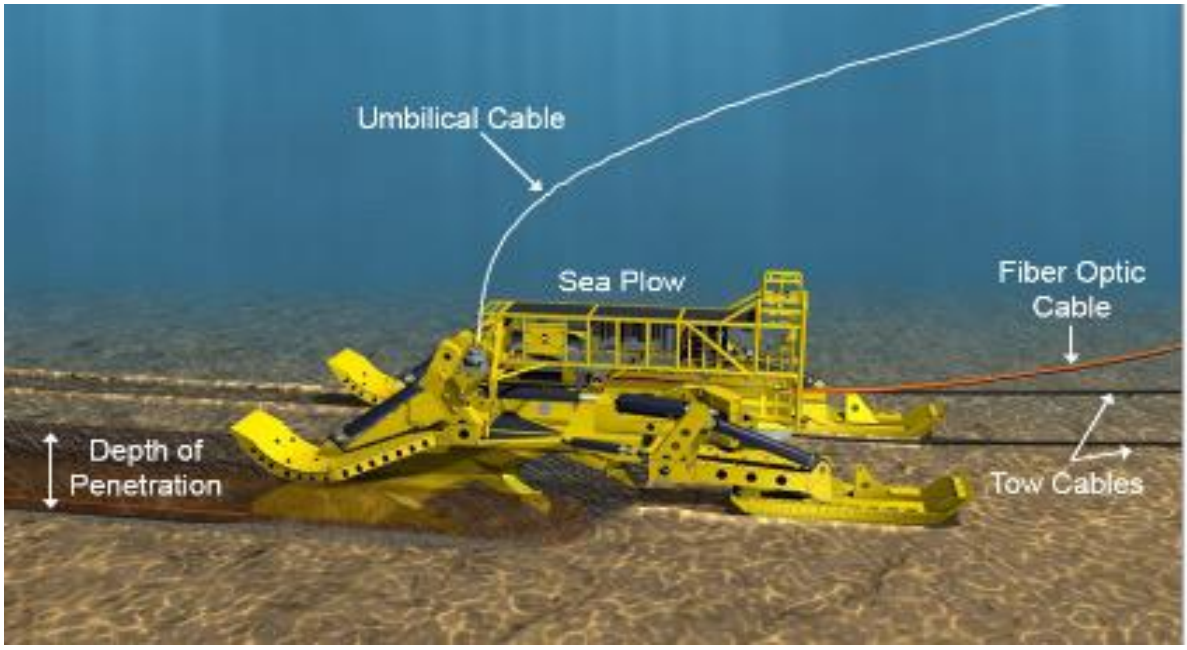
ENVIRONMENATAL AND SOCIAL IMPACTS ASSESSMENT STUDY REPORT



FOR THE PROPOSED INSTALLATION OF PEACE SUBMARINE FIBRE OPTIC CABLE IN KENYA TERRITORIAL WATERS UP TO THE KENYA BEACH MANHOLE IN NYALI, MOMBASA COUNTY

PROPONENT	
Telkom	**TELKOM KENYA LIMITED** **P.O BOX 30301-00100.** **NAIROBI - KENYA**
ENVIRONTECH	**ENVIRONTECH CONSULTANCY AFRICA LTD** **P.O Box 16601- 00100 Nairobi** **NEMA EIA/Audit Firm REG. No. 6085** **NEMA EIA/EA Lead Expert: 2930**
MAY 2021	

CERTIFICATION

Environtech Consultancy Africa Ltd submits the following Environmental and Social impacts Assessment Study (ESIA) Study Report for the proposed Installation of PEACE Submarine Fibre optic cable in Kenya territorial waters up to the Kenya Beach Manhole in Nyali, Mombasa County.

We, certify that the information provided is accurate and truthful.

Proponent: Telkom Kenya Ltd

Assignment: Environmental and Social Impact Assessment for the proposed Installation of PEACE Submarine Fibre optic cable in Kenya territorial waters up to the Kenya Beach Manhole in Nyali, Mombasa County.

Report Title: Environmental and Social Impact Assessment Study Report

FIRM OF EXPERTS:

ENVIRONTECH CONSULTANCY AFRICA LTD

Lead Expert NEMA Reg No**. 6085**

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Signed: _____ Date: _____

Stanley Mathenge Mwangi (MSC. Chemistry, MSC. Environmental Resources and Management)

Lead Expert NEMA Reg No**. 2930**

ENVIRONTECH CONSULTANCY AFRICA LTD.

PROPONENT:

TELKOM KENYA LIMITED

P. O. BOX 30301-00100

NAIROBI - KENYA

Signed: _____Date: _____

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ACRONYMS

BAP	Barrel Assemblies
BID	Background Information Document
BMH	Beach Man Hole
BMP	Best Management Practices
BTL	Bell Telephone Laboratory
CA	Communication Authority
CDA	Coast Development Authority
COMRED	Coastal and Marine Resources Development
Covid-19	Corona Virus Disease of 2019
CPP	Consultation and Public Participation
CTD	Conductivity, Temperature, and Depth
DARE 1	Djibouti-Africa Regional Express
DGPS	Differential Global positioning system
DMP	Disaster Management Plan
DoEWE	Department of Environment, Waste Management and Energy
DOIM	Deputy Offshore Installation Manager
DOSHS	Directorate of Occupational Safety and Health Services
EACC	East African Coast Current
ECA	Environtech Consultancy Africa Ltd
ECO	Environment Compliance officer
EEZ	Exclusive Economic Zone
EMCA	Environmental Management and Coordination Act
EOB	End of Burial
ESF	Environment and Social Framework
ESIA	Environmental and Social Impact Assessment
ESM&MP	Environmental and Social Management and Monitoring Plan
FwD	Forward
GcGPS	Globally corrected Global Positioning System
GDP	Gross Domestic Product
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
GS	Gravity Sample
HRA	High Risk Area
ICT	Information and Communication Technology
KCGS	Kenya Coast Guard Services

KeMFRI	Kenya Marine and Fisheries Institute
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KMA	Kenya Maritime Authority
KURA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Service
LK	Product name of specific cable tie
MEA	Multilateral Environmental Agreement
MMP&R	Mombasa Marine Park and Reserve (MMP&R)
MOG	Mogadishu
NEMA	National Environment Management Authority
NEs	Network Elements
NMK	National Museums of Kenya
NMS	Network Monitoring Systems
OIM	Offshore Installation Manager
OOS	Out of Service
OOW	Officer of the Watch
OS	Operation System
PEACE	Pakistan & East Africa Connecting Europe
PLGR	Pre-Lay Grapnel Run
RA	Risk Assessment
RCO	Route Clearance Operation
ROV	Remotely Operated Vehicle
RPL	Route Position Lists
SQL	Structured Query Language
Stbd	Starboard
TKL	Telkom Kenya Ltd
TSS	Traffic Separation Scheme
UHF	Ultra-High Frequency
UKMTO	United Kingdom Maritime Trade Operations
UNFCCC	United Nations Framework Convention on Climate Change
VEC	Valued Ecosystem Component
VRA	Voluntary Reporting Area
WBG	World Bank Group
WD	Water Depth
WGS	World Geodetic System

EXECUTIVE SUMMARY

There are numerous challenges to the Kenyan environment today. This has occurred because of unsustainable development projects, many of which have led to environmental degradation. In an effort to address this problem, the Kenya Government came up with legislation enshrined in the Environmental Management and Coordination Act, 1999 (Revised, 2015). Through this Act, the National Environment Management Authority (NEMA) was instituted, which has the statutory mandate to supervise and coordinate all environmental activities. EMCA's main role is to advocate, oversee and enforce environmental management. Under EMCA, it is a mandatory requirement that all projects are economically viable, socially acceptable and environmentally sound. For this reason, all new development projects are required to undergo an Environmental and Social Impact Assessment (ESIA). ESIA assesses the environmental and socio-economic impacts of a project before it is implemented to identify the likely environmental and social impacts of projects and propose mitigation measures for the adverse impacts.

The Environmental (Impact Assessments and Audit) Regulations, 2003 (Legal Notice 101) provide for the procedure and conduct for conducting environmental impact assessments and audits. The second schedule of the EMCA, 1999 that lists the projects that must undergo EIA has been amended by Legal Notice No. 31 & 32 of 2019 (The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. Legal Notice No 31 has reclassified the projects and facilities requiring EIA based on their risk to as Low, Medium, and High-risk projects. Legal Notice No. 32 of 2019 amended section 7 of legal notice 101 to require proponents of low risk and medium risk projects to submit an Environmental Impact Assessment (EIA) Summary project Report (SPR) while the proponents of High-Risk projects are required to submit a Comprehensive Study Report (CPR) to NEMA. The installation of PEACE Submarine fibre optic cable on Kenya Territorial Waters is classified high risk project. The study has also been undertaken in line with the requirements of World Bank Group (WBG) Environment and Social Framework (ESF) (2017).

Telkom Kenya Ltd (hereafter referred to as the Project Proponent/TKL), appointed **Environtech Consultancy Africa Ltd**, a registered Firm of Environmental Experts, Firm Registration No **6085**, to carry out the Environmental and Social Impact Assessment (ESIA) study for the proposed installation and operation of approximately 27 km of the Pakistan & East Africa Connecting Europe (PEACE) submarine fibre optic cable (hereafter referred to as the Project) in Kenya Territorial Waters. This was to comply with the Environmental Management and Coordination Act, 1999 (Revised, 2015). The Project involves the installation and operation of approximately 27 km of the submarine cable. TKL is the landing party of in Kenya for the PEACE submarine Optic Cable. The cable will connect Asia, Africa and Europe, providing an open, flexible and carrier-neutral services for its customers.

1. INTRODUCTION

1.1. Background information

Pakistan & East Africa Connecting Europe (PEACE) connects Asia, Africa and Europe, providing an open, flexible and carrier-neutral services for its customers. The PEACE submarine fibre optic cable is targeted for completion in 2021. When complete, the high-speed PEACE cable system will offer the shortest routes from China to Europe and Africa, interconnecting three of the world's most populous continents whilst at the same time dramatically reducing latency, delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications.

Telkom Kenya Limited (TKL) is the landing party to the PEACE cable and the project proponent for the PEACE cable landing in Kenya. The proposed project consists of marine components up to the beach manhole (BHM). This entails installation of a submarine cable for distance totaling to 26.583km from Kenya's maritime boundary, Exclusive Economic Zone (EEZ).

1.2. Project Proponent

TKL is an integrated telecommunications provider in Kenya. TKL was previously a part of the Kenya Posts and Telecommunications Corporation (KPTC) which was the sole provider of both postal and telecommunication services in the country. The company was established as a telecommunications operator in April 1999, after the split of Kenya Postal and Telecommunication Company (KPTC) into the Communications Commission of Kenya (CCK) now Communication Authority (CA), the Postal Corporation of Kenya (POSTA), and Telkom Kenya. The company is 60% owned by Helios Investment Partners[1], with the remaining stake held by Kenyans through the Kenyan Government.

TKL provides integrated telecommunications solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data, mobile money, and network services. Powered by its vast fiber optic infrastructure, it is also a major provider of wholesale, carrier-to-carrier traffic within the Kenya.

1.3. Purpose of the Report

The information contained in this Environmental and Social Impact Assessment (ESIA) Project Report, along with comments and inputs received from stakeholders and commenting authorities, will assist the competent authority, the National Environment Management Authority

[1] Helios was founded in 2004 to focus exclusively on private investment in Africa. Since its establishment, Helios has raised three private equity funds. Helios also took over the Modern Africa Fund in 2004, rationalizing and fully exiting the portfolio by 2007. In June 2016, Helios acquired 60% of Telkom Kenya, following receipt of regulatory approval.

(NEMA), in deciding whether or not to grant environmental authorization for the Project, and to inform the conditions associated with such authorization.

The ESIA process involves the identification, prediction and evaluation of actual and potential environmental and social impacts of the Project and outlines the mitigation measures for negative impacts and enhancement measures for positive impacts which the Project Proponent will implement.

The objectives of this document are to:

- Communicate the results of the ESIA process for the Project and alternatives considered;
- Ensure that the impacts identified during the ESIA process are assessed;
- Present the mitigation and enhancement measures which will be implemented by the Project Proponent to manage the impacts identified;
- Provide a record of comments and responses received from Stakeholders during the ESIA process; and
- Facilitate an informed decision-making process by the relevant authorities.

1.4. Project Justification

The TKL's PEACE Submarine Cable System will expand international telecommunication services through providing open and flexible services for TKL's customers. As such, the network would facilitate transmission of data, voice, internet and television signals allowing for international transmission of information, thereby bridging the information gap between Kenya and the rest of the world. Moreover, the high-speed PEACE cable system will offer the shortest routes from China to Europe and Africa, interconnecting three of the world's most populous continents whilst at the same time dramatically reducing latency, delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications.

1.5. Overall Objective of the Project

The high-speed PEACE Submarine fibre optic cable will offer the shortest routes from China to Europe and Africa, interconnecting three of the world's most populous continents whilst at the same time dramatically reducing latency, delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications.

1.6. Scope, Objectives and Terms of Reference (TOR)

1.6.1. Overall objective of the ESIA study

The objectives of the ESIA are to:

- Identify all potentially significant adverse environmental and social impacts of the Project and recommend measures for mitigation;

- Gather baseline data to inform the assessment of impacts and to monitor changes to the environment as a result of the Project as well as evaluate the success of the mitigation measures implemented;
- Recommend measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts; and
- Prepare an ESIA Project Report compliant to Environmental Management and Coordination Act (EMCA) and the Environmental (Impact Assessment and Audit) Regulations of 2003 (and the Amendments of 2016 and 2019), detailing findings and recommendations for review by NEMA.

1.6.2. Scope of EIA

The proposed scope of works for the study is in compliance with EMCA of 1999 (and 2015 Amendments) and the Environmental (Impact Assessment and Audit) regulations of 2013 (and the Amendments of 2009, 2016 and 2019) and include:-

- Determination of baseline data using primary data generation and secondary data available from various government published on air, meteorology, water, soil, flora & fauna, socio- economics, infrastructure, sensitive areas (forest, archaeological, historical etc.);
- Detailed description of all elements of the project activities during the preconstruction, construction and operational phase. The elements analyzed include the infrastructures of the project including waste collection, disposal and management, utility requirements and anticipated sea traffic changes;
- Identification of the source of pollution and assessing the impacts on the environment due to proposed project if any;
- Preparation of ESIA documents with recommendations on preventive and mitigative measures for limiting the impact on environment to the desired level during various stage of project;
- Development of a suitable post-study monitoring program to comply with various environmental and social regulations;
- Risks assessment (RA) and Disaster Management plan (DMP) describing the probable risks and preventive & precautionary measures to be followed in the event of emergency situations such as accidents, fire etc., and
- The social, economic and political impact of the proposed project

1.6.3. Terms of Reference (ToRs) for the ESIA

The ToRs for the proposed project ESIA are in accordance with Environmental Management and Coordination Act (EMCA) of 1999 (and 2015 Amendments) and the Environmental (Impact Assessment and Audit) regulations of 2013 (and the Amendments of 2009, 2016 and 2019):

1) Describe location/site, objectives, scope, nature of the proposed project;
2) Describe the proposed project activities during the proposed project cycle; construction, operation, decommissioning phases;
3) Analyze materials to be used in the construction and implementation of the project, and wastes to be generated proposing alternative/appropriate options/technologies;
4) Establish the suitability of the proposed project in the proposed location;
5) Review and establish all relevant baseline information as will be required by NEMA (Physical, Biological and Social Cultural and Economic) and identify any information gaps;
6) Describe and analyze the policy, legal and institutional framework including but not limited to Kenyan policies, laws, regulation and guidelines; international guidelines related to the proposed project, which have a bearing on the proposed project and will also serve as benchmarks for monitoring and evaluation, and future environmental audits;
7) Undertake an in-depth description of the proposed project and associated works together with the requirements for carrying out the works;
8) Analyze the efficacy of the designs, technology, procedures and processes to be used, in the implementation of the works;
9) Carry out Consultation and Public Participation (CPP): Identify key stakeholders and affected persons; and hold a public meeting (as need be) and provide /collect written evidence i.e. minutes/questionnaires;
10) Identify and analyze proposed project alternatives including but not limited to Project site alternatives, no project alternatives, design alternatives, material alternatives and technologies alternatives;
11) Identify, predict and carry out in-depth analysis of all actual potential and significant impacts on flora, fauna, soils, air, water, the social, cultural and community settings; the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated to be generated by the proposed project, both positive and negative throughout the project cycle;
12) Analyze occupational health and safety issues associated with the proposed project;
13) Recommend sufficient enhancement and mitigation measures for all the potential positive and negative impacts identified and analyzed;
14) Develop an Environmental and Social Management and Monitoring Plan (ESM&MP) proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures;
15) Prepare a comprehensive ESIA study report in accordance with EMCA 1999 and EMCA (amendment) 2015 and legislation under it;
16) Submit a draft ESIA Study report to the client for review;

17) Incorporate comments into the ESIA study report after review by client into a final ESIA study report;
18) Submit 10 hard copies and one soft copy of the ESIA study report to NEMA for the purposes of seeking a NEMA license that will approve the proposed project;
19) Submit to the client one copy of NEMA referenced ESIA study report, one soft copy of the ESIA study report and acknowledgment letter from NEMA;

1.7. Methodology of the EIA full study

1.7.1. Screening

The Project was screened to determine the need to undertake an ESIA based on:

- Project characteristics;
- Project area characteristics;
- The Second Schedule of EMCA (as amended in the Environmental (Impact Assessment and Audit) Regulations amendments of 2016, which lists the projects that must undergo an EIA; and
- World Bank Group (WBG) Environmental and Social Standards, 2017.

Based on the above criteria, it was concluded that an ESIA resulting in the preparation of an ESIA Project Report would be required for the Project due to the following aspects:

- Legal Notices no. 149 of the National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2016 and no 31 National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2019 classifies the Project (Telecommunication Infrastructure) as Medium Risk which can be approved through the preparation and submission of a ESIA Project Report[2];
- Legal Notice no. 32 of the National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2019 which states that every proponent undertaking a project specified in the Second Schedule of the Act as being a low risk project or a medium risk project, shall submit to the Authority a Summary Project Report of the likely environmental effects of the project;
- The fact that the Project is located within both natural and critical habitats; and
- The nature and extent of the potential impacts of the Project on the natural and critical habitats.

[2] As per the 2016 and 2019 amendments of the National Environment (Impact Assessment and Audit) Regulations, Projects are classified as Low, Medium and High Risk based on their environmental and social risks. Low and Medium Risk projects maybe approved through the submission of ESIA Project Reports; however, these amendments specify that High Risk projects shall require submission of an ESIA Study Report.

1.7.2. Desk Reviews

A literature review was undertaken based on the findings of the reconnaissance process, which involved reviewing legislation, policies, the County Integrated Development Plan (CIDP), and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional and biophysical/socio-economic environmental setting of the Project area.

The desk-based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement.

1.7.3. Site Visits

A site investigation[3] was undertaken from March 23-26 2021 and on Wednesday May 5 2021 during which detailed environmental and social baseline data was collected and preliminary stakeholder engagement undertaken. Data was collected through:

- Sharing the Project's Background Information Document (BID), and presented as Annex C) to identified formal stakeholders and requesting them to share their views/ comments on the Project;
- Focus Group Discussions (FGD) with the Area Chief and village elders; and
- Site walkovers.

Photography and Global Positioning Systems (GPS) were used to record the salient features and baseline conditions at the Project site and surroundings.

1.7.4. Baseline Data Collection

In order to understand the existing baseline environmental and social conditions in the project area, a variety of data collection methods were used. These are described below:

1.7.4.1. *Remote Sensing and GIS Analysis*

Remote sensing was undertaken and ground-truthing done by the consultants at the time of the site visit. Remote sensing was based on available satellite imagery of the Project area.

1.7.5. Data Analysis and Evaluation of Alternatives

The analytical process involved physical, socio-cultural, mathematical, and economic models, including evaluating costs and benefits. The models required expert judgment for accurate predictions. The emphasis was on the project location, design, technology, scale, or any other aspect that may be deemed significant in evaluating project alternatives.

[3] Site visits and investigations were conducted in strict adherence to Ministry of Health (MoH) guidelines on combating the spread of Corona Virus (Covid-19) disease. Masks and social distancing were mandated.

1.7.6. Stakeholder Engagement

Undertaking stakeholder engagement process conforming to the NEMA regulation as provided in Regulation 17 of the Environmental (Environmental Assessment, Impact and Audit) Regulations, 2003. Best international practice (World Bank, IFC and JICA) requiring that public consultation and disclosure process leading to Social and Environmental Assessment and Management Systems was also done.

1.8. Team Members

Environtech Consultancy Africa Ltd (ECA) was appointed by the Project Proponent to undertake the ESIA for the Project. ECA have no financial ties to, nor are they a subsidiary, legally or financially, of the Project Proponent. ECA is a multi-disciplinary and independent company of consulting environmentalists and scientists with world-wide experience. The Company headquarters are in Nairobi, Kenya.

The ESIA team for this Project is presented in Table 1-1.

Table 1-1 ESIA Team

No.	Name	Terms Of Reference
1	Dr. Francis Mwaura PHD -(**Lead Expert-0077 Biodiversity, ecosystem and NMR, Marine and Aquatic)** Stanley Mathenge Mwangi-(**lead Expert-2930**) Environmental and resources Management) ***Environmentalist/ Team Leader***) Kevin Musiega **(Lead Expert 1682**) (***Environmentalist***) Ambuya John (**Lead expert -8618**) (***Environmentalist***)	• Coordinating the other team members in the execution of the assignment. • Preparation of specific Terms of reference for each team member. • Keeping record of the assignment progress and reporting the same to client • Guidelines on the ESIA reporting/formats • Undertaking a flora and fauna survey of the study site by identifying and describing plant and animal communities present. • Identifying species and features of importance • Undertaking a fauna survey of the study site identifying and describing fauna communities present. • Identification of fauna species and features of importance • Compiling the final report

No.	Name	Terms Of Reference
	Dr. Christopher Mulanda Aura (PhD) **Marine and aquatic specialist**	**Marine and aquatic sciences-** Remote Sensing and GIS, Modeling & Projections, Environmental & Aquatic Sciences, Advanced Oceanography & Limnology, Climate Change Scenarios, Fisheries, Aquaculture, Socio-economics, Sustainability Sciences, Ecology, Data Analysis, Monitoring & Evaluation, Scientific/Art Writing & Reporting.
2	Joy Nabwire Wasirimba **-(Lead expert 6551**) **(sociologist/ Environmentalist)**	• Collecting socioeconomic and cultural baseline data of the project area • Mobilizing members of public for consultation exercise • Facilitating Consultation and public participation exercise • Identifying the socioeconomic and cultural impacts likely to emanate from the project. • Developing mitigation measures for the negative impacts socioeconomic impacts. • Consultation of stakeholders.
3	Eng. Andrew Gitau Gathekia-(Civil and structural Engineer/ Environmentalist -**Associate Expert 8002**)	• Interpreting the designs of the project • Giving the details of the construction activities of the project • Identifying the materials to be used for construction
4	Eng James Ngunjiri **Telecommunication engineering**	Interpreting and advising on Fibre optic Cable and telecommunication Matters
5	Job Mucoki (Assistant)-(**Associate expert -6803**)	Assisting the team as per assigned duties.

1.9. Report Structure

The ESIA full study report will be prepared in accordance to section 58 of the Environmental EMCA and in accordance with part II of the Environmental (Impact Assessment and Audit) Regulation, 2003, legal notice No. 101. The structure of this ESIA Project Report is outlined in Table 1-2.

Table 1-2 Report Structure

Section	Contents
Chapter 1: Introduction	Contains an overview of the Project, Project justification, Project Proponent, ESIA Objectives and Scope, Environmental and Social Impact Assessment Consultant and an outline of the report structure. Also outlines the approach to the ESIA and summarizes the process undertaken by the Project to date.
Chapter 2: Project Description	Includes a detailed description of the Project activities.
Chapter 3: Biophysical and Socio-economic Baseline	Describes the receiving biophysical and socio-economic baseline environment.
Chapter 4: Legal and Institutional Framework	Outlines the legislative, policy and administrative requirements applicable to the Project.
Chapter 5: Consideration of Alternatives	Describes the alternatives that have been considered and the reasons for the selection of the preferred alternative.
Chapter 6: Stakeholder Engagement	Describes the approach to and outcomes of the stakeholder engagement and public participation process.
Chapter 7: Impacts Assessment and Mitigation Measures	Describes and assesses the potential environmental and social impacts of the Project. Mitigation measures are also presented.
Chapter 8: ESM&MP	Specifies the mitigation and management measures to be undertaken and shows how the Project will mobilize organizational capacity and resources to implement these measures.
Chapter 9: Conclusions and Recommendations	Summarizes the key findings of the ESIA process and provides recommendations for the mitigation of potential impacts and the management of the Project.
References	Contains a list of references used in compiling the report.

In addition, the Report includes the following Annexes:

Annex A: ECA NEMA Registration and 2021 Practicing License

Annex B: NEMA Correspondences

Annex C: Background Information Document (BID) used during the Stakeholder engagement exercise

Annex D: Detailed minutes of stakeholder engagement meetings conducted during the ESIA process, including meeting photos and attendance registers/stakeholders' comments.

2. PROJECT DESCRIPTION

2.1. Project Overview

The Pakistan& East Africa Connecting Europe (PEACE) Cable System is a submarine fiber optic system connecting Pakistan, Kenya, Djibouti, East Africa, and Europe through Egypt, and connecting other countries through branching units (BU). As one of the international landings, PEACE Cable will land in Kenya from BU KAR (Karachi) to Mombasa landing site.

PEACE Cable will land in Kenya at Mombasa landing site which will be the Telkom House in Nyali, Mombasa County. In Kenya territorial waters, the Project involves installation and operation of approximately 27km of a 36mm submarine cable by appointed system installation subcontractor under assistance of Telkom Kenya Limited (TKL). The system will adopt the latest 200G technology which provides the capability to transmit over 16 Terabytes per second (Tbts/s) per fiber pair, servicing growing regional capacity needs, which have increased in the backdrop of the Corona Virus Disease (Covid-19) pandemic.

A geographical Overview of the cable system is shown in Figure 2-1 below.

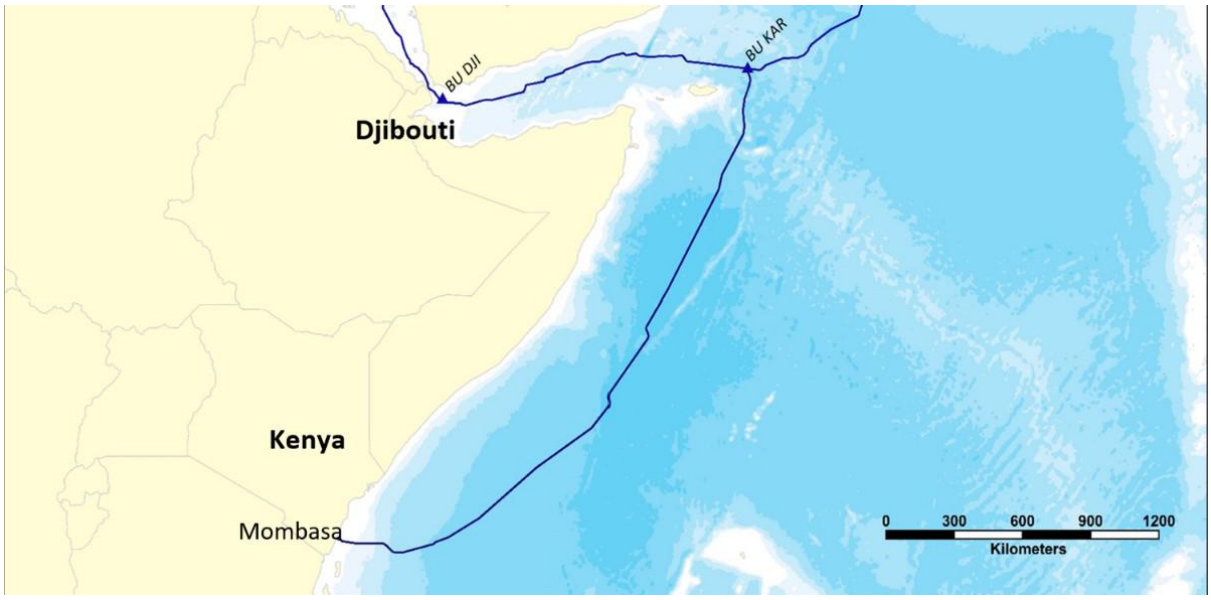

Figure 2-1 Overview of the PEACE Submarine Cable System

2.2. Proposed Project Background

2.2.1 Proposed Project Location

As previously stated, the proposed project location is in Kenya, Mombasa county, Nyali Subcounty, Nyali ward and then within the Kenyan territorial waters. The project area of installation will be both on both onshore and offshore Kenyan Coastline. The Kenya territorial waters component will consist of a portion of land (the beach) in which the

PEACE cable will be laid before reaching the termination point at the BMH. The cable will laid a further 0.071km from the BMH (4° 2'59.10"S, 39°42'21.96"E) at Nyali, Mombasa County up to the Kenya Maritime Waters (4° 7'30.84"S, 39°54'42.36"E).

2.2.1. Proposed Project GPS Coordinates

The proposed project GPS coordinates is shown in Table 2-1 below.

2.2.2. Project Activities

The projects activities together with the equipment and cable material are detailed below. The project activities have been sub-divided into four phases namely;

1. Design;
2. Installation and Construction;
3. Operations and Maintenance; and
4. Decommissioning.

Table 2-1 Submarine Cable GPS Coordinates and Distance and features

No.	Event	Latitude	Longitude	Distance (km)		Approx Depth (m)	Burial Depth (m)	Additional Route Features
				Between Positions	Cumulative Total			
1	BMH	4° 2'59.10"S	39°42'21.96"E		0.000	-12		Mombasa, Kenya
				0.000			2.0	0.050km beach coil and 0.021km allowance.
2	Cable Allowance	4° 2'59.10"S	39°42'21.96"E		0.000	-12		
				0.154			2.0	
3	POL	4° 3'1.38"S	39°42'26.40"E		0.154	-5		Anchor Block
				0.074			2.0	
4	POL	4° 3'3.06"S	39°42'28.08"E		0.228	-1		Low water mark.
				0.024			2.0	
5	LP	4° 3'3.66"S	39°42'28.62"E		0.252	0		Mombasa, Kenya
				0.124			1.5	
6	A/C	4° 3'6.48"S	39°42'31.44"		0.376	2		
				0.036			1.5	
7	POL	4° 3'7.62"S	39°42'31.92"E		0.412	2		Enter Marine National Reserve.
				0.382			1.5	
8	A/C	4° 3'19.08"S	39°42'36.60"E		0.794	2		
				0.323			1.5	
9	POL	4° 3'28.38"S	39°42'41.52"E		1.117	3		The border between very dense/ very stiff sediment and ROCK outcrop. Continue burial attempt.
				0.378			1.5	
10	A/C	4° 3'39.24"S	39°42'47.22"E		1.495	1		
				0.274			1.5	
11	A/C	4° 3'48.00"S	39°42'49.20"E		1.769	1		
				0.283			1.5	
12	A/C	4° 3'57.18"S	39°42'49.50"E		2.052	1		
				0.303			1.5	
13	A/C	4° 4'6.48"S	39°42'52.74"E		2.355	1		
				0.111			1.5	
14	A/C	4° 4'9.00"S	39°42'55.32"E		2.466	2		

No.	Event	Latitude	Longitude	Distance (km)		Approx Depth (m)	Burial Depth (m)	Additional Route Features
				Between Positions	Cumulative Total			
				0.138			1.5	
15	POL	4° 4'10.62"S	39°42'59.52"E		2.604	4		Enter area with intense fishing activities.
				0.024			1.5	
16	A/C	4° 4'10.92"S	39°43'0.24"E		2.628	5		
				0.055			1.5	
17	POL	4° 4'10.98"S	39°43'2.04"E		2.683	13		13m WD
				0.232			1.5	
18	A/C	4° 4'11.28"S	39°43'9.54"E		2.915	43		
				0.098			1.5	
19	POL/ Shore End	4° 4'10.32"S	39°43'12.60"E		3.013	48		End shore end; start surface lay.
				0.094			-	
20	A/C	4° 4'9.36"S	39°43'15.48"E		3.107	47		
				0.053			-	
21	POL	4° 4'9.18"S	39°43'17.16"E		3.160	41		Exit area with intense fishing activities.
				0.612			-	
22	A/C	4° 4'7.08"S	39°43'36.90"E		3.772	32		
				0.118			-	
23	POL	4° 4'7.20"S	39°43'40.74"E		3.890	41		Limit of Port Mombasa.
				0.668			-	
24	A/C	4° 4'8.04"S	39°44'2.40"E		4.558	136		
				0.393			-	
25	A/C	4° 4'9.72"S	39°44'15.00"E		4.951	148		
				0.077			-	
26	POL	4° 4'9.60"S	39°44'17.52"E		5.028	150		150m WD
				0.586			-	
27	POL	4° 4'8.58"S	39°44'36.48"E		5.614	160		160m WD
				0.071			-	
28	POL	4° 4'8.46"S	39°44'38.76"E		5.685	170		170m WD
				0.026			-	
29	POL	4° 4'8.40"S	39°44'39.60"E		5.711	180		180m WD
				0.156			-	

No.	Event	Latitude	Longitude	Distance (km)		Approx Depth (m)	Burial Depth (m)	Additional Route Features
				Between Positions	Cumulative Total			
30	POL	4° 4'8.16"S	39°44'44.64"E		5.867	177		177m WD
				0.092			-	
31	POL	4° 4'7.98"S	39°44'47.64"E		5.959	180		180m WD
				0.071			-	
32	A/C	4° 4'7.86"S	39°44'49.98"E		6.030	182		
				0.269			-	
33	A/C	4° 4'11.40"S	39°44'57.90"E		6.299	188		
				0.235			-	
34	Cable Crossing	4° 4'17.16"S	39°45'2.94"E		6.534	187		Fibre_Optic_Cable, DARE1 (As-laid RPL)
				0.246			-	
35	A/C	4° 4'23.22"S	39°45'8.16"		6.780	186		
				0.290			-	
36	A/C	4° 4'27.66"S	39°45'16.44"E		7.070	184		
				0.236			-	
37	POL	4° 4'28.62"S	39°45'24.06"E		7.306	184		Enter Security Zone.
				0.380			-	
38	A/C	4° 4'35.65"S	39°45'36.24"E		7.686	191		
				0.280			-	
39	Transition	4° 4'31.74"S	39°45'45.18"E		7.966	200		DA/ SA
				0.804			-	
40	PLDN	4° 4'36.36"S	39°46'10.86"E		8.770	314		End surface lay; start plough burial.
				0.002			1.5	
41	Slack Change	4° 4'36.36"S	39°46'10.92"E		8.772	314		Bottom slack changed from 1% to 0.15%.
				0.586			1.5	
42	POL	4° 4'39.72"S	39°46'38.28"E		9.358	312		Enter area with scars and sand waves.
				0.272			1.5	
43	A/C	4° 4'41.28"S	39°46'38.28"E		9.630	309		
				0.718			1.5	
44	A/C	4° 4'41.28"S	39°46'38.28"E		10.348	309		
				1.866			1.5	

No.	Event	Latitude	Longitude	Distance (km)		Approx Depth (m)	Burial Depth (m)	Additional Route Features
				Between Positions	Cumulative Total			
45	POL	4° 4'44.94"S	39°48'1.92"E		12.214	321		Exit area with scars and sand waves; enter area with mega ripples.
				0.872			1.5	
46	A/C	4° 4'46.80"S	39°48'30.12"E		13.086	330		
				1.688			1.5	
47	POL	4° 4'48.60"S	39°49'24.84"E		14.774	350		Exit area with mega ripples.
				0.339			1.5	
48	OCB	4° 4'48.96"S	39°49'35.82"E		15.113	355		Exit L18; enter L10A.
				1.932			1.5	
49	A/C	4° 4'51.00"S	39°50'38.40"E		17.045	380		
				0.514			1.5	
50	POL	4° 4'55.20"S	39°50'54.54"E		17.559	386		Exit Marine National Reserve.
				3.712			1.5	
51	A/C	4° 5'25.74"S	39°52'51.00"E		21.271	449		
				0.638			1.5	
52	A/C	4° 5'34.38"S	39°53'9.84"E		21.909	461		
				0.692			1.5	
53	A/C	4° 5'48.36"S	39°53'27.42"		22.601	472		
				0.649			1.5	
54	A/C	4° 6'5.04"S	39°53'40.32"E		23.250	481		
				0.110			1.5	
55	PLUP	4° 6'8.28"S	39°53'41.76"E		23.360	482		End plough burial; start PLIB.
				0.003			1.5	
56	Slack Change	4° 6'8.40"S	39°53'41.82"E		23.363	482		Bottom slack changed from 0.15% to 0.8%.
				0.541			1.5	
57	Cable Crossing	4° 6'24.48"S	39°53'48.96"E		23.904	487		Fibre_Optic_Cable, TEAMS (As-found)
				0.298			1.5	
58	Cable Crossing	4° 6'33.36"S	39°53'52.86"E		24.202	490		Fibre_Optic_Cable, TEAMS (Database)
				0.296			1.5	
59	PLDN	4° 6'42.12"S	39°53'56.76"E		24.498	492		End PLIB; start plough burial.
				0.002			1.5	

No.	Event	Latitude	Longitude	Distance (km)		Approx Depth (m)	Burial Depth (m)	Additional Route Features
				Between Positions	Cumulative Total			
60	Slack Change	4° 6'42.18"S	39°53'56.82"E		24.500	492		Bottom slack changed from 0.8% to 0.15%.
				0.280			1.5	
61	A/C	4° 6'50.52"S	39°54'0.48"E		24.780	495		
				0.909			1.5	
62	A/C	4° 7'13.56"S	39°54'19.02"		25.689	511		
				0.894			1.5	
63	Maritime Boundary	4° 7'30.84"S	39°54'42.36"		26.583	531		Kenya TW to Kenya EEZ

2.3. System Description

The wet plant will be initially designed and installed for the final capacity while the terminal station equipage will be adapted to the required initial capacity. The terminal station can be upgraded according to the growth of traffic demand. The Submarine Line Terminal Equipment (SLTE) provides the facility to insert new wavelengths without affecting the existing ones.

