ENVIRONMENTAL MANAGEMENT PLAN: FOR THE PROPOSED TELECOMMUNICATION BASE TRANSCEIVER STATION (BTS) TOWER IN NCAUTE VILLAGE, KAVANGO EAST REGION, NAMIBIA.

DATE: JULY 2020

D&P ENGINEERS
AND ENVIRONMENTAL CONSULTANTS
"Purpose with Passion"

PowerCom
(PTY) LTD

The Proposed Telecommunication Base Transceiver Station (BTS) Tower in Ncaute Village, Kavango East Region, Namibia: Environmental Management Plan (EMP)

Environmental Management Plan Prepared for

Powercom Pty Ltd

Erf 1970 Robert Mugabe Avenue,
Unit 2 Maerua Heights, Klein Windhoek
Phone: +264 (0) 61 201 2090
Email: info@powercom.na

D&P Engineers and Environmental Consultants (Pty) Ltd.

20 Joseph Mukwayo Ithana Street
Ludwigsdorf,
Windhoek-Namibia
PO Box 8401, Bachbrecht,
Telephone: +264 (61) 302 672/ 081299 8444
Facsimile: +264 (61) 255 207
Email: tdavid@dpe.com.na
https://www.facebook.com/DP-Engineers-and-Environmental-Consultants-193970370936785/

Project Number APP-001547

July 2020

Compiled by:

D&P Engineers and Environmental
Consultants (Pty) Ltd
Email: tkasinganeti@dpe.com.na
Authors:
Tendai E. Kasinganeti

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Definitions

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

i. Purpose of This Environmental Management Plan

This Environmental Management Plan follows on environmental flaws associated with the proposed project, which were identified through the Environmental Scoping Report. A conscious decision was made based on the recommendations and guidelines by the Directorate of Environmental Affairs EIA guidelines in order to assess both significant and less significant environmental impacts proposed by the development. The developed Environmental Management Plan (EMP) for this proposed activity will have to be effectively implemented by the client, to ensure that adverse environmental impacts are not considered.

The framework within which this EMP is developed includes identifying various activities, their occurrence in the construction and operation processes and the likely impacts that are associated with those activities.

It is therefore necessary to subcategorize the EMP into Construction and Operational activities. The first category of the EMPr which deals with project activities identified and highlight the activities impacts and the phases they are likely to occur. In this respect, this EMP alludes on anticipated construction activities and the mitigation measures that will need to be applied to reduce the severity of the impacts the proposed development may have on the surrounding environment. This will also include rehabilitation measures that will need to be implemented once the construction is completed and how to continuously monitor the plant in accordance to monitoring parameters highlighted herein.

ii. EMP PRINCIPLES

The following principles have informed the compilation of this environmental management Plan:

- The environment is considered to be composed of both biophysical and social components.
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Construction, in general, is a disruptive activity and all due consideration must be given to the environment, particularly the social environment, during the execution of the project to minimize the impact on the affected parties.
- Minimization of areas disturbed by construction activities will reduce the severity of the construction related environmental impacts and reduce rehabilitation requirements and costs.
- As minimum requirements, relevant standards relating to international, national, regional and local legislation, where applicable, shall be adhered to. This includes

requirements relating to waste emissions (e.g. hazardous, airborne, liquid and solid), waste disposal practices, noise regulations, road traffic ordinance etc.

- Reasonable measures to avoid pollution and environmental degradation are to be provided for.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling, or minimizing further pollution, environmental damage or adverse health effects must be paid for by the person responsible for harming the environment.
- The responsibility for the environmental, health and safety consequences of the proposed development exists throughout its life cycle

1. CHAPTER ONE: BACKGROUND

1.1. Introduction

Telecom Namibia's information and technology infrastructure development subsidiary, **Powercom (Pty) Ltd** is on a drive of construction network towers across the country. Powercom targets that, other than improving internet and voice connectivity in the regions, there is also a need to increase the company's footprint and asset base to best service ICT stakeholders and offer better connectivity in all regions of the country.

The proponent, **Powercom Pty Ltd** has been requested by Telecom Namibia (TN) mobile to install a telecommunication Base transceiver station tower in Ncaute Village. This development comes after various requests by the Shakambu Farmers Association, Hannes Balzar and Alfons Siyere (Shakambu Chairman), requesting the Telecom Namibia to provide Voice and Data services at Ncaute, Baramasoni , kapupahedi and surrounding villages in Kavango East Region.

In terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007)), an EIA is required to obtain an Environmental Clearance Certificate from the Ministry of Environment and Tourism (MET) before the project can proceed. Furthermore, as per the requirements of the Environmental Management Act No. 7 of 2007, Powercom has appointed **D&P Engineering and Environmental Consultants** to conduct an Environmental Assessment (EA) and develop an Environmental Management Plan (EMP) for the proposed project.

This has been followed by an application for Environmental Clearance Certificate (ECC) to the Ministry of Environment, Forestry and Tourism (MEFT): Directorate of Environmental Affairs (DEA).

