

WIOCC



**2AFRICA/GERA (EAST) SUBMARINE FIBRE OPTIC CABLE
SYSTEM TO BE LANDED AT AMANZIMTOTI, KWAZULU-
NATAL, SOUTH AFRICA**

West Indian Ocean Cable Company (WIOCC)

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

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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 IAIA's National Premium Award for excellence in environmental management and assessment. The qualifications and experience of the primary compilers of the Environmental Management Programme (EMPr) are listed below.

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ABBREVIATIONS AND ACRONYMS

AECI	African Explosives and Chemical Industries
Amafa	Amafa Heritage aKwaZulu Natali
ASN	Alcatel Submarine Networks
AWAC	Armour Wire Anchor Clamp
BMH	Beach Manhole
CA	Competent Authority
CBA	Critical Biodiversity Area
CLS	Cable Landing Station
dB	decibels
DEFF	Department of Environment, Forestry and Fisheries (now DFFE)
DFFE	Department of Forestry, Fisheries and Environment (previously DEFF)
DHSWS	Department of Human Settlements, Water and Sanitation
D'MOSS	Durban Metropolitan Open Space System
EA	Environmental Authorisation
ECO	Environmental Control Officer
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EMPr	Environmental Management Programme
EPCPD	eThekweni Environmental Planning and Climate Protection Department
eThekweni	eThekweni Metropolitan Municipality
HDD	Horizontal Directional Drilling
HU	Habitat Unit
HV	High Voltage
HWM	High Water Mark
LWM	Low Water Mark
MARPOL	The International Convention for the Prevention of Pollution from Ships
MMO	Marine Mammal Observer
Navtext	Navigational Telex
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
Nm	Nautical Mile
OC	Department of Forestry, Fisheries and Environment: Oceans and Coasts
PAM	Passive Acoustic Monitoring
PLGR	Pre-Lay Grapnel Run
PVC	Polyvinyl Chloride
RE	Resident Engineer
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SAMSA	South African Maritime Safety Authority
SAN Hydrographer	South African Navy Hydrographic Office
SCC	Species of Conservation Concern
SME	Small and medium sized enterprise
TLB	Tractor Loader Backhoe
TOPS	Threatened or Protected Species
WIOCC	West Indian Ocean Cable Company

#	CONTENT OF AN EMPR AS PER APPENDIX 4 OF THE 2014 EIA REGULATIONS (AS AMENDED APRIL 2017)	REFERENCE IN THE EMPR
1	An EMPR must comply with section 24N of the Act and include:	-
(a)	Details of; (i) the EAP who prepared the EMPR and; (ii) the expertise of that EAP to prepare an EMPR.	Page II and Annexure 1
(b)	A detailed description of the aspects of the activity that are covered by the EMPR as identified by the project description.	Chapter 1 of EMPR
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.	Figure 1 and 2 in Chapter 1 of EMPR.
(d)	A description of the impact management outcomes, including management statements, identifying the impacts that need to be avoided, managed and/or mitigated as identified through the environmental impact assessment process for all phases of the development including; (i) Planning and design, (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post closure and; (v) Where relevant, operation activities and rehabilitation of the environment after construction and, where applicable, post closure.	Chapters 4 – 8 of the EMPR and Annexure 2
(e)	A description of impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and may include actions to; (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practices; (iii) Comply with any applicable provisions of the Act regarding closure, where applicable and; (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	Chapters 4 – 8 of the EMPR
(f)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (e).	Section 3 of EMPR
(g)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (e).	Section 3 of EMPR
(h)	An indication of the persons who will be responsible for the implementation of the impact management actions.	Section 3 of EMPR
(i)	The time periods within which the impact management actions contemplated in paragraph (e) must be implemented.	Section 3 of EMPR
(j)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (e).	Section 3 of EMPR
(k)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	Section 3 of EMPR
(l)	An environmental awareness plan describing the manner in which; (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work and; (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	Section 5.6 of EMPR
(m)	Any specific information that may be required by the competent authority.	N/A
2	Where a government notice <i>gazetted</i> by the Minister provides for a generic EMPR, such generic EMPR as indicated in such notice will apply.	N/A

1 INTRODUCTION

1.1 Background

The purpose of this project is to install a fibre optic submarine cable to provide international high-speed connectivity and reliability. Businesses and consumers will benefit from enhanced capacity and reliability for services such as telecommuting, HD TV broadcasting, Internet services, video conferencing, advanced multimedia and mobile video applications. Internet traffic is growing exponentially as the demand for new applications like cloud computing and on-demand video grows. Furthermore, the demand for new connectivity reflects an end-user and business environment in which high-capacity data transmission is essential for sustainable growth and development.

Communication via submarine telecommunications 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 telecommunications cables will help strengthen 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 with a branch landing in South Africa at Amanzimtoti, located on the East Coast of South Africa within the eThekweni Metropolitan Municipality (eThekweni). This is to be operated by West Indian Ocean Cable Company (WIOCC). As the designated Landing Partner of the 2AFRICA/GERA (East) Cable System in South Africa, WIOCC has the required licenses to operate this system in South Africa and aims to secure local permits¹ to land the 2AFRICA/GERA (East) Cable System at Pipeline Beach in Amanzimtoti, KwaZulu-Natal.

1.2 Project Description

The main 2AFRICA/GERA (East) cable trunk will be located approximately 200 to 500 km from the shoreline in international waters and South Africa's Exclusive Economic Zone (EEZ) and will run down the East Coast of Africa (generally parallel to the coastline) and approach South African coastal waters from the north (i.e., from Mozambican waters). The proposed Amanzimtoti landing site (Figure 1) in South Africa is the northern-most landing point of the 2AFRICA/GERA (East) Cable System in South Africa and branches off the main trunk line which lands in Dufnefontein in the Western Cape. The section of the 2AFRICA/GERA (East) Cable System for which this Environmental Management Programme (EMPr) has been developed, deals with the cable offshore within South Africa's Exclusive Economic Zone (EEZ) (200 nautical miles/370 km from the seashore) through South Africa's territorial waters (12 nautical miles/22 km from the seashore) until it reaches the Beach Manhole (BMH) on shore at Amanzimtoti Pipeline Beach and then onwards following a terrestrial alignment to the Cable Landing Station (CLS) at Arbour Junction 2, Arbour Road, Umbogintwini. In this context, the project description incorporates the materials comprising the 2AFRICA/GERA (East) Cable System and the methods to be used to install the cable system in the marine and terrestrial environments.

The 2AFRICA/GERA (East) Cable System is comprised of the following project components from when it enters South Africa's EEZ until it reaches the CLS in Umbogintwini:

- ❑ Pre-installation activities including cable route survey, route engineering, route clearance and Pre-Lay Grapple Run (PLGR).
- ❑ Laying and burial of the cable in the offshore environment within South Africa's EEZ from where it branches off the trunk line until it reaches the shore (this will take place within the assessed 0.5 km wide cable corridor (250 m either side of the cable)).

¹ Of which an Environmental Authorisation is one.

- ❑ Laying and burial of the cable across the beach (approx. 100 m wide construction corridor - 50 m each side of the cable alignment)) up to the position of the proposed BMH (requiring excavations within the intertidal zone to bury the cable before it will be anchored into the BMH) and installation of a beach earth system (System Earth).
- ❑ On the beach, the cable will be buried to a target depth of 2 meters, substrate permitting. Horizontal Directional Drilling (HDD) will be used to install the section of cable underneath the vegetated coastal dune.
- ❑ Installation of the onshore cable between the BMH and the CLS (construction corridor of 5 m each side of the cable).
- ❑ Construction of a BMH on the inland side of the beach (underground structure with a volume of approximately 12 m³).

For additional details, refer to Chapter 4 of the Final Environmental Impact Assessment Report.

1.3 Construction Programme

As there is construction required for a BMH and associated trenching from the BMH to the CLS site, all the infrastructure required for the landing of the 2AFRICA/GERA (East) Cable System can be scheduled after the Environmental Authorisation (EA) and other required permits have been issued. Construction of the BMH and cable trenching from the BMH to the CLS is anticipated to take approximately 6 months to complete, depending on weather conditions.

It is anticipated that the actual landing of the cable at Pipeline Beach and its installation (along with the sea earth plate and cable) will take less than four weeks to complete (the main work of landing the cable from the vessel should be completed in 1 or 2 days; thereafter the shore-end team will fix the articulated pipe on the cable and bury it on the beach and in the near-shore waters. This is a gradual process which is expected to take up to four weeks).

Once the cable has been installed to the BMH, reinstatement and rehabilitation of the site will take place. It is anticipated that rehabilitation of the site will be completed within two weeks, however routine monitoring of the site will be scheduled to take place for at least six months after works cease. Monitoring will ensure that remedial works can be scheduled as soon as any issues are identified on site.

1.3.1 Timing of construction activities

- ❑ Timing of the construction activities will need to consider the peak holiday periods (December, January and April) when the beach area and surrounding roads are likely to be congested, making access and public safety, key concerns. The landing of the cable will be scheduled as best possible, to take place outside of the peak holiday season and legislated school holidays; however this depends on project roll out and the availability of ships to install the cable.
- ❑ eThekweni will be notified at least three months prior to construction and landing of the cable.
- ❑ eThekweni will be consulted, and a site inspection undertaken with the Contractor prior to the cable being landed, to ensure that any issues associated with the proposed cable landing are addressed.
- ❑ The seasonal timing of the offshore installation of the 2AFRICA/GERA (East) Cable System related to seasonal whale migration patterns is required to be taken into consideration. ASN must designate a suitably trained crew member with responsibility for recording sightings of marine mammals should the cable installation be planned for during the whale migration period (beginning of June to end of November).
- ❑ Cable landing must be timed to avoid the Sardine Run (June/July) where possible.

1.3.2 Construction activities

Construction will entail the following activities for the laying of the 2AFRICA/GERA (East) Cable System offshore by means of a purpose-built cable-laying ship:

- ❑ PLGR to clear the cable alignment of all debris (disused cables and fishing gear). Any debris recovered during these operations will be discharged ashore on completion of the operations and disposed in accordance with local regulations.
- ❑ Surface lay of unarmoured cable on the seabed in water depths greater than 1,000 m, where the risk of inadvertent damage from human activities is negligible.
- ❑ Simultaneous lay and plough burial at water depths of less than 1,000 m. The cable will be buried up to 2 m below the seabed where possible.

Construction will entail the following activities for the landing of the 2AFRICA/GERA (East) Cable System at the preferred beach landing site:

- ❑ 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.
- ❑ The marking of any existing in-service cables and pipelines at the shore end location (with the assistance of the cable owners).
- ❑ Construction of the BMH to accommodate the cable.
- ❑ 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 BMH to facilitate re-terminations.
- ❑ Installation of a system earth on the beach.
- ❑ Horizontal Directional Drilling (HDD) will be used to install the section of cable underneath the vegetated coastal dune.
- ❑ Securing the cable in the BMH by means of an armour wire anchor clamp (AWAC).
- ❑ Burial of the cable from the beach anchor block to the Low Water Mark (LWM) to a depth of 2 m.
- ❑ Provision of articulated pipe to provide additional cable protection in the shallow water environment.
- ❑ Pinning of the cable to outcropping rock where feasible, should it be required to anchor the cable.
- ❑ Reinstatement of the beach to its preconstruction profile.
- ❑ Excavation of a trench and inspection manholes from the BMH to the CLS along the preferred fronthaul route. The trench will be backfilled and shaped post installation of the cable.

1.4 Sensitive Environments

Sensitive environments are any aspects of the surrounding biophysical or social environment that should be provided additional care, protection or respect and these areas must be suitably and visibly demarcated and cordoned off prior to and during construction activities. Sensitive areas on site relate primarily to the beach, the frontal dune cordon, and social environments. The sensitive social environments include private properties, foot paths, roads, sidewalks, and property verges.

The construction zone associated with the trench for the laying of the cable on the beach, trench from the BMH to the CLS and the BMH need to be demarcated and cordoned off during construction and cable installation.

Refer to Figure 1 and Figure 2, which indicate the construction zone on the beach, BMH and trench between the BMH and CLS.

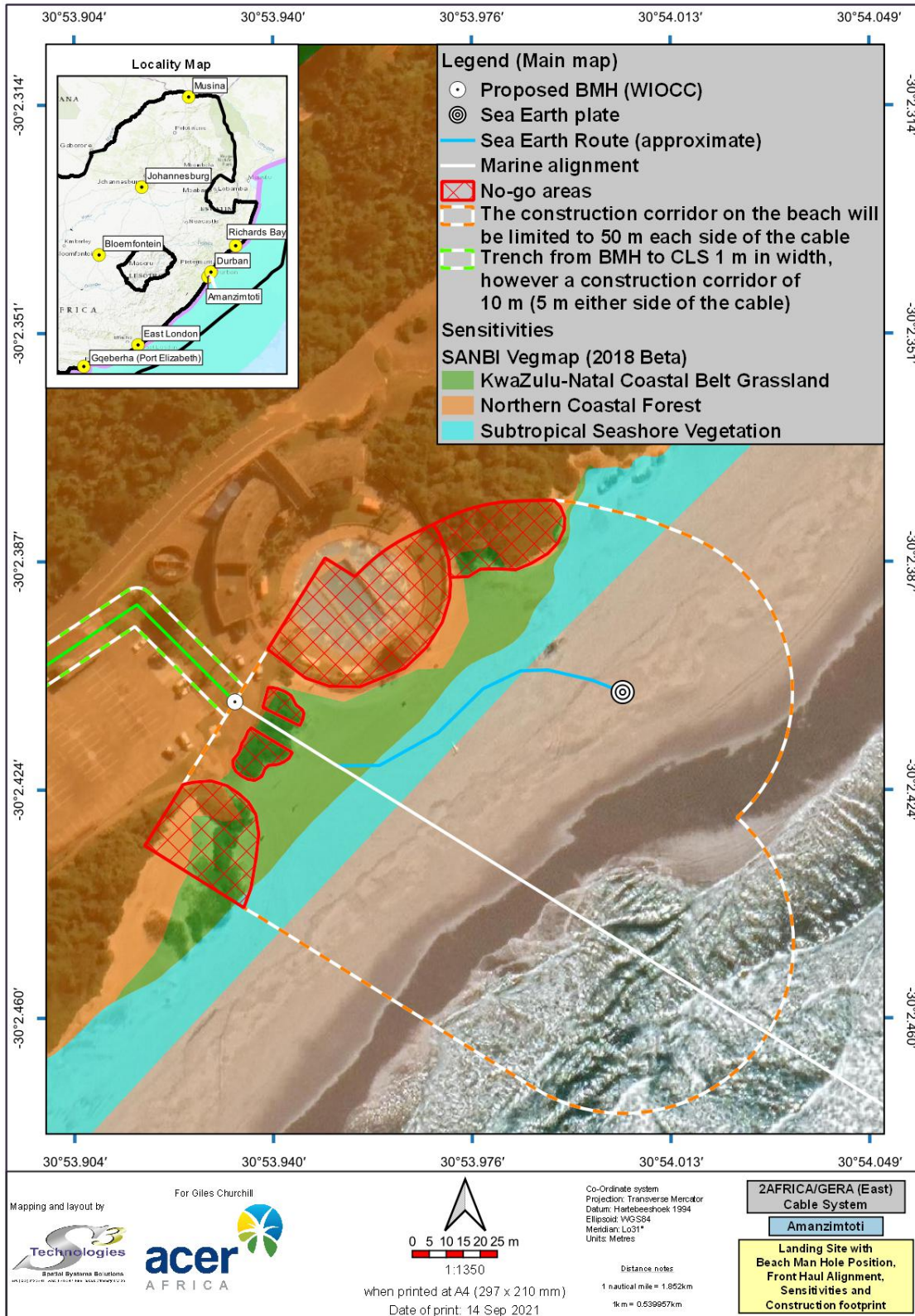


Figure 1 Sensitivity Map showing construction zone on the beach and primary dune cordon at the proposed landing point