2.3.1. Wet-plant Configurations

2.3.1.1. *Submarine cable*

The submarine cable to be used for the PEACE project will be repeatered submarine cables.

HORC-1 cable could be used for this project. The cables are specifically designed for repeatered submarine cable system with full range of protection/armours to meet all types of seabed conditions.

The HT HORC-1 cable family has been specifically designed for regional and trans-oceanic submarine networks with a full range of protection techniques to meet the many different types of seabed conditions.

The key features of this product are as follows:

- The fibres have a defined excess length relative to the loose tube. The tube is filled with a water blocking compound to prevent the progression of water ingress in the event of a break;
- Layers of polypropylene yarn, flooded in bitumen, are applied over the armouring to provide corrosion protection;
- The cable design ensures that no strain is exerted on the fibres during normal operation;
- There is a number of different armour versions to suit different seabed conditions, the specific characteristics of the cables used in the draft RPL; and
- The cable has a design life of 25 years. Extensive ageing tests have been performed which ensure continuous system performance over the design life.

The appearance and typical characteristics of HORC-1 cables are shown in the following sections.

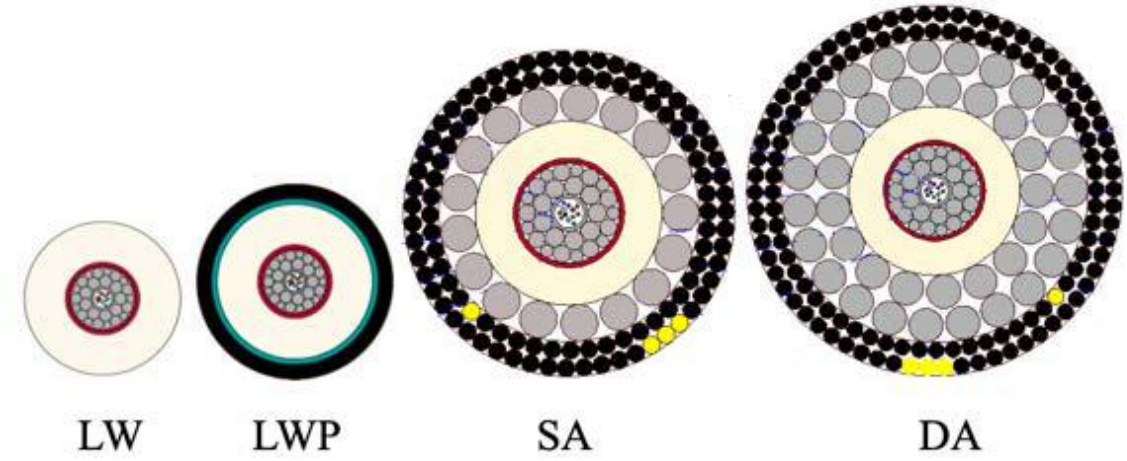

Figure 2-2 Overview of HT HORC-1

Table 2-2 Typically Characteristics of HT HORC-1

HT HORC-1	Unit	LW	LWP	SA	DA
Weight in air	Kg/m	0.6	0.8	2.4	4.5
Max Deploy Water Depth	m	8000	7000	2000	6000
Nominal Transient Tensile Strength (NTTS)	kN	50	50	210	420
Cable Breaking Load (CBL)	kN	60	60	275	560
DC resistance @ 20°C	Ohms/km	1.1	1.1	1.1	1.1
Operation Voltage	kV	12	12	12	12

2.3.2. Repeater

For PEACE Project, RPT 1660 R2 which can support up to 8 fibre pairs is proposed. The RPT 1660 adopts EDFA technology to amplify the optical signals.

Redundancy pumps and high reliability components are used in repeater to provide higher reliability.

Figure 2-3 Appearance of the HMN RPT 1660 R2

2.4. Pre-Lay Grapnel Run (PLGR)

2.4.1. General

Prior to the main lay installation operation, a Route Clearance Operation (RCO) & pre-lay grapnel run (PLGR) shall be carried out along the proposed cable route, in sections designated for burial. Out of service cables (OOS) shall be removed from the route as designated within the RPL. PLGR operations shall clear all debris that may prevent efficient installation & burial by the burial tool. The intention is to clear any seabed debris, for example, wires or hawsers, fishing equipment etc. that may have been deposited along the route. It is intended that, at the conclusion of PLGR and RCO, the route will be, as far as possible:

- Clear of OOS submarine cable systems;
- Clear of any chains, wires, ropes, warps, fishing equipment and any other items of equipment jettisoned, lost or abandoned; and
- Declared safe for cable laying and burial within the confines of the cleared route at the time of undertaking the route clearance operation.

Confirmation of the latest version of the RPLs will be established prior to operations, this being the primary source of reference for PLGR/RCO activity of the burial sections of the route. Wet-plant configurations

2.4.2. Cable Crossings

No towed equipment shall be used within 500m of any known and proven pipeline or in use submarine cable system unless specific written agreement has been reached between the Facility Owner and the Customer. Whilst within the 500m-exclusion zone, all towed equipment shall be recovered and secured on deck. At the time of writing, there are no known Pipelines or In-service cables along the cable route.

2.4.3. PLGR Operations

2.4.3.1. *PLGR Activities*

The PLGR may carried out by a tug or cable ship for buried area.

2.4.4. Deploying the Grapnels

The choice of grapnels to be used will depend on the nature of the seabed and burial depth proposed for the burial operations.

The PLGR vessel will pay out the grapnels until they are almost bottomed as the ship is maneuvered down the cable route. The amount of grappling wire to be paid out will be dependent on the depth of water and the graphs. The speed of the ship will be at the OIM's discretion but will be typically in the region of 1.5 to 2.0 Km/Hr. Once the required length of rope has been paid out,

rope pay-out will be stopped and the vessel will run down the advised cable route using the latest RPL provided.

2.4.5. Recovery of Grapnels

The grappling wire tension is monitored with Survey system and displayed in graphical form on the Bridge. During grappling, a steady rise in tension would normally indicate that an obstruction has been hooked. The Surveyor, OIM or DOIM will instruct the OOW to bring the vessel gradually to a stop.

The vessel will then manoeuvre to recover the grappling wire catenary. If the option is for a standard recovery, the grapnels are recovered with the vessel being manoeuvred either ahead or astern as required to maintain a satisfactory lead. Once the grapnels have been recovered to the stern they will be brought onto the aft deck with the hooked wire/obstruction. Debris will be stoppered off using chain stoppers and the grapnel disengaged. Depending on the extent of the debris it will either be recovered onto the working deck or may be slipped clear of the route. If slipping, a clump weight will be attached to the wire end and, by use of a slip rope, lowered to the seabed clear of the route.

The grapnels will be recovered periodically to check that they are clear of debris which may hinder their grappling ability or due to a change in seabed. The timing for these recoveries will be at the discretion of the OIM & DOIM and will be based on but not limited to the following: project schedule, weather, currents and seabed characteristics.

2.5. Marine Installation Operations

2.5.1. Introduction

After the PLGR work, marine installation will start as per installation plan. The installation plan is that the cable will be laid by a cable ship which equips with a cable plough and ROV. Normally, safety boat or guard boat will be mobilized to accompany the main lay vessel during marine operations, for the purpose of warding off possible interference from nearby boats (such as fishing boat).

2.5.2. Ploughing Operations

The plough will be launched at a distance as specified within RPL planned position after cable landing in. The ploughing will be conducted on a reasonable endeavors basis to a target depth according to project's technical requirement.

Below are the basic procedures for Plough:

2.5.2.1. *Loading the Plough*

- Ensure cable is initially being laid on the starboard (STBD) side of the plough in between the share and the STBD skid & stbd Stabilizer;
- Plough to raise depressor, then isolate power to plough, open bellmouth and have plough open to receive cable;
- Ensure power off cable;
- When ready to load plough, stop ship and stop payout on cable. Ensure cable is in speed control;
- Apply BTL Stopper, pre-form stopper or appropriate Yale grip to the cable as far aft as possible. You will be able to attach stopper alongside the share (provided the plough is traversed far enough to port), ensure no personnel stand in between cable & share;
- Attach equalizing wire to stopper and attach end of wire to deck;
- Payout on cable until weight is transferred to stopper, continue to payout until you have enough slack on deck forward of the plough to load the plough;
- One man with a safety harness is to climb on the plough to assist loading the cable into the plough;
- Raise cable into plough starting from the stern and working forward, ensure cable passes under roto in plough;
- Close bell mouth (will need chain block), close side parts on plough cable trough. Power up plough and lower depressor to ensure cable becomes located in the share. (60cm depressor height – higher may result in cable escaping the share) (All personnel clear of depressor when lowering). Ensure repeater doors on plough share are closed;
- Ensure that all the pins that hold the hinged parts of the plough are back in place and their safety retaining clips are also in place. There are 3 pins that are removed to load the plough;
- Pick Up easy on cable engine to take weight off deck stopper. Bring stopper close enough in to disconnect the wire from the end; and
- Plough is now ready for launch.

2.5.2.2. *Launching the Plough*

Good communications and operational awareness is essential for successful ploughing operations. It is very important that the role of each person involved in the procedure is understood and that a clear chain of command is established and made known to all personnel.

Throughout the Launch operation the Deck Supervisor controls the Ship moves and Cable payout instructions by UHF radio. Plough Supervisor controls the A Frame, Tow Winch, Umbilical Winch and Plough movements by Clearcoms but with UHF radio also to hand.

- Drawbar at 110 degrees, depressor 35cm. Ensure cable travel wheel is lowered and bell mouth is correctly secured. Umbilical tied off to stbd fwd motor cage with max 2x rubber cord bungee or LK 5 cable ties. Camera covers removed. Umbilical winch standing by in render and ready to pay out.
- Confirm with the Deck Supervisor that Bridge has given permission to launch the Plough.
- Assuming the Tow Apex is already engaged in the Rhino's horn and with the scissor frame in float, commence outboarding a frame to lift plough off deck. Pay out Tow wire as required to maintain slack.
  - Alternatively if Rhino's horn is not yet engaged...Pick up on Tow winch, lifting plough off deck, pickup into scissor frame high enough to engage rhino's horn. Pay out on tow winch so weight on horn. Outboard A frame paying out Tow wire as required]
- Call clearly 'All stations Plough off deck'.
  - When plough is clear of deck start plough motor and fully raise both skids. Plough motor off.
- Continue out boarding A frame. Just before vertical start plough motor and move drawbar to 85 degrees in small steps to allow skids to clear aft whiskers. Monitor share clearance visually. Plough motor off. A frame stop at 65 degrees.
- Tow block is put in place by deck crew. (Alternatively, If there is sufficient water depth (i.e. time available) the tow block may be put in position as the plough is lowered to the seabed)
- A frame fully out to 76 degrees at which point skids just in the water.
- Pickup on tow wire, release Rhino's horn, pay out tow wire. Payout slack on umbilical (NOT render). Plough in Water
- This is a critical moment for umbilical handling. It is very important that the umbilical does not pass under the drawbar at the surface. Ideally an area of slack will form between termination and fwd tie off point that clears the drawbar. Once the plough descends the bungees should break off and the umbilical lead establish to the side of/behind the draw bar.

  – If the Umbilical DOES pass under the draw bar, stop payout on the Tow wire. Pickup on Tow until top of drawbar above the surface. Slowly pickup on Umbilical to approx. 1.5 tonnes. Plough heading will turn slightly to port, separating umbilical from drawbar. Payout simultaneously on both Tow and Umbilical, verify visually/plough aft camera that the umbilical is now clear.

- Vessel commence moving ahead (approx 0.1km/h). Payout Tow, payout Umbilical quickly (slight slack on surface) for the first 30m of descent after which allow Umbilical to render (this is at the discrepancy of the CSE/Deck Supervisor).

- Plough wet checks, skids fully down and Drawbar returned to 110 degrees position during descent.
- Tow wire pays out, rate determined by application of buoys to umbilical. Umbilical winch continue to render at 0.6-1.0 tonnes always standing by to payout if needed.
- Plough Cab monitor carefully for 1) cable transit through plough 2) Depth and altitude. Maintain communications to bridge and deck. Call at 30m altitude and countdown clearly to seabed.
- Call 'on seabed'. Tow winch to pay out 2m extra of Tow wire and stop.
- Vessel continues moving ahead, Plough lowers drawbar to 80 degrees then monitors tow angle and tow force.
- Constant communication between the Plough control and Tow winch is now critical

  – If Tow angle < zero, Tow winch and drawbar stay stopped. Tow angle and force will rise as ship moves ahead.

  – If Tow angle in range zero to 15 degrees, Plough cab instruct Tow winch to speed up/slow down as needed to maintain 3-5 tonnes tow force at plough. Bring drawbar down slowly not letting tow angle drop below zero degrees.

  – If Tow angle > 15 degrees, Plough cab instruct Tow winch to payout quicker until angle within range.

Monitor bridles visually using plough cameras if possible.

- Plough Cab call all stations when drawbar at 45 degrees. Commence bringing in A frame.
- A frame stops before fully inboard position with tow wire still rotating A frame roller. Scissor frame is adjusted to lay level and prevent the Rhino's horn rubbing on the Tow wire. Then scissor frame is put back into float.
- Continue paying out Tow and rendering Umbilical. When drawbar is fully down engage the drawbar latches. When catenary is established (approx. 2.5x water depth). Tow winch stop paying out, umbilical payout additional 20m then leave in render.
- Call bridge when Plough starts moving off. Lower Depressor fully down, Grade in slowly by raising skids and stabs manually, then stabs in float. Keep plough share near level whilst grading in.

2.5.2.3. *Recovering the Plough*

Good communications and operational awareness is essential for successful ploughing operations. It is very important that the role of each person involved in the procedure is understood and that a clear chain of command is established and made known to all personnel.

Throughout the Recovery operation the Deck Supervisor controls the Ship moves and Cable payout instructions by UHF radio. Plough Supervisor controls the A frame, Tow winch, Umbilical Winch and Plough movements by Clearcoms but with UHF radio also to hand.

- Grade out plough, stabs in fixed. Raise depressor to 35cm (no higher). Ship stops.
- Ship starts backing up, commence picking up Tow wire. Umbilical winch picks up as required under direction of Plough supervisor not exceeding 1 tonne tension. Umbilical winch operator drives winch from local control to monitor fleeting of umbilical and pickup tension.
- Plough releases drawbar latches and raises drawbar to maintain tow angle between 0 and 15 degrees, 3-5 tonnes on bridles with plough not moving. Plough Control to maintain constant communications with Tow winch to achieve this. Grade back in slightly if needed to stop plough moving.
- With drawbar at 45 degrees commence booming out A frame.
- As vessel closes on plough, pickup speed on Tow winch will slow down. Pick-up on Tow wire very slowly as vessel comes above plough. Constant communications to be maintained between Plough and Tow winch.
- Once stern above plough (vessel ideally 5m ahead, NOT astern of plough) ensure drawbar is at 110 degrees. Vessel stops moving astern and starts moving ahead. Tow winch picks up in one continuous pull, weight comes onto the plough. Plough cab to monitor all signs and call 'All stations Plough off bottom' promptly as plough lifts.
- In water column set drawbar angle to 85 degrees. Ensure skids are down and level, stabs slightly raised and level.
- At surface plough motor and lights off. Stop picking up umbilical. Continue picking up tow wire to bring Plough through the splash-zone into the swing frame. Engage rhino's horn. Plough motor on and fully raise both skids. Plough motor off.

  – Due to the shape of the Tow Bridle Apex it is difficult to pull it around the A frame roller in one smooth motion. To overcome this, stop picking up on the Tow wire when the apex is just below the roller. Raise/inboard the A frame approx. 15 degrees ensuring that the Plough skids remain clear of the stern whiskers. Pick up again on the tow wire to put the Apex back below the roller. Lower/outboard the A frame whilst leaving Tow wire stationary. This will allow the Apex to move around the roller. Engage Rhino's horn when Apex sufficiently clear of roller]
- Inboard A frame from 76 to 65 degrees.

- Deck crew remove towing block from whiskers. (Alternatively this may be done between items 6 and 7 if the water depth is sufficient that enough time is available to complete this move)
- Inboard plough on A frame. As A frame passes through vertical, plough motor on and move drawbar from 80 to 110 degrees in small steps, always watching that the plough share is clear of all parts of the vessel and other equipment. When plough is safely inboard of stern sheaves fully lower both skids.
- Visually monitor cable at back of plough and over stern roller as plough is inboarded and lowered to deck. Be prepared to stop if necessary.
- Call clearly 'All stations Plough on deck'. Lower stabs as needed and. Plough motor off.

2.5.2.4. *Un-loading the Plough*

- Confirm vessel is stopped.
- Cable engine drum into speed control, stop payout.
- Power up Plough and raise depressor.
- Isolate the Plough.
- Cable tank manned.
- Apply stopper at aft end of Plough in between share and stern roller. Note that there is not much space here, consider Kevlar stopper. If it is not possible to apply a stopper here apply it forward of the Plough then pay out the cable until the stopper is clear of the Plough.
- Connect stopper to equalizing wire, connect to deck on the stbd side of the Plough.
- Payout on cable until weight is transferred to the stopper, continue payout until there is enough slack on deck to unload Plough.
- One man with harness to climb on the Plough to assist with cable removal.
- Open bell mouth on the plough (Chain Block to assist) and side parts to plough cable trough.
- Lower cable to deck.
- Pick up on cable until weight is removed from deck stopper; continue picking up until stopper is inboard.
- Remove stopper.
- Plough is now unloaded, if you need to remove plough from cable area pick up Plough on Tow Winch and traverse out of way. Lifting of relevant skids and stabilizers' will assist. If the cable will be sitting too high on aft deck consider this process before taking off stopper after unloading Plough. The Plough may be traversed to port to just clear the share or lifted up and traversed all the way to starboard to completely clear it from the cable. The latter is the preferred option for long cable installations with Repeaters to lay over the stern.

2.5.3. In Service Cable Crossings

At a position of 500 meters before the charted in-service cable (or as found from survey data, whichever comes first), the plough burial tool will be recovered and cable will surface lay over the in-service cable.

At a position 500 meters passed the charted in-service cable (or as found from survey data, whichever comes later) the plough will be lowered back in to the seabed and cable burial will resume.

2.5.4. ROV Burial Operations

2.5.4.1. *Cable Tracking*

There are several different tracking systems available; TSS, Inovatum, etc. It is important to remember to setup the surface control units (SCU) for the cable types before burial operations commence to ensure correct location and depth measurement can be achieved. TSS350 requires the correct tone frequency input to the SCU. Note that a certain frequencies can be picked up on the seabed for example the vessel (60Hz) so this and any other multiple of this frequency will result in bad and 'ghost' data being received. Also note not to run the water pumps at the same frequency as the cable.

Cable samples can be sent for analysis so a target scaling factor can be inputted for the TSS 440 system. If a target scaling factor is not available then the cable diameter can be input for better results.

2.5.4.2. *Burial*

The optimum speed of the ROV whilst jetting will depend on many factors, including; the soil strength and cohesion of the seabed; the ROV mode, tracks or free-fly; ROV maneuverability in adverse current; quality of cable tracker signal; whether the depressor can be used etc.

Burial speed will usually be determined by pre-trenching surveys/runs and be laid out in the job specific contracts.

2.5.4.3. *Pre-Burial Inspection*

For all areas where burial is required, it is beneficial to perform a pre-burial inspection pass. This will highlight any potential hazards, for example, suspensions and debris, and also indicate the status of the laid cable, for example, its tension and straightness.

A Final Splice area should always be inspected prior to attempting burial and multiple fixes taken around the bight as visibility is usually poor during jetting operations. Significant objects should also be fixed, for example, the splice box, ropes, Joint boxes, etc.

Although a pre-burial inspection will increase the overall time spent on the PLIB operation, it will significantly decrease the risk to both the ROV and the cable.

During operations (wind farm especially) a pre-burial inspection may be neglected. It may simply not part of the contract or the cable may have already been surveyed by another ROV after it was laid. The data collected from this survey may be deemed satisfactory for Excalibur to commence operations.

2.5.4.4. *Final Splice Burial*

Burial of a Final Splice area will involve manoeuvring the ROV around a bight of cable. The jet legs should be opened to maximum width, to allow for the turning movement of the ROV. The ROV pilot must also allow for the distance between the cable tracker and the burial tool. This applies particularly when tracking the cable with the TSS440 system where the distance from cable tracker is significantly ahead of the actual cables position under the ROV. This is not so much of an issue with the TSS350 system, but still applies during particularly tight cable radiuses.

2.5.4.5. *Cable Crossings*

Where the product cable crosses a 3rd party's cable which is surface laid or buried shallower than the required burial depth, it will support the cable and negate any jetting in that area.

With permission from the owner, it is beneficial to bury the 3rd party cable to the target burial depth for a reasonable distance each side of where the cable crosses. 50m each side is usually considered the minimum distance but this will depend on the size and characteristics of the 3rd party cable.

If it is not feasible to bury a section of the 3rd party's cable at the crossing point, then jetting should stop and the burial tool be graded out and stowed at least 10m before the crossing. The ROV should then traverse the crossing and resume jetting at least 10m from the crossing point.

2.6. Shore End Landing Operations

2.6.1. Introduction

This section describes the details of the shore end landing operations. The cable landing operation will be undertaken by cable ship, assisted by a subcontractor on the beach site.

The resources stated herein are for reference only, and we reserves the right to replace with any equivalent resources for the fulfilment of the project scope.

2.6.2. Organization and Communications

The success of the operation depends on good communications between the Beach Master, and ship, and other crafts to be used during the operation. The main communicating language for the

operation is English, and communications will be established on a dedicated channel to be agreed between all parties.

The Master on the cable ship will control the operations on board the cable ship. Control of landing the cable initially is by the beach master, coordinating with the cable ship master. In order to standardize the method of communication it may be necessary for either the cable ship to provide an UHF transceiver from their stock on board, to the Beach Master.

2.6.3. Beach Personnel

The following personnel are required for the cable landing operation:

- Beach Master: Coordination of beach operation.
- Diver/Rigger: Shore-end works, including installation and burial of articulated pipe / cable.
- Local Laborers: Cable landing operations, and beach works.
- Excavator Operator: Operate excavator for setting of dead man anchors, trenching and back filing on the beach and inshore.
- Watchmen: Keeping watch on the operational sites, as required.

2.6.4. Beach Preparation

Prior to the day of the cable landing a number of milestones will have been completed as listed below:

- Beach Man Hole (BMH) should be prepared and ready for cable pull in. A suitable strong point for anchoring off the cable end is required.
- 2.0 m depth of trench will be created by using an Excavator from Beach Man Hole to low water mark. Trenching on the terrestrial and beach section should be completed. In the event that the trenching is still being constructed, the landed cable will be anchored and coiled on the beach in the interim until such time when the trenching is completed.
- A cable quadrant, or Beach Sheave if required, should be installed and suitably anchored to a pre-installed dead man anchor.
- A calibrated Tension Meter or load cell will have to be installed, in-line at the quadrant or beach sheave to measure the in-line cable tension. The dead man anchor is to be proof load tested.
- The sub-contractor responsible for the shore-end scope of work should have completed a divers' survey and ensure that the landing route is clear of debris and obstacles.
- The beach area should be cordoned off with warning tape for general public safety and awareness.

- A meeting between the beach team and the cable barge should be arranged prior to commencement of the operation. This will enable the communication procedure to be established, potential problems highlighted and each party's method and procedure understood.

2.6.5. Shore end Landing Operations

The general outline of the cable landing operation is described below:

Step 1

A small boat will receive the end of the messenger rope from the cable barge.

Photo 2-1 Small boat with end of the messenger rope

Step 2

The messenger rope will be hauled to the beach and handed over to the beach team, who will receive it through the cable quadrant or beach sheave and attach it to the beach machinery (e.g. excavator). Due to the accessibility of some of the sites and the lack of suitable machinery the landing may be done using local labor.

Photo 2-2 Messenger rope hauling to the beach

Step 3

The light messenger rope will have been attached to the buoyant shore end rope, the length of which will approximate the total distance of cable to be floated ashore.

Step 4

On board the cable barge the shore end rope is connected to the sealed cable end with a swivel and stoppers suitable for the type and size of cable to be landed.

Photo 2-3 Messenger rope receipt at the beach

Step 5

Barge divers are positioned in the water at the point where the shore end rope/cable enters the water.

Step 6

The cable haul will commence with the cable barge divers, attaching floatation to the cable in the form of A4 floats or similar at suitable intervals as dictated by the weight of the particular cable in water. Upon instruction the beach master will commence the shore end pull and the divers will commence attaching floats at the prescribed interval. To indicate the position of the cable end, two floats and or a larger float should be attached and if possible of a different color or marked with tape.

Photo 2-4 Cable haul

Step 7

Guard boats will be positioned, either side of the cable line to ward off any oncoming craft.

Step 8

At a suitable position on the shore line the floats will be removed. With the cable floatation attached and confirmation that the cable line is straight the divers will commence removal of the floats from the shore line towards cable barge. The divers will closely monitor the cable to ensure no excess slack or suspensions are present on touchdown.

Photo 2-5 Ready to remove floats, near the beach

Step 9

Suitable small craft will be employed to collect all the floats as they are cut off by the divers. For ease of recovery it is recommended that these small craft are supplied with a strop so that the floats can be threaded on for towing back to the cable barge.

Photo 2-6 Small craft collecting floats after removal

Step 10

Once the cable has been hauled into the BMH, a permanent manhole stopper will be applied in the beach manhole.

Photo 2-7 Applying permanent manhole stopper

Step 11

Removal of the cable armor wires will commence and when completed the cable will be coiled into the BMH prior to making the beach joint.

Step 12

Cable ship landing operations are assumed to be completed when all the floats and other equipment and personnel are safely returned on board

2.6.6. Articulated Pipes Installation

Installation of Articulated Pipes will be conducted after the cable has been fed into the BMH and fixed with anchor plate inside of the BMH. Articulated pipes will start from the BMH duct and up to 100m in length.

The Articulated Pipes will be locked and tightened by bolts and nuts at every 10m interval.

Photo 2-8 Articulated pipes installation

2.6.7. Beach Restoration

When the cable has been installed and beach burial has been completed, including the back filling of any trenches that have been dug, the beach area is to be restored to its original condition. Only when reach restoration is complete, can demobilization of the beach equipment can be carried out.

Photo 2-9 Beach Restoration

2.6.8. Cable Burial by Divers (Post Lay Jetting)

Cable burial by Divers will utilize a Jet pump or airlift. Jetting will take place from the end of the point at which either mechanical or shore labor trenching finishes to the Injector burial stop position.

Photo 2-10 Post-cable Laying Equipment

2.7. Maintenance

The following test equipment is equipped for SUBMARINE CABLE project at Terminal Stations and Cable Depots for system operation and maintenance purpose.

2.7.1. Routine Maintenance

This chapter describes the suggestions for secure running, the method of obtaining the technical support for the NMS, and how to perform routine maintenance on a daily, weekly, monthly, or quarterly basis. Through routine maintenance, you can detect and rectify the potential faults to ensure the secure, stable, and reliable running of the NMS

2.7.1.1. *Daily Maintenance*

This topic describes how to perform daily maintenance. Daily maintenance allows you to collect the information about the running status and trend of the NMS in real time, which improves the efficiency of handling emergencies.

- Viewing Current Alarms
- Querying the NMS Security Logs
- Checking the Resource Usage of the NMS Server
- Checking the Status of Network Communications Between the NMS and NEs
- Checking the Running Status of the Processes and Services of the NMS
- Checking the HA System Resource Status
- Checking the Status of Data Replication Between the Primary and Secondary Sites in the Veritas High Availability System

- Backing Up the NMS Data

2.7.1.2. *Weekly Maintenance*

This topic describes how to perform weekly maintenance. Weekly maintenance allows you to find defects such as function failure or performance degradation during the running of the NMS in a timely manner. This helps you to take proper measures to handle the problem as soon as possible and eliminate potential risks and avoid accidents.

- Checking the Disk Status of the NMS Server
- Checking the Disk Space of the NMS Server
- Checking the Logs of the OS
- Checking the Logs of the SQL Server Database
- Checking the Logs of the Sybase Database
- Checking the Running Status of Anti-Virus Software
- Checking the Database Status

2.7.1.3. *Monthly Maintenance*

This topic describes how to perform monthly maintenance. Monthly maintenance keeps the NMS health in a good state for a long time, which ensures secure, stable and reliable running of the system.

- Checking User Configurations
- Backing Up System Files
- Viewing Alarm Statistics
- Checking the Server Time of the NMS
- Changing the Password of the Current User
- Releasing the Disk Space of the NMS Server

2.7.1.4. *Quarterly Maintenance*

This topic describes how to perform quarterly maintenance. Quarterly maintenance keeps the equipment room environment of the NMS in good condition, which ensures the reliability of power supply and related hardware.

- Checking the Equipment Room Environment
- Checking the Power Supply of the NMS Server
- Checking Hardware and Peripherals of the NMS Server

2.8. Decommissioning Phase

After 25 year's life span, the cable will be officially decommissioned, the system owner will cut off the system power supply and leave the cable in the seabed. No further activities will be implemented.

3. BIOPHYSICAL AND SOCIO-ECONOMIC BASELINE

3.1. Introduction

This chapter details the baseline information acquired during the marine and terrestrial survey. The chapter includes geophysical and hydrographic information that covers climatic, geophysical, and biological characteristics of the project area. The baseline information forms the basis on which the study will evaluate the environmental, health and safety impacts of the project activities. The baseline information on the project will be composed of both the marine and terrestrial component. The essential information on the baseline will be gathered during the desktop study and thereafter compounded by the data acquired during field work.

3.2. Biophysical Baseline

3.2.1. Climatic Conditions

3.2.1.1. *Mombasa*

Mombasa climate is classified as tropical savanna. In winter, there is much less rainfall in Mombasa than in the summer. This climate is considered to be Aw (winter dry season) according to the Köppen-Geiger climate. Tropical savanna climates have monthly mean temperature above 18°C (66°F) in every month of the year and typically pronounced dry season, with the driest month having precipitation less than 60mm (2.3 in) of precipitation.

The annual mean temperature in the county is 27.9°C with a minimum of 22.7°C and a maximum of 33.1°C. The hottest month is February with a maximum average of 33.1°C while the lowest temperature is in July with a minimum average of 22.7°C. Average humidity at noon is about 65 per cent.

In Mombasa (Indian Ocean), a water temperature of about 27.3°C is achieved in the annual average. The lowest water temperatures per month are reached in August at around 25.40°C. The average highest water temperatures are around 29.40°C and are measured during March. At about 29.40°C is the maximum water temperature of the year. This is reached March. The minimum value is 25.40°C and is measured the beginning of August.

The rainfall pattern is characterized by two distinct long and short seasons corresponding to changes in the monsoon winds. The long rains occur in April – June with an average of 1,040 mm and correspond to the South Eastern Monsoon winds. The short rains start towards the end of October lasting until December and correspond to the comparatively dry North Eastern Monsoons, averaging 240mm. The annual average rainfall for the county is 640mm.

3.2.1.2. *Proposed Project Area*

Temperature

The temperatures recorded at the maximum reached depth at each location are tabulated below. Note that generally the deepest reading is close to the seabed, but this is not always the case. The tabulated temperature values were recorded at the stated depth and it should not be assumed that this is always the same as the water depth at that location.

Currents

Off the east of Africa, the major currents run parallel and close to the coast of the continent. Though frequently strong, these currents concentrate into narrow flows becoming weak more than 100 miles offshore. Variations in the coastal currents throughout the year are only slight to the south of 2°S. To the north, the Somali Current reverses in direction during the year driven by the monsoon winds. During the Southwest Monsoon the current flows northeast while in the Northeast Monsoon it flows southwest.

The proposed project area is covered by East African Coast Current (EACC). The EACC runs northward throughout the year between latitudes 11°S and 3°S, with surface speeds exceeding 2knots in the northern summer, during the Southwest Monsoon. In the northern winter (the Northeast Monsoon), the EACC meets the southward flowing Somali Current near 3°S, where counter currents are formed at the surface.