In this respect, this document forms part of the application to be made to the DEA's office for an Environmental Clearance certificate for the proposed construction and operation of a telecommunication tower, in accordance with the guidelines an statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. Project Location

The project site is proposed in Ncaute Village, on the Southern boundary of Ncaute secondary school in Kavango East Region, Namibia. Please refer to the map below (Fig 1) giving a locality layout of the site:

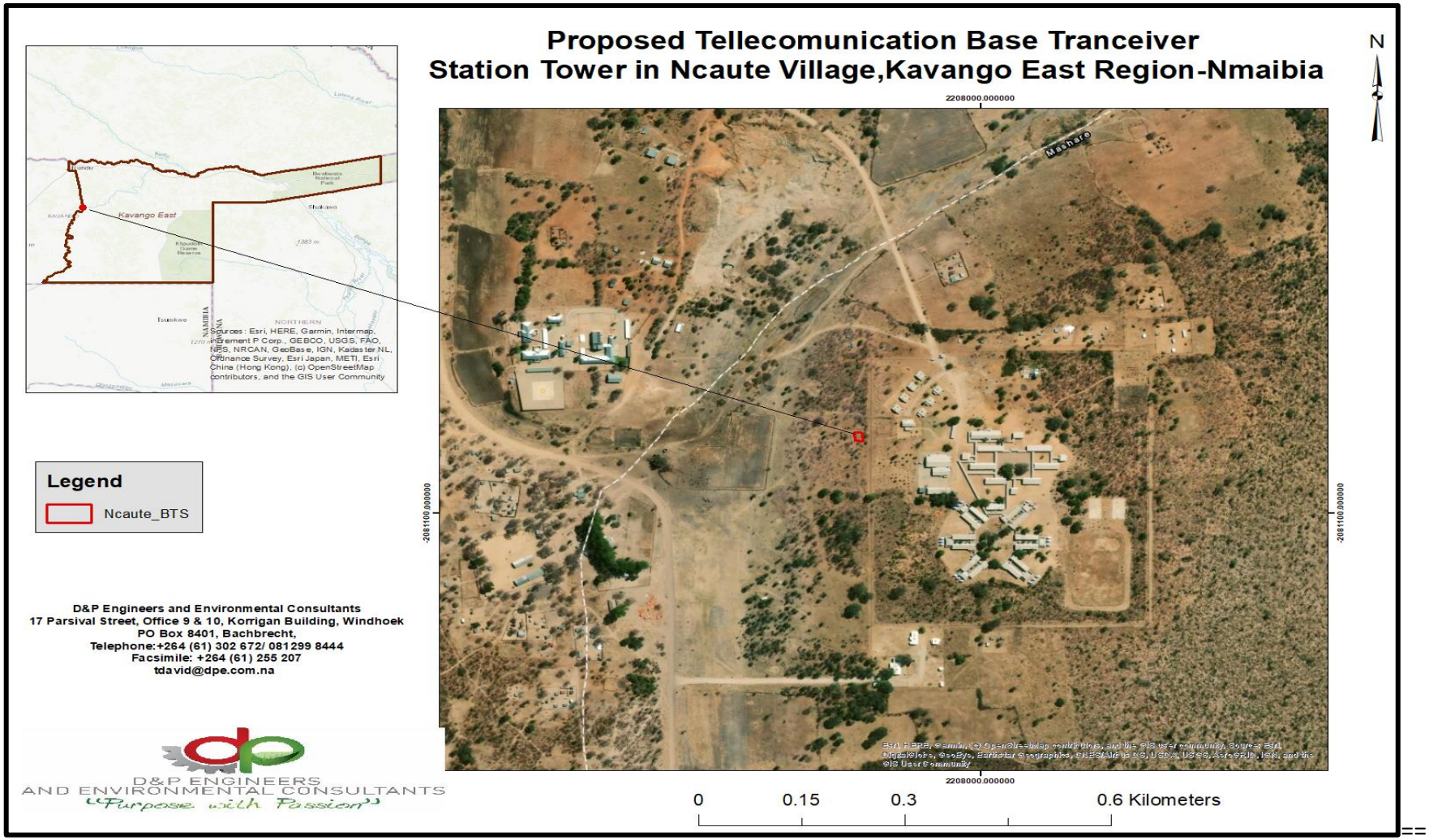

Figure 1: Proposed Project Site.

1.3. Project Overview

The proponents intend to establish a telecommunication base transceiver station tower in Ncaute Village. The proposed development is earmarked to improve network connectivity for the fast growing Ncaute Village as well as its surrounding villages and resettlement farms. The operations of the tower will be conducted with a high degree of safety for employees, equipment and neighbouring land uses. The proposed infrastructure will have minimal impacts on the natural resources, i.e. water, fauna and flora.