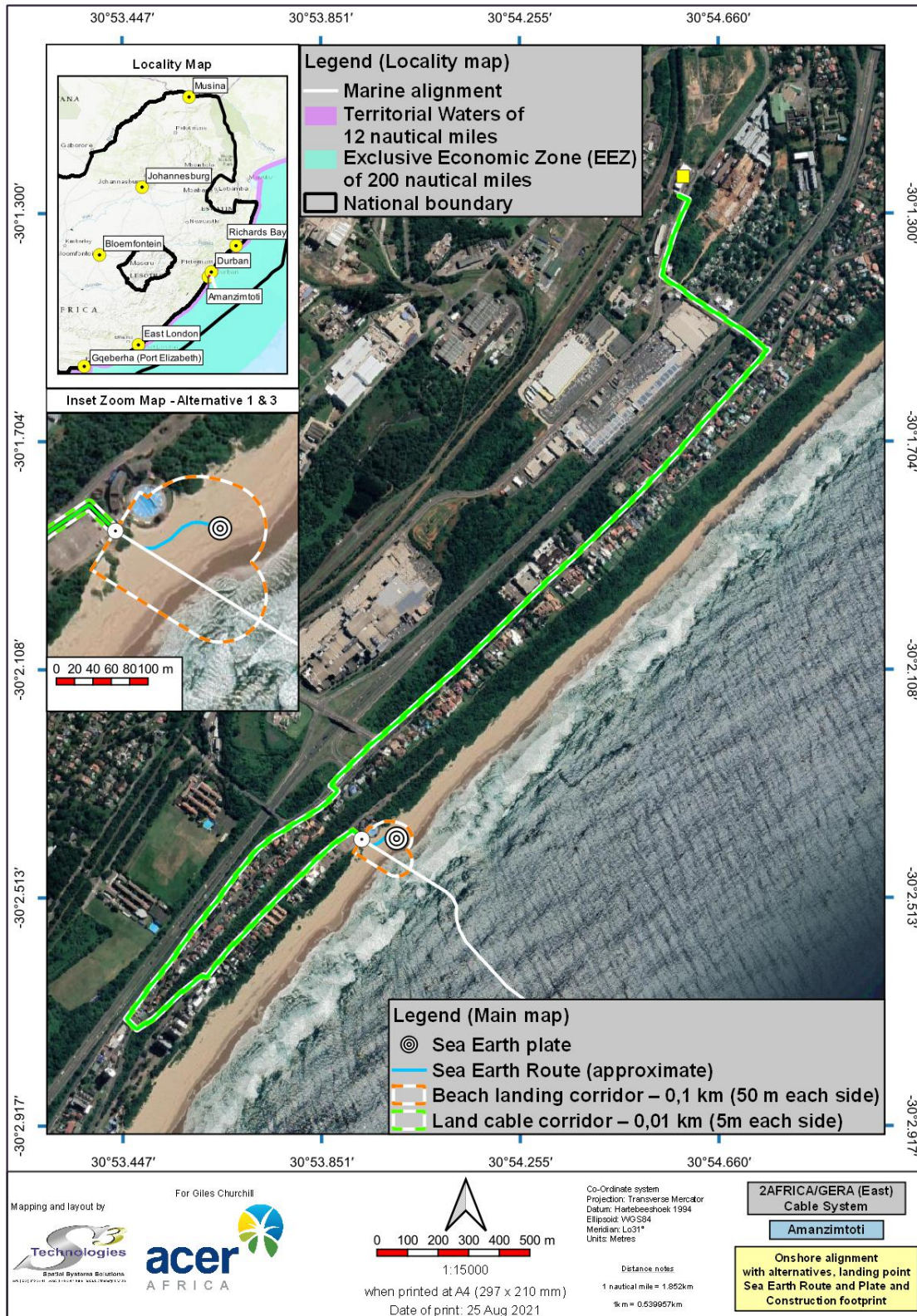


Figure 2 Map showing construction zone between the BMH and CLS at Umbogintwini

1.5 Objective and Scope of the Environmental Management Programme

This EMPr has been compiled with the holistic view to minimise potential direct site impacts, and indirect impacts to adjoining habitats and ecosystems linked to the sites. This EMPr undertakes to ensure a systematic and robust approach to the management of environmental impacts during the pre-construction, construction, operational and rehabilitation phases of the 2AFRICA/GERA (East) Cable System, to prevent long-term or permanent environmental degradation, as per the following approach:

- ❑ Assigns roles and responsibilities to the parties charged with its implementation as shown in Table 1.
- ❑ Sets out environmental specifications that are applicable to the project and its associated activities and provides guidance to achieve these environmental specifications.
- ❑ Defines corrective actions, which must be taken in the event of non-compliance with these environmental specifications.
- ❑ Specifies requirements and procedures for monitoring and reporting.
- ❑ Specifies requirements and procedures for record keeping.
- ❑ Makes provision for the fulfilment of other relevant legal requirements pertaining to the environment.
- ❑ Acts as a monitoring reference tool for ensuring compliance with the provisions of the EMPr.
- ❑ Makes provision for review of the EMPr.
- ❑ The updated EMPr will fulfil certain conditions of environmental authorisation (as contained within the EA).
- ❑ The updated EMPr will make provision for the fulfilment of other relevant conditions of environmental authorisation (as contained within the EA).

This EMPr contains management actions, given as specifications, addressing the various components of the work site and the specifications will apply to all phases of construction unless reference is made to a specific phase.

To give effect to the above, the Developer requires a commitment from the Project Manager and the Contractor on the following matters:

- ❑ To ensure that environmental conditions stipulated in the EA are implemented.
- ❑ To resolve problems and appropriate claims arising from damages immediately, to ensure a smooth flow of operations.
- ❑ To implement this EMPr for the benefit of all involved.
- ❑ To preserve the natural environment by limiting destructive actions on site.

This EMPr may be amended, as required, for the duration of the contract. The management of the environment changes over time and, therefore, this document shall be updated regularly to ensure environmental management is implemented during all phases of the project. Note however that amendments to the EMPr must be undertaken in accordance with Chapter 5 of the 2014 EIA Regulations, which may require a further process of authorisation from the Department of Forestry, Fisheries and the Environment (DFFE).

2 ENVIRONMENTAL PRINCIPLES AND LEGAL REQUIREMENTS

2.1 Environmental Principles

The following principles should be always considered by all parties during all phases of the project:

- The environment is composed of both biophysical and social components.
- Construction is a disruptive activity, and all due consideration must be given to the environment, including the social environment, during the execution of a project to minimise the impact.
- Minimisation of areas disturbed by construction activities (i.e., the footprint of the construction area) should minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs.
- As minimum requirements, all relevant standards relating to international, national, provincial, and local legislation, as applicable, shall be adhered to. This includes requirements relating to waste emissions (e.g., hazardous, airborne, liquid, and solid), waste disposal practices, noise regulations, road traffic ordinances, protected species, etc.
- Every effort should be made to minimise, reclaim and/or recycle “waste” material.
- Every effort should be made to apply the best practicable environmental option.

2.2 Applicable legislation

The Developer must comply with all applicable South African national, provincial, and local legislation related to environmental protection. Of relevance is Section 28 of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), which requires the Developer to comply with the provisions of duty of care and remediation of environmental damage

Below is a list of Acts, which are likely to be of relevance to this construction contract. Where any legislation or regulations referred to in this EMP are repealed, amended, or supplemented by any subsequent legislation or regulations which have been duly promulgated and have come into effect, the legislation thus referred to shall be deemed to have been repealed, amended, or supplemented by the subsequent legislation or regulation in question, and shall be construed accordingly.

- Animals Protection Act, 1962 (Act No. 71 of 1962).
- NEM: Air Quality Act, 2004 (Act No. 39 of 2004).
- Conservation of Agricultural Resources, 1983 (Act No. 43 of 1983).
- Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996).
- Environment Conservation Act, 1989 (Act No. 73 Of 1989).
- Hazardous Substances Act, 1973 (Act No. 15 of 1973).
- Land Survey Act, 1921 (Act No. 9 of 1921).
- Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
- Mine Health and Safety Act, 1996 (No. 29 of 1996).
- National Environmental Management Act, 1998 (No. 107 of 1998).
- National Environmental Management: Biodiversity Act (No. 10 of 2004).
- NEM: Waste Act, 2008 (No. 59 of 2008).
- National Forests Act, 1998 (No. 84 of 1998).
- National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998).
- National Water Act, 1998 (Act No. 36 of 1998).
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Promotion of Access to Information Act, 2000 (No 2 of 2000).
- Provincial and Local Government Ordinances and Bylaws.

- ❑ Soil Conservation Act, 1969 (Act No. 76 of 1969).
- ❑ Infrastructure Development Act (Act No. 23 of 2014).
- ❑ National Environmental Management: Integrated Coastal Management Amendment Act, 2014 (Act No. 36 of 2014)
- ❑ National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008).
- ❑ KwaZulu-Natal Nature Conservation Management Act, 1997 (Act 9 of 1997).
- ❑ Natal Nature Conservation Ordinance (Act 15 of 1974).
- ❑ KwaZulu-Natal Heritage Act, 2008 (Act 4 of 2008).
- ❑ eThekweni Coastal Management By-Law 2017

2.3 Environmental standards

All applicable environmental standards contained within the environmental legislation shall be adhered to. Without derogating from the generality of the above and without limitation, at the time of compiling this EMP, the following environmental guidelines and standards are highlighted. The list is intended to serve as a guideline only and is not exhaustive.

- ❑ Air quality guidelines. In terms of air quality, the Contractor will be required to describe how effective dust control measures will be achieved during the construction phase.
- ❑ Noise control regulations. The contractor must adhere to GNR.155 of 10 January 1992: Application of noise control regulations made under section 25 of the Environment Conservation Act, 1989 (Act No. 73 of 1989).
- ❑ Storage of hazardous substance. Hazardous substances must be stored and handled in accordance with the relevant legislation and standards which may include the Hazardous Substances Act, the Occupational Health and Safety Act, relevant associated Regulations, and applicable South African Bureau of Standards (SABS) and international standards.
- ❑ Health and safety of work team. Construction regulations (2003) published under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) apply to construction activities including “the moving of earth, clearing of land, the making of an excavation, tunnelling, piling, or any similar type of work”. A “health and safety plan” which addresses hazards identified, and includes safe work procedures to mitigate, reduce or control the hazards identified, is required under this Act. In addition, the Covid-19 Health and Safety Measures are required to be adhered to.
- ❑ Control of weeds and invader plants. The regulations applicable in the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) apply in KwaZulu-Natal. Declared weeds or invader plants are defined and categorised by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and the National Environmental Management: Biodiversity Act (No. 10 of 2004).

2.4 Environmental permitting requirements

Environmental permits that are likely to be required for various activities undertaken as part of the project are discussed briefly below. These must be obtained before the activity commences and according to the conditions contained within the permit. The applicant of the permit or licence for this project will be the relevant party as defined by the relevant legislation, which in most cases will be the Developer or the Contractor.

ENVIRONMENTAL AUTHORISATION

In terms of NEMA and its EIA Regulations published in December 2014 (as amended), it is necessary to undertake environmental investigations as an integral part of project planning to obtain environmental authorisation for a proposed activity deemed to potentially negatively affect the

environment. The construction and operation of 2AFRICA/GERA (East) Cable System is identified as an activity which may not commence without an EA from the relevant Competent Authority (CA) and one that requires assessment and communication of potential environmental impacts of activities based on the procedure as described in Sections 21 to 24 and Appendices 2, 3 and 4 of the Regulations R 983 of December 2014, as amended. Further, it is best business practice to understand the environmental consequences of a development.

An application for authorisation for the proposed 2AFRICA/GERA (East) Cable System was submitted to the CA on the 19 March 2021. The Department of Forestry, Fisheries and Environment (DFFE²) is the CA for this project, and accordingly, is responsible for decision-making on whether to authorise the proposed development. Should environmental authorisation be granted, the authorisation will probably contain several conditions of authorisation, including the compilation and approval of an EMPr. The EMPr will be legally binding on the Developer in its capacity as applicant in its application authorised by DFFE. Similarly, the provisions of the EMPr will be binding on all Contractors operating on the site during the life of the project, including the rehabilitation stage. This includes any third party appointed by the Contractor to fulfil its obligations.

HERITAGE AND PALAEOLOGICAL RESOURCES

Since the project is subject to an Environmental Impact Assessment, the South African Heritage Resources Agency (SAHRA) and Amafa Heritage aKwaZulu Natali (Amafa) are required to provide comment on the proposed project to facilitate final decision making by the DFFE.

During construction, should a cultural heritage resource be discovered, SAHRA (below the High-Water Mark (HWM)) or Amafa (above the HWM and in the terrestrial component of the project) would need to be notified immediately and construction activities put on hold. Depending on the find, this may affect all construction activities or only some and further assessment and permits may be required.

WASTE DISPOSAL

The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) was promulgated with the aim to provide laws regulating waste management to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development. In fulfilling the rights contained in Section 24 of the Constitution, the State, through the organs of state responsible for implementing this Act, must put in place uniform measures that seek to reduce the amount of waste that is generated and, where waste is generated, to ensure that waste is re-used, recycled, and recovered in an environmentally sound manner before being safely treated and disposed. As such, the interpretation and application of the Act must be guided by the national environmental management principles set out in Section 2 of NEMA.

BEACH DRIVING

The Developer will require a permit in terms of Section 4(1)(h) of GN 496 of 27 June 2014: Control of use of vehicles in the coastal area regulations, published under the National Environmental Management: Integrated Coastal Management Act, 1998 (Act No. 24 of 2008).

The permit application must set out the following:

- The geographic location and precise description of the area for which the permit is being issued.
- The duration for which the permit is required, including the commencement date.
- The conditions for the management of vehicles within the coastal area including:
 - Access points.
 - No-go Areas (ecologically sensitive areas, private property, etc).

² Previously the Department of Environment, Forestry and Fisheries (DEFF)

- Health and safety aspects (speed limits, right of way to public and wildlife).

WATER USE AUTHORISATIONS

- ❑ The required submissions to the Department of Human Settlements, Water and Sanitation (DHSWS) for water uses (in terms of Section 21 of the National Water Act No 36 of 1998) will be undertaken by ACER³ on the contractor's behalf.
- ❑ No construction is to commence until the relevant authorisations have been issued by the DHSWS.
- ❑ The Contractor is to abide by the conditions of the water use licenses/general authorisations and registrations, as applicable.

³ In terms of aquatic biodiversity, it was determined that no wetland or riverine systems were at risk of being impacted on by the proposed development. The nature of the proposed development and the proximity of the activities to the delineated watercourses resulted in all aspects being calculated to be of Low significance in the post-mitigation state within the DWS Risk Assessment Matrix. As one wetland lies within 500 m of the proposed project, a General Authorisation (GA) applies. (However, it is considered to warrant an exclusion, subject to confirmation from DHSWS.)

3 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

3.1 Organisational Structure

An organisational structure for the construction phase of the project is illustrated in Figure 2⁴. Communication and reporting lines related to the EMPr (including instructions, directives, and information) shall be channelled according to the organisational structure implemented by the Employer.

3.2 Roles and Responsibilities

The roles and responsibilities that are assigned to the various parties listed below are for all phases of the project. Refer to Table 1 for the Responsibility Matrix and Organisational Structure.

Table 1 Responsibility Matrix and Organisational Structure

Function	Name	Responsibilities
Developer	West Indian Ocean Cable Company (WIOCC)	Overall responsibility for ensuring that the development is implemented according to the requirements of the EA and EMPr
Project Manager	To be confirmed	Overall management of project and EMPr implementation
Project Engineer	To be confirmed	Developer's responsible agent to ensure that the Contractor adheres to construction specifications, the EA and EMPr
Resident Engineer	To be confirmed	Project Engineer's representative on site
Environmental Control Officer (ECO)	To be confirmed	Implementation of EMPr and liaison between the Project Proponent, Contractor and Authorities
Contractor	To be confirmed	Implementation and compliance with recommendations and conditions of the EMPr; appoints or delegates a dedicated person to work with the ECO

Figure 3 below illustrates the role players and their reporting relationships for the construction phase of the project. This figure depicts the practical reporting relationship, not necessarily the contractual or institutional relationships. All official communication and reporting lines related to the EMPr (including instructions, directives, and information) shall be channelled according to this organisational structure.

⁴ The organogram will need to be updated once all roles have been filled and companies appointed.

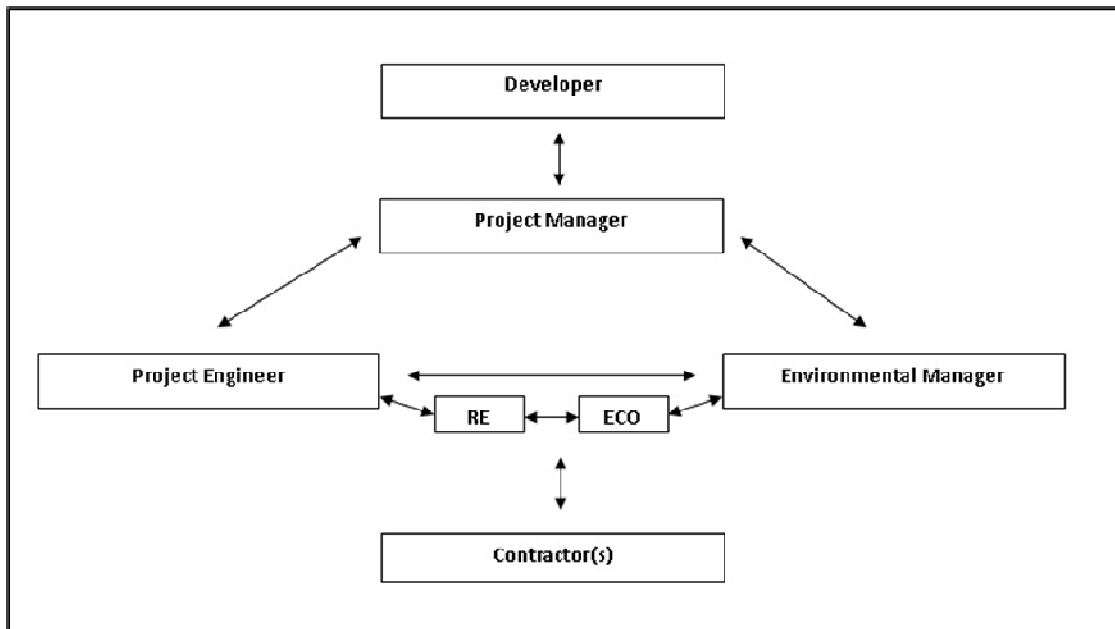


Figure 3 Organogram reporting relationships for the construction phase

3.2.1 Developer

WIOCC will be the Developer for all components of the work related to the project. The Developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr. In terms of the EMPr, the Developer is responsible for the following:

- ❑ Compilation and submission of an EMPr for the construction of the project to the environmental authority (DFFE) for approval prior to commencement of construction.
- ❑ Implementation of the approved EMPr.
- ❑ Submission of any substantial changes, updates or amendments to the EMPr to DFFE.
- ❑ Ensuring that the provisions of the EMPr are binding on all Contractors operating on the site during construction of the project.
- ❑ Ensuring that environmental inspections are conducted during construction to establish how well the Contractor is complying with conditions of authorisation and the EMPr.
- ❑ Ensuring that compliance/non-compliance records are kept in good order and made available on request by the authorities.
- ❑ Ensuring that the EA and EMPr are available at the construction site and Contractors are familiar with or made aware of the contents of the EA.
- ❑ Complying with all applicable environmental legislation, regulations, and guidelines, and ensuring that Contractors undertake responsibility to do the same.
- ❑ Being committed to the principles contained within NEMA including the duty of care and remediation of damage, in accordance with Section 28.
- ❑ The developer will appoint a Project Manager to liaise with the Project Engineer and Environmental Manager/ECO.
- ❑ The developer must appoint an independent external Environmental Control Officer (ECO) to undertake environmental audits of the site during construction and rehabilitation of the site.