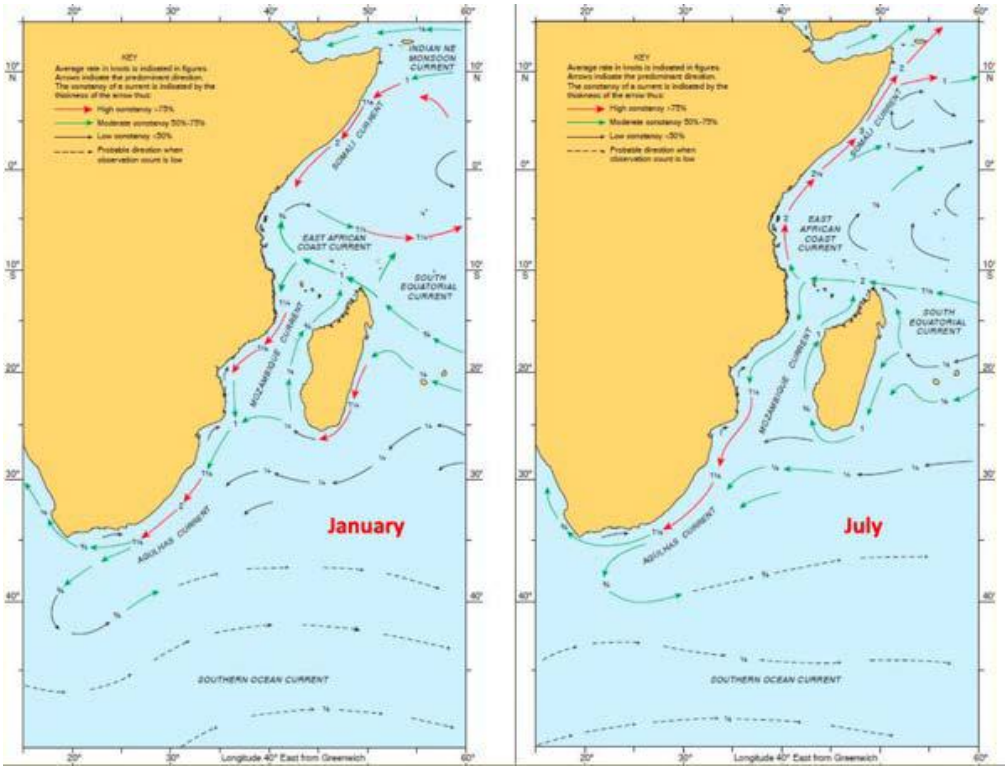

Figure 3-1 Predominant surface current off Eastern and Southern Africa

Sea State, Swell and Wind Direction

The sea state and wind direction were recorded daily in the daily progress report (DPR). Data used to determine the sea and weather conditions are detailed in the Appendix L of this report.

The figures below summarize those observations.

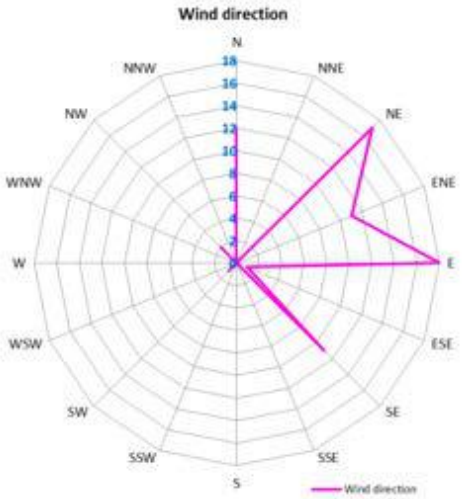

Figure 3-2 Rose diagram presenting wind direction

Meteorological Observations

The wind speed and atmospheric pressure were recorded daily in the daily progress reports. The figures below summarize those observations.

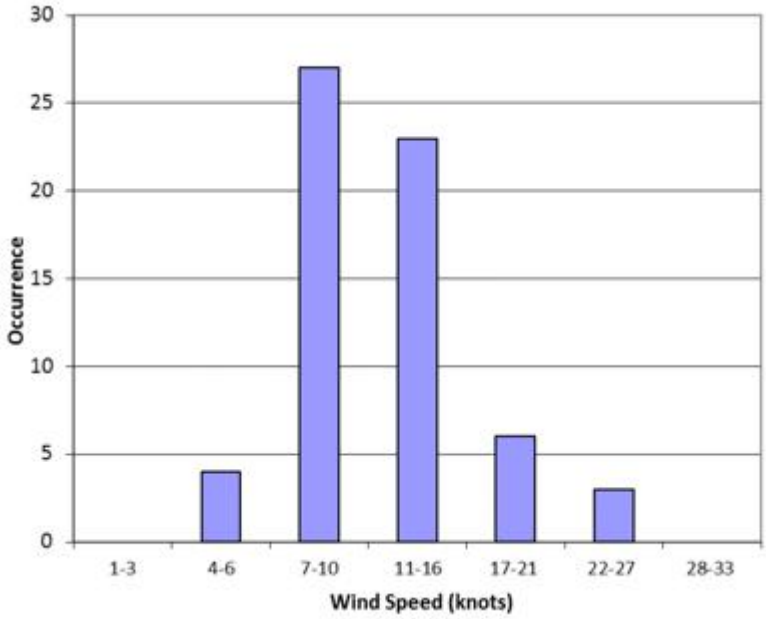

Figure 3-3 Graph showing occurrence of observed wind speeds

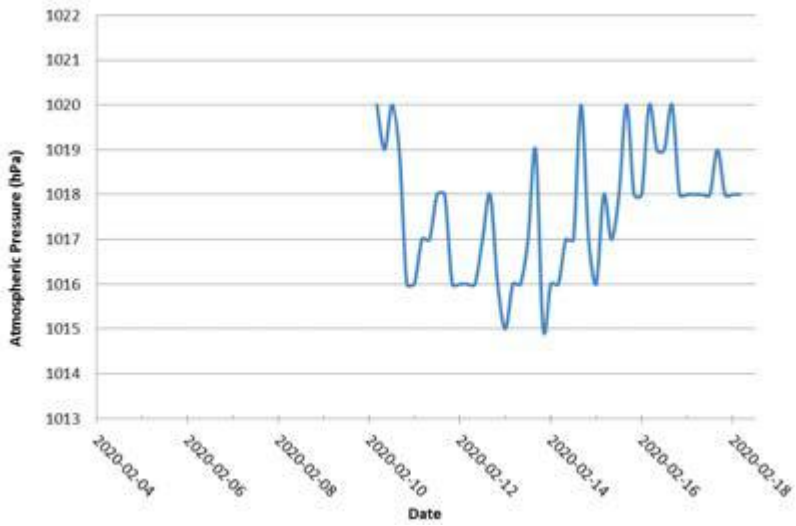

Figure 3-4 Graph showing atmospheric pressure

During the survey operation conducted by the RV Geo Resolution along the proposed route, the wind direction was generally from the northeast to east with Beaufort scale 2 to 6, light breeze to strong breeze. Small wavelets to larger waves with 0.2m to 4m wave height were observed. Air pressure ranged between 1015 and 1020 hPa.

3.2.2. Physiographic and Natural Conditions

3.2.2.1. *Mombasa County Topographic Features*

Mombasa County is characterized by a flat topography. The county lies within the coastal lowland which rises gradually from the seal level in the east to about 132m above sea level in the mainland. The terrain is characterized by three distinct physiographic features, which include the coastal plain, which is found along the shoreline, covering parts of the south coast, the Island, parts of Changamwe and the north coast. The plain consists of an expansive flat land mass with raised beach terraces covered mainly by coral limestone and back reef sand deposits.

The second category is the hilly areas mainly found within the Western part of the County that is underlain by shells and rises gently from 45m to 132m above sea level. This is characterized by poorly drained clay soils.

The third category is the Indian Ocean and the shoreline covered with geologically sedimentary rocks of Jurassic to recent age.

The topography has evolved as a result of lowering of the sea level over time leading to severe erosion by the storm water draining into the sea. The subsequent rise in sea level led to the submergence of the valleys and the creation of Mombasa Island surrounded by deep natural creeks, ports and harbors such as Kilindini, Tudor, Makupa and Old Port Creeks.

Other notable physiographic features include the fringing coral reefs, cliffs and tidal flats, sandy beaches, the coastal plain and a hilly dissected and eroded terrain.

3.2.2.2. *Mombasa Geology*

The geological (physical) characteristics of Mombasa area is categorized as follows:

- Coastal Plain area between Kisauni on the northern mainland and Mtongwe on the southern mainland including Mombasa Island. A coastal terrace consisting of elevated coral reef along the coast;
- The western area of Mombasa is composed of a rock layer of ground shale and sand. This area is composed of materials from the tertiary system and the Mesozoic system; and
- Mountainous plateau made of sandstone.

The town of Mombasa is centered on Mombasa Island, but extends to the mainland. The island is separated from the mainland by two creeks, Port Reitz in the south and Tudor Creek in the north. Mtwapa creek is found to the north of Mombasa County and it marks a separation with Kilifi County.

3.2.2.3. *Oceanographic Settings*

The tides in Mombasa are semi-diurnal (with a form of 0.18) and astronomical tides account for over 80% of water level variations (Odido, 1994). Water levels vary sinusoidally with two unequal peaks daily.

Tidal movements in the shallow lagoon system developed behind the modern reeds constitute the principal determinant of current direction and velocities with them. High velocity currents are generated in the vicinity of channels connecting these during initial stages of the flood tide (producing onshore currents) and latter stages of the ebb tide (offshore currents). Longshore currents produced by wave action in the lagoons may attain velocities of 0.5m/s. Waves in the eastern Indian Ocean are highest during the monsoons, particularly in July and August during the southeasterly monsoon, when the have maximum height of about 3 m with a period of 10-15 seconds.

Beyond the limits if the modern reefs the waters of the Indian Ocean deepen abruptly to the southwest down the continental slope; within 7km of the tip of Mombasa island water depths exceed 200m. The systems are connected to the edge of continental shelf by steep-sided submarine channels.

3.2.3. Ecological Conditions

The coastal zone is endowed with an abundance and variety of resources that provide ecological services and support both local and national economic activities. These include terrestrial and

marine habitats, such as coastal forests, mangrove swamps, coral reefs, sea grass meadows, rocky shores, estuaries, beaches, mudflats and sand dunes. These ecosystems are characterized by diverse species of flora and fauna, the most common being coconut trees and different species of fish.

3.2.3.1. *Coastal and mangrove forests*

The coastal forests exist as isolated blocks covering a total area of about 83,800 hectares in a narrow belt which extends inland for about 30 km. The largest of these forest patches is the Arabuko Sokoke forest reserve. Other forest patches include the Boni-Lungi, Dakacha, Dodori, the Shimba Hills Forest reserve and the Kaya forests.

These coastal forests bear unique communities of flora with high drought resilience, high levels of adaptation of birds, mammals and other fauna. These coastal forests are vital in biodiversity resilient support.

There are between 53,000 - 61,000 hectares of mangrove forests along the coast with the largest stands occurring in Lamu County (67 %) and the Funzi-Vanga system in the south coast. The mangrove ecosystem is a critical habitat for a variety of fish species and invertebrates, which depend on it for feeding and nursery grounds. The habitat also hosts a wide variety of bird life, and provides a line of defense against shoreline erosion and excessive suspended sediment from terrestrial sources. Coastal and mangrove forests are important carbon sinks.

Kaya forests are of spiritual and cultural importance to the Mijikenda community.

The proposed cable route does not traverse any areas mentioned above.

3.2.3.2. *Coral Reefs*

The coral reef system provides a natural defense of the shoreline from wave-erosion and is a source of white sand that replenishes local beaches. The coral reefs and associated lagoons harbor rich and diverse species of flora and fauna, which support artisanal fishery.

The proposed cable route does not traverse any area with coral reefs.

3.2.3.3. *Sea-grass Beds*

Sea grass beds are found predominantly in the sandy and muddy coastal lagoons and shallow reef slopes. They provide a habitat for a variety of commercially important fish species. These habitats also support relatively mature fish whose early life stages are found in estuaries and mud-flats. Sea grass meadows are feeding grounds for threatened and/or endangered species such as the green turtle, the hawksbill turtle and the dugong.

The proposed cable route traverses partial seas-grass near the landfall and on the beach.

Photo 3-1 Various patches of sea-grass encountered during survey

3.2.3.4. *River Basins, Deltas and Estuaries*

The Tana and Athi-Galana-Sabaki Rivers form the largest river basins in Kenya, with the relatively smaller basins drained by the R. Umba, R. Ramisi and R. Mwache. The Tana River discharges an average of 4 million cubic metres of freshwater and 6.8 million tonnes of sediment annually into the Ungwana Bay. The Athi-Sabaki River discharges about 6 million cu metres of freshwater and 5 to13 million tonnes of sediments into the Malindi Bay, annually. These high sediment loads are attributed to poor land use practices upstream and affect the sustainability of coastal habitats, the aesthetic value of beaches, adversely impacting coastal tourism. Major archaeological sites and Kaya forests in the north coast are found along river basins.

There a number of estuaries along the Kenyan coast which are generally sheltered from high energy waves and receive fine grain sediments from inflowing streams. These include the expansive Tana and Sabaki estuaries. Most of the estuarine shores are fringed by mangrove trees and associated plants. Estuaries have experienced various human-induced changes. The clearing of mangrove forest, for example exposes the soft shores and lead to erosion.

The proposed cable route does not traverse any areas mentioned above.

3.2.3.5. *Beaches and sand dunes*

Sand beaches are common along the Kenyan coastline, with river discharge being the main source of terrigenous sediment replenishing the beaches and dunes. There are an estimated 27,000 ha of beach and sand dunes in Kenya. Beaches provide nesting grounds for sea turtles, and an important habitat for shore and migratory birds. They are important in providing access to the sea for fishing, recreation and tourism. Among other functions, sand dunes are known to assist in the retention of freshwater tables against saltwater intrusion.

3.2.4. Biological Environment

The Nyali Beach is a home to several types of living organisms which directly or indirectly benefit from the available sedimentary sand depth.

3.2.4.1. *Fauna*

The Nyali beach is a nesting site for turtles which seasonally visit the beach to lay their eggs. The turtles that frequent the coastal beaches of Kenya are Green turtle, Hawksbill, Loggerhead, Olive Ridley and the Leatherhead turtle (Frazier 1975). These turtles visit the nesting site once or twice or more than 10 times depending on the species during the nesting season. The nesting season has been recorded to occur for four months which starts in the month of November and lasts up to February. The nesting period will last for 6 to 8 weeks depending on the species, and nesting sites is located approximately 500 metres from the project site.

The proposed installation window does not lie in nesting season.

The animals of interest which are associated with Mombasa marine reserve are found in Nyali is the star fish garden, Nyali coral garden, starfish and coral garden at White sands location, Bamburi coral garden, polyps-make up coral reefs- and the fish larva, radiolarian, copepod and Sea-star larva. The Coral reef runs across the whole stretch of the Mombasa marine reserve along and off the coastline. Marine mammals in Kenya comprise cetaceans (whales and dolphins) and sirenians (dugongs). Dugongs (Dugong dugon) are probably the most endangered marine mammal in the WIO region. Marine mammals can undertake long-distance movements of up to several hundred kilometers in a few days and therefore their management requires a transboundary approach.

The proposed cable route does not traverse any areas inhabited by the above.

3.2.4.2. *Flora*

The plants to be found along the Kenyan coastline are mangrove, palms, beach grass and sea oats which assist in the entrapment of blowing-sand. The site of Beach Man Hole is barren with no vegetation as it will be located 2 metres from Beach road's feeder road to Nyali Beach. The stretch

of the feeder road is clear of any vegetation until it reaches the sandy Nyali beach. The BMH will be located adjacent to the pristine palm fringed Nyali beach. The presence of dotted palm trees gives the Nyali beach its characteristic nature, with an end to end view of the beach. It is characterized by masses of white sands which cover the major part of the Indian ocean shore. There are also patches sea-grass in the proposed project as indicated at section 3.4.3.

3.3. Socio-Economic Baseline

3.3.1. Administrative Sub-division

Administratively, Mombasa County is divided into six sub-counties namely: Mvita, Nyali, Changamwe, Jomvu, Kisauni, and Likoni and thirty county assembly wards. These are further sub-divided into thirty locations and fifty seven sub-locations.

3.3.2. Population

Mombasa is the second largest city in Kenya after Nairobi. The population of Mombasa County stands 1,208,333 people, according to the 2019 Kenya Population and Housing Census. The county has a population density of 5,495 persons per square kilometer. Mombasa has a cosmopolitan population. However, the Swahili and Mijikenda people are the majority. Other communities include the Taita, Akamba and Kikuyu as well as a significant population of Luo and Luhya people from Western Kenya. Mombasa's unique blend of Africa, India and Arabia, can be attributed to its history as a major port of trade between Europe, Asia and Africa. The major religions practiced in the city are Islam, Christianity and Hinduism.

3.3.3. Land Use and Economic Activities

3.3.3.1. *General*

Mombasa Island is urbanized and of the land is used for commercial activity and residential settlement. Tourism is the main economic activity in Mombasa and the Kenyan coast area at large. Tourism is estimated to be contributing 45% to the regional economy. Mombasa is well known for tourism. It is a center of coastal tourism in Kenya. Mombasa Island's main attractions are: the Old Town and Fort Jesus. The Nyali, Bamburi, and Shanzu beaches are located north of the city. The Diani and Tiwi beaches are located south of Mombasa. Several luxury hotels exist on these beaches and attract large numbers of visitors. Mombasa is a major trade center and home to Kenya's largest seaport in Kenya, the Kilindini Harbor.

The port of Mombasa is a major contributor to the economy of Mombasa and Kenya at large. Shipping and port activities contributes about 15% to the regional economy. Many people in Mombasa are employed at the port. Others also come from different parts of the country too to work at the port. Manufacturing and processing industries also contribute to the economy of the

region. Other industries in Mombasa include: Limestone mining, cement manufacturing and Oil refinery.

Many Kenyans living in Nyali and Mombasa county derive a living by selling retail products along the Mombasa coastline. They depend on the tourist visiting the Nyali beach for recreation activities such as swimming, diving and sun-bathing.

The resorts situated along the Nyali beach are a tourist destination because of the sandy beaches. The tourist books these places due to ease of accessing the sandy beaches and Indian ocean to rejuvenate themselves.

The residents of Nyali, larger Mombasa county and rest of Kenyan occasionally visit Nyali for family outing or for work excursions. The associated reaction activities at Nyali beach are swimming in the Indian ocean, viewing the crystalline sandy beach, sun bathing, playful activities such as engaging in soccer, sand car racing The beach man hole site lies squarely on the high traffic sandy road which is the main access route to beach for the general public living in Nyali housing and the inhabitants of Mombasa county.

3.3.3.2. *Fishing activities*

Fishing activity near Mombasa landfall is intense, especially near the water breaks along the south-eastern margin of the reef from around KP2.5 to KP3.0. During the marine survey, fishing traps, marker buoys and fishing boats with artisanal fishing gears were observed (Figure 3-6 and Figure 3-7). Caution during cable installation and negotiation with local fishermen are recommended.

Figure 3-5 Buoys observed in the survey area

Figure 3-6 Fishing boats with gears in the survey area

3.3.3.3. *Shipping*

Shipping vessels were frequently encountered during survey operation. There are no formal traffic separation schemes operating along the eastern coast of Africa. For southern Africa (South Africa and Mozambique), the dominating factor for marine shipping is the influence of the Agulhas Current which streams south with considerable strength and are responsible for the heavy and dangerous seas sometimes encountered. Mariners northeast bound, if hugging the coast to avoid the strength of the current and possibly gain the benefit of an inshore counter current must proceed with caution and try keep their depths greater than 75m. Vessels running south may save time by keeping within the fast current but it should be appreciated that heavy and dangerous seas may be encountered, especially south of Cape St. Lucia (28° 31'S, 32° 24'E).

3.3.4. Transport

3.3.4.1. *Roads*

There is a total of 257.17km of bitumen surface roads, 127km of gravel surface roads and 91.29km of earth surface roads in the county. Main classified roads include Mombasa-Nairobi highway, Mombasa - Malindi road and Likoni - Lunga Lunga Road connecting Kenya and Tanzania. While the major roads are in fair condition, access roads within the residential and industrial areas are in deplorable state. The situation is worsened by the poor storm drainage systems most of which are in dilapidated conditions. The roads are maintained by the national government through Kenya Rural Roads Authority (KeRRA) and overseen by Sub-county Road Committees, Kenya Urban Roads Authority (KURA) and the Kenya National Highways Authority (KeNHA) and the private sector. The County has key bridges linking the Island with the mainland and other coastal areas; these include Nyali and Mtwapa bridges. The construction of the Dongo-Kundu by-pass will ease congestion at the central Business Sub-county as traffic from Nairobi to South coast shall be diverted at Miritini towards Likoni and Diani.

3.3.4.2. *Ferries*

The Likoni Ferry links the Island to Likoni and subsequently to Kwale and Tanzania through the Lunga-Lunga Border. Kenya Ferry Services operates more than 7 ferries and carries over 250,000 people and over 5,000 vehicles per day across the Likoni channel. It also operates in Mtongwe area at peak hours to minimize congestion at the Likoni Ferry crossing.

3.3.4.3. *Railway*

The County has ten kilometers of railway line and three railway stations from the colonial era. The Standard Gauge Railway replaces this parallel and colonial Uganda Railway that was originally built during the British colonial rule in the 19th century. It is the country's largest infrastructure project since independence. Under the East African Railway Master Plan, the Mombasa–Nairobi SGR will link up with other standard gauge railways that are being built in East Africa. This will tremendously revolutionize the transport industry.

3.3.4.4. *Port*

The port of Mombasa is also a key resource and the gateway to the East and Central African region, as it serves the entire region‘s export and import needs. In 2012, dredging was being undertaken with a view of deepening the Likoni channel to facilitate usage of the port by larger post panamax vessels. The figure below depicts the container terminal at the port of Mombasa.

3.3.4.5. *Airports*

The County has one international airport, the Moi International Airport in Changamwe sub-county. The airport is the second largest airport in Kenya and is used by both domestic and international flights. The airport is essential in the promotion of tourism and investment opportunities in the county and in the coast region.

3.3.4.6. *Cultural and Historical Heritage Setting*

Mombasa has a rich 2,000 year old record of history with a variety of cultural and historical heritage sites. One of the most renowned sites is the historic Fort Jesus. The fort has been classified as World Heritage Site by UNESCO. This 16th Century Fort was the apex of a historic struggle for control of the Kenya coast between the Portuguese army and the Shirazi Arabs. The war fought around Mombasa for hundreds of years with endless battles over this period.

The Old Town (Mji wa Kale) of Mombasa is embellished in Arab architecture and interlaced streets and alleys. Mombasa town has some old buildings and structures (including temples, mosques) which date back decades. Due to its historical and strategic status as a port gateway town and trade center, Mombasa is a melting pot of diverse peoples and cultures. The richly diverse fusion of Indian, Arabic and African in Mombasa is incredibly exhilarating and this bustling, heaving,

colorful commercial and cosmopolitan port town is a stimulating, fascinating experience. Contemporary Mombasa is an astonishing city where many cultures are woven into its rich tapestry and become a part of its atmosphere. Some other important sites include: Mama Ngina Waterfront Park, and some old buildings and structures (e.g. temples, mosques)

The proposed cable route does not traverse any Cultural or Historical Heritage areas mentioned above.

4. LEGAL AND INSTITUTIONAL FRAMEWORK

4.1. Overview

This Chapter outlines the existing national and international environmental and social legislation, policies and institutions applicable to the Proposed Project that will guide the development of the Project, which is subject to this ESIA Project Report. Since Kenya is a signatory to various international conventions and laws, relevant international conventions and Multilateral Environment Agreements (MEAs) on Biodiversity, Endangered Species, Law of the Sea, and Marine Dumping are also presented.

4.2. Policy Framework

4.2.1. Sessional Paper No.10 of 2014 on the National Environment Policy, 2014

The overall goal of this Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources.

Section 5.6 of this Session Paper focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and natural resources during the construction and operation of infrastructure developments including roads. These policy statements require the commitment of the Government to:

- Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) and Public Participation in the planning and approval of infrastructural projects;
- Develop and implement an environmentally friendly national infrastructural development strategy and action plan; and
- Ensure that periodic Environmental Audits are carried out for all infrastructural projects. Relevance to this Project

Relevance

In line with the above policy statements, this ESIA has been conducted for the proposed submarine fibre optic cable to ensure that environmental and social issues are appropriately addressed.

4.2.2. Kenya Vision, 2030

The Vision 2030, Kenya's long-term development blueprint aims to create a globally competitive and prosperous nation, transforming Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Vision

2030 three pillars, namely the Economic, Social, and Political are anchored on macroeconomic stability; continuity in governance reforms; enhanced equity, and wealth creation opportunities for the poor. The Economic Pillar that captures the expectations of the ICT market seeks to improve the prosperity of all regions of the country and all Kenyans by achieving a 10% GDP growth rate by 2017.

ICT is identified as an enabler or foundation for socio-economic transformation. The Vision recognizes the role of science, technology, and innovation in the modern economy in which new knowledge plays a central role in boosting wealth creation, social welfare, and international competitiveness.

Relevance

The proposed project will support the achievement of the Kenya Vision 2030 and enhance telecommunication infrastructure in the country.

4.2.3. National Environment Policy, 2013

The National Environment Policy aims to provide a holistic framework to guide the Management of the environment and natural resources in Kenya. It further ensures that the linkage between the environment and poverty reduction is integrated into all government processes and institutions to facilitate and realize sustainable development at all levels. This is done in the context of a green economy enhancing social inclusion, improving human welfare and creating employment opportunities, and maintaining the healthy functioning of the ecosystem.

The main goal of this Policy is "A better quality of life for present and future generations through sustainable management of the environment and natural resources.

Relevance

The implementation of the project will be guided by this policy to minimize environmental degradation and guarantee project sustainability.

4.2.4. National Information, Communications and Technology (ICT) Policy, 2019

This policy is designed to realize the potential of the digital economy by creating an enabling environment for all citizens and stakeholders. The ICT Policy defines the forward-looking position of the Government on various areas of the evolving ICT sector landscape in Kenya.

Relevance

The proposed project will support the ICT sector envisaged in the ICT policy especially in realizing its objectives.

4.2.5. National Oceans and Fisheries Policy, 2008

The policy notes that the oceans and fisheries sector plays an important role in the global economy. In Kenya, the sector provides food, employment, and income to a large population and earns the country Kshs 5 billion annually from the foreign exchange. Kenya's annual fish production is valued at approximately Kshs 8 billion at an ex-vessel price. These earnings are likely to increase if the underexploited areas such as aquaculture and the Exclusive Economic Zone (EEZ) are tapped.

The overall objective of this Policy is to enhance the fisheries sector's contribution to wealth creation, increased employment for youth and women, food security, and revenue generation through effective private, public and community partnerships.

Relevance

One of the guiding principles of the policy is sustainability and environmental integrity. The project will traverse areas with artisanal fishing activities. It is paramount for the contractor not to interfere with the ecosystem and fisheries resources. Again, fishing gear may negatively affecting the project through exposing the buried cable.

4.2.6. National Land Policy, 2009

The National Land Policy sets out goals and direction for the present and future management of land in Kenya. It contains measures and guidelines which enable the government to achieve optimal utilization and management of land. The policy highlights rapid urbanization, inadequate land-use planning unsustainable production, poor environmental management, inappropriate ecosystem protection, and management as the major concerns affecting land in Kenya. Further, the policy recognizes environmental problems facing the country. These problems include the degradation of natural resources such as forests, wildlife, water, marine, and coastal resources as well as soil erosion and the pollution of air, water, and land. The policy requires environmental assessments and audits to be undertaken in order to conserve and manage the environment to achieve sustainable management of land resources.

Relevance

Prior to the installation of the submarine fiber optic cable, an ESIA shall be done and submitted to NEMA for approval. During the construction and operation phases, appropriate measures shall be put in place to protect both the marine and terrestrial ecosystems from pollution and degradation.

4.2.7. Draft Integrated Coastal Zone Management Policy (ICZM), 2013

The ICZM policy is rooted in the understanding that the coastal and marine environment is a limited spatial area and a distinctive system in which a range of environmental and socio-economic interest interconnect in a manner which requires a dedicated and integrated management approach.

The Policy recognizes that the coastal zone is endowed with an abundance and variety of resources that provide ecological services and support both local and national economic activities. These include terrestrial and marine habitats, such as coastal forests, mangrove swamps, coral reefs, seagrass meadows, rocky shores, estuaries, beaches, mudflats, and dunes. These resources are exploited for tourism, fisheries, salt manufacturing, shipping, agriculture, and construction among other economic activities. The coastal area has its rich share of national heritage consisting of antiquities, monuments, and cultural and natural sites.

The preservation of the cultural and natural heritage has direct links with mainstream societal concerns such as development, environment, health, education, access to information, construction, and the coastal economy. The vision of the policy is "*A coastal zone with healthy ecosystems and resources that sustain the socio-economic development and well-being of the current and future generations*". It seeks to promote sustainable development in the coastal zone in line with the principles of the new constitution and objectives of vision 2030. The Government is committed to the implementation of this policy to ensure sustained benefits to coastal communities and the national economy.

Relevance

The proponent and the contractor should take note of sensitive marine and terrestrial habitats which should be protected and preserved and not interfered with during the project implementation.

4.2.8. National Climate Change Action Plan (NCCAP), 2018-2022

NCCAP, 2018-2022, is Kenya's second action plan on climate change. It was developed to implement the National Climate Change Response Strategy (NCCRS), 2010. That aimed to strengthen and focus nationwide actions towards climate change adaptation and GHG emission mitigation. The NCCAP documents measures and actions that will enable Kenya to reduce vulnerability to climate change and improve the country's ability to take advantage of the opportunities that climate change offers. According to NCCAP climate change significantly affects marine ecosystems, and could lead to large-scale shifts in patterns of marine productivity, biodiversity, community composition, and ecosystem structure. The impacts include;

- Submergence of low-lying areas, and increased water-logged areas
- Saltwater intrusion along the coast, due to sea-level rise, with implications for domestic, industrial, and agricultural uses and, coastal ecosystems
- Destruction of coral reefs
- Negative impact on the economic benefits of investments in the blue economy, including declining fisheries, damage to coastal ecosystems, and tourism and, damage to ports due to sea-level rise and storm surge.
- Declines in fisheries and livelihoods, due to ocean acidification, and warming ocean.

Relevance

Telkom Kenya Limited shall ensure low carbon technologies are utilized during the project implementation. It is advised that the proponent undertake a climate risk assessment for the project and implement mitigation measures such as climate proofing the fiber optic infrastructure from the effects of climate change.

4.2.9. The National Biodiversity Strategy and Action Plan (2019-2030)

The overall objective of the National Biodiversity Strategy and Action Plan (NBSAP) is to address the national and international undertakings elaborated in Article 6 of the Convention on Biological Diversity (CBD). It is a national framework of action to ensure that the present rate of biodiversity loss is reversed and the present levels of biological resources are maintained at sustainable levels for posterity. The general objectives of the strategy are to conserve Kenya's biodiversity to sustainably use its components; to fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and to enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation.

Relevance

The project should not interfere with marine and terrestrial ecosystems. Marine wildlife should be protected as well as other terrestrial flora and fauna species.

4.2.10. National Policy for Disaster Management, 2009

National Policy for Disaster management policy provides for disaster risk management which encompasses a full continuum from preparedness, relief, and rehabilitation, mitigation, and prevention. The Policy aims to increase and sustain the resilience of vulnerable communities to hazards through diversification of their livelihoods and coping mechanisms. The policy notes that disasters in Kenya that have occurred over the years are from diverse hazards such as droughts,

floods, fires, terrorism, collapsing buildings, accidents in the transport sector, and disease/epidemics. The hazards that lead to disaster are grouped into the following clusters:

- Environmentally-triggered (Climate-related; - droughts, floods, storms landslides)
- Geologic disasters include volcanic eruptions, tsunamis, earthquakes,
- Human-made disasters such as socio-economic, technologic industrial, human,
- Biologically triggered (epidemics i.e. disease, pests for human, livestock and crops and wildlife)

The overall goal of Disaster Management policy is to build a safe, resilient and sustainable society. The policy focuses on the following elements: Disaster Prevention, mitigation, preparedness, response, and recovery.

Relevance

The proponent and the contractor should collaborate with other agencies such as the Kenya Coast guard, Disaster Management units, Kenya Maritime Authority for early warning signs and be informed of any likely disaster.

4.2.11. Big Four Agenda

Big Four Agenda is the Jubilee Government development agenda. Under the Big Four Agenda, the Government seeks to build on the progress made so far under the Economic Transformation Agenda. The Government has prioritized policy objectives under "The Big Four" Agenda that will lead to the accelerated growth of the economy. The Agenda targets to:

- Support value addition and raise the manufacturing sector share of GDP to 15 percent by 2022;
- Focus on initiatives that guarantee food security and nutrition to all Kenyans by 2022;
- Provide Universal Health Coverage thereby guaranteeing quality and affordable healthcare to all Kenyans; and
- Provide Housing to all Kenyans by targeting the construction of at least five hundred thousand affordable houses by 2022.

Relevance

Telecommunication services are an enabler to achievement of the Big 4 Agenda.

4.3. Legal Framework

4.3.1. The Constitution of Kenya, 2010

Kenya Constitution is the supreme law in Kenya. This constitution gives a lot of emphasis on environmental conservation and sustainable development. In the Preamble, the Constitution states that "We, the people of Kenya will be respectful of the environment, which is our heritage, determined to sustain it for the benefit of future generations".

Article 2(5) of the Constitution states that the general rules of international law shall form part of the laws of Kenya. For the purposes of protection of the environment, several principles of international environmental law which act as a guide on the development of environmental legislation have been identified. Among the said principles are;

- the polluter pays principle;
- principle of public participation;
- principle of sustainability;
- principle of inter & intra- generational equity;
- principle of prevention; and
- precautionary principle

The principle of sustainable development is entrenched in Article 10 2(d) of the Constitution as one of the national values and principles of governance.

The Constitution guarantees the right to a clean and healthy environment at Article 42. Article 42 further guarantees the right to have the environment protected for the benefit of present and future generations through legislative and other measures particularly those contemplated in article 69 and the right to have obligations relating to the environment fulfilled under Article 70. Article 69 imposes obligations on the state. The state is required to;

a) ensure sustainable exploitation, utilization, management, and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b) work to achieve and maintain a tree cover of at least ten percent of the land area of Kenya;
c) protect and enhance the intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d) encourage public participation in the management, protection, and conservation of the environment;
e) protect genetic resources and biological diversity;
f) establish systems of environmental impact assessment, environmental audit, and monitoring of the environment;

g) eliminate processes and activities that are likely to endanger the environment; and
h) Utilize the environment and natural resources for the benefit of the people of Kenya.

Article (69) (2) imposes obligations on every person, to cooperate with state organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Article 70 provides an avenue for redress for any person who alleges that the right to a clean and healthy environment has been or is likely to be denied, violated, infringed, or threatened. The Court is empowered to issue preventive, cessation, or compensatory orders.

Article 70 relaxes the rule on locus standi as a result of which, there is no need to prove loss or injury by an applicant. Anyone may institute a claim seeking to enforce the environmental rights and obligations stipulated in the Constitution.

Enforcement contemplated by Article 70 will be done through the Environment and Land Court established under Article 162 (2) (b). The Court has the same status as the High Court. This effectively denies High Court jurisdiction over environmental matters under Article 165 (5) (b).

Relevance

The project shall be undertaken within the provision of the Constitution. TKL shall ensure that the project activities do not compromise the right to a clean and healthy environment. Measures shall be put in place to guarantee the sustainability of the project. Such measures shall include but not limited to pollution prevention and control, protection of biodiversity, sustainable utilization of natural resources among others.