1.4. Proposed project infrastructure

The project will involve construction of a base transceiver station tower encompassing the following:

- 80m Guyed mast within the footprint size of a 20m x 20m area
- Container building to house radio and network equipment
- Perimeter fencing
- Site access road

The site will be connected to the nearby electricity transformer at Ncaute Secondary School and the tower site layout will be as illustrated below:

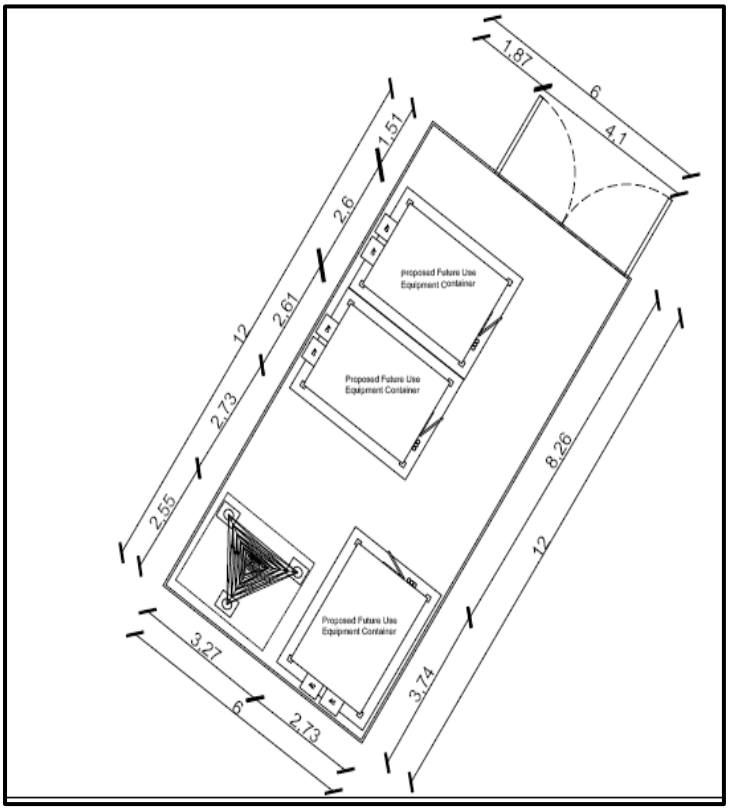

Figure 2: Left-Proposed Tower site layout

Figure 3: Right-Typical Network tower

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the EIA is identifying and reviewing the administrative, policy and legislative frameworks concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed project. This section looks at the legislative framework within which the proposed development will conform to; the focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in the table below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

Table 1:Policies, legal and Administrative regulations

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: - Guarding against overutilization of biological natural resources, - Limiting over-exploitation of non-renewable resources, - Ensuring ecosystem functionality, - Maintain biological diversity.	-Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability, through bringing development in an environmentally sensitive way.
Vision 2030 and National Development Plans	Namibia's overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	The proposed project, is an important element in employment creation, ICT and communication is crucial to rural development as well as a contribution to achieving the Vision 2030 of the country.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.	-Telecommunication infrastructure requires environmental clearance because it is a listed activity. -Through abiding to the requirements of the Environmental Assessment Policy of Namibia. The EIA and EMP will cater for the sustainable management of biophysical environment.
Environmental Management Act No. 07 of 2007	The Act aims at	This document is compiled in a nature that project implementation is in line with the objectives of the EMA. EIA

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	✓ Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; ✓ To provide for a process of assessment and control of projects which may have significant effects on the environment; The Act gives legislative effect to the Environmental Impact Assessment Policy. Moreover, the act also provides procedure for adequate public participation during the environmental assessment process.	guiding procedures developed by MET were also used in the course of this project.
Public Health Act (No. 36 of 1919)	Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	-The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected as will be alluded in the EMP. -Personal protective equipment shall be provided for employees in construction. -The development shall follow requirements and specification in relation to water supply and sewerage handling and solid waste management so as not to threaten public health of future residents on this piece of land.
Soil Conservation Act 76 of 1969	The objectives of this Act are to: ▪ Make provisions for the combating and prevention of soil erosion, ▪ Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.	-The project will have a rather localized impact on soils and on the soil through clearance for construction -It is however important to note that project footprint is restricted to 20 sqm x 20sqm

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Nature Conservation Ordinance 1996	To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The proposed project implementation is not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.
Protected Areas and Wildlife Management Bill	This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where necessary, rehabilitated and that essential ecological processes and life support systems be maintained. It protects all indigenous species and control the exploitation of all plants and wildlife.	Environmental recommendations and considerations on this project has ensured that the proposed activities will not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site, which is however unlikely because the areas forms part of urban locale.
Forest Act, 2001 (Act No. 12 of 2001)	The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).	-The proponent will have to ensure that there is no indiscriminate removal of vegetation in the area.
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	-The project proponent has been advised by the D&P Engineers and Environmental Consultants and recognises the need for ecosystems protection to manage the changing climatic environment.
National Policy on Climate Change for Namibia, 2010	In harmony with the findings of the IPCC over time and the Earth Summits held annually, the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	-The proponent during construction should ensure that there are limited greenhouse gas emissions from machinery--No blasting is expected to be conducted on site.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Water Resources Management Act, 2013 (Act No. 11 of 2013)	This Act provides for the management, protection, development, use and conservation of water resources. This also forms the regulation and monitoring of water resources.	The proposed activities are not expected to have any direct impacts on surface and ground water because of its scale.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development. (National Heritage	During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be older than 50 years, all measures will be taken protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or (d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.	The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Pollution Control and Waste Management Bill	This bill has not come into force. Amongst others, the bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	-To control air, water and land pollution as agitated by the Bill, the project proponent will ensure that proposed project activities will abide by the EMP's specification in terms of pollution prevention to land, water and air during the construction and operation phases.
Atmospheric Pollution Prevention Ordinance 11 of 1976	To provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto.	-Dust emission from construction activities, could be a great risk to the ambient air quality, hence there will be strict abidance to this Act. Employee health and safety will also be prioritised.
Electricity Act 4 of 2007	Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b) In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	-Obliges Powercom to comply with all relevant provisions of the Electricity Act and its regulations when installing electrical connections to the tower.
Electricity Act 4 of 2007	Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b) In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	-Obliges Powercom to comply with all relevant provisions of the Electricity Act and its regulations when installing electrical connections to the tower.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
The Atomic Energy and Radiation Protection Act, Act 5 of 2005:	Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP.	-Justifies the need for assessing the impact of electromagnetic radiation from the mas on the nearby residents. -2G telecommunication masts are not expected to have any negative impacts on nearby residents in terms of radiation propagation.
Hazardous Substances Ordinance 14 of 1974 Regulations Made in Terms Of Hazardous Substances Ordinance 14 of 1974 sections 3 and 27	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	-Powercom will have to conform to this Act and its regulations through application for relevant licences with the relevant bodies highlighted thereto. -However, the proposed technologies do not pose such dangers to the public or the natural environment.
Convection on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve vegetation on site as part of their plans for green and sustainable development.

