosystems (ranging from well protected to not protected).
- The proposed marine IBA (Bird Island / Dassen Island / Heuningnes river and estuary system / Lower Berg River wetlands), with confirmed coastal IBAs in the vicinity of the shore crossing including Dassen and Robben Islands, Rietvlei Wetland and False Bay Nature Reserve.

9.4.3.2 Disturbance of the coastal zone

Installation of the subsea cable through the surf-zone and across the beach would require the subsea cable to be buried to sufficient depth to ensure it is not exposed during seasonal variation of the beach levels. Excavated material would be disposed of onto the beach and into the surf-zone down-current of the construction site. Subtidal trenching would result in the mobilisation and redistribution of sediments in tidal currents and the littoral drift. This would result in localised increased suspended sediment concentrations in the water column. Where burial cannot be achieved and additional cable protection is required, an articulated split-pipe may be used to maximise cable security. The trenching and cable burial process would result in disturbance of high shore, intertidal and shallow subtidal sandy beach habitats and their associated macrobenthic communities through displacement, injury or crushing. Mobile organisms such as fish and marine mammals, on the other hand, would be capable of avoiding the construction area. Any shorebirds feeding and/or roosting in the area would also be disturbed and displaced for the duration of construction activities. On a high-energy coastline the recovery of the physical characteristics of intertidal and shallow subtidal unconsolidated sediments to their pre-disturbance state following trenching and cable burial will occur within a few tidal cycles under heavy swell conditions and will typically result in subsequent rapid recovery of the invertebrate epifaunal and infaunal communities to their previous state. If, following the disturbance, the surface sediment is similar to the original surface material, and if the final long-term beach profile has similar contours to the original profile, the addition or removal of layers of sand does not have enduring adverse effects on the sandy beach benthos.

9.4.3.3 Disturbance of nearshore benthic habitats

Trenching of the subsea cable in the littoral zone beyond 10-15 m depth would result in the mobilisation and redistribution of sediments in tidal currents and the littoral drift. This would result in localised increased suspended sediment concentrations in the water column. Where burial cannot be achieved and additional cable protection is required, an articulated split-pipe may be used to maximise cable security. Within the wave-base (0 – 50 m), the subsea cable and/or articulated split-pipes may be held in place with saddle clamps at specific locations. This would require drilling into the bedrock to secure the clamps. The subsea cable burial and/or securing process would result in disturbance of subtidal unconsolidated sediments and their associated macrobenthic communities through displacement, injury or crushing.

Although recovery is site specific and dependent on different modes of cable burial and varied sediment environments, studies have shown that on the inner and middle shelf, recovery of benthic communities following cable burial by plough typically occurs within 1-2 years and conclude that the physical presence of the cable and the disturbance caused by its burial had little effect on the benthic communities along the cable route.

9.4.3.4 Disturbance of offshore habitats

The grapnel used during the PLGR, and the subsea cable plough and/or tracked jet-trenching/burial ROV implemented during subsea cable laying would result in the disturbance and turnover of unconsolidated sediments along a swath of seabed. The plough blade disturbs a swath of seabed ≤1 m wide but potentially extending to a depth of 3 m. Jetting techniques create a trench typically ≤1 m wide, however sediment disturbance is extensive and redeposition can spread to hundreds of metres from the trench, with plumes of the suspended mud fractions potentially extending to 2 km from the cable route, thereby creating a larger impact footprint.

As the cable is typically only 17 mm to 50 mm in diameter, the disturbance associated with laying it on top of the sediment or consolidated substrate is limited to the footprint of the cable itself and any protective encasing material. Impacts associated with placing the cable directly onto the seabed include crushing, damaging or displacement of organisms. Unless cables traverse habitats supporting vulnerable slow-growing species (e.g., glass sponges, deep-water corals), the loss of substratum would be temporary as the cable itself would provide an alternative substratum for colonising benthic communities or provide shelter for mobile invertebrates. Once the cable has been laid, the affected seabed areas around the cable would with time[23] be recolonised by benthic macrofauna, with the encrusting epifauna resembling that inhabiting natural reefs in the area. Recovery time will vary depending on the type of benthic community, and is usually much slower in deeper areas, sometimes taking more than 10 years to fully recover. The impacts associated with cable burial are, however, a once-off disturbance, with affected communities able to recover naturally following the cable installation. Where the subsea cable is exposed, colonisation of the cable would commence within a few weeks. Studies from elsewhere have determined that benthic macro- and mega-fauna within 0–100 m of trenched and surface-laid cables showed negligible changes in abundance and distribution following cable installation.

9.4.3.5 Increase in noise

During installation of the subsea cable shore-crossing, noise and vibrations from excavation machinery may have an impact on surf-zone biota, marine mammals and shore birds in the area. The noise generated will, however, be localised and of short duration and mobile animals will be able to move out of the noise affected area.

Further offshore, underwater noise generated during subsea cable installation could affect a wide range of fauna; from benthic invertebrates and demersal species residing on the seabed along the subsea cable route, to those invertebrates and vertebrates occurring throughout the water column and in the pelagic habitat near the surface. Due to their hearing frequency ranges, the taxa most vulnerable to noise disturbance are turtles, pelagic seabirds, large migratory pelagic fish, and both migratory and resident cetaceans.

[23] The time taken will vary depending on the benthic community and can take many years. Recovery rates are usually slower in deep water than in shallower areas

The cumulative impact of increased background anthropogenic noise levels in the marine environment is an ongoing and widespread issue of concern. The sound level generated by the subsea cable laying vessel and subsea apparatus would fall within the hearing range of most fish and marine mammals and would be audible for considerable ranges (in the order of tens of kms) before attenuating to below threshold levels. However, the noise is not considered to be of sufficient amplitude to cause direct physical injury or mortality to marine life, even at close range. The underwater noise may, however, induce localised behavioural changes or masking of biologically relevant sounds in some marine fauna. As much of the cable route is aligned with the main offshore shipping lanes that pass around southern Africa, the vessel noise component of the ambient noise environment is expected to be significant along the cable route. The noise generated by the cable laying vessel would be no different from that of other vessel traffic throughout the oceans, and from the point of vessel operations no specific mitigation (e.g., avoidance of marine mammal migration periods) is therefore deemed necessary when the vessel is in high seas waters.

9.4.3.6 Increased turbidity

The disturbance and turnover of sediments during the PLGR and during trenching will result in increased suspended sediments in the water column and physical smothering of biota by the re-depositing sediments. The effects of elevated levels of particulate inorganic matter and depositions of sediment have been well studied, and are known to have marked, but relatively predictable effects in determining the composition and ecology of intertidal and subtidal benthic communities. Increased suspended sediments in the surf-zone and nearshore can potentially affect light penetration and thus phytoplankton productivity and algal growth, whereas further offshore it can load the water with inorganic suspended particles, which may affect the feeding and absorption efficiency of filter-feeders. The increased occurrence of turbidity plumes near the surface can also affect the feeding success of visual predators. However, due to the rapid dilution and widespread dispersion of settling particles, any adverse effects in the water column would be ephemeral and highly localised. Any biological effects on nectonic and planktonic communities would be negligible. Turbid water is a natural occurrence along the Southern African coast, resulting from aeolian and riverine inputs, resuspension of seabed sediments in the wave-influenced nearshore areas and seasonal phytoplankton production in the upwelling zones.

9.4.3.7 Physical presence of subsea cable

The diameters of the marine fibre optic cables range in size from 17 mm diameter (cables installed at a water depth of between 7,000 – 1,500 m) to a maximum of 50 mm diameter (rock armoured cable which is installed in shallow water depths (< 200 m). In shallow waters close to the beach (generally less than 10 m water depth) articulated pipes may be used to protect the armoured cable which have a diameter of 148 mm. Its presence and that of any protective steel sleeves or concrete mattresses effectively reduces the area of seabed available for colonisation by macrobenthic infauna in seabed sediments. The subsea cable itself and any protective covering, however, would serve as an alternative substratum for colonising benthic communities or provide shelter for mobile invertebrates and demersal fish (artificial reef effect). Assuming that the hydrographical conditions around the subsea cable and repeaters would not be significantly different to those on the seabed, a similar community to that typically found on hard substrata in the area can be expected to develop over time. The presence of subsea infrastructure (namely cable and repeaters) can therefore alter the community structure in an area, and effectively increase the availability of hard substrate for colonisation by sessile benthic organisms, thereby locally altering and increasing biodiversity and biomass, potentially

also attracting mobile macro- and megafauna who utilize the biofouling community as a food source. Although no direct mitigation measures are possible, the negative impact of the subsea cable presence on marine biota is considered to be of low significance. Designated cable protection zones with suitable habitats may in fact help to maintain and improve biodiversity and species abundance, and therefore act as *de facto* marine reserves or sanctuaries, although this concept has yet to be proven.

9.4.3.8 Potential impacts associated with emissions from the cable (e.g., heat, electromagnetic fields, leachate)

HEAT DISSIPATION

While high and medium voltage seabed power transmission cables can emit heat, the voltage associated with telecommunication cables (for powering the repeaters) is very low, and any associated heat emissions are understood to be negligible. Although the potential consequences of this thermal radiation on benthic organisms has not yet been investigated *in situ*, the narrow footprint of the cables and the expected low temperature differences suggest that impacts are likely to be negligible.

SOUND EMISSIONS

Under normal operations, fibre optics cables do not emit any audible sound. During the laying of the cable, it does vibrate as a result of regular vortex shedding as it descends through the water column. At ~10 Hz, this is a low frequency phenomenon and well below the hearing frequencies of marine fauna. Once the cable comes to rest on the seabed the sound ceases. In areas of high wave or current action on the continental shelf, cables can be exposed and undermined. Where undermining is significant, the suspended cable can vibrate or strum under the water motions. This sound would likewise be of low frequency and would not be of sufficient amplitude to cause auditory or non-auditory trauma in marine animals. The sound is expected to attenuate rapidly to below ambient levels.

ELECTRIC AND ELECTROMAGNETIC FIELDS

Fibreoptics cables carry a constant direct current of 1 - 1.6 Amperes to power the underwater repeaters. There is no external electric field associated with the power on the inner conductor as the polyethylene insulation ensures that the electric field remains only within the cable insulation. The direct current in the inner conductor does, however, set up a stationary magnetic field in the form of concentric rings emanating from the cable. The magnetizing force produced by this field diminishes with increasing radius from the cable such that at a distance of 1 m from the cable, the electromagnetic field (EMF) would be in the order of 0.32 micro-Tesla. This is two orders of magnitude lower than the typical magnetic flux densities of the earth, which range from 30 micro-Tesla at the equator to 60 micro-Tesla at the magnetic poles. Animals with the capacity to detect and use constant geomagnetic fields are thus likely to only detect the signal within close proximity to the source (within centimetres).

The marine environment is by no means devoid of electric and magnetic fields. Organisms use internal electric potentials and signals for a wide variety of biological functions (e.g., orientation or prey detection), and in some cases can perceive very small electric and magnetic fields. Perturbations from external electric and magnetic fields on such physiological systems need not necessarily have detrimental biological effects, as the magnitude of the effect will depend on the field intensities and exposure times to them, their frequency content, modulation, etc. A wide variety of taxa are sensitive to electromagnetic fields.

Elasmobranchs and chimaerids are the taxa most likely to detect the electrical fields produced by fibre-optic cables because their electroreceptive organs are sensitive to stimuli in the very low frequency range from 0.125 Hz to 8.0 Hz.

The injection of a low frequency electrical signal from the land station is known as 'toning' and is undertaken to aid in cable location in the event of a fault or when a safe distance needs to be kept from a cable during other marine work. Toning has been used for many years on submarine cables throughout the world, and no adverse effects on marine life have been reported.

LEACHING OF CONTAMINANTS

Modern deep-water fibre-optic cables are composed of hair-like glass fibres, a copper power conductor and steel wire strength member, all of which are sheathed in high-density polyethylene. Where extra protection is required, as for areas of rocky seabed or strong wave and current action, additional steel wire armour is added. No anti-fouling agents are used. The cable-grade polyethylene used for the sheath is essentially inert in seawater. Oxidation, hydrolysis and mineralization processes for polyethylene are extremely slow, with the total conversion to carbon dioxide and water estimated to take centuries. The effects of ultraviolet light, the main cause of degradation in most plastics, are minimized through the use of light-stabilized materials, burial of the cable into the seabed and the natural reduction in light penetration through the photic zone. Where the cable is located on the energetic continental shelf and mechanical abrasion of the cable's plastic sheathing by fine-grained particles is possible, the cable is either armoured or buried.

A study investigating potential leachates of copper, iron and zinc from the conductors and galvanized steel armour, identified that only zinc passed into the seawater, yielding concentrations of less than 6 mg/l for intact cables and less than 11 mg/l for cut cables with exposed wire armour ends[6]. The amount of leaching declined after ~10 days. Although this is above the recommended BCLME water quality guideline value of 5 µg/l (CSIR 2006), dilution of leachates by the surrounding water would be rapid and any negative effects on marine organisms are likely to be highly localised. Although zinc is an essential food element and occurs as Zn^{II} in dissolved form, it is listed amongst the 129 priority pollutants by the US Environmental Protection Agency as it can have lethal and sub-lethal effects at concentrations as low as 170 µg/l, particularly on the egg and larval stages of marine invertebrates.

