

VODACOM

**2AFRICA/GERA (EAST) SUBMARINE FIBRE OPTIC CABLE
SYSTEM TO BE LANDED AT PORT ELIZABETH (GQEBERHA),
Eastern CAPE, SOUTH AFRICA**

VODACOM (PTY) LTD

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

EIA REFERENCE: 14/12/16/3/3/2/2057

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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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Please refer to Annexure 1 for the EAPs Curriculum Vitae

TABLE OF CONTENTS

TABLE OF CONTENTS	III
LIST OF FIGURES	V
LIST OF TABLES	V
ABBREVIATIONS AND ACRONYMS	VI
1 INTRODUCTION.....	1
1.1 Background.....	1
1.2 Project Description.....	1
1.3 Construction Programme.....	2
1.3.1 <i>Timing of construction activities</i>	2
1.3.2 <i>Construction activities</i>	2
1.4 Sensitive Environments	3
1.5 Objective and Scope of the Environmental Management Programme	6
2 ENVIRONMENTAL PRINCIPLES AND LEGAL REQUIREMENTS	7
2.1 Environmental Principles	7
3 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS	10
3.1 Organisational Structure	10
3.2 Roles and Responsibilities.....	10
3.2.1 <i>Developer</i>	11
3.2.2 <i>Project Engineer and Resident Engineer</i>	12
3.2.3 <i>Environmental Manager</i>	12
3.2.4 <i>Environmental Control Officer (ECO)</i>	13
3.2.5 <i>Contractor</i>	14
3.3 Compliance Monitoring, Reporting and Record Keeping	15
3.3.1 <i>Compliance Monitoring</i>	15
3.3.2 <i>Design Phase</i>	15
3.3.3 <i>Construction Phase</i>	15
3.3.4 <i>Non-Compliance and Remedial Action</i>	16
3.3.5 <i>Regulatory Authorities’ Site Inspections</i>	16
3.4 Environmental Awareness Training.....	17
3.5 Emergency Preparedness and Reporting	17
3.6 Liaison with Stakeholders	18
3.7 Review and Updating of the EMPr.....	18
4 DESIGN PHASE	19
4.1 Environmental Authorisation (EA) and EMPr	19
4.2 Appointment of ECO	19
4.3 Erosion Control and drainage considerations.....	19
4.4 Storm water management	19
4.5 Stockpile areas	20
4.6 Spoil Areas.....	20
4.7 Construction Site.....	20
4.7.1 <i>Construction Site Layout Plan</i>	20
4.7.2 <i>Construction Camps & site office (potential accommodation)</i>	21
4.8 Access Roads	21
4.9 Aesthetics	21
4.10 Disturbance to Landowners and Service Providers.....	22
4.11 Dust and noise management.....	22

4.12	Safety and Security.....	22
5	PRE-CONSTRUCTION PHASE	23
5.1	Construction Site Layout, design and construction schedule.....	23
5.2	Construction Preparation	23
5.3	Acquisition of Permits and Licenses.....	24
5.4	Appointment of local labour and small and medium sized enterprises (SME's).....	24
5.5	Demarcation of sensitive areas	24
5.6	Environmental Awareness Training.....	25
6	CONSTRUCTION PHASE.....	26
6.1	Site Establishment.....	26
6.1.1	<i>Demarcation of the Site</i>	26
6.1.2	<i>Protection of Sensitive Habitats</i>	27
6.1.3	<i>Protection of Cultural Heritage Resources</i>	28
6.1.4	<i>Protection of Beach and Coastal Dune Environment</i>	29
6.1.5	<i>Topsoil Conservation</i>	30
6.2	Site Infrastructure	30
6.2.1	<i>Structures</i>	30
6.2.2	<i>Services</i>	30
6.2.3	<i>Construction Camp, Lay-Down Areas and Material Storage Yards</i>	31
6.2.4	<i>Storm Water Control</i>	31
6.2.5	<i>Roads and Access</i>	31
6.3	Implements and Equipment.....	32
6.4	Site Management.....	32
6.4.1	<i>Marine Environment</i>	32
6.4.2	<i>Terrestrial Environment</i>	34
6.4.3	<i>Hazardous Waste</i>	34
6.4.4	<i>Pollution Control</i>	35
6.4.5	<i>Air Quality</i>	36
6.4.6	<i>Noise Control</i>	36
6.4.7	<i>Fire Control</i>	37
6.5	Earthworks.....	37
6.5.1	<i>Excavations and Earthworks</i>	37
6.5.2	<i>Shaping and Trimming</i>	37
6.5.3	<i>Erosion control and protection</i>	38
6.6	Stockpiles, Storage and Handling.....	38
6.6.1	<i>Topsoil</i>	38
6.6.2	<i>Spoil</i>	39
6.6.3	<i>Vehicles and Equipment</i>	39
6.6.4	<i>Fuel</i>	39
6.6.5	<i>Hazardous Substances</i>	40
6.7	Water Use	40
6.8	Erosion Control	41
6.8.1	<i>Drainage Systems</i>	41
6.8.2	<i>Erosion Protection</i>	41
6.9	Weed and Invader Plant Control.....	41
6.10	Nuisance Control	41
6.11	Horizontal Directional Drilling (if required).....	42
7.	REHABILITATION PHASE	43
7.1	General Specifications.....	43
7.2	Removal of Structures and Infrastructure.....	43
7.3	Stockpiles, Inert Waste and Rubble.....	43

7.4	Hazardous Waste and Pollution Control.....	43
7.5	Final Shaping.....	44
7.6	Topsoil Replacement and Soil Amelioration.....	44
7.7	Planting.....	44
7.8	Grassing.....	45
7.9	Weed and Invader Plant Control.....	45
7.10	Monitoring of Rehabilitated Areas.....	45
8.	OPERATIONS PHASE.....	46
8.1	Marine activities.....	46
8.2	Land based activities.....	46
8.3	Alien Invasive Species Control.....	46
8.4	Soil Erosion and Stormwater Control.....	47
9.	CLOSURE PHASE.....	48
	ANNEXURE 1 – DETAILS OF THE EAP.....	49
	ANNEXURE 2 – REHABILITATION PLAN.....	56
	ANNEXURE 3 – CHANCE FINDS PROTOCOL.....	57