3. CHAPTER THREE: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The proposed Ncaute BTS tower will have environmental impacts as indicated in the Environmental Scoping Report (ESR). This section describes the Environmental Management Plan (EMP) for impacts associated with the proposed development. The EMP stipulates the management of environmental programs in a systematic, planned and documented manner. The EMP below includes the organizational structure, planning and monitoring for environmental protection at the proposed project development and other areas of its influence. The aim is to ensure that the proponent maintains adequate control over the project operations to:

- To prevent negative impacts where possible;
- Reduce or minimise the extent of impact during project life cycle;
- Prevent long term environmental degradation.

3.1. EMP Administration

There is a strong need to clearly outline the roles and responsibilities of all stakeholders to ensure that the EMP is fully implemented. To ensure that the EMP is effectively implemented, the consultant also recommends that MEFT: DEA also conduct regular inspection visits on site to enforce conducting of quarterly and biannual reports.

Furthermore, there is also a need for the proponent to appoint an overall responsible person to ensure the successful implementation of the EMP as highlighted below:

Table 2: Roles and Responsibilities in EMP Implementation

ROLE	ENVIRONMENTAL RESPONSIBILITIES
Powercom	Responsible to enforce EMP implementation during construction and operation phases.
Environmental Control Officer (ECO)	Implement, review and update the EMP. • Ensure all reporting and monitoring required under EMP is undertaken, documented and distributed as needed • Conduct environmental site training (tool box talks) and inductions with the support of an environmental consultant. • Conducts environmental audit at work site with the support of environmental consultant. • Ensure compliance and Bi-Annual reporting • Ensure materials being used on site are environmentally friendly and safe.
The Directorate of Environmental Affairs	Approve the EMP and any amendments to the EMP. • Approve reports of environmental issues and non-conformances as issued. • Review and approve environmental reports submitted as part of EMP implementation • Ensure that the client is compliant to the EMP through biannual reporting on environmental performance.
Site/ Project Manager	Control and monitor actions required by the EMP. • Report all environmental issues to Powercom. • Ensure documented procedures are followed and records kept on site. • Ensure any complaints are passed onto the management within 24 hours of receiving the complaint.
Site Employees	Follow requirements as directed by the EMP when conducting work. • Report any potential environmental issues to site manager, indicating any possible non-conformances observed

Table 3 : Construction and Operation EMP (C&O EMP)

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Ensure contractors are aware of the required management measures stipulated in the EMPr.	1)	This EMPr must form part of the contractual agreements with the specific contractors.	Once Off	Project Manager	Contractors	Construction & Pre-Construction
Ensure all construction staff is familiar with the Environmental awareness Plan.	2)	-The contractor is expected to have safety “tool box” talks in accordance with the risks and trends associated with the project. Proof of these talks shall be kept on site.	Daily	Contractor	ECO	Pre-Construction , Construction and Decommissioning
	3)	- The contractor will develop a specific emergency procedure and plan.	Once Off	Contractor	ECO	Pre-Construction
Increase employment Opportunities.	4)	Labour (skilled and unskilled) and contractors employed for the proposed project should be sourced locally.	Once Off	Contractor	Project Manager	Pre-Construction , Construction and Decommissioning
	5)	Local business will be used where unskilled labour is required. Reputable local business will be used where available.	Once Off	Contractor	Project Manager	Pre-Construction , Construction and Decommissioning