9.4.3.9 Pollution and accidental spills

Trenching during installation of the shore-crossing of the subsea cable will involve excavation and construction activities. There would thus be potential for or accidental spillage or leakage of fuel, chemicals or lubricants, litter, inappropriate disposal of human wastes and general degradation of ecosystem health on the shoreline. Any release of liquid hydrocarbons has the potential for direct, indirect, and cumulative effects on the marine environment through contamination of the water and/or sediments. These effects include physical oiling and toxicity impacts to marine fauna and flora, localised mortality of plankton, pelagic eggs and fish larvae, and habitat loss or contamination. Many of the compounds in petroleum products have been known to smother organisms, lower fertility, and cause disease in aquatic organisms. Hydrocarbons are incorporated into sediments through attachment to fine-grained particles, sinking and deposition in low turbulence areas. Due to differential uptake and elimination rates, filter-feeders, particularly mussels, can bioaccumulate organic (hydrocarbons) contaminants.

During construction, litter can enter the marine environment. Marine litter is a cosmopolitan problem, with significant implications for the environment and human activity all over the world. Marine litter travels over long distances with ocean currents and winds. It originates from many sources and has a wide spectrum of environmental, economic, safety, health, and cultural impacts. It is not only unsightly, but can cause serious harm to marine organisms, such as turtles, birds, fish and marine mammals.

9.4.3.9 Collisions with and entanglement by marine fauna (including seabirds)

Vessel traffic can affect large cartilaginous fish species, turtles and marine mammals by direct collisions or propeller injuries. The potential effects of vessel presence on turtles and cetaceans include behavioural disturbance, physiological injury, or mortality. Most lethal and serious injuries are caused by larger vessels and most vessel strikes occur on the continental shelf and when vessels are moving with speeds in excess of 10 knots. Given the slow speed of the vessels during surveying, the pre-lay grapnel run and the cable installation, ship strikes with marine mammals and turtles are unlikely, and should the impact occur, it would be very infrequent.

Entanglement of whales with old telegraph cables occurred during the telegraph era (1850s to 1950s) at sites where cables had been repaired on the edge of the continental shelf or on the adjacent continental slope in water depths down to 1,135 m. With improved design, laying and maintenance techniques, since development of the coaxial submarine cables in the 1950s and into the fibre-optic era in the early 1980s, no further entanglements with marine mammals have been recorded. Furthermore, as the cable would be buried along much of its length on the continental shelf, entanglements are highly unlikely.

As much of the cable would be installed in the offshore marine environment, the strong operational lighting used to illuminate the survey and cable vessels may disturb and disorientate pelagic seabirds feeding in the area. Operational lights may also result in physiological and behavioural effects of fish and cephalopods as these may be drawn to the lights at night where they may be more easily preyed upon by other fish and seabirds. The response of marine organisms to artificial lights can vary depending on a number of factors such as the species, life stage and the intensity of the light. Considering the extensive distributions and low numbers of pelagic seabirds likely to be encountered in the offshore environment, the likelihood of collisions would be low.

9.4.3.10 Cumulative impacts

The primary impacts associated with the installation of subsea cables in the Southern Benguela, Southeast Atlantic Deep Ocean and Southwest Indian Deep Ocean Ecoregions, relate to physical disturbance of the seabed, either through placing the cable on the seabed (>1,500 m depth) or by burying the cable in a trench excavated by a fit-for-purpose cable plough, diver-operated jet-pump or (where it crosses the beach) a tracked backhoe digger. As the 2AFRICA/GERA (East) Cable System (Duynefontein landing) cable routing will largely follow that of the existing SAFE cable, cumulative impacts need to be considered.

The proposed cable route, where possible, avoids sensitive reef areas and environments such as MPAs and EBSAs. Consequently, impacts will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. Cumulative impacts are therefore less likely. The greatest possibility of cumulative impacts is where the proposed cable route meets those of other existing subsea

cables, particularly as it passes through the Robben Island MPA and at the Duynefontein shore crossing. These cumulative impacts are, however, assessed to be of low to very low significance as in reality the total cumulative impacted area at any one time would be minimal, due to the natural recovery of nearshore benthic communities of unconsolidated habitats over the short- to medium term. In other words, the benthic habitats disturbed during the installation of the four existing cables in the 'cable corridor' passing through the Robben Island MPA, are likely to have already fully recovered, and so additional impacts in the same general area through routing of the proposed 2AFRICA/GERA (East) subsea cable are unlikely to be significant.

9.4.3.11 Marine impact assessment summary

Potential impacts of the project on the marine environment include:

- Physiological injury or behavioural disturbance of marine fauna caused by noise.
- Potential injury to marine mammals and turtles through vessel strikes.
- Disturbance of sediments and associated fauna.
- Elimination of biota in the cable's structural footprint
- Physical presence of the cable providing an alternative substratum for colonising benthic communities or resulting in faunal attraction to fish and mobile invertebrates.
- Temporary loss of benthic habitat and associated sessile communities in the coastal zone.
- Possible temporary impacts on adjacent habitat health due to turbidity.
- Temporary disturbance of marine biota.
- Possible impacts to marine water quality and sediments through hydrocarbon pollution or contamination by other waste.
- Potential impacts associated with emissions from the cable (e.g., heat, electromagnetic fields, leachate)
- Pollution of the beach and sea due to accidental spills and litter.
- Collisions with and entanglement by marine fauna.
- Cumulative impacts.

A summary of the assessment of impacts is provided below:

- Any behavioural or physiological impacts on marine fauna (including avifauna) due to noise from the geophysical survey and cable installation onshore and offshore would be localised, of low intensity and fully reversible. Mitigation potential is very low. **The impact of increased noise on marine fauna during the cable survey and cable installation is considered of VERY LOW significance both without and with mitigation.**
- Disturbance and destruction of sandy beach biota during trench excavation and subsea cable installation would be temporary, once-off and highly localised. The impacts on benthic communities as a result of cable installation through the littoral zone would be of medium intensity. Impacts would be short-term as communities within the wave-influenced zone are adapted to frequent natural disturbances and recover relatively rapidly. **The potential impacts of the cable's shoreline crossing on benthic organisms is deemed to be of LOW significance without mitigation.**

- The impacts of trenching and increased suspended sediments on benthic communities in nearshore benthic habitats within and beyond the surf-zone would be of medium intensity. Impacts would be once-off and highly localised. Impacts would be expected to endure over the short-term only as communities within the wave-influenced zone are adapted to frequent natural disturbances and recover relatively rapidly. **The potential impacts of cable installation on benthic organisms in the nearshore environments is consequently deemed to be of LOW significance without mitigation.**
- The potential direct impacts of crushing and sediment disturbance on benthic organisms in offshore habitats would be of medium intensity and once off (unless cable repair is necessary). Although the cable will extend along some 11,500 km of seabed, benthic impacts will be highly localised along the length of the subsea cable route. Impacts would be limited to the medium-term only as recolonisation of disturbed sediments from adjacent areas would occur within a year, but full recovery to functional similarity can take longer (medium- to long-term). The change in habitat from unconsolidated sediments to the hard substratum of the cable itself would, however, be permanent. Although the subsea cable route passes through offshore benthic habitats identified as 'vulnerable' (Cape Lower Canyon, Southern Benguela Sandy Shelf Edge, and Cape Rocky Mid-Shelf Mosaic) the loss of resources would be low and impacts would be partially reversible as unconsolidated habitat will be replaced by hard substratum in areas where the cable is not buried. Furthermore, the proportion of vulnerable habitat affected by the subsea cable installation can be considered negligible in relation to the available habitat area[24]. **Consequently, the potential impacts on benthic organisms of cable installation across the continental shelf and abyss is deemed to be of LOW significance without mitigation.**
- Disturbance and injury to marine biota due to construction noise or noise generated by the vessel and cable plough is deemed of low magnitude within the immediate vicinity of the construction site/subsea cable route, with impacts persisting over the short-term only. In both cases impacts are fully reversible once construction and subsea cable installation operations are complete. **Without mitigation, the direct impacts of construction and vessel noise on marine biota are therefore assessed to be of VERY LOW significance, respectively.**
- Elevated suspended sediment concentrations due to trenching and burial activities associated with the subsea cable installation is deemed of low intensity and would extend locally around the subsea cable route and down-current of the shore-crossing, with impacts persisting only temporarily. Within the wave-base at least, marine biota is typically adapted to periods of elevated turbidity and as suspended sediment concentrations would remain at sub-lethal levels, the loss of resources would be low, and impacts would be fully reversible. Mitigation potential is very low. **The impact of increased turbidity on marine biota is therefore assessed to be of VERY LOW significance without mitigation.**
- The physical presence of subsea infrastructure (namely cable and repeaters) can alter the community structure in an area, and effectively increase the availability of hard substrate for colonisation by sessile benthic organisms, thereby locally altering and increasing biodiversity and biomass, potentially also attracting mobile macro- and megafauna who utilize the biofouling community as a food source. Designated cable protection zones with suitable habitats may in fact help to maintain and improve biodiversity and species abundance, and therefore act as *de facto* marine reserves or sanctuaries, although this concept has yet to be proven. The impacts on marine

[24] Assuming a worst-case disturbance footprint of 5 m wide, the proportion of vulnerable habitats disturbed was calculated using the total areas for those habitats provided in Sink *et al.,* 2019: 0.0005% of Southern Benguela Sandy Shelf Edge; 0.004% of Cape Rocky Mid-Shelf Mosaic.

biodiversity through the physical presence of the subsea cable would be of medium intensity and highly localised along the cable itself. As the subsea cable would likely be left in place on the seabed beyond decommissioning of the project, its impacts would thus be permanent. No direct mitigation measures, other than the no-project alternative, are possible. There is no feasible potential for mitigation. **The potential impacts on marine biota due to the physical presence of the cable is deemed to be of LOW significance without mitigation.**

- Based on available information in the literature, the impacts on marine fauna through the generation of heat, sound, EMFs and leachates by the submarine cable would be of negligible intensity and highly localised along the cable itself. As the subsea cable would be in operation for up to 25 years, the impacts would persist over the long-term. No direct mitigation measures, other than the no-project alternative, are possible. **The potential impacts on marine biota, caused by heat dissipation, sound emissions, electric fields, electromagnetic fields and/or leaching of contaminants directly from the cable, are deemed to be of VERY LOW significance without mitigation.**
- Potential hydrocarbon spills and pollution in the intertidal and shallow subtidal zone during installation of the subsea cable are deemed of medium intensity within the immediate vicinity of the construction site, with impacts persisting over the short- to medium-term. Impacts of pollution and accidental spills would be direct, indirect, and cumulative. As the coastal habitats at the shore crossing have been identified as 'vulnerable' (Southwestern Cape Mixed Shore) the loss of resources could potentially be medium, with impacts being only partially reversible in the worst-case scenario. Mitigation potential is high. **Pollution and accidental spills on the shoreline during the construction phase is improbable and the impact is therefore assessed to be of LOW significance.**
- Given the slow speed of the vessels during surveying, the pre-lay grapnel run and the cable installation, ship strikes with marine mammals and turtles are unlikely, and should the impact occur, it would be very infrequent. Entanglement with the marine cable is improbable. The likelihood of collision by seabirds as a result of operational lights is low. However, in the event of a collision or entanglement, the impact is deemed of low intensity and would be site specific to the vessel/cable location. Injury through collision and/or entanglement would persist over the short term and considering the slow vessel speed would likely remain at sub-lethal levels. Mitigation potential is medium. **Although this direct impact could result in a medium loss of resources, collision with or entanglement of marine fauna is assessed to be of LOW significance without mitigation.**
- The proposed cable route, where possible, avoids sensitive reef areas and environments such as MPAs and EBSAs. Consequently, impacts will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. cumulative impacts are therefore less likely. The greatest possibility of cumulative impacts is where the proposed ASN cable route meets those of other existing subsea cables, particularly as it passes through the Robben Island MPA and at the Duynefontein shore crossing. **These cumulative impacts are, however, assessed to be of LOW to VERY LOW significance.**

Mitigation measures for the above-mentioned impacts are limited. However, those provided from this specialist report have been carried across to Section 10.3 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.4.4 Conclusion

Installation of the cable will potentially result in localised disturbance of the upper beach and intertidal and shallow subtidal sandy habitats, as well as unconsolidated seabed beyond the surf-zone and across the shelf. The impacts associated with cable burial are a once-off disturbance, with affected communities able to recover naturally following the cable installation. A single impact such as a cable burial, is preferred to continuous, multiple or recurring impacts such as those associated with, for example, a demersal trawl. The specialist report concludes that, if all environmental guidelines and appropriate management and monitoring recommendations advanced in the report are implemented, there is no reason why the proposed installation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) should not proceed.

9.5 Heritage Assessment

The HIA report (Appendix B5) provides an assessment of the potential impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on heritage resources.

9.5.1 Introduction

The cable system will enter South Africa's EEZ from Mozambique on the east coast. Thereafter the cable system follows a course south and west around the South African coast, before tracking north-east from a point approximately 100 km west of Cape Point to cross the contiguous zone and territorial waters before making landfall at Duynefontein. For the remainder of its length the cable system will be located well offshore within South Africa's EEZ and, where it skirts the southern extremity of the Agulhas Bank, beyond the outer limit of the EEZ on the continental shelf.