LIST OF FIGURES

Figure 1	Offshore cable corridor to the proposed landing point in Gqeberha	4
Figure 2	Sensitivity Map showing construction corridor between the Beach, BMH and CLS at Summerstrand	5
Figure 3	Organogram reporting relationships for the construction phase	11

LIST OF TABLES

Table 1	Responsibility Matrix and Organisational Structure.....	10
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ABBREVIATIONS AND ACRONYMS

ASN	Alcatel Submarine Networks
BMH	Beach Manhole
CLS	Cable Landing Station
CMB	Coastal Management Branch
dB	decibels
DFFE	Department of Forestry, Fisheries and Environment
DHSWS	Department of Human Settlements, Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ECPHRA	Eastern Cape Provincial Heritage Resources Authority
EIA	Environmental Impact Assessment
EEZ	Exclusive Economic Zone
EMPr	Environmental Management Programme
HDD	Horizontal Directional Drilling
HWM	High Water Mark
LWM	Low Water Mark
MARPOL	The International Convention for the Prevention of Pollution from Ships
MMOs	Marine Mammal Observers
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NMBMM	Nelson Mandela Bay Metropolitan Municipality
PLGR	Pre-Lay Grapnel Run
PVC	Polyvinyl Chloride
RE	Resident Engineer
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
SDS	Safety Data Sheet
SME	Small and medium sized enterprise
Vodacom	Vodacom (Pty) Ltd
WD	Water Depth

#	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 Port Elizabeth (Gqeberha), located on the East Coast of South Africa within the Nelson Mandela Bay Metropolitan Municipality (NMBMM). This is to be operated by Vodacom (Pty) Ltd (Vodacom) as the South African landing partner (Project Applicant). As the designated Landing Partner of the 2AFRICA/GERA (East) Cable System in South Africa, Vodacom 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 Pollock Beach in Port Elizabeth (Gqeberha), Eastern Cape.

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 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 Gqeberha landing site (Figure 1) in South Africa is the southern-most branch off the main trunk line which lands in Duynefontein 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 Pollock Beach and then onwards following a terrestrial alignment to the CLS in Summerstrand. 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 Summerstrand:

- ❑ Pre-installation activities including cable route survey, route engineering, route clearance and Pre-Lay Grapnel Run.
- ❑ Laying and burial of the cable in the offshore environment within South Africa's EEZ from 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).

¹ Of which an Environmental Authorisation is one.

- ❑ Laying and burial of the cable across the beach (construction corridor of 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 sea earth system (System Earth).
- ❑ 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 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 required environmental authorisation has been issued and the required beach driving permits have been granted. Construction of the BMH and cable trenching from the BMH to the CLS is anticipated to take approximately 3 – 4 months to complete depending on weather conditions.

It is anticipated that the actual landing of the cable at Pollock Beach and its installation 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 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 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 to take place outside of the peak holiday season and legislated school holidays as best possible however this depends on project role out and the availability of ships to install the cable.
- ❑ As far as practicably possible, avoid cable installation at the shore crossing during the peak squid spawning period between September and December.
- ❑ The NMBMM will be notified at least three months prior to construction and landing of the cable.
- ❑ The NMBMM Coastal Management Branch (CMB) 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 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)

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:

- ❑ Pre-Lay Grapnel Run (PLGR) to clear the cable alignment of all debris (disused cables and fishing gear up to the targeted burial depth of 1,500 m WD). 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 1,500 m, where the risk of inadvertent damage from human activities is negligible.
- ❑ Simultaneous lay and plough burial at water depths of less than 1,500 m. The cable will be buried up to 2 m below the seabed.

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 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 beach manhole to facilitate re-terminations.
- ❑ Installation of a sea earth (system earth) offshore in the shallow water environment if trenching is used to install the cable (if HDD is used to install the cable a system earth array will be installed on land near the BMH).
- ❑ Securing the cable in the beach manhole by means of an armour wire anchor clamp.
- ❑ Burial of the cable from the beach anchor block to the Low Water Mark (LWM) to a depth of 2 m (or 30 cm into bedrock, if reached sooner).
- ❑ Reinstatement of the beach and primary dune cordon to its preconstruction profile.
- ❑ Excavation of a trench and inspection manholes from the BMH to the CLS along the preferred fronthaul alignment. 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 2 below that indicates the construction zone on the beach, BMH and trench between the BMH and CLS.