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Minimise the impact on surrounding land uses and employees due to dust emissions.	6)	-Construction dust must be contained in the processing plant area, such that it does not affect neighbouring land uses	Once Off	Project Manager	Project Manager	Construction and Maintenance
	7)	Solid waste will be removed from site frequently so as to prevent the accumulation of waste on site.	Continuous	Project Manager	Project Manager	Construction, Operation and Maintenance
Minimise the potential exposure of employees and neighbouring operations to diseases.	8)	-Dust suppression and provision of PPE will be prioritised to prevent dust related illnesses such as Bronchitis. -Prior to employment, employees should be medically tested for fitness.	When Required	Project Manager	Project Manager	Construction, Operation and Maintenance
	9)	Clean overalls, gumboots and face protection PPE will be provided for.	Continuous	Project Manager	Project Manager	Construction, Operation and Maintenance
	10)	Workers should be adequately trained to follow all safety procedures and wear protective equipment provided.	Once Off	Project Manager	Project Manager	Operations
Minimise the impact of migrant workers and possible crime increase.	11)	No recruitment “at the gate” will be allowed.	Daily	Contractors	Project Manager	Construction, Operation and Maintenance
Reduce misconduct by employees on site.	12)	No alcohol /drugs are permitted on the construction site.	On going	Contractor, Employees	Project Manager	Construction, Maintenance

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
	13)	Each contractor will employ their own Safety Officer to monitor the safety conditions during the construction phase.	Daily	Employees/Contractor	ECO	Construction, Operation and Maintenance
	14)	No unauthorised ignition sources will be permitted on site and debris/waste shall not be burnt under any circumstances.	Daily	Employees/Contractor	ECO	Construction, Operation and Maintenance
	15)	All provisions of the Labour Act Nr 11 of 2007 in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work' must be complied with	On-going	Employees/Contractor	ECO	Construction, Operation and Maintenance
Prevent the loss of soil resources as a result of soil stripping.	16)	The construction footprint will be fenced off and unnecessary disturbance will be minimised.	Once Off	Employees/Contractor	ECO	Construction
	17)	Topsoil stripped will be stockpiled and reused for rehabilitation purposes following construction activities.	Once Off	Contractor	ECO	Construction
	18)	All excavations will be backfilled with sub soil and topsoil in the reverse order to which the soil profiles were removed.	Once Off	Contractor	ECO	Construction
Prevent sterilisation of soils as a result of hydrocarbon / chemical / waste contamination.	19)	No foreign matter such as rubble, waste or hazardous material will be mixed with the topsoil or used to backfill excavation.	Daily	Contractor	ECO	Construction

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
	20)	Spills will be cleaned up immediately after the incident. Contaminated soil will be disposed of as hazardous waste at a licensed hazardous landfill facility.	Daily	Contractor	ECO	Construction
	21)	Drip trays or a Polyvinyl chloride (PVC) lining shall be provided for equipment utilising hydrocarbons.	Daily	Contractor	ECO	Construction
	22)	No waste will be buried or burned on site.	Daily	Project Manager	Project Manager	Construction
	23)	Under no circumstances may open areas or the surrounding vegetation be used as toilet facilities		Project Manager	Project Manager	Construction & Operation
	24)	Toilets, permanent or portable/temporary, shall be Maintained in a hygienic state and serviced regularly. Portable toilets, should they be required, should be serviced by a reputable contractor and the contents shall be removed to a licensed disposal facility.	On-going	Contractor	Project Manager	Construction
Prevent contamination of surface water resources and onsite erosion as a result of contained runoff.	25)	No project infrastructure will be located within the 1:100 year flood lines or within 100 m of any perennial tributaries.	Daily	Project Manager	Project Manager	Construction

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
	26)	The development footprint will be landscaped in order to prevent pooling of water.	Once Off	Project Manager	ECO	Construction and Operation
	27)	No hazardous chemical must be discarded in the sewage or storm water system.	Daily	Project Manager	ECO	Operation
	28)	Energy dissipaters will be places at discharge points to reduce surface water runoff and possible pollution.	Once Off	Project Manager	Project Manager	Operation
Prevent the pollution of the surrounding environment as a result of waste generation, incorrect waste disposal and housekeeping.	29)	Waste will be sorted at source.	Daily	Employees/ Contractor	ECO	Construction, Operational and Decommissioning
	30)	Waste receptacles will be kept closed at all times when not in use.	Daily	Employees/ Contractor	ECO	Construction, Operational and Decommissioning
	31)	Littering on site is forbidden and the site must be cleared of litter at the end of each working day.	Daily	Employees/ Contractor	ECO	Construction, Operational and Decommissioning
	32)	Where possible, materials used or generated by construction activities must be recycled.	Weekly	Employees/ Contractor	ECO/ Project Manager	Construction, Operational and Decommissioning
	33)	Waste will not be stored for a period exceeding 90 days Or volumes exceeding 100 cubic metres.	Weekly	Employees/ Contractor		Construction, Operational and Decommissioning