4.3.2. The Kenya Information and Communications Act Chapter 411a, 2011 and Amendment, 2013

This Act in its Part II, 3. (1) establishes the Communications Commission of Kenya, a body mandated mainly 5. (1) To license and regulate postal, information and communication services in accordance with its provisions; 23. (1) Ensure there are provided throughout Kenya, such telecommunication services and in particular, emergency, public payphone and directory information services, as are reasonably necessary to satisfy the public demand thereof; 2. a) Protect the interests of all users of telecommunication services in Kenya with respect to the prices charged for and the quality and variety of such services; and, (c) encourage private investment in the telecommunication sector.

Under Part VII—Miscellaneous Provisions, the Act stipulates that, 85. (4) A telecommunication operator shall ensure that as little damage as possible is caused to the land and to the environment by reason of the exercise of the powers conferred by this section and shall pay fair and adequate

compensation to the owner or occupier of the land for any damage or loss sustained by reason thereof.

Relevance

- *The proponent to obtain permits from CA to construct, install, operate, and provide internet services through fibre optic cable.*
- *The contractor to implement this ESM&MP to limit damage to land and environment.*

4.3.3. Guidelines for Installation and Maintenance of Information and Communication Technology (ICT) Infrastructure, 2018

The objective of these Guidelines is to ensure that new and existing ICT infrastructure: (i) are protective of human health and the environment; (ii) do not expose the users or other persons near the ICT infrastructure to any danger, and (iii) do not adversely affect the integrity (proper end-to-end functioning) of other ICT networks.

Under its part II. conservation of the environment, the Guidelines require all licensees to ensure that the ICT infrastructure works they undertake does not compromise the environment, natural habitats and are safe to users and other persons.

Environmental Standards, Guidelines and Recommendations; Requires that while undertaking ICT infrastructure works, to comply with the Environmental Management and Co-ordination Act (EMCA) 1999; observe and adhere to International standards, guidelines and recommendations including: ITU-T L.1300 – Best practices for green data centres (Approved in 2014-06-29) describing best practices aimed at reducing the negative impact of data centers on the climate; IFC Environmental, Health & Safety Guidelines for Telecommunication; International Commission on Non-Ionizing Radiation Protections (INIRP) Guidelines for Exposure to EMF; and adopt ITU-T Recommendations L series: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant.

Guidelines further require licensees to undertake an initial Environmental Impact Assessment (EIA) audit and submit the same to NEMA for approval; Undertake regular EIA self-audits of the ICT infrastructure; avoid construction activities during the breeding season and other sensitive seasons or times of day; manage electronic and solid waste generated in the cause of construction by adhering to: the Waste Management Standards – Legal Notice 121: Environmental Management and Co-ordination Act (Waste Management) Regulations, 2006, and, the Water Quality Standards – Legal Notice 120: the Environmental Management and Coordination (Water Quality) Regulations, 2006; observe safety, health and welfare of workers and all persons lawfully present at workplaces in accordance with the Occupational Safety and Health Act, 2007; and , ensure workers are safeguarded from possible eye damage and risk of burns especially in high-powered

laser installations and be safeguarded from risk of injuries from microscopic fibre shards during fibre optic installations.

Licensees will be required to develop and adopt laser light safety and fibre management procedure as part of risk mitigation procedure.

Relevance

The submarine cable design, construction, installation, operation, maintenance, and decommissioning will be guided by these guidelines..

4.3.1. The Access to Information Act, 2016

The main objective of the Act is to give effect to the right of access to information by citizens as provided under Article 35 of the Constitution; provide a framework to facilitate access to information held by private bodies in compliance with any right protected by the Constitution and any other law; promote routine and systematic information disclosure by public entities and private bodies on constitutional principles relating to accountability, transparency and public participation and access to information; and provide a framework to facilitate public education on the right to access information under this Act.

Relevance

The submarine will provide a platform where local communities can access information whenever wherever.

4.3.2. Environmental Management and Coordination Act, 1999 (Revised 2015)

The Environmental Management and Coordination Act (EMCA), 1999, is the framework law on environmental management and conservation. The National Environment Management Authority (NEMA) was established as the principal instrument of government charged with the implementation of all policies relating to the environment, and to exercise general supervision and coordination over all matters relating to the environment. In consultation with the lead agencies, NEMA is empowered to develop regulations, prescribe measures and standards and, issue guidelines for the management and conservation of natural resources and the environment. The Act provides for environmental protection through:

- Environmental impact assessment;
- Environmental audit and monitoring; and
- Environmental restoration orders, conservation orders, and easements.

Part VI under Section 58 of the Act directs that any proponent for any project listed on the Second Schedule of the act undertake and submit to NEMA an Environment Impact Assessment (unless exempted by NEMA), who in turn may issue a license as appropriate.

Relevance

- *The proponent has contracted Environtech Consultancy Africa Ltd to undertake the ESIA and prepare the report for submission to NEMA.*
- *The proponent shall obtain an ESIA license before the commencement of works.*

There are some set of regulations developed under EMCA. These are discussed here below:

4.3.2.1. *The Environmental (Impact Assessment and Audit) Regulations, 2003*

These regulations outline the procedures and guidelines for carrying out environmental impact assessments and audits. The regulation requires that the EIA/EA be conducted by a registered lead or firm of experts in accordance with the terms of reference developed during the scoping exercise.

These regulations have been amended by the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. The amendment list projects into Low, Medium, and High Risk. For the low and medium-risk projects, an environmental impact assessment Summary Project Report (SPR) must be prepared. For the high-risk projects, a Comprehensive Project Report (CPR) is prepared and submitted to NEMA.

Relevance

The Environmental Consultant shall undertake an ESIA study in accordance with the general environmental impact assessment guidelines sector environmental guidelines provided for in Part III of the regulations.

4.3.2.2. *EMCA (Water Quality) Regulations, 2006*

The regulation provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams, springs, wells and other water sources). It is an offence under Regulation No. 4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. Regulation No. 11 further makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment.

Relevance

The project will take place within a water resource (Indian Ocean). The project activities should not cause pollution either through solid or liquid waste for instance leakages for installation equipment.

4.3.2.3. *EMCA (Waste Management) Regulations 2006 (Legal Notice 121)*

Part II, 4 (1) of the Regulations states that no person shall dispose off any waste on a public highway, street, road, recreational area or in any public place except in a designated receptacle. Regulation 4 (2) further states that a waste generator shall collect, segregate and dispose such waste in the manner provided for under these regulations.

The regulations requires a waste generator to collect, segregate and dispose each category of waste in such manners and facilities as provided by relevant county governments. Regarding transportation, licensed persons shall operate transportation vehicles approved by NEMA and will collect waste from designated areas and deliver to designated disposal sites.

Relevance

The proponent should ensure that any waste generated from the installation activities is properly disposed in accordance with the regulations.

4.3.2.4. *EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009*

These Regulations aim at ensuring the maintenance of a healthy environment for all people in Kenya; the tranquility of their surroundings and their psychological wellbeing by regulating noise levels and excessive vibration. The Regulations elevate the standards of living of the people by prescribing acceptable noise levels for different facilities and activities. The Regulations prescribe the maximum permissible noise levels from a facility or activity to which a person may be exposed to; provide for the control of noise; and provide for mitigating measures for the reduction of noise.

Any person who is likely to be involved in activities that emit noise or excessive vibrations beyond the permissible levels must obtain a license or a permit respectively from the authority.

Relevance

The contractor shall undertake to minimize any noise emanating from works and provide PPEs to workers who are likely to be exposed to high noise levels.

4.3.2.5. *EMCA (Air Quality) Regulations, 2014*

The objective of the Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Cabinet Secretary in consultation with the Authority. Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas.

Part 11 of the regulations prohibits any person from causing air pollution either directly or indirectly. The first schedule of the regulations sets tolerant limits for different parameters while the second schedule lists the priority air pollutants which are categorized as general source pollutants, mobile source pollutants and Green House Gases. The third schedule sets outs limits for both controlled and uncontrolled facilities. The fourth schedule provides guidelines for air pollution monitoring and parameters from stationary sources.

Relevance

The proposed project is not expected to have major impacts on the ambient air quality. However any machinery use in the works must be in good working order to minimize emissions. During the digging of fiber trenches and ducts measures to minimize dust shall be adopted.

4.3.2.6. *EMCA (Wetlands, Riverbanks, Lakeshores, and Seashores Management Regulations 2009)*

This regulation seeks to ensure wetland resources are utilized in a sustainable manner compatible with the continued presence of wetlands and their ecological goods and services. The main purpose is to provide for the conservation and sustainable use of wetlands and their resources in Kenya. Environmental Impact Assessment and Environmental Audit as required under the EMCA shall be mandatory for all activities likely to have an adverse impact on the management of wetlands.

Section 17 provides general principles that should be observed in the management and conservation of river banks, lakeshores, and the seashore:

a) Resources on the river banks, lakeshores, and the seashore shall be utilized in a sustainable manner;
b) Environmental impact assessment as required under the Act shall be mandatory for all major activities on river banks, lakeshores, and the seashore; and

c) Special measures, including prevention of soil erosion, siltation, and water pollution are essential for the protection of river banks, lakeshores, and the seashore.

Relevance

The proponent and the contractor shall ensure that the project activities do not degrade the seashore or cause siltation.

4.3.2.7. *EMCA (Controlled Substances) Regulations, 2007*

These Regulations aim to regulate the production, trade and use of controlled substances and products; provide for a system of data collection to facilitate compliance with relevant reporting requirements under the Montreal Protocol on Substances that Deplete the Ozone Layer; promote the use of ozone-friendly substances, products, equipment and technology; and ensure the elimination of substances and products that deplete the ozone layer. Ozone Depleting Substances are chemicals that destroy the stratospheric ozone layer in the atmosphere by increasing the ultraviolet rays from the sun to the earth's surface. Kenya is currently a consumer of ODS and therefore relies on importation and exportation of ODS. Any importer or exporter is required under these regulations to obtain an import license or export license respectively. An importer or exporter of any ODSs in piecemeal must obtain a permit for the same. It is a requirement to comply with the license and permit conditions.

Relevance

The project is not expected to have impacts on the ozone however the proponent and the contractor are advised to take note of these regulations.

4.3.2.8. *EMCA (Conservation of Biological Diversity and Resources, and Access to Genetic Resources and Benefits Sharing) Regulations, 2006*

The regulations were developed to protect biological diversity and resources. These Regulations apply to access to genetic resources or parts of genetic resources, whether naturally occurring or naturalized, including genetic resources bred for or intended for commercial purposes within Kenya or for export, whether in in-situ conditions or ex-situ conditions. They do not apply: to plants listed in the Agriculture Act Cap 318; the exchange of genetic resources where the exchange is done by a local community among themselves and for their own consumption; or where the exchange is certified to be purely for food or other consumptive purposes as prescribed by the relevant laws. Any person who intends to access genetic resources in Kenya needs an Access permit for genetic resources in Kenya with a certificate from National Council for Science and Technology. The process of accessing a permit involves a multi-agency engagement and a Prior Informed Consent as may be applicable.

Relevance

- *Execution of the project should not interfere with biodiversity especially the marine species.*
- *The proponent and the contractor should prevent introduction of alien/invasive species of flora and fauna within the project area.*

4.3.2.9. *EMCA (Fossil Fuel Emission Control) Regulations, 2006*

This Regulation aims at eliminating or reducing emissions generated by internal combustion engines to acceptable standards. The regulation provides guidelines on use of clean fuels, use of catalysts and inspection procedures for engines and generators.

Relevance

This regulation is triggered as the proponent would use vehicles and equipment that depend on fossil fuel as their source of energy. It is recommended the requirements of the regulation be implemented in order to eliminate or reduce negative air quality impacts.

4.3.2.10. *EMCA (Prevention of Pollution in Coastal Zone and Other Segments of the Environment) Regulation, 2003*

The regulations provides for pollution prevention in coastal zones. It is an offence to discharge hazardous substances in territorial waters of Kenya.

3 (1) No ship or any other person in Kenya shall be allowed to discharge any hazardous substance, chemical, oil or oily mixture into the territorial waters of Kenya or any segment of the environment contrary to the provisions of these Regulations

Relevance

The proponent must ensure proper disposal of any waste and prevent spillage of any hazardous substance and oils.

4.3.3. Kenya Maritime Authority Act, 2006

This is an Act of Parliament to provide for the establishment of the Kenya Maritime Authority (KMA) as a body with responsibility to monitor, regulate and coordinate activities in the maritime industry and for all other matters connected therewith and incidental thereto. The Act established Kenya Maritime Authority whose principal mandate is to regulate, co-ordinate and oversee maritime affairs. Among its other functions is to ensure, in collaboration with such other public agencies and institutions, the prevention of marine source pollution, protection of the marine

environment and response to marine environment incidents; regulate activities with regard to shipping in the inland waterways including the safety of navigation; and implement and undertake co-ordination in maritime security.

Relevance

The proponent shall liaise and collaborate with KMA during the project implementation this shall ensure safe navigation of ships, security and protection of marine environment.

4.3.4. Kenya Coast Guard Services Act, 2018

The Act establishes Kenya Coast Guard Service whose functions are:

a) to enforce maritime security and safety;
b) to enforce pollution control;
c) to enforce prevention of trafficking of the narcotic drugs, prohibited plants and psychotropic substances;
d) to enforce prevention of trafficking of illegal goods;
e) to enforce prevention of trafficking of illegal firearms and ammunitions;
f) to enforce sanitation measures;
g) to prosecute maritime offenders;
h) for port and coastal security;
i) for search and rescue;
j) for the protection of maritime resources including fisheries;
k) for the protection of archaeological or historical objects or sites; and
l) to perform any other function that may be conferred by this Act or any other written law.

Relevance

- *Prior to commissioning of the works or consultancy, the proponent shall seek written approval for the Kenya Coast guard Service. This will guarantee safe working conditions and safety.*
- *The contractor shall prevent any marine pollution.*

4.3.5. Fisheries Management and Development Act, 2016 (No. 35 of 2016).

The Fisheries Management and Development Act provide the framework for the development, management, exploitation, utilization and conservation of fisheries and for connected purposes. The overall objective of this Act is to provide for the conservation, management and development of fisheries and other aquatic resources to enhance the livelihood of communities dependent on fishing.

Relevance

The project shall cut across intense fishing zone which need proper management and protection.

4.3.6. Water Act 2016

The role of this Act of Parliament is to provide for the regulation, management and development of water resources and sewerage services and for other water related purposes. The Act establishes Water Resources Authority (WRA) with the mandate of regulating management and use of water resources.

The act makes it an offence to obstruct, interfere or divert water from any watercourse or water resource. It is also an offence to throw, convey, cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive matter or thing into or near to any water resource in such a manner as to cause, or likely to cause pollution of water resource.

Relevance

The contractor shall prevent pollution and contamination of the ocean.

4.3.6.1. *The Water Resources Management Rules, 2006*

These rules were developed under the Water Act, 2002 before it was repealed by the Water Act, 2016. The rules apply to all water resources and water bodies in Kenya, including all lakes, water courses, streams and rivers, whether perennial or seasonal, aquifers, including coastal channels leading to territorial waters.

The rules define different types of water sources (Surface and Ground water) and outlines measures for management and conservation as well as quality and monitoring procedures. Different types of water use activities that require authorization from the WRA are listed in the sixth schedule. One of such water use activity is construction activity.

Section 81(1) prohibits any person from discharging or applying any poisonous, toxic, noxious or obstructing matter, radioactive waste or other pollutants to water resources.

Relevance

The contractor shall prevent pollution and contamination of the ocean.

4.3.7. The Forest Conservation and Management Act, 2016

The is an Act of Parliament that was drafted to give effect to Article 69 of the Constitution with regard to forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socioeconomic development of

the country and for connected purposes. Article 30 of the Act classifies forests as public, community Classification of forests or private forests. Part IX outlines the offences under the act.

Relevance

The proponent should obtain a permit from the Kenya Forest Service to cut down trees or mangroves to pave way for the development. In addition, he should plant trees in areas within the facilities that will not be developed to compensate for loss during construction and identify and area for mangrove replanting

4.3.8. Wildlife Conservation and Management Act, 2013

The Wildlife Conservation and Management Act, 2013, it is the law charged with the responsibility of providing for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes. It designates protected areas, lists and provides for the protection of endangered, vulnerable and protected species as well as invasive species. It is critical in the study of biodiversity as it is the most comprehensive database alongside the IUCN red list of endangered species.

Relevance

The proposed fiber route shall enter the Marine National Reserve which is a protected area with harbors a rich marine ecosystem that includes marine species of international importance such as the endangered sea turtles and dolphins and open sea marine resources among others. The proponent should implement measures to prevent pollution which would degrade water quality and affect the wildlife

4.3.9. Physical and Land Use Planning Act, 2019

The Act provides for the planning, use, regulation and development of land and for connected purposes. It was enacted to ensure that every person engaged in physical and land use planning shall promote sustainable use of land and livable communities which integrates human needs in any locality. The Act allows the County Government to prepare a local physical and land use development plan in respect of a County, Sub-County, or unclassified urban area.

Relevance

The proponent should obtain applicable planning approvals from the County Government of Mombasa for construction activities.

4.3.10. The Occupational Health and Safety Act, 2007

This is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

Part four of this Act deals with machinery. Section 61 states that any machine driven by mechanical power should be well secured. The supplier should provide all the information on installation and safety. Section 55 states that all machines should be operated by qualified persons. While section 56, 57 and 58 lists all the machines including generators be securely fenced so as to be safe to every person employed or working at the premises. Following on these sections, section 60 requires that all fencing or other safeguards provided for safety should be of substantial construction and constantly maintained and kept in position while the parts required to be fenced or safeguarded are in motion.

Part VI provides for general health provisions while Part X provides for the general welfare of the workers with respect to supply of drinking water, washing facilities and first aid among other aspects. Section 53 of this Act requires that for workers employed in a process involving exposure to any injurious or offensive substances, suitable protective clothing and appliances (gloves, footwear, goggles, and head coverage) shall be provided.

The Act has the following functions among others:

- Securing safety and health for people legally in all workplaces
- Preventing employment of children in workplaces where their safety and health is at risk
- Encouraging entrepreneurs to set achievable safety targets for their enterprises
- Promoting the reporting of work-place accidents, dangerous occurrences and ill health with a view to finding out their causes and prevention of similar occurrences in future
- Promoting creation of a safety culture at workplaces through education and training in occupational safety and health.

Failure to comply with the OSHA, 2007 attracts penalties of up to KES 300,000 or 3 months jail term or both or penalties of KES 1,000,000 or 12 months jail term or both for cases where death occurs and is in consequence of the employer.

The act also offers more specific guidelines under rules made to govern certain aspects of health and safety. Such rules include the following:

- ***Safety and Health committee rules:*** This guides the formation, functions and procedures of such committees in workplaces.
- ***First Aid Rules***: These have details on First Aid requirements in terms of facilities and capacity building among non-medical workers.
- ***Hazardous Substances Rules:*** These rules regulate the handling, transportation and use of certain listed chemicals which may have negative effects on the body upon exposure. They apply to places of work.

- ***Noise Rules:*** The rules have established levels beyond which workers may not be exposed without protection.
- ***Medical Examination Rules:*** The rules offer guide on the need and target workers who have to undergo regular medical examination to identify the symptoms of hazardous exposure.

Relevance

- *In compliance the proponent and the contractor undertake to prevent pollution and minimize the emission.*
- *Workers shall be provided and prevailed upon to wear personal protective equipment appropriate for specific tasks to ensure their health, safety and wellbeing.*

4.3.11. The Public Health Act, 2012

The public Health Act regulates activities detrimental to human health. An environmental nuisance is one that causes danger, discomfort or annoyance to the local inhabitants or which is hazardous to human health.

The Act addresses matters of sanitation, hygiene and general environmental health and safety which is directly related to projects and associated activities. It is therefore recommended that measures be taken in accordance to that Act in order to safeguard the health of the workers and the public at large.

Relevance

- *The Proponent shall observe policy and regulatory requirements and implement measures to safeguard public health and safety.*
- *Warning signs shall be placed at all construction areas.*
- *The contractor shall avoid leaving open pits and trenches that could allow water ponding*
- *The contractor shall avoid causing environmental pollution that could be a health hazard to the public.*
- *Disposal of wastes shall be done properly in accordance with the regulations.*
- *Workers shall be provided with adequate sanitary facilities and clean drinking water.*

4.3.12. Work Injury Compensation Benefit Act 2007

This Act provides for compensation for employees on work related injuries and diseases contacted in the course of employment and for connected purposes. The Act includes compulsory insurance for employees. The Act defines an employee as any worker on contract of service with employer.

This Act is relevant to the proposed project thus it is recommended that all workers contracted during the project implementation phase have the required insurance covers so that they can be compensated in case they get injured while working.

Relevance

- *The proponent will ensure all contractors have insured the staff involved in installation and maintenance of the base station.*
- *Compensation will be undertaken for any employee in cases of injury or disease in line with working.*

4.3.13. Climate Change Act, 2016

This Act provides a legal framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development and other matters that relate to climate change. The Act provides incentives for the promotion of climate change incentives. This is to encourage persons to put in place measures for elimination of climate change including reduction of greenhouse emission and use of renewable energy and put in place measure to mitigate against adverse effects of climate change.

Relevance

- *The contractor is advised to minimize emission of CO_2 from construction activities*
- *Proponent is advised to climate proof the telecommunication infrastructure.*

4.3.14. HIV AIDS Prevention and Control Act, 2009

This Act commenced in March of 2009. It is an Act of Parliament to provide measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counseling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

Relevance

During the project implementation, the contractor is expected to create awareness to the employees on HIV/AIDS.

4.3.15. Penal Code (Cap. 63)

Section 191 of the Penal Code makes it an offence for any person or institution that voluntarily corrupts, or foils water for public springs or reservoirs rendering it less fit for its ordinary use. Similarly, section 192 prohibits making the atmosphere in any place noxious to health of persons/institution in dwellings or business premises in the neighborhood or those passing along a public way.

Relevance

The Contractor and proponent will be required to ensure strict adherence to the Environmental Management Plan throughout the Project cycle in order to mitigate any possible negative impact.

4.3.16. The National Museums and Heritage Act – Cap 216 (2006)

Kenya is rich in its antiquities, monuments, cultural and natural sites which are spread all over the country and the Act aims to preserve this national heritage. The National Museums of Kenya (NMK) is the custodian of the country's cultural heritage, its principal mission being to collect, document, preserve and enhance knowledge, appreciation, management and the use of these resources for the benefit of Kenya and the world. Through the National Museums of Kenya many of these sites are protected by law by having them gazetted under the Act

- ***Section 30*** of the Act requires all discoveries of buried artifacts to be reported to the NMK/GoK.
- It is a requirement under this law for Cultural Impact Assessment Studies coordinated by the NMK to precede development in any culturally sensitive site including the entire Kenya's coastline in which case, the NMK has been contacted in the case of the proposed development planning.

Relevance

The proponent to take note of the above act.

4.3.17. County Government Act, 2012

Part XI of the Act outlines the principles of planning and development facilitation. One of the principles is to protect and develop natural resources in a manner that aligns national and county government's policies.

Relevance

The proponent shall ensure that the project activities align with the county's development plans and protect natural resources.

4.3.18. Coast Development Authority Act (CDA), 1990

According to section 8 of the Coast Development Act (CDA) Act, its mandate is to coordinate regional data identification, collection, collation and correlation for integrated regional planning purposes, integrated regional planning for sustainable utilization and management of coastal resources, based on environmental carrying capacity, development of local capacities to sustain the continuation and maintenance of integrated communal projects through sensitization and training, initiation, harmonization, and coordination of sectoral and community interests in the

implementation of regional socio economic development projects, exploration, promotion, and conservation (including surveillance) of marine resources within EEZ and other coastal resources for sustainable development, sourcing for innovations and Research findings for implementation of pilot/ demonstration projects for the purpose of dissemination of the technology, promotion of private sector involvement in commercial activities and community development within its area of jurisdiction, and monitoring and evaluation of regional development projects and programmes for effective achievement of the set objectives.

Relevance

The proponent shall collaborate with the CDA during the project implementation.

4.4. Multilateral Environment Agreements

4.4.1. Convention on Biological Diversity (1992)

International treaty that was adopted at the Earth Summit in Rio de Janeiro in 1992, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development.

Relevance

The project shall protect and conserve both marine and terrestrial biodiversity.

4.4.2. United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is an international environmental treaty adopted on 9 May 1992 and opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992. It then entered into force on 21 March 1994, after a sufficient number of countries had ratified it. The UNFCCC objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to specify further action towards the objective of the UNFCCC.

Relevance

The proponent shall adopt measures to minimize Greenhouse gas emissions and adopt appropriate measures to mitigate climate change.

4.4.3. United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and

their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole.

The convention bides states to prevent and control marine pollution and is liable for damage caused by violation of their international obligations to combat such pollution

Relevance

The proponent and contractor shall prevent marine pollution through proper waste disposal and spillage prevention.

4.4.4. International Convention for the Prevention of Pollution from Ships (MARPOL)

International Convention for the Prevention of Pollution from Ships (MARPOL) 1973/78 The MARPOL Convention is the main international convention covering prevention of pollution by ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and also includes the Protocol of 1997 (Annex VI). MARPOL has been updated by amendments through the years. The Convention covers pollution by oil & oily water, noxious liquid substances in bulk, harmful substances in packaged form, sewage and garbage and air pollution from ships.

The Convention includes regulations aimed at preventing and minimizing pollution, both accidental pollution and that from routine operations. Kenya became a signatory to the convention in 1973. Therefore, the country is obliged to comply with the provisions of the Convention in preventing pollution of the environment by ships from the discharge of harmful substances or effluents containing substances in contravention of the convention. The designated national competency authority responsible for prevention of ship pollution is the Kenya Maritime Authority.

Relevance

The proponent and contractor shall prevent marine pollution.

4.4.5. Convention for the Protection of Submarine Telegraph Cables, 1888

The **Convention for the Protection of Submarine Telegraph Cables** is a multilateral treaty that was signed in 1884 in order to protect submarine communications cables that had begun to be laid in the 19th century.

The convention made it a punishable offence to damage submarine communications cables. In addition, all ships were to be regulated to staying a distance of 1 nautical mile (1.9 km) away

from cable laying ships when in operation. Any ship that accidentally hooked a cable and sacrificed its fishing nets to avoid breaking it would be compensated for the lost equipment.

Relevance

The cable will be protected under this convention.

4.5. WBG Environmental and Social Standards

The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. This Framework comprises:

- **A Vision for Sustainable Development**, which sets out the Bank's aspirations regarding environmental and social sustainability;
- **The World Bank Environmental and Social Policy for Investment Project Financing**, which sets out the mandatory requirements that apply to the Bank; and
- **The Environmental and Social Standards (ESSs)**, together with their Annexes, which set out the mandatory requirements that apply to the Borrower and projects. There are 10 ESSs as listed below:
    - **Environmental and Social Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts;
    - **Environmental and Social Standard 2**: Labor and Working Conditions;
    - **Environmental and Social Standard 3**: Resource Efficiency and Pollution Prevention and Management;
    - **Environmental and Social Standard 4**: Community Health and Safety;
    - **Environmental and Social Standard 5**: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
    - **Environmental and Social Standard 6**: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
    - **Environmental and Social Standard 7**: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;
    - **Environmental and Social Standard 8**: Cultural Heritage;
    - **Environmental and Social Standard 9:** Financial Intermediaries; and
    - **Environmental and Social Standard 10:** Stakeholder Engagement and Information Disclosure.

A summary of the scope of the WBG ESSs and the applicability to the Project is set out in Table 4-1.

Table 4-1 WBG Environmental and Social Standards

No.	ESS Title	Key Requirement	Relevance to the Project
1.	Assessment and Management of Environmental and Social Risks and Impacts	This ESS relates to integrating and managing environmental and social performance throughout the life of a project in line with national regulations and international standards. The standard requires the development of an Environmental and Social Management System (ESMS) that entails a structured approach to managing environmental and social risks and impacts.	The Project will be associated with some environmental and social impacts which will need to be appropriately managed.
2.	Labor and Working Conditions	This standard aims to ensure that the Proponent establishes, maintains and improves a worker-management relationship that promotes the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws and international standards (as defined by the International Labour Organisation (ILO). In particular, PS2 addresses child labour and forced labour, and promotes safe and healthy working conditions, and protecting and promoting the health of workers by recognising the role of employees.	Project workers (for all Project phases) will need to be provided with fair labour and working conditions. This will apply to all categories of workers irrespective of whether directly engaged by the Proponent or contractor (direct workers), engaged through third parties (contracted workers), and workers engaged by the Proponent's primary suppliers (supply chain).

No.	ESS Title	Key Requirement	Relevance to the Project
3.	Resource Efficiency and Pollution Prevention and Management	This ESS aims to abate pollution to air, water, and land that may threaten people and the environment at the local, regional, and global levels. This Standard promotes the ability of private sector companies to adopt such technologies and practices where feasible.	All required resources will need to be used efficiently and all wastes managed in accordance with the waste management hierarchy, where avoidance of waste generation is the first priority to avoid or minimize pollution as much as possible.
4.	Community Health and Safety	The role of this ESS is to anticipate and avoid adverse impacts on the health and safety of the affected communities throughout the life of the project as a result of routine and none routine events. The ESS also requires an assessment of how use of security by the Project to safeguard personnel and property could impact on community security considering human rights.	Implementation of the Project will need to ensure that the health and safety of local community members is not compromised.
5.	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS5 aims to anticipate and avoid physical and economic displacement or, where avoidance is not possible, to minimize adverse social and economic impacts.	Not applicable since the Project site is located in Kenya territorial waters but permission will be sought from KWS for the MMP&R section.

No.	ESS Title	Key Requirement	Relevance to the Project
6.	Biodiversity Conservation and Sustainable Management of Living Natural Resources	This ESS aims to protect and conserve biodiversity based on the Convention on Biological Diversity. It divides habitat into three categories, modified, natural, and critical, and guides on the required level of assessment for Projects in each type of habitat. For modified habitats (1), impacts on biodiversity should be minimized and mitigation measures implemented appropriately. For projects in natural habitat, mitigation measures should be designed to achieve no net loss of biodiversity where feasible. For projects in critical habitats, the project's mitigation strategy should be described in a Biodiversity Action Plan and be designed to achieve net gains of those biodiversity values for which the critical habitat was designated.	This ESS is applicable since the Project is located in areas without any significant biodiversity value as described in detail in Chapter 3 of this report. Again, reference will be made to this standard when designing the mitigation measures such as those for the appropriate management of invasive and alien species (IAS).
7.	Indigenous Peoples/Sub-Saharan African Historically Underserved	This ESS deals with safeguarding Indigenous Peoples. The aim is to protect the interests of Indigenous Peoples during project implementation. On a broader scale, it requires project implementation to avoid adverse impacts on	This ESS does not apply since the Project Site located within Kenya territorial waters devoid of any settlement. The Project will not result in

No.	ESS Title	Key Requirement	Relevance to the Project
	Traditional Local Communities	Indigenous Peoples as well as ensuring their participation and consent.	either physical or economic displacement as the submarine cable will be buried on the ocean floor.
8.	Cultural Heritage	This ESS recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. People identify with cultural heritage as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. Cultural heritage, in its many manifestations, is important as a source of valuable scientific and historical information, as an economic and social asset for development, and as an integral part of people's cultural identity and practice. ESS8 sets out measures designed to protect cultural heritage throughout the project life cycle.	This ESS does not apply to the Project Site since there are is no tangible and intangible cultural heritage.
9.	Financial Intermediaries	ESS9 recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. The Bank is committed to supporting sustainable financial sector development and enhancing the role of domestic capital and financial markets.	This ESS does not apply to the Project as the will be solely financed by the Proponent.

No.	ESS Title	Key Requirement	Relevance to the Project
10.	Stakeholder Engagement and Information Disclosure	Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks. Stakeholder engagement is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management and monitoring of the project's environmental and social risks and impacts. This ESS must be read in conjunction with ESS1. Requirements regarding engagement with workers are found in ESS2. Special provisions on emergency preparedness and response are covered in ESS2 and ESS4. In the case of projects involving involuntary resettlement, Indigenous Peoples or cultural heritage, the Borrower will also apply the special disclosure and consultation requirements set out in ESS5, ESS7 and ESS8.	The Project will undertake extensive key stakeholder engagement in the preparation of this EIA report.

4.6. License Issuance Institutions

The scoping report has established based on the legal framework detailed above ECA consultants will seek the following license from the respective institution.

Table 4-2 Institution Issuing Permits, Approval, Licenses

Institution	Licenses/Permit/Approval	Comments
Communication Authority of Kenya (CCK)	Submarine Cable Landing International Gateway	The license is available. The landing party (one of the partners in the consortium-Telkom Kenya) should inform CA of the intended project.
National Environmental Management Authority (NEMA)	ESIA	The Proponent to acquire this license before commencement of the project
Kenya Wildlife Service (KWS)	Installation written permit	The Proponent to acquire this permit before commencement of the project
National Construction Authority	Approval of constructing the BMH	The Proponent to acquire this permit before commencement of the project
Public works	Public works consent	The Proponent to acquire this permit before commencement of the project
Kenya Maritime Authority (KMA)	Compliance certificate	The Proponent to acquire this permit before commencement of the project
DOSHS	Workplace certificate	The Proponent to acquire this certificate before commencement of the project

Institution	Licenses/Permit/Approval	Comments
Proponent's Preferred Insurance company	WIBA policy	The Proponent to acquire this insurance cover before commencement of the project

The Proponent would be advised to seek or ensure the listed permits or license in table 4-2 above are applied for or confirm their availability before commencement of the project.

5. PROJECT ALTERNATIVES

5.1. Overview

Regulation 16 (b) of Environmental (Impacts assessment and Audit) Regulations, 2003, requires identification and analysis of project alternatives when undertaking an ESIA. An ESIA should identify and assesses alternatives to the proposed project. Only the best feasible alternative should be selected based on less negative impacts and cost-benefit analysis. An important alternative to be analyzed is the "no project" alternative. This is a fundamental analysis because it helps the proponents measure the impacts of the project against those which would have taken place without the project. Several options were considered in designing alternatives for the proposed project. These included the following options:

- Project Alternatives
- Technology Alternative
- Alternative Routes
- Installation configuration Alternative

5.2. Project Alternatives

5.2.1. Use of Alternative Routes

This option would result in use of alternative routes for the Telkom Optical Fibre Cable project implementation. This would result in longer fibre optic cable runs, high project cost, high environmental impacts and health risk. Since alternative route will mean there will be need for land acquisition for installation and as a result there will be added environmental and social impacts considering the current proposed installation is on road wayleave. The proposed route defined by the fibre optic installation plan is readily accessible and available, no additional land will be needed. Therefore, the use of alternate routes was determined to be unfeasible, and was dropped from further evaluation.

5.2.2. Installation Configuration Alternative

Different installation configurations for fibre optic cable, which include the aerial and underground installations.

5.2.2.1. *Aerial installation configurations*

Although most optical fibre cables are intrinsically lightweight, they are subject to stresses caused by the environmental and weather factors they are installed in. Aerial run cable can be affected by wind and storms, creating a situation that can cause the cable to stretch or sag, pulling on the fibres. Under most conditions aerial optical fibre cables needs to be supported by an

external support member, suspension strand, or "messenger". Unlike direct burial installations, aerial installations will often be executed by utility companies with specialized equipment for long haul runs. This making the process more expensive to install and maintain. This option of installation was disregarded because aerial installation is infeasible given the realities of the existing utility infrastructure, land use, weather and topography and was eliminated from further consideration.