The HIA report deals principally with the marine portion of the cable system located between the outer edge of the contiguous zone (i.e., 24 nautical miles offshore) to the high water, which is the extent of the jurisdiction of SAHRA[25]. The terrestrial portion of the cable route inland of the BMH falls under the jurisdiction of HWC but does not trigger the relevant section of the National Heritage Resources Act (Section 38(1)).

9.5.2 Approach

The HIA aims to identify heritage resources which may be impacted during the construction, operation and decommissioning phases of the project, assess their significance and provide recommendations for mitigation. The report therefore includes the following:

- A desk-top level literature review to assess the potential for maritime archaeological sites and submerged pre-colonial sites along the route of the cable system.
- A comment from a palaeontologist regarding the potential for impacts to palaeontological features arising from the installation of the cable system.
- A review of the geophysical survey reports (Fugro, 2020a; 2020b; 2020c) for the cable system for seabed anomalies that may represent heritage resources.

[25] SAHRA is the relevant heritage authority for all heritage resources located below the high-water mark of the sea up to a distance of 24 Nautical miles seaward.

The results of the studies listed above are integrated in the HIA report along with an assessment of the sensitivity and significance of any heritage resources, an evaluation of the potential impacts of the project on these resources and recommendations for measures to mitigate any negative impacts.

9.5.3 Findings

The heritage receptors defined for the impact assessment are:

- Submerged prehistoric archaeological resources.
- Palaeontological features and fossil material[26].
- Maritime archaeological resources, mostly historical shipwrecks.

These have been described in Section 6.6 of this EIA report and in more detail in the specialist report.

9.5.3.1 Submerged prehistoric archaeological material

The report finds that where submerged prehistoric archaeological material potential has survived post-glacial marine transgression, it will form part of the sedimentary make-up of the seabed and may be impacted by interventions on and in the seabed. The small footprint of the seabed intervention that will result from the installation of the cable system, however, makes the potential for direct impacts on submerged prehistoric archaeological material in the study area unlikely. The nature of the proposed seabed intervention, namely the burial of the cable in the seabed within the area covered by this assessment suggests that indirect impacts, which manifest themselves after and/or downstream of the activity are also unlikely.

9.5.3.2 Paleontological features and fossil material

The multiphase phosphorite nodules and phosphatic shell casts of various ages and fossil material that has been reworked into the latest, loose sediments on the seabed could potentially be disturbed by cable laying operations. Although the seabed plough method of cable burial on the shelf means that it is not possible to perform palaeontological mitigation as seabed materials are not brought up to the vessel for inspection and sampling, the limited subsurface seabed disturbance entailed in burying the cable by seabed plough, means that direct palaeontological impacts are considered to be negligible.

Where the cable crosses the shoreface and beach sands, the water jetting and trench digging may encounter reworked marine and terrestrial fossil bones and teeth, but the probability is unlikely given the widely scattered occurrence and the small, narrow volume of the excavation. This impact is therefore considered to be low to negligible.

The Velddrif Formation shelly deposits which may be encountered comprise a predominantly extant shell fauna which is of low palaeontological sensitivity. Given the small volume which will be affected, and the availability of Velddrif Formation exposures at many places along the coast, the impact may be considered negligible.

[26] Comment was also obtained from the palaeontologist Dr John Pether regarding the potential for the installation of the cable system to impact on submerged palaeontological resources.

The nature of the proposed seabed intervention also suggests that indirect impacts, which manifest themselves after and/or downstream of the activity are likely to be negligible.

No mitigation is required or proposed in respect of submerged prehistoric archaeology or palaeontology in the Deep and Shallow Water portions of the cable route where installation will be burial by plough as it is extremely unlikely that sites or material will be affected by the installation of the cable and also impossible to mitigate any disturbance.

9.5.3.3 Maritime archaeological resources

The 2AFRICA/GERA (East) cable system will be installed well to the north of the historical anchorage in Table Bay, in an area with very few shipping casualties. Only seven named wrecks are located in the vicinity of the cable route as it crosses the contiguous zone, territorial waters and inland waters to the landfall at Duynefontein. None of these wrecks appear to be within the 1 km buffered study area used for the assessment. Three of these wrecks are currently older than 60 years and thus subject to protection under the National Heritage Resources Act. Two unknown, unnamed wrecks are recorded in the area in South African Naval records, but these are outside the study area and a substantial distance from the cable route.

Nine shipping losses are recorded within the EEZ and on continental shelf in the vicinity of the proposed cable route. With one exception, these wrecks are all World War U-boat casualties and although not protected by the Act, should be treated as war graves and avoided during installation of the cable system.

The cable design and cable surveys undertaken by Fugro identified a number of side scan sonar and magnetic anomalies in and on the seabed of the cable corridor. The bulk of these were geological but some humanly derived debris was noted. It is not known whether any of these anomalies represent historical shipwrecks or related material.

The small footprint of the seabed intervention and the potential for seabed debris to damage the cable plough, which means that these contacts are likely to be carefully avoided during cable installation, suggests that the potential for direct impacts on maritime archaeological sites or material in the study area is negligible.

The nature of the proposed seabed intervention suggests that indirect impacts, which manifest themselves after and/or downstream of the activity and can take the form of, for example, seabed scour, are unlikely to affect any of the handful of known wrecks in vicinity of the cable system.

Mitigation measures from this specialist report have been carried across to Section 10.6 of this report and incorporated into the EMPr (Appendix F), as relevant.

9.5.4 Conclusion

The HIA concludes that the proposed installation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) raises no red flags, contains no fatal flaws and is unlikely to have any impact on known or unknown maritime and underwater cultural heritage resources. It is, therefore, considered acceptable.

9.6 Avifauna Assessment

9.6.1 Introduction

This report (Appendix B6) is a generic, desktop assessment of the potential impacts of the construction and operation of marine fibre optic cable systems on avifauna in South Africa, prepared by WildSkies (2021). This assessment was commissioned following comments raised by DFFE: OC regarding possible impacts on offshore avifauna. The findings can be applied to all the 2AFRICA landings on the West and East coasts of South Africa.

9.6.2 Approach

The investigation utilised desk-top assessments and a review of available literature to investigate and identify factors associated with the installation and operation of subsea cables and their potential impacts on seabirds associated with South Africa's EEZ and coastline. In addition, the investigation identified mitigation and management measures that may be employed during and post installation.

9.6.3 Findings

South African waters boast a rich diversity of seabirds and shorebirds, many of which occur in the area affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). The 2018 'State of South Africa's Birds' (Taylor & Peacock, 2018) states that "seabirds have declined faster than any other group of birds and now account for a third of all threatened species". Reasons for the poor conservation status of seabirds include slow reproductive rates; dependence on islands for breeding (and consequent vulnerability to disturbance and introduced predators); direct mortality through interaction with fishery activities; and competition between seabirds and fisheries.

Three main impacts of the subsea cable installations on birds were identified, along with general mitigation measures, as described below.

- **Offshore habitat destruction** during installation of the marine cable is an indirect impact most likely to affect seabird prey base and is likely to be of low significance given the limited development footprint and short construction period. The onshore and near-shore components of the cable system have a very small footprint and are generally located on sandy beaches (to facilitate cable burial) and not the more ecologically sensitive rocky shorelines. Although work within this zone is normally completed within a week, the site should be carefully managed to ensure that no unnecessary impacts occur. Particularly sensitive bird areas should be avoided when planning cable landing sites and include avoiding MPAs, IBAs, sensitive onshore areas and any islands.
- **Disturbance effects** will be limited, if breeding sites are not impacted on, as cable installation moves relatively quickly (up to 20 kilometres of cable laid per day). As described above, the onshore and near-shore activities will be extremely limited spatially and temporally, and any impacts on shore birds should be minor and short lived. Disturbance will therefore be a localised and temporary effect. Breeding areas for sea and shorebirds should be avoided, to minimise impacts.
- Since no food will be available to sea birds during cable installation or during the pre-lay grapnel run, **possible incidental mortality of seabirds striking the cable laying vessel** will be of low significance. Birds may approach the vessel to investigate but will not spend extended periods close to the ship or congregate in large numbers (since no

food is available). Further, since no feeding behaviour will be induced, birds will not be distracted (which is thought to contribute to their collision and entanglement at fishing vessels) whilst in flight close to the ship. Lighting on board project vessels should be kept to a minimum in order to reduce the risk of attracting and disorientating seabirds.

Mitigation measures from this specialist report have been carried across to Section 10.2 and 10.3 of this report and incorporated into the EMPr (Appendix F), as relevant. Refer also to the recommendations above.

9.6.4 Conclusion

In general, the significance of anticipated impacts of submarine telecommunications cables projects on seabirds and shorebirds is low, provided the cable avoids particularly sensitive bird areas such as MPAs, IBAs, sensitive onshore areas and any islands.

9.7 Marine Mammal Assessment

9.7.1 Introduction

This report is a generic, desktop assessment of the potential impacts of the construction and operation of marine fibre optic cable systems on marine mammals in Southern African waters, prepared by Sea Search (2021) (Appendix B7). This assessment was commissioned following comments raised by DFFE - O&C regarding possible impacts of marine telecommunications cable projects on marine mammals. These findings can be applied to all the 2AFRICA landings on the West and East coasts of South Africa.

9.7.2 Approach

The investigation utilised desk-top assessments and a review of available literature to investigate and identify factors associated with the installation and operation of telecommunications cable systems around South Africa which could potentially impact on marine mammals. In addition, the investigation identified mitigation and management measures that may be employed during and post installation.

9.7.3 Findings

Submarine telecommunications cables have been laid across the ocean floor since the mid-1800s, with over a million kilometres of cable now deployed worldwide. Given that the laying of the cable is relatively brief in comparison to other human activities floor such as mining and trawling and the fact that the footprint of the cable is narrow (up to 8 m for the actual cable but a few km for initial acoustic/benthic surveys), the impacts of benthic destruction and modification is not thought to impact marine mammals in any measurable way. The main impacts of the cable laying process which might affect marine mammals have been identified as follows:

- Avoidance of noise and masking of vocalisations by general ship noises and depth sounders.
- Potential startle responses of marine mammals to multi-beam echosounders, which could lead to mass stranding events.

- Entanglement of cetaceans in the cable is possible during deployment or once laid but has not been recorded in over 30 years. This is thought to be a result of modern materials and cable laying methods (including shallow water burial) and thus, entanglement is not regarded as a threat.

Given that most marine mammals occur in South Africa's water throughout the year, the timing of installation is not considered to be of great importance, however based on the data available, the months of June – October tend to be more important to vulnerable species such as Fin Whales, Blue Whales and Sei whales.

Mitigation options for these activities are limited but include ensuring use of well-maintained ships and equipment to minimize noise production from engines. Switching off non-essential sonar systems, and cautious use of multi-beam echosounders. Avoidance of peak whale seasons.

It is recommended that the vessel appoint a suitably trained crew member with relevant experience in marine mammal identification as a Marine Mammal / Protected Species Observer (MMO/PSO), to ensure no mammals are within the potential impact zone of sonars, cables, or noise pollution.

10 DESCRIPTION OF ENVIRONMENTAL ISSUES AND ASSESSMENT OF THEIR SIGNIFICANCE

The key issues identified during Scoping and carried through to the Impact Assessment are formulated as seven[27] key questions:

- What are the potential social and socio-economic impacts associated with the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the marine environment including MPAs?
- What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the fishing industry?
- What impact will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the beach and dune cordon at Van Riebeeckstrand?
- What impact will the construction of 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on cultural and heritage resources, including any paleontological resources?
- What cumulative impacts will result from the construction of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?

Potentially significant impacts associated with each of the above issues are discussed and assessed in the sections below. Where relevant, significance ratings have been assigned to impacts, according to the assessment conventions (Section 7.4), and presented in Impact Assessment tables (Table 11 to Table 17). The tables assess the significance of expected impacts before mitigation, as well as after application of the recommended mitigation measures (in Chapter 10 and in the EMPr), as applicable.

Note that mitigation measures may be repeated, where they apply to multiple phases of the project.

10.1 What are the potential social and socio-economic impacts associated with the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?

In the broader planning context, the project contributes positively to development goals and the socio-economic environment of South Africa and Southern Africa as a whole. The 2AFRICA/GERA (East) Cable System (Duynefontein landing) (noting this also includes the main trunkline from the Mozambique/SA EEZ boundary) will, however, render areas of the seabed unavailable to the Oil and Gas industry. During installation, there is also potential to negatively impact other existing cables. At the local level, social and socio-economic impacts of the project will be minor. During the construction/installation phase, social and socio-economic impacts (+ve and -ve) are of medium and low significance after management/mitigation. During operation, they are also of medium and low significance after management/mitigation (Table 11).

[27] The FSR framed the issues initially as eight questions, however impacts on wetlands have been combined with impacts on the natural environment (flora, fauna and avifauna), resulting in seven issues for assessment.

10.1.1 Boost to economic development (nationally and internationally)

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will provide additional and affordable international bandwidth which will support the country's economic development initiatives locally and abroad.