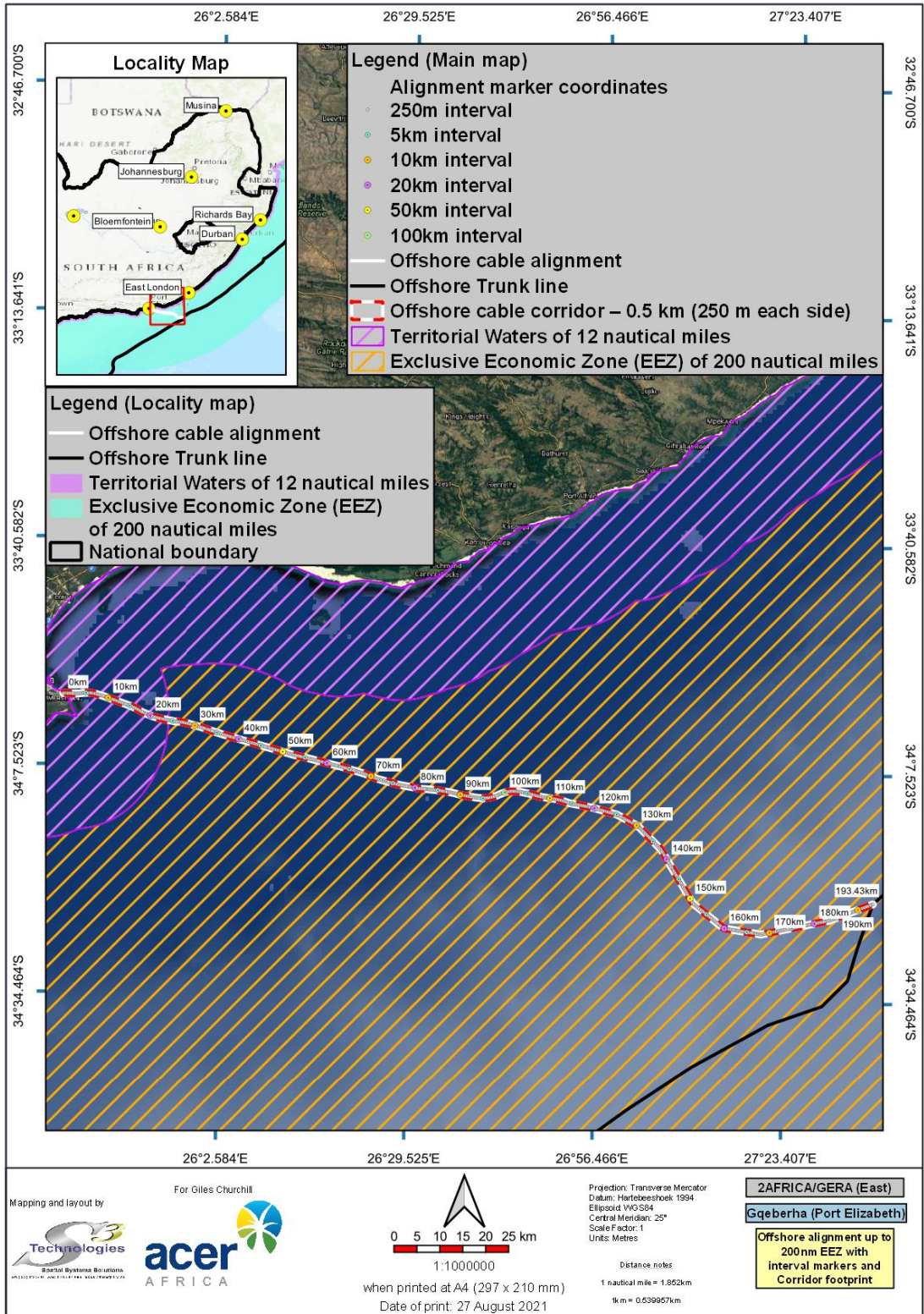


Figure 1 Offshore cable corridor to the proposed landing point in Gqeberha

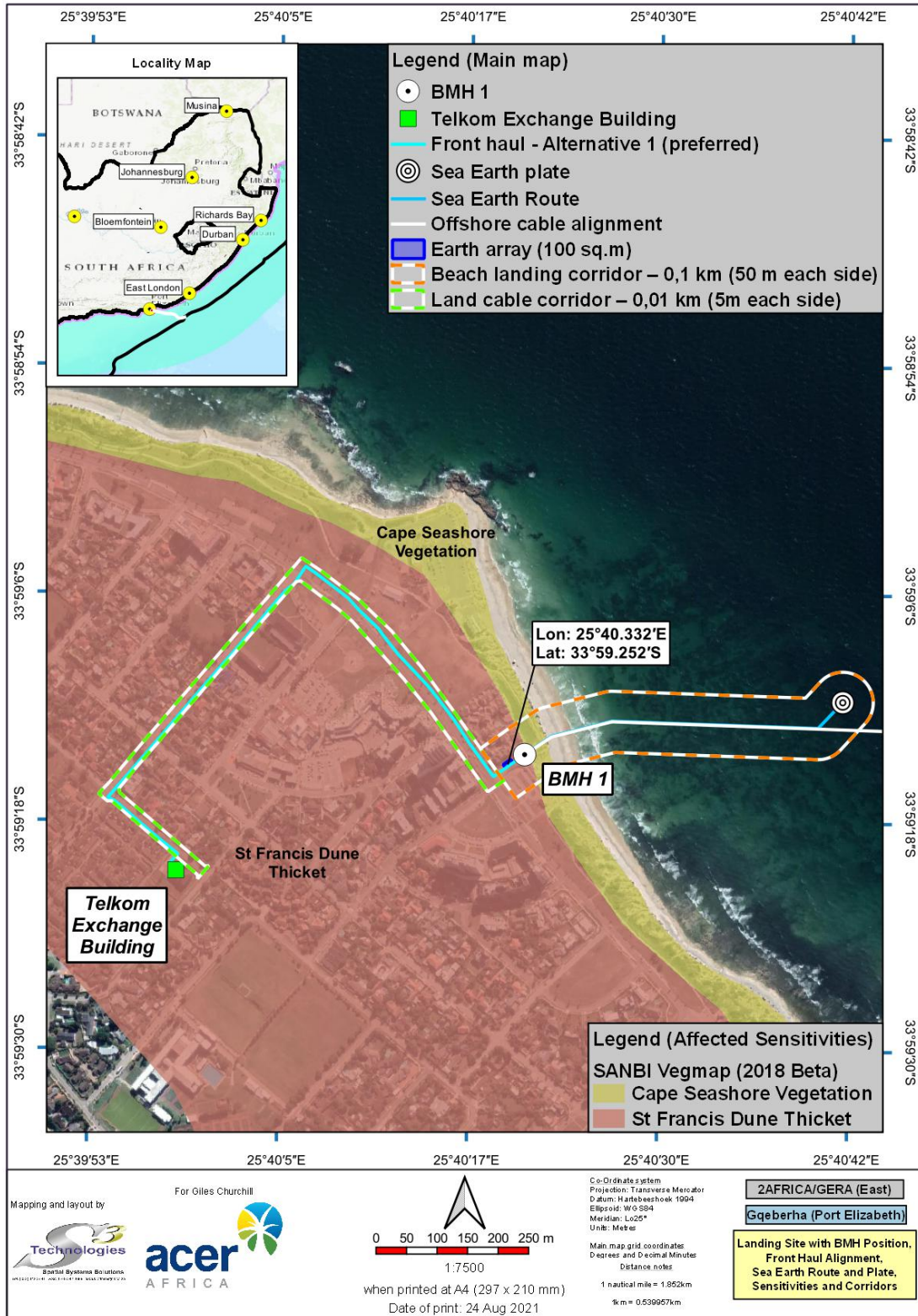


Figure 2 Sensitivity Map showing construction corridor between the Beach, BMH and CLS at Summerstrand

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 environmental authorisation).
- ❑ The updated EMPr will make provision for the fulfilment of other relevant conditions of environmental authorisation (as contained within the environmental authorisation).