5.2.2.2. *Underground cable installation Configurations*

The Underground cable installation configuration is designed to provide extra protection for the cables, but can also offer certain installation advantages. The cables are plowed in or buried in a trench when buried directly and the installation process can be very quick. Duct or conduit for underground burial is manufactured using rigid, very rugged, abrasion resistant material. Underground cable installation is a series of ducts placed under the streets, accessible by utility vaults or Manholes. Installed conduit is advantageous because it offers a route for new cable installation or old removal without damage to streets, pavements, edifices, etc. Considering the challenges that comes with aerial installation like weather challenges and destruction of cable from external forces, the underground conduit was considered to the most optimal installation configuration.

5.2.3. Technology Alternatives

A number of technological alternatives that either did not fulfill the purpose of the project or did not meet the agreed criteria were evaluated. The major factors that affected the acceptability of those options were potentially adverse environmental effects and problems related to technical feasibility. The following alternative technologies were considered as alternative to the fibre optic cable.

5.2.3.1. *Wireless Network Alternative*

A wireless network alternative could address some elements of the project purpose and need but would be unable to provide the capacity or speed needed to fully meet the purpose. In addition, the installation of wireless infrastructure would require ground disturbance. Unlike the proposed alternative, which uses existing ROWs, development of a wireless network typically requires disturbance of undeveloped areas for necessary site improvements and construction of access roads. At the current level of technological development, fiber-optics is up to 250,000 times faster than wireless, and a single fiber can carry 69,000 times more data than the entire bandwidth delivered by a wireless tower. As a result of above mentioned challenges, a wireless network was eliminated from further consideration due to its inability to fully meet the purpose and need, and its greater potential for ground disturbance and associated environmental impacts.

5.2.3.2. *Radio*

Radio waves carry information over the air from one point to another. Along the way, the waves encounter various obstacles or obstructions that can impact range and performance, depending on the characteristics of the radio wave. In addition, regulatory rules govern the use and limitations of radio waves. Signals using these radio frequencies are generally limited to a one to three-mile radius, or three to 28 square miles, which makes application in less densely populated areas less economical. These frequencies are inherently more susceptible to weather and environmental interferences which made this option does not meet the purpose of the project.

5.2.3.3. *Telephony*

The telephone industry predominantly uses copper twisted-pair for the delivery of communications services to commercial and residential customers. Plain old telephone systems have been the primary means of communicating both locally and long distance. The problem is that it was designed for the transmission of voice communications. It's a mature technology, but inadequate by design, the amount of bandwidth that can be delivered is restricted by the characteristics of the copper twisted-pairs installed between the customer and central office.

Services such as DSL delivered across a local exchange carrier's existing copper wire system are capable of delivering very high speeds. However, DSL suffers performance limitations based on the distance from the customer premises to the serving central office. Distances are limited to about four to five miles from a central office for the lowest speed solutions and 10,000 feet or less for the fastest. Additionally, much of the plant is physically incapable of providing broadband service. *The option does not meet the purpose of the project.*

5.2.3.4. *Satellite Data Transmission*

A non-cable option of replacing the proposed telecommunication and data transmission services is satellite communications. The use of communications satellites to provide the services identified as necessary would require no construction or interference with environment, but would not provide the capacity or quality of service proposed under the project. Satellite networks, such as direct broadcast satellite, currently offer only one-way Internet access. Upstream access is limited to existing copper telephone lines. Other alternatives like Low Earth Orbit (LEO) Satellite Systems are not scheduled to be completed for years and have not proven capable of providing "carrier-class" voice or data services. Fibre optic cables transmit voice and data traffic with higher reliability and security at a cheaper rate than satellite. While a satellite call must travel 27,000 miles (35,780 km) from the earth to the satellite and then another 27,000 miles back, Mombasa County fiber optic call need only travel about 200 miles point- to-point. At the speed of light this helps to eliminate the delays suffered during a satellite data transmission.

Additionally, users will have to buy equipment and only a limited number of users can be served in one region, high signal latency hampers certain applications, environmental factors may reduce signal quality, and data traffic is typically capped monthly or daily in current commercial offers. In view of all these issues concerning quality and affordability of service, satellite broadband, like wireless broadband, is a complementary rather than an alternative infrastructure, even though in specific circumstances (for example very remote/mountainous areas) it may be the only viable alternative. The option does not meet the purpose of the project.

5.2.3.5. *Laser Radio Transmission*

A laser radio transmitter transmits data via a semiconductor laser, opening the door to ultra-high-speed WiFi. The laser that can emit microwaves wirelessly, modulate them, and receive external radio frequency signals, enabling it to function as a laser radio transmitter.

Unlike conventional lasers that emit a single frequency of light, laser frequency combs emit multiple frequencies simultaneously — evenly spaced to resemble the teeth of a comb. Inside the laser, the different frequencies of light beat together to generate microwave radiation. The light inside the cavity of the laser causes electrons to oscillate at microwave frequencies that are within the communications spectrum.

The first thing the device needed to transmit microwave signals was an antenna. To create the antenna, a gap is etched into the top electrode of the device, creating a dipole antenna (like the rabbit ears on the top of an old TV). The frequency comb was modulated to encode information on the microwave radiation created by the beating light of the comb. Using the antenna, the microwaves are radiated out from the device, containing the encoded information. The radio signal is received by a horn antenna, filtered, and sent to a computer.[4]

This technology is still nascent and under development, therefore, not available for consideration in this Project.

5.2.4. Fibre Optic Cable Alternatives

The growing need for fast broadband 'connectivity' in society and the economy requires a reliable, affordable, and scalable state-of-the art communications infrastructure network. Internet Protocol (IP) traffic has been growing exponentially for years, as human activities are increasingly going online, and there is no let-up in this trend. Services such as HDTV, 3D TV, 4K, video on demand, video conferencing, and new online applications in every profession and business imaginable are all driving further growth in data traffic. The following details the

[4] The TechBriefs website: https://www.techbriefs.com/component/content/article/tb/pub/techbriefs/communications/36378 Accessed on 4/3/2021

advantages of incorporating a high speed data fibre-optic cable for the proposed project, when compared with other technologies outlined below:

Table 5-1 Fibre optic cable advantages

Speed:	**Fibre optic networks operate at high speeds - up into the gigabits**
Bandwidth:	large carrying capacity and Low attenuation (data loss)
Distance:	Signals can be transmitted further without needing to be "refreshed" or strengthened.
Resistance:	Greater resistance to electromagnetic noise such as radios, motors or other nearby cables.
Maintenance	Fibre optic cables costs much less to maintain
Durability	Longer life expectancy than copper or coaxial cable

Additionally, the quality of sound received over fibre optic cables is extremely clear and it does not vary with atmospheric conditions. Cables offer excellent confidentiality, light weight and reliability. The fact that the optic cable system will lead to increased speeds and reduced internet costs is a welcome idea for the business and corporate world in Kenya. This is the most optimal option in terms of technology and reduction of redundancies and also uses mostly existing wayleaves of mostly road infrastructures remains the most optimal option.

5.3. The "No-Action (No Project)" Alternative

Under the '**No Action'** alternative, the proponent would not carry out the intended proposed installation of the optic fibre cable and the anticipated negative impacts resulting from commissioning and operation of the development as proposed, would not occur. Additionally, the resultant socio-cultural/economic benefits that would be created by the proposed installation of the optic fibre cable project would also be foregone. This decision is not favorable if the vision 2030 are to be achieved.

While the "**No Action"** alternative may ensure non-interference in the biodiversity, social conditions, the resultant implication is that there will be no improvement to the Kenya telecommunication status hence no growth will be experience as a result in improved speed and ways of doing business. Additionally, this will imply that the proponent will not be able to meet the growing customers' needs of better and faster internet without the project. This project is anticipated to create employment in the participating countries. The enhancement of communications and global connectivity through this project will directly affect local businesses,

education and employment opportunities within the country. The PEACE Cable System is a priority project for the enhancement of Information and Communication technology infrastructure in the regions and a robust and reliable international telecommunications link will have significant benefits for the citizens of the region. Therefore, this alternative was excluded from further consideration.

5.4. The proposed Development

This report has identified social, physical and economic impacts for this proposed fibre optic installation. This alternative will have minimal impacts on the physical and social environment and has considered the necessary mitigation measures to either eliminate completely or reduce the impacts to negligible. Since the proposed project will not interfere with any sensitive environment and negative impacts are very minimal and when mitigated they are reduced to negligible levels. Maximum benefits shall be realized with the implementation of the project. This will in turn determine the way business is done in Kenya, in sectors such as entertainment, political, education and training. Additionally, the implementation of the project will result to magnitude of benefits to the country and neighboring ones as well. Thus, the proposed fibre optic installation is the best and most viable option.

6. STAKEHOLDER ENGAGEMENT

6.1. Overview

This Chapter presents a summary of the stakeholder engagement undertaken as part of the ESIA process for the Project. It also serves as a summary of a more detailed Stakeholder Engagement Plan (SEP), which presents the engagement approach and identifies stakeholders and the mechanisms through which stakeholders have been engaged.

The engagement process has been designed to meet both Kenyan legal requirements for consultation and public participation (CPP) in relation to an ESIA Project Report, and international requirements for engagement as outlined in the WBG ESSs.

6.2. Objectives of Stakeholder Engagement

The objectives of engaging stakeholders during the ESIA process and beyond include:

- **Ensuring understanding:** An open, inclusive and transparent process of culturally appropriate engagement and communication is undertaken to ensure that stakeholders are well informed about the Project as it develops. Information is disclosed as early and as comprehensive as possible and appropriate.
- **Involving stakeholders in the assessment:** Stakeholders are included in the scoping of issues, the assessment of impacts, the generation of mitigation and management measures and the finalization of the ESIA Project Report. They also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.
- **Building relationships:** Through supporting open dialogue, engagements help establish and maintain a productive relationship between the Project and stakeholders. This supports not only an effective ESIA, but also strengthens the existing relationships and build new relationships between the Proponent and stakeholders.
- **Engaging vulnerable peoples:** An open and inclusive approach to consultation increases the opportunity of stakeholders to provide comment on the Project and to voice their concerns. Some stakeholders, however, need special attention in such a process due to their vulnerability. Special measures are to be considered to ensure that the perspectives of vulnerable stakeholders are heard and considered.
- **Managing expectations:** It is important to ensure that the Project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process serves as one of the mechanisms for understanding and then

managing stakeholder and community expectations, where the latter is achieved by disseminating accurate information in an accessible way.

- **Ensuring compliance:** The process is designed to ensure compliance with both local regulatory requirements and international best practice.

One of the key outcomes of engagement should be free, prior and informed consultation of stakeholders, where this can be understood to be:

- **Free:** engagement free of external manipulation or coercion and intimidation;
- **Prior:** engagement undertaken in a timely way, for example, the timely disclosure of information; and
- **Informed:** engagement enabled by relevant, understandable and accessible information.

6.3. Project Stakeholders

A **stakeholde**r is defined as **any individual or group which is potentially affected by the Project or who has an interest in the Project and its potential impacts**. Different issues are likely to concern different stakeholders; as such, stakeholders have been grouped in accordance with their connections to the Project.

Table 6-1 presents the range of stakeholder groups that have been identified and included within the stakeholder engagement process to date.

Table 6-1 Project Stakeholders

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders to be Consulted	Comment
National Government	National Regulatory Bodies Government Agencies	National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with law throughout all stages of the Project life cycle.	National Environment Management Authority (NEMA) Kenya Wildlife Service (KWS) Kenya Maritime Authority (KMA) Kenya Marine and Fisheries Research Institute (KEMFRI) Kenya Fisheries Service (KeFS) Coast Development Authority (CDA) Kenya Ports Authority (KPA) National Museums of Kenya (NMK)	The aim was to conduct a stakeholder engagement meeting with the relevant departments at the County Level and determine whether further engagements are required at the national level. In all cases NEMA was consulted.
County Government	Mombasa County (001)	The County Government is also of primary importance as it is responsible for implementation of legislation, and development plans and policies at the County level. The County Government also	Department for Environment, Waste Management & Energy (DoEWE)	These are the departments identified as being relevant to project development. They were all engaged aim in one meeting.

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders to be Consulted	Comment
		have a role in issuing permits and processing applications. Finally, the County Government has a role in ensuring the views of the communities it represents are presented to the Project.		
Traditional Authorities	Administrative and Customary authorities such as Village Elders	Local community leaders acting as representatives of their local community. The traditional leaders and local authorities are the gatekeepers and play a key role in mobilization and maintaining law and order	Area Chiefs Sub-Chief Elders Beach Management Unit (BMU)	These stakeholders were key to community mobilization and determination of availability of cultural sites and artifacts

6.4. Approach to Stakeholder Engagement

Stakeholder engagement for the Project was and will be undertaken using a stage-gated approach in line with the various phases of its development as follows:

- ESIA process engagement; and
- Post ESIA engagement.

6.4.1. ESIA Process Engagement

The Objectives of the ESIA process engagement were to:

- To meet/communicate with key stakeholders and introduce them to the Project and ESIA process.
- To discuss the Project with the stakeholders including identified impacts and the plans in place to manage them.
- To obtain stakeholders' view on the Project.
- To obtain stakeholders' concerns on the Project.
- To understand stakeholders' expectation from the Project.
- To collect baseline data through a variety of methods including using participatory tools.
- To notify stakeholders of the next steps of the Project development.

Table 6-2 presents a summary of the stakeholder engagements conducted during the ESIA process, while a summary of the key issues raised/comments made is presented in Section 6.4.2. The results of the stakeholder consultations have been incorporated into the baseline information as well as into the impact assessment Chapter (Chapter 7 of this ESIA Project Report).

Table 6-2 Details of ESIA Process Stakeholder Engagement

Stakeholder	Mode of Engagement	Engagement Date	Venue
Kenya Wildlife Service (KWS)	By email and meeting	April 22 2021	By email and Coast Region offices
Kenya Coast Guard Service (KCGS)	By email and meeting	April 22 2021 May 6 2021	By email and Mombasa office
Coast Development Authority (CDA)	By email And meeting	April 22 2021	By email

Stakeholder	Mode of Engagement	Engagement Date	Venue
County Government of Mombasa	By email and Key Informant Interview (KII)	March 23 2021- May 7 2021	Department of Environment, Waste & Energy (DoEWE) at Bima Towers, Mombasa
Nyali Beach Management Unit	Meeting	March 23 2021- May 7 2021	Nyali Beach
Nyali Administrators and General Public	Meeting and by email	March 23 2021- May 7 2021	Nyali Beach at Early Birds Banda
New Nyali Residents Association	By email and meeting	March 23 2021- May 7 2021	By email and Nyali Beach, at Mwamba Drive
Kenya Ports Authority (KPA)	By email and meeting	March 23 2021- May 7 2021	By email and Mombasa office
Fort Jesus National Monument	By email and meeting	March 23 2021- May 7 2021	Mombasa for fort Jesus office
Coastal & Marine Resources Development (COMRED)	By email and meeting	March 23 2021- May 7 2021	By email and physically through Mombasa office
Nyali Sun Africa Hotel	Meeting	March 23 2021- May 7 2021	Early Birds Banda at Nyali Beach
Kenya Maritime Authority (KMA)	By email And meeting	March 23 2021- May 7 2021	By email and through Mombasa Office

6.4.2. Outcomes of Engagement Conducted to Date

As indicated in Table 6-2 stakeholder engagement meetings were held during the ESIA process of the Project.

The key questions and concerns raised by stakeholders during the ESIA process are outlined in Table 6-3. The Background Information Document (BID), detailed minutes of the stakeholder engagement meetings conducted during the ESIA process, meeting photos, attendance registers, and the developed stakeholder engagement database, are all presented in Appendix D and Appendix E.

Table 6-3 Outcomes of ESIA Process Stakeholder Engagements

Main Theme brought up by Stakeholders	Key stakeholders issues/ comments
On stakeholder engagement	• Proponent should train and involve the community in cable surveillance. • Proponent should engage with fishermen who are likely to temporary lose their livelihoods during cable installation (compensation preferred). • Continue engaging the local community to achieve social license to operate.
On previous stakeholder engagement	• Proponent should endeavor to improve on community engagement to avert escalation of grievances to the courts. For example, community members reported that the proponent had used coercion (threats) during the Djibouti-Africa Regional Express (DARE 1) undersea cable system installation forcing them to consider seeking legal redress. • Community members also reported that the proponent had not taken any action on their reports that a submarine fiber optic was dangerously hanging. Communication went cold. • Community would like to be involved in all the steps of the cable installation and maintenance as they can serve as an early warning system for any adverse incidences.
On positive project impacts/ opportunities	• Employment opportunities for the local community members during construction and operations (cable surveillance). • Increased internet speeds, access and reliability. • Reduced internet costs due to increased supply. • Economic growth through job creation and improved communication locally and internationally.

Main Theme brought up by Stakeholders	Key stakeholders issues/ comments
	• Improved security due to community involvement.
On negative environmental impacts/risks	• Reduction in water quality (turbidity) due to seabed ploughing. • Coral reef bleaching. • Disturbance to faunal breeding areas due to seabed ploughing at the coral reef and seagrass areas. • Chemical pollution due to potential release of buried pollutants such as heavy metals. • Noise pollution during ploughing and burying the cable. • Water pollution due to waste generated onboard the cable installation vessels. • Disturbance of benthic and aquatic life e.g. Interference with humpback whale migration- in the deeper waters. • Air pollution from ship fossil fuel emissions and dust from land trenching.
On negative social impacts/risks	• Temporary loss of fishermen livelihoods during cable installation due to sea water turbidity and access restrictions, damage to nets, and fish hibernation. • Disruption to recreational and touristic activities such as scuba diving, swimming, Marine Park visits, etc. • Hindrance to safe navigation. • Conflict with other marine resource users if no adequate engagement is done. • Occupation accidents and incidents.
Management of negative impacts	• Continuously engage fishermen throughout the cable installation process. • Ensuring total cable burial (no hanging cables) to avert boat entanglement and ease navigation. • Employ local residents in the cable installation and maintenance process. • Muffle generators and use fully-serviced machines and equipment.

Main Theme brought up by Stakeholders	Key stakeholders issues/ comments
	• Erect signage during installation and restore disturbed areas. • Compensate fishermen for lost days. • Avoid routing cable through coral reefs, seagrass and faunal breeding areas. • Conduct public awareness during cable installation to avert conflicts. • Cable ship to constantly broadcast position when working near high marine traffic areas. • Develop and implement waste management. Includes hazardous waste. • Avoid installing cable during both northern and southern humpback whale migration. • Plough should suck all the sediments along the trench area to avoid them being dispatched by the water currents and the waves to the coral heads, the sea grass beds and other critical habitats where they are likely to suffocate them.
Corporate Social Responsibility (CSR)	As part of CSR, the proponent should consider undertaking any or all of the following community projects; public toilet on Nyali beach, electricity connection, piped water supply, community training in cable surveillance and optimum internet use, etc.

All stakeholder comments were noted and were considered in the assessment of the Project at all phases. Where necessary, responses were given by both the ECA team present in the various meetings (refer to Appendix D for detailed minutes of the stakeholder engagement meetings).

6.4.3. Post ESIA Engagement

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the next stages of Project planning and development will therefore feed into and inform on-going stakeholder engagement as the Project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage, a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

In particular, post ESIA stakeholder engagement is expected at the following Project stages:

- **Mobilisation phase:** At this stage, information regarding the exact locations of specific Project infrastructure, detailed construction schedule, expected construction team (including employment opportunities) will be shared with the Project stakeholders.
- **Construction phase:** Periodic Project updates as well as any changes in planning will be shared with Project stakeholders.
- **Demobilisation phase:** Notifying the stakeholders the end of the construction activities and close-out of outstanding construction phase related grievances. This is also expected to mark the start of the operation phase.
- **Operations Phase:** Periodic updates to Project stakeholders on the operations issues, share operation information where required or deemed necessary and communicate any changes in operation plans.
- **Decommissioning Phase:** Inform stakeholders when the Project comes to an end as well as future plans for the Project Site.

7. ANTICIPATED IMPACTS

7.1. Overview

The predicted impacts to the physical, biological and socio-economic environment as a result of the Project are described in this Chapter. This Chapter also details potential mitigation measures in order to avoid, minimize, reduce, remedy or compensate for potentially negative impacts, and enhance potential benefits of the Project. Furthermore, this Chapter provides a prediction of the residual impacts that will remain, assuming that the appropriate mitigation measures are implemented.

The impact assessment laid out in this Chapter is as follows:

- Each section begins with the type of impact being assessed (e.g. Section 7.4.1 – Impact on employment, and Section 7.5.2 – Exposed cables, etc.).
- Background information relating to the impact is then provided. This includes a description of the baseline environment that will be affected, the Project aspect or activities that will cause the impact and a description of the effected receptors.
- The significance of the impact pre-mitigation is then assessed and rated through use of a rating table.
- Following the pre-mitigation rating tables, a section describing the recommendations and mitigation/management measures are provided.
- Once the recommended mitigation/management measures are provided, a residual impact (post-mitigation) is rated through use of a less detailed rating table.

7.2. Impact Assessment Methodology

7.2.1. Impact Assessment Process

The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimize any potential adverse effects and to enhance potential benefits.

The impacts of the Project were identified based on the findings of stakeholder consultation, the existing baseline conditions, the Project activities and professional knowledge of the consultants. Impacts are first distinguished as either positive or negative. The cross-sectoral issues and aspects are: biodiversity; air quality; waste management; noise and vibration; social aspects particularly employment, economy, labour and working conditions, and disease transmission.

7.2.2. Definition of Key Terminology

Project - The features and activities that are a necessary part of the Project Proponent's development plans without which the Project cannot proceed. The Project is also the collection of features and activities for which authorization is being sought.

Project Site - The (future) primary operational area for the Project activities.

Project Footprint - The area that may reasonably be expected to be directly affected by Project activities, across all phases. The Project Footprint includes land used on a temporary basis such as construction lay down areas, materials yards, borrow pits or construction haul roads, as well as disturbed areas in transport corridors, both public and private.

Area of Influence -The area where impacts could reasonably be expected.

Project Area - Also referred to as the Study Area is the area that needs to be studied in order to adequately understand and describe the baseline likely to be affected by the Project. The Project Area encompasses the Project Footprint, Project Site and the Area of Influence.

7.2.3. Impact Types and Definitions

An impact is any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the Project could affect the bio- physical and socio-economic environment.

Impacts are described according to their nature or type, as summarized in Table 7-1.

Table 7-1 Impact Nature and Type

Nature or Type	Definition
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct impact	An impact that results from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre- existing habitats or between an effluent discharge and receiving water quality).

Nature or Type	Definition
Indirect impact	An impact that results from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).
Induced impact	An impact that results from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).
Cumulative impact	An impact that acts together with other impacts (including those from concurrent or planned future third-party activities) to affect the same resources and/or receptors as the Project.

7.2.4. Assessing Significance

Impacts are described in terms of 'significance'. Significance is a function of the magnitude of the impact and the sensitivity/vulnerability/importance of resource/receptor.

7.2.4.1. *Determining Impact Magnitude*

Impact magnitude (sometimes termed severity) is a function of the type, extent, duration, scale and frequency of the impact. These characteristics apply to both planned and unplanned events/impacts and are briefly described in Table 7-2.

An additional characteristic that pertains only to unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in Table 7-3.

Table 7-2 Impact Characteristics Methodology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect) as explained in Table 7-1.	• Direct • Indirect • Induced
Extent	The "reach" of the impact (e.g., confined to a small	• Local - impacts that affect an area in a radius of 20km around the development site.

Characteristic	Definition	Designations
	area around the Project Footprint, projected for several kilometers, etc.).	• Regional - impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. • International - impacts that cross national borders, affect nationally important environmental resources or affect an area that is nationally important/or have macro-economic consequences.
Duration	The time period over which a resource / receptor is affected.	• Temporary - impacts are predicted to be of short duration and intermittent/occasional. • Short-term - impacts that are predicted to last only for the duration of the construction period. • Long-term - impacts that will continue for the life of the Project but ceases when the Project stops operating. • Permanent - impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	[no fixed designations; intended to be a numerical value or a qualitative description of "intensity"]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value or a qualitative description]

Table 7-3 Definition for Likelihood Designations

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

The overall magnitude of an impact is a combination of the above characteristics. The universal magnitude designations are:

- Negligible;
- Small;
- Medium; and
- Large.

7.2.4.2. *Determining sensitivity/vulnerability/ importance of resource/receptor*

There are a range of factors to be considered when defining the sensitivity/vulnerability/ importance of the resource/receptor, which may be physical, biological, cultural or human. Other factors may also be considered when characterizing sensitivity/vulnerability/ importance, such as legal protection, government policy, stakeholder views and economic value.

As for the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis. The sensitivity/vulnerability/importance designations used herein for all resources/receptors are:

- Low;
- Medium; and
- High.

Table 7-4 presents an illustrative example of the sensitivity/vulnerability/importance of the resource/receptor.

Table 7-4 Illustrative Example of Sensitivity/Vulnerability/Importance of the Resource/Receptor

Designation	**Receiving environment**	
	Biophysical environment	**Socio-economic environment**
Low	The impact affects the environment in such a way that natural functions and processes are not affected.	People/communities are able to adapt with relative ease and maintain pre-impact livelihoods.
Medium	Where the affected environment is altered but natural functions and processes continue, albeit in a modified way.	People/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.
High	Where natural functions or processes are altered to the extent that they will temporarily or permanently cease	Affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.

7.2.4.3. *Determining Impact Significance*

As earlier stated above, Impact Significance is a function of the magnitude of the impact and the sensitivity/vulnerability/importance of resource/receptor. This is the ultimate impact classification. As presented in Table 7-5 below, the impact significance can be Negligible, Minor, Moderate or Major.

Table 7-5 Impact Significance

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
Magnitude		**Low**	**Medium**	**High**
	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	High	Moderate	Major	Major

Table 7-6 below presents a brief description of the different categories of Impact Significance.

Table 7-6 Significance Definitions

Significance Level	Definition
Negligible	An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.
Minor	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate	An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that 'moderate' impacts have to be reduced to 'minor' impacts, but that moderate impacts are being managed effectively and efficiently.
Major	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the ESIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects, there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.

7.2.4.4. *Identification of Mitigation and Enhancement Measures*

For activities with significant impacts, the ESIA process is required to identify, in collaboration with the Project Developer/Proponent, suitable and practical mitigation measures that can be

implemented. Mitigation that can be incorporated into the Project design, in order to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the Project Proponent as these are likely to form the basis for any conditions of approval by NEMA. The implementation of the mitigation is ensured through compliance with the Environmental and Social Management and Monitoring Plan (ESM&MP).

7.2.4.5. *Residual Impact Evaluation*

After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significance rating for the residual impact.

Note: It is important to note that positive impacts are not rated, they are merely stated. It is considered sufficient for the purpose of the Impact Assessment to indicate that the Project is expected to result in a positive impact, without characterizing the exact degree of positive change likely to occur.

7.3. Installation/Construction Related Impacts

7.3.1. Impact on Employment, Procurement and the Economy

7.3.1.1. *Description of the Baseline Environment*

TKL is an operational telecommunication company in Kenya with employees in its various ranks exemplifying availability of skilled labor within the company. The Project will provide a myriad of additional employment opportunities during the construction/installation phase.

TKL also requires their contractors to employ at least 70% of the labor force within the local and surrounding communities.

Additionally, materials for construction/installation can be sourced from within Kenya, particularly, in Mombasa and Nairobi cities, further benefiting the local economy.

7.3.1.2. *Project Activities*

The project will have a positive impact on the employment. The enhancement of communications and global connectivity will directly affect local businesses, education and employment opportunities in Kenya, and is likely to have an indirect effect of attracting more tourism to current tourist centers because of the ease of communication. A robust and reliable international telecommunications link will have significant benefits for Kenyan residents, regardless of gender or ethnic community, in the following ways:

- Providing better quality services at reduced operational costs and user charges;
- Providing more reliable international communications;

- Providing competitive prices for national and international connectivity;
- Stimulating investment and economic growth;
- Increasing employment opportunities; and
- Easing access to education and broad knowledge such as medicine

These impacts support Kenya government, UN and World Bank goals of reducing poverty, increasing economic development and opportunity for all, and enabling social changes through universal internet access.

7.3.1.3. *Sensitive Receptors*

The inhabitants of communities in Mombasa County, especially the neighboring Nyali area will be able to benefit from direct and indirect employment opportunities and the supply of the required goods and services, especially those experienced in the installation of submarine cables. Again, the users all over Kenya.

7.3.1.4. *Impact Summary (Pre-enhancement)*

Type of Impact
Positive Impact
Direct and indirect employment opportunities and the procurement of construction materials, goods and services, and combined multiplier effect of this economic growth will result in increased incomes for successful candidates and their local communities; promoting some degree of an increase in standards of living.

7.3.1.5. *Enhancement/Management Measures*

In order to enhance this positive impact, the following management measures will be implemented:

- The contractor should prioritize the recruitment of workers (unskilled, semi-skilled) from the local communities in Mombasa County, where available.
- The Contractor should notify identified representatives of the County Government and Local Administration (i.e. the Area Chief) of the specific jobs and the skills required for the Project, during the recruitment process.
- Advertisements on the employment and procurement opportunities during the construction phase should be placed at the Chief's Office notice board. In the event that the position cannot be filled from within the Project Area, it will be advertised further country-wide then nationally.

- No recruitment is to take place on the Project site. This is particularly important with respect to casuals.
- The Contractor should aim at procuring locally available materials where feasible and use local suppliers where appropriate.

7.3.2. Impact on Biodiversity

7.3.2.1. *Description of the Baseline Conditions*

The habitats in the Project Area are natural and critical, therefore, contain important biodiversity habitats of conservation concern. As earlier indicated, the submarine cable traverses Mombasa Marine Park and Reserve (MMP&R), a home to a colourful variety of marine species including crabs, starfish, stone fish, cucumbers sea urchins, corals, turtles, sea grasses and interesting migratory birds including crab plovers. MMP&R is part of the Western Indian Ocean (WIO) region, a hotspot of biodiversity hosting over 2,200 species of fish, five species of marine turtles and more than thirty five marine mammal species. The region boasts of the longest unfragmented fringing reef in the world, with over 350 species of corals, and a diverse assemblage of coastal forests, mangrove forests and seagrass beds. It is estimated that about 22% of the species found in the WIO region are unique to this region. The ecosystem services provided by this rich marine environment are estimated at over 25 billion US$ per year and more than 60 million people directly depend on these ecosystems.[5]

Humpback whale migration also occurs in the project area; Northern humpback whale migration normally occurs between July-August; and southern migration that takes place between October/November. These ceteceans may become entangled by these cables unless these cables are well pegged to the seafloor. Sound travels far and fast underwater so marine sound travels far and fast underwater so marine mammals can use it to: navigate, find food and communicate. In dark environment whales maintain contact with a set of 17-20 calls unique to their community and hearing sense is the most important for most marine mammals. Marine mammals may or may not be affected by noise depending on whether the noise frequency overlaps with their hearing range. Any form of noise above their hearing range likely to be generated during the installation of these cables is likely to disorientate the movement of these marine mammals.

[5] IUCN Website: https://www.iucn.org/regions/eastern-and-southern-africa/our-work/coastal-and-ocean-resilience Retrieved on 5/3/2021.

7.3.2.2. *Project Activities*

The pre-laying grapple run

The grapnel will penetrate the seabed to a depth of up to 0.8 meters. Due to the intrusive nature of this operation some negative impact is unavoidable. Impacts include the generation of:

- a small amount of turbidity
- through physical contact mortality or injury to marine organisms, particularly plants and other organisms that have low mobility.

The pre-laying grapple run and cable installation will have some minor physical impact on sea bed geology. This impact will be limited to the area where the cable will be installed only and will vary in intensity depending on the installation method (cable burial in a trench or laying on the seabed).

Cable laying

The laying of cables leads to seabed disturbance and associated impacts of damage, displacement or disturbance of flora and fauna,

- increased turbidity
- release of contaminants
- alteration of sediments.

These effects are mainly restricted to the installation, repair works and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor (in the order of 5m width if the cable has been ploughed into the seabed).

Some mobile benthos can avoid disturbance and though sessile species (bivalves, tubeworms etc.) will be impacted.

The cable installation process will only result in short term direct impacts to the subtidal bottom habitats and assemblage present on intertidal area at the beach landing point. The short term loss of benthic organisms directly along the cable routes is not considerate to represent an unacceptable ecological impact. The rapid natural reinstatement of the seabed will result in the area being available or rapid recolonization and hence, no permanent impacts are anticipated from cable project.

Raised turbidity and suspended sediment levels can have a number of adverse effects on marine organisms, particularly in areas that would normally have clear waters.

Where suspended sediment concentrations are present for prolonged periods, or are particularly high and widespread, visibility can be reduced affecting the ability of some fish to feed.

Raised turbidity can also reduce light penetration in the water column and reduce photosynthesis/ productivity in sea grasses and affecting the coral reef presents in the area (2 fringing reefs).

However the duration, spatial extent and level of suspended sediment associated with route clearance and cable installation in this project are unlikely to cause such problems.

Nevertheless, turbidity levels should be minimized during cable lay operations by minimizing the duration and extent of physical seabed disturbance.

7.3.2.3. *Sensitive Receptors*

The main sensitive receptors are fauna, flora and life support systems in the Project area.

7.3.2.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, the impacts on biodiversity will be a "**Moderate Negative Impact**" pre-mitigation as summarized below.

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impacts on biodiversity are expected to be restricted to the construction/installation area footprint.
Duration	Short-term	Adverse effects will cease shortly after construction/installation
Scale	Medium	This impact will be manifested within the Project area (approximately 27km).
Frequency	Continuous	Impact will be manifested throughout the construction phase.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significant Rating Before Mitigation		

Moderate Negative

7.3.2.5. *Mitigation/Management Measures*

No immediate mitigation known due to temporal nature of impact (less than 24h) would be selected. But this can be achieved using the sea plough burial method in preference to jetting wherever possible. The impact of turbidity generation is assessed as being of low significance.

The Project will implement mitigation measures to reduce the risks of impacts on flora, fauna and marine habitats with particular attention is paid to sensitive marine species including marine mammals and turtles. This will include:

- Marine vessels will be required to adhere to IMO regulations on bilge and ballast water discharge in order to avoid tensional introduction of non-native species to the marine environment
- Monitoring for the presence of marine mammals and turtles during marine activities (Contractors will implement a suitable system for spotting marine mammals and turtle whilst pre-installation and installation vessels are at sea. Should these species be observed in the vicinity of the work area, the vessels will execute measures to avoid collision or disturbance. Vessel operators will maintain a distance of 100m or greater and will travel at 10 knots or less when safety permits until animals are more than 500m away. Abrupt changes in direction will be avoided
- Working with an appropriate environmental organization to develop a notification process;
- Minimizing the impact of lighting at the beach areas.
- Areas of habitat that are temporarily disturbed during cable installation will be restored upon the completion of the installation phase. Areas are disturbed during installation activities will be rehabilitated ASAP after the cable has been installed.
- The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary effects from pollution, sedimentation, or accidental spills.
- Consider an appropriate means by which exposure to Electromagnetic Fields can be minimized or reduced so as to reduce its effects on marine wildlife and ecosystem.
- Bury cables to an adequate depth in order to reduce the cable induced temperature rise of the upper layer of the sea bottom and to avoid impairment of marine species by electromagnetic fields.

- Select suitable burial techniques to minimise disturbance effects of benthic species and habitats and the release of contaminants.
- Schedule cable laying to reduce disturbances in sensitive areas (e.g. feeding, resting, moulting, spawning or nursery areas) at sensitive phases of the year.