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
	34)	Waste generated on the proposed site should be collected by authorised waste contractors and frequently disposed of at a licensed landfill site as the last resort. Recycling/reuse of waste should be enforced where feasible.	Weekly	Employees/ Contractor	ECO/ Project Manager	Construction, Operational and Decommissioning
Prevent the impact on water and soil resources through the accidental spillage or leakage of waste or the incorrect storage/handling of hazardous substance.	35)					
	36)	Cleaning of equipment/vehicles should be done in a designated area to prevent soil and water pollution.	Weekly	Employees/ Contractor	ECO/ Project Manager	Construction and Decommissioning
	37)	Storage areas containing hazardous substances/materials are to be clearly demarcated and labelled.	Daily	Employees/ Contractor	ECO/ Project Manager	Construction and Decommissioning
	38)	Remediation of spillages must be conducted as far as practically reasonable.	On-Going	Employees/ Contractor	ECO/ Project Manager	Construction and Decommissioning
	39)	When mortar is used on site, the following guidelines apply: - Carefully control all on-site operations that involve the use of mortar and concrete; - Limit mortar mixing to single sites where possible;	Daily	Employees/ Contractor	ECO/ Project Manager	Construction and Decommissioning

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	**Timeframe**	**Executing Party**	**Monitoring Party**	
		- Use plastic trays or liners when mixing mortar and concrete: Do not mix mortar and concrete directly on the ground; - Dispose of in the approved manner				
Prevent possible sedimentation of water resources as a result of runoff from cleared areas.	40)	No alterations to banks or beds of watercourses is allowed (a dry gully is also recognized as a water course);	On-going	Contractor/Employees	ECO	Construction and Decommissioning
	41)	Stockpile will be shaped to divert storm water around the site to minimise soil erosion of the site as well as to prevent the contaminated water runoff.	On-going	Contractor	ECO	Construction and Decommissioning
	42)	Use of biodegradable sanitiser should be used to prevent pollution of soil and water resources.	Once off	Project manager	ECO	Operation
	43)	The storm water drainage system must be adequately designed based on site conditions in order to ensure the free flow of surface run-off.	Daily	Project manager	ECO	Operation
Ensure electrical line is done with minimal disturbance to the environment	44)	Ensure that the electrical right of way is approved by NORED	Once Off	Project manager	ECO	Construction

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Prevent possible groundwater contamination as a result of hazardous waste spillage and uncontrolled waste handling.	45)	No equipment or tools with oil or grease is allowed to be placed on bare ground, these must always be placed on a lined surface.	Weekly	Contractor/Employees	ECO/ Project Manager	Construction, Operational and Decommissioning
	46)	Cement mixing will take place on a lined surface. No Cement will be mixed on a bare surface.	Weekly	Contractor/Employees	ECO/ Project Manager	Construction, Operational and Decommissioning
	47)	No waste will be allowed to be disposed of into excavations.	Weekly	Contractor/Employees	ECO/ Project Manager	Construction, Operational and Decommissioning
	48)	Waste water will be contained to prevent the ingress into the groundwater system.	Weekly	Contractor/Employees	ECO/ Project Manager	Construction, Operational and Decommissioning
	49)	Sewage facilities will be maintained and kept in a good order to prevent any sewage spills. -The septic tanks will always be maintained and emptied when required. All sewerage waste is under the Management of the municipality.	Weekly	Contractor/Employees	ECO/ Project Manager	Construction, Operational and Decommissioning
	50)	Cleared areas will be rehabilitated as soon as these areas are not in use anymore.	Following Construction	Project Manager	ECO	Operations

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Reduce the impact of noise on surrounding land uses and employees.	51)	Construction activities should be restricted to 07:00hrs to 17:00hrs during weekdays and 08:00hrs to 13:00hrs during weekends.	Daily	Contractor/Employees	ECO	Construction and Decommissioning
	52)	Machinery will be kept in good working order to reduce noise emissions.	Daily	Contractor/Employees	ECO	Construction and Decommissioning
	53)	Should noise be problematic, silencers will be fitted to construction vehicles and generators.	Weekly	Contractor/Employees	ECO	Construction and Decommissioning
	54)	Demolish and remove all infrastructure not required post closure.	Following Construction	Contractor/Employees	ECO	Construction and Decommissioning
	55)	Any complaints received must be recorded in the Complaints Register.	Daily	Contractor/Employees	ECO	Construction and Decommissioning
Minimise pollution as a result of uncontrolled waste disposal and storage.	56)	Recyclable waste must be stored separately from waste disposed to landfill.	Weekly	Contractor/Employees	ECO	Construction, Operational and Decommissioning
	57)	Waste will be stored in designated areas.	Daily	Contractor/Employees	ECO	Construction, Operational and Decommissioning
	58)	Waste bins will be labelled for their designated use.	Daily	Contractor/Employees	ECO	Construction, Operational and Decommissioning

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Protect artefacts of cultural or archaeological importance.	59)	If any human remains (or any other concentrations of archaeological heritage material) are exposed during construction, all work must cease and it must be reported immediately to the nearest museum/archaeologist or to the NHC, so that a systematic and professional investigation can be undertaken	Daily	ECO	Project Manager	Construction,
	60)	Construction workers will be made aware of the requirement to report archaeological discoveries	Weekly	ECO	Project Manager	Construction,
Minimise the impact on the visual character of the surrounding areas by the construction of the plant infrastructure.	61)	Artificial lighting will be restricted to areas under construction. Yellow sodium lights will are recommended on site as they do not attract as many invertebrates at night and will not disturb the wildlife.	Once Off	Project Manager	Project Manager	Construction & Operation
	62)	Natural vegetation, wherever possible, must be retained.	On-going	Project Manager	Project Manager	Construction & Operation
	63)	The structures on site must be designed to minimise visual intrusion.	Once Off	Project Manager	Project Manager	Construction & Operation
	64)	The colour selection and tone must be carefully considered to mitigate visual impacts.	Once Off	Project Manager	Project Manager	Construction & Operation