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 environmental authorisation 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.

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).
- ❑ Eastern Cape Provincial Development Plan (2014). Eastern Cape Vision 2030.
- ❑ Nelson Mandela Bay Municipality (2017/18 – 2021/22). Integrated Development Plan

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 the Eastern Cape Noise Control Regulations (GN 181/PG 824/20011210).
- ❑ 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 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 the Eastern Cape. 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 the National Environmental Management Act, 1998 (Act No. 108 of 1998) (as amended) (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 environmental authorisation from the relevant competent authority 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. In terms of NEMA and the (Environmental Impact Assessment) EIA Regulations, certain listed activities require environmental authorisation before they can proceed.

An application for authorisation for the proposed 2AFRICA/GERA (East) Cable System was submitted to the Environmental Authorities on the 12 March 2021. The Department of Forestry, Fisheries and Environment (DFFE) is the competent authority 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 the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) is 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 HWM) or ECPHRA (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).
 - Health and safety aspects (speed limits, right of way to public and wildlife).

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 2². 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	Vodacom (PTY) Ltd.	Overall responsibility for ensuring that the development is implemented according to the requirements of environmental authorisation 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 and environmental authorisation 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.

² The organogram will need to be updated once all roles have been filled and companies appointed.

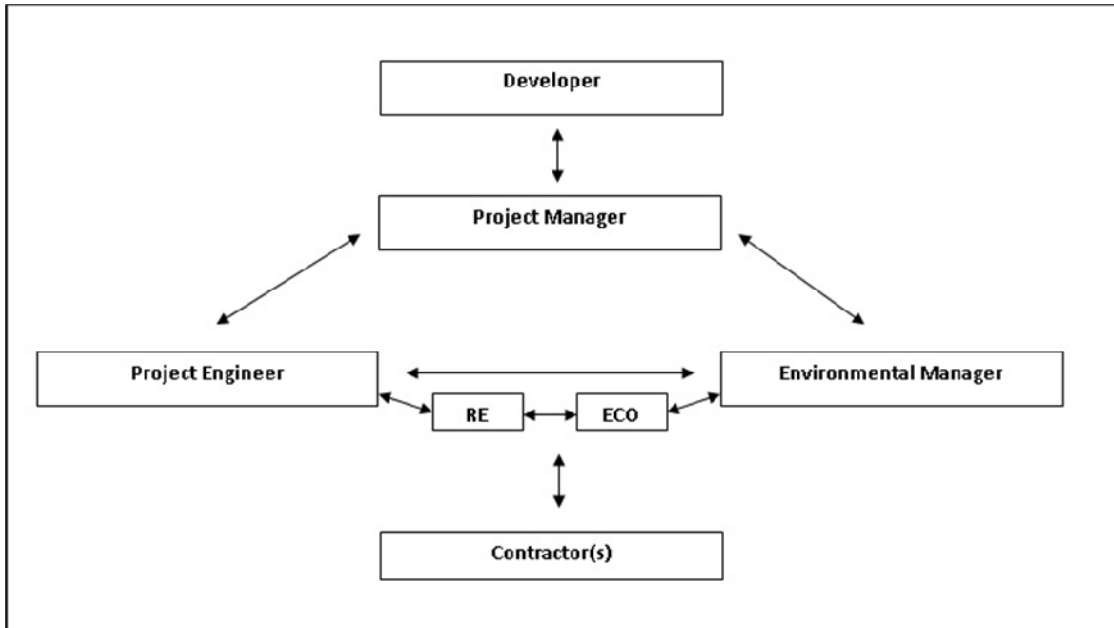


Figure 3 Organogram reporting relationships for the construction phase

3.2.1 Developer

Vodacom 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 environmental authorisation.
- ❑ 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 environmental authorisation.
- ❑ 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 the NMBMM Coastal Management Branch (CMB).
- ❑ 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 changes³ to the EMPr.
- ❑ Producing a monthly environmental audit report. These monthly environmental audit reports must be submitted to DFFE: Director of Compliance, the NMBMM and Vodacom for their records.
- ❑ 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.

³ 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 the NMBMM Coastal Management Branch (CMB) 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, NMBMM and Vodacom.

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*

The NMBMM 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. 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 the Coastal Management Branch of the NMBMM.
- 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 coastal and nearshore zone.
 - ASN to implement the guidelines and standards of the ICPC to ensure safety of other cables on the East Coast of South Africa.
 - Vodacom to engage directly with offshore concession holders to notify them of the proposed development and to draw up a Memorandum of Understanding (MoU) (if required) which outlines the rights, obligations and roles and responsibilities of both parties in terms of the installation and operation of subsea infrastructure.
 - Vodacom to liaise regularly with the offshore Aquaculture Development Zone (ADZ) operators and to maintain clear lines of communications between both parties.
 - 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.
 - Pin cable to rock outcropping to prevent movement and limit abrasion.

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 the NMBMM.

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): Eastern Cape Noise Control Regulations (GN 181/PG 824/20011210) 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.

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 Project/Resident Engineer 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.
- Vodacom to communicate timeously⁴ with sporting events organisers and hosting venues (e.g. yacht clubs, skiboat clubs, scuba diving clubs) at Algoa Bay for scheduling and co-ordination purposes.
- 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.
- The NMBMM must be duly informed once work has commenced on site.
- 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.

⁴ Big events, possibly including 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 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 the NMBMM.