7.3.2.6. *Residual Impact (Post-mitigation)*

Based on the implementation of the mitigation measures, the significance of the impacts on biodiversity will be a "Minor Negatively" post mitigation as per the summary below.

Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	The impacts on biodiversity are expected to be restricted to the construction footprint.
Duration	Short-term	Using sea plough method generation with decrease turbidity generation.
Scale	Negligible	With adequate management measures in place, the extent of this impact will be reduced to negligible levels.
Frequency	Continuous	With the implementation of the management measures, the impact on biodiversity is not likely to happen.

Magnitude

Small

Significant Rating After Mitigation

Minor Negative

7.3.3. Impacts on Local Air Quality

7.3.3.1. *Description of the Baseline Environment*

The Project area is located within Kenya territorial waters where the only source of air pollution emanates from ships movements burning fossils.

7.3.3.2. *Project Activities*

Cable laying will require use of dedicated cable lay vessels resulting in a number of general environmental impacts and risks. During normal operational activities vessels emit exhaust gases. Assuming that the vessels are well maintained, emissions of pollutants will be minimal and within allowable limits.

Additionally, there is potential some dust generation during the construction at the shore crossing BMH and ducts. Dust is most likely to be generated during the transportation of materials on unpaved roads and during trench digging and soil movement.

Increased levels of dust in the air have the potential to impact environment (flora, communities) and social resources. However, the construction (BMH and ducts) period will be very short (approximately 3 weeks); any dust would be limited to the construction area, access route and very near surrounds only. Dust related impacts largely reversible within a short timescale. Therefore, no impacts are predicted to occur as a result of increased dust.

7.3.3.3. *Sensitive Receptors*

The main sensitive receptors are the beach users and other ocean users. There are no affected households (residential areas) at the Project area given its location in Kenya territorial waters.

7.3.3.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, impacts on local air quality during the construction phase will be **"Minor Negative Impact"** pre-mitigation as per the assessment below.

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The gaseous and dust emissions will be localized within the project area, access route and near surroundings.
Duration	Short-term	Effects will cease shortly after construction
Scale	Small	No significant impacts are predicted to occur as a result of increased dust.
Frequency	Continuous	This impact will be manifested throughout the construction phase
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Low		

Significant Rating Before Mitigation
Minor Negative

7.3.3.5. *Mitigation/Management Measures General Measures*

To minimize air emissions the Project's cable laying vessels will operate in line with the requirements specified under MARPOL 73/78 Annex VI, Prevention of air pollution from ships.

- The Project should require that construction contractors operate only well maintained engines
- Should considerable dust generation occur during construction, causing plumes of dust in the vicinity of the works and behind
- Construction vehicles, a routine wetting program of all unpaved surfaces including roads and construction areas will be undertaken to ensure sufficient moisture content is maintained to suppress dust generation.
- Construction traffic speed control measures will be enforced on unpaved roads (reduced dust generation levels are often consistent with reduced traffic speeds).
- Operation in line with the requirements specified under MARPOL 73/78 Annex VI
- When mitigated by compliance with MARPOL requirements, the impact of vessel operations on air quality is assessed as being of low significance.
- The project should require that construction contractors operate only well maintained engines.

On dust, the following mitigation measures are recommended:

- Dust suppression techniques, such as increasing the moisture content of excavated materials and roadways by applying water or non-toxic chemicals, can be used to reduce the amount of dust in the air, particularly where construction activities are taking place in close proximity to dust sensitive receptors e.g. residential/commercial areas. Other dust management measures include speed restrictions on dust generating vehicles;
- Develop and implement a grievance procedure in the event of any noise and vibration impact complaints being received.

7.3.3.6. *Residual Impact (Post-Mitigation)*

Based on the implementation of the mitigation measures, the significance of the impact on the noise environment will be **"Negligible Negative Impact"** post mitigation per the assessment below.

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The gaseous and dust emissions will be localized within the construction site
Duration	Short-term	Effects will cease shortly after construction phase
Scale	Small	No significant impacts are predicted to occur as a result of increased dust.
Frequency	Continuous	This impact will be manifested throughout the construction phase
Magnitude		
Negligible		
Significant Rating After Mitigation		
Negligible		

7.3.4. Waste and Effluent

7.3.4.1. *Description of the Baseline Conditions*

Countries in the Western Indian Ocean are endowed with coastal and marine ecosystems rich in biodiversity and luxuriant resources that are important to the well- being of their people. However, these resources are under pressure from a variety of natural and man-made factors, including; resource overexploitation, pollution, unplanned coastal development and climate change. Marine litter is becoming a significant contributor to marine pollution in the World Oceans and WIO, is not exempt. Over 80% of marine pollution that constitute marine litter and microplastics is from land-based sources, largely associated with the increasing use of synthetic materials, industrialization and urbanization of coastal areas, where disposal and waste management practices are inadequate. Many types of marine litter particularly plastics persist for hundreds of years and are the most damaging to the marine environment. They have a wide range of adverse impacts to the ecological, socio- economic, recreational and aesthetic values of coastal and marine ecosystems.[6]

[6] Nairobi Convention Website: https://nairobiconvention.org/Meeting%20Documents/December%202018/WIO-RAPMaLi_Full%20Revised%20Draft_29102018_Final.pdf Retrieved on 5/3/2021

7.3.4.2. *Project Activities*

A variety of non-hazardous (packaging...) and hazardous (oil wastes, paints...) wastes are typically generated during vessels operations.

Hazardous wastes can clearly have a toxic effect on organisms and can in some circumstances lead to bioaccumulation and ultimately lethal or sub-lethal affects if badly managed. In addition, some non-hazardous waste types can be equally harmful, particularly non degradable plastics that can remain at sea for many years posing an entanglement risk to sea birds and marine life.

Annex V of MARPOL prohibits the disposal to sea of any plastics whilst restricting the discharge of other non-hazardous waste in coastal waters and in designated "Special Areas".

Hazardous waste should be stored on board the vessel until it can be disposed at a suitably equipped port, respecting the requirements of the Basel Convention on Transboundary Shipment of Hazardous Wastes.

Effluents, on the other hand, can include sewage water, grey waters (discharge from showers and sinks) and potentially contaminated drainage from the ship deck. Sewage and grey waters can have high bacteria levels, surfactants and a high Biological Oxygen Demand (BOD), all which can result in potential human health issues and harm to marine organisms, particularly in sensitive areas or locations with poor mixing and dilution potential.

These wastewaters should therefore be managed in accordance with applicable international regulations and guidance, including the requirements of MARPOL 73/78, Annex IV (sewage).

MARPOL, Annex 1 also addresses discharge of oily waters, for example, bilge waters. For ships of 400 gross tonnage and above, for control of oil from machinery spaces, wastewater must have an oil concentration below 15ppm without any prior dilution. More specifically:

- Within special areas – discharges are prohibited, except when the ship is proceeding en route, and the oil content of the effluent without dilution does not exceed 15 ppm, and the ship has in operation oil filtering equipment with automatic 15 ppm stopping device.
- Outside special areas - discharges are prohibited, except when the ship is proceeding en route, the oil content of the processed bilge water (from machinery spaces) effluent is less than 15 ppm, and the ship has in operation an oil discharge monitoring and control systems, oily-water separating or filtering equipment

7.3.4.3. *Sensitive Receptors*

The sensitive receptors to poor waste and effluent management will be other users of the Indian Ocean waters, and fauna and flora within the Project Area.

7.3.4.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, the impacts on biodiversity will be a "**Moderate Negative Impact**" pre-mitigation as summarized below.

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impacts are expected to be restricted to the installation area footprint.
Duration	Short-term	Adverse effects will cease shortly after installation
Scale	Medium	This impact will be manifested within the Project area (approximately 27km).
Frequency	Continuous	Impact will be manifested throughout the installation phase.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significant Rating Before Mitigation		
Moderate Negative		

7.3.4.5. *Mitigation/Management Measures*

- Hazardous waste should be stored on board the vessel until it can be disposed at a suitably equipped port and through a NEMA licensed waste handler, respecting the requirements of the Basel Convention on Transboundary Shipment of Hazardous Wastes.
- Waste management is required to avoid the risk of harm to the environment and human health.
- When mitigated by compliance with MARPOL requirements and the impact of aqueous discharges (excluding ballast waters) in vessel operations is assessed as being of low significance.

- When mitigated by compliance with MARPOL requirements, the impact of solid waste in vessel operations is assessed as being of low significance.

7.3.4.6. *Residual Impact (Post-mitigation)*

Based on the implementation of the mitigation measures, the significance of the impacts on biodiversity will be a "Minor Negative" post mitigation as per the summary below.

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impacts are expected to be restricted to the construction vessels and Project footprint.
Duration	Short-term	Effects only during construction/installation
Scale	Negligible	With adequate management measures in place, the extent of this impact will be reduced to negligible levels.
Frequency	Unlikely	With the implementation of the management measures, the impact on wastes and effluent will not happen.
Magnitude		
Small		
Significant Rating After Mitigation		
Minor Negative		

7.3.5. Impact on Noise Environment and Vibration

7.3.5.1. *Description of the Baseline Environment*

Anthropogenic sound is created in the ocean both purposefully and unintentionally. The result is noise pollution that is high-intensity and acute, as well as lower-level and chronic. The locations of noise pollution are along well-traveled paths in the sea and particularly encompass marine waters. Increased use of the sea for commercial shipping, geophysical exploration, and advanced warfare has resulted in a higher level of noise pollution over the past few decades. Informed estimates suggest that noise levels are at least 10 times higher today than they were a few decades ago.

Sound is an extremely efficient way to propagate energy through the ocean, and marine mammals have evolved to exploit its potential. Many marine mammals use sound as a primary means for

underwater communication and sensing. The sound environment of the ocean is an important aspect of marine mammal habitat and we can expect marine mammals to choose their locations and modify their behavior based, in part, on natural and anthropogenic sounds.

Human presence at sea is normally on the surface, and the sounds that we produce within the water are rarely given much consideration. The air-sea interface creates a substantial sound barrier. Sounds waves in the water are reduced in intensity by more than a factor of a thousand when crossing the air-sea boundary. This means that we are effectively insulated from the noise produced by rotating propellers that drive our ships or by high-intensity sonars used to measure the depth or probe the interior of the sea. The conflict between human and marine mammal use of the sea is fundamentally a consequence of the fact that we do not inhabit the same sound environment. Marine mammals live with their ears in the water, and we live, even at sea, with our ears in the air.[7]

7.3.5.2. *Project Activities*

Construction traffic typically consists of large, heavy vehicles which will generate noise and vibration during the transportation of materials for construction of the landing site (BMH and ducts).

Impact to local residences, restaurants, hotel are not predicted to occur as the increase in noise levels associated with the construction of the landing site will only be small, will be limited to short construction period, and because construction will be take place during day-light hours only.

7.3.5.3. *Sensitive Receptors*

The main sensitive receptors are varied: for marine environment, they will be the users of the oceans, fauna and flora, and the construction workers; and for BMH, they will be the local residences, restaurants, hotel.

7.3.5.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, the impacts on local air quality during construction phase will be “Minor Negative Impact” pre-mitigation as per the below table:

Type of impact
Direct Negative Impact
Rating of Impact

[7] Marine Mammal Commission Website: https://www.mmc.gov/wp-content/uploads/hildebrand.pdf Retrieved on 6/3/2021.

Characteristic	Designation	Justification of Choice
Extent	Local	The noise and vibrations will be localized and limited to the project area.
Duration	Short-term	Effects will cease after construction is completed
Scale	Small	The noise and vibrations generated not exceed the maximum levels permitted in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009
Frequency	Continuous	Noise and vibrations will be generated throughout the construction phase (daytime); however, no noise will be generated at night since construction activities are expected to be limited to daytime activities only.

Magnitude
Medium
Sensitivity/Vulnerability/Importance of the Resource/Receptor
Low
Significant Rating Before Mitigation
Minor Negative Impact

7.3.5.5. *Mitigation/Management Measures*

- The project will require the contractor to use equipment and vehicles that are in good working order, well maintained, and that have all noise suppression equipment intact and in working order; and
- Contractor will be required to implement best driving practices when approaching and leaving the site to minimize noise emissions.

7.3.5.6. *Residual Impact (Post-mitigation)*

Based on the implementation of the mitigation measures, the significance of the impact on local air quality will be a **"Negligible Negative Impact"** post mitigation per the assessment below.

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**

Extent	Local	The noise and vibrations will be localized within the construction site
Duration	Short-term	Effects will cease shortly after construction phase
Scale	Small	The noise and vibration levels is likely to be less than 70 dB(A) – to be confirmed by monitoring, and in conformance to the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 and IFC guidelines.
Frequency	Unlikely	Noise and vibrations will only be generated when Project equipment and machinery are being operated. No Project associated noise will be generated at night.
Magnitude		
Negligible		
Significant Rating After Mitigation		
Negligible		

7.3.6. Occupational and Community Health and Safety (OCHS)

7.3.6.1. *Description of the Baseline Environment*

TKL is an operational telecommunication company in Kenya with employees in its various ranks exemplifying availability of skilled labor within the company. The Project will provide a myriad of additional employment opportunities during the construction/installation phase. TKL also requires their contractors to employ at least 70% of the labor force within the local and surrounding communities.

7.3.6.2. *Project Activities*

There is potential for impacts on human health and safety to occur as a result of accidents and unplanned events that may occur during the Project installation activities. The project activities have the potential to results in a direct and indirect negative impact on human health and safety within the development area and near surrounds.

7.3.6.3. *Sensitive Receptors*

At particular risk are artisanal fishermen and other vessels (divers, jet ski...) that may move at night-time or in reduced visibility conditions when the Project activities are taking place. Collision

of Project vessels with fishing boat and nets or other vessels could results in damage of vessels and equipment, injury or loss of life.

Collision of Project vessels with fishing boats and nets or other vessels could result in damage of vessels and equipment, injury or loss of life. In the terrestrial environment, human health and safety could be impacted through road traffic accidents involving construction vehicles.

In onshore environment, human health and safety could be impacted through road traffic accidents involving construction vehicles. The risk of other injury associated with the construction activities at the landing site will be limited to the work force only (as the site will be secured to avoid public incursion into the active development area) but there is some risk of public injury associated with the installation of the cable between the landing site and CLS as this construction will not be fenced.

7.3.6.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, impacts to exposure of the workforce to poor labour and working conditions will be a **"Minor Negative Impact"** pre-mitigation as per the assessment below.

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impact is limited to the Project Area
Duration	Short-term	Some impacts will last only a short while (minor injury)
Scale	Small	The impact is limited to the Project Area
Frequency	Intermittent	Impact is likely to recur/occur intermittently throughout the construction phase.
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significant Rating Before Mitigation		

Minor Negative

7.3.6.5. *Mitigation/Management Measures*

All active construction areas will be marked with high-visibility tape to reduce the risk accidents:

- All open trenches and excavated areas will be backfilled as soon as possible after the construction has been completed;
- Access to open tranches and excavated areas will be secured to prevent pedestrians or vehicle from failing in;
- The project will require all contractors to implement an Environmental, Health and Safety plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment;
- Contractors will be required to wear suitable personnel protective equipment (hard hats, high-visibility vests, safety boots and gloves and life vests);
- All construction and cable repair workers will sufficiently trained in the safe methods of working with fibre optic cables to avoid injury associated with laser lights and fibres;
- While a ship is laying its maneuverability is restricted, as such it will display the day signals and lights of a hampered vessel to avoid collision with other vessels at sea;
- Vessels will increase watch when navigating in areas that are known to be used by fishermen and other vessels. If other vessels are observed within the near vicinity, the project vessel will stop moving, make contact with the other vessel if possible, and wait until it has been confirmed that the course of both vessels will not result in collision or damage to equipment;
- Works have to take place outside of periods of festival periods as much as possible;
- Cable survey and installation could cause temporary disruption to the flow of recreational sea use. However, these operations are limited to short periods of time and other activities can generally avoid the work area without significant diversion; and
- The project will notify the ports authority and others activities, so that vessels in the area would be warned in advance of the ongoing operations through a "Notice to recreational sea users" report transmitted daily.

No impacts to marine activities are thus predicted to occur a result of the project activities.

7.3.6.6. *Residual Impact (Post-Mitigation)*

Based on the implementation of the mitigation measures, the significance of the residual impact related to exposure of the workforce to Occupational Health and Safety (OHS) risks will be a **"Minor Negative Impact"** post mitigation as per the assessment below.

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impact will be limited to the project area
Duration	Long-term	The implications of poor health and safety practices can be severe including loss of life which can significantly affect households and communities ability to maintain their quality of life and livelihoods.
Scale	Small	With the implementation of the management measures, the number of Project workers exposed to OCHS risks will be very small. The contractor, e-Marine, has a comprehensive **Safety, Health and Environment Management Plan** for the Project. The Plan is Annexed.
Frequency	Unlikely	With the implementation of the management measures, exposure OCHS risks will be rare.
Magnitude		
Small		
Significant Rating After Mitigation		
Minor Negative		

7.3.7. Partial Loss of Productive Assets

7.3.7.1. *Description of the Baseline Environment*

Fishing activity near Mombasa landfall is intense, especially near the water breaks along the south-eastern margin of the reef. During the marine survey, fishing traps, marker buoys and fishing boats with artisanal fishing gears were observed. Again, there some commercial and recreational activities (e.g. boating, diving, swimming, etc.) being undertaken along the route of the cable.

7.3.7.2. *Proposed Project Activities*

Excavation and backfilling operations required to install the submarine and underground optical fiber cable may: (i) Impact partially benthic and aquatic life or even destroy their breeding areas; (ii) Temporarily impede access to fishing areas, commercial establishments and residential

buildings, and undertaking of touristic activities such as diving, marine park visits, boating, etc. Turbidity may also force the fish and other marine animals to migrate away from the project area.

7.3.7.3. *Sensitive Receptors*

The receptors for partial loss of productive assets will be the fishermen, tourists, and owners of the recreational businesses.

7.3.7.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, traffic impacts during the construction phase will be **"Moderate Negative"** pre-mitigation as per the assessment below.

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	To a great extent, partial loss of productive assets will be limited to the Project Area and its environs. However, if there is no fish catch then fish traders will be unable to earn their living and owners of recreational business, their employees will also struggle to feed their families.
Duration	Short-term	This impact will cease to be manifested after the completion of cable installation and settling of the waters.
Scale	Medium	Fishermen, fish traders, and commercial and recreational business owners, their employees and their dependents will be affected.
Frequency	Continuous	This impact will be throughout the cable installation phase.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significant Rating Before Mitigation		
Moderate		

7.3.7.5. *Mitigation/Management Measures*

Partial loss of productive assets; and temporary limitation of access to fishing areas, commercial establishments, and to residential properties will be mitigated as follows:

- For the partial impact on fishing areas, implementation of compensation measures for affected parties should be considered;
- For the temporary limitation of access to commercial establishments and residential buildings, careful planning of construction activities to minimize duration of impact; and
- Caution during cable installation.

7.3.7.6. *Residual Impact (Post-Mitigation)*

Based on the implementation of the proposed mitigation measures, the significance of traffic impacts will be a **"Minor Negative"** post mitigation as per the assessment below.

Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	To a great extent, traffic impacts will be limited to the Project Area, its environs and sensitive receptors therein;
Duration	Short-term	This impact will cease to be manifested after the completion of cable installation phase.
Scale	Small	With the implementation of the mitigation measures, the sensitive receptors will be able to cope with temporary loss of productive assets.
Frequency	Intermittent	Among cases not involved in original negotiations.

Magnitude

Small

Significant Rating After Mitigation

Minor Negative

7.3.8. Impact on Disease Transmission

7.3.8.1. *Description of the Baseline Environment*

Three most prevalent communicable diseases in Mombasa County are: HIV/AIDs at 4.1% of the population; TB at 700/100,000; and Malaria at 8%. There is an increase in non- communicable diseases (NCDs) such as hypertension and cervical cancer, drug and substance abuse. Although

no comprehensive data exists; Cancer and cardiovascular diseases are emerging as the leading causes of mortality and morbidity. This has resulted in a big disease burden in the County. The facility based Maternal mortality rate as at 2017 stood at 195/100,000 live births, under-five mortality 32.3/1,000 and Infant mortality rate 57/1,000; all of them below the national average. Drug and substance abuse is a high burden in the county, with three functional drug rehabilitative centers in the County serving over 600 clients.[8]

7.3.8.2. *Project Activities*

Construction of the Project may lead to an increase in communicable and sexually transmitted diseases including HIV/AIDS mainly as a result of interactions between Project workers as well as those between Project workers and the local community members.

Another important health risk at the moment is the COVID-19 pandemic which has become a global health challenge including in Kenya. There is a risk of increasing its spread amongst the Project workers and their contacts if construction activities commence during the period when COVID-19 is peaking. Since the situation and development of COVID-19 in Kenya is dynamic, the impact of COVID-19 will be evaluated separately based on the situation during the period of operation, please find a tentative mitigation plan for COVID-19 in the Annexes.

7.3.8.3. *Sensitive Receptors*

The receptors of increased disease transmission will be the neighboring community at the BMH as well as Project workers.

7.3.8.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, impacts on disease transmission during the construction phase will be **"Moderate Negative"** pre-mitigation as per the assessment below.

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	It is anticipated that the potential impacts of increased disease transmission will have impacts will be limited to the Project Area.

[8] County Government of Mombasa (2018): Second Health Strategic And Investment Plan (CHSIP II).

Duration	Long-term	The impacts identified are expected to be linked to the construction and operation period and therefore long-term.
Scale	Small	Any increase in disease transmission will result in negative impacts to the health system.
Frequency	Likely	The incidence of communicable disease is likely to recur in the absence of mitigation and monitoring measures.

Magnitude

Medium

Sensitivity/Vulnerability/Importance of the Resource/Receptor

Medium

Significant Rating Before Mitigation

Moderate Negative

7.3.8.5. *Mitigation/Management Measures*

- The Contractor will prepare a COVID-19 response and management plan based on a risk assessment considering international guidance, e.g. from World Health Organization (WHO), and in accordance with Kenyan regulatory requirements.
- Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks.
- In the event of a new disease, increased transmission or outbreak compared to the baseline, the Contractor should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented.
- Given the expected small number of Project workers during the construction phase, provision of accommodation by the Proponent will be voided. As most construction workers will be sourced from the local community, it is envisaged that workers will commute to work and back. Any workers not from the local area, will be expected to source their own accommodation.

- The following will be implemented at a minimum in order to minimize disease transmission:
    - Ensuring workers wear masks, sanitize and observe social distance.
    - Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination.
    - Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area.
    - Implementing measures to reduce the presence of stagnant water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds.
    - Ensuring appropriate food preparation and monitoring measures are in place.
- The workforce will be provided with access to selected treatment at health facilities at or near the Project Site as deemed necessary for this Project. The requirements for these health facilities should be based on a risk assessment considering access to existing health facilities and travel time to facilities that offer international standards of care. Access to health care should include direct employees, and sub-contractors working on site.
- Pre-employment screening protocols will be put in place within the framework of equal opportunities and non-discrimination. This should include pre-employment medicals and follow up medicals as appropriate. The screening protocols should consider heath conditions related to the nature of the work undertaken, employee residential details and legal requirements. Workers should not be denied employment on the basis of the outcomes of the screening but should be provided treatment or alternative roles as appropriate.
- The Project should prepare and implement a communicable disease management plan during the construction phase. This plan should be explained clearly to the workforce.
- No recruitment is permitted on the construction site. This will serve to prevent in migration of work seekers from outside the local area.
- Conduct awareness campaigns on HIV/AIDS and Covid-19 among the workers and the locals. This can be undertaken through the various NGOs and government agencies in the County.
- Erection of billboards / informative signs to sensitize locals on the need to practice safe sex to help in the fight against HIV/AIDS and Covid-19.

7.3.8.6. *Residual Impact (Post-Mitigation)*

Based on the implementation of the mitigation measures, the significance of the impact on disease transmission will be a **"Minor Negative"** post mitigation as per the assessment below.

Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	This impact will be limited to the Project Area.
Duration	Short-term	With the implementation of the mitigation measures, community and worker exposure to diseases attributed to the Project will be avoided or effectively controlled within a short period of time.
Scale	Small	With the implementation of the mitigation measures, the increase in disease prevalence attributable to the Project will be avoided.
Frequency	Likely	The incidence of communicable diseases and other diseases attributable to the Project will be avoided or only occur rarely.
Magnitude		
Small		
Significant Rating After Mitigation		
Minor Negative		

7.3.9. Traffic Impacts

7.3.9.1. *Description of the Baseline Environment*

Nyali Subcounty is well connected with tarmac roads to Mombasa Town, Mtwapa, Kilifi, Kwale and Malindi. Existing traffic along these roads is regulated as per the Traffic Act (Cap 402, Revised in 2013 and 2015) and the Traffic (Amendment) Act of 2017.

At Nyali, where the BMH will be constructed, there is a network of access roads and currently has very light traffic, mainly limited to operations by the residents.

7.3.9.2. *Proposed Project Activities*

During the construction phase, various trucks will be expected to deliver materials such as cement, sand and gravel as well as warehouse super structures, internal structures and electro-mechanical components. These trucks will be using the available local and wider road network and regulated as per the Traffic Act (Cap 402, Revised in 2013 and 2015) and the Traffic (Amendment) Act of 2017. Although the existing road network is open to traffic and will thus be serving its purpose, increased traffic due to transportation of the required Project materials and equipment has a potential of slowing down road traffic along the routes that will be used.

The risk of injuries from road traffic accidents are generally low but may increase during civil construction work (including site mobilization and demobilization) associated with the movement of equipment and people by road.

The increase in traffic could also create dust, noise and safety (including injury or even death due to accidents) impacts for other road users and people living or working within close proximity to the roads on the selected transport routes. Traffic impacts will be further exacerbated if the selected equipment and/or delivery routes are through neighboring Nyali Estate and Mombasa Old Town which is already a highly populated and active area.

7.3.9.3. *Sensitive Receptors*

The receptors for traffic impacts will be the existing users of the roads that will also be used during the transportation of Project equipment, machinery and workers.

7.3.9.4. *Significance of Impact (Pre-mitigation)*

Based on the analysis provided above, traffic impacts during the construction phase will be **"Minor Negative"** pre-mitigation as per the assessment below.

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	To a great extent, traffic impacts will be limited to the Project Area and its environs. Increased traffic attributed to transportation of project equipment along major in-country highways will be negligible since such highways are already approved and continuously used for transportation of large volumes of goods in addition to general transport services.
Duration	Short-term	This impact will cease to be manifested after the completion of the construction phase.
Scale	Medium	Given the highly urbanized and industrial nature of Nyali Subcounty, a big number of people will be potentially affected; however, this will be largely dependent on the selected transportation routes.

Frequency	Continuous	This impact will be continuously felt throughout the construction phase.

Magnitude

Small

Sensitivity/Vulnerability/Importance of the Resource/Receptor

Medium

Significant Rating Before Mitigation

Minor

7.3.9.5. *Mitigation/Management Measures*

- Prepare and implement an appropriate community Grievance Redress Mechanism (GRM). The GRM should be communicated to all the local community members and neighbours around the BMH.
- As much as possible, avoid transportation of Project equipment and materials through busy trading centres and towns by using by-passes as appropriate.
- Regularly maintain Project vehicles and equipment as per the manufacturers' recommendations.

7.3.9.6. *Residual Impact (Post-Mitigation)*

Based on the implementation of the proposed mitigation measures, the significance of traffic impacts will be a **"Minor Negative"** post mitigation as per the assessment below.

Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	To a great extent, traffic impacts will be limited to the Project Area and its environs; however, it is understood that some of the required Project components such as electrical and mechanical equipment will be imported from overseas. Increased traffic attributed to transportation of project equipment along major in-country highways will be negligible since such highways are already approved and continuously used for transportation of large volumes of goods in addition to general transport services.

Duration	Short-term	This impact will cease to be manifested after the completion of the construction phase.
Scale	Small	With the implementation of the mitigation measures, the number of affected persons will be low.
Frequency	Regular	With the scheduling of the Project Activities, noticeable traffic impacts will occur regularly; only during scheduled transportation of Project materials and equipment.

Magnitude
Small
Significant Rating After Mitigation
Minor Negative

7.3.10. Soil Degradation

7.3.10.1. *Baseline and project Activities*

In the terrestrial environment small amounts of soil will be disturbed during the excavation of the cable trench and during construction of the BMH.

The extent of the impact is limited to on-site and local. The duration will range from temporary to permanent as some impacts will last only a short while (effects of disturbance during construction) and some will cause a permanent change (removal). Although the habitat type and flora species present are predominantly common and widespread, the magnitude of the change will be low as some natural processes will be affected as a result of small amounts of habitat loss or disturbance. The impact significance pre-mitigation is minor.

7.3.10.2. *Mitigation/Management Measures*

The Project will implement mitigation measures to minimize the extent of the impact to the terrestrial environment and to restore areas that are disturbed. This will include:

- limiting clearing and restoring areas of disturbance;
- using controls to prevent incursion into adjacent areas;
- implementing a hazardous materials management plan; and
- to prevent habitat alteration the reinstatement of trench material would be advised. Where possible and appropriate, top soil will be segregated and replaced on other back fill material to promote regeneration of vegetation.

All soil that is disturbed during trench digging will be restored to approximate original depths as the trenches are backfilled.

7.3.11. Navigation Safety

7.3.11.1. *Baseline and project Activities*

The route that will be followed by the marine cable also falls along a major sea routes for ships calling in and out the Kenya ports from India and middle East regions. There is therefore likelihood for interference on the safety of navigation along this route especially in the deeper waters of Kenya EEZ during the cable installation. Again, the area adjacent to the Mombasa port entry and Nyali, acts as a security/ship waiting area for ships before they are cleared to enter the port of Mombasa.

The cable installation period may temporarily interfere with ships waiting to be cleared to enter Mombasa port and even those leaving Mombasa port for international voyage.

7.3.11.1. *Mitigation/Management Measures*

The proponent/contractor should to work closely with the Kenya Maritime Authority and in-charge of marine traffic safety of navigation and the Kenya Ports Authority in-charge for clearance for ships calling or leaving the port of Mombasa.

7.3.12. Piracy

7.3.12.1. *Baseline and project Activities*

Piracy risk is categorized as High in the project area. The whole section is located within best Management Practices (BMP) High Risk Area (HRA), Combined Maritime Force CTF150 (High Risk Area) and United Kingdom Maritime Trade Operations (UKMTO) Voluntary Reporting Area (VRA). An attempted boarding and robbery in Mombasa Port was recorded in 2018.

7.3.12.2. *Mitigation/Management Measures*

- Cable installation vessel is advised to carry armed guards, hardened against pirate attack and maintain anti-piracy watches while transiting areas of high risk; and
- The vessels should also report all piratical and armed robbery incidents including suspicious movements to the International Maritime Bureau.

  The International Maritime Bureau operates a Piracy Reporting Centre, which is located at the address given below:

  ICC International Maritime Bureau (Asia Regional Office) PO Box 12559, 50782 Kuala Lumpur, Malaysia

Tel: + 60 3 2078 5763

Fax: + 60 3 2078 5769

Telex MA34199 IMBPCI

E-mail: imbkl@icc-ccs.org

24 Hours Anti-Piracy HELPLINE Tel: + 60 3 2031 0014 Web site:

http://www.icc-ccs.org/imb/overview.php

IMB's Kuala Lumpur based Piracy Reporting Centre (PRC) is the only center of its kind in the world. It remains the only agency providing round the clock reporting of incidents worldwide.

7.3.13. Conflicts with the local community

7.3.13.1. *Baseline and project Activities*

Projects of such magnitude usually attract public uproar especially from the local community if they are not involved in its implementation. Conflicts usually arise due to inadequate consultations with the local community, importation of unskilled labourers, loss of access to fishing areas and non-provision of equal opportunities to women.

7.3.13.2. *Mitigation/Management Measures*

- Consultation with the host community and relevant stakeholders on the mitigation measures proposed for the negative impacts
- Offer women equal employment opportunities as men.
- Utilize area Chiefs and Ward administrators in the recruitment of local unskilled labour.

7.3.14. Internet User Safety

During stakeholder engagement and consultation, a concern was raised regarding the safety of users (fraud and cyber bullying). It was noted that the proponent will have little or no influence over the safe use of the cable by their clients.

To assure internet security, to the extent feasible, TKL should partner with Communication Authority (CA) to promote the safe use of internet through such methods as customer information campaigns which may include distribution of information at the time of customer service sign-up or by mail with billing information, or through public advertising campaigns.

7.4. Operations Related Impacts

During operation it is expected that the cable will have no significant negative environmental or social impacts. During the operational phase there will be no routine maintenance of the cable and the cable will have a passive influence on the environment.

7.4.1. Electromagnetic fields

Electromagnetic fields are generated by operational transmission cables. Electric fields increase in strength as voltage increases.

In addition, induced electric fields are generated by the interaction between the magnetic field around a submarine cable and the ambient saltwater.

Magnetic fields are generated by the flow of current and increase in strength as current increases. The strength may reach the multiple of the natural terrestrial magnetic field. In general, HVDC cables produce stronger electromagnetic fields than AC cables.

The World Health Organization has considered the effects on EMF on marine life. It concludes that although all organisms are exposed to the geomagnetic field, marine animals are also exposed to natural electric fields caused by sea currents moving through the geomagnetic field. Electrosensitive fish, such as sharks and rays in oceans, can orient themselves in response to very low electric fields by means of electroreceptive organs.

It acknowledges that some investigators have suggested that human-made Electromagnetic fields from undersea power cables could interfere with the prey sensing or navigational abilities of these animals in the immediate vicinity of the sea cables. However, none of the studies performed, to assess the impact of undersea cables on migratory fish or pelagos and all the relatively immobile fauna inhabiting the sea floor (benthos), have found any substantial behavioural or biological impact.

The potential impact to marine life from electromagnetic fields is considered low.

7.4.2. Exposed cables

Cables can become exposed on beaches and in other areas prone to erosion. In addition to the unsightly nature of an exposed cable at low tide, it represents a safety risk to beach users and also substantially increases the risk of cable failure.

For beach crossings the cable is typically installed in flexible steel pipe with an outside diameter in the order of 20 cm and buried in a trench 2 m deep dug previously by equipment such as a backhoe. In the unlikely event of severe erosion resulting in the pipe becoming exposed it will be reburied.

The cable impact during operations is considered minimal and therefore the impact of exposed cables is assessed to be low.

7.5. Decommissioning

It is expected that the cable will be abandoned in place at the end of the Project's lifetime. No impacts are predicted to occur in association with the cable during this stage of the Project. The cable will continue to have a passive influence on the environment and will be benign, so will not degrade or pollute the environment.

A full decommissioning plan will be developed at the end of the cable's useful life and it will consider best practice at that time. The plan will consider the potential for environmental and social impacts for the decommissioning alternatives.