3.2.2 Project Engineer and Resident Engineer

The Project Engineer represents the Employer and co-ordinates all aspects of the project, including project co-ordination, design, and construction. The Resident Engineer (RE) is the Project Engineer's representative on site. The Project Engineer is ultimately responsible for ensuring, on behalf of the Employer that the provisions of the EMPr are complied with. The Project Engineer, assisted by the RE on site, is responsible for the following:

- ❑ Ensuring that the provisions of the EMPr are binding on all Contractors operating on the site during the construction phase of the project by including the approved EMPr as part of the Contract documents.
- ❑ Approving final construction site layout plans.
- ❑ If necessary, on the recommendation of the Environmental Manager or ECO, instruct the Contractor(s) to suspend any or all works on site, if the Contractor(s) or his/her Sub-contractors/suppliers fail to comply with the EMPr and/or EA.
- ❑ Liaising directly with the Environmental Manager in terms of environmental issues and maintaining close channels of communication with the Environmental Manager regarding foreseeable activities that may require environmental input.
- ❑ On behalf of the Developer, reviewing any substantial changes, updates or amendments to the EMPr prior to its submission to DFFE for approval.
- ❑ Ensuring that an environmental performance certificate is obtained from the Environmental Manager prior to awarding the Certificate of Completion to the Contractor(s).
- ❑ Including the approved EMPr as part of the contract documents.
- ❑ Ensuring that the Contractor(s) and Sub-contractor(s) are conversant with the requirements of the EMPr.
- ❑ Compiling preliminary construction site layout plans prior to construction commencing.
- ❑ Ensuring that the Contractor(s) complies with the EMPr and, if not, ensuring that the Contractor(s) bears the costs of damages/compensation resulting from non-compliance with the EMPr.
- ❑ Ensuring that the Contractor(s) conducts all activities in a manner that minimises disturbance to the project area, local communities and road users and forwards complaints and queries by members of the public at the site office, to the RE.
- ❑ Ensuring that a register of complaints and queries by members of the public is maintained at the site office and the actions taken in response to these complaints.
- ❑ Liaising directly with the Environmental Manager in terms of environmental issues and maintaining close channels of communication with the Environmental Manager regarding foreseeable activities that may require environmental input.
- ❑ Ensuring that all EMPr-related instructions from the RE to the Contractor are recorded in the site diary.
- ❑ Having available a copy of the EMPr at the construction site at all times and ensuring that all staff, Contractors and Sub-contractors are familiar with or made aware of the contents of the EMPr.
- ❑ Complying with all applicable environmental legislation, regulations, and guidelines, and ensuring that Contractors undertake responsibility to do the same.

3.2.3 Environmental Manager

The Environmental Manager is responsible for managing and co-ordinating environmental obligations and shall advise the Project Engineer, the Employer and Contractors on all environmental management matters relating to the project. This includes providing input during all phases of construction (including design), monitoring environmental performance of Contractors during

construction, and ensuring that all environmental specifications and EMPr requirements are met at all times.

The Environmental Manager is responsible for the following:

- ❑ Co-ordinating all matters relating to the environmental management of the project.
- ❑ Assisting the Developer, the Project Engineer, the RE and the Contractor(s) with EMPr compliance and all environmental legislation relating to the project.
- ❑ Liaising with the relevant authorities with respect to environmental authorisations, permits, agreements, etc.
- ❑ Liaising closely with and reporting any breaches of EMPr implementation and the relevant legislation to the Project Engineer.
- ❑ Attending project meetings and reporting and advising as necessary on environmental matters.
- ❑ Reviewing and updating the EMPr in relation to specific requests, non-compliances or changes in the legislation.
- ❑ Providing input during the design phase in accordance with the conditions in the EA.
- ❑ Providing input into construction site layout plans.
- ❑ Obtaining specialist input as required.
- ❑ On behalf of the Developer, informing DFFE of non-compliance of any of the conditions of the authorisation within a reasonable period.
- ❑ Making information available to the authorities on request.
- ❑ Ensuring that the EMPr forms part of the tender documentation.
- ❑ Providing the Project Engineer with an environmental performance certificate at the end of a contract confirming that all environmental specifications applicable to the Contractor have been met.
- ❑ Being fully conversant with the EMPr and all relevant environmental legislation, guidelines and standards.
- ❑ Ensuring that all authorisations, licenses, and permits required in terms of the applicable legislation have been obtained.
- ❑ Providing the Project Engineer with an environmental performance certificate at the end of a contract confirming that all environmental specifications applicable to the Contractor have been met.
- ❑ With assistance of the ECO, reviewing training programmes, construction site layout plans, method statements and specifications and advising, as necessary.

3.2.4 Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is the Environmental Manager's representative on site and is responsible for the following:

- ❑ Assisting with enforcing of the site environmental specifications on site via the RE.
- ❑ Ensuring a clear line of communication is maintained with eThekweni.
- ❑ Conducting regular site visits to monitor and verify compliance with the EMPr and EA and keeping records of compliance/non-compliance.
- ❑ Ensuring that a copy of the EA and latest version of the EMPr are always available on site.
- ❑ Ensuring that the Contractor is conversant with the requirements of the EMPr. The ECO should ensure that all members of staff on site have attended an environmental awareness-training course (if deemed necessary).
- ❑ Identifying and assessing previously unforeseen, actual, or potential impacts of the project on the environment.
- ❑ Bringing any environmental concerns to the attention of the RE.

- ❑ Recommending to the RE that the Contractor suspend any or all works on site if the third parties who carry out all or part of the Contractor's obligations fail to comply with the environmental specifications.
- ❑ Advising on the rectification of any pollution, contamination or damage to the project site, rights of way and adjacent land.
- ❑ Ensuring that the Contractor(s) bear the costs of damages/compensation resulting from non-compliance with the EMPr.
- ❑ Attending site meetings (scheduled and *ad hoc*).
- ❑ Recording complaints or queries from I&APs and actions taken to address complaints.
- ❑ Ensuring that all EMPr-related instructions from the RE to the Contractor are recorded in the site diary.
- ❑ Maintaining a photographic record of the site throughout construction and rehabilitation.
- ❑ Ensuring that the RE and Contractor(s) are made aware of all applicable changes⁵ to the EMPr.
- ❑ Producing a monthly environmental audit report. These monthly environmental audit reports must be submitted to DFFE: Director of Compliance, eThekweni and WIOCC for their records.
- ❑ Monitoring of the site for a period of six months post construction.
- ❑ Reviewing and approving construction method statements with input from the Environmental Manager, Project Engineer and RE, where necessary, to ensure that the environmental specifications contained within this EMPr are adhered to.
- ❑ Keeping accurate and detailed records of all EMPr-related activities on site.
- ❑ Checking that a copy of the EMPr is available on site.

3.2.5 Contractor

The Contractor is the successful tenderer, appointed by the Employer to undertake the project. It is the responsibility of the Contractor to ensure that he or an appointed advisor is well versed in environmental matters to efficiently carry out the requirements of the EMPr. The Contractor is responsible for the following:

- ❑ Be responsible for the implementation of the applicable environmental specifications in accordance with the requirements and provisions of this EMPr.
- ❑ Compile construction site layout plans.
- ❑ Obtain any required written permission from the landowner for use of a suitable site for the erection of the construction camp, storage yards, and stockpile areas.
- ❑ Ensuring that a register of complaints and queries by members of the public is maintained at the site office and the actions taken in response to these complaints.
- ❑ Ensure that all third parties who carry out all or part of the Contractor's obligations comply with the requirements and provisions of this EMPr.
- ❑ Report any non-compliance to the RE and ECO within 12 hours of the event occurring.
- ❑ Report any non-compliance event that constitutes an emergency immediately and in line with the protocol applicable to the specific emergency event.
- ❑ Ensure that all employees and sub-contractors attend the environmental awareness-training course (if deemed necessary) and are familiar with or are made aware of the contents of the EMPr and EA.
- ❑ Ensure that a copy of the EA and the approved EMPr is always available at the construction site and all sub-contractors and staff are familiar with contents of the EA.

⁵ DFFE-approved where there are substantial changes.

3.3 Compliance Monitoring, Reporting and Record Keeping

3.3.1 Compliance Monitoring

The Environmental Manager, with assistance from the ECO, will monitor environmental compliance with the EMPr by all parties concerned. The ECO must be an external independent auditor and must submit monthly audit reports to department.

3.3.2 Design Phase

During the design phase, the Environmental Manager will meet with the Project Engineer to highlight design needs as specified in the EMPr. On completion of the design, relevant information will be reviewed by the Environmental Manager to ensure that the design demonstrates compliance with environmental requirements. The Project Engineer will also provide preliminary construction site layout plans to the Environmental Manager for review.

3.3.3 Construction Phase

3.3.3.1 Construction Site Layout Plan

Prior to construction, the Project Engineer, with input from the Environmental Manager and ECO, must approve the construction site layout plan prepared by the Contractor showing the positions and extent of all permanent and temporary site structures and infrastructure. The Project Engineer is responsible for the co-ordination of construction site layout plans should there be an overlap between multiple Contractors on site.

The construction site layout plan will be discussed with eThekweni during the site inspection with the contractor and ECO prior to the cable being landed.

3.3.3.2 Method Statements

Prior to construction, the RE and ECO will agree which activities require a written method statement. Where relevant, the Contractor must submit a written method statement, which should include the following:

- The type of construction activity.
- Locality where the activity will take place.
- Identification of impacts that might result from the activity.
- Identification of activities or aspects that may cause an impact.
- Methodology and/or specifications for impact prevention for each activity or aspect.
- Methodology and/or specifications for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

The ECO must review the construction method statements to ensure that the environmental specifications contained within this EMPr are adhered to.

3.3.3.4 Site Inspections and Meetings

The ECO will conduct site inspections and meetings to establish how well the Contractor is complying with the EMPr. The ECO will compile a site inspection checklist, to be forwarded to the RE and

Contractor for their attention and records. The checklists will also be included as an appendix to the monthly audit report to be submitted to DFFE: Director of Compliance, eThekweni and WIOCC.

Anything of an environmental nature that arises in between the site audits must be recorded in the site diary and recorded in written correspondence to the ECO. If required, the ECO must conduct a site visit to address the matter and must report the matter in an addendum to the site inspection checklist.

3.3.4 *Non-Compliance and Remedial Action*

The Contractor(s) and Sub-contractors are deemed not to have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications within the boundaries of the construction site.
- There is contravention of the EMPr specifications that relate to activities outside the boundaries of the construction site.
- Construction activities take place outside demarcated areas.
- Environmental damage ensues due to negligence or intent.
- Failure to comply with corrective or other instructions issued by the Project Engineer within a specific time period.

Where the ECO identifies non-compliance by the Contractors and Sub-contractors, it will be discussed during the site visits (when identified) and remedial actions and timeframes specified. The ECO must record these incidents of non-compliance, the remedial actions, and timeframes in the site inspection checklist. The RE must also record the relevant instructions for the Contractor(s) in the site diary.

If the specified remedial action has not been carried out by the Contractor(s) within the period stipulated, the non-compliance must be dealt with as follows:

- Where non-compliance has resulted in environmental damage to the site which cannot be rectified by the remedial action specified by the ECO, or the Contractor(s) has failed to carry out the remedial work within the prescribed time limit (or permitted extension thereof), the ECO shall convene a meeting between the RE and the Contractor to discuss the appropriate remedial action.
- The Project Engineer shall issue an instruction to the Contractor to procure execution of the remedial work as agreed between the parties, and the Contractor shall be obliged to procure such remedial work within the prescribed period to the satisfaction of the Project Engineer.
- Failure by the Contractor to comply with an instruction from the Engineer to procure the carrying out of the required remedial work shall constitute a material breach of the Contract.
- Where the Employer has taken action to procure the remediation of such consequences it shall be entitled to recover from the Contractor the full cost of remediation.

Incidents of non-compliance, the remedial actions and timeframes must be recorded in the site inspection checklist and the site diary.

3.3.5 *Regulatory Authorities' Site Inspections*

eThekweni and other relevant authorities may conduct site inspections as desired.

3.4 Environmental Awareness Training

Environmental awareness is a requirement for all construction crews. This not only ensures the safety of the personnel, but also helps to protect the integrity of the environment during construction. If the ECO deems the environmental awareness training course necessary, the ECO must arrange that all Contractors' employees attend to familiarise themselves with requirements of the EA and EMPr. The training course should enable the employees to acquire a basic understanding of the environment, the EMPr, EA and specific environmental features pertaining to the Work Site.

As a minimum the environmental awareness training programme must include the following:

- The importance of compliance with all environmental policies, procedures, plans and systems.
- Understanding, and importance of, and the reasons why, the environment must be protected.
- Basic awareness and understanding of the key environmental features of the work site and environs, particularly sensitive habitats.
- The significant environmental impacts, actual or potential, that could occur as a result of their work activities.
- The mitigation measures required to be implemented when carrying out their work activities.
- The environmental benefits of positive environmental performance.
- The various roles and responsibilities in achieving compliance with the environmental policy and procedures, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures.
- Health and safety awareness.

A record of the environmental awareness training programme must be kept by the ECO and RE.

3.5 Emergency Preparedness and Reporting

The Contractor must compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts. The RE should be familiar with these procedures and be responsible for the co-ordination thereof should there be multiple Contractors on site simultaneously.

Emergencies are defined as serious cases of the following incidents, which cannot be dealt with according to the standard specifications contained in Sections 4 - 8, and include:

- Accidental discharges to water and land.
- Accidents involving members of the public.
- Accidental exposure of employees to hazardous substances.
- Accidental veld fires.
- Accidental spillage of hazardous substances.
- Natural disasters (e.g., flooding).

These plans should include:

- Emergency organisation (manpower) and responsibilities, accountability, and liability.
- A list of key personnel.
- Details of emergency services applicable to the area (e.g., the fire department, ambulance services, spill clean-up services, etc.).
- Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- Actions to be taken in the event of different types of emergencies.

- ❑ Incident recording, progress reporting and remediation measures required to be implemented.
- ❑ Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- ❑ Training plans, testing exercises and schedules for effectiveness.

In compiling the emergency plans, the Contractor shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), the National Environmental Management Act, 1998 (Act No. 107 of 1998), the National Water Act, 1998 (Act No. 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) as amended and/or any other relevant legislation.

3.6 Liaison with Stakeholders

Liaison with stakeholders is to be co-ordinated by the Project Engineer and the Contractor. This will include liaison with utility providers, neighbours, and relevant authorities. This may include on site notice boards. Complaints or queries received from stakeholders and actions taken to address complaints must be addressed in writing (with copies forwarded to the Environmental Manager and ECO).

3.7 Review and Updating of the EMPr

The EMPr is a living document and should be reviewed and updated in response to new or changing technical information, environmental conditions, legislation and policy, and environmental best practice. Substantial changes must be approved by DFFE.

Sections 4 to 8 contain the environmental specifications required for each of the stages, viz. design, pre-construction, construction, rehabilitation, and operation. These sections are deliberately repetitive, as in many cases, an environmental aspect requires attention at more than one stage of the project cycle.

4 DESIGN PHASE

The Project Engineer is responsible for undertaking these aspects and must obtain input and assistance, where appropriate, from the Environmental Manager and ECO.

4.1 Environmental Authorisation (EA) and EMPr

- ❑ The Developer must ensure that the conditions of the EMPr, EA and any other relevant licenses/permits are brought to the attention of the Project Engineer and Contractor (as well as any appointed sub-contractors).
- ❑ The Developer must provide the Contractor with a copy of the EA and EMPr.
- ❑ The EA and EMPr must be made binding to the main Contractor as well as sub-contractors.
- ❑ The Contractor must ensure that the construction crew are aware of the requirements set out in the EA and EMPr for this development prior to commencing activities on site.

4.2 Appointment of ECO

- ❑ The Developer must appoint an independent external Environmental Control Officer (ECO) who must monitor the Contractor's compliance with the EA and EMPr.
- ❑ The ECO must attend all relevant project meetings and provision must be made at the monthly site meetings for environmental issues.