While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA/GERA (East) Cable System supports SIP 15 via its international connectivity, capacity and speed.

10.1.2 Impacts on existing marine telecommunications cables and submarine pipelines

On its final approach to the coast, the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will have multiple crossings of other existing and planned cables (see Figure 8). In total, the proposed route crosses 2 in-service and 3 out of service cables and 1 planned cable. MTN will abide by the guidelines and standards of the ICPC, which are in place to ensure safety of existing marine telecommunications systems. Therefore, it is not anticipated that the 2AFRICA/GERA (East) Cable System (Duynefontein landing) will negatively impact on existing marine telecommunications cables.

The proposed route crosses no pipelines.

10.1.3 Impacts on Oil and Gas exploration concession areas

The proposed cable alignment passes through several O&G exploration blocks. There will be potential conflicts of interest between the Developer and O&G rights holders, should the cable and/or its exclusion zone pass directly through planned drilling areas or interfere with offshore subsea infrastructure development for O&G.

Impact Oil and Gas has stated their concerns regarding impacts of the cable on their activities (future and planned) and have indicated that they have started exploration activities offshore on the East Coast of South Africa. They have requested *"early engagement on the drafting of an Co-operation Agreement to clearly outline the roles and responsibilities of both parties in terms of financial obligations, protection of subsea infrastructure, insurance, rights and obligations, and principles of co-operation so this is in place in good time prior to commencement of cable operations over Impact's Exploration rights."*

ENI South Africa note that *"the proposed route cable does enter our block, however it seems the cable does not cross through our area of drilling interest as outlined in our drilling EIA".*

O&G interests and their future drilling activities pose a risk to the development of the proposed 2AFRICA/GERA (East) Cable System. It is thus of primary importance for ASN to facilitate and MTN to engage and conclude Co-operation Agreements with all affected O&G Rights Holders to limit the disruption of either Party's commercial activities.

10.1.4 Improved/increased opportunities for education and job creation (during operation)

In improving and facilitating communications and economic development in South Africa, the project is anticipated to contribute positively towards education and job creation in the country, thus assisting to improve livelihoods.

10.1.5 Increased employment opportunities and opportunities for local business and SMMEs (during installation)

Since the landing of the marine cable onto shore is a specialised activity, and no (Alternative 1) or limited (Alternative 2) land-based infrastructure will need to be constructed, very few temporary jobs will be available during the installation phase. Local businesses and accommodation facilities may benefit from the project team temporarily staying in the area.

10.1.6 Damage to property

Implementation of the preferred alternative (Alternative1) makes use of existing infrastructure inland of the beach, and thus will not result in damage to property. Implementation of Alternative 2 will require some trenching to reach the ACE BMH, which may cause limited temporary damage to municipal roads/verges. However, the site will be reinstated and made good after installation .

10.1.7 Community safety

The movement of heavy machinery on the beach, as well as excavation and other installation activities, will pose a safety risk to members of the local community. Therefore, public access to the landing area will need to be limited during the installation period. Permits will be required to use vehicles on the beach. Due to construction of the BMH and trenching, Alternative 2 poses a higher community safety risk than Alternative 1, because it will take longer and will involve vehicles/equipment accessing the site both on the beach and on the inland side.

10.1.8 Impacts associated with the proximity to Koeberg Nuclear Power Station

Cognisance must be taken of the fact that the project takes place close to a nuclear power station. It is not expected that construction vehicles or other construction activities related to the 2AFRICA/GERA (East) Cable System (Duynefontein landing) would interfere unduly with evacuation routes or procedures in the Precautionary Action Zone (PAZ) of Koeberg. However, should an incident take place at the power station that requires surrounding areas to be evacuated, the personnel involved in landing and linking the cable to the BMH and CLS must be prepared for such an event. An evacuation plan is contained in Appendix F.

10.1.9 General disruption and nuisance impacts for residents and visitors

For the preferred landing alternative (Alternative 1), installation is of very short duration and no construction of infrastructure or trenching is required inland of the beach. Therefore, minimal disturbance to surrounding infrastructure, residents, visitors, and other beach users is expected (including Kelp Harvesters).

While the shore end landing will create additional noise and temporary visual impact and change the sense of place on the beach, this will be of very limited duration. As there is a vast expanse of beach in this area, beach goers, kelp harvesters will be able to access other parts of the beach during the period where the construction site is cordoned off.

For the landing Alternative 2, construction of a BMH and a short section of trenching to reach the existing ACE BMH will be required. This may result in nuisance impacts such as noise and dust, as well as general additional localised disturbance from construction vehicles and construction staff working in the area. The temporary influx of non-residents to the area may result in an increased crime risk. However, the scale of the work and size of the labour force will be small, and these impacts can therefore be relatively easily managed.

During operation/maintenance of the cable, the impacts on beach infrastructure and beach and sea users will be negligible, as maintenance activities will be very infrequent and more likely to be required offshore.

Should decommissioning of the cable involve removal of the cable from the beach, similar (but less intense) impacts to cable installation, are anticipated.

In terms of general nuisance impacts, Alternative 1 is preferred to Alternative 2, although the significance of these impacts will be low for both.

10.1.10 Mitigation measures

10.1.10.1 During planning and design

- MTN to implement the guidelines and standards of the ICPC to ensure safety of other cables landing on the West Coast of South Africa.
- MTN to engage directly with offshore concession holders to notify them of the proposed development and to draw up a Co-operation Agreement (if required by the concession holder) which outlines the rights, obligations and roles and responsibilities of both parties in terms of the installation and operation of subsea infrastructure.
- Have emergency procedures in place to evacuate the project areas at short notice in the event of an incident at Koeberg.

10.1.10.2 During installation

- Installation should preferably be timed to occur outside of peak holiday seasons (December, January, and April). (However, this will need to be weighed up against avoiding migration seasons for whales and other scheduling factors affecting the project).
- The emergency evacuation plan (due to Koeberg) must be issued to each contractor on site and the ECO and/or RE must ensure that all contractors are aware of and understand the contents of the emergency evacuation plan.
- Where possible, make use of local labour/SMME's and use local goods and services.
- Cordon off work areas that pose a risk to the public and ensure that alternative access to the beach is provided.
- Construction vehicles must obey regulated speed limits, lights will be switched on at all times and no large vehicles will use the roads at dawn, dusk, at night or in heavy mist conditions to reduce the risk of accidents with other vehicles and pedestrians.

- ❑ Prior to construction commencing Mr Ted Knott from the Coastal Co-ordination: Centralised Operations & Programmes, Recreation & Parks must be contact to ensure sufficient warning is given to any potential kelp harvesters on Van Riebeeckstrand Beach (Cell: 084 705 7568; Email: Edward.knott@capetown.gov.za)
- ❑ Noise control standards are to be adhered to as contained in the EMPr.
- ❑ Dust must be suppressed using standard dust suppression techniques.
- ❑ Practice good housekeeping to limit negative visual impacts and leave the site clean and free of waste of any kind.
- ❑ Trenching (inland) to be reinstated as soon as the cable is laid, and the site returned to the same or better condition than it was prior to construction.

Table 11 Assessment of potential socio-economic and social impacts resulting from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Boost to economic development (operation)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Medium	Highly Probable	Medium	High
	Mitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Medium	Highly Probable	Medium	High
Improved educational and job opportunities (operation)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Low	Highly Probable	Low	High
	Mitigated	Positive	National/ Inter-national	Long-term	Medium	Continuous	Low	Low	Low	Medium	High
Increased employment and business opportunities (installation)	Unmitigated	Positive	Regional	Short-term	Negligible	Once-off	Low	N/A	Probable	Low	High
	Mitigated	Positive	Regional	Short-term	Low	Once-off	Low	N/a	Probable	Low	High
Impacts on O&G concession areas (operation)	Unmitigated	Negative	Local	Permanent	Low	Once-off	Low	Low	Probable	Low	Medium
	Mitigated	Negative	Local	Permanent	Low	Once-off	Low	Moderate	Probable	Low	Medium

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Impacts on existing tele-communications cables (installation)	Unmitigated	Negative	Site-specific	Short-term	Medium	Once-off	Low	Medium	Improbable	Medium	Medium
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	Medium
Damage to properties (Alternative 2)	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	Medium	Probable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	High
Community safety risks	Unmitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Probable	Low	High
General disruption and nuisance impacts (installation)	Unmitigated	Negative	Local	Short-term	Low	Once-off	N/A	High	Highly Probable	Low	High
	Mitigated	Negative	Local	Short-term	Negligible	Once-off	N/A	High	Highly Probable	Low	High

10.2 What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)?

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) Alternative 1 has a negligible impact on dune and wetland vegetation and the dune slack wetland and is thus preferred over Alternative 2. However, the impacts of both Alternative 1 and Alternative 2 on terrestrial and wetland ecosystems (vegetation, wetlands, fauna and avifauna) will be of low significance after mitigation (Table 12).

10.2.1 Impact on terrestrial areas of conservation value

No CBAs or protected areas will be affected. Due to the very limited impact that both Alternatives will have on dune vegetation and dune slack wetland in this area, after mitigation (see sections below) the negative impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on threatened terrestrial ecosystems and/or other areas of conservation value is assessed to be of low significance.

10.2.2 Loss of, or disturbance to terrestrial vegetation

As confirmed by the specialist findings, Alternative 1 will have little to no impact on vegetation. Alternative 2 will disturb a limited area of vegetation, as a trench would need to be excavated through a portion of the foredune, and through the dune slack area behind the foredune as well through the vegetated fringe on the landward side of the dune slack wetland. This impact is assessed to be of low-to-medium significance without mitigation, bearing in mind that there are no plant Species of Conservation Concern that could be affected. If the recommended mitigation measures are properly implemented, especially the minimisation of disturbance to intact vegetation and rehabilitation of all vegetated areas that are disturbed, it is predicted that the residual impacts would reduce to low significance.

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From a vegetation perspective, Alternative 1 is preferred over Alternative 2.

10.2.3 Loss of, or disturbance to wetlands

Due to the presence of a wetland in the dune slack area near the cable landing site, a number of potentially negative impacts to freshwater ecosystems could occur during the construction phase. These include:

- Loss of vegetation and associated habitat within the dune slack wetland and/or its buffer area through excavation of a trench through this area for the proposed cable (not applicable to Alternative 1).
- Physical destruction or damage of wetland areas through the storage of construction materials or the temporary lay-down of equipment in these areas.
- Destruction/damage of wetland areas through the dumping of excavated material into these areas, and/or through pumping of sediment-laden water into wetland areas if de-watering of trenches is necessary for laying of cables.
- Destruction of the habitat associated with wetland areas, as a result of increased pedestrian and vehicular traffic in close proximity to these areas during construction.
- Pollution of wetland areas through leakage of fuels, oils, and other pollutants from construction machinery, or from washing of equipment and other vehicles.

- Contamination of surface soils and underlying sub-surface water through runoff and infiltration of fuel, oil and other pollutants from mechanical diggers and other construction machinery.
- Disturbance of aquatic and semi-aquatic fauna (e.g., birds and frogs) associated with the wetland area, due to the increased noise levels associated with the operation of mechanical diggers and other machinery, and the presence of workers in the area during the construction phase.

The potential impacts listed above are, however, anticipated to be of low intensity and short duration, particularly in the case of Alternative 1 which does not require construction of new infrastructure inland of the beach. With mitigation, all of the impacts would be of low significance or would be avoided altogether, even for Alternative 2, provided the rehabilitation of disturbed areas is carried out properly with follow-up monitoring of the vegetation re-establishment.

From a wetland perspective, Alternative 1 is preferred over Alternative 2.

10.2.4 Impacts on non-marine fauna

The amount of habitat loss for mammals, reptiles and amphibians that would result from the proposed cable installation is likely to be minimal, especially in the case of Alternative 1. Consequently, there are unlikely to be any significant impacts on non-marine animals relating to the loss or transformation of existing habitat. There will, however, be temporary disturbances relating to noise, vibration, and the presence of machinery and workers in the work areas during construction, as well as possible pollution. These disturbances may result in temporary impacts on non-marine fauna and some animals may be trapped in the trenches that would be excavated, especially in the case of Alternative 2 . No terrestrial fauna Species of Conservation Concern are identified at the project site, and the significance of project impacts on non-marine fauna is assessed as low for both Alternatives.

10.2.5 Disturbance to shorebirds

The shore end activities at Van Riebeeckstrand, for the installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) have the potential to disturb coastal birds that forage on the beaches, possibly including species that nest and breed on the beaches and dunes (for example the African Black Oystercatcher). However, trench excavation and subsea cable installation across the beach will be of extremely short duration, once-off and highly localised. Furthermore, the affected area is not pristine and is already subject to anthropogenic disturbance. Shore birds are mobile and will be able to temporarily avoid the disturbed zone and use other areas of the beach for foraging. Alternative 2 poses slightly more risk to shore birds than Alternative 1, as Alternative 2 will impact potential nesting habitat provided by the vegetation on the dune and dune slack wetland area. However, with mitigation, the impact of the project on shorebirds is anticipated to be of low significance.

Given the fast recovery of the sandy beach following excavation and laying of the cable (see the section below), the project is not expected to have any significant impact on the sandy beach biota which provide food sources for shorebirds.