7.6. Summary of Impacts and Residual Impacts

7.6.1. Summary of Construction Impacts and Residual Impacts

Table 7-7 Summary of Construction/Installation Impacts and Residual Impacts

Impact	Significance (Pre-mitigation)	Residual Impact
Impacts on employment, procurement and economy	Positive	Positive
Impact on Biodiversity	Moderate Negative	Minor Negative
Impacts on local air quality	Minor Negative	Negligible
Waste and effluent	Moderate Negative	Minor Negative
Impact on noise environment and vibration	Minor Negative	Negligible
Impact on occupational and community health and safety	Minor Negative	Negligible
Partial loss to productive assets	Moderate Negative	Minor Negative
Impacts on disease transmission	Moderate Negative	Minor Negative
Traffic impacts	Minor Negative	Negligible
Soil Degradation	Minor Negative	Negligible
Navigation safety	Minor Negative	Negligible
Piracy	Minor Negative	Negligible
Conflicts with local community	Negligible	
Internet user safety	Negligible	

7.6.2. Summary of Operation Impacts

Table 7-8 Summary of Operation Impacts

Impact	Significance (Pre-mitigation)
Electromagnetic fields	Minor Negative
Exposed cables	Minor Negative

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESM&MP)

8.1. Introduction

The purpose of this Environmental and Social Management and Monitoring Plan (ESM&MP) is to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the Project. The ESM&MP specifies the mitigation and management measures to which the Proponent and the Contractor are committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESM&MP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya.

The key objectives of the ESM&MP are to:

- Formalize and disclose the programme for environmental and social management; and
- Provide a framework for the implementation of environmental and social management initiatives.

Best practice principles require that every reasonable effort is made to reduce, and preferably to prevent, negative impacts while enhancing the Project benefits. These principles have guided the ESIA process.

The overall responsibility for the ESM&MP lies with the Proponent (TKL) and the Contractor (e-Marine) that will be appointed and responsible for carrying out the specific Project activities.

8.2. TKL E&S Compliance Framework

In the development, construction and operation of the Project, TKL and its contractors and business partners will adhere to the following standards:

- All applicable legislation and regulations in Kenya; and
- World Bank Group (WBG) Environmental and Social Standards (2017).

This ESM&MP has been developed in accordance with the requirements of these regulations and standards.

8.3. Environmental and Social Management and Monitoring Plan (ESM&MP)

The ESM&MP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts with respect to:

- The cable installation phase (including mobilization and demobilization activities associated with the construction phase); and
- The operations/maintenance phase.

In practice, some of the recommended management measures will be incorporated into the Project design/influence the Project design, to avoid or minimize the identified negative Project impacts as indicated in this ESM&MP.

Table 8-1 summarizes the ESM&MP for the Project. It describes the mitigation measures to be undertaken, and, to ensure the mitigation measures are adequately implemented, a monitoring programme is also described. This programme provides for parameters that can be monitored, and suggests how monitoring should be done, how frequently, and who should be responsible for such monitoring.

Table 8-1 Environmental and Social Management and Monitoring Plan (ESM&MP)

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
General	Contractor, e-Marine already has a health, safety and environment management plan (HSEMP) that can be revised to meet conditions set out in the environmental authorization (ESIA Certificate for the Project issued by NEMA). All applicable elements of this ESM&MP should be used in revising the contractor (HSEMP), which is to be used for the construction phase, and against which the E&S performance of the contractor will be monitored.	Contractor	A revised project-specific HSEMP	Once (prior to commencement of construction activities.	No additional cost (expected to be undertaken by the contractor's environmental and social team)
Impacts on Employment, Procurement and the Economy (Section 7.2.1)	• The contractor will prioritize the recruitment of workers (unskilled, semi-skilled) from the local communities and in conjunction with Community Liaison Team. • The Contractor will notify identified representatives of the County Government and Local Administration (i.e. the Area Chief) of the	Contractor	• Contractor recruitment plan • Employment records	• Preparation of Human Resources guiding documents (including recruitment	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	specific jobs and the skills required for the Project, during the recruitment process. • Advertisements on the employment and procurement opportunities during the construction phase will be placed at the Chief's Office notice board. In the event that the position cannot be filled from within the Project Area, it will be advertised further country-wide then nationally. • No recruitment is to take place on the Project site. This is particularly important with respect to casuals. • The Contractor will aim at procuring locally available materials where feasible and use local suppliers where appropriate.			guidelines) prior to construction • Employment records checked monthly	
Impact on Biodiversity (Section 7.2.2)	• Marine vessels will be required to adhere to IMO regulations on bilge and ballast water discharge in order to avoid tensional introduction of non-native species to the marine environment	• Proponent • Contractor • KWS	Developed and implemented BAP	Once (prior to commencement of construction activities.	100,000.00

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Monitoring for the presence of marine mammals and turtles during marine activities (Contractors will implement a suitable system for spotting marine mammals and turtle whilst pre-installation and installation vessels are at sea. Should these species be observed in the vicinity of the work area, the vessels will execute measures to avoid collision or disturbance. Vessel operators will maintain a distance of 100m or greater and will travel at 10 knots or less when safety permits until animals are more than 500m away. Abrupt changes in direction will be avoided • Working with an appropriate environmental organization to develop a notification process; • Minimizing the impact of lighting at the beach areas. • Areas of habitat that are temporarily disturbed during cable installation will be restored upon the completion of the installation phase. Areas				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	are disturbed during installation activities will be rehabilitated ASAP after the cable has been installed. • The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary effects from pollution, sedimentation, or accidental spills. • Consider an appropriate means by which exposure to Electromagnetic Fields can be minimized or reduced so as to reduce its effects on marine wildlife and ecosystem. • Bury cables to an adequate depth in order to reduce the cable induced temperature rise of the upper layer of the sea bottom and to avoid impairment of marine species by electromagnetic fields. • Select suitable burial techniques to minimise disturbance effects of benthic species and habitats and the release of contaminants.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Schedule cable laying to reduce disturbances in sensitive areas (e.g. feeding, resting, moulting, spawning or nursery areas) at sensitive phases of the year.				
Impacts on Local Air Quality (Section 7.2.3)	To minimize air emissions the Project's cable laying vessels will operate in line with the requirements specified under MARPOL 73/78 Annex VI, Prevention of air pollution from ships. • The Project should require that construction contractors operate only well maintained engines • Should considerable dust generation occur during construction, causing plumes of dust in the vicinity of the works and behind • Construction vehicles, a routine wetting program of all unpaved surfaces including roads and construction areas will be undertaken to ensure sufficient moisture content is maintained to suppress dust generation.	Contractor	• No recorded incidents or dust-related grievances to surrounding land users • Records of audits/visual inspection	Daily	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Construction traffic speed control measures will be enforced on unpaved roads (reduced dust generation levels are often consistent with reduced traffic speeds). • Operation in line with the requirements specified under MARPOL 73/78 Annex VI • When mitigated by compliance with MARPOL requirements, the impact of vessel operations on air quality is assessed as being of low significance. • The project should require that construction contractors operate only well maintained engines. On dust, the following mitigation measures are recommended: • Dust suppression techniques, such as increasing the moisture content of excavated materials and roadways by applying water or non-toxic chemicals, can be used to reduce the amount of				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	dust in the air, particularly where construction activities are taking place in close proximity to dust sensitive receptors e.g. residential/commercial areas. Other dust management measures include speed restrictions on dust generating vehicles; • Develop and implement a grievance procedure in the event of any noise and vibration impact complaints being received.				
Wastes and Effluents (Section 7.2.4)	• Hazardous waste should be stored on board the vessel until it can be disposed at a suitably equipped port and through a NEMA licensed waste handler, respecting the requirements of the Basel Convention on Transboundary Shipment of Hazardous Wastes. • Waste management is required to avoid the risk of harm to the environment and human health. • When mitigated by compliance with MARPOL requirements and the impact of aqueous	Contractor	• An effective WMP in place • No recorded grievances at the waste sources or related to the supply of construction materials	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	discharges (excluding ballast waters) in vessel operations is assessed as being of low significance. • When mitigated by compliance with MARPOL requirements, the impact of solid waste in vessel operations is assessed as being of low significance.		• Records of audits/visual inspection		
Impact on noise environment and vibration (Section 7.2.5)	• The project will require the contractor to use equipment and vehicles that are in good working order, well maintained, and that have all noise suppression equipment intact and in working order; and • Contractor will be required to implement best driving practices when approaching and leaving the site to minimize noise emissions.	Contractor	• No recorded noise-related incidents or grievances to surrounding land users • Noise monitoring records	Monthly	Included in overall pricing
Occupational and Community Health and	• All open trenches and excavated areas will be backfilled as soon as possible after the construction has been completed;	• TKL (contractual arrangements)	• Employment records and other key performance	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
Safety (OCHS) (Section 7.2.6)	• Access to open tranches and excavated areas will be secured to prevent pedestrians or vehicle from failing in; • The project will require all contractors to implement an Environmental, Health and Safety plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment; • Contractors will be required to wear suitable personnel protective equipment (hard hats, high-visibility vests, safety boots and gloves and life vests); • All construction and cable repair workers will sufficiently trained in the safe methods of working with fiber optic cables to avoid injury associated with laser lights and fibers; • While a ship is laying its maneuverability is restricted, as such it will display the day signals	• Contractor (implementation)	indicators (KPIs) for worker rights • A record of workers' grievances • Emergency Response Plan • Induction documentation for all workers to include necessary items • Daily toolbox talks		

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	and lights of a hampered vessel to avoid collision with other vessels at sea; • Vessels will increase watch when navigating in areas that are known to be used by fishermen and other vessels. If other vessels are observed within the near vicinity, the project vessel will stop moving, make contact with the other vessel if possible, and wait until it has been confirmed that the course of both vessels will not result in collision or damage to equipment; • Works have to take place outside of periods of festival periods as much as possible; • Cable survey and installation could cause temporary disruption to the flow of recreational sea use. However, these operations are limited to short periods of time and other activities can generally avoid the work area without significant diversion; and • The project will notify the ports authority and others activities, so that vessels in the area would				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	be warned in advance of the ongoing operations through a "Notice to recreational sea users" report transmitted daily.				
Impact on Disease Transmission (Section 7.2.7)	• The Contractor will prepare a COVID-19 response and management plan based on a risk assessment considering international guidance, e.g. from World Health Organization (WHO), and in accordance with Kenyan regulatory requirements. • Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks. • In the event of a new disease, increased transmission or outbreak compared to the	Contractor in liaison with TKL	• HIV/AIDS/Malaria/TB Policy • Covid-19 Response and Management Plan • Worker Code of Conduct • Disciplinary procedures for workers who contravene the Code of Conduct	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	baseline, the Contractor should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented. • Given the expected small number of Project workers during the construction phase, provision of accommodation by the Proponent will be voided. As most construction workers will be sourced from the local community, it is envisaged that workers will commute to work and back. Any workers not from the local area, will be expected to source their own accommodation. • The following will be implemented at a minimum in order to minimize disease transmission: o Ensuring workers wear masks, sanitize and observe social distance.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	o Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination. o Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area. o Implementing measures to reduce the presence of stagnant water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds. o Ensuring appropriate food preparation and monitoring measures are in place. • The workforce will be provided with access to selected treatment at health facilities at or near the Project Site as deemed necessary for this Project. The requirements for these health facilities should be based on a risk assessment considering access to existing health facilities and travel time to facilities that offer				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	international standards of care. Access to health care should include direct employees, and sub-contractors working on site. • Pre-employment screening protocols will be put in place within the framework of equal opportunities and non-discrimination. This should include pre-employment medicals and follow up medicals as appropriate. The screening protocols should consider heath conditions related to the nature of the work undertaken, employee residential details and legal requirements. Workers should not be denied employment on the basis of the outcomes of the screening but should be provided treatment or alternative roles as appropriate. • The Project should prepare and implement a communicable disease management plan during the construction phase. This plan should be explained clearly to the workforce.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• No recruitment is permitted on the construction site. This will serve to prevent in migration of work seekers from outside the local area. • Conduct awareness campaigns on HIV/AIDS among the workers and the locals. This can be undertaken through the various NGOs and government agencies in the County. • Erection of billboards / informative signs to sensitize locals on the need to practice safe sex to help in the fight against HIV/AIDS.				
Temporary Loss of Productive Assets (Section 7.2.7)	• For the partial impact on fishing areas, implementation of compensation measures for affected parties should be considered; • For the temporary limitation of access to commercial establishments and residential buildings, careful planning of construction activities to minimize duration of impact; and • Caution during cable installation.	• Proponent • Contractor • Local leaders	• Minutes of negotiation with fishermen • Compensation records, whenever possible • Records of complaints	Before and throughout cable installation	500,000.00 (To be included in contractor costs)

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
Traffic Impacts (Section 7.2.8)	• Prepare and implement an appropriate community Grievance Redress Mechanism (GRM). The GRM should be communicated to all the local community members and neighbors' around the BMH. • As much as possible, avoid transportation of Project equipment and materials through busy trading centers and towns by using by-passes as appropriate. • Regularly maintain Project vehicles and equipment as per the manufacturers' recommendations.	• Proponent, Contractor • County Government • Kenya Police	• Incident records • Records of complaints • Grievance mechanism in place, where traffic incidents are recorded and addressed	Monthly	Included in overall pricing
Soil Degradation (Section 9.2.9)	The Project will implement mitigation measures to minimize the extent of the impact to the terrestrial environment and to restore areas that are disturbed. This will include: • limiting clearing and restoring areas of disturbance;	Contractor		Throughout construction	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• using controls to prevent incursion into adjacent areas; • implementing a hazardous materials management plan; and • to prevent habitat alteration the reinstatement of trench material would be advised. Where possible and appropriate, top soil will be segregated and replaced on other back fill material to promote regeneration of vegetation. All soil that is disturbed during trench digging will be restored to approximate original depths as the trenches are backfilled.				

8.4. Roles and Responsibilities

8.4.1. Contractual Obligation

In order to ensure that this ESM&MP and/or derivatives thereof are enforced and implemented, these documents must be given legal standing. This shall be achieved through incorporating the ESM&MP and/or derivative documents as an addendum to the contract documents for the Contractor specifying that the requirements of this ESM&MP and/or derivative documents apply and must be met. This will ensure that the obligations are clearly communicated.

8.4.2. Responsibilities and Duties

8.4.2.1. *The Proponent (TKL)*

The Project Proponent has overall responsibility for ensuring that the construction and development of the Project is undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the ESM&MP and recommendations from the relevant authorities. The responsibilities of the Proponent will include:

- Appoint or designate a suitably qualified Project Manager (PM) to manage the implementation of the proposed Project;
- Appoint the Project Contractor (PC);
- Establish and maintain regular and proactive communications with the designated/ appointed Project Manager (PM) and Environmental Compliance Officer (ECO); and
- Ensure that the ESM&MP is reviewed and updated as necessary.

Reporting Structure

The Proponent will liaise with and/or take instruction from the following:

- Government/regulatory authorities such as NEMA, KWS, KMA, etc.; and
- General Public.

8.4.2.2. *Proponent's Project Manager (PM)*

The primary role of the PM is to ensure that the Contractor and Proponent's staff complies with the environmental specifications in the ESM&MP. The PM shall further:

- Oversee the general compliance of the Contractor with the ESM&MP and other pertinent site specifications; and
- Liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

In addition, the PM shall:

- Designate or appoint a suitably qualified Environmental Manager (EM) that will manage all environmental aspects on behalf of the PM and the Project Proponent;
- Review and approve Method Statements produced by the Contractor in connection with the ESM&MP;
- Assume overall responsibility for the effective implementation and administration of the ESM&MP;
- Be familiar with the contents of the ESM&MP, and his/her role and responsibilities as defined therein;
- Ensure that the ESM&MP is included in the Contractor's contract;
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the ESM&MP in terms of the specifications outlined therein. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, access/haul roads, etc.;
- Issue site instructions giving effect to the ECO requirements where necessary;
- Keep a register of all complaints and incidents (spills, injuries, legal transgressions, etc.) and other documentation related to the ESM&MP;
- Report to the ECO any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s);
- Implement recommendations of possible audits;
- Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred;
- Facilitate proactive communication between all role-players in the interests of effective environmental management; and
- Ensure that construction staff is trained in accordance with requirements of the ESM&MP.

Reporting Structure

The PM will report to the Proponent (TKL). Weekly meetings between the contractor and Proponent, and monthly reporting will be required.

8.4.2.3. *Environmental Control Officer (ECO)/ Environmental Health and Safety (EHS) Officer*

Through the PM, the Project Proponent will appoint an ECO/EHS Officer to monitor and oversee implementation of the ESM&MP for the proposed construction works. The ECO/ EHS Officer is

given authority to ensure that the ESM&MP is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

The role of the ECO/EHS Officer shall be to:

- Act as site 'custodian' for the implementation, integration and maintenance of the ESM&MP in accordance with the contractual requirements;
- Ensure successful implementation of the ESM&MP; and
- Ensure that the Contractor, his employees and/or sub-contractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO/EHS Officer will be to:

- Liaise with the PM on the level of compliance with the ESM&MP achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the PM;
- Demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the PM concerning works in these areas;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and Project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM who will communicate the results and conclusions with the Project Proponent;
- Communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;
- Advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
- Review complaints received and make instructions as necessary; and
- Identify and make recommendations to minor amendments to the ESM&MP as and when appropriate.

Reporting Structure

The ECO will report to the PM, who in turn will report to the Project Proponent.

8.4.2.4. *Contractor*

The Contractor will implement the development. The Contractor will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESM&MP. The role of the Contractor shall be to:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Preserve the natural environment by limiting any destructive actions on site;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PM;
- Take into consideration the legal rights of the Communities and individual Project Proponent's staff;
- Ensure quality in all work done, technical and environmental;
- Underwrite the Project Proponent's Environmental Policy at all times, and
- Ensure that all sub-contractors and other workers appointed by the Contractor are complying with and implementing the ESM&MP during the duration of their specific contracts.

The responsibilities of the Contractor will be to:

- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the ESM&MP. The Contractor must appoint or designate a Safety, Health, Environment and Quality Officer (SHEQO) to monitor daily implementation of the ESM&MP on the Contractor's behalf as a minimum;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PM;
- Advise the PM of any incidents or emergencies on site, together with a record of action taken;

Reporting Structure

The Contractor will report to the PM and ECO, as and when required.

8.4.2.5. *Sub-contractors*

The Contractor may from time to time appoint sub-contractors. The role of the sub-contractors shall be to:

- Perform certain services and/or provide certain products on behalf of the Contractor. The sub- contractors will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESM&MP; and
- Ensure environmental awareness among employees so that they are fully aware of and understand the Environmental Specifications and the need for them.

The responsibilities of the sub-contractor will be to:

- Be familiar with the contents of the ESM&MP, and his/her roles and responsibilities as defined therein;
- Comply with the Environmental Specifications in the ESM&MP and associated instructions issued by the Contractor to ensure compliance;
- Notify the Contractor verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; and
- Notify the Contractor, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigation measures may be implemented timeously.

Reporting Structure

Sub-contractors will report to and receive instructions from the Contractor.

8.4.3. Monitoring

8.4.3.1. *Undertaking Audits*

The PM shall appoint a qualified and experienced ECO/EHS Officer to ensure implementation of and adherence to the ESM&MP.

The ECO/EHS Officer shall conduct audits to ensure that the system for implementation of the ESM&MP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- The ESM&MP and the Method Statements being used are the up to date versions.
- Variations to the ESM&MP, Method Statements and non-compliances and corrective actions are documented.
- Emergency procedures are in place and effectively communicated to personnel.

The audit programme shall consist of the following at a minimum:

- First audit no later than 1 month after construction commences;
- Thereafter audits at monthly intervals, at a minimum;
- An audit one week prior to practical completion of the Project is granted; and
- A post construction audit within 1 week after the Contractor has moved off site.

The contractor and the Project Proponent will also be required to meet at least weekly to discuss and check progress of implementing the ESM&MP.

8.4.3.2. *Compliance with the ESM&MP*

The Contractor and/or his agents are deemed not to have complied with the ESM&MP and remedial action if:

- There is evidence of contravention of the ESM&MP clauses within the boundaries of the site or extensions;
- Environmental damage ensues due to negligence; and
- The Contractor fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

9. CONCLUSION AND RECOMMENDATIONS

9.1. Conclusion

The project activities are expected to have no significant effect on the environmental or social environment. This is mainly a result of the benign nature of the Project and the associated activities as well as the result of the integration of mitigation/management measures into the project design. However, the environmental and social impact assessment does indicate some potential for limited environmental and social impacts to habitats and flora; fauna; water quality; and occupational and community health and safety. The potential is reduced through the implementation of standard mitigation measures and industry best practices, none of which are excessive in cost.

Given the low potential for negative impacts and the high potential for significant positive benefits (both direct and indirect), the Project would be deemed to have a high level of environmental and social acceptability.

1. **Cable impacts on the sea floor and fauna** is probably the major concern of this ESIA; fauna benefits from new substrate on the sea bed and although disturbance and degradation happen during cable installation, sensitive ecosystems recover shortly after. Special care would be taken during cable installation to avoid exposure of sensitive areas to prolonged high turbidity;
2. The impact assessment has also demonstrated that the impacts likely to be generated in the **cable laying operation in deep offshore** water will be minimal. No impacts are expected on fisheries or shipping activities providing normal international marine activity procedures are followed. To avoid unnecessary environmental damage from inappropriate disposal of wastes and foul waters, environmental auditing and monitoring of the marine vessel facilities and the contractor's waste handing methods is recommended;
3. **Cable laying in shallow waters** is potentially the most likely phase of the cable laying operation when impacts may occur. In deeper sections of water there is potential for discharges of waste and foul water from the vessel. During burial of the cable (if required) across the shallow reef or sand areas, there is potential for sediment disturbance, local deterioration in water quality, impacts on local fishing activities, impact on the ecology of the area and impacts on tourist areas and possibly cultural heritage sites through noise disturbance. These impacts can be readily mitigated through appropriate briefing of the contractor and monitoring of their works by careful construction site and method management, minimization of sediment disturbance, and maintenance of good communication with the relevant authorities; and

4. Impacts from **onshore cable laying** include noise and dust during BMH and duct construction (if required), run-off especially in areas prone to flooding, impacts on sensitive coastal resources and on tourist activities have all been assessed. Mitigation will include briefing of the contractor about environmental requirements, monitoring of methods, timing, activities to avoid impacts on nearby sensitive receivers, route selection and avoidance of sensitive ecological resources on the shore, isolating areas for protection of the public and avoiding additional damage to the site, covering of stockpiled areas and good construction site housekeeping and management.

9.2. Recommendations

The proponent and contractor are advised to implement the Environmental Management & Monitoring Plan (ESM&MP) to eliminate the occurrence of the anticipated negative impacts, enhance the positive ones and achieve good environmental and social practices.

The implementation of the mitigation measures detailed in Chapters 7 and listed in the ESM&MP (Chapter 8) will provide a basis for ensuring that the potential positive and negative impacts associated with the project are enhanced and mitigated, respectively, to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, we find no reason why the Project, should not be authorized, contingent on the mitigations and monitoring for potential environmental and socio- economic impacts as outlined in the ESM&MP.

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ANNEXES

Annex A: Environtech Consultancy Africa (ECA) NEMA Registration and 2021 Practicing License

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/13671

Application Reference No: NEMA/EIA/EL/18040

M/S **ENVIRONTECH CONSULTANCY AFRICA LTD**
(individual or firm) of address

P.O. Box 16601-00100, NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**

registration number **6085**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **1/8/2021** Expiry Date: **12/31/2021**

Signature.....

(Seal)

Director General
The National Environment Management Authority

P.T.O.

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/13661

Application Reference No: NEMA/EIA/EL/18039

M/S **Stanley Mathenge Mwangi**
(individual or firm) of address

P.O. Box 16601-00100, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **2930**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

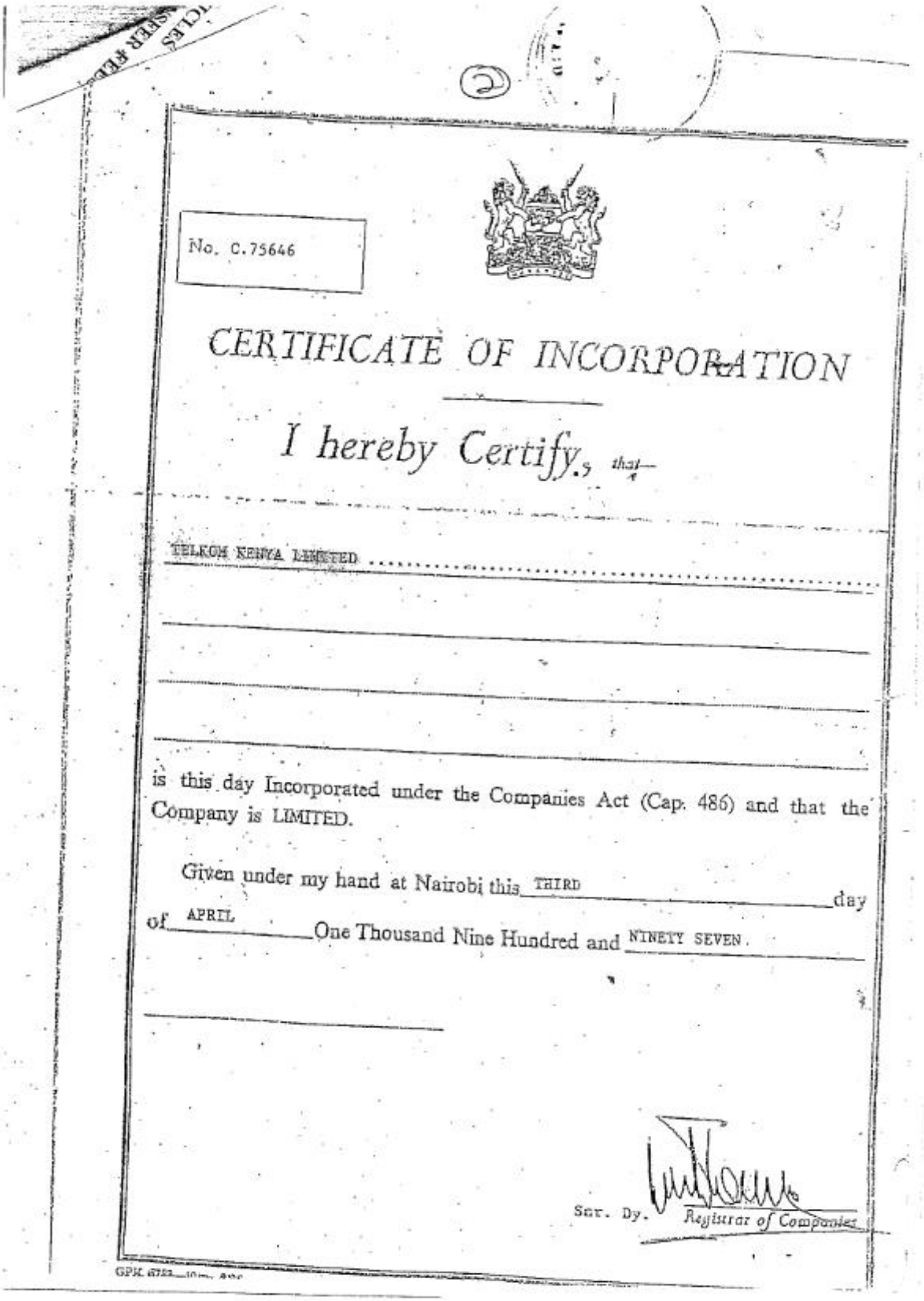
Issued Date: **1/8/2021** Expiry Date: **12/31/2021**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

- **Appendix B. Proponent Details**



No. C.75646

CERTIFICATE OF INCORPORATION

I hereby Certify, that—

TELKOM KENYA LIMITED

is this day Incorporated under the Companies Act (Cap. 486) and that the Company is LIMITED.

Given under my hand at Nairobi this THIRD day of APRIL One Thousand Nine Hundred and NINETY SEVEN.

Asst. Dy. Registrar of Companies

Telegrams: "INTESTATE", Nairobi
Telephone: Nairobi 227461
Please address all communications to:
THE REGISTRAR-GENERAL and
When replying please quote
Ref. No. .....
and date

DEPARTMENT OF
THE REGISTRAR-GENERAL
P.O. Box 30031-00100
NAIROBI

....., 20.....

THE COMPANY SECRETARY,
TELKOM KENYA LIMITED,
P.O BOX 30301-00100,
NAIROBI .

REF. 75646..... **29/01/2009**

Dear Sir(s),

RE: THE COMPANIES ACT (CAP 486)

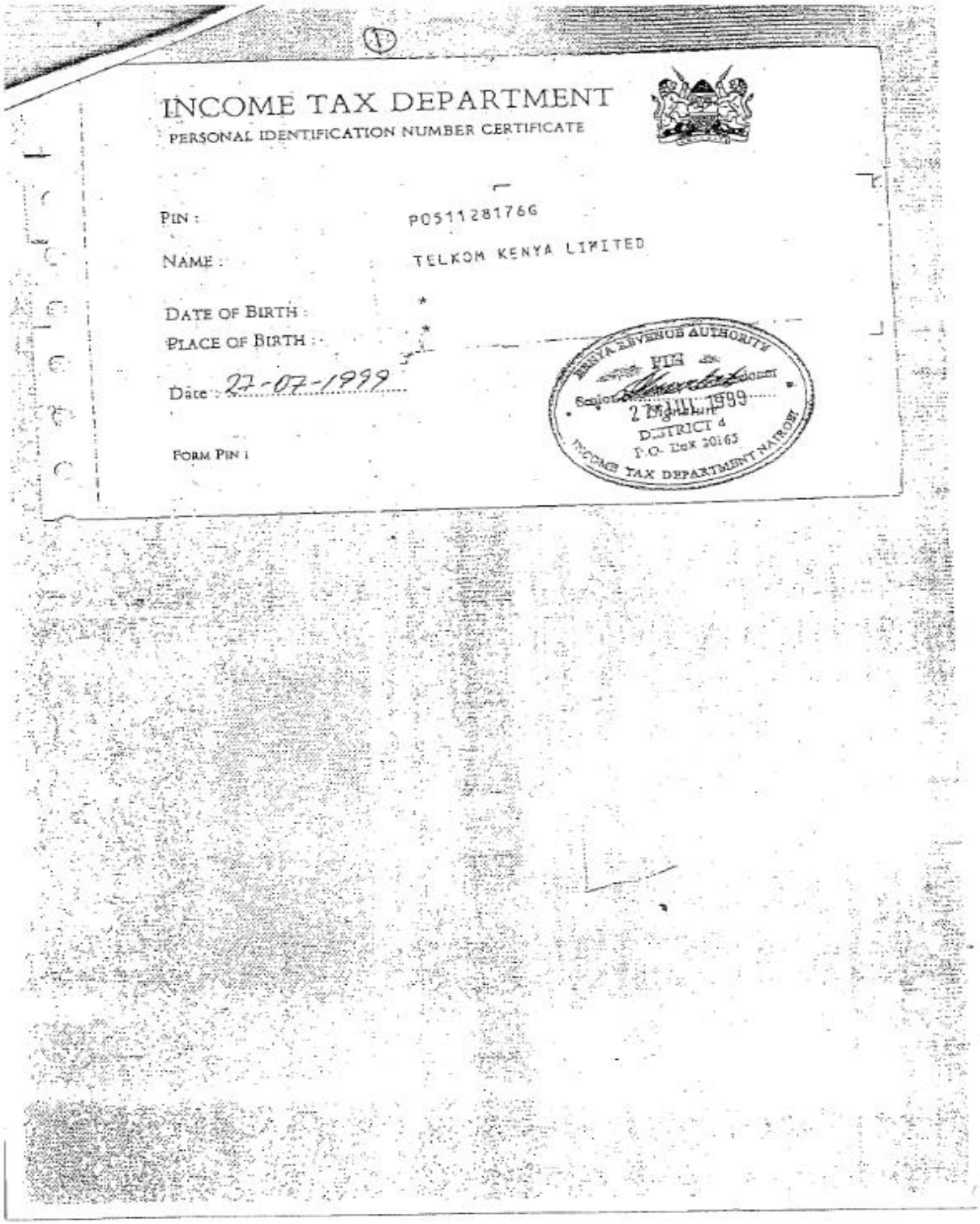
TELKOM KENYA LIMITED

I wish to advice that the above company has been changed from **(PRIVATE to PUBLIC)** company. Its new Registration Number is **C .3/2009.**

Please quote this number on all company documents, forms, correspondence etc. that are filed at or addressed to the registry henceforth.

Yours faithfully,

ASSISTANT REGISTRAR OF COMPANIES



INCOME TAX DEPARTMENT

PERSONAL IDENTIFICATION NUMBER CERTIFICATE

PIN : P051128176G

NAME : TELKOM KENYA LIMITED

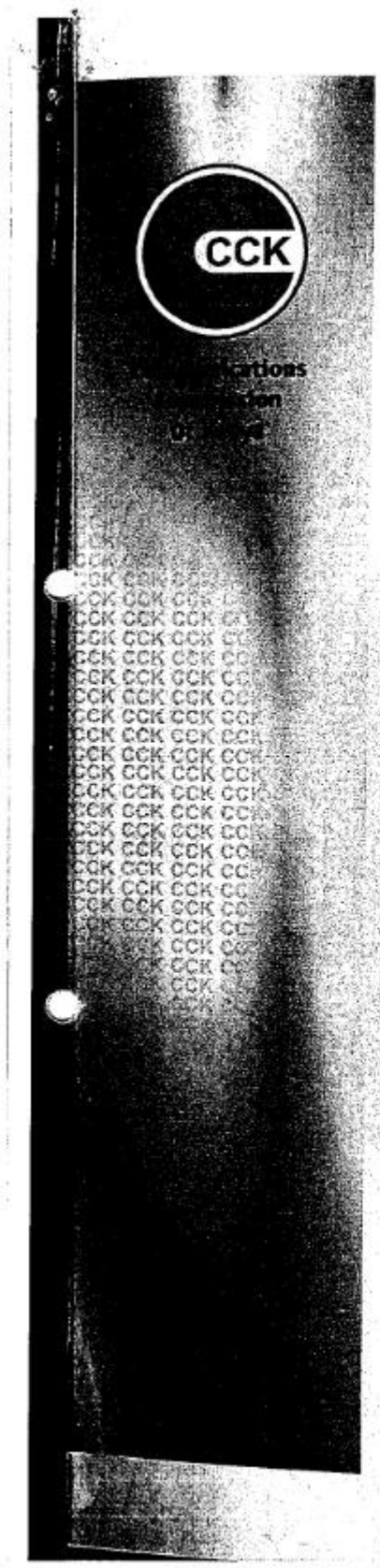
DATE OF BIRTH :

PLACE OF BIRTH :

Date : 27-07-1999

FORM PIN 1

KENYA REVENUE AUTHORITY
PIN
Signature
27 JULY 1999
DISTRICT 4
P.O. Box 20165
INCOME TAX DEPARTMENT NAIROBI



REPUBLIC OF KENYA

NETWORK FACILITY

PROVIDER - TIER 1

LICENCE

GRANTED TO

TELKOM KENYA

LIMITED

CCK
Communications Commission of Kenya

NETWORK FACILITIES PROVIDER TIER 1 LICENCE

GRANTED BY

THE COMMUNICATIONS COMMISSION OF KENYA

TO

TELKOM KENYA LIMITED

FOR THE

CONSTRUCTION, INSTALLATION AND OPERATION OF ELECTRONIC COMMUNICATIONS SYSTEMS

IN

THE REPUBLIC OF KENYA

LICENCE NO. TL/NFP/T1/00001

Page 1 of 24

THE LICENCE TERMS

The Communications Commission of Kenya (the "**Commission**"), in accordance with the Kenya Communications Act of 1998 (the "**Act**"), hereby authorises **Telkom Kenya Limited** (the "**Licensee**") to construct, install and operate electronic communications systems as described herein (the "**Licensed Systems**") in accordance with the Terms and Conditions set out in this Licence.