4.3 Erosion Control and drainage considerations

- ❑ Technical design and planned construction methods must build in measures to prevent soil erosion and scouring associated with the construction of all infrastructure.
- ❑ In determining the location of the stockpile areas, areas of high erosion potential must be avoided.
- ❑ The design must allow for the ground conditions encountered, including adequate allowance for settlement of embankments and drainage layers.
- ❑ Technical design and planned construction methods must build in measures to avoid soil compaction associated with the construction of all infrastructure.
- ❑ Drainage systems must be kept as natural as possible.
- ❑ Runoff must not be canalised or concentrated in areas where sheet flow may occur, or where highly erodible soils occur.
- ❑ Excavation of soils must be selective to ensure that the topsoil is placed back on top.
- ❑ Shoring must occur where excavations take place in loose sand and pose a safety risk for workers (shoring will be at the discretion of the Contractor following consultations with the RE).

Refer to Section 6.8 for further detail regarding erosion control and drainage considerations. It must be noted however, that little to no erosion is expected on site due to the topography and sandy soil profile.

4.4 Storm water management

- ❑ The design of storm water management measures must be undertaken in close collaboration with the Environmental Manager.
- ❑ Storm water must be kept separate from any sewage effluent system.

- Licences from the Department of Human Settlements, Water and Sanitation (DHSWS) are required for all activities that may alter the bed or banks of a watercourse.

Refer to Section 6.2 for further detail regarding storm water control. It must be noted however, that little to storm water is expected on site due to the fact that excavations are limited to the beach, primary dune cordon and road reserves on route to the CLS site and the sandy soil profiles of the area.

4.5 Stockpile areas

- Where possible, stockpile areas must be identified and approved by the Project Engineer and ECO during the design phase.
- Environmentally sensitive and no-go areas must be avoided.
- As far as possible, existing roads must be used to access stockpile areas.
- 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.

Refer to Section 6.6 for further detail regarding stockpiling.

4.6 Spoil Areas

- The Contractor must dispose of excess excavation material and construction rubble at a licensed waste disposal site.
- Spoil areas must not negatively affect surface drainage and must not alter the topography to the extent that they become visually intrusive.
- Spoil areas must be re-vegetated and rehabilitated after construction.

Refer to Section 6.6 for further detail regarding spoil.

4.7 Construction Site

4.7.1 Construction Site Layout Plan

- For land-based operations a construction site layout plan must be compiled during the design phase by the Project Engineer, with assistance from the Environmental Manager. The plan should show the positions and extent of the known temporary site structures and infrastructure as listed below (as applicable).

Additional items and amendments to this plan must be made during the pre-construction phase.

- Site access (including entry and exit points).
- Roads and haul/access routes.
- Security requirements (including temporary and permanent fencing, and lighting) and accommodation areas for security staff.
- Gates and fences.
- Sanitation (including the treatment/removal of sewage).
- Construction materials storage areas including the storage of fuels.
- Vehicle and equipment storage areas.
- Wash bays.
- Storm water control measures.
- Excavations and trenches.

- Stockpile/laydown areas.
 - Waste management including waste storage and disposal sites.
 - Areas where vegetation will need to be cleared (if required).
 - Features and plants to be conserved (specifically the coastal dune cordon directly north of the proposed landing site).
- Prior to construction commencing the construction site layout plan must be approved by eThekweni.
- All land-based services and infrastructure (surface and buried) and associated wayleaves that may be affected by the terrestrial portion of the cable, must be identified, and communicated to relevant parties so they can be appropriately avoided/ managed to prevent damage and disruption.
- Beach users should be forewarned of cable laying activities and schedules through on-site signage and other communication via the Amanzimtoti beach office, as relevant.
- For the marine based operations, the following mitigation measures are proposed:
- Plan routing of proposed cable to as far as practicably possible avoid sensitive benthic habitats in the deep water, coastal and nearshore zone.
 - WIOCC to implement the recommendations of the ICPC to ensure safety of other cables on the East Coast of South Africa.
 - WIOCC to engage directly with offshore concession holders to notify them of the proposed development and to draw up a Co-operation Agreement (if required) which outlines the rights, obligations and roles and responsibilities of both parties in terms of the installation and operation of subsea infrastructure.
 - Divers to limit the working area to as narrow a corridor as possible during burial, attachment of articulated split pipe and pinning of the cable.
 - If cable requires re-alignment over the hard substrata by divers, the cable should be lifted to minimise damage to macro-benthic biota (gorgonians etc.).
 - Bury cable in areas of soft sediment.
 - Undertake the work on a calm sea day.
 - Ensure cable protection in the nearshore by burial or armoured casing where possible.
 - Pinning of the cable to outcropping rock in the shallow water environment should it be required to prevent movement and limit abrasion of the cable.
 - Align routing of cable as closely as possible to the routes of existing or de-commissioned cables, thereby avoiding the impact of as yet undisturbed ecosystem types.
- For the land based operations, the following measures must be undertaken by the appointed contractor with regards to the crossing of High Voltage (HV) electricity services:
- Before any construction work takes place, you are to contact the Senior Manager for HV Cables, Mr Papayya on 031 322 1097 or PapayyaD@elec.durban.gov.za to arrange a representative.
 - All cable crossings shall be as close to 90 degrees as possible and a minimum vertical clearance of 1,500 mm from ground level. A horizontal clearance of 2,000 mm on either side of the HV cable to be maintained, at all times during construction activity.
 - Services must be encased in a duct.
 - Depth from ground level should be 2,500 mm to 3,000 mm (to be confirmed by HV Cables representative on site).
 - Road ground levels shall not be changed to avoid breaking of safety clearance.
 - Servitude or wayleave agreements must have been secured by the applicant from the relevant authorities for the installation of the proposed infrastructure.

4.7.2 Construction Camps & site office (potential accommodation)

Given the limited construction footprint and short construction period it is unlikely that a construction camp or site office will be required. In the event that a construction camp is required the positioning of the construction camp or site office must be agreed on with eThekweni.

4.8 Access Roads

- ❑ The design phase must make provision for the utilisation of existing roads in the area to access the site.
- ❑ The design phase must make provision for the establishment of required temporary access roads within the boundaries of construction site.
- ❑ The final design must detail all access roads outside the construction site.

4.9 Aesthetics

- ❑ During design, the overall aesthetics of the project must be considered, with a view to minimising any potential negative impacts and/or to improve the visual aesthetics of the local environment.
- ❑ Project infrastructure should be designed to blend with the local environment.

4.10 Disturbance to Landowners and Service Providers

- ❑ The Project/Resident Engineer must ensure that the necessary liaison with landowners, land users, service providers and other affected parties has taken place prior to construction and where required, the relevant consent obtained.
- ❑ Design must include mitigation measures to ensure construction noise levels are within permitted levels.
- ❑ Sufficient notice to the local community, including neighbouring landowners and/or tenants, must be provided by the Project Engineer in consultation with the Environmental Manager and ECO, before construction commences. Information regarding the expected types of construction activities must be supplied.

Refer to Section 6.10 for further detail regarding disturbances.

4.11 Dust and noise management

- ❑ Appropriate dust control management practices and procedures must be defined during the design phase to ensure the effective suppression of dust during all activities.
- ❑ The design must include appropriate mitigation measures to ensure noise levels are within their lawfully acceptable limits, according to the Environment Conservation Act, 1989 (Act No. 73 of 1989) and the local by-laws.
- ❑ If required during dry conditions control measures must be applied, such as the operation of a water sprayer truck/tank using non-portable water to assist in settling the dust.

4.12 Safety and Security

- ❑ During the site induction programme, emphasise the prohibition of 2AFRICA/GERA (East) Cable System staff accessing/trespassing onto private property.
- ❑ Develop a communication channel with the local South African Police Services so that potential situations and/or issues can be dealt with formally.
- ❑ Make use of a private security company/ies during all phases of the project.
- ❑ Notify surrounding community forums of the proposed construction programme prior to construction commencing.

5 PRE-CONSTRUCTION PHASE

The pre-construction phase refers to the period following final project planning and the tender phase, leading up to, but not including the establishment on site by the appointed Contractor. These items may be the responsibility of the Contractor or the Project Engineer. Input and assistance may be obtained, where necessary, from the Environmental Manager and ECO.

5.1 Construction Site Layout, design and construction schedule

- The Contractor is to adhere to the following, in terms of site layout and design:
 - Limit the size of the site to a minimum.
 - Provide suitable drainage to prevent soil erosion from stormwater runoff.
 - Locate materials and soil stockpile areas, fuels, and chemical storage areas away from environmentally sensitive areas and protected from stormwater runoff, fire and access by unauthorised persons.
 - Locate and clearly indicate convenient access routes, temporary loading and parking areas and turning circles so that vehicle movement can be confined to these areas.
 - Locate chemical toilets so that they are easily accessible by staff and for servicing.
 - Locate temporary waste bins and skips so that they are easily accessible for emptying and removal.
 - Design layout to control and reduce noise from source.
 - Position components and equipment to limit visual intrusion.
- Prior to construction the Project/Resident Engineer must draw up a construction schedule for all phases of construction.
- 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 several other factors such as major sporting events, peak whale seasons and other scheduling factors affecting the project.
- The Project/Resident Engineer is to provide a programme of project activities and time schedules to the ECO, who is also to be made aware of any amendments to the construction programme or alteration to the scope of work, so that their impacts on the environment can be assessed prior to construction.
- eThekweni must be duly informed once work has commenced on site.
- WIOCC to communicate timeously⁶ with sporting events organisers and hosting venues (e.g. ski boat clubs) at Amanzimtoti for scheduling and co-ordination purposes.
- To eliminate interactions with future Oil and Gas activities on cable system infrastructure and operations, the landing partner must undertake the following:
 - 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

5.2 Construction Preparation

- The ECO must take detailed, colour photographs of the site before any clearing may commence.

⁶ International events are likely scheduled a year or more in advance.

- ❑ The Contractor must ensure that he/she is familiar with the mitigation measures prior to construction commencing:
- ❑ Sanitation arrangements must be to the satisfaction of the Environmental Manager, the ECO, and the local authorities, and be compliant with all applicable legal requirements.
- ❑ The Contractor must ensure that the Project Engineer and Environmental Manager are given timely notice of the intention to commence construction.

5.3 Acquisition of Permits and Licenses

Applicable permits and licences must be obtained prior to construction.

5.4 Appointment of local labour and small and medium sized enterprises (SME's)

- ❑ Where recruitment is necessary, there must be a "local first" recruitment policy, as far as possible, to maximise employment opportunities for the local communities, taking account of the local skills base and the existing legislation and policies on professional procurement.
- ❑ Where possible, preference should be given to labour intensive practises to encourage job creation.
- ❑ The overall environmental management approach must include provision for the use of local contractors, and priority must be given to the sub-contracting to local SMEs.
- ❑ Ensure recruitment measures are aimed particularly at construction workers classified as designated employees in terms of the Employment Equity Act (black people, as defined in the Act, women, and disabled people).
- ❑ The Contractor's procurement process is bound by the contract agreement with the Employer and must be in accordance with applicable procurement norms and standards.
- ❑ The Contractor is encouraged to make use of emerging contractors from formerly disadvantaged communities, as sub-contractors or by the formation of joint ventures.

5.5 Demarcation of sensitive areas

- ❑ Environmentally sensitive areas (assessed as discussed below) must be suitably demarcated and cordoned off prior to construction activities commencing.

BEACH AND COASTAL DUNE

- ❑ A preconstruction photographic survey should be undertaken of the route in order to identify the topography of the shoreline, dune cordon, and inland areas along the cable alignment in order to allow for the reinstatement of these systems to mimic the present morphology, once the cable has been laid.

FAUNA AND FLORA

- ❑ A pre-construction inspection of the site must take place by the ECO to ensure that animals nesting, sheltering, or roosting in vegetation or on the beach, or within close proximity to the construction footprint will not be compromised.

HERITAGE RESOURCES

- ❑ Any geophysical data generated to support the installation of the cable system must be archaeologically reviewed for the presence of historical shipwrecks or related material.
- ❑ 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 archaeological material, be accidentally encountered during cable installation, 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.

5.6 Notification of affected parties

- ❑ All land-based services and infrastructure (surface and buried) and associated wayleaves that may be affected by the terrestrial portion of the cable, must be identified and communicated to relevant parties so they can be appropriately avoided/ managed to prevent damage and disruption.
- ❑ Beach users should be forewarned of cable laying activities and schedules through on-site signage and other communication via the Amanzimtoti beach office, as relevant.
- ❑ The Amanzimtoti Beach Office and KZN Sharks Board must be notified prior to the cable landing so that shark nets and any other potentially affected beach infrastructure (e.g. lifeguards' platforms) can be temporarily moved and/or appropriately managed.

5.7 Environmental Awareness Training

Environmental awareness is a requirement for all construction crews. This not only ensures the safety of the personnel, but also helps to protect the integrity of the environment during construction. If the ECO deems the environmental awareness training course necessary, the ECO must arrange that all Contractors' employees attend to familiarise themselves with requirements of the EA and EMPr. The training course should enable the employees to acquire a basic understanding of the environment, the EMPr, EA and specific environmental features pertaining to the Work Site.

6 CONSTRUCTION PHASE

The construction phase refers to the period of the project during which the actual works are carried out, deemed to include site establishment and site works. When carrying out the works during the construction phase, the environmental objective is to minimise the footprint of damage, disturbance and/or nuisance (to the social and biophysical environment), to responsibly manage use of water resources and to prevent pollution. Unless otherwise specified, it is the responsibility of the Contractor to comply with that described hereunder.

6.1 Site Establishment

When establishing the site, the environmental objective is to minimise the footprint of disturbance and to minimise the extent of soil erosion and compaction, loss of vegetation and the potential for pollution of soils and water resources.

No construction activities with the 'potential to affect the general public's enjoyment of the coast should be scheduled to take place during peak seasons. Every effort must be made to avoid landing the 2AFRICA/GERA (East) Cable System during the peak tourism periods such as the Christmas Period, School Holidays, and the Easter Long Weekend.

The site must be established in accordance with the approved construction site layout plan, prior to the commencement of construction. Any relaxation or modification of the construction site layout plan must be approved by the Project Engineer, ECO, and eThekwini.

6.1.1 Demarcation of the Site

The extent of the construction site, including working areas, must be clearly demarcated and no movement or work outside these areas is permitted.

- ❑ If the construction footprint and construction activities block a regularly used public access route/s, then suitable alternative/s public access route/s must be identified and demarcated accordingly. If no suitable alternative can be found, then a safe controlled 2-way traffic scheme should be set up. The size of the construction footprint must be kept to a minimum by constructing suitable boundaries to avoid infringement of the development on the natural habitat.
- ❑ Cordon off work areas that pose a risk to the public and ensure that alternative access to the beach is provided.
- ❑ All construction activities must remain within the boundaries of the demarcated areas.

The Contractor must:

- ❑ Identify and demarcate the extent of the construction site as indicated on the approved construction site layout plan using a method as approved by eThekwini building regulations.
- ❑ Minimise the extent of the construction site footprint as much as possible.
- ❑ Ensure that material stockpiles are fenced and has controlled security access.
- ❑ Identify and demarcate sensitive sites in collaboration with the ECO. This may require perimeter fencing or steel droppers with barrier tape.
- ❑ Maintain site demarcations in position until the cessation of construction works and ensure that no personnel or construction materials move outside the designated site.
- ❑ Ensure that the site is not used for any purpose other than for the carrying out of construction activities.

- ❑ Ensure that no natural features are painted or permanently marked. Marking for surveying and other purposes must be done using pegs, beacons or rope and droppers.
- ❑ Inform eThekweni once work has commenced on site.

6.1.2 Protection of Sensitive Habitats

- ❑ The removal of indigenous vegetation must be kept to a minimum by minimising the construction footprint and by confining areas for structures, services, stockpiling, etc. to existing disturbed areas or areas within the construction site.
- ❑ As far as possible, indigenous plants or natural features should not be disturbed, destroyed, or removed. Should the ECO confirm that clearing of indigenous vegetation is unavoidable, plant material must be transplanted where practical and possible.
- ❑ Vehicle and pedestrian traffic outside the construction area by construction personnel must be avoided.
- ❑ The coastal dune cordon directly north and south of the proposed landing site must be treated as a No-go Area and no works or construction personnel may enter this area.
- ❑ The pegged-out route of the preferred fronthaul alignment should avoid all areas of the Coastal Thicket Habitat Unit (HU), of which large portions fall within Durban Metropolitan Open Space System (D'MOSS) and Critical Biodiversity Area (CBA): Irreplaceable units. The Degraded Land HU should be the preferred construction area.
- ❑ If the final pegged out route encroaches into area of D'MOSS and CBA: Irreplaceable planning units, written permission to do so must be obtained from eThekweni Environmental Planning and Climate Protection Department (EPCPD). An offset for species disturbed, as described below, is proposed if this will occur.
 - If any indigenous woody tree species within this unit are cut down to provide space for constructure, an offset ratio of 1:3 must be implemented for every species felled.
 - Three (3) specimens of the species felled must be planted within an area zoned as open space in the study area. The positioning of the species is to be discussed with EPCPD and Ezemvelo KwaZulu-Natal Wildlife (EKZNW).
- ❑ No threatened or protected species should be disturbed, cut or felled. If this is completely unavoidable, the relevant permits must be obtained from the relevant CA prior to construction. The same offset ratio as described above is recommended if the protected species are to be felled. It is unlikely that translocation of the mature woody species will be possible.
- ❑ The construction footprint should be confined to the preferred fronthaul alignment trench and the preferred BMH Alternative 3. Sediment netting should be erected around each construction area to avoid unnecessary disturbance of the surrounding terrestrial environment.
- ❑ The areas of disturbance which contain natural groundcover should be backfilled, tilled and revegetated with a mixture of indigenous grass species to improve soil cohesion and reinstate groundcover. Species recommend for planting include: *Oplismenus hirtellus*, *Asystasia gangetica* and *Cynodon dactylon*.
- ❑ A pre-construction walkthrough of the pegged out proposed development footprint should be conducted by a suitably qualified botanist with experience in the region.
- ❑ All Species of Conservation Concern (SCC) and/or Threatened or Protected Species (TOPS) identified within the footprint must be marked and Ordinary TOPS permits obtained where disturbance of these species will occur. If deemed feasible, the SCC and TOPS to be disturbed should be translocated to suitable habitat outside of the disturbance footprint.