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 the NMBMM 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 the NMBMM 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.

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 imprisonment⁵.
- ❑ 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.

⁵ In terms of the Animals Protection Act, 1962 (Act 71 of 1962) Section 2.

- ❑ 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 the NMBMM.

6.1.3 Protection of Cultural Heritage Resources

Onshore

- ❑ If a cultural heritage artefact on site is uncovered, work in the immediate vicinity must be stopped immediately. The Contractor must take reasonable precautions to prevent any person from removing or damaging any such article and must immediately inform the RE and ECO of such a discovery. ECPHRA the provincial heritage authority of the Eastern Cape must be contacted so that an archaeological/heritage resources consultant can be appointed to record the site and excavate if necessary. Work may only resume once clearance is given in writing by ECPHRA.
- ❑ There is a very small chance that fossils may occur in the aeolianites so a Fossil Chance Find Protocol should be added to the EMPr (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 burials or human remains be encountered at any stage during the installation of the cables, work in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and ECPHRA must be notified immediately so that a decision can be made on how best to deal with the remains.

Offshore

- ❑ Along the inshore waters and beach crossing, an alert for the occurrence of palaeontological material be included in the EMPr, specifically for the divers working in the shoreface and the operators excavating the trench in the beach and dune, particularly if rock trenching is required. Any fossil material noted during these activities must be collected immediately by the divers.
- ❑ 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.
- ❑ The three seabed anomalies (SSS contact E2-G-S527, and magnetic and sonar contacts E2-G-M001 and E2-G-S344) are avoided during cable installation.
- ❑ 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.
- ❑ Should any shipwrecks be identified as part of this project then SAHRA must be notified to enable the information to be added to the national shipwreck database. Any new discoveries or updated data is a valuable resource in adding to our knowledge of South Africa's maritime history
- ❑ 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 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.

- ❑ Should any archaeological sites or material be encountered during the course of laying the cable on land, work must cease in that area until the project archaeologist and the ECPHRA 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 a strictly enforced EMPr.
- ❑ Ensure that contracted construction personnel are aware of, and adhere to, the requirements of the EMPr.
- ❑ Keep heavy vehicle traffic associated with construction in the coastal zone to a minimum.
- ❑ Restrict vehicles to clearly demarcated access routes and construction areas only. These should be selected under guidance of the NMBMM.
- ❑ 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.
- ❑ The cable should be buried within the beach to a depth approximately 1 m below the deflated beach state and thereby probably lying within the shingle or beach aeolianite (beach rock) strata of the beach. Machinery may be required to excavate a trench through the beach rock to the required depth, this being to a depth approximating 300 mm with a width of approximately 300 mm. Such excavation should be addressed through the use of an excavator with a cutting head or perhaps "jack hammer", with displaced material being set aside. Once the cable has been set in place, excavated material should be set back into the trench using an epoxy material (or similar material suitable to the receiving environment), to the original profile of the beach rock.
- ❑ Some monitoring of the excavated trench may be required from time to time, particularly following periods of beach scour or significant storm events to ensure that the reinstated trench and cover material remains intact and cable/conduit exposure has not arisen.
- ❑ 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.

- ❑ Where disturbance of the vegetated dune arises, the affected area should be raked back to an angle of repose ~ 27°, stabilised using geofabric bags and suitably planted with appropriate vegetation (ideally the same dune species that are currently present on the dune cordon including *Tetragonia decumbens*, *Carpobrotus edulis* and *Gazania rigens*).
- ❑ 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.

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 the NMBMM. 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 the NMBMM.

- ❑ Adequate sanitation facilities⁶ 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 ablution 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.
- ❑ 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 the NMBMM 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.

⁶ Chemical toilets and hand washing facilities.

- ❑ 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.

6.2.5.1 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.

6.3 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.

6.4 Site Management

6.4.1 Marine Environment

- ❑ Timing: many of the affected fisheries operate year-round, therefore the timing of cable installation to avoid certain periods of peak fishing activity is not considered to be advantageous to any sectors except the squid jig fishery which is closed from April to June.
- ❑ 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), 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.
- ❑ 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.

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 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 dedicated MMO and PAM operator should be appointed to ensure compliance with mitigation measures during seismic geophysical surveying. The MMO or PAM operator can be either an independent MMO or a suitably trained crew member.

6.4.2 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.
- ❑ 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.
- ❑ Targeted notification of the affected user groups (onshore and offshore) prior to cable landing, must be provided. This must include the Airports Company South Africa (ACSA)⁷. Information regarding the expected types of construction activities must be supplied and signage/notices erected where appropriate

6.4.3 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.

⁷ At the time of writing this report, the contact people are: Patric Maxaxa, Senior Safety Compliance Officer, and Gcisa Salukazana, Safety Compliance Officer.

- ❑ A record must be kept of all spills and the corrective actions taken. Also, should spills and leaks occur, DEFF: Branch O&C must be part of the relevant authorities to be notified ypeterson@environment.gov.za.
- ❑ 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.
- ❑ 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.

6.4.4 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 the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA).

6.4.5 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 NOX 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.

6.4.6 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 and the NMBMM 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.

6.4.7 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 equipment⁸ (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.

6.5 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.

6.5.1 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 the South African Bureau of Standards (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.

6.5.2 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.

⁸ In terms of SABS 1200.

6.5.3 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 erosion⁹ 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.
- ❑ 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.

6.6 Stockpiles, Storage and Handling

6.6.1 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.

9 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.

- ❑ 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.

6.6.2 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 the NMBMM, 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.

6.6.3 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.

6.6.4 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.

6.6.5 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 the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“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 the NEMA, 1998.
- ❑ 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. Areas cleared of hazardous waste must be re-vegetated according to the Environmental Manager’s instructions.
- ❑ Should the spill be serious and constitute an emergency, the emergency procedure must be applied.

6.7 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 NMBMM approval.

6.8 Erosion Control

6.8.1 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.

6.8.2 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.

6.9 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.

6.10 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.