10.2.6 Mitigation measures

10.2.6.1 Design and scheduling

- ❑ Existing paths through the dune slack area must be used for the cable route to avoid destruction of natural vegetation in this area.
- ❑ As far as practicable, ensure that construction activities required for subsea cable installation occur concurrently thereby minimizing the disturbance duration in the coastal and nearshore zone.

10.2.6.2 During construction phase of the proposed cable shore-crossing

Intertidal zone and beach

- ❑ Obtain a vehicle access permit from DFFE-OC prior driving in the coastal zone.
- ❑ The Environmental Control Officer (ECO) must check the affected area on the shoreline for nests of birds, prior to installation. If found, nests must be relocated, or cordoned off and avoided as far as possible.
- ❑ Restrict disturbance of the intertidal and subtidal areas to the smallest area possible. Once the shore crossing is finalised and the associated construction site is determined, the area located outside of the site should be clearly demarcated and regarded as a 'no-go' area.
- ❑ Ensure that contracted construction personnel are aware of, and adhere to, the requirements of the EMPr.
- ❑ Keep heavy vehicle traffic associated with construction in the coastal zone to a minimum.
- ❑ Restrict traffic in the intertidal area to minimum required.
- ❑ Restrict vehicles to clearly demarcated access routes and construction areas only. These should be selected under guidance of the local municipality.
- ❑ Maintain vehicles and equipment to ensure that no oils, diesel, fuel or hydraulic fluids are spilled.
- ❑ For equipment maintained in the field, oils and lubricants must be contained and correctly disposed of off-site.
- ❑ Good housekeeping must form an integral part of any construction operations on the beach from start-up.
- ❑ Ensure regular collection and removal of refuse and litter from intertidal areas.
- ❑ There is to be no vehicle maintenance or refueling on the beach.
- ❑ Ensure that all accidental diesel and hydrocarbon spills are cleaned up accordingly.
- ❑ No mixing of concrete in the intertidal zone.
- ❑ Regularly clean up concrete spilled during construction.
- ❑ No dumping of construction materials, excess concrete or mortar in the intertidal and subtidal zones or on the seabed.
- ❑ After completion of construction activities, remove all artificial constructions or created shore modifications from above and within the intertidal zone.
- ❑ No accumulations of excavated sediments or rock stockpiles should be left above the high-water mark. Any substantial sediment accumulations below the high-water mark should be levelled to follow the natural profile.

Dune and dune slack area

- ❑ The temporal and spatial footprint of the development should be kept to a minimum.
- ❑ Vegetated portions of the foredune area should be demarcated as no-go areas and avoided as far as possible.

- ❑ The vegetated portions of the dune slack area should be demarcated as no-go areas and all construction activities should be restricted to the existing pathways through the dune slack area, as far as possible.
- ❑ The dune slack wetland should be treated as a "no-go" area and appropriately demarcated as such when construction work is carried out. No vehicles, machinery, personnel, construction material, cement, fuel, oil, bitumen or waste should be allowed into this area, unless express permission is granted by the ECO for specific activities and such work is carried out under close supervision of the ECO.
- ❑ Areas of intact natural vegetation within the dune slack wetland or its adjacent buffer area that are unavoidably disturbed when the cable is laid should be rehabilitated, under the guidance and supervision of a botanist with knowledge of wetland rehabilitation.
- ❑ The dune slack wetland between the ACE beach anchor block and BMH must be treated as a no-go area and personnel and plant must be confined to the existing access road across the dune slack wetland.
- ❑ Mechanical diggers and all other machinery and vehicles that are to be used in close proximity to the dune slack wetland should be checked for oil and fuel leaks every day, before they are allowed to enter the wetland or a buffer area of 10 m around the edge of the wetland. If any machinery or vehicles are found to have an oil or fuel leak, they must not be allowed on site until the leaks have been rectified.
- ❑ Refueling and fuel storage areas may not take place or be located within 100 m of the beach.
- ❑ Refueling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, should be located on impervious bases and should have bunds around them (sized to contain 110% of the tank capacity) to contain any possible spills.
- ❑ No washing of vehicles or plant make take place on site.
- ❑ No discharge of effluents or polluted water, including sediment-laden water from the de-watering of trenches (if carried out), should be allowed to enter into the dune slack wetland.
- ❑ Sensitive and no-development areas (private property, coastal dunes, drainage lines, etc.) must be avoided and stockpile areas must be kept away from areas of undisturbed natural vegetation.
- ❑ The dune slack wetland should be inspected on a regular basis (at least weekly) by the ECO for signs of disturbance, sedimentation and pollution during the construction phase. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.

Non marine fauna

- ❑ During the construction phase, measures should be put in place to ensure that fauna do not fall down and become trapped in the trenches that are excavated for the cable. This might include covering the excavations or placing barriers around them, while they are standing open. Furthermore, excavations should be dug in a staged manner so that they are not standing open for a prolonged period of time.
- ❑ Existing paths must be used for the cable route to avoid destruction of faunal habitat in natural vegetation.
- ❑ Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person.
- ❑ All spills of hazardous material should be cleared in the appropriate manner according to the nature and identity of the spill and all contaminated soil removed from the site.
- ❑ Avoid sensitive faunal habitats such as intact portions of the dune slack wetland behind the foredunes.

Table 12 Assessment of potential impacts of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the natural environment (terrestrial vegetation, wetlands, fauna, and avifauna)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Impact on terrestrial areas of conservation value	Unmitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Probable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Loss/ disturbance of terrestrial vegetation (Alternative 1)	Unmitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Probable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Loss/ disturbance of terrestrial vegetation (Alternative 2)	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	Moderate	Highly Probable	Low-Medium	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Probable	Low	High
Loss/ disturbance of dune slack wetland habitat (Alternative 1)	Unmitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Probable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Loss/ disturbance of dune slack wetland habitat (Alternative 2)	Unmitigated	Negative	Site-specific	Medium-term	Low	Once-off	Low	Moderate	Highly Probable	Low-Medium	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Probable	Low	High

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Impacts on non-marine fauna (Alternative 1)	Unmitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Highly Probable	Low-Medium	High
	Mitigated	Negative	Site-specific	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Impacts on non-marine fauna (Alternative 2)	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Highly Probable	Low-Medium	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	High
Disturbance of avifauna (shorebirds)	Unmitigated	Negative	Site-specific to National/ Inter-national	Short-term	Low	Once-off	Moderate	High	Highly Probable	Low	High
	Mitigated	Negative	Site-specific to National/ Inter-national	Short-term	Low	Once-off	Moderate	High	Highly Probable	Low	High
Loss/ disturbance of sandy beach biota in coastal zone	Unmitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Medium	High
	Mitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Low	High

10.3 What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the marine environment including MPAs?

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will have impacts along its routing, on a wide variety of marine ecosystems and biota associated with the seabed and the water body around it. The cable routing affects two MPAs and areas that are CBAs.

The potential negative impacts of the project on marine flora and fauna on shore, nearshore and offshore, are all of low significance before and after mitigation (noting the potential for mitigation is limited), with the exception of accidental pollution, which would be of medium significance before mitigation and low significance after mitigation. The cable will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 1852 m either side of the cable, which is considered a positive impact of medium significance (Table 13).

10.3.1 Disturbance to seabirds

The shore end activities at Van Riebeeckstrand, for the installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) have the potential to disturb coastal birds that forage on the beaches, possibly including species that nest and breed on the beaches (for example the African Black Oystercatcher). However, trench excavation and subsea cable installation across the beach will be of extremely short duration, once-off and highly localised. Furthermore, the affected area is not pristine and is already subject to anthropogenic disturbance. Shore birds are mobile and will be able to temporarily avoid the disturbed zone and use other areas of the beach for foraging. Alternative 2 poses slightly more risk to shore birds than Alternative 1, as Alternative 2 will impact potential nesting habitat provided by the vegetation on the dune and dune slack wetland area. However, with mitigation, the impact of the project on shorebirds is anticipated to be of low significance.

Given the fast recovery of the sandy beach following excavation and laying of the cable (see the section below), the project is not expected to have any significant impact on the sandy beach biota which provide food sources for shorebirds.

Seabirds may approach the cable laying vessel to investigate but will not spend extended periods close to the ship or congregate in large numbers (since no food is available). Further, since no feeding behaviour will be induced, birds will not be distracted (which is thought to contribute to their collision and entanglement at fishing vessels) whilst in flight close to the ship. Lighting on board project vessels could, however, potentially attract and disorient seabirds. The possible incidental mortality of seabirds striking the cable laying vessel is anticipated to be of low significance.

10.3.2 Loss of, or disturbance to, sandy beach biota in the coastal zone

As detailed in the specialist findings (Section 9.4.3), disturbance and destruction of sandy beach biota will result during trench excavation and subsea cable installation across the surf zone and beach, but recovery will be rapid. The impacts on benthic communities in the coastal zone is considered to be of low significance.

10.3.3 Loss of, or disturbance to marine flora and fauna

10.3.3.1 Marine flora

The landing of the cable on shore at Van Riebeeckstrand will be across sandy substrate and will not affect kelp beds. Should any marine flora be disturbed by installation of the cable, it is anticipated that it would re-establish after the cable is buried and therefore the cable would have no significant impact on marine flora.

10.3.3.2 Benthic organisms in sandy beach, littoral zone, nearshore and offshore habitats

The seashore, littoral zone and the seabed will be disturbed by pre-installation and installation activities along the route alignment of the marine cable, which will injure or crush benthic invertebrates in their path. Cable burial will disturb sediments and may affect benthic organisms by smothering or by turbidity plumes which alter light conditions and concentrations of suspended particles in the water column. As indicated in the specialist findings (Section 9.4.3) affected benthic communities will recover over time and the impacts of the project on benthic organisms is deemed to be of low significance.

10.3.3.3 Disturbance/injury of marine fauna due to noise

Physiological injury or behavioural disturbance of marine fauna can be caused by noise. However, as detailed in the specialist findings (section 9.4.3), the nature of the noise resulting from installation and maintenance activities, as well as from the cable itself during operation, will result in impacts that are considered to be of very low significance, both without and with mitigation.

10.3.3.4 Effect of increased turbidity on marine biota

Pre-installation and installation activities along the route alignment of the marine cable will result in a localised and temporary increase in sediment concentration near the seabed and in the water column. Increased turbidity in the water can affect marine biota in various ways; however, as detailed in the specialist findings (Section 9.4.3), turbid water is a natural occurrence on this coastline and the biota are adapted accordingly. The impact of increased turbidity on marine biota, as a result of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) is considered to be of low significance.

10.3.3.5 Artificial reef effect due to presence of the cable

The physical presence of the cable on the seabed may have an “artificial reef” effect. As described in the specialist findings (Section 9.4.3), where not buried, the cable will provide a substrate for colonisation by sessile benthic organisms, thereby locally altering the composition of the benthic biota community. Although no direct mitigation measures are possible, the negative impact of the subsea cable presence on marine biota is considered to be of low significance. It is possible that the cable protection zones with suitable habitats may in fact act as marine sanctuaries, and as a result, have a positive effect on marine biodiversity and species abundance.

10.3.3.6 Pollution

Pollution by hydrocarbons and other litter is possible during the preinstallation and installation phases of the project and can have a variety of negative impacts on the health of marine organisms. Pollution is preventable, however, by good housekeeping and environmental management during preinstallation and installation. Once the cable is in place, there is no further risk of pollution other than if repairs to the cable are required. With mitigation, the effect of pollution on marine biota, as a result of cable installation, is anticipated to be of low significance.

10.3.3.7 Collisions with and entanglement by marine fauna

As indicated in the findings of the marine specialist report, the likelihood of large marine mammals colliding with the survey or cable laying vessels or becoming entangled with the cable is low.

10.3.3.8 Effects of cable" emissions" on marine biota

As discussed in this report, heat dissipation, electric fields and electromagnetic fields emanating from the cable are of such low magnitude that their potential impacts on marine life are considered negligible.

10.3.3.9 Long term protection due to exclusion zone

The long-term impacts of the marine telecommunications cable on the benthic environment (both fauna and flora) are expected to be positive due to the implementation of the legislated buffer zone, which protects this environment from disturbance due to bottom trawling activities, mineral exploration and the anchoring of vessels.

10.3.4 Impact on marine protected areas and threatened marine ecosystems

While the majority of the cable route traverses offshore habitats with a conservation status of "least concern", it does, pass through various ecologically sensitive areas. These include Offshore Controlled Zones of the Robben Island MPA (also traversed by other cables landing at Duynefontein), Restricted Zone of the South Atlantic Seamount MPA and CBAs defined in the recent National Coastal & Marine Spatial Biodiversity Plan (Version 1).

The cable installation will mostly affect communities in unconsolidated habitats, which are less sensitive to disturbance and recover more quickly than those inhabiting hard grounds. The cable burial report (Fugro, 2020a) does, however, indicate that limited subsections of the cable will traverse hard ground (overlaid with a veneer of loose sand), where target burial depths will not be achieved, and a subsection of rock outcrop where the cable will have to be surface laid. Where a cable crosses rocky substrate, it may move with the current and chafe against the rock and any organisms attached to the rock. Where this is a risk, the cable design engineers align the cable as far as possible in the same direction as the current, to reduce cross currents and thus reduce movement.