6.1.2.1 Protection of Watercourses and Drainage Lines

- ❑ The Contractor must not cause any physical damage to any aspect of a watercourse (either on or off site), other than that necessary to complete the works as specified and in accordance with the accepted method statement.

- ❑ The Contractor must repair the existing drainage systems and augment these where applicable with additional drainage or increased capacity to accommodate normal, as well as flood conditions.
- ❑ The Contractor must ensure that uncovered soil and stockpiles are not eroded, and material washed away.
- ❑ The Contractor must not alter the flow of water, i.e., it may not be stopped, disconnected, diverted, ponded, or caused to become stagnant.

6.1.2.2 *Protection of Fauna and Flora*

- ❑ Wild animals must not be fed, handled, removed, hunted, snared, captured, injured, or killed or otherwise interfered with. The penalty clause associated with the needless destruction of wildlife is a fine and/or imprisonment⁷.
- ❑ The Contractor must ensure that the construction area is kept clean, tidy, and free of litter/rubbish that would attract animal pests.
- ❑ The Contractor must not use any pesticides on site.
- ❑ Where construction works pose a safety risk to animals, the Contractor must ensure that they are adequately cordoned off.
- ❑ Construction work must be confined to the construction sites and interference with indigenous plant and animal species must be avoided.
- ❑ Indigenous species should be retained, where possible. Where retention of indigenous species is not possible, the areas should be rehabilitated back to natural vegetation.
- ❑ All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962).
- ❑ If a particular animal species is perceived to become a pest or hazard, the Contractor may apply to the Project/Resident Engineer and ECO for a mitigation programme to be established.
- ❑ Any beach infrastructure that may be disturbed by the construction of facilities on land and by the installation of the cable, must be protected, or replaced at the cost of the applicant, should they get damaged due to implementation of the proposed project activities or negligence by the applicant.
- ❑ Should any municipal infrastructure be damaged due to construction work on site, the applicant/contractor will be responsible for the rehabilitation of such infrastructure (i.e., grass, paving etc.) to the satisfaction of eThekweni.

6.1.3 *Protection of Cultural Heritage Resources*

Onshore

- ❑ Should any archaeological sites or material be accidentally encountered during the course of installing the cable, work must immediately cease in that area, the area must be cordoned off and the material made safe but left in situ, a suitably qualified archaeologist must be called to site to assess the significance of the find and Amafa must be notified of the find.
- ❑ In the event of human remains being uncovered during work, all activities in the vicinity must cease and the site made secure until a suitably qualified archaeologist and Amafa have been notified, the significance of the material has been assessed and a decision has been taken as to how to deal with it.

Offshore

- ❑ In respect of palaeontology, there is a very small chance that fossils may occur in the Umkwelane Formation aeolianites. A Chance Find Protocol has been included in the EMPr

⁷ In terms of the Animals Protection Act, 1962 (Act 71 of 1962) Section 2.

- (Refer to Annexure 3). If fossils are found once trenching has commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample.
- Should any possible archaeological or palaeontological 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 accidentally disturbed must be recorded, and their contextual information (a report) must be lodged with a SAHRA-approved institution.
 - In respect of shipwrecks and maritime archaeology, the following is recommended:
 - The potentially anthropogenic seabed anomalies (SSS contacts E3-A-S005 and associated linear contact, E3-G-S0213, E3-G-S214, E3-G-S210 and E3-G-S219 and magnetic anomalies E3-G-M001 - E3-G-M005) are avoided during cable installation.
 - Any further geophysical data generated to support to installation of the cable system must 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.
 - Any shipwreck-related material recovered from the seabed during the pre-lay grapnel runs must be retained, kept wet, and the maritime archaeological must be notified of the find.
 - 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.
 - The Griqualand is classified as a dangerous wreck and should be avoided.
 - 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 shall be archaeologically reviewed for the presence of historical shipwrecks or related material. If possible, the project archaeologist should be consulted before data is collected to ensure that the survey specifications and data outputs are suitable for archaeological review.
 - Any shipwreck-related material recovered from the seabed during the pre-lay grapnel runs must be retained, kept wet, and the maritime archaeologist must be notified of the find.
 - 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 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.

6.1.4 Protection of Beach and Coastal Dune Environment

- Obtain a vehicle access permit from DFFE -OC prior driving in the coastal zone.
- While shore bird breeding is not anticipated to be an issue, due to the transformed nature of the dunes at the landing site, the ECO must check the affected area on the shoreline for nests of birds, prior to installation. If found, nests must be 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.
- All construction activities in the coastal zone must be managed according to this EMP.
- Ensure that contracted construction personnel are aware of, and adhere to, the requirements of the EMP.

- ❑ Keep heavy vehicle traffic associated with construction in the coastal zone to a minimum.
- ❑ Restrict vehicles to clearly demarcated access routes and construction areas only. These should be selected under guidance of eThekweni.
- ❑ 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 refuelling 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 intertidal sediments should be left above the high-water mark, and any substantial sediment accumulations below the high-water mark should be levelled.
- ❑ If machinery is utilised, such as an excavator, stringent management measures must be implemented to prevent negative impacts on the coastal environment. Access to the beach may prove difficult where sizable plant machinery is utilised. The Environmental Control Officer should address and oversee such matters. Following establishment of the trench, the excavated material must be laid in a similar order to the previous state.
- ❑ An alternative pedestrian walkway should be established during the laying of the cable and restoration stage of the project. In addition, the dune cordon should be fenced off to prevent use by the public for beach access.
- ❑ The cable should be buried within the beach to a depth approximating ~1m below the deflated beach state (cable burial target of 2 m). Where possible, and within the intertidal and supratidal environment, consider laying the cable at or around the depth of the shelly layer or “transitional point” within the beach sediments that is marked by increased deposition of shell and related debris, or a change in grain size.
- ❑ Although the use of HDD is proposed to avoid disturbance of vegetation, where disturbance of the vegetated dune does arise, the affected area should be raked back to an angle of repose ~ 27°, stabilised using a geofabric and suitably planted with appropriate vegetation (ideally the same dune species that are currently present on the dune cordon).
- ❑ No Tracked Mobile Machines (e.g. tracked bulldozer/tractor loader backhoe (TLB)) or Trackless Mobile Vehicles may be permitted to disturb the vegetated portion of the dune cordon.
- ❑ Excavation of the preferred BMH must remain within the existing disturbed carpark footprint.
- ❑ Sediment netting should be erected around the construction footprint of the preferred BMH to avoid movement of soils into adjacent areas by coastal aeolian processes.

6.1.5 Topsoil Conservation

For all excavations inland from the primary dune cordon the following conditions must be abided by to protect topsoil on site:

- ❑ Ahead of all construction, the topsoil layer must be stripped from all areas to be cleared, excavated, compacted, or otherwise disturbed.
- ❑ In the absence of a recognisable topsoil layer, the upper most 300 mm of soil must be stripped.
- ❑ The topsoil must be stockpiled separately from overburden material (subsoil and rocky material).

- ❑ Construction works must be co-ordinated to limit unnecessarily prolonged exposure of stripped areas and stockpiles.
- ❑ Vegetation and soil must be retained in position for as long as possible, removing it immediately ahead of construction/earthworks in that area.
- ❑ Herbaceous vegetation, along with overlying grass and other fine organic matter must be stripped and stockpiled.
- ❑ The stockpile height of topsoil must not exceed 1 m unless approved by the ECO.
- ❑ The stripped topsoil must be stored in an approved location and in an approved manner for later reuse in the rehabilitation process.

6.2 Site Infrastructure

6.2.1 Structures

- ❑ A security hut may be provided at the construction site. Only security personnel may be housed on the construction site. Accommodation for other construction staff must be in suitable venues off site.

6.2.2 Services

6.2.2.1 Water

- ❑ Water if required for construction must be sourced from a municipal supply point as agreed with eThekweni. No water may be abstracted from natural water bodies.
- ❑ Water for drinking will be sourced from a municipal supply and bought to site in containers.

6.2.2.2 Sanitation and Ablution Facilities

- ❑ The Contractor's intended methods for waste management and waste minimisation must be implemented at the outset of the contract and approved by the Project Engineer and eThekweni.
- ❑ Adequate sanitation facilities⁵ must be provided and maintained for construction workers and security personnel on site.
- ❑ Sanitation facilities must be in the form of portable serviced toilets.
- ❑ Separate sanitation facilities must be provided for male and female workers.
- ❑ Outside toilets must be provided with locks and doors and adequately secured to prevent them from blowing over.
- ❑ All sanitation and ablation facilities must be suitably screened from surrounding properties and the general public.
- ❑ The facilities must be placed outside areas susceptible to flooding.
- ❑ All wastewater and grey water must be disposed of at an approved wastewater treatment works and records of disposal are to be supplied to the ECO.

6.2.3 Construction Camp, Lay-Down Areas and Material Storage Yards

- ❑ The construction camp will (as applicable) house material stockpiles, fuels, storage facilities and a security hut.
- ❑ The construction camp (if applicable) may not be located within the Coastal Public Property.
- ❑ No construction workers may be accommodated at the construction camp.

⁵ Chemical toilets and hand washing facilities.

- ❑ All storage areas and material laydown sites must be located within predetermined zones as per the approved construction site layout plan.
- ❑ Additional areas required by the Contractor for laydown and storage must be approved by eThekweni with input from the Project Engineer and ECO, in the form of an amended construction site layout plan indicating the extent and anticipated utilisation of the storage and laydown areas.
- ❑ The construction camp and laydown areas must be kept secure and neat at all times with appropriate access control measures employed during construction.
- ❑ Security lighting must be positioned so that it does not pose a nuisance to neighbouring properties or a danger to road users.

6.2.4 Storm Water Control

Although unlikely to occur on site given the existing storm water infrastructure inland of the beach the following should be considered with regards to storm water control:

- ❑ Appropriate drainage measures must be taken to ensure that excessive run-off, and as a result, soil erosion, does not occur on the construction site.
- ❑ Storm water diversions must be constructed to direct run-off safely and appropriately away from the site.

6.2.5 Roads and Access

- ❑ The design phase must make provision for the utilisation of existing roads in the area (as far as possible).
- ❑ Any clearing for access, both within, and where necessary, outside the construction site may only be undertaken once the necessary landowner permission has been obtained.
- ❑ All drivers must be polite and considerate to fellow road users and allow right of way when appropriate.
- ❑ All vehicles including 2AFRICA/GERA (East) Cable System contractors and sub-contractors must be in a road worthy condition and have valid licenses.
- ❑ All drivers must have relevant vehicle usage licenses.
- ❑ Soil compaction should be minimized by keeping vehicle and construction plant access ways and parking areas to a minimum and making use of existing compacted/hardened surfaces wherever possible.
- ❑ Roads must be capable of accommodating the type of vehicles and/or mechanical plant that contractors plan to use on site.
- ❑ 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.
- ❑ Enforce a disciplinary code/measure for 2AFRICA/GERA (East) Cable System drivers who do not comply with safe road/driving regulations.
- ❑ Safe pedestrian access and crossing must be provided where necessary.
- ❑ Damage to public or private roads or driveways caused by the Contractor during the construction phase must be repaired immediately to the same or a better state.
- ❑ Only those vehicles and drivers permitted to access the beach as per the ORV permit can drive on the beach.
- ❑ Access to the beach is only allowed from the access point authorised in the ORV permit.

6.3 Health and Safety

- ❑ A health and safety file must be kept on site and all incidents are to be recorded and reported to the designated safety officer by the contractor.
- ❑ Include an HIV/AIDS and Covid-19 awareness component in the induction programme of all construction workers coming onto site.
- ❑ The Contractor is bound by the Regulations as included in the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- ❑ Other specifications should be outlined in a Health and Safety Plan commissioned by the Developer.

6.4 Implements and Equipment

- ❑ Mobile plant and equipment appropriate to the task must be utilised to minimise the impact on and extent of damage to the environment.
- ❑ Should the ECO at any time determine that the method, mobile plant, or equipment utilised by the Contractor is unsuitable for the task at hand, or unnecessarily detrimental to the environment, then he/she must specify the use of a suitable alternative.
- ❑ No mobile plant is permitted to be refuelled on the beach.

6.5 Site Management

6.5.1 Marine Environment

- ❑ The fishing industry and key stakeholders must be notified prior to the commencement of cable installation. These include DFFE, the SA Fishing Industry Association, the South African Navy Hydrographic Office (SAN Hydrographer), South African Maritime Safety Authority (SAMSA) and Ports Authorities. For the duration of the installations phase of the operation, a navigational warning should be broadcast to all vessels via Navigational Telex (Navtext). Once installed, the as laid cable co-ordinates must be accurately charted and supplied the SAN Hydrographer.
- ❑ 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.
- ❑ Cable route must be recorded and accurately charted. The as installed cable route must then be provided to the SAN Hydrographer.
- ❑ Follow the cable route plan as accurately as possible during landing of the cable at the BMH to prevent lateral drag across the seafloor.
- ❑ Waste generation on board the cable laying vessel must be minimised, and the disposing/treating of non-recyclable wastes must be done in an environmentally sound manner (The International Convention for the Prevention of Pollution from Ships (MARPOL) prohibits the disposal to sea of any plastics whilst restricting the discharge of other non-hazardous waste in coastal waters).
- ❑ Hazardous waste and debris recovered from the seabed during pre-lay clearing activities should be stored on board the vessel until it can be disposed at a suitably equipped port.
- ❑ Discharge of sewage and bilge waters must be managed in accordance with applicable MARPOL requirements.
- ❑ Ensure the cable laying vessel is well-maintained to minimize noise production from engines.
- ❑ Switching off non-essential sonar systems, and cautious use of multi-beam echosounders.
- ❑ 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).

- ❑ Cable laying should be scheduled to take place outside of the main migration seasons for whales (June – November) where possible.
- ❑ 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.
- ❑ Lighting on board STC project vessels should be kept to a minimum to reduce the risk of attracting and disorientating seabirds.
- ❑ It is recommended that the cable laying vessel keep records of any mortality of seabirds and that this effect be evaluated to determine its' significance. It is extremely unlikely that shore birds will be exposed to any risk of incidental mortality.
- ❑ It is recommended that the cable alignment avoids all Important Bird Areas and other important onshore areas.

The following mitigation measures are recommended during cable laying operations through contaminated sediments adjacent to the African Explosives and Chemical Industries (AECI) pipeline in the shallow water environment:

- ❑ Minimise disturbance of sediments during installation as far as practically possible (e.g. do not use water jetting during burial).
- ❑ Limit cable burial to periods of good sea conditions with minimal longshore currents (as far as practically possible).
- ❑ Cease burial during periods of strong current, rough sea conditions or development of a large (>1km) visible plume.
- ❑ Monitor the plumes during cable burial to ascertain the spatial extent with the aim to limit the plume to less than 1 km of the cable alignment.

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 μ Pa 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 behaviour 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) where possible.
- ❑ Ensure that passive acoustic monitoring (PAM) is incorporated into any surveying taking place at night or between June and November.
- ❑ A suitably trained crew member must be appointed as a MMO and PAM operator to ensure compliance with mitigation measures during seismic geophysical surveying.

6.5.2 Terrestrial Environment

- ❑ Suitable, sufficient, and conveniently located sanitation facilities must be provided as per the approved construction site layout plan.
- ❑ The Contractor is entirely responsible for enforcing their use and for maintaining all toilets in a clean, orderly, and sanitary condition to the satisfaction of the ECO.
- ❑ Sewage must be disposed at a licensed wastewater treatment site and may under no circumstances be dumped or buried.
- ❑ The Contractor must ensure that personnel make use of the litter bins provided and that the construction site and the construction camp are kept tidy and litter free at all times.
- ❑ All domestic waste must be collected in litter bins.
- ❑ Litter bins must be equipped with a closing mechanism to prevent their contents from blowing out and scavengers from getting in.
- ❑ Litter bins must be emptied weekly (or as required before they reach capacity).
- ❑ Domestic waste must be taken to the nearest municipal landfill site. Waste must be transported responsibly, avoiding waste spills *en-route*.
- ❑ Where necessary, a storage area must be dedicated on site for the collection of construction waste.
- ❑ No solid waste may be burned or buried on site or disposed by any other method.
- ❑ Where feasible, wastepaper, glass and metal waste must be collected separately and arranged for collection by recycling Contractors.
- ❑ No burning of waste is permitted.
- ❑ Dewatering of the trench shall be facilitated with the help of a diesel pump if required, and the management of the pump shall be in accordance with the mitigation measures to prevent oil spillages on the beach and in the sea water.
- ❑ The coastal dune cordon directly north and south of the proposed landing site must be treated as a No-go Area and no works or construction personnel may enter this area.