Objective	No.	Monitoring				Project Stage
		Mitigation and Management Measures	Timeframe	Executing Party	Monitoring Party	
Minimise the safety risks due to increased possibility of crime and safety conditions of employees.	65)	Clear sign boards should be erected at the entrance to the site to indicate that a construction area is being entered and safety precautions should be followed;	Once Off	Contractor/Employees	Project Manager/ECO	Construction
	66)	Notification signs must be posted around the site warning residents and visitors about the hazards around the construction site;	Once Off	Contractor/Employees	Project Manager/ECO	Construction
	67)	Workers should be adequately trained to follow all safety procedures and wear protective equipment where required;	Continuous	Contractor/Employees	Project Manager/ECO	Construction & Operation
Prevent the impacts resulting from traffic intrusion (Air and Road)	68)	Reduce the amount of trucks entering the premises by transporting larger loads;	Continuous	Contractor/Employees	Project Manager/ECO	Construction
	69)	Speed limits will be restricted on the access road to 10 km/h.	Continuous	Contractor/Employees	Project Manager/ECO	Construction & Operation
	70)	Air traffic intrusion should be avoided through visible towers and a blinking tower light.	Continuous	Contractor/Employees	Project Manager/ECO	Construction & Operation
	71)	The operational footprint will be kept as small as possible. All disturbed areas will be rehabilitated.	Continuous	Project Manager	Project Manager/ECO	Construction & Operation

4. Environmental Managment Programme

4.1. Overview

The following management programme need to be implemented during construction, operation and decommissioning of the proposed network tower and its associated infrastructure envisaged.

- Construction Management Plan;
- Construction Control Plan,
- Rehabilitation Plan; and
- Operation Management Plan.

Many of the issues to be addressed in these plans are regulated in existing laws, regulations and guidelines. In addition, it is recognized that the content of several plans will be generic, in the sense that existing procedures are documented in standard code of practice, and that adaption of such generic plans will only be possible as a dynamic process during construction, operation and decommissioning.

4.2. Construction Management Plan

The construction management plan to be implemented by the contractor shall include the following key measures:

4.2.1. Management of Construction Campsite

1. The contractor shall comply will all relevant laws and regulations concerning water provision, sanitation, wastewater discharge and liquid and solid waste handling and disposal. The contractor is referred to the requirements of the EMA
2. The construction camp will be access controlled to prevent the access of livestock and local fauna.
3. The contractor shall not locate the campsite, or sanitation facilities, in any areas in which vegetation is pristine, nor within 100 m from any watercourse.
4. The contractor shall at all times carefully consider the machinery required for the desired task while minimizing the extent of environmental damage.
5. The contractor shall keep construction campsites clean and tidy at all times.
6. The contractor shall not leave domestic waste uncontained, and temporary storage shall be enclosed to keep out people and animals.
7. No permanent domestic waste disposal shall be permitted at the campsites.
8. All domestic refuse is to be removed to an existing licensed landfill site.
9. The contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures may include appropriate instruction of employees about the fire risks and the construction of firebreaks around the site perimeter.

10. All vehicles and plant will be allocated a dedicated parking area in the camp site. Plant still standing for long periods of time will be provided with a drip tray in order to contain any possible hydrocarbon spills. Drip trays will be provided with absorbent material on a permanent basis.
11. Adequate firefighting equipment shall be made available and maintained on site.
12. Decommissioning of the campsite will involve removal of all compacted platforms and slab foundations or as agreed with the land owner.

4.2.2. Management of Fuels and other Hazardous Materials

13. The contractor shall comply with all applicable laws, regulations, permits and approval conditions and requirements relevant to the storage, use and proper disposal of hazardous materials.
14. The contractor shall manage all hazardous materials and wastes in a safe and responsible manner, and shall prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials.
15. Should soil be contaminated by hazardous substances, soil will be removed and disposed of at a registered hazardous waste disposal facility.
16. The contractor shall not construct fixed fuel storage or refuel any vehicle or equipment within 100 m from a watercourse or wetland, within a floodplain, or where there is the potential for spilled fuel to enter a watercourse or groundwater. Should it not be possible to establish such facilities outside the 100 m zone, the contractor shall ensure that the necessary precautions to prevent and clean up spillages.
17. The contractor shall enclose a fixed storage.
18. The contractor shall place on – site tools and equipment, such as pumps, compressors, and generators on impermeable sheeting (i.e. polyethylene or other similar materials) to prevent hydraulic fluid or fuel leaks from contaminating soils or groundwater or entering any watercourse or wetland.
19. The contractor shall take all reasonable precautions to prevent fuel and lubricant spills during the course of construction. To this end, the contractor shall ensure that regular audits are performed to verify that no leakage or defective equipment is brought onto site.
20. The contractor shall ensure that there is sufficient spill containment and absorbent material available on site to manage accidental spills. The contractor shall immediately clean up accidental spillages of fuel and oils, or other hazardous substances.