1. This Licence is issued on 17/4/09 (the "**Issuance Date**") under licence number TL/NFP/T1/00001 and amends, and replaces the building, construction and operations of systems authorised under the following licences:

Licence	Licence Number	Effective Date	Licence Period
1. Operation of Local Systems and the Provision of Local Services	TL-99-0001	1st July 1999	25 years
2. Operation of Long-Distance Systems and the Provision of Long-Distance Services	TL-99-0002	1st July 1999	25 years
3. Data Carrier Network Systems and Services	TL/DCNO/00001	30th March 2007	15 years
4. Construction, Installation and Operate of Mobile Cellular Systems and Provision of Mobile Cellular Services	TL/MCO/00004	20th December 2007	15 years

2. This Licence shall in no way release the Licensee from any liabilities, responsibilities or obligations arising out of any agreements and/or contracts entered into under the previous licence/s in Term 1. above..

3. This Licence is granted for a period of **25 years** from 1st July 1999 ("the **Effective Date**") unless it is revoked earlier in accordance with the Licence Conditions herein. The Licensee is subject to penalties as described in Annex 3 below.

4. The Licensed Systems are transmission systems, switching or routing systems and other resources which permit the conveyance of signals either by wire, by radio, by optical or by other electromagnetic means. The licensed systems may be used to establish satellite networks, terrestrial fixed and mobile networks. For the avoidance of doubt, these networks include electronic communications networks established over other utilities such as electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed

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5. The Licensee shall be required to obtain separate authorizations from the Commission, as necessary for utilization of resources, such as radio-frequency spectrum and numbering in case such resources are required.

6. The Licensee is authorised to connect the Licensed Systems to:

   6.1. other telecommunication systems operated under a licence granted by the Commission in accordance with the Act;

   6.2. any telecommunication apparatus, which is, approved for connection by the Commission in accordance with its Type Approval and Certification requirements.

7. All equipment and devices comprising the Licensed Systems shall in all respects be of an approved industrial standard, type approved by the Commission and conforming to the Commission's regulations as may be issued from time to time.

8. This Licence and the Licensee are subject to the provisions of the Act including, but not limited to, licence modifications and enforcements.

9. Words importing the singular shall include the plural and vice versa; words denoting persons shall include bodies corporate and unincorporated associations of persons and vice versa.

10. In this Licence the following terms shall have the following meanings:

    10.1. "**Act**" means the Kenya Communications Act 1998, any successor legislation and any subsequent amendments made thereto;

    10.2. "**Application Services**" means electronic communications services which are normally provided for remuneration and consists wholly or mainly in the conveyance of signals on electronic communications networks including telecommunications and transmission services over electronic communications networks including those used for broadcasting, but exclude services providing or exercising editorial control over, content transmitted using electronic communications networks and services;

    10.3. "**Application Service Provider (ASP)**" means a licensee authorised by the Commission to provide Application Services;

    10.4. "**Compliance Report**" means a report to be prepared periodically by the Licensee detailing its performance in respect of every licence condition;

    10.5. "**Compliance Certificate**" means a certificate to be issued by the Commission to a licensee following the receipt and satisfactory review of a Compliance Report;

10.6. **"Content Services"** means information of any kind normally provided at a fee and is delivered over electronic communications networks and services. They include broadcasting content, financial information services and other information society services;

10.7. **"Content Service Provider (CSP)"** means a person authorised by the Commission to provide content services;

10.8. **"Consumer"** means any natural person who uses or requests a publicly available electronic communications;

10.9. **"Effective Date"** means the date when the Licence was first issued, or in the case of a Licence replacement, the date when the original Licence was issued;

10.10. **"Emergency Access"** means connectivity between the Emergency Organisation and any public access point within the Licensed System;

10.11. **"Emergency Services"** means services provided to the public at no cost so as to access a Public Emergency Service Providers;

10.12. **"End-User"** means a User not providing Public Communications Networks or publicly available electronic communications services;

10.13. **"Government"** means the Government of the Republic of Kenya;

10.14. **"National Regulatory Authority (NRA)"** means the body or bodies charged by another country with the regulatory responsibilities as regards electronic communications within that country;

10.15. **"Network Facilities Provider (NFP)"** means a licensee authorised by the Commission to build and commercially operate Telecommunication/electronic communications Systems;

10.16. **"Network Management Centre"** means a physical point within a network where various management, monitoring, storage and control functions are implemented;

10.17. **"Public Communications Network"** means an electronic communications network used wholly or mainly for the provision of publicly available electronic communications services;

10.18. **"Public Emergency Service Providers"** means organisations designated by the Government for the provision of emergency services including but not limited to the police, fire brigade, ambulance, and coastguard;

10.19. **"Regulations"** means the Kenya Communications Regulations, 2001 and its subsequent amendments;

10.20. "**Template Co-location/Infrastructure Sharing Offer**" means a standard template of the agreement between the Licensee and Requesting Licensees;

10.21. "**Reference Service Level Agreement (SLA)**" means a standard template of the SLA between the Licensee and Requesting Licensees;

10.22. "**Requesting Licensee**" means a person licensed by the Commission who intends to be a Subscriber;

10.23. "**Service Level Agreement**" means an agreement entered between the Licensee and a Subscriber defining the nature of the services to be provided and establishing a set of parameters to be used in measuring the agreed service level;

10.24. "**Subscriber**" means any natural person or legal entity who or which is party to a contract with the provider of publicly available electronic communications services for the supply of such services;

10.25. "**Tier**" is used to distinguish the scope of the various NFP licences. The Commission shall, from time to time, define the various Tiers;

10.26. "**Telecommunication System**" means a system used for transmission, reception and switching of signals, such as electrical or optical, by wire, fibre, or electromagnetic means;

10.27. "**Universal Service**" means the minimum set of services, as may be defined by the Commission from time to time, and which are of a specified quality and which is available to all Users at an affordable price;

10.28. "**User**" means a legal entity or natural person using or requesting a publicly available electronic communications service.

THE LICENCE CONDITIONS

1. CONDITION 1: EXPANSION OF THE LICENSED SYSTEMS

1.1. The Licensee shall fulfil the system expansion requirements set out in Annex 1 of this Licence (the "System Expansion Requirements") and as reviewed by the Commission every five years thereafter.

1.2. The Licensee shall ensure that it maintains information in a form prescribed by the Commission for the purposes of satisfying the Commission that the Licensee is meeting the System Expansion Requirements.

1.3. The Licensee shall be liable to pay such penalties as set out in Annex 3 for failure to meet the System Expansion Requirements.

2. CONDITION 2: UNIVERSAL ACCESS AND SERVICE OBLIGATIONS

The Licensee shall be required to participate in the provision of Universal Services as may be specified by the Commission from time to time.

3. CONDITION 3: ESTABLISHMENT OF THE LICENSED SYSTEMS

3.1. The Licensee shall submit, for the Commission's records, network schematic diagrams with actual topographical and physical coordinates of its planned network before embarking on its construction.

3.2. In addition to 3.1 above, the Licensee shall comply with physical planning, environmental, maritime, security, public health and civil aviation and other requirements as set out by relevant Government authorities. The Licensee shall, upon receipt of approvals from all the said Government authorities, file the same with the Commission. In particular, the Licensee shall:

3.2.1. Take proper and adequate safety measures to safeguard life against any danger, including electromagnetic emissions emanating from the Licensed Systems.

3.2.2. Ensure that the Licensed Systems do not become a health, environmental or a safety hazard and is not in contravention of any statue, rule or regulation and public policy.

3.2.3. Ensure that its Licensed Systems blend with the environment.

3.3. While establishing international systems, the Licensee shall ensure that the Network Control & Management Centre is located in Kenya.

7. CONDITION 7: NUMBERING AND NUMBER PORTABILITY

7.1. The Licensee shall operate the Licensed Systems in accordance with the national Numbering Plan(s) unless and until the Commission, upon reasonable notice, prescribes a new numbering plan(s) amending or replacing the Initial Numbering Plan(s). Any new numbering plan shall contain transitional provisions

7.2. The Licensee shall fulfil any requirements, which the Commission may prescribe from time to time in relation to numbering including but not limited to requirements to facilitate number portability.

8. CONDITION 8: INTERCONNECTION

Interconnection procedures shall be in accordance with the Regulations.

9. CONDITION 9: INTERRUPTIONS TO THE LICENSED SYSTEMS

9.1. The Licensee shall not intentionally interrupt the operations of the Licensed Systems or any part thereof, or the services provided to Requesting Licensee, in the normal course of business, nor shall it in the normal course of business suspend the provision of any type of connectivity without having first sought and obtained approval from the Commission in writing and subsequently providing reasonable advance notice to persons likely to be affected by such interruption or suspension.

9.2. In the event of an unintentional/unforeseen interruption of the Licensed Systems or part thereof, which are significant in nature, the Licensee shall inform the public and notify the Commission in writing within 24 hours outlining the cause of such interruption and the steps being undertaken to rectify such interruption.

9.3. The provision in 9.1 and 9.2 shall not prejudice the rights of the Commission or any person affected by such interruptions.

9.4. The provision in 9.1 shall not apply if, the interruption or suspension is to a Subscriber whose system or apparatus or use thereof is endangering the integrity of the Licensed Systems.

9.5. The provision in 9.1 shall not apply if the interruption of service is as provided for under the relevant interconnection and/or service agreements between the Licensee and the Subscriber.

9.6. Interruption in 9.5 above shall not be effected on any day preceding a non-working day or public holiday for non-payment of applicable charges.

10. CONDITION 10: USE OF LICENSED SYSTEMS FOR THE PROVISION OF EMERGENCY SERVICES

10.1. The Licensee shall make the Licensed Systems available and accessible for the provision of Emergency Services free of charge.

10.2. The Licensee shall interconnect the Licensed Systems with the emergency communication systems operated by the police and any other designated Public Emergency Service Providers as may be specified by the Commission from time to time.

10.3. The obligation in 10.1 shall not apply in the event that it is not, in the Commission's view, reasonable to require the Licensee to provide the connectivity requested by means of the Licensed Systems in the particular circumstances where provision is beyond the Licensee's control.

11. CONDITION 11: PUBLIC EMERGENCIES

11.1. In case of a major disaster such as earthquakes, floods and similar events or any other situation of emergency or a crisis of local, regional or national scope which require special attention on the part of the Licensee, the Licensee shall provide the necessary connectivity to the Government giving priority to the support activities required to overcome the emergency. For this purpose, the Licensee shall co-ordinate with and follow the instructions of the Commission in accordance with Section 88 of the Act.

11.2. In case the emergency or crisis is related to aspects of national security, the Licensee shall co-ordinate with the competent entity indicated by the Commission and provide the necessary connectivity in accordance with the instructions of the Commission or the competent entity indicated thereby in accordance with Section 88 of the Act.

11.3. Within nine (9) months from the Effective Date, the Licensee shall submit to the Commission its plan for procedures and operations it shall follow in the event of any such emergency and shall update such plan upon request by the Commission.

11.4. The Licensee may be entitled to reimbursement by the Government of its direct costs for the provision of the services mentioned in 11.1 and 11.2 if the Commission is convinced such costs are reasonable after evidence of such incurred costs is provided thereof.

12. CONDITION 12: ACCESS TO SITES AND RECORDS

12.1. The Licensee shall upon request provide unlimited access to all equipment sites and operational areas to duly authorised staff of the Commission, any person authorised by the Commission or law enforcement agency in order for the said to effectively perform their duties.

12.2. The Licensee shall establish and maintain information records in regard to its operations, in a format prescribed by the Commission from time to time, for a minimum period of two (2) years from the date such records came into being, for purposes of availing such information on request by the Commission, any person authorised by the Commission or any law enforcement agency.

12.3. The Licensee shall permit the Commission (or a person authorised by the Commission) to inspect the Licensee's systems, premises, facilities, files, records and other data to enable it to exercise its functions under the Act.

13. CONDITION 13: BILLING ACCURACY

13.1. The Licensee shall, prior to the commencement of Licensed Systems, establish a procedure to ensure the accuracy of its billing system, which must be submitted to the Commission for approval. Such an approval shall not be unreasonably delayed or withheld and in any event, the Commission shall give its approval or disapproval within three (3) months from date of receipt of the said submission.

13.2. The Commission shall reserve the right to examine the billing system before and after it is operational in order for the Commission to be satisfied that the billing process has the characteristics required as set out above. The Commission (or an independent auditor appointed by the Commission) may require the Licensee to:

13.2.1. furnish the Commission with any information it reasonably requires;

13.2.2. on reasonable notice, allow the Commission (or any person authorised by the Commission) access to any relevant premises of the Licensee, and

13.2.3. on reasonable notice, allow the Commission (or any person authorised by the Commission) to examine or test the whole or any part of the billing process.

13.3. Where the Commission gives the terms of its approval or disapproval, pursuant to Condition 13.1 and 13.2, it is agreed that the Licensee shall take all reasonable steps to comply with such terms issued by the Commission within the shortest time possible but in any event not more than thirty (30) days from the date the terms are issued.

preventing, restricting or distorting competition in Kenya (or a part of it), in relation to any business activity relating to the Licensed Systems. Without limiting the generality of the foregoing, any such act or omission shall include:

15.1.1. any abuse by the Licensee, either independently or with others, of a dominant position in Kenya which unfairly excludes or limits competition between the Licensee and any other party;

15.1.2. entering into any contract or engaging in any concerted practice with any other party, which unfairly prevents, restricts or distorts competition in Kenya, or

15.1.3. effecting anti-competitive changes in the telecommunications market in Kenya, and in particular, anti-competitive mergers and acquisitions in the communications sector.

15.2. In the event it appears to the Commission that the Licensee is in breach of 15.1, the Commission shall give written notice to the Licensee:

15.2.1. stating that the Commission is investigating a possible contravention;

15.2.2. setting out detailed reasons why it appears to the Commission that there is a breach by the Licensee of this Condition, and

15.2.3. setting out the steps the Commission believes the Licensee should take in order to remedy the alleged breach and giving the Licensee a reasonable time in which to correct the alleged breach.

15.3. The Commission shall allow the Licensee thirty (30) days from the date of the notice to make representations to the Commission, before the Commission takes further action.

16. CONDITION 16: PROHIBITION ON UNDUE DISCRIMINATION

16.1. Subject to 16.3 without prejudice to the obligations imposed on the Licensee under this Licence, the Licensee shall not (whether in respect of the rates or other terms and conditions applied or otherwise) show undue preference to, or exercise undue discrimination against, particular persons or persons of any class or description in respect to the provision of the Licensed Systems.

16.2. Subject to 16.3 the Licensee may be deemed to have shown such undue discrimination if it unfairly favours to a material extent the provision of any communications services to another communication business it carries out so as to place at a significant competitive disadvantage persons competing with that business.

13.4. The Licensee shall not render any bill in respect of any Licensed Systems unless every amount stated in the bill is derived in accordance with the procedure agreed with the Commission in 13.1 or/and 13.2 above.

13.5. The Licensee shall keep such records as may be necessary or may be determined by the Commission to be necessary for the purpose of satisfying the Commission that the billing process has the characteristics required above and shall retain any records for more than two (2) years from the date on which they came into being.

13.6. Any changes to the Licensee's billing system shall be notified to the Commission and shall be subject to the requirements under this Condition.

14. CONDITION 14: PRIVACY AND CONFIDENTIALITY

14.1. The Licensee shall use all reasonable endeavours to ensure the privacy and confidentiality of proprietary information and business secrets obtained in the course of its business from any person to whom it provides the Licensed Systems by establishing and implementing reasonable procedures for maintaining confidentiality of such information.

14.2. The Licensee shall maintain sufficient information on its confidentiality procedures to satisfy the Commission, at its reasonable request, that the requirements of 14.1 are being met.

14.3. The Licensee shall not use or allow to be used any apparatus comprised in the Licensed Systems (except for the purpose of law enforcement, national interest or where it is in accordance with any statute in force in Kenya) which is capable of recording, silently monitoring, or intruding into its Subscriber's communications traffic unless the Licensee complies with 14.4 and 14.5 below.

14.4. Except for the purposes of law enforcement, the Licensee shall make every reasonable effort to inform the parties whose traffic is to be recorded, silently monitored or intruded into before commencing the recording, silent monitoring or intrusion, that the traffic is to be or may be recorded, silently monitored or intruded into.

14.5. The Licensee shall maintain a record of the means by which the parties have been informed that their traffic is to be or may be recorded, silently monitored or intruded into and the purpose of such recording. The Licensee shall furnish the Commission with such information on request.

15. CONDITION 15: FAIR TRADING

15.1. Without prejudice to other obligations imposed on the Licensee under this Licence, the Licensee shall not engage in any activities, whether by act or omission, which have, or are intended to or likely to have, the effect of unfairly

16.3. The Licensee shall not be deemed to have shown undue discrimination to the extent that:

16.3.1. it is due to matters beyond the Licensee's control;

16.3.2. the provision of connectivity would expose any person engaged in its provision to undue risk of health or safety, or

16.3.3. it is not, in the Commissions' view, reasonably practicable or technically feasible (including where the Licensee is not in a position to provide connectivity in a particular area by reason of the fact that its systems are not sufficiently built out).

16.4. Any question relating to whether any act done or course of conduct amounts to undue preference or undue discrimination shall be determined by the Commission.

17. CONDITION 17: PROHIBITION OF CROSS-SUBSIDIZATION

17.1. The Licensee shall not subsidise or cross-subsidise, or permit itself to be subsidised or cross-subsidised or give or receive undue preference to or from, as the case may be, any of its associated businesses or persons as concerns the provision of the Licensed Systems and/or any other licences granted to the Licensee by the Commission.

17.2. The Licensee shall maintain necessary records to evidence resource transfers between its associated businesses or persons. The Commission may at its discretion request the licensee to submit this or other information related to the licensed businesses to satisfy the Commission that no cross-subsidy is taking place.

17.3. In the event that the Commission determines that cross-subsidy has occurred the Commission shall give written notice to the licensee setting out the steps the Commission believes the Licensee should take in order to remedy the alleged breach and giving the Licensee a reasonable time in which to correct the alleged breach. The Commission shall allow the Licensee 30 days from the date of the notice to make representations to the Commission, before the Commission takes further action.

17.4. Where the Commission deems it necessary and appropriate to supervise compliance with the provisions of this Licence, it may order the Licensee to provide the Licensed Systems through a separate division or divisions, a separate branch or branches or a separate subsidiary or subsidiaries.

18. CONDITION 18: NOTIFICATION OF CHANGE IN SHAREHOLDING

18.1. Subject to 18.3 below, the Licensee shall notify the Commission of:

18.1.1. any change in the proportion of the shares held directly in a Licensee by any person, and

18.1.2. the acquisition of any shares and such shares not being shares already listed in any stock exchange held directly in a Licensee by a person not already holding shares, and the proportion of such shares held by that person immediately before acquisition.

18.2. The Licensee shall notify the Commission prior to any entity acquiring ownership or control of all or a majority of the stock of the Licensee such that the Licensee shall stand as a subsidiary in relation to that entity.

18.3. The Licensee shall be obliged to notify the Commission of any acquisition of shares or change in shareholding of the Licensee by any person and such shares not being shares already listed in any stock exchange only if, by reason of that acquisition or change, the total number of shares in the Licensee held by that person together with any shares held by any nominee or trustee for that person immediately after the change or acquisition:

18.3.1. exceeds 15 per cent of the total number of shares in the Licensee (where it does not exceed 15 per cent prior to that change or acquisition);

18.3.2. exceeds 30 per cent of the total number of shares in the Licensee (where it does not exceed 30 per cent prior to that change or acquisition), and

18.3.3. exceeds 50 per cent of the total number of shares in the Licensee (where it does not exceed 50 per cent prior to that change or acquisition).

18.4. In any case referred to in 18.1 or 18.2, notification shall be given by a date, which is thirty (30) days prior to the taking effect of such change or acquisition, as the case may be.

18.5. In instances referred to in 18.2 and 18.3, if the Commission disapproves of the change in shareholding notified to it, it shall notify the Licensee within thirty (30) days of receipt of notification. The Commission may within sixty (60) days of notifying the Licensee of its disapproval, having taken into account representations made by interested parties, and giving reasons for its decision, prohibit the change in shareholding where it believes it is in the public interest to do so.

19. CONDITION 19: PRE-NOTIFICATION OF JOINT VENTURES

19.1. The Licensee shall notify the Commission not later than thirty (30) days before the taking effect of any of the agreements or arrangements to which this Condition applies giving particulars of the agreements and/or arrangements. The agreements or arrangements are an agreement with any person for the establishment or control of anybody corporate for the purpose of:

19.1.1. the running of a telecommunications system which requires a licence under the Act;

19.1.2. providing telecommunications services in Kenya which requires a licence under the Act;

19.1.3. carrying of content over telecommunications systems which requires a licence under the Act;

19.1.4. the production of telecommunications apparatus for supply in Kenya where that production would lead, in the Commission's view, to a monopoly situation which would not otherwise exist in relation to the supply of telecommunications apparatus of any description in Kenya;

19.1.5. an agreement for the establishment of a partnership for any of those purposes and in those circumstances, and

19.1.6. any other agreement or arrangement in the nature of the joint venture for the purpose of running a business which requires a licence under the Act or for the purpose of providing telecommunications services in Kenya.

19.2. 19.1 above applies in relation to an agreement or arrangement for the establishment or control of anybody corporate or partnership where the Licensee has or is to have not less than twenty (20%) per cent of the voting power in any organ controlling that body.

20. CONDITION 20: ACCOUNTING REQUIREMENTS

20.1. Within nine (9) months from the Effective Date, the Licensee shall submit to the Commission the accounting principles which relating to the running of the Licensed Systems and which allows the recording of investments, expenses and revenues in accordance with accounting standards recognised in Kenya.

20.2. Within sixty (60) days of the end of each fiscal year of the License, the Licensee shall deliver to the Commission its balance sheet as at the end of such fiscal year and the related statements of operations, equity and cash flows, in each case accompanied by a report thereon of independent auditors stating that such financial statements fairly present the financial position of the Licensee at the dates indicated and were prepared in accordance with accounting principles submitted to the Commission in accordance with 20.1 above.

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licensing amendments

20.3. The Commission may request the Licensee to submit other accounting information it may require in order to effectively supervise.and enforce the terms of this Licence and in particular if the accounting principles established by the Licensee fail to achieve the objectives set forth in that Condition.

21. CONDITION 21: REQUIREMENT TO PROVIDE INFORMATION

21.1. The Licensee is required to maintain such information as will enable the Commission to carry out its functions under the Act in such manner and at such times as the Commission may request.

21.2. The Commission shall have the right to request the Licensee to submit periodic reports, statistics and other data as well as request additional information with a view to supervise and enforce effectively the terms of this Licence.

21.3. In particular, by the 15th July of every year or as agreed by the Commission, the Licensee shall submit a Compliance Report detailing the performance of the previous operational year ended 30th June.

Compliance Returns which include Spectrum return forms

21.4. The Commission shall review the Compliance Report and:

21.4.1. If the Licensee is in compliance with the Licence, issue the Licensee with a Compliance Certificate in respect of compliance for the year under review, and

21.4.2. If the Licensee is not in compliance with the Licence, require the Licensee to remedy the area of non-compliance in accordance with the provisions of this Licence and the Act.

21.5. In making a request for information, the Commission will ensure that no undue burden is imposed on the Licensee in procuring and furnishing such information,

unless the Commission considers such information is essential to enable it to exercise its functions under the Act.

21.6. The Commission shall have the right to publish information which it receives under this Condition unless, following representations by the Licensee, the Commission is satisfied that the information is of such confidential nature that disclosure would have a material adverse effect on the Licensee's business.

22. CONDITION 22: DISPUTE SETTLEMENT

The dispute settlement mechanism set out in the Act shall apply to any dispute or disputes that arise out of the provisions of this Licence.

23. CONDITION 23: FORCE MAJEURE

23.1. Where the Licensee is impeded, hindered or otherwise prevented from carrying out any obligation contained herein, or as required by the Commission, by natural disasters such as fire, flood, earthquake, volcanic eruption, action of Government, state of war, civil common or insurrection, riots, embargo or any other cause beyond the control of the Licensee, the Commission may (after due consideration of the Licensee's request) exempt the Licensee from performing such obligation for so long as and to the extent that the performance of the obligation is affected by such force majeure.

23.2. The Licensee seeking to rely on force majeure as an exemption shall demonstrate to the Commission that it took all reasonable steps to minimize the impact of the force majeure on the performance of its obligations and where any Licensed Systems were damaged by such force majeure, that it took reasonable steps to repair or rebuild such systems once the force majeure had ceased or been eliminated.

24. CONDITION 24: LICENCE REVOCATION

Notwithstanding any other Condition in this License, the Commission may at any time revoke this Licence by giving six (6) months' notice in writing in any of the following circumstances:

24.1. if the licensee communicates to the Commission in writing on their intention to terminate the Licence;

24.2. if the Licensee does not provide evidence of commencement of the provision of the Licensed Systems nine (9) months from the Effective Date. The Licensee shall submit such evidence by completing a Compliance Report in order to satisfy the Commission that the Licensee has complied with this requirement;

24.3. if any amount payable under Conditions 27 is unpaid forty-five (45) days after the Commission notifies the Licensee that the payment is overdue, such notification not to be given earlier than fourteen (14) days after the date on which the payment is due;

24.4. if the Licensee has breached a Condition in this Licence, and in the Commissions opinion the breach is of a material nature, and the Licensee has failed to comply with any notice issued by the Commission under the Act or under the Regulations and thereafter has been given by the Commission a further sixty (60) days in which to make representations in relation to the matters set out in the earlier notice which the Commission has taken into account or matters which the Licensee believes are relevant and the Commission appears not to have taken into account;

24.5. if the Licensee is dissolved or enters into liquidation, bankruptcy or equivalent proceedings or makes a general assignment for the benefit of creditors, and

24.6. if the Licensee fails to notify the Commission of any of the events specified in Condition 18 or 19 and the Commission has given written notice to the Licensee that the Commission intends to revoke the Licence on the grounds set out in Condition 18 or 19 respectively.

After the end of the six (6) months' notice, the Commission shall publish a notice in the Kenya Gazette stating that it intends to revoke this Licence and setting out the reasons on which this intention is based. Revocation shall take effect seven (7) days following publication of the notice in the Kenya Gazette.

25. CONDITION 25: LICENCE RENEWAL

The Commission may renew this Licence at the request of the Licensee following the expiry of the Licence Period for an additional fifteen (15) years provided that the Commission has carried out a formal review to determine whether or not the Licence should be renewed, which review shall be concluded two (2) years prior to the expiry of the Licence Period.

26. CONDITION 26: LICENCE TRANSFER

The Licensee shall not assign, delegate, transfer or encumber in any manner the rights, interests or obligations under this Licence without the prior, express and written consent of the Commission, such consent not to be unreasonably withheld or delayed.

27. CONDITION 27: LICENCE FEES

The Licensee shall pay to the Commission:

27.1. An initial Licence fee amounting to Kenya Shillings fifteen million (KShs. 15,000,000) and upfront operating fee amounting to Kenya Shillings five million (KShs. 5,000,000).(note fees paid by existing licensees).

27.2. On 1st July of each year, an annual operating fee equivalent to zero-point-five percent (0.5%) of the audited annual gross revenues accruing from the Licensed Systems during the previous financial year or Kenya shillings five million (KShs. 5,000,000) only whichever is higher.

27.3. Any other fee payable under this Licence including but not limited to frequency and numbering fees.

Signed for and on behalf of Communications Commission of Kenya

Director General

17/4/09
Date

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ANNEX 1: SYSTEM EXPANSION REQUIREMENTS

I. In case of GSM-based wireless telephone services, the following **Network Coverage** shall apply:

TO BE COVERED BY 19TH DECEMBER 2010		
AREAS/DISTRICT		**MAJOR ROADS/HIGHWAYS**
• Nairobi and Greater Environs including Thika, Athi River, Ngong and Limuru • Kisumu • Nakuru • Naivasha • Eldoret • Machakos • Mtitu Andei	• Voi • Malindi • Mombasa and Costal strip from Diani to Malindi • Malindi • Meru • Kericho • Nyeri • Nanyuki	• Nairobi – Thika Road • Nairobi - Athi River • Nairobi – Limuru • Nairobi - Ngong • Nairobi–Mombasa Highway • Nairobi – Eldoret Highway • Nairobi – Kisumu Highway

TO BE COVERED BY 19TH DECEMBER 2012		
AREAS/DISTRICT		**MAJOR ROADS/HIGHWAYS**
• Gilgil • Kabarnet • Molo • Njoro • Magadi • Embu • Meru • Kitale • Kisii • Siaya • Busia • Bungoma • Kakamega • Webuye • Mumias • Kerugoya • Kilifi	• Migori • Diani • Kwale • Nyahururu • Muranga • Kajiado • Namanga • Karatina • Ahero • Kitui • Lamu • Lokichoggio • Garissa • Narok • Maseno • Sagana	• Kilifi – Malindi Road • Nairobi – Nyeri Road • Ahero – Kisii Road • Embu – Meru Road • Eldoret – Kitale Road • Nairobi – Namanga Road • Kisumu – Busia Road

II. {other requirements particular for any other Licensed Systems}

ANNEX 2: QUALITY OF SERVICE REQUIREMENTS

I. In case of GSM-based wireless telephone systems, the following minimum Quality of Service (QoS) thresholds shall apply:

Selected KPI	Threshold Targets	
	Implement Immediately	Implement After 3 Years
1) Completed Calls	90%	95%
2) Call Setup Success Rate	90%	95%
3) Dropped Calls	2%	2%
4) Blocked Calls	10%	5%
5) Speech Quality (MOS, PESQ)	95% > 2.7	95% > 3.1
6) Call Setup Time	< 13.5 s	< 13.5 s

Notes

As regards compliance assessment on the Quality of Service, the following procedures shall apply:

i) Besides the submission of returns by the Licensee on the QoS parameters, the Commission will continuously conduct independent QoS measurements in relation to the Licensee in all the provinces of the country;

ii) The results of each QoS parameter will be the average of all the measurements done for all the provinces during the entire reporting period of 12 months commencing from the effective date of this notice;

iii) The Licensee will only be assessed on the geographical areas of coverage where the license coverage obligation applies at the time of measurement;

iv) The Licensee shall achieve the threshold of at least 80% of the listed QoS parameters provided for in the license as per the returns and the independent QoS measurements;

v) Failure to achieve the threshold of at least 80% of the listed QoS parameters, after notification by the Commission to the Licensee, shall constitute non-compliance with the QoS Condition and the Licensee shall be liable to a penalty in accordance with the Act; and

vi) The Commission shall, prior to carrying out tests to verify compliance with this condition, share with the Licensee the QoS measurement framework to be used.

II. **{other requirements particular for any other Licensed Systems}**

ANNEX 3: APPLICABLE PENALTIES

The Licensee shall be subject to penalties as described in Section 26 of the Act. Unless otherwise stated, failure to comply with any of the Licence Conditions above will constitute a contravention which may be subject to a penalty.

In the event that the Licensee fails to remedy any contravention within three months after notification by the Commission, the Licensee shall be subject to a penalty of Kenya shillings five hundred thousand (Kshs 500,000) only for each contravention for every month or part thereof during which the contravention continues.

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Annex c: NEMA Correspondences

Annex d: Background Information Document (BID)

Annex E: Detailed Minutes from Stakeholder Engagement Meetings

Annex E: Photos from Stakeholder Engagement Meetings

Annex F: COVID-19 Mitigation Plan

Overview

Coronaviruses (CoV) are a large family of viruses that are common and are typically associated with mild illnesses, similar to the common cold.

A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans. The severe diseases have included:

- Middle East Respiratory Syndrome (MERS-CoV) (first reported in 2012, all cases have been linked to countries in or near the Arabian Peninsula)
- Severe Acute Respiratory Syndrome (SARS-CoV)

On 31 December, 2019, a new coronavirus was identified in China (Wuhan City), and was initially known as 2019 Novel Coronavirus (2019-nCoV). It has been now formally named COVID-19. Its identification was confirmed on 07 January 2020.

COVID-19 presents with fever and symptoms of lower respiratory illness (e.g., cough or difficulty breathing). Fever may not be present in all patients. Identification of COVID-19 is made through tests as well as patient history (especially recent travel).

The COVID-19 global pandemic is impacting construction projects on many levels. Delays, disruptions and uncertainty as well as increased costs present a number of challenges. Questions are asked about approaches to manage the risks on active construction projects globally. Below is a plan to manage the risks of the current COVID-19 epidemic to construction workers and to surrounding communities.

Keeping Construction Sites Open

- If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place; and
- Our site operating procedures will be consistent with national efforts but also be cognisant of the local situation to avoid confusion and duplication of effort

Social Distancing

- Home working for those that can.
- Virtual meetings, or where meetings are essential, restricting numbers so social distancing can be actively practiced.
- Altering shift patterns to reduce numbers on site so that social distancing can be achieved (can also help to reduce congestion on public transport)
- Planning site activities to facilitate social distancing

- Reduce camp densities and redistribute workers within worker camps to facilitate social distancing (e.g. reducing the number of people occupying a dormitory).
- Secure alternative housing provisions for workers housed outside accommodation camps to facilitate distancing and to minimise interactions with communities.
- Close, or amend hours for canteens; stagger meals times and remove every second chair so that no one can sit beside or opposite another person.
- Stagger access to toilets, shower rooms, drying rooms and gyms etc to facilitate social distancing.
- Practice social distancing for toolbox talks.
- Reduce number of people attending training; hold training/awareness raising outside if facilities are cramped.

Health Screening and Cleaning

- Active health screening, for example, employee checks at entrances to worker camps
- Increase number of cleaners and frequency of cleaning, especially with common shared contact surfaces (e.g. door handles, drinks dispensers, taps, desks, etc.)
- Increase handwashing facilities and provision of protective equipment (e.g. hand sanitiser, gloves and face masks, etc.)

Quarantine and Access Restrictions

- Quarantine for incoming expatriate workers;
- Quarantine for all residents of an accommodation block / work group if one case emerges;
- Work teams selected to reduce transmission risk (i.e. keeping work teams from different camps / locations apart);
- Use of questionnaires to assess risk for allowing access; and
- Restrict access and egress from camps and construction sites:
    - No exit for camp residents (needs to be balanced by provision of other means to assure wellbeing); and
    - No, or highly restricted access from outsiders (e.g. essential supplies only)

Employee Wellbeing

- Regular transparent communications to reassure workforce;
- Additional wellbeing options at worker camps e.g. providing televisions in each bed room; additional internet access; organising virtual exercise classes, faith group sessions or similar (survey the workforce to assess interest);
- Support emotional and mental wellbeing of all employees by facilitating access to counselling resources, or organising relevant local groups like faith groups to be on-virtual- hand to support those in need;

- Wage and job protection; and
- Clear communication on how benefits can be accessed.

Community Interaction

- Goal is to minimise risk of Project spreading virus into, within and between communities.
- Assess and mitigate all activities that bring Project personnel into direct, or indirect contact with communities.
- Restrict/cancel face to face engagement, CSR activities etc.
- Revisit stakeholder engagement and information disclosure channels:
    - How to safely keep communities informed; and
    - How to provide a safe means of collecting and responding to grievances.
    - Use alternative means, appropriate to the communities, to distribute information:
        - Social media
        - Online/virtual public information displays
        - Public address systems mounted on vehicles
        - Leaflets and posters

Annex G: Marine Cable Survey report

Annex H: Project Health, Safety & Environment Management Plan

Annex I: No Objection Letters

Annex J: Beach Manhole Structural Design

Annex J: Project BOQ