6.5.3 Hazardous Waste

- ❑ Ensure compliance with all national, regional and local legislation with regard to the storage, handling and disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. The onus is on the Contractor to identify and interpret the applicable legislation.
- ❑ The Contractor shall submit an Oil Spill Contingency Plan (relevant to management on land) prior to construction commencing for prior approval by the ECO.
- ❑ The ship operators shall be expected to have their own offshore Oil Spill Contingency Plans.
- ❑ Position hazardous substance stores as indicated on the approved construction site layout plan, in areas not threatening human life or the environment.
- ❑ Keep a record of all hazardous substances stored on site for submission to the ECO.
- ❑ A record must be kept of all spills and the corrective actions taken.
- ❑ Store all hazardous substances in secure, safe, and weatherproof facilities, underlain by a bunded concrete slab to protect against soil and water pollution.
- ❑ Provide for controlled loading/unloading areas, underlain by an impervious paving or Polymerizing Vinyl Chloride (PVC) sheet to protect against soil and water pollution.
- ❑ Ensure that personnel handling hazardous substances have been educated in terms of the correct handling, use and disposal thereof.
- ❑ Empty containers in which hazardous substances were kept are to be treated as hazardous waste.
- ❑ Bunded areas must have a capacity of 110% of the volume of the hazardous substances stored within the bund.
- ❑ Drip trays must be used where dispensing mechanisms or stored receptacles may leak.

- ❑ No servicing or the maintenance of vehicles and machinery may take place on site.
- ❑ All used filter materials should be stored in a secure bin for disposal off site. Hazardous waste shall not be stored or stockpiled in any area other than that designated on the construction-site layout.
- ❑ Regularly dispose of all hazardous waste not earmarked for reuse, recycling, or resale (such as oil contaminated with chlorinated hydrocarbons, bitumen, tar, electrical cleaning solvent, certain chemicals and fluorescent tubes) at a registered, DHSWS approved hazardous waste disposal site.

6.5.4 Pollution Control

- ❑ Special care during rainy periods must be taken to prevent the contents of sumps and drip trays from overflowing.
- ❑ Surrounding watercourses and stormwater drains must be protected from direct or indirect spillage of pollutants such as refuse, garbage, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials, etc.
- ❑ The Contractor must ensure that an emergency preparedness plan is in place for implementation in the case of a spill or substances that can be harmful to an individual or the receiving environment.
- ❑ The Contractor must ensure that accidental oil or fuel spills or leakages (other than those classed as emergency) are immediately contained and cleaned up.
- ❑ Oil or fuel spills must not be hosed into a storm water drain or sewer, or into the surrounding natural environment.
- ❑ No discharge of effluents or polluted water, including sediment-laden water from the dewatering of trenches (if carried out), should be allowed to drainage lines or stormwater drains.
- ❑ Small oil or fuel spills must be cleaned with an approved absorbent material, such as 'Drizit' or 'Spill-sorb'.
- ❑ Oil or fuel spills must be contained in water using an approved oil absorbent fibre.
- ❑ Soil contaminated by oil or fuel must be treated using one of the following approved methods, as per instruction of the ECO:
 - The soil to the depth of the contamination must be removed and disposed at a registered hazardous waste disposal site.
 - The soil to the depth of the contamination must be removed and regenerated using approved bio-remediation methods.
- ❑ Do not allow the use of any natural surface water body for swimming, bathing, or the cleaning of clothing, tools, or equipment.
- ❑ Vehicles may not be serviced or repaired on site (other than in emergencies).
- ❑ No washing of vehicles or plant make take place on site.
- ❑ Conduct regular visual assessments to identify any pollution issues within and downstream/down slope of work areas.
- ❑ The Contractor is liable for the costs of remedying damages resulting from pollution, in accordance with Section 28 of NEMA.

6.5.5 Air Quality

- ❑ Vehicles emitting black smoke and fumes must be repaired and maintained.
- ❑ Project vessels must operate in compliance with MARPOL regarding limits on SO² and NO_x emissions from ship exhausts, the prohibition of ozone depleting substances and the 4.5% limit on the sulphur content of fuel.
- ❑ The Project shall require that contractors operate only modern and well-maintained engines.
- ❑ Appropriate dust-suppression techniques must be employed on all exposed surfaces during periods of high wind. Potential methods include:

- Remove only limited vegetation to accommodate construction activities.
- Re-vegetate disturbed areas once all construction is completed.
- No burning of waste material shall be allowed anywhere on site or in the surrounding areas.

6.5.6 Noise Control

- Compliance with the legislation with respect to noise is mandatory.
- Noise suppression measures must be applied to all construction equipment.
- Construction equipment must be kept in good working order and, where appropriate, fitted with silencers.
- Community complaints with regard to noise generation must be responded to, taking reasonable action to ameliorate the impact.
- Establish operating time limits and conditions for construction purposes where possible. The recommended operating times are 06h00 to 17h00 on weekdays.
- No noisy work is permitted after working hours or at weekends and public holidays unless an agreement has been reached with the neighbouring residents prior to weekends or public holidays allowing the 2AFRICA/GERA (East) Cable System construction activities to occur during these times.
- Keep the location of stationary plant (generators and compressors) as far away from residential homesteads as possible.
- Use screening where feasible to reduce noise impacts.
- Use enclosures, screens, and barriers to reduce and contain some of the noise.
- Choose low noise construction equipment and/or methods.
- Modify construction equipment or construction methodology or programmes. This can entail operating a noisy activity whilst other less noisy activities also operate, thus, masking some of the noise.
- Businesses and residents adjacent to the areas where construction will be taking place should be informed two weeks prior to any construction activities taking place.
- Prior to any construction activity that may cause damage to private property, ensure that there is a photographic record of all areas that may be damaged.
- The complaints register based at the construction camps will function as a means for residents to register complaints regarding noise pollution. These complaints must be investigated and acted upon.

6.5.7 Fire Control

- Adequate precautions must be taken to ensure that fires are not started as a result of construction. The Contractor will be held liable for any damage to property adjoining the site as a result of any fire caused by one of his employees.
- The construction site must be equipped with adequate firefighting equipment⁹ (this includes at least one fire extinguisher of the appropriate type, irrespective of the site).
- Immediate steps must be taken to extinguish any fire, which may break out on the construction site.
- No open fires are permitted anywhere on site.
- Gas and liquid fuel must not be stored in the same storage area.
- Smoking must not be permitted within 5 m of any fuel or chemical storage area.

⁹ In terms of SABS 1200.

6.6 Earthworks

Although earthworks for the proposed development are limited primarily to the beach and trench to the CLS site the following conditions must be abided by on site and will also apply to any earthworks which could take place inland from the beach.

6.6.1 Excavations and Earthworks

- ❑ Excavation must be programmed to take place once the required materials are on site. This facilitates the immediate laying of services and/or construction of subsurface infrastructure and minimises open excavations.
- ❑ Earthworks should be carried out in accordance with SABS 1200.
- ❑ Signs or hazard tape must be placed in and around areas where excavations are in progress.
- ❑ Excavations and backfilling must be done on a progressive basis.
- ❑ Trenches or tunnels excavated in sandy colluvial and alluvial material may be inherently unstable and will need to be shored. If trenches need to be taken below groundwater seepage levels, shoring or lateral support will be required to prevent sidewall collapse. Extreme caution should be exercised in working in any unshored excavation and it is important that any trench deeper than 1.2 metres is shored prior to entering the excavation.
- ❑ Bulk (shaping) and fine (trimming) earthworks must be executed according to the design (aimed at the prevention of soil erosion, efficient storm water control, the eventual reestablishment of vegetation and ultimately achieving aesthetically acceptable landscapes).
- ❑ Mechanical diggers and all other machinery and vehicles that are to be used should be checked for oil and fuel leaks every day. 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.

6.6.2 Shaping and Trimming

- ❑ The Contractor must execute bulk (shaping) and fine (trimming) earthworks according to the design (aimed at the prevention of soil erosion, of efficient stormwater control, of the eventual reestablishment of vegetation and of ultimately achieving aesthetically acceptable landscapes).
- ❑ The shaping and trimming operations must be planned to allow for topsoil application: final trimmed levels must make provision for the specified depth of reapplied topsoil.
- ❑ Trimmed surfaces must be left slightly rough to facilitate topsoil binding for the natural establishment of vegetation.
- ❑ Where machine operations are not practicable, trimming must be carried out using hand tools.

6.6.3 Erosion control and protection

- ❑ Minimise clearance of vegetation; retain shrubs and grasses wherever possible.
- ❑ Do not allow surface water or storm water to be concentrated, or to flow down the cable servitude without erosion protection measures being in place.
- ❑ Protect all areas susceptible to erosion¹⁰ and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- ❑ Erosion problems must be repaired on a progressive basis throughout the contract.

10 This may include:

- Use of approved groundcover or grass.
- Construction of cut off berms (earth and/or rock pack) - these are to be angled across the contour and normally would approximate an angle of 30° from the bisector of the contour.
- Placing of brushwood on bare surface.
- Other technical methods as directed by the Engineer.

- ❑ Surfaces made bare should be grassed as soon as possible after construction to minimise time of exposure. Locally occurring, indigenous runner grasses should be used. Where runners cannot be locally sourced from natural areas within a 50 km radius, then a sterile variety of Couch Grass (*Cynodon dactylon*) can be commercially sourced and planted. Alien invasive grasses such as *Pennisetum clandestinum* (Kikuyu) must not be used.
- ❑ Soil erosion controls must be inspected and maintained on a regular basis during construction and operation.
- ❑ Conduct regular visual assessments to identify any soil erosion issues, particularly any erosion scars or recently deposited drifts of silt associated with construction, drainage structures or spoil.
- ❑ The extent of exposed soil areas must be minimised at all times.
- ❑ Erosion that takes place during rainfall events must be rehabilitated immediately.

6.7 Stockpiles, Storage and Handling

6.7.1 Topsoil

Although earthworks for the proposed development are limited primarily to the beach, BMH and trench to the CLS the following conditions must be abided by on site if any earthworks are undertaken with respect to topsoil protection:

- ❑ If temporary stockpiling is required, stockpiles must be positioned as indicated on the approved construction site layout plan.
- ❑ Any additional topsoil stockpile areas required by the Contractor must be approved by the ECO, in the form of an amended construction site layout plan indicating the position and extent thereof.
- ❑ Topsoil is to be kept separate from subsoil and handled twice only – once to strip and stockpile, and once to replace and level.
- ❑ Stockpile height must not exceed 1 m unless approved by the ECO.
- ❑ All topsoil must be stored in such a way and in such a place that it will not cause the damming up of water, erosion gullies, or wash away itself.
- ❑ Topsoil stockpiles must be protected from erosion by wind and water.
- ❑ Topsoil must not be compacted in any way during storage.
- ❑ Exotic/invasive plants and broad leaf weeds that emerge on topsoil stockpiles must be removed.
- ❑ Topsoil (with vegetation) should be retained in position for as long as possible, with removal only occurring immediately ahead of construction and earthworks in that area.
- ❑ Where soil requires excavation, the original topsoil (the upper most 300 mm of soil, together with plant roots and organic matter) must be stripped and stockpiled separately.
- ❑ Topsoil may not be stored in heaps exceeding 1 metre in height.
- ❑ Topsoil must not become buried, mixed with spoil (excavated subsoil), rubble or building material, or subjected to compaction or contamination by vehicles or machinery. This will render the topsoil unsuitable for use during rehabilitation. The Contractor will be held liable for the replacement of any topsoil rendered unsuitable for use during rehabilitation, for reasons due to negligence or mismanagement on site.

6.7.2 Spoil

- ❑ A photographic record (before construction and after rehabilitation) must be kept of all spoil sites for monitoring purposes.
- ❑ Spoil areas must not negatively affect surface drainage, and they must not alter the topography to the extent that they become visually intrusive.

- ❑ The use of spoil sites for the disposal of hazardous or toxic wastes is not permitted.
- ❑ Spoil must be stored in such a way and in such a place that it will not cause the damming up of water, erosion gullies, or wash away itself.
- ❑ Spoil sites must be approved by the ECO in consultation with eThekweni, in the form of an amended construction site layout plan. The following information is required for approval:
 - The location of the proposed spoil site.
 - The quantity of material to be spoiled.
 - The type of material to be spoiled.
 - The proposed method of spoiling.
- ❑ Spoil areas must be re-vegetated and rehabilitated after the construction phase.
- ❑ Excess spoil is to be disposed at the nearest municipal land fill site and records of this disposal must be provided to the ECO.
- ❑ Spoil (excavated subsoil) must be stored in low heaps, not exceeding 1 metre in height.
- ❑ Spoil must be positioned on the higher side of a disturbed area wherever possible.
- ❑ Spoil sites must be rehabilitated once work in that area is complete.

6.7.3 Vehicles and Equipment

- ❑ Vehicles used during construction must have the minimum impact on the environment and other road users.
- ❑ Vehicles, machinery and equipment must be checked regularly to ensure that none have leaks or cause spills of oil, diesel, grease or hydraulic fluid. Problematic vehicles, machinery or equipment must be sent for repair or removed from site immediately.
- ❑ Drip trays must be provided for any machinery that will be in a single position for longer than one day. Drip trays are to be watertight and must be emptied regularly and before rain events. The contents of drip trays are to be treated as hazardous waste.
- ❑ All the necessary handling and safety equipment for vehicles, machinery and equipment must be provided by the Contractor and used or worn by staff.

6.7.4 Fuel

- ❑ No fuel may be stored on site.
- ❑ No fuel may be stored on site within 100 m of the beach.
- ❑ No fuel may be stored on site within 100 m of a wetland or water resource (if applicable)
- ❑ An impervious layer (paving or PVC sheeting with a layer of sand) must be provided on which vehicles must park during refuelling. This will help to accommodate fuel spills during refuelling.
- ❑ All the necessary handling and safety equipment for fuels must be provided by the Contractor to, and used or worn by, staff.

6.7.5 Hazardous Substances

No hazardous substances are anticipated to be stored on site during cable installation. Should hazardous substances be stored on site the following will apply:

- ❑ Compliance with all national, regional, and local legislation must be ensured with regard to the storage, transport and use of harmful and hazardous substances and materials.
- ❑ In terms of Section 30 of NEMA pertaining to the control of incidents. In the event of a significant land-based spill or leak of hazardous substances during the beach landing, such an incident must be reported to the relevant authorities, in accordance with section 30 of NEMA.

- ❑ The Contractor must provide a register of hazardous substances to be used on site and must provide proof to the Project Engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials must be clearly displayed on the storage facility or containment structure.
- ❑ The Contractor must provide the Project Engineer with details of the preventative measures that are proposed to be installed to mitigate against pollution of the surrounding environment from leaks or spillages. This must include the emergency procedures to be implemented in the event of misuse or spillage of substances that will negatively impact on an individual or the environment.
- ❑ Hazardous substances may only be stored under controlled conditions (in a secured, appointed area that is fenced, has restricted entry, has weatherproof facilities, and is underlain by a bunded concrete slab to protect against soil and water pollution).
- ❑ Controlled loading/unloading areas must be provided which are underlain by an impervious paving or PVC sheet to protect against soil and water pollution.
- ❑ Personnel handling hazardous substances must be educated in terms of the correct handling, use and disposal thereof.
- ❑ Empty containers in which hazardous substances were kept must be treated as hazardous waste.
- ❑ The responsibility for spill treatment lies with the Contractor. The individual responsible for, or who discovers a hazardous waste spill, must report the incident to the RE. The ECO must assess the situation in consultation with the RE and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil/water must be determined by the Environmental Manager in consultation with the Project Engineer.
- ❑ All spills in the marine/beach environment must be reported to the ECO immediately and the DFFE – Oceans and Coasts (OC) ypeterson@environment.gov.za
- ❑ Should the spill be serious and constitute an emergency, the emergency procedure must be applied.

6.8 Water Use

Should water be required on site the following will apply:

- ❑ A supply of water for construction purposes must be identified and approved by the Project/Resident Engineer.
- ❑ No abstracting of water from any watercourse is permitted, unless authorised by DHSWS, for the volumes required in terms of the National Water Act, 1998 (Act No. 36 of 1998).
- ❑ Non-portable water is permitted for dust suppression subject to eThekweni approval.

6.9 Erosion Control

6.9.1 Drainage Systems

- ❑ Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to the primary dune cordon.
- ❑ Drainage must be provided in accordance with the local topography to accommodate stormwater and to minimise soil erosion.

6.9.2 Erosion Protection

- ❑ All areas susceptible to erosion must be protected to ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and construction area.

- ❑ Natural vegetation must be retained, wherever possible.
- ❑ Vehicular or pedestrian access must not be permitted into areas beyond the demarcated boundary of the construction area.
- ❑ Shoring must occur where excavations are in loose sand.
- ❑ Erosion problems must be repaired on a progressive basis throughout the contract.