6.11 Horizontal Directional Drilling (if required)

- ❑ 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 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 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 compiled for this development. Compliance with the NMBMM 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 cordon or its adjacent buffer area that are unavoidably disturbed when the cable is laid should be rehabilitated.
- ❑ 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 Vodacom once the Cable Landing Site becomes operational.
- ❑ 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 the NMBMM

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

- ❑ Vodacom 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

GILES JOHN CHURCHILL

Current Position:	Director and Senior Environmental Consultant
Name of Firm:	ACER (Africa) Environmental Consultants
Name of Staff:	Giles John Churchill
Profession:	Environmental Consultant
Date of Birth:	25 June 1976
Years with Firm:	13
Nationality:	South African



PROFESSIONAL REGISTRATIONS AND MEMBERSHIP

EAPASA Registered Environmental Assessment Practitioner: Number 2019/1687

SACNASP Registration Number: 116348 (Registered as a Professional Natural Scientist – in the field of Environmental Science)

Member of IAIA – KwaZulu-Natal Chapter

KEY QUALIFICATIONS AND RELEVANT PROJECT EXPERIENCE

Key competencies

- Environmental Impact Assessment.
- Public Participation Processes
- Environmental Management Programmes
- Environmental Compliance Monitoring
- Environmental Auditing
- Safety, Health & Environment Representative (HW-592-PA-05000118)

Project Experience:

2020 – Ongoing	Alcatel Submarine Networks: Proposed landing of the 2AFRICA Cable System in Duynefontein South Africa. Environmental Authorisation and associated permits/licenses Environmental Assessment Practitioner [Project Manager and lead EAP]
2020 – Ongoing	Alcatel Submarine Networks: Proposed landing of the 2AFRICA Cable System in Amanzimtoti South Africa. Environmental Authorisation and associated permits/licenses Environmental Assessment Practitioner [Project Manager and lead EAP]
2020 – Ongoing	Alcatel Submarine Networks: Proposed landing of the Equiano Cable System in Swakopmund, Namibia. Environmental Authorisation and associated permits/licenses Environmental Assessment Practitioner [Project Manager and lead EAP]
2020 – Ongoing	Alcatel Submarine Networks: Environmental Screening for the proposed landing of the Equiano Cable System in Lome, Togo. Environmental Screening. Environmental Assessment Practitioner [Project Manager and lead EAP]
2016 – 2020	Tronox Fairbreeze Mine. External annual audit of water use licences on Tronox Fairbreeze Mine for the years 2016 – 2018. Environmental Compliance Auditing [Environmental Auditor]
2019 – Ongoing	Alcatel Submarine Networks: Proposed landing of the Equiano Cable System in Melkbosstrand South Africa. Environmental Authorisation and associated permits/licenses

	Environmental Assessment Practitioner [Project Manager and lead EAP]
2019 – Ongoing	Alcatel Submarine Networks: Proposed landing of the Equiano Cable System in Swakopmund Namibia. Environmental Authorisation and associated permits/licenses Environmental Assessment Practitioner [Project Manager and lead EAP]
2019	ARPE Ltd. Site inspection and compliance audit of the Agago-Achwa Hydropower Projects, HPP1 and HPP2, located on the Achwa River in northern Uganda. Environmental Compliance Officer [ECO]
2018-2019	Kikagati Power Company: Feasibility of a new fish pass design relating to the Development of a 14 MW Hydropower Project Located along River Kagera in South West Uganda at the border with Tanzania Environmental Assessment Practitioner [Project Manager and lead EAP]
2018 – 2019	Democratic Republic of the Congo Fonds de Promotion de l'Industrie: High level environmental and social scan, including the identification of socio-economic development opportunities for the development of a 18,000 ha greenfields sugar production and processing project, the Kabalo Sugar Development in the Kabalo District of the Tanganyika Province of the DRC
2018 – 2019	Eskom: Makaula 132KV Line and Substation Environmental Compliance Auditing [Environmental Compliance Officer (ECO)]
2017 – 2018	MTN: Proposed landing of the ACE Cable System on the West Coast of South Africa Environmental Compliance Auditing [Environmental Compliance Officer (ECO)]
2018:	Umzimvubu Local Municipality. Environmental Authorisation and associated permits/licenses for gravel access roads and concrete causeways near Mount Frere [EAP].
2018:	Umzimvubu Local Municipality. Environmental Authorisation and associated permits/licenses for gravel access roads and concrete causeways near Mount Frere [EAP].
2017-18:	Dube Tradeport. The extension of the Tongaat Trunk Sewer Line, KwaZulu-Natal. [Environmental Compliance Officer (ECO)].
2017:	Umzimvubu Local Municipality. Environmental Authorisation and associated permits/licenses for gravel access roads and concrete causeways near Mount Frere [EAP].
2017:	Umzimvubu Local Municipality. Environmental Authorisation and associated permits/licenses for gravel access roads and concrete causeways near Mount Ayliff [EAP].
2017:	Leo Mattioda. Environmental Authorisation and Associated Mining Permit for a Borrow Pit on Mr J Readman's Farm near Heatonville [EAP].
2017:	Eskom Distribution Limited. Clocolan-Ficksburg 88 kV Power Line and Marallaneng Substation, Free State. [EAP].
2016 - 2017	MTN: Proposed landing of the ACE Cable System on the West Coast of South Africa Environmental Impact Assessment including Scoping, Public Participation, Impact Assessment, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. [Project Manager, EAP, ECO]
2016 - 2017:	Transnet National Ports Authority. Replacement of Critical Pipe Sections in the Port of Richards Bay, Kwazulu-Natal. Environmental Assessment Practitioner services for obtaining Environmental Authorisation, a Water Use Licence and Protected Species Permits. Project Manager. [EAP, ECO]
2016 - 2017:	Transnet National Ports Authority. Construction of an additional rail line within the Port of Richards Bay, Kwazulu-Natal.