However, as indicated in the specialist findings and in the sub-sections above, the identified impacts on the coastal zone, the marine benthic habitats and associated biota, fish, marine mammals, seabirds, and shorebirds are all considered to be of low significance. The protection provided either side of the cable after installation, is considered to be positive. Accordingly, the negative impact on the marine protected areas and threatened marine ecosystems through which the cable will pass, is anticipated to be of low significance.

10.3.5 Mitigation measures

10.3.5.1 Design and scheduling

- Align routing of cable as closely as possible to the routes of existing or de-commissioned cables (even when traversing an MPA), thereby avoiding the impact of as yet undisturbed ecosystem types.
- Plan routing of proposed cable to as far as practicably possible avoid sensitive benthic habitats in the coastal and nearshore zone.
- As far as practicable, ensure that construction activities required for subsea cable installation occur concurrently thereby minimizing the disturbance duration in the coastal and nearshore zone.

10.3.5.2 General

- Ensure that constant monitoring for the presence of marine mammals and turtles is maintained by a ship's staff member designated as a Marine Mammal Observer (MMO). The observation post must keep a record of sightings, recording date, time, coordinates and approximate distance. This is particularly important should cable installation across the continental shelf be scheduled during the whale migration period (beginning of June to end of November).
- Should a cetacean become entangled in towed gear, contact the South African Whale Disentanglement Network formed under the auspices of DFFE to provide specialist assistance in releasing entangled animals.

10.3.5.3 During geophysical surveys

Although surveying of the cable alignment has been completed, should any further survey work be required along the cable alignment the following mitigation measures must be implemented by the survey vessel:

- Onboard MMOs should conduct visual scans for the presence of cetaceans around the survey vessel prior to the initiation of any acoustic impulses.
- Pre-survey scans should be limited to 15 minutes prior to the start of survey equipment.
- “Soft starts” should be carried out for any equipment of source levels greater than 210 dB re 1 µPa at 1 m over a period of 20 minutes to give adequate time for marine mammals to leave the area.
- Terminate the survey if any marine mammals show affected behavior within 500 m of the survey vessel or equipment until the mammal has vacated the area.

- Avoid planning geophysical surveys during the movement of migratory cetaceans (particularly baleen whales) from their southern feeding grounds into low latitude waters (beginning of June to end of November), and ensure that migration paths are not blocked by sonar operations. As no seasonal patterns of abundance are known for odontocetes occupying the proposed exploration area, a precautionary approach to avoiding impacts throughout the year is recommended.
- Ensure that passive acoustic monitoring (PAM) is incorporated into any surveying taking place at night or between June and November.
- A dedicated MMO and PAM operator should be appointed to ensure compliance with mitigation measures during seismic geophysical surveying. The MMO can be either an independent MMO or a suitably trained crew member.

10.3.5.4 During cable installation

- If cable installation across the continental shelf is scheduled during the whale migration period (beginning of June to end of November), consideration will be required from the cable-laying vessel to appoint a suitably trained crew member as a dedicated MMO with experience in seabird, turtle and marine mammal identification and observation techniques, to carry out daylight observations of the subsea cable route and record incidence of marine mammals, and their responses to vessel activities. Data collected should include position, distance from the vessel, swimming speed and direction, and obvious changes in behavior (e.g., startle responses or changes in surfacing/diving frequencies, breathing patterns). Both the identification and the behavior of the animals must be recorded accurately.
- Should a cetacean become entangled in towed gear, contact the South African Whale Disentanglement Network to provide specialist assistance in releasing entangled animals.

Table 13 Assessment of potential impacts of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the marine environment including MPAs

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Loss/ disturbance of sandy beach biota in coastal zone	Unmitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Medium	High
	Mitigated	Negative	Local	Short-term	Medium	Once-off	Low	High	Definite	Low	High
Loss/ disturbance of marine flora	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	Medium
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	Medium
Loss/ disturbance of marine benthic organisms	Unmitigated	Negative	Site-specific	Short to medium-term	Medium	Once-off	Low	High	Definite	Low	High
	Mitigated	Negative	Site-specific	Short to medium-term	Medium	Once-off	Low	High	Definite	Low	High
Disturbance/ injury of marine fauna due to noise	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
Impact of increased	Unmitigated	Negative	Local	Short-term	Low	Intermittent	Low	High	Probable	Low	High

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Site Specific, Local, Regional, National/ International)	Duration (Short-term, Medium-term, Long-term, Permanent)	Intensity (Negligible, Low, Medium, High)	Frequency (Once off, Intermittent, Periodic, Continuous)	Irreplace-able loss of resources (Low, Moderate, High)	Revers-ibility of impacts (Non-reversible, Low, Moderate, High)	Probability (Improbable, Probable, Highly Probable, Definite)	Significance (Low, Medium, High)	Confidence (Low, Medium, High)
turbidity on marine biota	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Artificial reef effect on marine biota	Unmitigated	Neutral	Site-specific	Long-term to permanent	Medium	Once-off	Low	Moderate	Definite	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pollution effects on marine biota	Unmitigated	Negative	Site-specific	Short to medium term	Medium	Intermittent	Medium	Moderate	Improbable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	High
Injury of large marine fauna and seabirds due to collision or entanglement	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	Medium	Moderate	Improbable	Low	High
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	Low	High	Improbable	Low	High
Effect of cable “emissions” on marine biota	Unmitigated	Negative	Site-specific	Long-term	Negligible	Intermittent to continuous	Low	High	Improbable	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Impact on marine areas of conservation value	Unmitigated	Negative	Site-specific	Medium to long-term	Medium	Once-off	Low	Low	Definite	Low	High
	Mitigated	Negative	Site-specific	Medium to long-term	Low	Once-off	Low	High	Definite	Low	High
Long term protection of marine flora and fauna due to exclusion zone	Unmitigated	Positive	Local	Long-term	High	Continuous	N/A	N/A	Highly Probable	Low-Medium	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.4 What impacts will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the fishing industry?

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will potentially negatively impact the following fisheries which operate in the same area as the proposed marine cable alignment, to a greater or lesser extent:

- Demersal Trawl.
- Mid-Water Trawl.
- Demersal Longline.
- Small Pelagic Purse Seine.
- Large Pelagic Purse Seine.
- Tuna Pole.
- Traditional Linefish.
- West Coast Rock Lobster.
- Small Scale Fisheries.

The potential for mitigation of identified impacts of the project on fisheries (other than the no-go option) is not possible. However, the identified impacts on the fishing sector (discussed below) are assessed as being of low significance. (Refer to Table 14).

10.4.1 Potential reduction in catch rates during geophysical survey as a result of noise

The elevated noise produced during the geophysical survey may negatively affect certain target species, resulting in a temporary decline in catch rates. The fishing sector most likely to be affected, is the small pelagic purse seine. However, as described in Section 9.2.3, due to the short-term duration and low intensity of the noise, the impact on catch rates for all sectors is considered to be of low significance. No mitigation measures are possible.

10.4.2 Temporary exclusion from fishing ground during cable-laying operations (1,500 m from the vessel)

The temporary exclusion of fisheries from around the cable laying vessel will effectively reduce fishing grounds, which in turn could potentially result in a loss of catch and/or displacement of fishing effort for the Demersal Trawl, Mid-Water Trawl, Demersal Longline, Small Pelagic Purse Seine, Large Pelagic Purse Seine and Traditional Linefish sectors. Less likely to be affected are the Tuna Pole, West Coast Rock Lobster and Small-Scale Fisheries. However, the impact will be short term and for all sectors overall, is considered to be of low intensity and low significance.

10.4.3 Long-term exclusion of anchoring and trawling around the cable (500 m on either side of the cable)

The permanent 500 m exclusion zone on either side of the cable will reduce the area of fishing grounds previously available to the demersal trawl or longline operations. Trawling would be excluded either side of a 45 km section of the cable situated between 1,000 m and 200 m water depths (as shown in Figure 49).

Skippers would have to adapt their operations accordingly, as they would need to lift gear off the seabed when moving over the cable, to prevent risk of damage to both the cable and their own fishing gear.

As indicated in the specialist findings (Section 9.2.3), the area excluded from trawling represents a very low proportion (0.08%) of the total demersal trawl fishing ground used in the area. Fishing effort would need to be redirected away from this area to other areas where catches can be made. There is low potential for mitigation of the above impacts. The overall significance of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) is assessed as low.

It should be noted that fishing effort in this area is already limited by several other cables coming into land at Duynefontein and Melkbosstrand (see Figure 49). By placing the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) in proximity to these other cables, the impacts mentioned above are confined to a limited spatial area. Nevertheless, there is a cumulative effect on the trawling industry, which is discussed in section 10.7.

10.4.4 Mitigation measures

10.4.4.1 Prior to installation

- ❑ The fishing industry and key stakeholders should be notified prior to the commencement of cable installation. These include the SA Fishing Industry Association, DFFE , the South African Navy Hydrographic Office (SAN Hydrographer), SAMSA and Ports Authorities.

10.4.4.2 During installation

- ❑ For the duration of the installation phase of the operation, a navigational warning should be broadcast to all vessels via Navigational Telex (NAVTEX) and Cape Town radio.
- ❑ Once installed, the cable route must be surveyed and accurately charted with the SAN Hydrographer.
- ❑ Request, in writing, the SAN Hydrographer to broadcast a navigational warning via Navigational Telex (NAVTEX) and Cape Town radio for the duration of the survey operation.
- ❑ Timing: Many of the affected fisheries operate year-round and timing of the survey to avoid certain periods of peak fishing activity is therefore not considered to be advantageous to any of the sectors.
- ❑ Manage the lighting on the survey vessel to ensure that it is sufficiently illuminated to be visible to fishing vessels and compatible with safe operations.
- ❑ Implement a grievance mechanism in case of disruption to fishing or navigation.

Table 14 Assessment of potential impacts of construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the fishing industry

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Reduction in catch rates due to noise emissions during geophysical survey	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Temporary exclusion of fisheries from within 1,500 m of the cable laying vessel	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Probable	Low	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long term exclusion of anchoring and trawling around cable (1852 m)	Unmitigated	Negative	Local	Long-term	Medium	Continuous	Low	High	Definite	Low	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.5 What impact will the construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on the beach and dune cordon at Van Riebeeckstrand?

The proposed alignment of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) across the beach to link with existing ACE infrastructure on land is proposed as the best practical option and Alternative 2 was discarded. The significance of potential negative impacts of the proposed Alternative 1 on drivers of coastal processes, sediment transport and habitat/ecomorphology of the beach and dunes will be low, both before and after mitigation (Table 15).

10.5.1 Alteration of drivers of coastal process, (e.g. wind and wave)

The cable will align approximately shore perpendicular and lie at a point >1m below the surface, effectively having no impact on localised wind and wave regime. Some minor disruption of inter-tidal and supra-tidal wave regime may arise during the construction phase. The significance of the impact is assessed as low.

10.5.2 Interruption of sediment transport regime

Some minor perturbation is expected during construction during excavation of the dune, beach and intertidal zone. Sediment mobilisation at the point of excavation through dune may arise, exacerbating present trends towards engulfment. Following cable burial and establishment, the sediment transport regime should rapidly reach a state of equilibrium. The significance of the impact is assessed as low.

It is noted that there is a risk of exposure of the cable, based on reported exposure of a previously installed cable in 2016/2017. Burial to a depth of 2m is thus recommended to prevent this.

10.5.3 Alteration of habitat/eco-morphology

No excavation or disturbance is anticipated landward of the dune crest on account of the presence of an existing sub terranean conduit. However, excavation will arise through the primary dune and beach. Reinstatement of materials and natural aeolian winnowing will sculpt the excavated area. The significance of the impact is assessed as low.

10.5.4 Mitigation measures

- The 2AFRICA cable should use the same route as the existing ACE cable, which will collate disturbance impacts and improve management and restoration initiatives.
- A depth approximating 2 m should be achieved in the burial of the cable.
- Shoring and protective measures should be instituted along the beach and primary dune to prevent slumping and ensure depth of burial is achieved.
- Once all trenching and backfilling has been completed, following the laying of the cable, it is proposed that the dune be reinstated and sculpted to mimic the pre-construction state.
- A stylized imaged of post trenching measures required, is presented in Figure 50 below.