6.10 Weed and Invader Plant Control

- ❑ The Contractor is responsible for the control of weeds and invader plants within the construction area for the duration of the construction phase.
- ❑ This control involves killing the plants present, killing the seedlings, which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (as amended) or in terms of Working for Water guidelines.
- ❑ The ECO must identify alien plants (terrestrial and aquatic species, as applicable) that should be removed by the Contractor.
- ❑ The ECO must monitor all sites disturbed by construction activities for colonisation by weeds, exotics, or invasive plants, to be controlled by the Contractor as they emerge.
- ❑ Removed vegetation must be disposed at a municipal waste disposal facility.
- ❑ Affected areas must be reinstated and rehabilitated as soon as practically possible.
- ❑ Alien invasive plants around any work areas and within the cable servitude must be kept under control during both construction and operation. During construction, mechanical methods should be encouraged as the main form of control.

6.11 Nuisance Control

- ❑ Disruptions to adjacent homeowners and surrounding properties must be minimised and managed.
- ❑ Private property, access roads and other existing services on and in the vicinity of the construction site must be treated with respect and protected against damage.
- ❑ The Contractor must bear the cost of the repair of damage as a result of the Contractor's operations on site.
- ❑ On-going liaison with service providers and other parties must be undertaken to minimise disruption and interruptions to services.
- ❑ Sufficient prior notice must be provided to surrounding landowners, service providers and other parties regarding the disruption of access.
- ❑ Construction activities must be restricted to within the construction site.
- ❑ The movement of construction workers must be confined, as far as possible, to the construction area.

6.12 Horizontal Directional Drilling

- ❑ A detailed geotechnical study must be conducted by the proponent prior to any directional drilling taking place.
- ❑ A professional team with sufficient experience in HDD must be appointed by the proponent to conduct the necessary drilling
- ❑ The Contractor shall prepare a detailed Method Statement for undertaking HDD for approval by the ECO and project manager.
- ❑ As part of the method statements to be provided by the contractor prior to construction, procedures for monitoring the flow and recycling of bentonite will be submitted and reviewed.

This will include emergency measures to deal with unwanted spillages. Details will also be required of where and how the bentonite grout is finally disposed of. Although this grout is nontoxic, it has the consistency of mud and disposal thereof will have to be carefully controlled to avoid any adverse environmental impacts

- ❑ Drilling fluids (if required) and muds must strictly be water-based and biodegradable. In this regard, the HDD team is required to have Material Safety Data Sheets for drilling fluids on site.
- ❑ Suitably sized containers must be available on site to accommodate drilling fluid (if required) and waste generated through HDD.
- ❑ The Contractor shall take all expected measures required to prevent risks typically associated with HDD methods of construction including but not limited to ground subsidence during drilling operations, inadvertent spills of bentonite and final disposal of the grout

7. REHABILITATION PHASE

The rehabilitation phase refers to the period of the project after the completion of the actual works, the onset signalled by site clean-up, site rehabilitation, the withdrawal of the Contractor from site, and coinciding with the maintenance/operational period. The concept of progressive rehabilitation is to be implemented throughout the life of the project. As soon as work in one area is complete the rehabilitation of that site is to commence. This will involve returning the condition of the disturbed areas to a state that they were in before the project began, or better.

The Contractor will be required to abide by the conditions of this EMP and Rehabilitation Plan (Annexure 2) compiled for this development. Compliance with the eThekweni requirements regarding rehabilitation of the construction zone should be adhered to.

7.1 General Specifications

- ❑ The principle of progressive reinstatement must be followed wherever possible. This includes the reinstatement of disturbed areas on an ongoing basis, immediately after the specified construction activities for that area are concluded.
- ❑ As soon as construction is finished and the construction site or lay down area is vacated, the disturbed areas must be rehabilitated by landscaping, levelling, topsoil dressing, alien plant eradication and vegetation establishment.
- ❑ Erosion control measures must be implemented, and the effectiveness thereof must be monitored and corrected where necessary.

7.2 Removal of Structures and Infrastructure

- ❑ All construction plant, equipment, signage, storage containers, temporary fencing and gates, temporary services, fixtures, foundations, and any other temporary construction infrastructure must be cleared from the construction site.
- ❑ Access roads utilised during construction must be returned to a usable state and/or a state no worse than prior to construction.

7.3 Stockpiles, Inert Waste and Rubble

- ❑ All stockpiles and surplus material must be transported to an approved location off site.
- ❑ After the stockpiled material has been removed, the site must be re-instated and rehabilitated.
- ❑ The site must be cleared of all inert waste including surplus construction materials.
- ❑ All domestic waste must be removed and disposed at the nearest municipal waste disposal facility.

7.4 Hazardous Waste and Pollution Control

- ❑ All fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps must be removed from site.
- ❑ Pollution containment structures must be removed from site.
- ❑ All sanitation infrastructure and wastewater disposal systems must be removed from site.

7.5 Final Shaping

- ❑ The reinstated construction site must be graded to ensure free flow of run-off and to prevent damming of water.
- ❑ No excavated material or stockpiles must be left on site and all material remaining after construction must be smoothed over to blend in with the surrounding landscape.
- ❑ The site must be monitored for signs of erosion and remedial action taken where there are problems.
- ❑ All trenches and excavations must be made safe through backfilling and shaping to conform to the surrounding topography.
- ❑ Programme the backfill of trenches and excavations so that subsoil is deposited first, followed by topsoil. Compact in layers for best results.
- ❑ Deficiency of backfill may not be made up by excavating haphazardly within the work site. Additional fill may only be imported from approved borrow areas as indicated by the ECO.
- ❑ Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material.

7.6 Topsoil Replacement and Soil Amelioration

- ❑ The principle of progressive reinstatement must be followed wherever possible. This includes the reinstatement of disturbed areas on an ongoing basis, immediately after the specified construction activities for that area are concluded.
- ❑ Top soiling activities must preferably be executed prior to the rainy season or any expected wet weather conditions.
- ❑ Topsoil placement must be executed concurrently with construction where possible, or as soon as construction in an area has ceased.
- ❑ Stockpiled topsoil must be replaced and redistributed together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes and roads.
- ❑ Topsoil must be replaced to the original depth, as much as was removed prior to construction.
- ❑ Topsoil must be replaced in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas.
- ❑ The suitability of substitute material must be approved by the ECO.
- ❑ Topsoil, suspected to be contaminated with the seed of alien vegetation must not be used.
- ❑ Remaining stockpiled topsoil must be shaped in an acceptable manner so as to blend in with the local surrounding area.
- ❑ After topsoil placement is complete, available stripped vegetation must be replaced randomly by hand over the top soiled area.

7.7 Planting

- ❑ 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.
- ❑ All planting work must be undertaken by a suitably qualified Contractor, making use of the appropriate equipment.
- ❑ The sourcing of seed or other plant material used for vegetation establishment on the top of the beach must be from within 50 km radius of the site and within the bioclimatic region.
- ❑ The careful reinstatement of disturbed areas with locally indigenous herbaceous vegetation must be conducted progressively.

- ❑ The use of fertilisers must be carefully controlled by the ECO. No fertiliser must be used in the re-vegetation process near watercourses or wetlands areas.
- ❑ If possible, reseeded and replanting must occur just prior to or during the wet season. If planting and reseeded occurs in a dry period, it may be necessary to irrigate plants to ensure their successful establishment.

7.8 Grassing

- ❑ Grassing must be undertaken by a suitably qualified Contractor.
- ❑ Replace the existing grass blocks that were removed prior to construction on the hard edge.
- ❑ Within terrestrial, non-wetland areas, indigenous runner grasses must be used. Exotic invasive grasses, such as Kikuyu (*Pennisetum clandestinum*) must not be used.

7.9 Weed and Invader Plant Control

- ❑ The Contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the rehabilitation phase.
- ❑ The control involves killing the plants present, killing the seedlings, which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (as amended) or in terms of Working for Water guidelines.
- ❑ The use of herbicides is not permitted within identified sensitive areas. The removal of weeds and invader plants within these areas must be undertaken by hand.
- ❑ Affected areas must be reinstated and rehabilitated as soon as practically possible.

7.10 Monitoring of Rehabilitated Areas

- ❑ Upon completion of all work, the ECO and Resident Engineer must survey all rehabilitated areas to ensure compliance with specifications.
- ❑ A photographic record must be maintained.
- ❑ Alien weed control and soil erosion will be the main items that require monitoring by WIOCC once the Cable Landing Site becomes operational.
- ❑ Once the initial revegetation takes place during the rehabilitation phase, a suitably qualified professional must conduct site audits and address any revegetation concerns until revegetation is considered successful (i.e. >80% indigenous cover). A generally accepted monitoring period of revegetated areas after this initial period is monitoring every 3 months for the first 12 months and every 6 months thereafter until the vegetation has successfully been established. Photographic records of all revegetated areas must be taken for reporting purposes.
- ❑ Should any Council infrastructure be damaged due to construction work on site, the applicant/contractor will be responsible for the rehabilitation of such infrastructure (i.e., grass, paving etc.) to the satisfaction of eThekweni.

8. OPERATIONS PHASE

The operations phase refers to the period of the project during which the project will be in operation. This section of the EMPr outlines general environmental specifications that are required to be implemented by the Employer.

8.1 Marine activities

- ❑ Cable repair vessel to be deployed as soon as possible to a site of cable damage or breakage.
- ❑ Waste generation on board the cable repair vessel must be minimised, and the disposing/treating of non-recyclable wastes must be done in an environmentally sound manner (MARPOL prohibits the disposal to sea of any plastics whilst restricting the discharge of other non-hazardous waste in coastal waters).
- ❑ Someone on board the cable repair vessel must assume a designated responsibility for spotting marine mammals. Should these species be observed in the vicinity of the work area, the vessel shall execute measures to avoid collision or disturbances.
- ❑ The Ports Authority must be notified of the marine activities associated with cable laying activity, so that vessels in the area are warned in advance of the ongoing operations through a 'Notice to Mariners' report.
- ❑ Vessel movement and activity shall observe standard navigational safety procedures and local communication protocols, as applicable, to avoid conflicts with other vessels in the project area.
- ❑ Ensure the cable laying vessel is well-maintained to minimize noise production from engines.
- ❑ Switching off non-essential sonar systems, and cautious use of multi-beam echosounders.
- ❑ A suitably qualified crew member must be appointed as a dedicated Marine Mammal / Protected Species Observer (MMO/PSO).
- ❑ The lighting on the cable laying vessels should be reduced to a minimum compatible with safe operations whenever and wherever possible. Light sources should, if possible and consistent with safe working practices, be positioned in places where emissions to the surrounding environment can be minimised.
- ❑ It is recommended that the cable laying vessel keep records of any mortality of seabirds and that this effect be evaluated to determine its' significance. It is extremely unlikely that shore birds will be exposed to any risk of incidental mortality.

8.2 Land based activities

- ❑ Cable repair contractors must be immediately mobilised, and repairs be undertaken as efficiently as possible.
- ❑ Ensure that beach and dune erosion is monitored and repaired timeously to manage and mitigate the effects of climate change (such as an increase in storm events coupled with sea-level rise) from exposing the cable.
- ❑ Should the cable need to be retrieved from a sensitive portion of the route the contractor must be briefed prior to the work being undertaken and the works area must be demarcated by red tape or temporary fencing.
- ❑ Rubble and debris from all repair activities must be stored in a designated area and removed from site to an appropriately licensed landfill or waste transfer station.

8.3 Alien Invasive Species Control

- ❑ WIOCC is responsible for the control of weeds and invader plants.

- ❑ The control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion.
- ❑ Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) or in terms of Working for Water guidelines.
- ❑ Removed vegetation must be disposed at the closest municipal waste disposal facility.

8.4 Soil Erosion and Stormwater Control

- ❑ Soils must be monitored for signs of erosion at regular intervals. Upon identification of a potential erosion problem, measures are to be put in place to prevent further soil loss.
- ❑ Particular attention must be paid to areas around drainage structures.
- ❑ Runoff must not be canalised or concentrated in areas where sheet flow may occur, or where highly erodible soils occur.
- ❑ Stormwater drainage measures must be implemented where necessary to control runoff and prevent soil erosion.

9. CLOSURE PHASE

- ❑ At the end of the project life span, should a decision be made to retrieve the entire or portions of the marine cable, this must be done in accordance with a Decommissioning Plan.
- ❑ Waste generation on board the cable retrieval vessel must be minimised, and the disposing/treating of non-recyclable wastes must be done in an environmentally sound manner (MARPOL prohibits the disposal to sea of any plastics whilst restricting the discharge of other non-hazardous waste in coastal waters).
- ❑ Someone on board the cable retrieval vessel must assume a designated responsibility for spotting marine mammals. Should these species be observed in the vicinity of the work area, the vessel shall execute measures to avoid collision or disturbances.
- ❑ The Ports Authority must be notified of the marine activities associated with cable retrieval activities, so that vessels in the area are warned in advance of the ongoing operations through a 'Notice to Mariners' report.

ANNEXURE 1 – DETAILS OF THE EAP

CURRICULUM VITAE

ASHLEIGH MCKENZIE

Proposed position:	Environmental Scientist
Name of Staff:	Ashleigh McKenzie
Profession:	Environmental Scientist
Date of birth:	28 August 1964
Years with firm:	20
Nationality:	South African

PROFESSIONAL REGISTRATIONS AND MEMBERSHIP

Registered with the Environmental Assessment Practitioners Association of South Africa (2019/1337)

Registered with the South African Council for Natural Scientific Professions (Reg No: 400026/05)

Member of IAIA – South African Chapter

KEY QUALIFICATIONS AND RELEVANT EXPERIENCE

Master of Sciences in Environmental Science, University of Natal, Durban, South Africa (graduated 1998).

Master of Sciences in Genetics, University of Natal, Pietermaritzburg, South Africa (graduated 1991).

Mrs Ashleigh McKenzie has been working in the field of Environmental Management for 20 years and has experience in the application of environmental management tools across a broad range of projects, including Environmental Impact Assessments, Environmental Management Plans and Environmental Compliance Monitoring.

Key Competencies

- Environmental Impact Assessment.
- Public Participation Processes
- Environmental Management Programmes
- Environmental Compliance Monitoring
- Environmental Auditing

PROJECT EXPERIENCE:

SUBSEA TELECOMMUNICATIONS CABLES

2000	Telkom undersea telecommunications cable and control station, Mtunzini, KZN. Scoping Report and EMP for laying of undersea telecommunications cable in Mlalazi Nature Reserve and construction of a control station in the town of Mtunzini. [EAP]
2020	2AFRICA/GERA (EAST) Submarine Fibre Optic Cable System Landing Site at Amanzimtoti, South Africa. Final Environmental Screening Report / Permit Study Report [EAP]

ROADS, BRIDGES, FUEL PIPELINES AND ELECTRICITY LINES (LINEAR DEVELOPMENTS)

1998	Sasol/Total/Petronet Joint Venture Crude Oil Pipeline from Durban to Vrede. Public Involvement aspects of the Environmental Impact Assessment. [Junior EAP]
1998	Sasol Gas Pipeline, South Durban. Public Involvement aspects of the Environmental Impact Assessment. [Junior EAP]
1999/2000	Upgrade and tolling of the John Ross Highway, Richards Bay, KZN. Scoping Report and application for authorisation. [Junior EAP]
2000	Lesotho Road Project. Assessment of biophysical impacts on a proposed road from Semonkong to Ha Mosi, Lesotho. [EAP]
2000	Realignment of the MR569. Felixton. KZN. Scoping Report and Application for authorisation. [EAP]
2003	Community Restoration and Development, Lake Matsamo, Swaziland. EMP compliance monitoring of construction of rural development infrastructure including schools, roads, bridges, fencing, irrigation schemes, dipping tanks. [EAP]
2005	Upgrade of the John Ross Highway, Richards Bay/Empangeni. Compilation of EMP for the design, preconstruction, construction, rehabilitation and maintenance phases of the John Ross Highway. [EAP]
2007/2008	Phase 3 Upgrade of the John Ross Highway, between the N2 and Grantham Highway, Empangeni. Basic Assessment Report and Application for authorisation. [EAP]
2009/2010	New Multi-Products Pipeline (NMPP) Electrical Distribution Infrastructure and Above Ground Fuel Storage for Pump Station 1. Drafting of Scoping Report, Environmental Impact Assessment Report and Environmental Management Plan (EMP) as part of Application for authorisation. [EAP]
2009/2010	New Multi-Products Pipeline (NMPP) Electrical Distribution Infrastructure and Above Ground Fuel Storage for Pump Station 3. Drafting of Scoping Report, Environmental Impact Assessment Report and Environmental Management Plan (EMP) as part of Application for authorisation. [EAP]
2009/2010	New Multi-Products Pipeline (NMPP) Electrical Distribution Infrastructure and Above Ground Fuel Storage for Pump Station 5. Drafting of Scoping Report, Environmental Impact Assessment Report and Environmental Management Plan (EMP) as part of Application for authorisation. [EAP]
2010	Proposed Venus-Sigma 765 kV Transmission Power Line, Sigma-Hector 400 kV Transmission Power Lines (x 2), and New feeder bays at Hector Sub-station (x 3) (EIA: 12/12/20/1397/1, EIA: 12/12/20/1397/3 2). EIA team member assisting with review of specialist studies and integration of specialist findings for the Environmental Impact Assessment. Compilation of the Environmental Management Plan (EMP) for the design, construction and operation phases of the powerlines. [EAP]
2010	Proposed Sigma Substation EIA: 12/12/20/1397/2. EIA team member assisting with review of specialist studies and integration of specialist findings for the Environmental Impact Assessment. Compilation of the Environmental Management Plan (EMP) for the design, construction and operation phases of the Sigma Substation. [EAP]
2013/2014	Proposed St Faiths 765 kV Sub-Station and Turn-In and Turn-Out Transmission Lines. Review of specialist studies and integration of specialist findings for the Environmental Impact Assessment.