	Environmental Assessment Practitioner services for obtaining Environmental Authorisation, a Water Use Licence and Protected Species Permits. Project Manager
2016:	Eskom Distribution Limited. Clocolan-Ficksburg 88 kV Power Line and Marallaneng Substation, Free State. Environmental Assessment Practitioner services for amending the existing Environmental Authorisation and obtaining Water Use Authorisation] Project Manager.
2016	ISimangaliso Wetland Park, World Heritage Site: Redevelopment of the St Lucia Estuary Precinct Environmental Impact Assessment (Basic Assessment) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager. [EAP, ECO]
2015 – 2016	Eskom: Proposed 100 MW Concentrated Solar Facility (CSP 2) near Upington within the Northern Cape Environmental Impact Assessment including Scoping, Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager
2015 – 2016	Eskom: Proposed 100 MW Concentrated Solar Facility (CSP 3) near Upington within the Northern Cape Environmental Impact Assessment including Scoping, Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager
2015	Eskom Transmission: Site Specific Addendums to the Construction and Operational Environmental Management Programmes for the construction of the Kappa - Omega 765 kV Transmission Line within the Western Cape. Compilation of site specific addendums to the Construction and Operational Environmental Management Programmes (EMPr) for the Kappa-Omega 765 kV Transmission Line. Activities undertaken included the liaison with landowners, commissioning of specialists, correspondence to authorities, drafting of application for amendments and review of specialist reports. [Project Manager, EAP, ECO]
2015	Rehabilitation Plan for the Amatikulu Sand Mining Operation (Mr K.A Pearse) Rehabilitation Plan as required by DMR for a Sand Mining operation on the Amatikulu River (EMP: REF KZN30/5/1/2/10086MP)
2015	Mine Closure Plan for the Amatikulu Sand Mining Operation (Mr K.A Pearse) Drafting of Mine Closure Report, Environmental Risk Report and Final Performance Assessment Report for the closure of Mine PERMIT NUMBER (KZN 30/5/1/2/10086MP)
2014 – 2016	Vodacom Environmental Screening of proposed Vodacom Towers and Base Stations including review of current legislation, Public Participation, commissioning of specialists (if required), drafting of Terms of Reference, correspondence with authorities and Environmental Compliance Monitoring
2014	Mhlathuze Water, Jozini - Ingwavuma Water Supply Scheme (Zones 8-12) near Jozini, Northern KwaZulu-Natal. Environmental Impact Assessment (Basic Assessment) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager.
2014	Department of Public Works: Proposed Marula Pack House and Jam processing facility near Manguzi, Northern KwaZulu-Natal. Environmental Compliance Monitoring and submission of quarterly audit reports to the Department of Environmental Affairs. Project Manager.
2014-2015	Senekal Boerdery – Agricultural Development near Mkuze, Northern KwaZulu-Natal.

	Environmental Impact Assessment (Full EIA) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager.
2014-2015	Mhlatuze Water, Jozini - Ingwavuma Water Supply Scheme: Environmental Compliance Monitoring Environmental Compliance Monitoring of all contractors involved in the construction of the Jozini – Ingwavuma Water Supply Scheme. Duties included environmental compliance monitoring, environmental auditing and assisting with permit applications as and when required.
2012-2015	iSimangaliso Wetland Park, World Heritage Site: Redevelopment of the Sodwana Beach Node Environmental Impact Assessment (Basic Assessment) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager
2008-2018	iSimangaliso Wetland Park, World Heritage Site: Environmental Auditing Environmental Auditing and Compliance Monitoring of infrastructure developments within the iSimangaliso Wetland Park.
2007-2013	iSimangaliso Wetland Park, World Heritage Site: Phase 4 Infrastructure Development Programme. Environmental Management Programme Environmental Management of infrastructure development programme, including processes required in terms of both iSimangaliso internal procedures and EIA Regulations under Sections 21 and 22 of the Environment Conservation Act 73 of 1989; compilation of Environmental Management Plans (EMP) and EMP compliance monitoring for upgrades and construction of roads and other tourist and Park infrastructure on the Eastern and Western Shores, uMkhuze and Coastal Forest Reserve for the Wetlands Authority, iSimangaliso Wetland Park.
2007 - 2018	iSimangaliso Wetland Park, World Heritage Site: Buffer Zone Management Assistance to iSimangaliso in identifying and assessing potential impacts of proposed developments in iSimangaliso's Zone of Influence, and preparing comment on behalf of iSimangaliso on such developments as part of formal EIA and other legal planning processes.
2013	Department of Public Works: Proposed Marula Pack House and Jam processing facility near Manguzi, Northern KwaZulu-Natal. Environmental Impact Assessment (Basic Assessment) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager.
2013	Richards Bay Industrial Development Zone (RBIDZ): Proposed widening of Medway Road within Richards Bay, Northern KwaZulu-Natal. Environmental Impact Assessment (Basic Assessment) including Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. Project Manager.
2013	Eskom Transmission: Construction and Operational Environmental Management Programmes for the construction of the Kappa - Omega 765 kV Transmission Line within the Western Cape. Compilation of the Construction and Operational Environmental Management Programmes (EMPr) for the Kappa-Omega 765 kV Transmission Line. Activities undertaken included the liaison with landowners, commissioning of specialists, correspondence to authorities, drafting of water use licence applications and review of specialist reports. Project Manager.
2013	UMkhanyakude District Municipality, Extension to the Mtubatuba Water Treatment Works. Compilation of the Environmental Management Plan (EMP), commissioning of specialists and correspondence to authorities. Compliance monitoring and submission of Environmental Compliance Audit Reports to the relevant authorities. Project Manager