4.2.3. Management of the Construction Footprint

21. The contractor shall prevent littering and the random discard of solid waste on the site.
22. The contractor shall manage hazardous waste.
23. The contractor shall minimize the risk of fires.
24. The contractor shall prevent trespassing on the site.

25. The contractor shall prohibit, and actively monitor and prevent, poaching or harassment of wild animals by contract employees.
26. The contractor will ensure that travelling speeds do not exceed 10 km/h and shall ensure that this restriction is enforced. This may include, but not limited to, the monitoring of vehicle speeds and the erection of speed limit signs.

4.2.4. Management of Dust and Noise Nuisance during construction and tower maintenance

27. The contractor shall control dust along the construction footprint so as to ensure that no detrimental effects to occupiers of the land or general public are caused. Control measures to be considered include the use of water browsers to wet down surfaces that have been denuded and which have the potential to generate dust.
28. Wetting of denuded areas, including the topsoil stockpile, will be done in such a manner than only enough water is utilized for dust suppression, and to ensure no unduly runoff is caused.
29. The contractor shall comply with legal requirements for the management of noise impacts.
30. The contractor's employees shall not make recreational use of all – terrain vehicles or motorcycles on site.
31. An appropriate freeboard will be enforced for trucks hauling dirt, sand, soil and other lose materials. All material transported by trucks will be covered to prevent undue nuisance dust during transportation.

4.2.5. Waste Management

32. Temporary storage of construction waste will be limited to within the construction camp site, and areas designated.
33. The contractor shall be responsible for the collection and removal of waste from the construction site.
34. The contractor shall arrange for the removal of waste on a weekly basis to a registered landfill site. Records of this disposal shall be kept on site.
35. Hazardous waste will be separated from domestic waste and stored is demarcated bins.
36. Hazardous waste bins will be stored on a hard standing surface, covered and made water tight.
37. The contractor shall respect the property and rights of the landowners and occupiers at all times and shall treat all such persons with courtesy.
38. Access over land, the integrity of fences, the closure of gates, control of veld fires, littering, dust control, noise abatement, harassment of animals, sedimentation and contamination of surface and ground water, damage to landscape and vegetation, and all such environmental matters, shall be controlled as far as practical by the contractor in the best interests of Powercom.

4.2.6. Complaints Register

39. The contractor and proponent shall establish and maintain a register for periodic review by the Project Management Team that logs all complaints raised by I&APs about the construction and operational activities.
40. The register shall be regularly updated and maintain records, including the name of the complainant, his/her domicile and contact details, the nature of the complaint and if any action was taken to rectify the problem.

4.2.7. Rehabilitation Plan

41. The contractor shall restore the construction footprint to the natural contours of the ground and shall allow normal surface drainage, as far as practical.
42. The contractor shall loosen compacted soils along the construction footprint by means of a plough or scarified. Scarifying areas where topsoil has been removed shall be carried out prior to the replacement of topsoil. Care shall be taken to avoid topsoil inversion if scarifying is carried out in areas where topsoil has not been removed. Any ripping or scarifying operations shall not exceed a depth of 100 mm.
43. The contractor shall prevent concentrated runoff along, or next to, the construction footprint, and shall do so by shaping the land, establishing vegetation, and taking other appropriate measures to absorb and disperse runoff.
44. In places where erosion control is required, including gullies, watercourses, large depressions, and steep slopes, the contractor shall construct diversion banks across the construction footprint to divert the flow of water away from the construction area and into the natural drainage courses.
45. Where the land is naturally armoured with surface rock or stone, the contractor shall, after construction, replace the armouring over the construction footprint to protect against erosion.

4.2.8. Operational Management Plan

46. The tower should operate in compliance with regulations and recommendations from Namibia Civil Aviation Authority.
47. Tower safety features such as paint and tower lighting should always be maintained and kept in the right working order.
48. General network tower maintenance should follow construction recommendations for anything applicable to which, i.e. waste, safety, I&Aps as well as site management.
49. Tower site security should ensure that the network tower is safe from vandalism.
50. The tower Environmental Clearance Certificate should be renewed every three years from date of ECC Approval, to update the EMP.
51. Emphasis to consult the traditional authority on any developments on the tower site should be upheld and observed at all times

5. External Auditing

The key to a successful EMP is appropriate monitoring and review to ensure effective functioning of the EMP and to identify and implement corrective measures in a timely manner. In the event where discrepancies are identified, the problem must be investigated and attended to. All the results obtained during environmental monitoring must be documented for audit purposes.

An audit of the environmental management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards. Audits should be conducted during the construction phase of the facility to ensure adherence to the management measures contained in the EMP. The construction audit schedule will be determined by the conditions of the ECC such as Biannual reports. The frequency of the construction and operational audits may vary and will be synchronised with the construction schedule.

During Operation, audits will also be undertaken by an appointed consultant, in addition every 6 months from the awarding of the Environmental Clearance Certificate a report will be compiled on environmental performance. It is imperative to understand a clearance certificate is valid for 3 years only, after which a renewal will have to be applied for along with performance report over the past years in terms of environmental compliance to existing legislation and this EMP.