Compilation of the Environmental Impact Assessment Report (EIAR) and Environmental Management Plan (EMP) for the design, construction and operation phases of the St Faiths Substation. [EAP]

- 2015** **Proposed Upgrade of the Hammarsdale Interchange, National Route 3 (N3), eThekweni Outer West, KwaZulu-Natal.** Application for Environmental Authorisation (Basic Assessment Process) in terms of the National Environmental Management Act (NEMA) EIA Regulations and Application for Water Use Licenses in terms of the National Water Act. [Project Manager, EAP]
- 2015 – Ongoing** **Proposed Upgrade of the N2 and N3 National Routes between Durban and Pietermaritzburg, KwaZulu-Natal.** Applications for Environmental Authorisation (Basic Assessment Processes) in terms of the National Environmental Management Act (NEMA) EIA Regulations and Application for Water Use Licenses in terms of the National Water Act for the following national road sections [Project Manager, EAP]:
- BA1: Basic Assessment for the Capacity Upgrades to the N2 (Solomon Mahlangu I/C to south of Umgeni Rd I/C), including expansion of EB Cloete and Solomon Mahlangu Interchanges, and the N3 (EB Cloete to Paradise Valley), including provision of temporary access for construction below Westville and Paradise Valley viaducts. **(Completed and Environmental Authorisation issued).**
- BA2: Basic Assessment for the Capacity Upgrades to the N3 from Paradise Valley to Key Ridge, including provision of temporary access for construction below the uMhlatuzana viaduct. **(Completed and Environmental Authorisation issued).**
- BA3: Basic Assessment for the Proposed Upgrade of the N3 from Hammarsdale to Cato Ridge. **(Completed and Environmental Authorisation issued).**
- BA4: Basic Assessment for the Proposed Upgrade of the N3 from Cato Ridge to Lynnfield Park **(Completed and Environmental Authorisation issued)**
- BA5: Basic Assessment for the Proposed Upgrade of the N3 from Lynnfield Park to Murray Road **(Completed and Environmental Authorisation issued)**
- BA6: Basic Assessment for the Proposed Upgrade of the N3 from New England Road IC to Twickenham Road (still in progress)

TOURISM AND CONSERVATION MANAGEMENT INFRASTRUCTURE IN PROTECTED (CONSERVATION) AREAS AND WORLD HERITAGE SITES

- 2000 – 2008** **Greater St Lucia Wetland Park World Heritage Site¹.** Environmental Management Programme for Phase 1, 2 3 and 4 Infrastructure Development. Environmental Scoping, Basic Assessments and applications for legal approvals², for upgrades and construction of Park management and tourism infrastructure including roads, airstrips, bridges, water supply pipelines, reservoirs, electricity supply, solid waste transfer stations, field ranger camps, picnic sites, game viewing hides, game watering holes, coastal dune rehabilitation initiatives, ablution facilities, boardwalks, jetties, park entrance gates and tourism centres within the Greater St Lucia Wetland Park World Heritage Site. Development of construction Environmental Management Plans (EMP's) for the above infrastructure projects. EMP Compliance Monitoring of construction phase of contracts. [EAP]
- 2000 – 2008** **Greater St Lucia Wetland Park World Heritage Site³.** Environmental Management Programme for Phase 1, 2 3 and 4 Infrastructure Development. Environmental Scoping, Basic Assessments and applications for legal approvals⁴, for upgrades and construction of Park management and tourism

¹ The Greater St Lucia Wetland Park has been renamed iSimangaliso Wetland Park (effective November 2007).

² In terms of the EIA Regulations under Sections 21 and 22 of the Environment Conservation Act 1989 (Act No 73 of 1989) and later in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998). All work done aligned with the requirements of the World Heritage Convention Act, 1999 (Act No 49 of 1999).

³ The Greater St Lucia Wetland Park has been renamed iSimangaliso Wetland Park (effective November 2007).

⁴ In terms of the EIA Regulations under Sections 21 and 22 of the Environment Conservation Act 1989 (Act No 73 of 1989) and later in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998). All work done aligned with the requirements of the World Heritage Convention Act, 1999 (Act No 49 of 1999).

infrastructure including roads, airstrips, bridges, water supply pipelines, reservoirs, electricity supply, solid waste transfer stations, field ranger camps, picnic sites, game viewing hides, game watering holes, coastal dune rehabilitation initiatives, ablution facilities, boardwalks, jetties, park entrance gates and tourism centres within the Greater St Lucia Wetland Park World Heritage Site. [EAP]

- 2000 – 2007** **Greater St Lucia Wetland Park World Heritage Site: Tourism Investment Sites.** Development of Environmental Code of Conduct and Environmental Guidelines for Tenderers and Concessionaires. Development of Environmental Management System (EMS) for the construction and operation phases of tourism activities in the Greater St Lucia Wetland Park. Review of Environmental Impact Assessment Documentation submitted for concessioned tourism investment sites, on behalf of the Park Authority. EMP Compliance Monitoring of construction of Thonga Beach Lodge, Mabibi, Greater St Lucia Wetland Park. General environmental input provided on behalf of the Park Authority, as required, for development at tourism investment sites within the Greater St Lucia Wetland Park. [EAP]
- 2002 2007** **Construction of new School Building, Enkovukeni Primary School, Enkovukeni Ward, within the Greater St Lucia Wetland Park World Heritage Site.** Environmental assessment process, compilation of Basic Assessment Report and application for environmental authorisation. Input into permit conditions in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) and Regulations No R1061, 28 October 2005 under Section 86 of the Act.[Project Manager, EAP]
- 2002 – 2007** **Construction of new School Building, Bhanga Nek Primary School, KwaDapha Ward, within the Greater St Lucia Wetland Park World Heritage Site.** Environmental assessment process, compilation of Basic Assessment Report and application for environmental authorisation. Input into permit conditions in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) and Regulations No R1061, 28 October 2005 under Section 86 of the Act.[Project Manager, EAP]
- 2002 – 2015** **Greater St Lucia Wetland Park World Heritage Site: Buffer Zone Management.** Assistance to the Park Authority in identifying and assessing potential impacts of proposed developments in the Park's Zone of Influence (a Buffer Zone including areas surrounding and affecting the Park), and preparing comment on behalf of the Park Authority on such developments as part of formal EIA and other legal planning processes. [EAP]

NATURAL RESOURCE MANAGEMENT

- 2001** **Community Restoration and Development, Lake Matsamo.** Feasibility study for the mitigation of the loss of medicinal plants due to inundation by Lake Matsamo. Feasibility study for the mitigation of the loss of reeds due to inundation by Lake Matsamo. Feasibility study for the mitigation of the loss of indigenous wood due to inundation by Lake Matsamo.[Junior EAP]
- 2004** **St Lucia Farms. Rehabilitation Plan.** Compilation of rehabilitation plan to restore area cleared of indigenous bush on private farm in Hluhluwe, KwaZulu-Natal. [Junior EAP]

COASTAL MANAGEMENT AND HARBOURS

- 1998** **Walkway on the coastal dunes at Merewent, South Durban.** Scoping Report. [Junior EAP]
- 2002** **Beach driving and boat launching in the Greater St Lucia Wetland Park.** Technical study, environmental assessment and public participation process required in terms of Section 24(7) of the National Environmental Management Act Regulations: Control of Vehicles in the Coastal Zone. [EAP]
- 2003** **Beach driving and boat launching in the Siyaya Coastal Park.** Technical study, environmental assessment and public participation process required in terms of Section 24(7) of the National

	Environmental Management Act Regulations: Control of Vehicles in the Coastal Zone. Greater St Lucia Wetland Park Authority. [Project Manager, EAP]
2005/2006	Beach driving and boat launching in the Greater St Lucia Wetland Park: Update Study. Study to determine changes in ecological and socio-economic conditions in the Greater St Lucia Wetland Park since implementation of the National Environmental Management Act: Regulations for the Control of Vehicles in the Coastal Zone. [EAP]
2008	Expansion of Richards Bay Harbour Container Terminal Infrastructure. Technical Scoping Report. [Junior EAP]
2008 – 2012	Re-engineering of Durban Container Terminal, Durban Harbour. Environmental Investigations and technical reporting as part of a NEMA 24(G) Application for Authorisation (retrospective authorisation). [EAP]
2011 – 2012	Decommissioning of two diesel Pencil Tanks at the Durban Container Terminal, Durban Harbour. Basic Assessment process and application for Environmental Authorisation. [Project Manager, EAP]

WATER SECTOR

1998	BoTT projects – rural water supply, Eastern Cape. Scoping Reports for 7 rural water supply projects, Eastern Cape. [Junior EAP]
1998	Rural water supply at Amanuswa, Vulamehlo, KZN. Scoping Report for rural water supply project at Amanuswa, Vulamehlo, KZN South Coast. [Junior EAP]
1999	Okulu Dam, KZN. Environmental Scoping. Scoping Study for the construction of a dam on the Okula River. Crystal Holdings, Tongaat, KZN. [EAP]
2000	Magaliesburg wastewater treatment works, Gauteng. Environmental Impact Assessment of proposed wastewater treatment works, Magaliesburg, Gauteng. [Junior EAP]
2000/2001	Inyoni and Ingweni Dams, KZN. Scoping Study for the construction of two farm dams on the Inyoni and Ingweni Rivers. Inyoni Farms. KZN. [EAP]
2000/2001	Establishment of a Catchment Management Agency (CMA) for the Thukela Water Management Area, KZN. Public Participation in development of a CMA Proposal. [EAP]
2001	Rehabilitation of Pemba's water supply, northern Mozambique. Environmental input into the Engineering Feasibility Study for the upgrade and expansion of bulk water supply infrastructure and wellfield expansion. Compilation of Environmental Management Plan for the pre-construction and construction phase of this project. [Project Manager, EAP]
2005	Olifants River Water Resources Development Project. Compilation of Environmental Management Plan for the pre-construction and construction phase of the de Hoop Dam and related infrastructure. [EAP]
2005	Olifants River Water Resources Development Project. Compilation of Environmental Management Plan for exploratory activities (drilling/ prospecting) related to the de Hoop Dam. [EAP]
2015 – 2020	Applications and registrations associated with water use licenses and general authorisations. Co-ordination and management of applications to the Department of Human Settlements, Water and

Sanitation in terms of Chapter 4 of the National Water Act, 1998 (Act No 36 of 1998), in particular, Section 40(4) for various road infrastructure projects. [Project leader, EAP]

MINING SECTOR

- 2007 – 2008** Borrow Pit 2, Quarry 2 and Quarry 3 (Sisonke District Municipality) for the upgrade of Sani Pass, P318. Compilation of Environmental Scoping Reports, Environmental Impact Reports and Environmental Management Programme Reports and Applications to the Department of Minerals and Energy, for mining permits in terms of the Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002). [Project leader, EAP]
- 2008 – 2009** Review of environmental documentation produced for mining applications (August – March). Peer reviewed a series of geohydrological specialist reports, Environmental Management Programme Reports (EMPRs) and Scoping reports for Ground Water Consulting Services Ltd. [Project leader, EAP]

AGRICULTURE/AGRI-INDUSTRY

- 2002** Proposed Umzimvubu Goat Processing and Production Facility in Mount Ayliff, Eastern Cape. Scoping Report for the development of a goat abattoir and small tannery plus other goat products production facility in a rural area of the Eastern Cape. [EAP]
- 2005/2006** Ntingwe Tea Outgrowers Programme. Detailed Application for Authorization in terms of Section 22 of the Environment Conservation Act, Act No. 73 of 1989, in respect of an activity identified under Section 21 of the said Act. [EAP]
- 2014** Feasibility Study for the proposed Petrusville Tannery, Renosterberg Local Municipality, Northern Cape. Investigation of the feasibility of establishing and operating a tannery in the Renosterberg Municipal Area of the Northern Cape from an environmental perspective including with respect to compliance with the environmental legislative framework. [Project Manager, EAP]
- 2014** Feasibility Study for the proposed Malmesbury Dairy, Western Cape. Environmental feasibility investigation for the expansion of the Malmesbury Dairy and construction of a UHT Production Plant. [Project Manager, EAP]
- 2016** Review of EIA for proposed sugarcane development at the homestead section of IYSIS Ranch, Mhlume, Swaziland. Review of the Environmental Impact Assessment Report for the proposed development. The focus of the review was risks to Tongaat-Hullet's Tambankulu Estate's agricultural operations, mainly in the form of risks to water quantity and quality in the Mbuluzi River. [EAP]

STRATEGIC ENVIRONMENTAL ASSESSMENT

- 1999** Richards Bay Strategic Environmental Assessment. Public Involvement Programme conducted for the Strategic Environmental Assessment of land designated for proposed industrial and urban development in Richards Bay. Municipality of Richards Bay. [EAP]
- 2011 – 2012** Environmental Constraints Frameworks (ECF) for Eskom's Field Services Areas viz Witbank, Pietermaritzburg and Groblersdal. Conceptualisation and development of a strategic ECF, specific to Eskom's infrastructure development (in collaboration with S3 Technologies (GIS specialists). The ECF is a GIS based tool set up to generate three main outputs for any particular geographical area of operation. [EAP]

EMPLOYMENT RECORD:

- 1999 - 2020** : **Environmental Assessment Practitioner**
Employed by ACER (Africa) Environmental Management Consultants
- 1998 - 1999** : **Environmental Assessment Practitioner**
Employed by GIBB Africa Consulting Engineers
- 1997 - 1998** : **Environmental Assessment Practitioner**
Freelance Environmental Consultant, subcontracting to Mark Wood Environmental Consultants, AfriDev Consultants in Environmental and Rural Development and GIBB Africa
- 1995 - 1997** : **Environmental Scientist (part time)**
Worked on a part time/ *ad hoc* basis while studying at the Department of Geographical and Environmental Sciences, University of Natal, Durban
- 1994 - 1995** : **Assistant Farm Manager**
Osgodsby Farm, Richmond, KwaZulu-Natal
- 1991 - 1994** : **Molecular Biology Researcher**
Vegetable and Ornamental Research Institute, Agricultural Research Council and Department of Botany, University of Natal, Pietermaritzburg
- 1987 - 1988** : **Research Assistant (Soil Sciences)**
Department of Soil Science, University of Natal, Pietermaritzburg

EDUCATION

- 1995 - 1997** : University of Natal, Durban
MSc in Environmental Sciences
- 1988 - 1990** : University of Natal, Pietermaritzburg
MSc in Genetics (Plant Molecular Biology)
- 1987** : University of Natal, Pietermaritzburg
BSc (Honours) in Genetics and Biotechnology
- 1983 - 1985** : University of Natal, Pietermaritzburg
BSc majoring in Genetics and Biochemistry

COURSES UNDERTAKEN

- 2002:** Public Participation (Department of Agriculture and Environmental Affairs/ Manyaka Greyling Meiring)
- 2003:** Non-financial and Environmental Auditing- Methods and Techniques (Eagle Environmental)
- 2004:** Occupational Health and Safety Legal Compliance Seminar (Hank Jacobs, Safety Preparation Services)
- 2005:** Implementing Environmental Management Systems (ISO14001: 2004) (Centre for Environmental Management, Potchefstroom University)
- 2011:** Applying joint problem solving, as a process for consultation and delivery of services. (M.O.D Consulting, Kloof, KwaZulu-Natal)
- 2014:** Sharpening the tool: New techniques and methods in EIA (SE Solutions, 1 day course)
- 2015:** IAP2 – Public participation (IAIA/Golder Associates, 1 day course)

PUBLICATIONS

Diab, RD; Ellery, WN; Tooley, J; McKenzie, A and K Barnes. 1999. *The no development option versus the development option in an underdeveloped area*. Impact Assessment and Project Appraisal. Volume 17, number 3, pages 243-252.

Ellery, WN; Tooley, J; McKenzie, MA and C Bill. 1998. *Sustainable use of indigenous trees within and surrounding the Thukela Biosphere Reserve, KwaZulu-Natal*. Natal Town and Regional Planning Commission Report.

PRESENTATION PAPERS

Tooley, Janice, McKenzie, Ashleigh, Heinsohn, Dieter, van Schalkwyk, Len and Wahl, Beth. 2002. Integrating cultural heritage resource and environmental management.

Tooley, Janice, McKenzie, Ashleigh, Heinsohn, Dieter, Ballot, Steve and Barnard, Duard. 2004. Environmental Management in the Greater St Lucia Wetland Park: *On Shifting Sands*

Scherzer, PJ; Heinsohn, R-D; Tooley, J and McKenzie, A. 2005. Integration: are we doing all we can?

LANGUAGE SKILLS

Language	Reading	Speaking	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Satisfactory	Adequate	Adequate

REFERENCES:

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ANNEXURE 2 – REHABILITATION PLAN

ANNEXURE 3 – CHANCE FINDS PROTOCOL