2012	<p>Sasol Onshore Seismic Exploration (Mozambique) Implementation of Compensation Procedures in line with World Bank requirements for Sasol's Onshore Seismic Exploration Activities in, Inhambane Province, Mozambique. [Project Manager, EAP]</p>
2012	<p>Sasol Natural Gas Project: Resettlement Planning and Implementation Program – Offshore: Sofala 3D Shallow Water Seismic Exploration (Mozambique) Implementation of Compensation Procedures in line with World Bank requirements for Sasol's Offshore Seismic Exploration off the Sofala Banks, Sofala Province, Mozambique. [Project Manage, EAP].</p>
2012	<p>Transnet Capital Projects, Nsezi Rail Upgrade Technical Scoping Report including the commissioning of specialists, drafting of Terms of Reference and correspondence with authorities. [Project Manager, EAP]</p>
2011	<p>Mozambique Coal Industry Export Initiative Rail and Port Infrastructure Study (FEL 1 and 2): Environmental Aspects (Mozambique) Initial assessment and high level screening of environmental site selection criteria and concept designs for a deep water coal export port and associated rail links. The outcomes of the project included an integrated FEL 1 and FEL 2 report which included site screening, a description of the environment, identification of fatal flaws and red flags, and possible socio-economic development opportunities. [EAP]</p>
2010 – 2011	<p>Mulilo Renewable Energy, Thukela Hydro Electric Power Schemes Environmental Impact Assessment including Scoping, Public Participation, commissioning of specialists, drafting of Terms of Reference, correspondence with authorities and applications for water use permits. [Project Manager, EAP]</p>
2010	<p>CBM Agricultural Development Project (Mozambique) Environmental Authorisation Process including an Environmental Pre-viability Study and Definition of Scope of Work for the Impact Assessment. [EAP]</p>
2008 – 2009	<p>Transnet Capital Projects, Geotechnical Survey of the Port of Richards Bay Environmental Authorisation Process including the compilation of five Basic Assessment Reports, commissioning of specialists and correspondence to authorities and Interested and Affected Parties. [Project Manager, EAP]</p>
2008 – 2009	<p>Sasol Offshore Seismic Exploration (Mozambique) Implementation of Compensation Procedures in line with World Bank requirements for Sasol's Offshore Seismic Exploration Activities in Blocks 16 and 19, Inhambane Province, Mozambique. [Project Manager]</p>
2009	<p>Transnet Capital Projects, Amendment to Sand Mining EMP Amendment to existing Transnet Limited sand Mining EMP: Portion 12 of Reserve 6, No. 15825 GV within the District of uMhlatuze Application No. KZN6/2/1221</p>
2008	<p>uMlalazi Local Municipality, Eshowe Environmental Planning Services</p>
2008	<p>Proposed re-engineering of Durban Container Terminal in the Port of Durban Environmental Impact Assessment Report in support of an Application for Exemption</p>
2008	<p>iSimangaliso Wetland Park, World Heritage Site: Placement of the DAR 1 and DAR 2 to Construct Artificial Reefs. Drafting of the Technical Guidelines for the placement of the DAR 1 and DAR 2 for the purpose of creating artificial reefs including appointment of specialists, drafting of Terms of Reference, review of specialist reports, authority correspondence and assistance with establishing environmental monitoring programs. [EAP]</p>
2008	<p>KwaZulu-Natal Department of Transport: Roads, Causeways and Pedestrian Bridges EMP Compliance Monitoring [ECO]</p>

2007 **KwaZulu-Natal Department of Transport: Environmental Authorisation process and Mining Licences for the opening of Borrow Pits and Quarries required for the upgrade of Sani Pass Road (P318): Phase 1, KwaZulu-Natal, South Africa**
 Assisting author in the compilation of the Scoping and EIA for the design, preconstruction, construction, rehabilitation and maintenance phases of the proposed Borrow Pit and Quarries as well as submission of documents to the Department of Mineral Resources. [EAP]

EDUCATION:

1989 - 1993 : **Greytown High School**

1995-1999 : **Bachelor of Science Rhodes University**
 (Majoring in Zoology and Geography)

2000 : **Honours Degree Rhodes University**
 Ichthyology Fisheries Science

2001 –2003 : **Master of Science Rhodes University**
Thesis Title: AN INVESTIGATION INTO THE CAPTIVE SPAWNING, EGG CHARACTERISTICS AND EGG QUALITY OF THE MUD CRAB (*Scylla serrata*) IN SOUTH AFRICA. (Located at: <http://eprints.ru.ac.za/50/>)

EMPLOYMENT HISTORY:

2007 – Present **Agricultural, Community, Environmental and Rural Development Consultants (Pty) Ltd. t/a ACER (Africa) Environmental Consultants**
 Director and Senior Environmental Consultant

2005 – 2007 **AQUAZUL (Aquaculture Consultant/Facilitator) [Self Employed]**
Projects Included:

2005 – 2006 **Agricultural Research Council (ARC)**
 Project Manager for the Department of Science and Technology (Government) Small Scale Community Aquaculture development initiative in KwaZulu Natal Tugela Estates project.

2005 – 2006 **Agricultural Research Council (ARC)**
 Project Manager for the Department of Science and Technology (Government) Small Scale Community Aquaculture development initiative in KwaZulu Natal Makhathini Flats Cage culture Project (*Tilapia spp.*).

2005 – 2006 **Agricultural Research Council (ARC)**
 Project Manager for the Department of Science and Technology (Government) Small Scale Community Aquaculture development initiative in KwaZulu Natal Riverview Hatchery (*Tilapia*).

2006 **Golder Associates**
 Assessment of the Aquaculture potential of the Sondos Agricultural Project near Khartoum in the Sudan.

2003 – 2005 **Stellenbosch University (Aquastel)**
 Farm Manager Riverview Tilapia Farm – Assessment of *Tilapia (O. mossambicus)* for commercial pond culture in Northern KwaZulu-Natal.

GILES CHURCHILL

Languages:

LANGUAGE	SPEAK	READ	WRITE
English	Excellent	Excellent	Excellent
Afrikaans	Fair	Excellent	Fair

References:

Mr A Zaloumis
CEO – iSimangaliso Wetland Park
Email: apz@worldonline.co.za
Tel: 035 5901663

Mr Vishane Ramharak
AECOM
Email: vishane.ramharak@aecom.com
Tel: 084 0388 011

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe my qualifications and experience.



Giles John Churchill
1 August 2020

ANNEXURE 2 – REHABILITATION PLAN

ANNEXURE 3 – CHANCE FINDS PROTOCOL