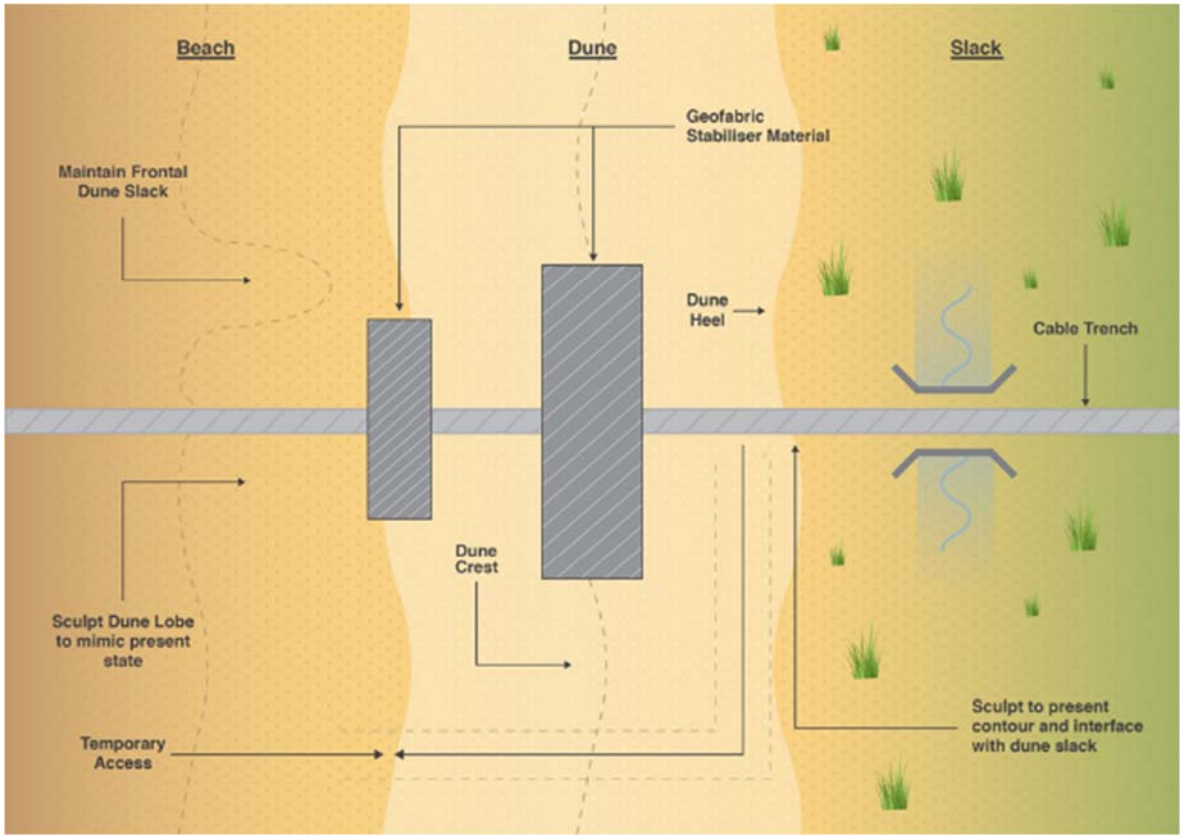

Figure 50 Stylised image of post trenching measures required

Table 15 Assessment of potential impacts of construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on the beach and dune cordon at Van Riebeeckstrand

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Alteration of drivers of coastal process, (e.g., Wind and wave) (Alternative 1)	Unmitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
	Mitigated	Negative	Local	Short-term	Negligible	Once-off	Low	High	Improbable	Low	High
Interruption of sediment transport regime (Alternative 1)	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Highly Probable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Highly Probable	Low	High
Alteration of habitat/eco-morphology (Alternative 1)	Unmitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Improbable	Low	High
	Mitigated	Negative	Local	Short-term	Low	Once-off	Low	High	Improbable	Low	High

10.6 What effects will the construction of 2AFRICA/GERA (East) Cable System (Duynefontein landing) have on cultural and heritage resources, including any paleontological resources?

While there is potential for the project to negatively impact on submerged pre-historic archaeological resources and palaeontological resources, the likelihood is very low. The significance of the impact is assessed as medium. Potential negative impacts on maritime archaeological resources (e.g., shipwrecks) are improbable. Should they occur, the significance is assessed as medium (refer to Table 16).

10.6.1 Disturbance or destruction of submerged pre-historic archaeological resources

As indicated in the specialist findings, there is the potential for the survival in submerged, seabed contexts of archaeological material and palaeo-environmental evidence forming part of the sedimentary make-up of the seabed. This could potentially be impacted by interventions on and in the seabed. However, the small footprint of the seabed intervention that will result from the installation of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) makes the potential for direct impacts on submerged prehistoric archaeological material in the study area unlikely. The significance of the impact is considered to be medium, without mitigation.

10.6.2 Disturbance or destruction of palaeontological resources and fossil material

Specialist findings (Section 9.5.3) indicate that there is potential for disturbance or destruction of palaeontological resources due to excavation by the seabed plough, or disturbance of fossil material from water jetting across the shoreface. However, the very small proportion of disturbed surface area and volume of material affected in relation to the area and volume potentially containing the resource, makes the likelihood of direct or indirect impact extremely low. There is little scope for mitigation. Due to the irreplaceability of the resource, the significance of the impact is considered to be medium, without mitigation.

10.6.3 Disturbance or destruction of maritime archaeological resources

Since no wrecks have been identified within the 1 km study area buffer around the proposed cable alignment or within less than 8 km of the route, the risk to these maritime archaeological resources (direct or indirect) is considered to be negligible. Due to the irreplaceability of the resource, the significance of the impact, should it occur, is considered to be medium.

10.6.4. Mitigation measures

- No mitigation is proposed in deep and shallow water.
- In inshore waters and on the beach crossing, it is recommended that an alert for the occurrence of submerged prehistoric archaeological material, be included in the EMPr for the project, specifically for the divers working in the shoreface and the operators excavating the trench in the beach and dune.

- Due to the dynamic nature of the environment, should any possible archaeological or paleontological material be accidentally disturbed during these activities it must be immediately reported to the ECO and/or the monitoring archaeologist for further advice. Any finds accidently disturbed must be recorded, and their contextual information (a report) must be lodged with a SAHRA-approved institution.
- If any further geophysical data, particularly in the Inshore Waters portion of the cable route, is generated to support the installation of the cable system it be archaeologically reviewed for the presence of historical shipwrecks or related material. If possible, the project archaeologist should be consulted before data are collected to ensure that the survey specifications and data outputs are suitable for archaeological review.
- Should the data identify wreck material at or near the location of any portion of the cable, micro-siting of the cable and/or the possible implementation of an exclusion zone around the archaeological feature should be sufficient to mitigate the risks to the site.
- Should any maritime archaeological sites or material be accidentally encountered during the course of laying the cable, work must cease in that area until the project archaeologist and SAHRA have been notified, the find has been assessed by the archaeologist, and agreement has been reached on how to deal with it.
- Nine shipping losses are recorded within the EEZ and on continental shelf in the vicinity of the proposed cable route. With one exception these wrecks are all World War U-boat casualties and although not protected by the Act, should be treated as war graves, and avoided during installation of the cable system.

Table 16 Assessment of potential impacts of construction and operation of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on cultural and heritage resources, including any paleontological resources

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Disturbance or destruction of submerged pre-historic archaeological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable,	Medium	Low
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance or destruction of palaeontological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable	Medium	Low
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance or destruction of maritime archaeological resources	Unmitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable	Medium	Low
	Mitigated	Negative	Site-specific	Short-term	Low	Once-off	High	Non-reversible	Improbable,	Medium	Low

10.7 What cumulative impacts will result from the construction of the 2AFRICA/GERA (East) Cable System (Duynefontein landing)?

A cumulative impact is an incremental impact upon the environment that results from the impact of a proposed action when added to past, existing, and reasonably foreseeable future actions which can be both positive and negative in nature.

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) is a linear project (approximately 2800 km in length), traversing various marine and terrestrial ecosystems and resulting also in indirect social/socio-economic impacts potentially throughout South Africa. As such, it is difficult to quantify the impacts. A qualitative assessment of cumulative impacts has been undertaken and considers the impacts of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) together with impacts from the existing cables and planned fibre-optic marine cables off the West Coast of South Africa.

Both positive and negative cumulative impacts are anticipated. Overall, the significance of negative cumulative impacts is assessed to be low and there are no cumulative impacts (negative) which are identified as fatal flaws.(Table 17)

10.7.1 Cumulative social and socio-economic impacts

The positive socio-economic impacts associated with the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will cumulatively add to the positive impacts of other fibre optic cable landings in South Africa, through additional bandwidth and internet connectivity availability to the country. This has the potential to unlock investment and advance socio-economic development and education.

There are several existing cables circumnavigating South Africa. Where cables land on shore on the West Coast, they are in relatively close proximity, with increased incidence of cable crossings. There is, therefore, an increased risk of damage to existing cables when new cables are being installed. However, with implementation of ICPC guidelines and standards, the contribution of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) to cumulative risks is considered to be of low significance.

The increase in cables crossing Oil and Gas Concession areas will cumulatively exclude increased areas from potential future mining. Given the relatively small surface area taken up by the cables in contrast to the large areas of the exploration blocks, the contribution of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) to this cumulative impact, is considered to be of low significance. In addition to the above, agreements will be entered into between the cable landing partner and the offshore concession holders to ensure that the activities of both parties can co-exist without limiting each other's commercial operations.

In terms of construction impacts, given the brief installation period, the potential for this project to add cumulatively to disruption and nuisance impacts on the beach at the landing site is not significant.

10.7.2 Cumulative impacts on terrestrial ecosystems

The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) (preferred alternative) makes use of the existing ACE infrastructure on land and in this way, minimises cumulative impacts on the terrestrial environment, including freshwater wetlands. Alternative 2 will contribute in a very minor way to the levels of transformation and disturbance that have already occurred in the dune slack area and surrounding urban development.

10.7.3 Cumulative impacts on marine ecosystems

As discussed in the marine ecology specialist report (Appendix B4), the cumulative impact of increased background anthropogenic noise levels in the marine environment is an ongoing and widespread issue of concern. However, given that disturbance and injury to marine biota due to construction noise or noise generated by the vessel and cable plough is of low magnitude within the immediate vicinity of the construction site/subsea cable route, with impacts persisting over the short-term only, the contribution of the project to cumulative noise impacts in the marine environment is considered to be of low significance.

While the cable itself will remain in place over the long term, most of the negative impacts of the cable installation and operation on benthic organisms and other marine biota (as shown in Table 17) are once-off, and short term. With the exception of possible pollution events, all these impacts are of low significance before mitigation. In this light, the contribution of this project towards cumulative (negative) impacts on marine ecosystems and MPAs crossed by the cable on the Cape West Coast, is considered low. Refer to Table 17.

10.7.4 Cumulative impacts on the fishing industry

A negative cumulative impact associated with the proposed development during the operational phase is the cumulative loss of fishing grounds to the deep-sea demersal trawling and long lining industry due to the exclusion zones that are/will be implemented around existing and planned cables landing on the west coast. The proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will add to the exclusion zones already in place for existing and planned cables landing at Duynefontein, Melkbosstrand and Yzerfontein.

By aligning the 2AFRICA/GERA (East) Cable System (Duynefontein landing) in proximity to other cables landing in this area, the disruption to demersal fishing operations will be minimised by confining impacts to a similar area. Trawling will still be able to take place over the alignment, although the gear will have to be lifted across the exclusion zone.

However, as shown in Figure 49, the accumulation of existing and planned cables crossing trawl grounds off the west coast is increasing the proportion of the trawl grounds that would be excluded, in relation to the trawling grounds available. The trawl paths are also interrupted multiple times, as they cross multiple cables. This may necessitate the trawl gear to be lifted and dropped multiple times as the ship passes over multiple cables, or for the gear to be lifted once until all the cables are crossed, and then lowered again.

Annual fish quota allocations to the fishing industry are defined by the permits issued to the fisheries participants and, as such, it is envisaged that the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) will not impact on the amount of fish caught but rather the level of fishing effort expended in certain affected areas within the fishing grounds.

The contribution of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) to cumulative impacts on the fishing industry is considered to be of low significance.

10.7.5 Cumulative impacts on the beach and coastal dunes at Van Riebeeckstrand

If the preferred Alternative 1 is implemented along the same route as the ACE cable and uses existing infrastructure on land, the cumulative impact of the proposed 2AFRICA/GERA (East) on the beach and coastal dunes will be of low significance. Should Alternative 2 be used, the project will add to existing disturbance of the beach and dunes, but this is also considered to be of low significance.

10.7.6 Cumulative impacts on heritage (marine)

The likelihood of disturbance or destruction of submerged pre-historic archaeological resources and palaeontological resources as a result of installation of submarine cables landing on the west coast is improbable and the intensity of the impact on these resources would be low. Cable routes are surveyed beforehand for maritime archaeological resources such as wrecks, and routes are amended to avoid these resources. Based on the likely direct and indirect impacts of the installation of seabed cables off the Cape West Coast, the cumulative negative impacts of the project on heritage resources, in combination with other systems already installed on the seabed, are likely to be of low significance.

It is considered that the accumulated and valuable knowledge that subsea cable surveys provide regarding the presence of wrecks is a positive impact on heritage resources in general.

10.7.7 Cumulative impacts associated with climate change

On a global scale, the cumulative provision of improved and affordable bandwidth between countries can potentially have a positive impact with respect to climate change. The International Cable Protection Committee (ICPC) represents 97% of the world's subsea telecom cables (https://www.iscpc.org/). A report prepared by the environmental advisor of the ICPC, Dr Mike Claire entitled: "Submarine Cable Protection and the Environment: A Bi-Annual Update" (30 September 2020) addresses the role of submarine cables in a post-Covid world, where submarine telecommunications cables are an enabler for changing people's behaviour away from hydrocarbons and climate impacting sources. Lessons learned from the lockdown will inform how businesses operate in future— leading to an increase in virtual, online meetings compared to those requiring long haul flights, and increased home-working— all of which will help in lowering greenhouse gas emissions. The ICPC estimates that internet traffic increased between 25% and 50% between November 2019 and the early stages of lockdown in April 2020, and this will likely continue as we adapt to the "new-normal" virtual world. Communications revenue for the quarter ending July 31, 2020, saw a 355% increase compared to the previous year. This is just one indication of the increased video conferencing occurring as a result of widespread remote work, remote education, and remote personal video communication.

The cumulative impact of cables with respect to the production of greenhouse gases is not considered significant. A life cycle analysis study suggests that over a typical operational lifetime of 25 years (manufacture-to-decommissioning)[28] the main sources of carbon emissions

[28] Donavan, 2009. "Twenty thousand leagues under the sea: A life cycle assessment of fibre optic submarine cable systems".

from cables are due to a) power consumption at the terminal station (chiefly related to air conditioning and powering of the terminal equipment); and b) vessel transits for cable maintenance (ACER, 2021).

On a local scale, the impact of climate change may be playing a role in the observed dune regression at Duynefontein. Restoration of the dune immediately following establishment of the cable is important, to ensure that disturbance of the dune by the project, does not exacerbate dune regression induced due to climate change or other factors.

Table 17 Assessment of potential cumulative impacts of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing)

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
Cumulative social and socio-economic impacts (positive)	Unmitigated	Positive	National/ Inter-national	Long-term	Low	Continuous	Low	Low	Highly Probable	Medium	Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative social and socio-economic impacts (negative)	Unmitigated	Negative	Site specific to National	Short-term to permanent	Medium to low	Once-off	Low	Moderate to High	Highly probable to improbable	Medium	Medium
	Mitigated	Negative	Site specific to National	Short-term to permanent	Low to Negligible	Once-off	Low	Moderate to High	Highly probable to improbable	Low	Medium
Cumulative ecological impacts (terrestrial environment)	Unmitigated	Negative	Site specific	Short-term	Low	Once-off	Low	Moderate to High	Highly Probable	Low	Medium
	Mitigated	Negative	Site specific	Short-term	Low to Negligible	Once-off	Low	Moderate to High	Highly Probable	Low	Medium
Cumulative ecological impacts (marine environment)	Unmitigated	Negative	Site specific to national/ international	Short-to long term	Low	-	-	-	Highly Probable	Medium	Medium
	Mitigated	Negative	Site specific to national/ international	Short-to long term	Low	-	-	-	Highly Probable	Low	Medium
Long term protection of	Unmitigated	Positive	Regional	Long-term	Medium	Continuous	N/A	High	Highly Probable	Medium	Medium

Description and Nature of Impact	**Mitigation**	**Nature** (Positive, Negative, Neutral)	**Spatial Extent** (Site Specific, Local, Regional, National/ International)	**Duration** (Short-term, Medium-term, Long-term, Permanent)	**Intensity** (Negligible, Low, Medium, High)	**Frequency** (Once off, Intermittent, Periodic, Continuous)	**Irreplace-able loss of resources** (Low, Moderate, High)	**Revers-ibility of impacts** (Non-reversible, Low, Moderate, High)	**Probability** (Improbable, Probable, Highly Probable, Definite)	**Significance** (Low, Medium, High)	**Confidence** (Low, Medium, High)
marine biota within cable exclusion zones (cumulative)	Mitigated	Positive	Regional	Long-term	Medium	Continuous	N/A	High	Highly Probable	Medium	Medium
Cumulative impacts on demersal fishing	Unmitigated	Negative	Regional	Long-term	Medium	Continuous	Low	Moderate	Definite	Low	Medium
	Mitigated	Negative	Regional	Long-term	Low	Continuous	Low	Moderate	Definite	Low	Medium
Cumulative impacts on beach and coastal dunes	Unmitigated	Negative	Site-specific	Short-term	Low	-	Low	High	Probable	Low	Low
	Mitigated	Negative	Site-specific	Short-term	Low	-	Low	High	Probable	Low	Low
Cumulative impacts on heritage (marine)	Unmitigated	Negative	Site-specific	Short to medium-term	Medium	-	High	Non-reversable	Improbable	Low	Low
	Mitigated	Negative	Site-specific	Short to medium-term	Medium	-	High	Non-reversable	Improbable	Low	Low

11 ENVIRONMENTAL IMPACT STATEMENT

Taking the key issues and the assessment of associated potential impacts into account, a summary of the environmental impacts of the proposed activity, and their significance (after mitigation, where applicable) is provided below.

Social and socio-economic impacts

Overall, the project is expected to contribute positively to the goal of improving livelihoods for South Africans through the education and economic opportunities opened up as a result of access to improved telecommunications networks. While expanding access to communication technology will be done primarily through broadband infrastructure roll-out, this requires a national backbone connected to the rest of the world. In this case, the proposed 2AFRICA/GERA (East) Cable System supports SIP 15 via is international connectivity, capacity and speed. The significance of this positive impact is assessed as medium.

The 2AFRICA/GERA (East) Cable System (Duynefontein landing) (noting this includes the main trunkline from the Mozambique/SA EEZ boundary) will, however, render areas unavailable to some concession holders in the Oil and Gas sector. To eliminate interactions with future Oil and Gas activities on cable system infrastructure and operations, the landing partner must undertake the following:

- Obtain consent letters from existing Oil & Gas Rights Holders as required by the MPRDA.
- Conclude agreements between the cable landing partner and the various offshore concession holders to ensure that the activities of both parties can co-exist without limiting each other's commercial operations.
- Map the marine cable system route and formally Register the cable routing as a real right against the Deed and against the Oil and Gas Rights at the Mineral and Petroleum Titles Registration Office

The use of the seabed by both the “telecommunications” and “Oil & Gas” sector to promote positive socio-economic development can be assured and is not mutually exclusive. If the parties cooperate and share their plans, then potential impacts can be minimised. Multiple uses of the sea and the seabed can occur without undue and conflicting negative impact by the different sector activities on each other and on the natural resources.

Letters of No Objection and/or Co-operation Agreements between the cable developer/operator and affected O&G Rights Holders are required [29] and this is being dealt with directly by ASN and MTN outside of this EIA process. During installation, there is potential to negatively impact other existing subsea telecommunications cables. However, this can be managed by adherence to international guidelines and standards.

The project may cause minor nuisance impacts to the local community near Van Riebeeckstrand during the installation phase. In general, for both Alternative 1 and Alternative 2, the negative social and socio-economic impacts are of low significance, after mitigation.

Impacts on terrestrial ecosystems (vegetation, wetlands, and fauna)

[29] In terms of Section 53 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA), any person who intends to use the surface of any land in a manner which may be contrary to the objectives of the MPRDA or is likely to impede such objectives, must apply to the Minister for approval in the prescribed manner. Proof is required that no prospecting or mining right holders have objected to the proposed development based on its incompatibility with their interests.

The installation of the cable across Van Riebeeckstrand beach to the proposed BMH sites (both Alternative 1 and Alternative 2) affects an area under the conservation category of "Other Natural Area" in terms of the WCBSP. Once the cable is installed, the beach is expected to quicky recover to its natural state. Alternative 1, because it makes use of existing infrastructure inland of the beach, will have no impact on terrestrial vegetation, wetland, or other freshwater ecosystems and, therefore, will not impact negatively on any threatened terrestrial ecosystems or ecological support areas. Alternative 2 will affect a limited extent of dune vegetation and a dune slack wetland area associated with Cape Seashore Vegetation (Least Concern) and occurring near the transition to Cape Flats Dune Strandveld (Endangered). The present ecological state of the dune slack wetland is, however, rated as "Seriously Modified". Due to the very limited impact that both Alternatives will have on dune vegetation and dune slack wetland in this area, after mitigation, the negative impacts of the 2AFRICA/GERA (East) Cable System (Duynefontein landing) on terrestrial areas of conservation value is assessed to be of low significance.

Impacts on marine ecosystems, vegetation, fauna and avifauna

The proposed marine cable traverses' short sections of the Robben Island MPA, the South Atlantic Seamount MPA and some CBAs. However, the residual impacts of the cable on the benthic environment will be of low significance. The potential negative impacts of the project on marine flora and fauna (small and large) on shore, nearshore and offshore, are all of low significance (after applying mitigation where feasible). Similarly, the impacts on seabirds and shorebirds will be of low significance.

The cable, once in place, will afford a section of the seabed long term protection due to the exclusion of anchoring and trawling 500 m either side of the cable, which is considered a positive impact of low to medium significance.

Impacts on fisheries

Several fisheries operating in the area will potentially be negatively affected by the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing). A potential decline in catch rates due to temporary noise disturbance is assessed as being of low significance. The potential effect on operational activities and decline in catch rates due to the temporary (500 m) safety exclusion zones around survey and cable laying vessels is assessed as being of low significance. The long-term effect on operational activities due to the 500 m exclusion zone either side of the cable will negatively impact fishing sectors, most particularly the demersal trawl and demersal longline as it traverses a heavily trawled area. However, the cable will not prevent trawling from continuing in the area, as trawlers will lift gear as they pass over the cable. The loss of fishing ground is estimated to be less than 45 km^2 of the total trawl grounds available in that area and overall, the significance of this impact is assessed as low. The potential for mitigation of identified impacts of the project on fisheries is very low.

Impacts on the beach and coastal dunes

The proposed alignment of the cable across the beach to link with existing ACE infrastructure on land (Alternative 1) is proposed as the best practical option and Alternative 2 is not supported. The significance of potential negative impacts of the proposed Alternative 1 on drivers of coastal processes, sediment transport and habitat/ecomorphology of the beach and dunes will be low, both before and after mitigation. It is noted that burial of the cable to 2 m is advised, as well as dune stabilisation post installation, due to the sediment mobilisation prevailing at this site.

Impacts on cultural heritage

While there is evidence of submerged pre-historic archaeological resources, palaeontological resources and maritime archaeological resources in the broader study area, the likelihood of the project negatively impacting these resources is very low. Only seven named wrecks are located in the vicinity of the cable route as it crosses the contiguous zone, territorial waters and inland waters to the landfall at Duynefontein. However, none of these wrecks appear to be within 1 km of the cable alignment. As the impacts would be non-reversable if they should occur, the significance of impacts on these cultural heritage resources is assessed as medium, (after applying mitigation, where possible).

Cumulative impacts

The impacts resulting from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) are both positive and negative and along with other existing or future cables along the East and West Coasts of South Africa, will have cumulative effects on the social and biophysical environment. Conflicts of interest may increase over time between the subsea fibre optic cable developers and the trawling industry in the West Coast area, as increasing areas become excluded due to cables crossing trawling grounds. Similarly, conflicts of interest may increasingly arise between the subsea fibre optic cable developers and the O&G industry, particularly as offshore exploration activities ramp up and drilling plans materialise. Direct and early engagement between role-players will be required to ameliorate cumulative impacts.

The No Development Alternative

The No-Development Alternative would avoid potential negative impacts on the natural environment and competing seabed users. However, it would preclude the positive impacts which improved telecommunications would have on the country's socio-economic environment and would fail to support the country's SIP 15 goals. It is anticipated that, with required mitigation of negative impacts, the advantages of the project will outweigh the disadvantages. For this reason, the No-Development Alternative is not preferred.

12 CONCLUDING STATEMENT/RECOMMENDATION OF THE EAP

Based on the findings of the specialists and the assessment of key issues and associated impacts undertaken in this report, it is the professional opinion of the EAP that there are no fatal flaws associated with the proposed project and that the negative impacts resulting from the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) can be mitigated to acceptable levels. Therefore, the project should be granted environmental authorisation by DFFE, conditional on compliance with the mitigation measures as recommended in this report and contained within the EMPr.

The project components to be authorised are the installation and operation of the marine cable, along the alignment as proposed, with the Alternative 1 shore end landing at Van Riebeeckstrand which links up to the existing ACE infrastructure (BMH to CLS).

The location and alignment of the proposed infrastructure is indicated in the table below and in relevant Figures in this report.

GPS Co-ordinates of the proposed 2AFRICA/GERA (East) Cable System (Duynefontein landing) infrastructure (approximate)		
Location	**Latitude (S)**	**Longitude (E)**
Start of trunk cable at Mozambique/SA EEZ boundary	27°14’43.97”S	34°56’15.53’’E
Mid-point of marine cable	35°55’26.82’’S	25°05’54.54"E
ACE Cable System BMH at Van Riebeeckstrand, Duynefontein (Alternative 1)	33°41'39.96"S	18°26'23.22"E
ACE Cable system beach anchor block	33°41'39.97"S	18°26'20.75"E
Sea Earth Plate at Van Riebeeckstrand, Duynefontein	33°41'42.96"S	18°26'16.44"E
ACE Cable Landing Station	33°41'35.81"S	18°26'58.57"E
Approximate length of marine cable	2,800 km	

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APPENDIX A: EAP *CURRICULUM VITAE*

APPENDIX B: SPECIALIST REPORTS, *CURRICULUM VITAE* AND DECLARATIONS

APPENDIX C: PROPERTY DETAILS

APPENDIX D: PUBLIC PARTICIPATION DOCUMENTATION

APPENDIX E: COMMENTS AND RESPONSES REPORTS

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME

APPENDIX G: SUPPORTING MAPS